STATEMENT OF BASIS / PROPOSED FINAL SOIL REMEDY DECISION	REGION 2 ID# PR2170027203

NAVAL ACTIVITY PUERTO RICO (former Naval Station Roosevelt Roads)
Ceiba, Puerto Rico
April 2015

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, or indeno(1,2,3-cd)pyrene in site soils.

FACILITY DESCRIPTION

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 occurred from the various storage tanks, resulting in the release of petroleum hydrocarbons to the environment.

CORRECTIVE MEASURES STUDY

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 U.S. Environmental Protection Agency (EPA) approved the CMS in February 2006.

The final approved remedial action for groundwater, containment and collection of free product via collection wells using skimming methods, monitored natural attenuation for the dissolved constituent groundwater plumes, along with institutional controls restricting the use of groundwater, has been implemented and is ongoing at SWMU 7 and 8.

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 polycyclic aromatic hydrocarbon (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).

Revised CAOs for the chemicals of concern (COCs) are presented in Table 1. Since the CAOs for SWMUs 7/8 were developed in 2003 and 2005, the EPA requested these CAOs be revised using the latest calculation methods and toxicity factors. The revised CAOs were calculated for the latest toxicity factors and calculation methods per the EPA Regional Screening Levels (RSLs). Therefore, revised CAOs were calculated for the chemicals detected in soils. This Statement of Basis proposes the final corrective measures for soil associated with the SWMUs.

TABLE 1
Revised 2012 Corrective Action Objectives

Chemical of Concern	Maximum Observed Concentration		Surface Soil CAO[3]	Total Soil CAO* [3]	Soil Revised CAO* [4]	
	Historical Maximum[1]	2009-Maximum [2]			Industrial Land Use	Residential Land Use
Arsenic	3.4	4.3	3.81	55	3.81	0.39/2.5**
Benzo(a)anthracene	6J	ND	7.8	73	7.8	0.15
Benzo(a)pyrene	23J	ND	7.8[3]	7.3	7.3	0.015
Benzo(b)fluoranthene	5.9J	ND	7.8	73	7.8	0.15
Indeno(1,2,3-cd)pyrene	5.3J	ND	7.8	73	7.8	0.15

CAO Corrective Action Objective

(1) From Table 5-2 of Final CMS Task I Report (Baker, 2005).

(2) From Table 3-1 of CMS Addendum for SWMU 7/8, (June, 2012).

(3) Based on the EPA RSLs calculator, November 2011 from the following weblink: http://www.epa.gov/region9/superfund/prg/. See CMS Addendum report for details.

(4) For Benzo(a)pyrene, CAO is based on a target risk of 1×10^{-5} while residential RSL is based on a target risk of 1×10^{-6}.

* Based on industrial worker protection

** Arsenic background level is 2.5 mg/kg J Estimated values

NA Not Applicable

All values reported in milligrams per kilogram (mg/kg).

FIELD INVESTIGATION

In preparation for performing the soil excavations, a soil sampling was conducted to improve the delineation of the areas for excavation. The objective of this post CMS investigation was primarily to delineate the extent for excavation at each of the three areas as follows:

- 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.

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.

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.

DISCUSSION OF RESULTS

PAH

During the 2009 sampling event, eighteen soil samples were collected and analyzed for PAH compounds benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, and indeno(1,2,3-

cd)pyrene. The newly collected samples were collocated with previously detected PAH areas, in addition to other samples collected from a grid across the recommended excavation areas. Analytical results indicated that all normal sample results were below the reporting limits as well as below the method detection limits (MDLs) in all normal samples, including areas with previous high detections. One duplicate sample had low level PAHs; however, the sample did not exceed revised CAOs for industrial land use and was only slightly above the residential RSL value. Based on the undetectable level of PAHs, site-wide concentrations are below industrial use based levels. The MDLs are slightly higher than the residential RSLs value of 0.015 mg/kg. However, based on absence of any of the PAHs at the MDLs, PAHs are no longer persistent in site soils. The absence of PAH concentrations currently in site soils could be attributable to the degradable nature of PAHs in exposed soils over time as a result of exposure to sun, air, and presence of bacteria acting as degradation agents.

Therefore, no further actions are recommended for soil PAHs due to their absence above MDLs in the upper 2 feet of soil in any of the three areas of concern indicated by the 2005 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 revised CAO of 3.81 mg/kg in the following two borings: B23 and B26 (Figure 2). The background arsenic value is 2.5 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 SWMUs 7/8 is naturally occurring using the 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 (COCs).

Historically, arsenic has been reported as a common naturally occurring element in soil on the island of Puerto Rico. A 2003 study issued by the Agency for Toxic Substances and Disease Registry indicates that arsenic occurs in soil on the island of Puerto Rico at concentrations ranging from 1 to 22 mg/kg (Agency for Toxic Substances and Disease Registry. 2003. Petitioned Public Health Assessment, Soil Pathway Evaluation, Isla De Vieques Bombing Range, Vieques, P.R. February 7). Inorganic background levels for the NAPR property were provided in a background report (Summary Report for Environmental Background Concentrations of Inorganic Compounds. 2006), which included arsenic background levels to be between 0.21 mg/kg to 2.5 mg/kg, with an estimated upper-limit concentration of 2.65 mg/kg. Arsenic is not a contaminant of fuel oils such as those formerly used at the TWFF, and no other metals were identified as a COC.

Overall distribution of arsenic across the areas of concern is random and does not indicate a distinct distribution pattern; this distribution is most likely representative of soil mineralogy of the area. In addition, arsenic distribution is similar among the majority of samples collected across the site, with no elevated or “source” area. Therefore, detected arsenic appears to be related to the natural soil variability and mineralogy, and does not indicate a site-specific release.

The surface soil background level for arsenic of 2.65 mg/kg and the revised CAO of 3.81 mg/kg were not exceeded by the site-wide statistical estimates for arsenic. The arsenic site-wide statistical estimate (UCL95%) value for arsenic is 2.5 mg/kg, indicating site arsenic levels are within background levels and do not exceed the surface soil revised CAO.

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 and 2.5 mg/kg, which are below the revised CAO of 3.81 mg/kg, as well as the background levels of 2.65 mg/kg. No single detection is indicative of extremely elevated values. Therefore, the detected arsenic levels at SWMUs 7/8 are considered naturally occurring within the surface soil and no further action is recommended for arsenic in site soils.

Overall distribution of arsenic across the areas of concern does not indicate an area-specific release; arsenic presence is most likely representative of soil mineralogy of the area. Therefore, detected arsenic appears to be related to the background soil, and represents the natural soil variability and mineralogy, and arsenic levels are also below the revised CAO for industrial land use.

PROPOSED FINAL REMEDY

In summary, site soil residual concentrations for the COCs, PAHs and arsenic, are either below detection limits or similar to background levels. Therefore, no further action (NFA) is recommended for site soils at SWMUs 7/8 under industrial land use, as soils do not pose exposure related risks to human health or the environment.

The existing land use controls (LUCs) are included as part of the corrective action to prevent unintended land use for the area, and also exposure to shallow groundwater. The current LUCs include the following:

- A restriction on land use to non-residential uses only.
- A restriction on access and/or certain invasive activities in areas where surface soil, subsurface soil and or sediments are contaminated.
- A restriction on use of groundwater and installation of new wells in or near areas of known groundwater contamination.
- Prior to the construction of any improvements, the potential for vapor intrusion from groundwater and possible resulting impacts to air quality must be considered and properly addressed by any developer.

Existing LUCs are further described in the Quitclaim Deed for CDR Parcel 2 (includes SWMU 55) signed by the Navy and the Local Redevelopment Authority (LRA) on December 20, 2011. The LRA is in agreement with future reuse and appropriate restrictions outlined herein as noted in the attached letter dated May 4, 2015. Under current land use, access to the SWMUs 7/8 area is controlled through security fencing, and this institutional control (IC) will be maintained into the foreseeable future, until CAOs are achieved. The LUCs will be included in any lease or transfer deed. If development other than industrial use (i.e., residential or per the April 2010 amended Reuse Plan) is proposed, the new owner will be required to work with the PREQB and EPA to establish any additional investigation, risk assessment, and/or cleanup activities. If the property owner wishes to remove the LUC on the groundwater from the deed in the future, it will be the responsibility of the property owner to demonstrate that groundwater meets all state and federal requirements, and must obtain approval from the Navy, EPA, and PREQB prior to LUC removal.

The proposed remedy and corrective action will continue to be evaluated to ensure long term effectiveness and protection of human health and the environment.

PUBLIC PARTICIPATION

Public review and comment on the proposed remedy for SWMUs 7/8 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.

Public Comment Period

May 15, 2015 through June 15, 2015

Submit Written Comments

Written comments on this Statement of Basis for SWMU 7/8 will be accepted during the public comment period. To submit comments or obtain further information on the proposed remedy for SWMU 7/8 or request a public meeting, please provide written correspondence to:

Douglas M. Pocze
USEPA Project Manager
ERRD-SPB-FFS
290 Broadway
New York, NY 10007-1866

If requested during the Public Comment Period, a public meeting will be held to respond to any oral comments or questions regarding the proposed determination. The public will be notified of the date, time, and place of any public meeting as soon as it is scheduled.

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.

Summary Report for Environmental Background Concentrations of Inorganic Compounds, dated October 17, 2006.

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

Revised Corrective Action Objectives for Solid Waste Management Units 7&8, 54, and 55, dated June 1, 2012.

FURTHER INFORMATION

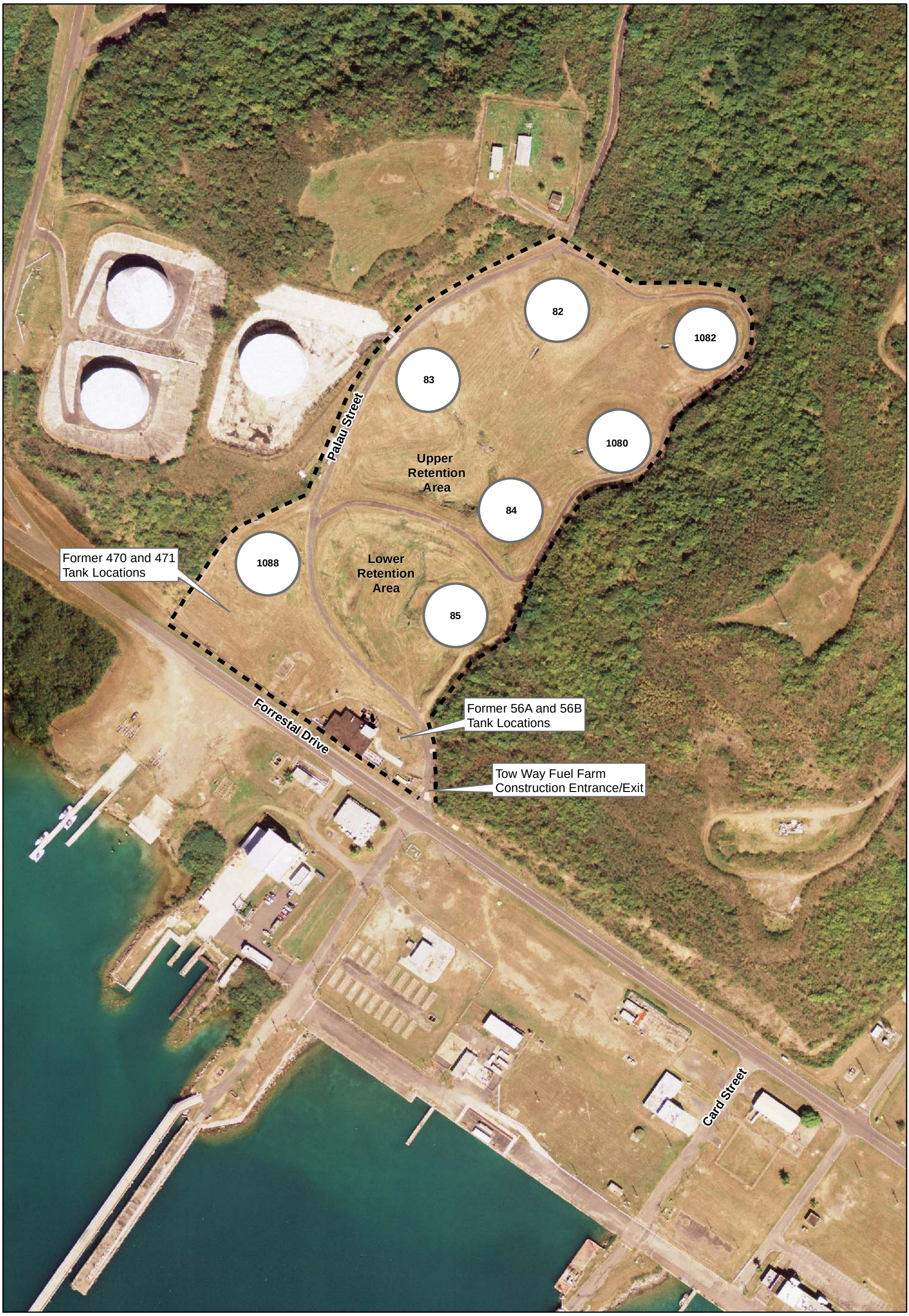
The Administrative Record documents can be reviewed anytime at:

http://go.usa.gov/8mnm

During regular business hours, a hardcopy of the Statement of Basis and reference documents listed under Key Documents will be available for public review.

Puerto Rico Environmental Quality Board
Land Pollution Control Area – 3rd Floor
Hazardous Wastes Permits Division
San José Industrial Park
1375 Ponce de Leon Ave.
State Road 8838, El Cinco
Río Piedras, PR 00926
Attn. Ms. Gloria Toro (Project Manager), phone 787-767-8181 x3586 or x3581 (Secretary)

Ceiba Library – Ceiba Mayor's Office
Lauro Piñero Avenue
Plaza de Recreo
Ceiba, PR 00735, phone 787-885-2180



Fence

Former Fuel Tank

Originated By: Thomas Kessler *Thomas Kessler*
Checked By: Philip Jones *Philip Jones*

N

0 100 200 Feet
1 inch = 200 feet

FIGURE **1**
SWMU 7/8 Base Map
Tow Way Fuel Farm
Naval Activity Puerto Rico

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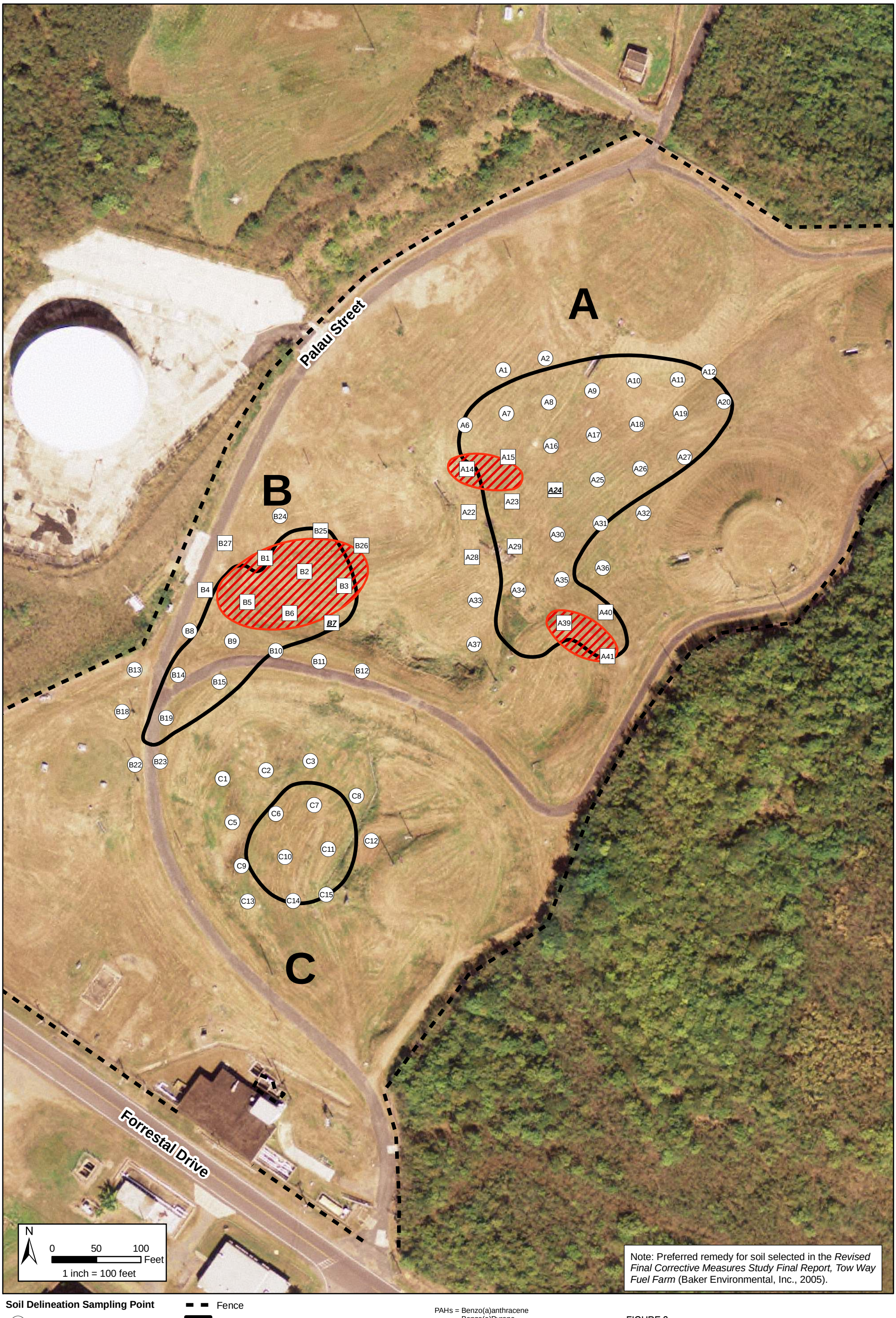

Soil Delineation Sampling Point

- 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

CH2MHILL

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COMMONWEALTH OF PUERTO RICO
DEPARTMENT OF
ECONOMIC DEVELOPMENT
& COMMERCE
DDEC

ROOSEVELT
ROADS

Local Redevelopment Authority
#355 FD Roosevelt Ave., Of. 106
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Tel: 787-758-4747

LRA-15-99

May 4th, 2015

Mr. Gregory Preston
Director
Naval Facilities Engineering Command
BRAC Program Management Office East
203 S. Davis Drive, Bldg. 247
Joint Base Charleston, SC 29404

Re: Statement of Basis for SWMU 7/8, 54, 55 and 75, Naval Activity Puerto Rico, Ceiba, PR

Mr. Preston:

As part of the ongoing environmental remediation and cleaning process being conducted by the U.S. NAVY in Former Naval Station Roosevelt Roads (FNSRR), the Roosevelt Roads Local Redevelopment Authority (RRLRA) is issuing this letter in response to the U.S. Environmental Protection Agency (USEPA) and the Puerto Rico Environmental Quality Board (PREQB) requirements, related to the statement of basis for the SWMU's 7/8, 54, 55 and 75.

The RRLRA hereby acknowledges and accepts the recommendations and final corrective measures proposed by the NAVY, EPA and PREQB on all the aforementioned SWMU's as pursuant to the Resource Conservation and Recovery Act (RCRA).

Best regards,

María de L. Blázquez
Executive Director
Roosevelt Roads Local Redevelopment Authority