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October 27, 2010

U.S. Environmental Protection Agency – Region II  
290 Broadway – 22<sup>nd</sup> Floor  
New York, NY 10007-1866

Attn: Mr. Adolf Everett, P.E.  
Chief, RCRA Programs Branch

Re: Contract N62470-10-D-3000  
IQC for A/E Services for Multi-Media  
Environmental Compliance Engineering Support  
Delivery Order (DO) 0002  
U.S. Naval Activity Puerto Rico (NAPR)  
EPA I.D. No. PR2170027203  
Final Statement of Basis for SWMUs 13, 53, and 46/AOC C

Dear Mr. Everett:

Michael Baker, Jr., Inc. (Baker), on behalf of the Navy, is pleased to provide you with one hard copy of the Final Statement of Basis for SWMU 13, the Final Statement of Basis for SWMU 46/AOC C, and the Final Statement of Basis for SWMU 53, Naval Activity Puerto Rico for your review and approval.

These documents have been modified as requested by the EPA in the email from Timothy Gordon dated October 19, 2010 and the PR EQB comments dated August 30, 2010 in the email from Timothy Gordon on October 19, 2010. Additional distribution has been made as indicated below.

If you have questions regarding this submittal, please contact Mr. Mark Davidson at (843) 743-2124.

Sincerely,

**MICHAEL BAKER JR., INC.**

A handwritten signature in black ink that reads "Mark E. Kimes".

Mark E. Kimes, P.E.  
Activity Coordinator

MEK  
Attachments

cc: Ms. Debra Evans-Ripley, BRAC PMO SE (letter only)  
Mr. David Criswell, BRAC PMO SE (letter only)  
Mr. Mark E. Davidson, BRAC PMO SE (1 hard copy)  
Mr. Pedro Ruiz, NAPR (1 hard copy)  
Mr. Tim Gordon, USEPA Region II (1 hard copy)  
Mr. Carl Soderberg, US EPA Caribbean Office (1 hard copy)  
Ms. Bonnie Capito, NAVFAC Atlantic–Code EV42 (1 hard copy for the Administrative Record)  
Mr. Felix Lopez, US F&WS (1 hard copy)  
Mr. Brenda Smith, TechLaw, Inc. (1 hard copy)  
Ms. Wilmarie Rivera, PREQB (1 hard copy)  
Ms. Gloria Toro, PREQB (1 hard copy)

**STATEMENT OF BASIS/ PROPOSED FINAL REMEDY DECISION**REGION 2  
ID# PR2170027203**NAVAL ACTIVITY PUERTO RICO (former Naval Station Roosevelt Roads)  
Ceiba, Puerto Rico  
(October 26, 2010)****Facility/unit Type:** SWMU 13 – Former Pest Control Shop and associated Drainage Ditch**Contaminants:** PAHs, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, alpha-chlordane, gamma-chlordane, dieldrin**Media:** sediment**Proposed Final Remedy:** Excavation and off-site disposal of 61.47 tons of contaminated sediment from a drainage ditch.**FACILITY DESCRIPTION**

On October 20, 1994, a Final Resource Conservation and Recovery Act (RCRA) Part B permit was issued by the USEPA Region 2 to Naval Station Roosevelt Roads (NSRR). This permit contained requirements for RCRA Facility Investigation (RFI) activities at specified Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs), including SWMU 13.

SWMU 13 consists of the area that contained the Old Pest Control Shop (Building 258), including the drainage ditch along Forrestal Drive. Pesticides for use on the base were mixed and pesticide application equipment was cleaned at this location. This area was not used for pesticide storage. The Old Pest Control Shop was demolished in 1988 following excessive hurricane damage. The site currently consists of a concrete paved area surrounded by grass on the east and south and secondary growth vegetation on the north and west. SWMU 13 is bordered on the east by a grass-covered, concrete-lined drainage swale. This drainage swale parallels Forrestal Drive.

The drainage swale leads to a culvert that directs water flow west-southwest under the site to an outlet in the wooded area.

During a Phase I RFI 4,4'-DDD, 4,4'-DDE, and 4,4'-DDT exceeded the residential risk-based concentrations (RBCs) in at least three of the sediment samples. During the Phase II RFI all six of the pesticides detected (4,4'-DDD, 4,4'-DDE, 4,4'-DDT, alpha-chlordane, dieldrin, and gamma-chlordane) exceeded the residential RBCs in at least two of the samples and in as many as seven of the samples. The industrial RBCs were exceeded for 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, and dieldrin.

**EXPOSURE PATHWAYS**

Based on data from the Phase I and Phase II RFI investigations, screening of sediment data from SWMU 13 resulted in unacceptable risks for on-site commercial workers and future military residents. Exposure pathways considered included dermal contact, incidental ingestion and inhalation of dust.

Pathways for human health risks were eliminated by removal of sediments in the drainage ditch above approved remedial goals.

**SELECTED REMEDY**

The remedial goals for SWMU 13 were based on the current property use, the future use of Naval Activity Puerto Rico (NAPR) as an industrial facility, and the most likely future potential human and ecological receptors. Values selected to protect human receptors were based on commercial/industrial worker scenarios. They are also more conservative (therefore more protective) than values calculated for construction workers because commercial/industrial workers would likely encounter long-term exposure. Selection of more conservative military residential goals or other EPA-published health-based screening criteria such as risk-based concentrations (RBCs) would be overly conservative because there is no current housing at SWMU 13, nor is residential use of the property likely to occur in the future. The following table summarizes the remedial goals for SWMU 13.

Compound	Remedial Goal
Pesticides	
Dieldrin	0.2 mg/kg
4,4'-DDT	6.3 mg/kg
4,4'-DDD	6.3 mg/kg
4,4'-DDE	9.0 mg/kg
alpha - Chlordane	7.0 mg/kg
gamma – Chlordane <sup>(1)</sup>	7.0 mg/kg
Total cPAHs	10 mg/kg

Note: Total cPAHs include: Benzo(a)anthracene, benzo(a)pyrene, benzo(b)floranthene, benzo(k)floranthene, chrysene, indeno(1,2,3-cd)pyrene and dibenzo(a,h) anthracene.  
(1) Also identified as beta-Chlordane

Soils were excavated to achieve the remedial goals. Institutional controls will be required to prohibit future residential development.

**INNOVATIVE TECHNOLOGIES CONSIDERED**

Excavation and off-site disposal of contaminated soil was a presumptive remedy for this SWMU. Excavation and off-site disposal is proven and commonly used at remediation and general construction sites. It is reliable, effective and easily implemented. Clean-up goals could be achieved using this method and it could provide an immediate benefit to the environment. Therefore, no innovative technologies were considered.

**CORRECTIVE ACTION COMPLETED**

Heavy equipment was mobilized on April 10, 2006. It was obtained from local suppliers. Site preparation included verification of utility locations with on-site Navy personnel, installing erosion controls, clearing and grubbing, constructing lay-down and staging areas, establishing access routes for equipment and transport vehicles, and delineating work areas. The excavation was completed with appropriately sized heavy equipment, primarily a backhoe and included the removal of 61.47 tons of sediment. When confirmation samples indicated that contaminant concentrations were above remedial goals over-excavation was performed. Most of the activities were completed by June 2006. Additional removal, disposal and restoration were completed from January to April 2009. Upon completion excavation, the ditch was filled with stones, topped with 1" of gravel and compacted.

**PUBLIC PARTICIPATION**

Public review and comment on the completed remedy for SWMU 13 will be implemented as required by the USEPA. A public notice of the public comment period will be published in both Spanish and English in select Puerto Rico newspapers.

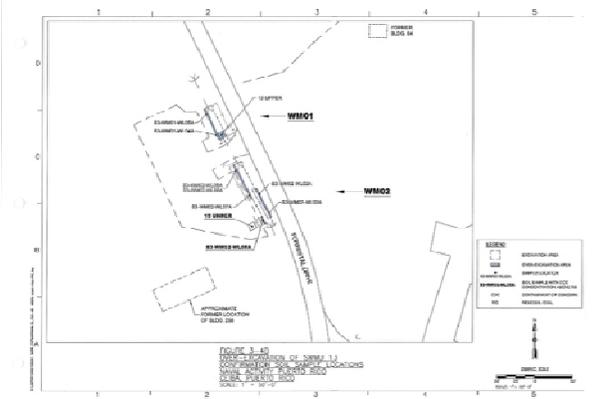
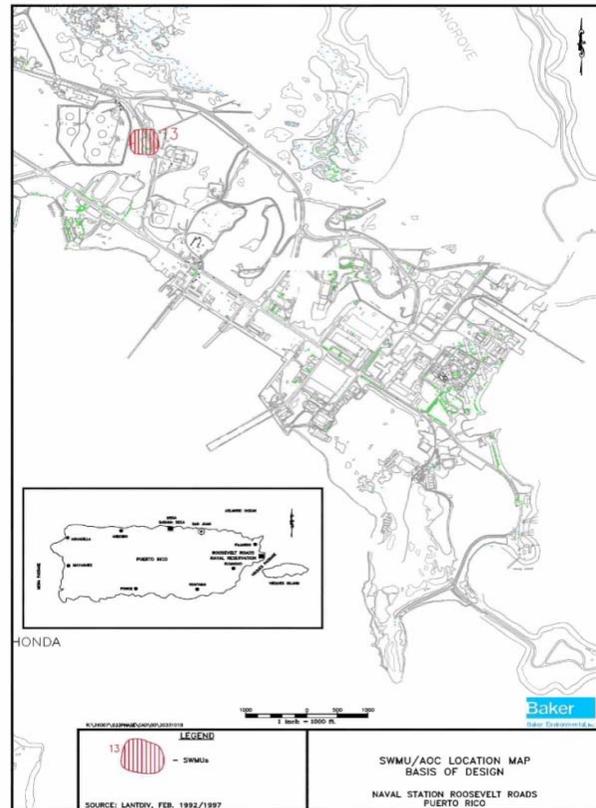
**NEXT STEPS**

Following completion of public review and comment on the completed remedy, the USEPA will advise NAPR of any required modifications based on the public comments, or its acceptability. Following USEPA's input concerning the implemented remedy, NAPR will amend the remedy (if required).

Corrective Action Complete (CAC) with controls is recommended for this SWMU. The controls will consist of a deed restriction prohibiting residential development at this site.

**KEY DOCUMENTS**

- Revised Final II CMS Final Report SWMU 13 and SWMU 46/AOC C, August 4, 2000.
- 100% Basis of Design Corrective Measures Implementation Work Plan for SWMUs 13 and 46/AOC C, January 25, 2001.
- Final Project Closeout Report – Remedial Action for Soil Remediation at Various Sites (SWMU's 9, 13, 46, and 53) and AOC C, August 6, 2010.



**KEY WORDS**

SWMU 13, Sediment, PAHs, benzo(a)pyrene, 4,4'-DDD, 4,4'-DDE, 4,4'-DDT, alpha-chlordane, dieldrin, and gamma-chlordane, excavation, off-site disposal, NAPR, NSRR, CAC, corrective action complete

**FURTHER INFORMATION**

U.S. Environmental Protection Agency  
Region 2 RCRA File Room  
290 Broadway, 15<sup>th</sup> floor  
New York, NY 10007-1866  
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U.S. Environmental Protection Agency  
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Santurce, PR 00907-4127  
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phone 787-977-5855

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 the following internet web page address: <http://nsrr-ir.org/>

**STATEMENT OF BASIS/ PROPOSED FINAL REMEDY DECISION**

**REGION 2  
ID# PR2170027203**

**NAVAL ACTIVITY PUERTO RICO (former Naval Station Roosevelt Roads)  
Ceiba, Puerto Rico  
(October 26, 2010)**

**Facility/unit Type:** SWMU 46/AOC C – Pole Storage Yard Covered Pad and the Transformer Storage Pad

**Contaminants:** PAHs (Benzo(a)pyrene, Dibenzo (a,h) anthracene) and PCBs

**Media:** Surface soil

**Proposed Final Remedy:** Excavation and off-site disposal of 113.04 tons of contaminated soil from a depth of approximately six-inches from five areas designated MU01, MU02, MU03, MU04 and MU05.

**FACILITY DESCRIPTION**

On October 20, 1994, a Final Resource Conservation and Recovery Act (RCRA) Part B permit was issued by the USEPA Region 2 to Naval Station Roosevelt Roads (NSRR). This permit contained requirements for RCRA Facility Investigation (RFI) activities at specified Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs), including SWMU 46/AOC C.

SWMU 46 and AOC C are located adjacent to each other behind Buildings 2326 and 2042 along Valley Forge Road. SWMU 46 consists of two concrete pads, (approx. 25x40 and 28x60 feet). The pads are covered by a roof, the sides are open, and the area containing the pads is surrounded by a chain-link fence. The concrete pads are surrounded by grassy areas. Both pads were used as "under 90-day" hazardous waste storage/accumulating facilities for base operations. Before this, various materials of an electrical nature were stored on the pads.

AOC C is south and adjacent to SWMU 46. AOC C consists of three raised concrete pads with curbing. The two northern pads are divided into two sections by a concrete curb (approx. 34x15 and 52x32 feet). The southern pad is one continuous pad measuring (approx. 20x53 feet) During the RFI, the three pads contained numerous transformers. Staining was observed on all three pads. The eastern third of the middle pad was covered with tar. The area surrounding the pads was overgrown with tall grass and shrubs.

A Phase I RFI was conducted at SWMU 46/AOC C in 1996 and additional investigations were performed in 1998. Several carcinogenic polynuclear aromatic hydrocarbons (cPAH) were detected above residential risk-based concentrations (RBC) in surface soil samples at SWMU 46/AOC C. Benzo(a)pyrene exceeded the industrial RBC in three samples (2 from SWMU 46 and one from AOC C). One surface soil sample from SWMU 46 exceeded the industrial RBC for dibenzo(a,h)anthracene. Polychlorinated biphenyl (PCBs) exceeded residential RBCs in 19 samples at both SWMU 46 and AOC C, and exceeded the industrial RBCs in 7 samples at both SWMU 46 and AOC C. Inorganic parameters (primarily arsenic and beryllium) exceeded residential and/or industrial RBC screening criteria. Inorganic parameters were later

eliminated from further consideration during the risk evaluation process because these elements did not produce unacceptable carcinogenic risks or noncarcinogenic hazard quotients or hazard indices.

**EXPOSURE PATHWAYS**

Based on data from the Phase I RFI and subsequent supplemental data, risk screening of soil data from SWMU 46/AOC C resulted in unacceptable carcinogenic risks for on-site commercial workers and future military residents. Exposure pathways considered included dermal contact, incidental ingestion and inhalation of dust.

Pathways for human receptors were eliminated by removal of surface soils above the approved remedial goals.

**SELECTED REMEDY**

The remedial goals for SWMU 46 were based on the current property use, the continued industrial use of the Naval Activity Puerto Rico (NAPR) property, and the most likely future potential human and ecological receptors. These values were selected to protect commercial/industrial workers from contaminants in surface soil. The following table summarizes the remedial goals for SWMU 46/AOC C.

Compound	Remedial Goal
PCB-1260	25 mg/kg
Total cPAHs	10 mg/kg

Note: Total cPAHs include: benzo(a)anthracene, benzo(a)pyrene, benzo(b)floranthene, benzo(k)floranthene, chrysene, indeno(1,2,3-cd)pyrene and dibenzo(a,h) anthracene.

Soils were excavated to achieve the remedial goals. Institutional controls (land use restrictions) will be established to prevent future residential property use.

**INNOVATIVE TECHNOLOGIES CONSIDERED**

Excavation and off-site disposal of contaminated soil was a presumptive remedy for this SWMU. Excavation and off-site disposal is proven and commonly used at remediation and general construction sites. It is reliable, effective and easily implemented. Clean-up goals could be achieved using this method and it could provide an immediate benefit to the environment. Therefore, no innovative technologies were considered.

### **CORRECTIVE ACTION COMPLETED**

Heavy equipment was mobilized on April 10, 2006. It was obtained from local suppliers. Site preparation included verification of utility locations with on-site Navy personnel, installing erosion controls, clearing and grubbing, constructing lay-down and staging areas, establishing access routes for equipment and transport vehicles, and delineating work areas. The excavation was completed with appropriately sized heavy equipment, primarily a backhoe and included the removal of 113.04 tons of surface soils from a depth of approximately six-inches from five areas designated MU01, MU02, MU03, MU04 and MU05.

Three samples from the floor of each area in SWMU 46/AOC C were collected in accordance with the sampling plan. PCB-1260 and total cPAH concentrations were below remedial goals in all 15 samples, indicating that over-excavation was not required. The placement of fill in the excavated area was completed in January 2009.

### **PUBLIC PARTICIPATION**

Public review and comment on the completed remedy for SWMU 46/AOC C will be implemented as required by the USEPA. A public notice of the 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 completed remedy, the USEPA will advise NAPR of any required modifications based on the public comments, or its acceptability. Following USEPA's input concerning the implemented remedy, NAPR will amend the remedy (if required).

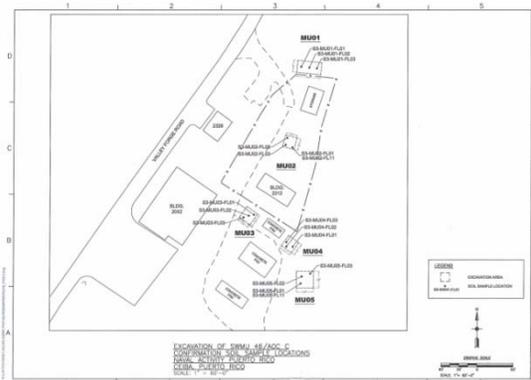
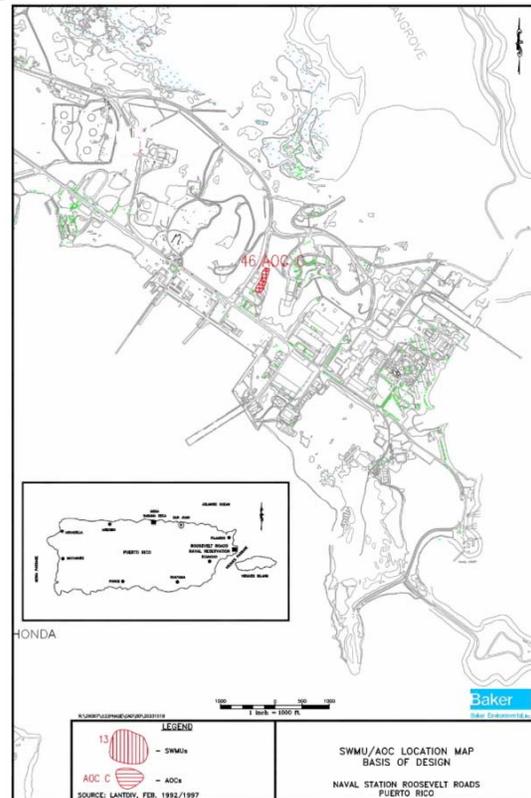
Corrective Action Complete (CAC) with controls is recommended for this SWMU. The controls will consist of a deed restriction prohibiting residential development at this site.

### **KEY DOCUMENTS**

Revised Final II CMS Final Report SWMU 13 and SWMU 46/AOC C, August 4, 2000.

100% Basis of Design Corrective Measures Implementation Work Plan for SWMUs 13 and 46/AOC C, January 25, 2001.

Final Project Closeout Report – Remedial Action for Soil Remediation at Various Sites (SWMU's 9, 13, 46, and 53) and AOC C, August 6, 2010.



### **KEY WORDS**

SWMU 46, AOC C, transformer, Surface Soil, Soil, PAHs, benzo(a)pyrene, dibenzo (a,h) anthracene, PCBs, excavation, off-site disposal, NAPR, NSRR, CAC, corrective action complete

### **FURTHER INFORMATION**

U.S. Environmental Protection Agency  
Region 2 RCRA File Room  
290 Broadway, 15<sup>th</sup> floor  
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Puerto Rico Environmental Quality Board  
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Attn: Ms. Wilmarie Rivera  
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**STATEMENT OF BASIS/ PROPOSED FINAL REMEDY DECISION**

**REGION 2  
ID# PR2170027203**

**NAVAL ACTIVITY PUERTO RICO (former Naval Station Roosevelt Roads)  
Ceiba, Puerto Rico  
(October 26, 2010)**

**Facility/unit Type: SWMU 53 - Former Malaria Control Building**

**Contaminants:** Pesticides (4,4'-DDT, 4,4'-DDE, chlordane, heptachlor epoxide, kepone) and Inorganics (arsenic, chromium and zinc)

**Media:** Soil

**Proposed Final Remedy:** Excavation and off-site disposal of 262.62 tons of non-hazardous contaminated soil and 55.55 tons of hazardous soil for a total of 318.17 tons of soil.

**FACILITY DESCRIPTION**

On October 20, 1994, a Final Resource Conservation and Recovery Act (RCRA) Part B permit was issued by the USEPA Region 2 to Naval Station Roosevelt Roads (NSRR). This permit contained requirements for RCRA Facility Investigation (RFI) activities at specified Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs), including SWMU 53.

SWMU 53 is the area of Building 64, known as the Malaria Control Building, which was built in 1942 and condemned in 1980. The building was used to store pesticides such as aldrin and 4,4'- dichlorodiphenyltrichloroethane (DDT). No wastes are known to have been disposed at the unit and there are no known releases related to this unit. The information gathered from the visual site inspection revealed that there are no known wastes dumped at this facility, nor was there any evidence of source contamination. However, there were indications of possible past leakage of chemicals on the storage shelves inside the building and identified migration pathways along the floor leading to the outside. Therefore, soils investigations were performed.

Several investigations have been performed at SWMU 53 including: a Phase I Environmental Assessment (EAs), Sampling and Analysis Investigation (SAI), a RFI, and a Corrective Measures Study (CMS), as follows:

Investigation	Year	Soil Samples
Phase I EA	2000	No samples
SAI	2001	15 surface, 7 subsurface
RFI	2002	16 surface, 16 subsurface
CMS Invest	2003	22 surface

The extent of several metals and pesticides were delineated in soils by the investigations. The data were used to develop remedial goals for the site.

**EXPOSURE PATHWAYS**

Based on data from the various investigations, risk screening of soil data from SWMU 53 resulted in unacceptable risks for on-site future residents as well as terrestrial invertebrate and plant communities. Pathways for future residents and ecological receptors were eliminated by removal of soils above the approved remedial goals.

**SELECTED REMEDY**

Based on the potential of the site for residential use, remedial goals at SWMU 53 were selected for the most likely future potential human receptors, as well as the current ecological receptors present at the site. These remedial goals are protective of any future property use scenario and no engineering controls or property use restrictions are necessary to protect human and ecological health. Human health screening criteria were established as the remedial goals for heptachlor epoxide and arsenic. Ecological screening criteria were established as remedial goals for 4,4'-DDT, 4,4'-Dichlorodiphenyldichloroethylene (DDE), chlordane, kepone, lead, zinc, and chromium.

The following table summarizes the remedial goals for SWMU 53.

Compound	Remedial Goal (mg/kg)
Pesticides	
4,4'-DDT	0.396
4,4'-DDE	0.106
Chlordane	0.099
Heptachlor epoxide	0.053
Kepone	0.099
Inorganics	
Lead	49.5
Arsenic	3.9
Zinc (surface soil)	106
Zinc (subsurface soil)	98.5
Chromium (surface soil)	44.1
Chromium(subsurface soil)	148

Soils were excavated to achieve the remedial goals. No long term restrictions, controls or monitoring are required with this remedy.

**INNOVATIVE TECHNOLOGIES CONSIDERED**

Excavation and off-site disposal of contaminated soil was a presumptive remedy for this SWMU. Excavation and off-site disposal is proven and commonly used at remediation and general construction sites. It is reliable, effective and easily implemented. Clean-up goals could be achieved using this method and it could provide an immediate benefit to the environment. Therefore, no innovative technologies were considered.

