UNITED STATES NAVY
NAVAL STATION ROOSEVELT ROADS
CEIBA, PUERTO RICO
RCRA FINAL PERMIT REQUIRED QUARTERLY
PROGRESS REPORT
PERIOD AUGUST 1, 1995 - OCTOBER 31, 1995

TABLE OF CONTENTS

Page

Introduction 1
Section 1 - Work Completed 3
Section 2 - Summary of Findings 7
Section 3 - Summary of Changes 9
Section 4 - Community Relations Summary 11
Section 5 - Problems Encountered/Response Taken 15
Section 6 - Personnel Changes 17
Section 7 - Planned Work 19
Section 8 - Reports/Information 21

INTRODUCTION

This quarterly report is comprised of the following separate sections:

1. Work Completed - A description of activities conducted, pursuant to the provisions of the Corrective Action portion of the Final Permit, during the reporting period.

2. Summary of Findings - A brief summary of corrective action related findings developed during the reporting period.

3. Summary of Changes - A brief summary of any changes made in the corrective action program.

4. Community Relations Summary - A brief summary of any contacts made with the local community or interested groups during the reporting period.

5. Problems Encountered/Response Taken - A brief summary of problems or conditions that caused a response to be made in the corrective action program.

6. Personnel Changes - Personnel changes made during the period.

7. Planned Work - A list of tasks planned for the next period.

8. Reports/Information - Pertinent reports, analytical summaries, etc., generated during the period.

Each section includes a separate list of contents and separate attachments as necessary and appropriate.

SECTION 1
WORK COMPLETED

Work related to the Corrective Action Provisions of the NSRR Final RCRA Permit was performed in a number of different areas during this reporting period. Tasks which were commenced, worked on, or completed this period included:

- Revisions to the RFI work plans.
- Submission of work plan addendum for SWMUs 7 and 8.
- SWMU 45 Interim Corrective Measure 60% Design.
- SWMU 45 Interim Corrective Measure 100% Design.
- Field investigations performed at SWMUs 6, 12, 14, and AOC B.
- Field investigations performed at OU1 and AOC D.
- Investigations related to the free product recovery system at the Tow Way Fuel Farm necessitated by EPA comments on the initial system progress reports.

Each of these is discussed in detail in the paragraphs which follow.

RFI Work Plans

Revised RFI Work Plans, addressing EPA comments, were submitted September 13, 1995. These plans were reviewed by the EPA and conditional approval of the plans was received in a letter telefaxed to LANTDIV on September 29, 1995. Accompanying the conditional approval were some relatively minor comments from the EPA. On October 2, 1995, additional comments from A.T. Kearney were received. These sets of comments were addressed and the affected work plan pages were revised and submitted on October 20, 1995. The only issue remaining to be resolved is data validation procedures. In mid-October, comments from the EPA Edison Laboratory regarding data validation were received. Efforts to address these comments are presently underway.

A meeting was held at Region II on August 15, 1995 to discuss the work plans. At that time, the plans were reviewed in detail and the resulting discussions were utilized in preparing the comment responses described above. SWMUs 7 and 8 (Tow Way Fuel Farm) were identified as requiring significant work since there was so much existing information that needed to be understood and incorporated into the work plan. Because of this, it was agreed that revised work plans for SWMUs 7 and 8 would be provided separately in an addendum. This addendum was submitted to Region II on October 4, 1995. Action on the addendum is still pending.

SWMU 45 Interim Corrective Measure

The 60% RAC Design Package for the Interim Corrective Measure at SWMU 45 was submitted August 11, 1995. Included in this package were:

- 50% Basis of Design
- 60% Cost Estimate and
- Project Specifications

Comments were received on the 60% design which were incorporated into the 100% design. On October 17, 1995, the 100% RAC Design Package was submitted. Action on this item is still pending.

Field Investigations at SWMUs 6, 12, 14, and AOC B

Field investigations were conducted at SWMUs 6, 12, 14, and AOC B in September 1995. The purpose of the investigation was to obtain some sampling and analytical data for these sites to allow the Navy to prioritize sites for funding. Sampling and analysis was performed generally in accordance with the work plans; however, the complete scope of work for the RFI was not completed. A copy of appropriate sections of the report submitted to the Navy is provided in Section 2 of this progress report. Only certain sections of the report are provided since the full report also addressed other, non-Region II, Navy facilities. All the data for NSRR has been included.

Field Investigations at OU 1 and OU 7

The field portion of the RFI for Operable Units 1 and 7 was started in late October, 1995. These efforts were undertaken in advance of their scheduled time in response to the Navys' need to prioritize funding for sites where no sampling/analytical existed.

No data is presently available from these investigations. A summary of the data will be provided with the next progress report.

The investigations were conducted in accordance with the RFI work plans. Once data validation issues are resolved, the data will be submitted for validation. A formal RFI report will be started after the data validation is complete.

Tow Way Fuel Farm Free Product Recovery

The recovery system at the Tow Way Fuel Farm is presently not operating while additional studies are performed. These studies are a direct results of the comments received on the first set of progress reports submitted. The report for the investigations is due in February, 1996.

SECTION 2
SUMMARY OF FINDINGS

"Findings" related to the Corrective Action program were limited to the results of the investigations conducted at SWMUs 6, 12, 14, and AOC B. These are provided in Attachment 2-1 and discussed in Section 1 of this progress report.

Attachment 2-1

September 1995 Investigations
SWMUs 6, 12, 14, and AOC B
Summary of Findings

2.2 Naval Station Roosevelt Roads - Sites 11 and 17

2.2.1 Site 11 - SWMU 6 (Building 145)

SWMU 6 - Building 145 comprises a portion of Installation Restoration (IR) Site 11. The building is a former bunker, approximately 60 yards long, 7 feet high, and 8 feet wide. Presently, three concrete piers (opened at the top) are located at the site. Stacks of wood debris are situated between the piers. The area surrounding the former bunker currently is used for storage of flat bed trailers. See Figure 2-3 for general site conditions at Site 11.

2.2.2 Site 11 - AOC B (Building 25)

AOC B - Building 25 is also included as part of IR Site 11 and is located adjacent to and southwest of SWMU 6. Building 25 was used by the Public Works Supply Department for temporary storage of materials from 1951 until the structure collapsed in 1979. Based on a review of aerial photographs flown in 1957, the entire area around the building was used for open storage of drummed material.

Presently, all that remains of Building 25 is the floor slab which is used for the storage of heavy equipment (e.g., bulldozers and cranes). The ground surrounding the slab is relatively flat. AOC B also is presented in Figure 2-3.

2.2.3 Site 17 - SWMU 12 (Fire Training Pit Oil/Water Separator)

The Fire Training Pit Oil/Water Separator is located approximately 40 feet northeast of the Fire Training Pit (SWMU 14) in an open grassy field adjacent to the Air Operations Department. Reportedly, this SWMU began operating in 1983.

The oil/water separator is an inground concrete tank that measures approximately 7 feet x 30 feet x 10 feet deep. Waste oils are burned at the Fire Training Pit during training exercises, the excess of which is collected in the oil/water separator. Water from this unit is pumped to the Sewer Drainage System to be processed by one of the Naval Station wastewater treatment plants. Oils from this unit are pumped back into the Fire Training Pit for reuse. A map of this SWMU is presented in Figure 2-4.

2.2.4 Site 17 - SWMU 14 (Fire Training Pit)

The Fire Training Pit (see Figure 2-4) was used for crash crew training from the early 1960s through 1983. Prior to 1983, fire training operations were conducted in an unlined pit where waste oils, solvents, fuels, wood, trash, fuel filter elements, and oily rags were burned and extinguished using aqueous film-forming foam (AFFF) and potassium bicarbonate (Purple K). The present fire training pit was constructed in 1983 at the same location as the old pit.

3.0 FIELD ACTIVITIES

Surface soil, subsurface soil and groundwater were collected as part of site characterization activities at each facility. All soil samples were collected using a stainless steel sampling spoon. Soils were classified in the field by a geologist using the United Soil Classification System (USCS) by the visual-manual methods described in ASTM D-2488. Lithologic descriptions were recorded in a field logbook. Soil classification included characterization of soil type, grain size, color, moisture content, and other pertinent information such as indications of contamination (i.e., staining, odor, elevated photoionization detector [PID] measurements).

Soil and groundwater samples were obtained using the Geoprobe ® Direct Push technology. This technology utilizes a large 4 foot core barrel which is pushed into the ground via a hydraulic hammer. Once the desired depth is reached the core barrel is removed from the borehole and opened. Soil that enters the core barrel is kept intact by a thin acetate tube which permits the geologist to view an undisturbed sample. Each tube is capped and labeled as to boring location and sample depth. Upon determining groundwater depth, subsurface samples are then chosen from the core barrels. A stainless steel sampling spoon was used to collect the soil from the acetate tubes.

Groundwater samples also were collected by using Geoprobe ® Direct Push technology. A 0.75 inch outside diameter steel rod with three feet of slotted screen was pushed into the ground via a hydraulic hammer. Four foot sections of steel riser pipe then were attached to the section of screen. This is procedure was continued until the screen bisected the groundwater table. Once the screen was fully submerged, the temporary well was left for 15 minutes to up to 2.5 hours to recharge (depending on site conditions). A peristaltic pump with disposable polyethylene tubing was then used to collect a groundwater sample directly into sampling containers from each temporary monitoring well.

Soil and groundwater sample containers for analyses of Volatile Organic Compounds (VOCs) were filled first, with the soil packed to diminish headspace. Upon filling the VOC containers, remaining soil was homogenized, and then placed into appropriate laboratory containers in order of volatilization (i.e., semivolatiles, pesticides, and polychlorinated biphenyls [PCBs], total petroleum hydrocarbon [TPH], and inorganics, as required). Groundwater sample containers also were filled in decreasing order of volatilization. Samples were kept in coolers on ice and under strict chain-of-custody until delivered to the laboratory.

Please note that QA/QC samples (duplicate samples, trip blanks, rinsate blanks, etc.) were not obtained as part of the preliminary screening sampling effort.

Any soil cuttings were returned to the borehole. Groundwater was obtained by directly filling sampling containers (purging was not conducted). Therefore, generation of investigation derived wastes (IDW) requiring off-site disposal was eliminated. Disposable sampling devices (spoons, tubing), utilized during the field effort, were double-bagged and disposed in on-base municipal containers.

3.2 Naval Station Roosevelt Roads

Sampling activities conducted at Naval Station Roosevelt Roads during this investigation included the collection of surface and subsurface soil and groundwater samples. A Geoprobe® direct push system, provided by Target Environmental Services, Columbia, Maryland, was used to collect the subsurface soil and groundwater samples. The sampling technique for the Geoprobe® system is described in Section 3.0.

Soil samples were collected using decontaminated stainless steel spoons. Prior to sample collection, all vegetation (grass and roots) was removed from the location.

Each sampling point was measured in relation to a permanent structure in the vicinity (building, fence, etc.) and marked on a field map. Points were then drafted onto existing site figures during report preparation.

3.2.1 Site 11 - SWMU 6 and AOC B

3.2.1.1 Surface Soil Investigation

Two surface soil samples were obtained from 0 to 6 inches depth from SWMU 6 and three samples were collected from AOC B (Figure 2-3). Samples were acquired from 0 to 6 inches depth.

3.2.1.2 Subsurface Soil Investigation

Subsurface soil samples were only collected at SWMU 6 and AOC B. Two soil borings were advanced at SWMU 6 and three borings were advanced at AOC B (Figure 2-3) via the Geoprobe® method.

The Geoprobe® system described in Section 3.0 involves the advancement of a small diameter sampling tube with a clear acetate liner. The sampling tube was advanced in two foot intervals using a hammer drill. At the end of each sample interval, the tube was extracted from the borehole and the liner removed. The liner was then capped and marked with the boring number and depth interval.

It should be noted that the scope of work called for the collection of two subsurface samples from each boring. Because of the high percentage of rock fragments in the soil and subsequent low sample recovery, insufficient volume was available to obtain multiple samples. Therefore, a single composite sample was obtained at each location from an interval starting at the ground surface and continuing to a maximum depth of eight feet. It was necessary at some locations to advance two or more adjacent borings to obtain sufficient volume for a single composite sample. Sampling was consistent with methods noted above.

3.2.1.3 Groundwater Investigation

Three groundwater samples were collected at AOC B during this investigation as presented on Figure 2-3. Groundwater samples were collected at the same locations as the soil borings with the exception of AOCB-HP02. This sampling point was moved from its original location, AOCB-SB02 (see Figure 2-3) due to insufficient recharge in that area of the site.

Groundwater samples were collected by advancing the hollow-stem Geoprobe® rods with disposable drive point approximately two to three feet into the water table (typically encountered at a depth of eight feet below ground surface). The rods were then raised approximately six inches to one foot to allow groundwater to enter the rods. Flexible Teflon tubing was installed through the rods and connected to a peristaltic pump. Groundwater was pumped directly into the sample containers.

3.2.2 Site 17 - SWMUs 12 and 14

3.2.2.1 Surface Soil Investigation

Two surface soil samples were obtained from SWMU 12 and three samples were collected from SWMU 14 (Figure 2-4). Samples were acquired from 0 to 6 inches depth.

3.2.2.2 Subsurface Soil Investigation

Subsurface soil sampling was not included in the investigation of this site.

3.2.2.3 Groundwater Investigation

Groundwater sampling was not included in the investigation of this site.

3.2.3 Analytical Program

Completed COC documentation is provided in Appendix A. All samples were analyzed by Weston.

Table 3-1 summarizes the soil and groundwater sampling programs conducted at Sites 11 and 17. Results of the investigations are presented in Section 5.0 of this report.

3.2.3.1 Site 11

At SWMU 6 all surface and subsurface samples were analyzed for the Appendix IX parameter list. The parameter list for all AOC B samples (soil and groundwater) also included the Appendix IX list and TPH (Modified 8015).

Surface soil, collected at Site 11, were analyzed for VOCs (Method 8240), SVOCs (Method 8270), PCBs (Method 8080), and TPH (Modified 8015).

Suites of compounds which make up the Appendix IX list include:

- VOCs (Method 8240)
- SVOCs (Method 8270)
- Pesticides and Organophosphate pesticides (Method 8080)
- Herbicides (Method 8150)
- Dioxin (SW-846 Method 8280)
- PCBs (Method 8080)
- Metals (SW-846)
- Cyanide (Method 9010)
- Sulfide (Method 9030)

3.2.3.2 Site 17 - SWMUs 12 and 14

Surface soil, collected from Site 17, included analyses of VOCs (Method 8240), SVOCs (Method 8270), PCBs (Method 8080), and TPH (Modified 8015).

4.3 Naval Station Roosevelt Roads - Site 11

Site 11 incorporates Building 145 (SWMU 6) and Building 25 (AOC B). Soil conditions in the vicinity of Building 145 consist primarily of brown to tan sand, gravel, silt and clay. Soils at Building 25 are primarily a mixture of grey/brown sand and gravel with some clay and silt.

A slight petroleum odor was noticed within borehole AOCB-SB02; however, was not noticed in the soil samples. This may indicate a petroleum layer at the watertable at this location.

Groundwater was encountered at a depth of 8 feet below ground surface at Site 11. At Building 25 (AOC B), a slight sheen and petroleum odor were noted during groundwater sampling activities.

A temporary benchmark with an assumed elevation of 100 feet MSL was established during the investigation at Building 25. Groundwater elevations were calculated at 91 feet MSL, 91.6 feet MSL, and 92.4 feet MSL at sample locations AOCB-HP01, HP02, and HP03, respectively. Groundwater appears to flow southeast toward Ensenada Honda.

4.4 Naval Station Roosevelt Roads - Site 17

Site 17 is comprised of a fire training pit and oil/water separator (SWMU 12) and a second fire training pit (SWMU 14). Soil is described as brown sand and silt, with some fine to coarse gravel and little clay.

Groundwater was not encountered at the maximum boring depth of 6 feet below ground surface at this location.

5.2 Naval Station Roosevelt Roads

Data have been presented with appropriate criteria for Region II sites, including Federal MCLs for groundwater. Because no Region II RBC values are available for groundwater and soils, Region III RBCs for tapwater (groundwater) and industrial and residential RBCs for soils were used in this report. Concentrations exceeding criteria have been highlighted, depending on criteria.

Analytical results for detected concentrations of organic and inorganic compounds in surface soil, subsurface soil, and groundwater are summarized on Tables 5-7 through 5-12, respectively.

6.4 Naval Station Roosevelt Roads - Sites 11 and 17 - Surface Soil Summary

Organic compounds which were found to exceed criteria include: benzo(a)anthracene, benzo(b)fluoranthene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, and dibenzo(a,h)anthracene. Of these compounds, benzo(a)pyrene was detected above industrial RBCs in 3 of 10 samples. Benzo(a)anthracene, benzo(b)fluoranthene, and dibenzo(a,h)anthracene exceeded industrial RBCs in one sample each. Residential RBCs were exceeded by benzo(a)pyrene in five samples, and indeno(1,2,3-cd)pyrene in two samples. The other compounds were detected above residential RBCs in three samples each. Table 6-6 presents organic compounds exceeding criteria in surface soils.

As shown in Table 6-7, only arsenic concentrations in surface soils exceed industrial RBCs in three of five samples and residential RBCs in all samples.

6.5 Naval Station Roosevelt Roads - Sites 11 and 17 - Subsurface Soil Summary

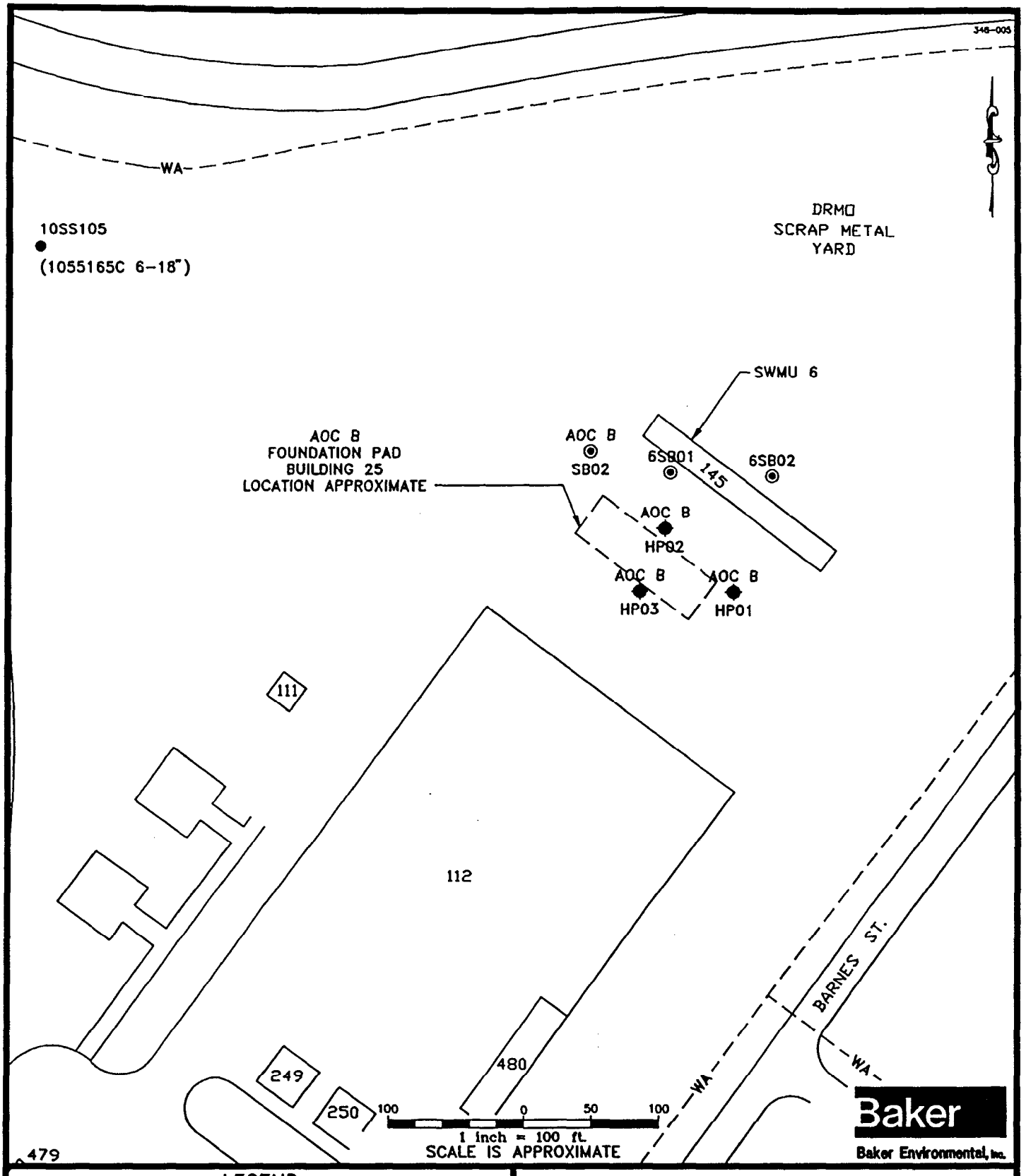
Benzo(a)pyrene and dibenzo(a,h)anthracene were found in subsurface soil sample AOCB-SB03 in concentrations greater than established residential RBC values (see Table 6-8).

Only arsenic was detected in exceedance of the residential RBC value in four of five subsurface soil samples, as presented in Table 6-9.

6.6 Naval Station Roosevelt Roads - Sites 11 and 17 - Groundwater Summary

No organic or inorganic compounds were present in groundwater above tap water or Federal MCL concentrations.

Tables 6-1 and 6-5 present a summary of those contaminants which have exceeded criteria for soil and groundwater, respectively.



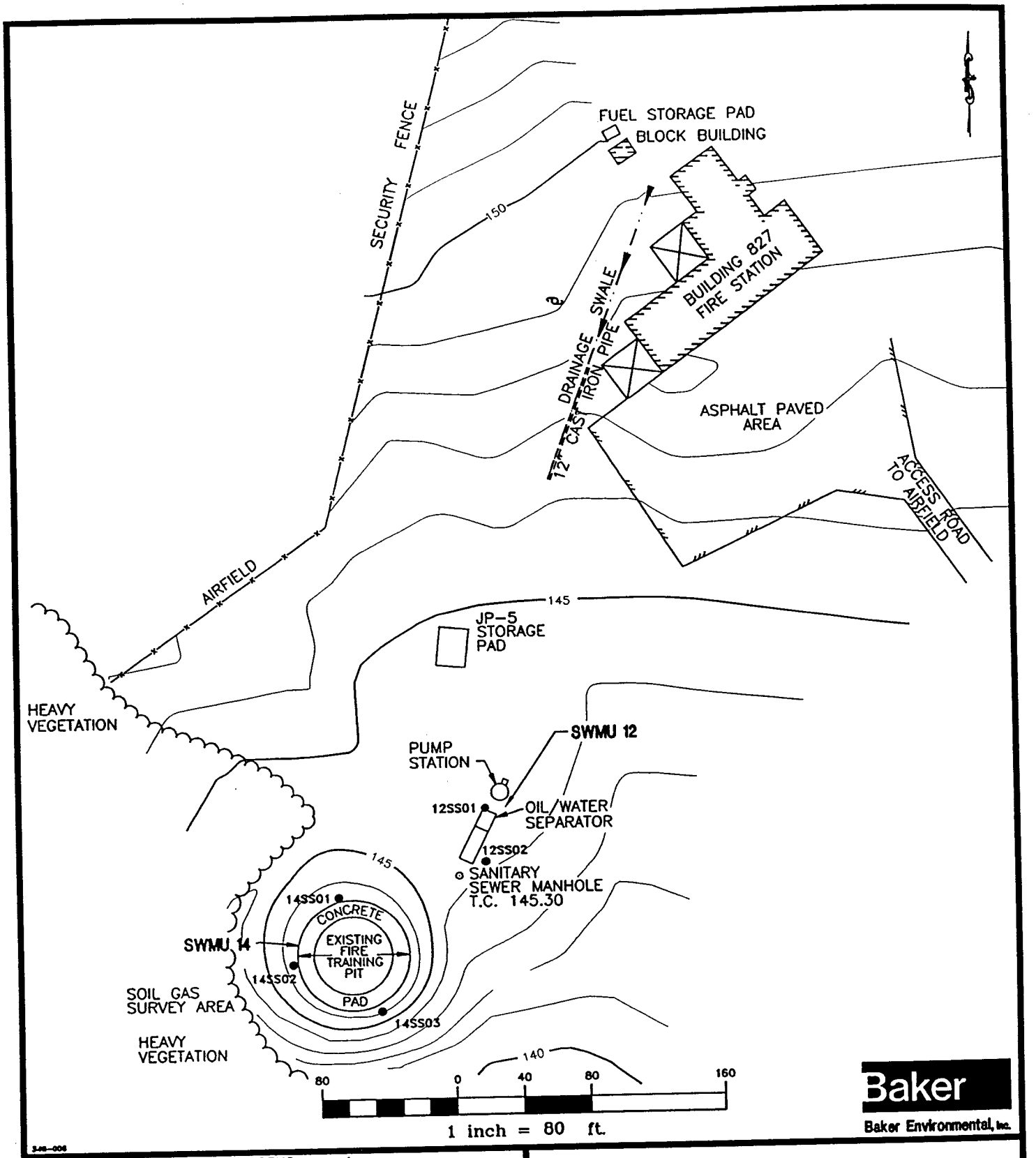
LEGEND

- 10SS105 — 1992 SOIL SAMPLE LOCATION (APPROXIMATE)
- 249 — STATION STRUCTURE
- WA — WATERLINE
- SOIL BORING LOCATION
- HYDROPUNCH LOCATION

SOURCE: STATION PUBLIC WORKS BASE MAP, FEB. 1992
SOURCE: BAKER ENVIRONMENTAL GPS SURVEY, NOV. 1992

FIGURE 2-3
SOIL AND GROUNDWATER SAMPLING LOCATIONS
SITE 11 – AOC B AND SWMU 6

NAVAL STATION ROOSEVELT ROADS
PUERTO RICO



348-006

LEGEND

- ● SOIL SAMPLING LOCATION
- 145 SURFACE ELEVATION CONTOUR
- ← SURFACE WATER DRAINAGE DIRECTION

SOURCE: STATION PUBLIC WORKS BASE MAP, FEB. 1992
SOURCE: BAKER ENVIRONMENTAL GPS SURVEY, NOV. 1992

FIGURE 2-4
SOIL SAMPLING LOCATIONS
SITE 17 - SWMU 12 AND 14

NAVAL STATION ROOSEVELT ROADS
PUERTO RICO

TABLE 3-1

SUMMARY OF SAMPLING PROGRAM

Naval Station Roosevelt Roads	Site 11 (SWMU 6)	Surface Soil and Subsoil	2 2	Appendix IX
	(AOC B)	Surface Soil and Subsoil	3 3	Appendix IX and TPH
		Groundwater	3	Appendix IX and TPH
	Site 17 (SWMU 12)	Soil	2	VOC, SVOC, PCBs, TPH
	(SWMU 14)	Soil	3	VOC, SVOC, PCBs, TPH

* includes total and dissolved fractions

SECTION 5.0 TABLES

TABLE 5-7
DETECTED CONCENTRATIONS OF ORGANIC COMPOUNDS IN SURFACE SOILS
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS
PUERTO RICO

SAMPLE ID	Industrial	Residential	6SS01	6SS02	AOCBSS01	AOCBSS02	AOCBSS03	12SS01	12SS02
MATRIX	Soils [ug/kg]	Soils [ug/kg]	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
VOLATILES (ug/kg)									
Acetone	200000000	7800000	16 B	13 B	11 B	19	11 U	12 U	11 U
SEMIVOLATILES (ug/kg)									
1,2-Dichlorobenzene	180000000	7000000	340 U	340 U	350 U	350 U	350 U	380 U	370 U
Naphthalene	82000000	3100000	340 U	340 U	350 U	350 U	420	380 U	370 U
2-Methylnaphthalene	82000000	3100000	340 U	340 U	350 U	350 U	270 J	380 U	370 U
Acenaphthylene	61000000	2300000	40 J	340 U	71 J	52 J	62 J	380 U	370 U
Acenaphthene	120000000	4700000	340 U	340 U	370	58 J	2500	380 U	370 U
Dibenzofuran	8200000	310000	340 U	340 U	93 J	350 U	720	380 U	370 U
Fluorene	82000000	3100000	340 U	340 U	190 J	350 U	1500	380 U	370 U
Phenanthrene	61000000	2300000	120 J	42 J	2300	560	15000	380 U	370 U
Anthracene	610000000	23000000	47 J	340 U	570	190 J	3100	380 U	370 U
Fluoranthene	82000000	3100000	760	350	3500	1400	23000	380 U	370 U
Pyrene	61000000	2300000	950	390	4700	1700	21000	380 U	370 U
Butylbenzylphthalate	410000000	16000000	340 U	340 U	47 J	200 J	120 J	380 U	370 U
Benzo(a)anthracene	7800	880	370	150 J	2100	890	11000	380 U	370 U
Chrysene	780000	88000	670	280 J	2400	1300	13000	380 U	370 U
bis(2-Ethylhexyl)phthalate	410000	46000	54 J	340 U	150 J	100 J	350 U	39 J	370 U
Benzo(b)fluoranthene	7800	880	760	280 J	3800	1700	14000	380 U	370 U
Benzo(k)fluoranthene	78000	8800	310 J	120 J	1100	640	3500	380 U	370 U
Benzo(a)pyrene	780	88	340	130 J	2000	920	8200	380 U	370 U
Indeno(1,2,3-cd)pyrene	7800	880	330 J	91 J	930	630	4200	380 U	370 U
Dibenzo(a,h)anthracene	780	88	77 J	340 U	220 J	140 J	1100	380 U	370 U
Benzo(g,h,i)perylene	61000000	2300000	330 J	340 U	820	580	170 J	380 U	370 U

Notes:
ug/kg - micrograms per kilogram
NC - No criteria available
NA - Not analyzed
U - Analyzed, not detected
B - Present in blank
J - Present below detection limit
S - Method of Standard Addition
Industrial/Residential - Industrial and Residential Risk Based Concentrations (March 1995)
SB Background - MCB Camp Lejeune base background, updated through CTO-0303 (August 1995)

TABLE 5-7
DETECTED CONCENTRATIONS OF ORGANIC COMPOUNDS IN SURFACE SOILS
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS
PUERTO RICO

SAMPLE ID MATRIX	Industrial Soils [ug/kg]	Residential Soils [ug/kg]	6SS01 SOIL	6SS02 SOIL	AOCBSS01 SOIL	AOCBSS02 SOIL	AOCBSS03 SOIL	12SS01 SOIL	12SS02 SOIL
PESTICIDE/PCBS (ug/kg)									
Heptachlor epoxide	630	70	41 U	1.7	10	6.2	49	NA	NA
Dieldrin	360	40	82 U	8.2 U	43 U	41 U	7.4 J	NA	NA
4,4'-DDE	17000	1900	82 U	8.2 U	15	16	53	NA	NA
4,4'-DDD	24000	2700	82 U	8.2 U	4.3 J	41 U	9.5	NA	NA
4,4'-DDT	17000	1900	13 J	8.2 U	8.5 J	10	16	NA	NA
gamma-Chlordane	4400	490	410 U	41 U	210 U	210 U	30	NA	NA
Aroclor-1260	740	83	820 U	82 U	430 U	410 U	420 U	91 U	91 U
PCDD/PCDF (ug/kg)									
Total HXCDD	NC	NC	0.42 U	0.31 U	0.82 JS	0.75 JS	0.76 JS	NA	NA
Total PECDF	NC	NC	0.44 U	0.25 U	0.16 JS	0.15 U	0.18 JS	NA	NA
Total HXCDF	NC	NC	0.60 U	0.30 U	1.1 JS	0.93 JS	0.94 J	NA	NA
TPH (ug/kg)									
Diesel Fuel	NC	NC	NA	NA	44 U	4.4 U	44 U	47 U	47 U

Notes:
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TABLE 5-7
DETECTED CONCENTRATIONS OF ORGANIC COMPOUNDS IN SURFACE SOILS
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS
PUERTO RICO

SAMPLE ID	Industrial	Residential	14SS01	14SS02	14SS03
MATRIX	Soils [ug/kg]	Soils [ug/kg]	SOIL	SOIL	SOIL
VOLATILES (ug/kg)					
Acetone	200000000	7800000	11 U	60 U	12 U
SEMIVOLATILES (ug/kg)					
1,2-Dichlorobenzene	180000000	7000000	110 J	120 J	120 J
Naphthalene	82000000	3100000	360 U	390 U	380 U
2-Methylnaphthalene	82000000	3100000	360 U	390 U	380 U
Acenaphthylene	61000000	2300000	360 U	390 U	380 U
Acenaphthene	120000000	4700000	360 U	390 U	380 U
Dibenzofuran	8200000	310000	360 U	390 U	380 U
Fluorene	82000000	3100000	360 U	390 U	380 U
Phenanthrene	61000000	2300000	360 U	390 U	380 U
Anthracene	610000000	23000000	360 U	390 U	380 U
Fluoranthene	82000000	3100000	360 U	200 J	380 U
Pyrene	61000000	2300000	360 U	380 J	41 J
Butylbenzylphthalate	410000000	16000000	270 J	220 J	260 J
Benzo(a)anthracene	7800	880	360 U	68 J	380 U
Chrysene	780000	88000	360 U	76 J	380 U
bis(2-Ethylhexyl)phthalate	410000	46000	360 U	390 U	380 U
Benzo(b)fluoranthene	7800	880	360 U	390 U	380 U
Benzo(k)fluoranthene	78000	8800	360 U	390 U	380 U
Benzo(a)pyrene	780	88	360 U	390 U	380 U
Indeno(1,2,3-cd)pyrene	7800	880	360 U	61 J	380 U
Dibenzo(a,h)anthracene	780	88	360 U	390 U	380 U
Benzo(g,h,i)perylene	61000000	2300000	360 U	100 J	380 U

Notes:
ug/kg - micrograms per kilogram
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DETECTED CONCENTRATIONS OF ORGANIC COMPOUNDS IN SURFACE SOILS
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS
PUERTO RICO

SAMPLE ID	Industrial	Residential	14SS01	14SS02	14SS03
MATRIX	Soils [ug/kg]	Soils [ug/kg]	SOIL	SOIL	SOIL
PESTICIDE/PCBS (ug/kg)					
Heptachlor epoxide	630	70	NA	NA	NA
Dieldrin	360	40	NA	NA	NA
4,4'-DDE	17000	1900	NA	NA	NA
4,4'-DDD	24000	2700	NA	NA	NA
4,4'-DDT	17000	1900	NA	NA	NA
gamma-Chlordane	4400	490	NA	NA	NA
Aroclor-1260	740	83	14	15	22
PCDD/PCDF (ug/kg)					
Total HXCDD	NC	NC	NA	NA	NA
Total PECDF	NC	NC	NA	NA	NA
Total HXCDF	NC	NC	NA	NA	NA
TPH (ug/kg)					
Diesel Fuel	NC	NC	44 U	2300	48 U

Notes:
ug/kg - micrograms per kilogram
NC - No criteria available
NA - Not analyzed
U - Analyzed, not detected
B - Present in blank
J - Present below detection limit
S - Method of Standard Addition
Industrial/Residential - Industrial and Residential Risk Based Concentrations (March 1995)
SB Background - MCB Camp Lejeune base background, updated through CTO-0303 (August 1995)

TABLE 5-8
DETECTED CONCENTRATIONS OF INORGANIC COMPOUNDS IN SURFACE SOILS
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS
PUERTO RICO

SAMPLE ID	Industrial	Residential	6SS01	6SS02	AOCBSS01	AOCBSS02	AOCBSS03	12SS01	12SS02	14SS01	14SS02	14SS03
MATRIX	Soils	Soils	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
% Solids	[mg/kg]	[mg/kg]	96.8	96.4	93.3	95.3	94.2	87.2	88.0	92.3	84.1	85.5
ANALYTES (mg/kg)												
Arsenic	3.3	0.37	2.1	2.9	3.6	5.5	4.8	NA	NA	NA	NA	NA
Barium	140000	5500	69.3	19.2	50.3	72.2	48.0	NA	NA	NA	NA	NA
Cadmium	1000	39	1.1	0.28	1.3	1.1	1.2	NA	NA	NA	NA	NA
Cobalt	120000	4700	10.0	4.6	8.7	14.2	7.0	NA	NA	NA	NA	NA
Chromium	10000	390	35.3	7.1	17.7	18.1	20.1	NA	NA	NA	NA	NA
Copper	76000	2900	177	26.5	80.0	124	59.5	NA	NA	NA	NA	NA
Mercury	610	23	12.9	0.28	0.49	0.84	0.18	NA	NA	NA	NA	NA
Nickel	41000	1600	9.6	2.6	7.4	10.4	6.5	NA	NA	NA	NA	NA
Lead	NA	400	200	10.9	129	63.2	102	NA	NA	NA	NA	NA
Selenium	10000	390	0.096 U	0.091 U	0.77 U	0.16	0.77 U	NA	NA	NA	NA	NA
Vanadium	14000	550	62.6	28.1	60.5	83.7	52.8	NA	NA	NA	NA	NA
Zinc	610000	23000	210	25.5	167	119	167	NA	NA	NA	NA	NA

Notes:
mg/kg - milligrams per kilogram
NA - Not analyzed
U - Analyzed, not detected
Industrial/Residential - Industrial and Residential Risk Based Concentrations (March 1995)

TABLE 5-9
DETECTED CONCENTRATIONS OF ORGANIC COMPOUNDS IN SUBSURFACE SOILS
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS
PUERTO RICO

SAMPLE ID MATRIX	Industrial Soils [ug/kg]	Residential Soils [ug/kg]	6SB01 SOIL	6SB02 SOIL	AOCBSB01-01 SOIL	AOCBSB02 SOIL	AOCBSB03 SOIL
VOLATILES (ug/kg)							
Acetone	200000000	7800000	14	11 U	11 U	11 U	11 U
SEMIVOLATILES (ug/kg)							
Phenol	1.00E+09	47000000	47 J	370 U	360 U	360 U	360 U
Acenaphthene	120000000	4700000	350 U	370 U	360 U	360 U	140 J
Dibenzofuran	8200000	310000	350 U	370 U	360 U	360 U	37 J
Fluorene	82000000	3100000	350 U	370 U	360 U	360 U	87 J
Phenanthrene	61000000	2300000	350 U	370 U	360 U	360 U	800
Anthracene	610000000	23000000	350 U	370 U	360 U	360 U	190 J
Fluoranthene	82000000	3100000	87 J	370 U	360 U	64 J	1300
Pyrene	61000000	2300000	120 J	370 U	360 U	83 J	1400
Benzo(a)anthracene	7800	880	62 J	370 U	360 U	45 J	610
Chrysene	780000	88000	91 J	370 U	360 U	74 J	720
Benzo(b)fluoranthene	7800	880	110 J	370 U	360 U	110 J	750
Benzo(k)fluoranthene	78000	8800	350 U	370 U	360 U	51 J	380
Benzo(a)pyrene	780	88	57 J	370 U	360 U	54 J	610
Indeno(1,2,3-cd)pyrene	7800	880	45 J	370 U	360 U	360 U	380
Dibenzo(a,h)anthracene	780	88	350 U	370 U	360 U	360 U	94 J
Benzo(g,h,i)perylene	61000000	2300000	47 J	370 U	360 U	360 U	350 J
1,4-Dioxane	520000	58000	1400 U	1500 U	1500 U	1400 U	1400 J

Notes:
ug/kg - micrograms per kilogram
NA - Not analyzed
U - Analyzed, not detected
J - Present below detection limit
E - Exceeds linear calibration range
Industrial/Residential - Industrial and Residential Risk Based Concentrations (March 1995)

TABLE 5-10
DETECTED CONCENTRATIONS OF INORGANIC COMPOUNDS IN SUBSURFACE SOILS
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS
PUERTO RICO

SAMPLE ID	Industrial	Residential	6SB01	6SB02	AOCBSB01-01	AOCBSB02	AOCBSB03
MATRIX	Soils	Soils	SOIL	SOIL	SOIL	SOIL	SOIL
% Solids	[mg/kg]	[mg/kg]	94.6	87.7	90.2	93.0	92.3
TOTAL ANALYTES (mg/kg)							
Arsenic	3.3	0.37	1.1 U	1.4	1.4	0.46	2.0
Barium	140000	5500	80.2	33.6	98.8	81.1	52.8
Cadmium	1000	39	0.56	0.30	0.69	1.0	0.51
Cobalt	120000	4700	14.3	9.0	12.3	13.6	15.0
Chromium	10000	390	15.0	7.9	9.9	15.5	19.5
Copper	76000	2900	124	22.7	80.3	96.4	94.0
Mercury	610	23	2.2	0.084 U	0.11 U	0.14	0.077 U
Nickel	41000	1600	43.6	17.3	34.1	83.6	54.5
Lead	NA	400	32.6	1.3	72.0	11.5	13.8
Tin	1000000	47000	1.5	2.8	1.7 U	1.7 U	1.6 U
Vanadium	14000	550	89.5	43.1	76.6	79.2	82.9
Zinc	610000	23000	75.6	36.7	93.5	76.1	59.6

Notes:
mg/kg - milligrams per kilogram
NA - Not analyzed
U - Analyzed, not detected
Industrial/Residential - Industrial and Residential Risk Based Concentrations (March 1995)

TABLE 5-11
DETECTED CONCENTRATIONS OF ORGANIC COMPOUNDS IN GROUNDWATER
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS
PUERTO RICO

SAMPLE ID	Tap Water	MCL	AOCBHP01	AOCBHP02	AOCBHP03
MATRIX	[ug/L]	Groundwater [ug/L]	WATER	WATER	WATER
SEMIVOLATILES (ug/L)					
bis(2-Ethylhexyl)phthalate	4.8	6	10 U	1 J	3 J

Notes:
ug/L - micrograms per liter
U - Analyzed, not detected
MCL - Maximum Contaminant Level, Federal Register (May 1995)
NCWQS - North Carolina Water Quality Standard November 1993
Tap Waterstrial/Residential - Industrial and Residential Risk Based Concentrations (March 1995)

TABLE 5-12
DETECTED CONCENTRATIONS OF INORGANIC COMPOUNDS IN GROUNDWATER
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS
PUERTO RICO

SAMPLE ID MATRIX	Tap Water [ug/L]	MCL Groundwater [ug/L]	AOCBHP01 WATER	AOCBHP02 WATER	AOCBHP03 WATER
ANALYTES (ug/L)					
Barium	2600	2000	16.7	71.4	7.3
Cobalt	2200	NC	2.2 U	4.6	2.2 U
Chromium	180	100	2.4 U	4.0	4.9
Copper	1400	1300	9.6	54.4	4.1
Lead	NC	15	7.7	10.4	2.4
Selenium	180	50	1.6 U	1.6 U	3.5
Vanadium	260	NC	10.2	29.4	42.3
Zinc	11000	NC	6.3	21.9	5.2

Notes:
ug/L - micrograms per liter
NC - No criteria available
NA - Not analyzed
U - Analyzed, not detected
MCL - Maximum Contaminant Level, Federal Register (May 1995)
Tap Waterstrial/Residential - Industrial and Residential Risk Based Concentrations (March 1995)

SECTION 6.0 TABLES

TABLE 6-6

ORGANIC COMPOUNDS EXCEEDING CRITERIA - SURFACE SOIL
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

Sample Id. Media	Industrial Soils [ug/kg]	Residential Soils [ug/kg]	6SS01 SOIL	6SS02 SOIL	AOCBSS01 SOIL	AOCBSS02 SOIL	AOCBSS03 SOIL
SEMIVOLATILES (ug/kg)							
Benzo(a)anthracene	7800	880	370	150 J	2100	890	11000
Benzo(b)fluoranthene	7800	880	760	280 J	3800	1700	14000
Benzo(a)pyrene	780	88	340	130 J	2000	920	8200
Indeno(1,2,3-cd)pyrene	7800	880	330 J	91 J	930	630	4200
Dibenzo(a,h)anthracene	780	88	77 J	340 U	220 J	140 J	1100

Sample Id. Media	Industrial Soils [ug/kg]	Residential Soils [ug/kg]	12SS01 SOIL	12SS02 SOIL	14SS01 SOIL	14SS02 SOIL	14SS03 SOIL
SEMIVOLATILES (ug/kg)							
Benzo(a)anthracene	7800	880	380 U	370 U	360 U	68 J	380 U
Benzo(b)fluoranthene	7800	880	380 U	370 U	360 U	390 U	380 U
Benzo(a)pyrene	780	88	380 U	370 U	360 U	390 U	380 U
Indeno(1,2,3-cd)pyrene	7800	880	380 U	370 U	360 U	61 J	380 U
Dibenzo(a,h)anthracene	780	88	380 U	370 U	360 U	390 U	380 U

Notes:
ug/kg - micrograms per kilogram
NA - Not analyzed
U - Analyzed, not detected
J - Present below detection limit
Industrial/Residential - Industrial and Residential Risk Based Concentrations (March 1995)

TABLE 6-7

INORGANIC COMPOUNDS EXCEEDING CRITERIA - SURFACE SOIL
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

Sample Id.	Industrial	Residential	6SS01	6SS02	AOCBSS01	AOCBSS02	AOCBSS03
Media	Soils	Soils	SOIL	SOIL	SOIL	SOIL	SOIL
% Solids	[mg/kg]	[mg/kg]	96.8	96.4	93.3	95.3	94.2
ANALYTES (mg/kg)							
Arsenic	3.3	0.37	2.1	2.9	3.6	5.5	4.8

Sample Id.	Industrial	Residential	12SS01	12SS02	14SS01	14SS02	14SS03
Media	Soils	Soils	SOIL	SOIL	SOIL	SOIL	SOIL
% Solids	[mg/kg]	[mg/kg]	87.2	88.0	92.3	84.1	85.5
ANALYTES (mg/kg)							
Arsenic	3.3	0.37	NA	NA	NA	NA	NA

Notes:
mg/kg - milligrams per kilogram
NA - Not analyzed
Industrial/Residential - Industrial and Residential Risk Based Concentrations (March 1995)

TABLE 6-8

ORGANIC COMPOUDS EXCEEDING CRITERIA - SUBSURFACE SOIL
SITE 11
NAVAL STATION ROOSEVELT ROADS. PUERTO RICO

Sample Id. Media	Industrial Soils [ug/kg]	Residential Soils [ug/kg]	6SB01 SOIL	6SB02 SOIL	AOCBSB01-01 SOIL	AOCBSB02 SOIL	AOCBSB03 SOIL
SEMIVOLATILES (ug/kg)							
Benzo(a)pyrene	780	88	57 J	370 U	360 U	54 J	610
Dibenzo(a,h)anthracene	780	88	350 U	370 U	360 U	360 U	94 J

Notes:

ug/kg - micrograms per kilogram

U - Analyzed, not detected

J - Present below detection limit

Industrial/Residential - Industrial and Residential Risk Based Concentrations (March 1995)

TABLE 6-9

INORGANIC COMPOUDS EXCEEDING CRITERIA - SUBSURFACE SOIL
SITE 11
NAVAL STATION ROOSEVELT ROADS. PUERTO RICO

Sample Id.	Industrial	Residential	6SB01	6SB02	AOCBSB01-01	AOCBSB02	AOCBSB03
Media	Soils	Soils	SOIL	SOIL	SOIL	SOIL	SOIL
% Solids	[mg/kg]	[mg/kg]	94.6	87.7	90.2	93.0	92.3
TOTAL ANALYTES (mg/kg)							
Arsenic	3.3	0.37	1.1 U	1.4	1.4	0.46	2.0

Notes:
mg/kg - milligrams per kilogram
U - Analyzed, not detected
Industrial/Residential - Industrial and Residential Risk Based Concentrations (March 1995)

APPENDIX A-2.3
SITES 11 AND 17 - SURFACE SOIL

FREQUENCY OF DETECTION SUMMARY
SURFACE SOIL
CTO 348
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

SAMPLE ID	6SS01	6SS02	AOCBSS01	AOCBSS02	AOCBSS03	12SS01
MATRIX	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
% Solids	96.8	96.4	93.3	95.3	94.2	87.2
VOLATILES (ug/kg)						
Chloromethane	10 U	10 U	11 U	10 U	11 U	12 U
Bromomethane	10 U	10 U	11 U	10 U	11 U	12 U
Vinyl chloride	10 U	10 U	11 U	10 U	11 U	12 U
Chloroethane	10 U	10 U	11 U	10 U	11 U	12 U
Methylene Chloride	5 U	5 U	5 U	5 U	5 U	6 U
Acetone	16 B	13 B	11 B	19	11 U	12 U
Carbon Disulfide	5 U	5 U	5 U	5 U	5 U	6 U
1,1-Dichloroethene	5 U	5 U	5 U	5 U	5 U	6 U
1,1-Dichloroethane	5 U	5 U	5 U	5 U	5 U	6 U
1,2-Dichloroethene (total)	5 U	5 U	5 U	5 U	5 U	6 U
Chloroform	5 U	5 U	5 U	5 U	5 U	6 U
1,2-Dichloroethane	5 U	5 U	5 U	5 U	5 U	6 U
2-Butanone	10 U	10 U	11 U	10 U	11 U	12 U
1,1,1-Trichloroethane	5 U	5 U	5 U	5 U	5 U	6 U
Carbon Tetrachloride	5 U	5 U	5 U	5 U	5 U	6 U
Vinyl acetate	10 U	10 U	11 U	10 U	11 U	12 U
Bromodichloromethane	5 U	5 U	5 U	5 U	5 U	6 U
1,2-Dichloropropane	5 U	5 U	5 U	5 U	5 U	6 U
cis-1,3-Dichloropropene	5 U	5 U	5 U	5 U	5 U	6 U
Trichloroethene	5 U	5 U	5 U	5 U	5 U	6 U
Dibromochloromethane	5 U	5 U	5 U	5 U	5 U	6 U
1,1,2-Trichloroethane	5 U	5 U	5 U	5 U	5 U	6 U
Benzene	5 U	5 U	5 U	5 U	5 U	6 U
trans-1,3-Dichloropropene	5 U	5 U	5 U	5 U	5 U	6 U
Bromoform	5 U	5 U	5 U	5 U	5 U	6 U
4-Methyl-2-pentanone	10 U	10 U	11 U	10 U	11 U	12 U
2-Hexanone	10 U	10 U	11 U	10 U	11 U	12 U
Tetrachloroethene	5 U	5 U	5 U	5 U	5 U	6 U
1,1,2,2-Tetrachloroethane	5 U	5 U	5 U	5 U	5 U	6 U
Toluene	5 U	5 U	5 U	5 U	5 U	6 U
Chlorobenzene	5 U	5 U	5 U	5 U	5 U	6 U
Ethylbenzene	5 U	5 U	5 U	5 U	5 U	6 U
Styrene	5 U	5 U	5 U	5 U	5 U	6 U
Xylene (total)	5 U	5 U	5 U	5 U	5 U	6 U
Acrolein	520 U	520 U	540 U	520 U	530 U	580 U

FREQUENCY OF DETECTION SUMMARY
SURFACE SOIL
CTO 348
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

SAMPLE ID	6SS01	6SS02	AOCBSS01	AOCBSS02	AOCBSS03	12SS01
MATRIX	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
% Solids	96.8	96.4	93.3	95.3	94.2	87.2
VOLATILES (ug/kg) cont.						
Acrylonitrile	100 U	100 U	110 U	100 U	110 U	120 U
Trichlorofluoromethane	10 U	10 U	11 U	10 U	11 U	12 U
Dichlorodifluoromethane	21 U	21 U	21 U	21 U	21 U	23 U
Acetonitrile	100 U	100 U	110 U	100 U	110 U	120 U
Iodomethane	10 U	10 U	11 U	10 U	11 U	12 U
Propionitrile (Ethyl Cyanide)	52 U	52 U	54 U	52 U	53 U	58 U
3-Chloropropene	21 U	21 U	21 U	21 U	21 U	23 U
Methacrylonitrile	21 U	21 U	21 U	21 U	21 U	23 U
Dibromomethane	10 U	10 U	11 U	10 U	11 U	12 U
Isobutyl alcohol	2100 U	2100 U	2100 U	2100 U	2100 U	2300 U
1,2-Dibromoethane	21 U	21 U	21 U	21 U	21 U	23 U
1,1,1,2-Tetrachloroethane	10 U	10 U	11 U	10 U	11 U	12 U
1,2,3-Trichloropropane	10 U	10 U	11 U	10 U	11 U	12 U
trans-1,4-Dichloro-2-butene	21 U	21 U	21 U	21 U	22 U	23 U
1,2-Dibromo-3-chloropropane	21 U	21 U	21 U	21 U	21 U	23 U
2-Chloro-1,3-Butadiene	100 U	100 U	110 U	100 U	110 U	120 U
Methylmethacrylate	21 U	21 U	21 U	21 U	21 U	23 U
Ethylmethacrylate	21 U	21 U	21 U	21 U	21 U	23 U
Pentachloroethane	21 U	21 U	21 U	21 U	21 U	23 U

FREQUENCY OF DETECTION SUMMARY
SURFACE SOIL
CTO 348
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

SAMPLE ID	6SS01	6SS02	AOCBSS01	AOCBSS02	AOCBSS03	12SS01
MATRIX	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
% Solids	96.8	96.4	93.3	95.3	94.2	87.2
SEMIVOLATILES (ug/kg)						
Phenol	340 U	340 U	350 U	350 U	350 U	380 U
bis(2-Chloroethyl)ether	340 U	340 U	350 U	350 U	350 U	380 U
2-Chlorophenol	340 U	340 U	350 U	350 U	350 U	380 U
1,3-Dichlorobenzene	340 U	340 U	350 U	350 U	350 U	380 U
1,4-Dichlorobenzene	340 U	340 U	350 U	350 U	350 U	380 U
Benzyl alcohol	340 U	340 U	350 U	350 U	350 U	380 U
1,2-Dichlorobenzene	340 U	340 U	350 U	350 U	350 U	380 U
o-Cresol	340 U	340 U	350 U	350 U	350 U	380 U
2,2'-oxybis(1-Chloropropane)	340 U	340 U	350 U	350 U	350 U	380 U
meta & para-Cresol	340 U	340 U	350 U	350 U	350 U	380 U
N-Nitroso-di-n-propylamine	340 U	340 U	350 U	350 U	350 U	380 U
Hexachloroethane	340 U	340 U	350 U	350 U	350 U	380 U
Nitrobenzene	340 U	340 U	350 U	350 U	350 U	380 U
Isophorone	340 U	340 U	350 U	350 U	350 U	380 U
2-Nitrophenol	340 U	340 U	350 U	350 U	350 U	380 U
2,4-Dimethylphenol	340 U	340 U	350 U	350 U	350 U	380 U
Benzoic acid	1700 U	1700 U	1700 U	1700 U	1800 U	1900 U
bis(2-Chloroethoxy)methane	340 U	340 U	350 U	350 U	350 U	380 U
2,4-Dichlorophenol	340 U	340 U	350 U	350 U	350 U	380 U
1,2,4-Trichlorobenzene	340 U	340 U	350 U	350 U	350 U	380 U
Naphthalene	340 U	340 U	350 U	350 U	420	380 U
4-Chloroaniline	340 U	340 U	350 U	350 U	350 U	380 U
Hexachlorobutadiene	340 U	340 U	350 U	350 U	350 U	380 U
4-Chloro-3-methylphenol	340 U	340 U	350 U	350 U	350 U	380 U
2-Methylnaphthalene	340 U	340 U	350 U	350 U	270 J	380 U
Hexachlorocyclopentadiene	340 U	340 U	350 U	350 U	350 U	380 U
2,4,6-Trichlorophenol	340 U	340 U	350 U	350 U	350 U	380 U
2,4,5-Trichlorophenol	1700 U	1700 U	1700 U	1700 U	1800 U	1900 U
2-Chloronaphthalene	340 U	340 U	350 U	350 U	350 U	380 U
2-Nitroaniline	1700 U	1700 U	1700 U	1700 U	1800 U	1900 U
Dimethylphthalate	340 U	340 U	350 U	350 U	350 U	380 U
Acenaphthylene	40 J	340 U	71 J	52 J	62 J	380 U
2,6-Dinitrotoluene	340 U	340 U	350 U	350 U	350 U	380 U
3-Nitroaniline	1700 U	1700 U	1700 U	1700 U	1800 U	1900 U
Acenaphthene	340 U	340 U	370	58 J	2500	380 U

FREQUENCY OF DETECTION SUMMARY
SURFACE SOIL
CTO 348
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

SAMPLE ID	6SS01	6SS02	AOCBSS01	AOCBSS02	AOCBSS03	12SS01
MATRIX	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
% Solids	96.8	96.4	93.3	95.3	94.2	87.2
SEMIVOLATILES (ug/kg) cont.						
2,4-Dinitrophenol	1700 U	1700 U	1700 U	1700 U	1800 U	1900 U
4-Nitrophenol	1700 U	1700 U	1700 U	1700 U	1800 U	1900 U
Dibenzofuran	340 U	340 U	93 J	350 U	720	380 U
2,4-Dinitrotoluene	340 U	340 U	350 U	350 U	350 U	380 U
Diethylphthalate	340 U	340 U	350 U	350 U	350 U	380 U
4-Chlorophenyl-phenylether	340 U	340 U	350 U	350 U	350 U	380 U
Fluorene	340 U	340 U	190 J	350 U	1500	380 U
4-Nitroaniline	1700 U	1700 U	1700 U	1700 U	1800 U	1900 U
4,6-Dinitro-2-methylphenol	1700 U	1700 U	1700 U	1700 U	1800 U	1900 U
N-Nitrosodiphenylamine (1)	340 U	340 U	350 U	350 U	350 U	380 U
4-Bromophenyl-phenylether	340 U	340 U	350 U	350 U	350 U	380 U
Hexachlorobenzene	340 U	340 U	350 U	350 U	350 U	380 U
Pentachlorophenol	1700 U	1700 U	1700 U	1700 U	1800 U	1900 U
Phenanthrene	120 J	42 J	2300	560	15000	380 U
Anthracene	47 J	340 U	570	190 J	3100	380 U
Di-n-butylphthalate	180 JB	200 JB	220 JB	470 B	280 JB	250 JB
Fluoranthene	760	350	3500	1400	23000	380 U
Pyrene	950	390	4700	1700	21000	380 U
Butylbenzylphthalate	340 U	340 U	47 J	200 J	120 J	380 U
3,3'-Dichlorobenzidine	670 U	680 U	700 U	700 U	700 U	750 U
Benzo(a)anthracene	370	150 J	2100	890	11000	380 U
Chrysene	670	280 J	2400	1300	13000	380 U
bis(2-Ethylhexyl)phthalate	54 J	340 U	150 J	100 J	350 U	39 J
Di-n-octyl phthalate	340 U	340 U	350 U	350 U	350 U	380 U
Benzo(b)fluoranthene	760	280 J	3800	1700	14000	380 U
Benzo(k)fluoranthene	310 J	120 J	1100	640	3500	380 U
Benzo(a)pyrene	340	130 J	2000	920	8200	380 U
Indeno(1,2,3-cd)pyrene	330 J	91 J	930	630	4200	380 U
Dibenzo(a,h)anthracene	77 J	340 U	220 J	140 J	1100	380 U
Benzo(g,h,i)perylene	330 J	340 U	820	580	170 J	380 U
1,4-Dioxane	1300 U	1400 U	1400 U	1400 U	1400 U	1500 U
Pyridine	670 U	680 U	700 U	700 U	700 U	750 U
N-Nitrosodimethylamine	340 U	340 U	350 U	350 U	350 U	380 U
2-Picoline	340 U	340 U	350 U	350 U	350 U	380 U
N-Nitrosomethylethylamine	340 U	340 U	350 U	350 U	350 U	380 U

FREQUENCY OF DETECTION SUMMARY
SURFACE SOIL
CTO 348
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

SAMPLE ID	6SS01	6SS02	AOCBSS01	AOCBSS02	AOCBSS03	12SS01
MATRIX	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
% Solids	96.8	96.4	93.3	95.3	94.2	87.2
SEMIVOLATILES (ug/kg) cont.						
Methyl methanesulfonate	340 U	340 U	350 U	350 U	350 U	380 U
N-Nitrosodiethylamine	340 U	340 U	350 U	350 U	350 U	380 U
Ethyl methanesulfonate	340 U	340 U	350 U	350 U	350 U	380 U
Aniline	1700 U	1700 U	1700 U	1700 U	1800 U	1900 U
N-Nitrosopyrrolidine	1700 U	1700 U	1700 U	1700 U	1800 U	1900 U
Acetophenone	340 U	340 U	350 U	350 U	350 U	380 U
N-Nitrosomorpholine	670 U	680 U	700 U	700 U	700 U	750 U
o-Toluidine	340 U	340 U	350 U	350 U	350 U	380 U
N-Nitrosopiperidine	340 U	340 U	350 U	350 U	350 U	380 U
a,a-Dimethylphenethylamine	1700 U	1700 U	1700 U	1700 U	1800 U	1900 U
2,6-Dichlorophenol	340 U	340 U	350 U	350 U	350 U	380 U
Hexachloropropene	670 U	680 U	700 U	700 U	700 U	750 U
p-Phenylenediamine	670 U	780 U	700 U	700 U	700 U	750 U
N-Nitroso-di-n-butylamine	340 U	340 U	350 U	350 U	350 U	380 U
Safrole	340 U	340 U	350 U	350 U	350 U	380 U
1,2,4,5-Tetrachlorobenzene	340 U	340 U	350 U	350 U	350 U	380 U
Isosafrole	340 U	340 U	350 U	350 U	350 U	380 U
1,4-Naphthoquinone	1700 U	1700 U	1700 U	1700 U	1800 U	1900 U
1,3-Dinitrobenzene	670 U	680 U	700 U	700 U	700 U	750 U
Pentachlorobenzene	340 U	340 U	350 U	350 U	350 U	380 U
1-Naphthylamine	340 U	340 U	350 U	350 U	350 U	380 U
2-Naphthylamine	340 U	340 U	350 U	350 U	350 U	380 U
2,3,4,6-Tetrachlorophenol	340 U	340 U	350 U	350 U	350 U	380 U
1,3,5-Trinitrobenzene	3400 U	3400 U	3500 U	3500 U	3500 U	3800 U
Diallate	340 U	340 U	350 U	350 U	350 U	380 U
Phenacetin	340 U	340 U	350 U	350 U	350 U	380 U
Diphenylamine	340 U	340 U	350 U	350 U	350 U	380 U
5-Nitro-o-toluidine	670 U	680 U	700 U	700 U	700 U	750 U
4-Aminobiphenyl	340 U	340 U	350 U	350 U	350 U	380 U
Pronamide	340 U	340 U	350 U	350 U	350 U	380 U
2-sec-Butyl-4,6-dinitrophenol	670 U	680 U	700 U	700 U	700 U	750 U
Pentachloronitrobenzene	340 U	340 U	350 U	350 U	350 U	380 U
4-Nitroquinoline-1-oxide	1700 U	1700 U	1700 U	1700 U	1800 U	1900 U
Methapyrilene	840 U	840 U	870 U	870 U	880 U	940 U
Aramite	670 U	680 U	700 U	700 U	700 U	750 U

FREQUENCY OF DETECTION SUMMARY
SURFACE SOIL
CTO 348
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

SAMPLE ID	6SS01	6SS02	AOCBSS01	AOCBSS02	AOCBSS03	12SS01
MATRIX	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
% Solids	96.8	96.4	93.3	95.3	94.2	87.2
SEMIVOLATILES (ug/kg) cont.						
Chlorobenzilate	340 U	340 U	350 U	350 U	350 U	380 U
p-Dimethylaminoazobenzene	670 U	680 U	700 U	700 U	700 U	750 U
3,3'-Dimethylbenzidine	670 U	680 U	700 U	700 U	700 U	750 U
2-Acetylaminofluorene	670 U	680 U	700 U	700 U	700 U	750 U
7,12-Dimethylbenz(a)anthracene	670 U	680 U	700 U	700 U	700 U	750 U
Hexachlorophene	3400 U	3500 U	3500 U	3500 U	3500 U	3800 U
3-Methylcholanthrene	340 U	340 U	350 U	350 U	350 U	380 U
EPA METHOD 8141 (ug/kg)						
o,o,o-Triethyl phosphorothioate	27 U	27 U	28 U	27 U	28 U	NA
Thionazin	27 U	27 U	28 U	27 U	28 U	NA
Sulfotep	27 U	27 U	28 U	27 U	28 U	NA
Phorate	62 U	62 U	64 U	62 U	63 U	NA
Dimethoate	100 U	99 U	100 U	99 U	100 U	NA
Disulfoton	69 U	68 U	71 U	69 U	70 U	NA
Methyl parathion	69 U	68 U	71 U	69 U	70 U	NA
Ethyl Parathion	69 U	68 U	71 U	69 U	70 U	NA
Famphur	69 U	68 U	71 U	69 U	70 U	NA

FREQUENCY OF DETECTION SUMMARY
SURFACE SOIL
CTO 348
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

SAMPLE ID	6SS01	6SS02	AOCBSS01	AOCBSS02	AOCBSS03	12SS01
MATRIX	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
% Solids	96.8	96.4	93.3	95.3	94.2	87.2
PESTICIDE/PCBS (ug/kg)						
alpha-BHC	41 U	4.1 U	21 U	21 U	21 U	NA
beta-BHC	41 U	4.1 U	21 U	21 U	21 U	NA
delta-BHC	41 U	4.1 U	21 U	21 U	21 U	NA
gamma-BHC (Lindane)	41 U	4.1 U	21 U	21 U	21 U	NA
Heptachlor	41 U	4.1 U	21 U	21 U	21 U	NA
Aldrin	41 U	4.1 U	21 U	21 U	21 U	NA
Heptachlor epoxide	41 U	1.7	10	6.2	49	NA
Endosulfan I	41 U	4.1 U	21 U	21 U	21 U	NA
Dieldrin	82 U	8.2 U	43 U	41 U	7.4 J	NA
4,4'-DDE	82 U	8.2 U	15	16	53	NA
Endrin	82 U	8.2 U	43 U	41 U	42 U	NA
Endosulfan II	82 U	8.2 U	43 U	41 U	42 U	NA
4,4'-DDD	82 U	8.2 U	4.3 J	41 U	9.5	NA
Endosulfan sulfate	82 U	8.2 U	43 U	41 U	42 U	NA
4,4'-DDT	13 J	8.2 U	8.5 J	10	16	NA
Methoxychlor	410 U	41 U	210 U	210 U	210 U	NA
Endrin aldehyde	82 U	8.2 U	43 U	41 U	42 U	NA
Isodrin	41 U	4.1 U	21 U	21 U	21 U	NA
Kepone	82 U	8.2 U	43 U	41 U	42 U	NA
alpha-Chlordane	410 U	41 U	210 U	210 U	210 U	NA
gamma-Chlordane	410 U	41 U	210 U	210 U	30	NA
Toxaphene	820 U	82 U	430 U	410 U	420 U	NA
Aroclor-1016	410 U	41 U	210 U	210 U	210 U	45 U
Aroclor-1221	410 U	41 U	210 U	210 U	210 U	45 U
Aroclor-1232	410 U	41 U	210 U	210 U	210 U	45 U
Aroclor-1242	410 U	41 U	210 U	210 U	210 U	45 U
Aroclor-1248	410 U	41 U	210 U	210 U	210 U	45 U
Aroclor-1254	820 U	82 U	430 U	410 U	420 U	91 U
Aroclor-1260	820 U	82 U	430 U	410 U	420 U	91 U
HERBICIDES (ug/kg)						
2,4-D	330 U	340 U	350 U	350 U	350 U	NA
2,4,5-TP (Silvex)	67 U	68 U	69 U	69 U	70 U	NA
2,4,5-T	67 U	68 U	69 U	69 U	70 U	NA

FREQUENCY OF DETECTION SUMMARY
SURFACE SOIL
CTO 348
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

SAMPLE ID	6SS01	6SS02	AOCBSS01	AOCBSS02	AOCBSS03	12SS01
MATRIX	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
% Solids	96.8	96.4	93.3	95.3	94.2	87.2
PCDD/PCDF (ug/kg)						
2378-TCDD	0.28 U	0.18 U	0.12 U	0.05 U	0.41 U	NA
Total TCDD	0.28 U	0.23 U	0.12 U	0.08 U	0.46 U	NA
Total PECDD	0.92 U	0.48 U	0.17 U	0.11 U	0.54 U	NA
Total HXCDD	0.42 U	0.31 U	0.82 JS	0.75 JS	0.76 JS	NA
Total TCDF	0.27 U	0.16 U	0.07 U	0.04 U	0.60 U	NA
Total PECDF	0.44 U	0.25 U	0.16 JS	0.15 U	0.18 JS	NA
Total HXCDF	0.60 U	0.30 U	1.1 JS	0.93 JS	0.94 J	NA
TPH (ug/kg)						
Gasoline	NA	NA	33 U	30 U	33 U	33 U
Diesel Fuel	NA	NA	44 U	4.4 U	44 U	47 U

FREQUENCY OF DETECTION SUMMARY
SURFACE SOIL
CTO 348
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

SAMPLE ID	6SS01	6SS02	AOCBSS01	AOCBSS02	AOCBSS03	12SS01
MATRIX	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
% Solids	96.8	96.4	93.3	95.3	94.2	87.2
ANALYTES (mg/kg)						
Silver	0.24 U	0.15 U	0.21 U	0.27 U	0.27 U	NA
Arsenic	2.1	2.9	3.6	5.5	4.8	NA
Barium	69.3	19.2	50.3	72.2	48.0	NA
Beryllium	0.14 U	0.088 U	0.12 U	0.16 U	0.16 U	NA
Cadmium	1.1	0.28	1.3	1.1	1.2	NA
Cobalt	10.0	4.6	8.7	14.2	7.0	NA
Chromium	35.3	7.1	17.7	18.1	20.1	NA
Copper	177	26.5	80.0	124	59.5	NA
Mercury	12.9	0.28	0.49	0.84	0.18	NA
Nickel	9.6	2.6	7.4	10.4	6.5	NA
Lead	200	10.9	129	63.2	102	NA
Antimony	1.6 U	1.1 U	1.5 U	1.9 U	1.9 U	NA
Selenium	0.096 U	0.091 U	0.77 U	0.16	0.77 U	NA
Tin	1.6 U	1.0 U	1.5 U	1.8 U	1.9 U	NA
Thallium	0.096 U	0.091 U	0.15 U	0.15 U	0.15 U	NA
Vanadium	62.6	28.1	60.5	83.7	52.8	NA
Zinc	210	25.5	167	119	167	NA
Cyanide	0.38 U	0.46 U	0.49 U	0.40 U	0.50 U	NA
Sulfide	23.1 U	25.4 U	26.8 U	25.5 U	26.3 U	NA

FREQUENCY OF DETECTION SUMMARY
SURFACE SOIL
CTO 348
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

SAMPLE ID	12SS02	14SS01	14SS02	14SS03
MATRIX	SOIL	SOIL	SOIL	SOIL
% Solids	88.0	92.3	84.1	85.5
VOLATILES (ug/kg)				
Chloromethane	11 U	11 U	60 U	12 U
Bromomethane	11 U	11 U	60 U	12 U
Vinyl chloride	11 U	11 U	60 U	12 U
Chloroethane	11 U	11 U	60 U	12 U
Methylene Chloride	6 U	5 U	30 U	6 U
Acetone	11 U	11 U	60 U	12 U
Carbon Disulfide	6 U	5 U	30 U	6 U
1,1-Dichloroethene	6 U	5 U	30 U	6 U
1,1-Dichloroethane	6 U	5 U	30 U	6 U
1,2-Dichloroethene (total)	6 U	5 U	30 U	6 U
Chloroform	6 U	5 U	30 U	6 U
1,2-Dichloroethane	6 U	5 U	30 U	6 U
2-Butanone	11 U	11 U	60 U	12 U
1,1,1-Trichloroethane	6 U	5 U	30 U	6 U
Carbon Tetrachloride	6 U	5 U	30 U	6 U
Vinyl acetate	11 U	11 U	60 U	12 U
Bromodichloromethane	6 U	5 U	30 U	6 U
1,2-Dichloropropane	6 U	5 U	30 U	6 U
cis-1,3-Dichloropropene	6 U	5 U	30 U	6 U
Trichloroethene	6 U	5 U	30 U	6 U
Dibromochloromethane	6 U	5 U	30 U	6 U
1,1,2-Trichloroethane	6 U	5 U	30 U	6 U
Benzene	6 U	5 U	30 U	6 U
trans-1,3-Dichloropropene	6 U	5 U	30 U	6 U
Bromoform	6 U	5 U	30 U	6 U
4-Methyl-2-pentanone	11 U	11 U	60 U	12 U
2-Hexanone	11 U	11 U	60 U	12 U
Tetrachloroethene	6 U	5 U	30 U	6 U
1,1,2,2-Tetrachloroethane	6 U	5 U	30 U	6 U
Toluene	6 U	5 U	30 U	6 U
Chlorobenzene	6 U	5 U	30 U	6 U
Ethylbenzene	6 U	5 U	30 U	6 U
Styrene	6 U	5 U	30 U	6 U
Xylene (total)	6 U	5 U	30 U	6 U
Acrolein	570 U	540 U	3000 U	580 U

FREQUENCY OF DETECTION SUMMARY
SURFACE SOIL
CTO 348
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

SAMPLE ID	12SS02	14SS01	14SS02	14SS03
MATRIX	SOIL	SOIL	SOIL	SOIL
% Solids	88.0	92.3	84.1	85.5
VOLATILES (ug/kg) cont.				
Acrylonitrile	110 U	110 U	600 U	120 U
Trichlorofluoromethane	11 U	11 U	60 U	12 U
Dichlorodifluoromethane	23 U	22 U	120 U	23 U
Acetonitrile	110 U	110 U	600 U	120 U
Iodomethane	11 U	11 U	60 U	12 U
Propionitrile (Ethyl Cyanide)	57 U	54 U	300 U	58 U
3-Chloropropene	23 U	22 U	120 U	23 U
Methacrylonitrile	23 U	22 U	120 U	23 U
Dibromomethane	11 U	11 U	60 U	12 U
Isobutyl alcohol	2300 U	2200 U	12000 U	2300 U
1,2-Dibromoethane	23 U	22 U	120 U	23 U
1,1,1,2-Tetrachloroethane	11 U	11 U	60 U	12 U
1,2,3-Trichloropropane	11 U	11 U	60 U	12 U
trans-1,4-Dichloro-2-butene	23 U	22 U	120 U	23 U
1,2-Dibromo-3-chloropropane	23 U	22 U	120 U	23 U
2-Chloro-1,3-Butadiene	110 U	110 U	600 U	120 U
Methylmethacrylate	23 U	22 U	120 U	23 U
Ethylmethacrylate	23 U	22 U	120 U	23 U
Pentachloroethane	23 U	22 U	120 U	23 U

FREQUENCY OF DETECTION SUMMARY
SURFACE SOIL
CTO 348
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

SAMPLE ID	12SS02	14SS01	14SS02	14SS03
MATRIX	SOIL	SOIL	SOIL	SOIL
% Solids	88.0	92.3	84.1	85.5
SEMIVOLATILES (ug/kg)				
Phenol	370 U	360 U	390 U	380 U
bis(2-Chloroethyl)ether	370 U	360 U	390 U	380 U
2-Chlorophenol	370 U	360 U	390 U	380 U
1,3-Dichlorobenzene	370 U	360 U	390 U	380 U
1,4-Dichlorobenzene	370 U	360 U	390 U	380 U
Benzyl alcohol	370 U	360 U	390 U	380 U
1,2-Dichlorobenzene	370 U	110 J	120 J	120 J
o-Cresol	370 U	360 U	390 U	380 U
2,2'-oxybis(1-Chloropropane)	370 U	360 U	390 U	380 U
meta & para-Cresol	370 U	360 U	390 U	380 U
N-Nitroso-di-n-propylamine	370 U	360 U	390 U	380 U
Hexachloroethane	370 U	360 U	390 U	380 U
Nitrobenzene	370 U	360 U	390 U	380 U
Isophorone	370 U	360 U	390 U	380 U
2-Nitrophenol	370 U	360 U	390 U	380 U
2,4-Dimethylphenol	370 U	360 U	390 U	380 U
Benzoic acid	1800 U	1800 U	1900 U	1900 U
bis(2-Chloroethoxy)methane	370 U	360 U	390 U	380 U
2,4-Dichlorophenol	370 U	360 U	390 U	380 U
1,2,4-Trichlorobenzene	370 U	360 U	390 U	380 U
Naphthalene	370 U	360 U	390 U	380 U
4-Chloroaniline	370 U	360 U	390 U	380 U
Hexachlorobutadiene	370 U	360 U	390 U	380 U
4-Chloro-3-methylphenol	370 U	360 U	390 U	380 U
2-Methylnaphthalene	370 U	360 U	390 U	380 U
Hexachlorocyclopentadiene	370 U	360 U	390 U	380 U
2,4,6-Trichlorophenol	370 U	360 U	390 U	380 U
2,4,5-Trichlorophenol	1800 U	1800 U	1900 U	1900 U
2-Chloronaphthalene	370 U	360 U	390 U	380 U
2-Nitroaniline	1800 U	1800 U	1900 U	1900 U
Dimethylphthalate	370 U	360 U	390 U	380 U
Acenaphthylene	370 U	360 U	390 U	380 U
2,6-Dinitrotoluene	370 U	360 U	390 U	380 U
3-Nitroaniline	1800 U	1800 U	1900 U	1900 U
Acenaphthene	370 U	360 U	390 U	380 U

FREQUENCY OF DETECTION SUMMARY
SURFACE SOIL
CTO 348
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

SAMPLE ID	12SS02	14SS01	14SS02	14SS03
MATRIX	SOIL	SOIL	SOIL	SOIL
% Solids	88.0	92.3	84.1	85.5
SEMIVOLATILES (ug/kg) cont.				
2,4-Dinitrophenol	1800 U	1800 U	1900 U	1900 U
4-Nitrophenol	1800 U	1800 U	1900 U	1900 U
Dibenzofuran	370 U	360 U	390 U	380 U
2,4-Dinitrotoluene	370 U	360 U	390 U	380 U
Diethylphthalate	370 U	360 U	390 U	380 U
4-Chlorophenyl-phenylether	370 U	360 U	390 U	380 U
Fluorene	370 U	360 U	390 U	380 U
4-Nitroaniline	1800 U	1800 U	1900 U	1900 U
4,6-Dinitro-2-methylphenol	1800 U	1800 U	1900 U	1900 U
N-Nitrosodiphenylamine (1)	370 U	360 U	390 U	380 U
4-Bromophenyl-phenylether	370 U	360 U	390 U	380 U
Hexachlorobenzene	370 U	360 U	390 U	380 U
Pentachlorophenol	1800 U	1800 U	1900 U	1900 U
Phenanthrene	370 U	360 U	390 U	380 U
Anthracene	370 U	360 U	390 U	380 U
Di-n-butylphthalate	300 JB	680 B	710 B	1000 B
Fluoranthene	370 U	360 U	200 J	380 U
Pyrene	370 U	360 U	380 J	41 J
Butylbenzylphthalate	370 U	270 J	220 J	260 J
3,3'-Dichlorobenzidine	740 U	720 U	770 U	760 U
Benzo(a)anthracene	370 U	360 U	68 J	380 U
Chrysene	370 U	360 U	76 J	380 U
bis(2-Ethylhexyl)phthalate	370 U	360 U	390 U	380 U
Di-n-octyl phthalate	370 U	360 U	390 U	380 U
Benzo(b)fluoranthene	370 U	360 U	390 U	380 U
Benzo(k)fluoranthene	370 U	360 U	390 U	380 U
Benzo(a)pyrene	370 U	360 U	390 U	380 U
Indeno(1,2,3-cd)pyrene	370 U	360 U	61 J	380 U
Dibenzo(a,h)anthracene	370 U	360 U	390 U	380 U
Benzo(g,h,i)perylene	370 U	360 U	100 J	380 U
1,4-Dioxane	1500 U	1400 U	1500 U	1500 U
Pyridine	740 U	720 U	770 U	760 U
N-Nitrosodimethylamine	370 U	360 U	390 U	380 U
2-Picoline	370 U	360 U	390 U	380 U
N-Nitrosomethylethylamine	370 U	360 U	390 U	380 U

FREQUENCY OF DETECTION SUMMARY
SURFACE SOIL
CTO 348
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

SAMPLE ID	12SS02	14SS01	14SS02	14SS03
MATRIX	SOIL	SOIL	SOIL	SOIL
% Solids	88.0	92.3	84.1	85.5
SEMIVOLATILES (ug/kg) cont.				
Methyl methanesulfonate	370 U	360 U	390 U	380 U
N-Nitrosodiethylamine	370 U	360 U	390 U	380 U
Ethyl methanesulfonate	370 U	360 U	390 U	380 U
Aniline	1800 U	1800 U	1900 U	1900 U
N-Nitrosopyrrolidine	1800 U	1800 U	1900 U	1900 U
Acetophenone	370 U	360 U	390 U	380 U
N-Nitrosomorpholine	740 U	720 U	770 U	760 U
o-Toluidine	370 U	360 U	390 U	380 U
N-Nitrosopiperidine	370 U	360 U	390 U	380 U
a,a-Dimethylphenethylamine	1800 U	1800 U	1900 U	1900 U
2,6-Dichlorophenol	370 U	360 U	390 U	380 U
Hexachloropropene	740 U	720 U	770 U	760 U
p-Phenylenediamine	740 U	720 U	770 U	760 U
N-Nitroso-di-n-butylamine	370 U	360 U	390 U	380 U
Safrole	370 U	360 U	390 U	380 U
1,2,4,5-Tetrachlorobenzene	370 U	360 U	390 U	380 U
Isosafrole	370 U	360 U	390 U	380 U
1,4-Naphthoquinone	1800 U	1800 U	1900 U	1900 U
1,3-Dinitrobenzene	740 U	720 U	770 U	760 U
Pentachlorobenzene	370 U	360 U	390 U	380 U
1-Naphthylamine	370 U	360 U	390 U	380 U
2-Naphthylamine	370 U	360 U	390 U	380 U
2,3,4,6-Tetrachlorophenol	370 U	360 U	390 U	380 U
1,3,5-Trinitrobenzene	3700 U	3600 U	3900 U	3800 U
Diallate	370 U	360 U	390 U	380 U
Phenacetin	370 U	360 U	390 U	380 U
Diphenylamine	370 U	360 U	390 U	380 U
5-Nitro-o-toluidine	740 U	720 U	770 U	760 U
4-Aminobiphenyl	370 U	360 U	390 U	380 U
Pronamide	370 U	360 U	390 U	380 U
2-sec-Butyl-4,6-dinitrophenol	740 U	720 U	770 U	760 U
Pentachloronitrobenzene	370 U	360 U	390 U	380 U
4-Nitroquinoline-1-oxide	1800 U	1800 U	1900 U	1900 U
Methapyrilene	920 U	900 U	970 U	950 U
Aramite	740 U	720 U	770 U	760 U

FREQUENCY OF DETECTION SUMMARY
SURFACE SOIL
CTO 348
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

SAMPLE ID	12SS02	14SS01	14SS02	14SS03
MATRIX	SOIL	SOIL	SOIL	SOIL
% Solids	88.0	92.3	84.1	85.5
SEMIVOLATILES (ug/kg) cont.				
Chlorobenzilate	370 U	360 U	390 U	380 U
p-Dimethylaminoazobenzene	740 U	720 U	770 U	760 U
3,3'-Dimethylbenzidine	740 U	720 U	770 U	760 U
2-Acetylaminofluorene	740 U	720 U	770 U	760 U
7,12-Dimethylbenz(a)anthracene	740 U	720 U	770 U	760 U
Hexachlorophene	3700 U	3600 U	3900 U	3800 U
3-Methylcholanthrene	370 U	360 U	390 U	380 U
EPA METHOD 8141 (ug/kg)				
o,o,o-Triethyl phosphorothioate	NA	NA	NA	NA
Thionazin	NA	NA	NA	NA
Sulfotep	NA	NA	NA	NA
Phorate	NA	NA	NA	NA
Dimethoate	NA	NA	NA	NA
Disulfoton	NA	NA	NA	NA
Methyl parathion	NA	NA	NA	NA
Ethyl Parathion	NA	NA	NA	NA
Famphur	NA	NA	NA	NA

FREQUENCY OF DETECTION SUMMARY
SURFACE SOIL
CTO 348
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

SAMPLE ID	12SS02	14SS01	14SS02	14SS03
MATRIX	SOIL	SOIL	SOIL	SOIL
% Solids	88.0	92.3	84.1	85.5
PESTICIDE/PCBS (ug/kg)				
alpha-BHC	NA	NA	NA	NA
beta-BHC	NA	NA	NA	NA
delta-BHC	NA	NA	NA	NA
gamma-BHC (Lindane)	NA	NA	NA	NA
Heptachlor	NA	NA	NA	NA
Aldrin	NA	NA	NA	NA
Heptachlor epoxide	NA	NA	NA	NA
Endosulfan I	NA	NA	NA	NA
Dieldrin	NA	NA	NA	NA
4,4'-DDE	NA	NA	NA	NA
Endrin	NA	NA	NA	NA
Endosulfan II	NA	NA	NA	NA
4,4'-DDD	NA	NA	NA	NA
Endosulfan sulfate	NA	NA	NA	NA
4,4'-DDT	NA	NA	NA	NA
Methoxychlor	NA	NA	NA	NA
Endrin aldehyde	NA	NA	NA	NA
Isodrin	NA	NA	NA	NA
Kepone	NA	NA	NA	NA
alpha-Chlordane	NA	NA	NA	NA
gamma-Chlordane	NA	NA	NA	NA
Toxaphene	NA	NA	NA	NA
Aroclor-1016	45 U	42 U	46 U	46 U
Aroclor-1221	45 U	42 U	46 U	46 U
Aroclor-1232	45 U	42 U	46 U	46 U
Aroclor-1242	45 U	42 U	46 U	46 U
Aroclor-1248	45 U	42 U	46 U	46 U
Aroclor-1254	91 U	85 U	93 U	91 U
Aroclor-1260	91 U	14	15	22
HERBICIDES (ug/kg)				
2,4-D	NA	NA	NA	NA
2,4,5-TP (Silvex)	NA	NA	NA	NA
2,4,5-T	NA	NA	NA	NA

FREQUENCY OF DETECTION SUMMARY
SURFACE SOIL
CTO 348
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

SAMPLE ID	12SS02	14SS01	14SS02	14SS03
MATRIX	SOIL	SOIL	SOIL	SOIL
% Solids	88.0	92.3	84.1	85.5
PCDD/PCDF (ug/kg)				
2378-TCDD	NA	NA	NA	NA
Total TCDD	NA	NA	NA	NA
Total PECDD	NA	NA	NA	NA
Total HXCDD	NA	NA	NA	NA
Total TCDF	NA	NA	NA	NA
Total PECDF	NA	NA	NA	NA
Total HXCDF	NA	NA	NA	NA
TPH (ug/kg)				
Gasoline	33 U	33 U	180 U	36 U
Diesel Fuel	47 U	44 U	2300	48 U

FREQUENCY OF DETECTION SUMMARY
SURFACE SOIL
CTO 348
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

SAMPLE ID	12SS02	14SS01	14SS02	14SS03
MATRIX	SOIL	SOIL	SOIL	SOIL
% Solids	88.0	92.3	84.1	85.5
ANALYTES (mg/kg)				
Silver	NA	NA	NA	NA
Arsenic	NA	NA	NA	NA
Barium	NA	NA	NA	NA
Beryllium	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA
Cobalt	NA	NA	NA	NA
Chromium	NA	NA	NA	NA
Copper	NA	NA	NA	NA
Mercury	NA	NA	NA	NA
Nickel	NA	NA	NA	NA
Lead	NA	NA	NA	NA
Antimony	NA	NA	NA	NA
Selenium	NA	NA	NA	NA
Tin	NA	NA	NA	NA
Thallium	NA	NA	NA	NA
Vanadium	NA	NA	NA	NA
Zinc	NA	NA	NA	NA
Cyanide	NA	NA	NA	NA
Sulfide	NA	NA	NA	NA

FREQUENCY OF DETECTION SUMMARY
SURFACE SOIL
CTO 348
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

SAMPLE ID MATRIX % Solids	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
VOLATILES (ug/kg)						
Chloromethane	10 U	60 U	ND	ND		0/10
Bromomethane	10 U	60 U	ND	ND		0/10
Vinyl chloride	10 U	60 U	ND	ND		0/10
Chloroethane	10 U	60 U	ND	ND		0/10
Methylene Chloride	5 U	30 U	ND	ND		0/10
Acetone	11 B	60 U	19	19	AOCBSS02	1/10
Carbon Disulfide	5 U	30 U	ND	ND		0/10
1,1-Dichloroethene	5 U	30 U	ND	ND		0/10
1,1-Dichloroethane	5 U	30 U	ND	ND		0/10
1,2-Dichloroethene (total)	5 U	30 U	ND	ND		0/10
Chloroform	5 U	30 U	ND	ND		0/10
1,2-Dichloroethane	5 U	30 U	ND	ND		0/10
2-Butanone	10 U	60 U	ND	ND		0/10
1,1,1-Trichloroethane	5 U	30 U	ND	ND		0/10
Carbon Tetrachloride	5 U	30 U	ND	ND		0/10
Vinyl acetate	10 U	60 U	ND	ND		0/10
Bromodichloromethane	5 U	30 U	ND	ND		0/10
1,2-Dichloropropane	5 U	30 U	ND	ND		0/10
cis-1,3-Dichloropropene	5 U	30 U	ND	ND		0/10
Trichloroethene	5 U	30 U	ND	ND		0/10
Dibromochloromethane	5 U	30 U	ND	ND		0/10
1,1,2-Trichloroethane	5 U	30 U	ND	ND		0/10
Benzene	5 U	30 U	ND	ND		0/10
trans-1,3-Dichloropropene	5 U	30 U	ND	ND		0/10
Bromoform	5 U	30 U	ND	ND		0/10
4-Methyl-2-pentanone	10 U	60 U	ND	ND		0/10
2-Hexanone	10 U	60 U	ND	ND		0/10
Tetrachloroethene	5 U	30 U	ND	ND		0/10
1,1,2,2-Tetrachloroethane	5 U	30 U	ND	ND		0/10
Toluene	5 U	30 U	ND	ND		0/10
Chlorobenzene	5 U	30 U	ND	ND		0/10
Ethylbenzene	5 U	30 U	ND	ND		0/10
Styrene	5 U	30 U	ND	ND		0/10
Xylene (total)	5 U	30 U	ND	ND		0/10
Acrolein	520 U	3000 U	ND	ND		0/10

FREQUENCY OF DETECTION SUMMARY
SURFACE SOIL
CTO 348
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

SAMPLE ID MATRIX % Solids	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
VOLATILES (ug/kg) cont.						
Acrylonitrile	100 U	600 U	ND	ND		0/10
Trichlorofluoromethane	10 U	60 U	ND	ND		0/10
Dichlorodifluoromethane	21 U	120 U	ND	ND		0/10
Acetonitrile	100 U	600 U	ND	ND		0/10
Iodomethane	10 U	60 U	ND	ND		0/10
Propionitrile (Ethyl Cyanide)	52 U	300 U	ND	ND		0/10
3-Chloropropene	21 U	120 U	ND	ND		0/10
Methacrylonitrile	21 U	120 U	ND	ND		0/10
Dibromomethane	10 U	60 U	ND	ND		0/10
Isobutyl alcohol	2100 U	12000 U	ND	ND		0/10
1,2-Dibromoethane	21 U	120 U	ND	ND		0/10
1,1,1,2-Tetrachloroethane	10 U	60 U	ND	ND		0/10
1,2,3-Trichloropropane	10 U	60 U	ND	ND		0/10
trans-1,4-Dichloro-2-butene	21 U	120 U	ND	ND		0/10
1,2-Dibromo-3-chloropropane	21 U	120 U	ND	ND		0/10
2-Chloro-1,3-Butadiene	100 U	600 U	ND	ND		0/10
Methylmethacrylate	21 U	120 U	ND	ND		0/10
Ethylmethacrylate	21 U	120 U	ND	ND		0/10
Pentachloroethane	21 U	120 U	ND	ND		0/10

FREQUENCY OF DETECTION SUMMARY
SURFACE SOIL
CTO 348
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

SAMPLE ID MATRIX % Solids	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
SEMIVOLATILES (ug/kg)						
Phenol	340 U	390 U	ND	ND		0/10
bis(2-Chloroethyl)ether	340 U	390 U	ND	ND		0/10
2-Chlorophenol	340 U	390 U	ND	ND		0/10
1,3-Dichlorobenzene	340 U	390 U	ND	ND		0/10
1,4-Dichlorobenzene	340 U	390 U	ND	ND		0/10
Benzyl alcohol	340 U	390 U	ND	ND		0/10
1,2-Dichlorobenzene	340 U	380 U	110 J	120 J	14SS03	3/10
o-Cresol	340 U	390 U	ND	ND		0/10
2,2'-oxybis(1-Chloropropane)	340 U	390 U	ND	ND		0/10
meta & para-Cresol	340 U	390 U	ND	ND		0/10
N-Nitroso-di-n-propylamine	340 U	390 U	ND	ND		0/10
Hexachloroethane	340 U	390 U	ND	ND		0/10
Nitrobenzene	340 U	390 U	ND	ND		0/10
Isophorone	340 U	390 U	ND	ND		0/10
2-Nitrophenol	340 U	390 U	ND	ND		0/10
2,4-Dimethylphenol	340 U	390 U	ND	ND		0/10
Benzoic acid	1700 U	1900 U	ND	ND		0/10
bis(2-Chloroethoxy)methane	340 U	390 U	ND	ND		0/10
2,4-Dichlorophenol	340 U	390 U	ND	ND		0/10
1,2,4-Trichlorobenzene	340 U	390 U	ND	ND		0/10
Naphthalene	340 U	390 U	420	420	AOCBSS03	1/10
4-Chloroaniline	340 U	390 U	ND	ND		0/10
Hexachlorobutadiene	340 U	390 U	ND	ND		0/10
4-Chloro-3-methylphenol	340 U	390 U	ND	ND		0/10
2-Methylnaphthalene	340 U	390 U	270 J	270 J	AOCBSS03	1/10
Hexachlorocyclopentadiene	340 U	390 U	ND	ND		0/10
2,4,6-Trichlorophenol	340 U	390 U	ND	ND		0/10
2,4,5-Trichlorophenol	1700 U	1900 U	ND	ND		0/10
2-Chloronaphthalene	340 U	390 U	ND	ND		0/10
2-Nitroaniline	1700 U	1900 U	ND	ND		0/10
Dimethylphthalate	340 U	390 U	ND	ND		0/10
Acenaphthylene	340 U	390 U	40 J	71 J	AOCBSS01	4/10
2,6-Dinitrotoluene	340 U	390 U	ND	ND		0/10
3-Nitroaniline	1700 U	1900 U	ND	ND		0/10
Acenaphthene	340 U	390 U	58 J	2500	AOCBSS03	3/10

FREQUENCY OF DETECTION SUMMARY
SURFACE SOIL
CTO 348
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

SAMPLE ID MATRIX % Solids	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
SEMIVOLATILES (ug/kg) cont.						
2,4-Dinitrophenol	1700 U	1900 U	ND	ND		0/10
4-Nitrophenol	1700 U	1900 U	ND	ND		0/10
Dibenzofuran	340 U	390 U	93 J	720	AOCBSS03	2/10
2,4-Dinitrotoluene	340 U	390 U	ND	ND		0/10
Diethylphthalate	340 U	390 U	ND	ND		0/10
4-Chlorophenyl-phenylether	340 U	390 U	ND	ND		0/10
Fluorene	340 U	390 U	190 J	1500	AOCBSS03	2/10
4-Nitroaniline	1700 U	1900 U	ND	ND		0/10
4,6-Dinitro-2-methylphenol	1700 U	1900 U	ND	ND		0/10
N-Nitrosodiphenylamine (1)	340 U	390 U	ND	ND		0/10
4-Bromophenyl-phenylether	340 U	390 U	ND	ND		0/10
Hexachlorobenzene	340 U	390 U	ND	ND		0/10
Pentachlorophenol	1700 U	1900 U	ND	ND		0/10
Phenanthrene	360 U	390 U	42 J	15000	AOCBSS03	5/10
Anthracene	340 U	390 U	47 J	3100	AOCBSS03	4/10
Di-n-butylphthalate	180 JB	1000 B	ND	ND		0/10
Fluoranthene	360 U	380 U	200 J	23000	AOCBSS03	6/10
Pyrene	360 U	380 U	41 J	21000	AOCBSS03	7/10
Butylbenzylphthalate	340 U	380 U	47 J	270 J	14SS01	6/10
3,3'-Dichlorobenzidine	670 U	770 U	ND	ND		0/10
Benzo(a)anthracene	360 U	380 U	68 J	11000	AOCBSS03	6/10
Chrysene	360 U	380 U	76 J	13000	AOCBSS03	6/10
bis(2-Ethylhexyl)phthalate	340 U	390 U	39 J	150 J	AOCBSS01	4/10
Di-n-octyl phthalate	340 U	390 U	ND	ND		0/10
Benzo(b)fluoranthene	360 U	390 U	280 J	14000	AOCBSS03	5/10
Benzo(k)fluoranthene	360 U	390 U	120 J	3500	AOCBSS03	5/10
Benzo(a)pyrene	360 U	390 U	130 J	8200	AOCBSS03	5/10
Indeno(1,2,3-cd)pyrene	360 U	380 U	61 J	4200	AOCBSS03	6/10
Dibenzo(a,h)anthracene	340 U	390 U	77 J	1100	AOCBSS03	4/10
Benzo(g,h,i)perylene	340 U	380 U	100 J	820	AOCBSS01	5/10
1,4-Dioxane	1300 U	1500 U	ND	ND		0/10
Pyridine	670 U	770 U	ND	ND		0/10
N-Nitrosodimethylamine	340 U	390 U	ND	ND		0/10
2-Picoline	340 U	390 U	ND	ND		0/10
N-Nitrosomethylethylamine	340 U	390 U	ND	ND		0/10

FREQUENCY OF DETECTION SUMMARY
SURFACE SOIL
CTO 348
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

SAMPLE ID MATRIX % Solids	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
SEMIVOLATILES (ug/kg) cont.						
Methyl methanesulfonate	340 U	390 U	ND	ND		0/10
N-Nitrosodiethylamine	340 U	390 U	ND	ND		0/10
Ethyl methanesulfonate	340 U	390 U	ND	ND		0/10
Aniline	1700 U	1900 U	ND	ND		0/10
N-Nitrosopyrrolidine	1700 U	1900 U	ND	ND		0/10
Acetophenone	340 U	390 U	ND	ND		0/10
N-Nitrosomorpholine	670 U	770 U	ND	ND		0/10
o-Toluidine	340 U	390 U	ND	ND		0/10
N-Nitrosopiperidine	340 U	390 U	ND	ND		0/10
a,a-Dimethylphenethylamine	1700 U	1900 U	ND	ND		0/10
2,6-Dichlorophenol	340 U	390 U	ND	ND		0/10
Hexachloropropene	670 U	770 U	ND	ND		0/10
p-Phenylenediamine	670 U	780 U	ND	ND		0/10
N-Nitroso-di-n-butylamine	340 U	390 U	ND	ND		0/10
Safrole	340 U	390 U	ND	ND		0/10
1,2,4,5-Tetrachlorobenzene	340 U	390 U	ND	ND		0/10
Isosafrole	340 U	390 U	ND	ND		0/10
1,4-Naphthoquinone	1700 U	1900 U	ND	ND		0/10
1,3-Dinitrobenzene	670 U	770 U	ND	ND		0/10
Pentachlorobenzene	340 U	390 U	ND	ND		0/10
1-Naphthylamine	340 U	390 U	ND	ND		0/10
2-Naphthylamine	340 U	390 U	ND	ND		0/10
2,3,4,6-Tetrachlorophenol	340 U	390 U	ND	ND		0/10
1,3,5-Trinitrobenzene	3400 U	3900 U	ND	ND		0/10
Diallate	340 U	390 U	ND	ND		0/10
Phenacetin	340 U	390 U	ND	ND		0/10
Diphenylamine	340 U	390 U	ND	ND		0/10
5-Nitro-o-toluidine	670 U	770 U	ND	ND		0/10
4-Aminobiphenyl	340 U	390 U	ND	ND		0/10
Pronamide	340 U	390 U	ND	ND		0/10
2-sec-Butyl-4,6-dinitrophenol	670 U	770 U	ND	ND		0/10
Pentachloronitrobenzene	340 U	390 U	ND	ND		0/10
4-Nitroquinoline-1-oxide	1700 U	1900 U	ND	ND		0/10
Methapyrilene	840 U	970 U	ND	ND		0/10
Aramite	670 U	770 U	ND	ND		0/10

FREQUENCY OF DETECTION SUMMARY
SURFACE SOIL
CTO 348
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

SAMPLE ID MATRIX % Solids	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
SEMIVOLATILES (ug/kg) cont.						
Chlorobenzilate	340 U	390 U	ND	ND		0/10
p-Dimethylaminoazobenzene	670 U	770 U	ND	ND		0/10
3,3'-Dimethylbenzidine	670 U	770 U	ND	ND		0/10
2-Acetylaminofluorene	670 U	770 U	ND	ND		0/10
7,12-Dimethylbenz(a)anthracene	670 U	770 U	ND	ND		0/10
Hexachlorophene	3400 U	3900 U	ND	ND		0/10
3-Methylcholanthrene	340 U	390 U	ND	ND		0/10
EPA METHOD 8141 (ug/kg)						
o,o,o-Triethyl phosphorothioate	27 U	28 U	ND	ND		0/5
Thionazin	27 U	28 U	ND	ND		0/5
Sulfotep	27 U	28 U	ND	ND		0/5
Phorate	62 U	64 U	ND	ND		0/5
Dimethoate	99 U	100 U	ND	ND		0/5
Disulfoton	68 U	71 U	ND	ND		0/5
Methyl parathion	68 U	71 U	ND	ND		0/5
Ethyl Parathion	68 U	71 U	ND	ND		0/5
Famphur	68 U	71 U	ND	ND		0/5

FREQUENCY OF DETECTION SUMMARY
SURFACE SOIL
CTO 348
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

SAMPLE ID MATRIX % Solids	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
PESTICIDE/PCBS (ug/kg)						
alpha-BHC	4.1 U	41 U	ND	ND		0/5
beta-BHC	4.1 U	41 U	ND	ND		0/5
delta-BHC	4.1 U	41 U	ND	ND		0/5
gamma-BHC (Lindane)	4.1 U	41 U	ND	ND		0/5
Heptachlor	4.1 U	41 U	ND	ND		0/5
Aldrin	4.1 U	41 U	ND	ND		0/5
Heptachlor epoxide	41 U	41 U	1.7	49	AOCBSS03	4/5
Endosulfan I	4.1 U	41 U	ND	ND		0/5
Dieldrin	8.2 U	82 U	7.4 J	7.4 J	AOCBSS03	1/5
4,4'-DDE	8.2 U	82 U	15	53	AOCBSS03	3/5
Endrin	8.2 U	82 U	ND	ND		0/5
Endosulfan II	8.2 U	82 U	ND	ND		0/5
4,4'-DDD	8.2 U	82 U	4.3 J	9.5	AOCBSS03	2/5
Endosulfan sulfate	8.2 U	82 U	ND	ND		0/5
4,4'-DDT	8.2 U	8.2 U	8.5 J	16	AOCBSS03	4/5
Methoxychlor	41 U	410 U	ND	ND		0/5
Endrin aldehyde	8.2 U	82 U	ND	ND		0/5
Isodrin	4.1 U	41 U	ND	ND		0/5
Kepone	8.2 U	82 U	ND	ND		0/5
alpha-Chlordane	41 U	410 U	ND	ND		0/5
gamma-Chlordane	41 U	410 U	30	30	AOCBSS03	1/5
Toxaphene	82 U	820 U	ND	ND		0/5
Aroclor-1016	41 U	410 U	ND	ND		0/10
Aroclor-1221	41 U	410 U	ND	ND		0/10
Aroclor-1232	41 U	410 U	ND	ND		0/10
Aroclor-1242	41 U	410 U	ND	ND		0/10
Aroclor-1248	41 U	410 U	ND	ND		0/10
Aroclor-1254	82 U	820 U	ND	ND		0/10
Aroclor-1260	82 U	820 U	14	22	14SS03	3/10
HERBICIDES (ug/kg)						
2,4-D	330 U	350 U	ND	ND		0/5
2,4,5-TP (Silvex)	67 U	70 U	ND	ND		0/5
2,4,5-T	67 U	70 U	ND	ND		0/5

FREQUENCY OF DETECTION SUMMARY
SURFACE SOIL
CTO 348
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

SAMPLE ID MATRIX % Solids	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
PCDD/PCDF (ug/kg)						
2378-TCDD	0.05 U	0.41 U	ND	ND		0/5
Total TCDD	0.08 U	0.46 U	ND	ND		0/5
Total PECDD	0.11 U	0.92 U	ND	ND		0/5
Total HXCDD	0.31 U	0.42 U	0.75 JS	0.82 JS	AOCBSS01	3/5
Total TCDF	0.04 U	0.6 U	ND	ND		0/5
Total PECDF	0.15 U	0.81 U	0.16 JS	0.18 JS	AOCBSS03	2/5
Total HXCDF	0.3 U	0.6 U	0.93 JS	1.1 JS	AOCBSS01	3/5
TPH (ug/kg)						
Gasoline	30 U	180 U	ND	ND		0/8
Diesel Fuel	4.4 U	48 U	2300	2300	14SS02	1/8

FREQUENCY OF DETECTION SUMMARY
SURFACE SOIL
CTO 348
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

SAMPLE ID MATRIX % Solids	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
ANALYTES (mg/kg)						
Silver	0.15 U	0.27 U	ND	ND		0/5
Arsenic	NA	NA	2.1	5.5	AOCBSS02	5/5
Barium	NA	NA	19.2	72.2	AOCBSS02	5/5
Beryllium	0.088 U	0.16 U	ND	ND		0/5
Cadmium	NA	NA	0.28	1.3	AOCBSS01	5/5
Cobalt	NA	NA	4.6	14.2	AOCBSS02	5/5
Chromium	NA	NA	7.1	35.3	6SS01	5/5
Copper	NA	NA	26.5	177	6SS01	5/5
Mercury	NA	NA	0.18	12.9	6SS01	5/5
Nickel	NA	NA	2.6	10.4	AOCBSS02	5/5
Lead	NA	NA	10.9	200	6SS01	5/5
Antimony	1.1 U	1.9 U	ND	ND		0/5
Selenium	0.091 U	0.77 U	0.16	0.16	AOCBSS02	1/5
Tin	1 U	1.9 U	ND	ND		0/5
Thallium	0.091 U	0.15 U	ND	ND		0/5
Vanadium	NA	NA	28.1	83.7	AOCBSS02	5/5
Zinc	NA	NA	25.5	210	6SS01	5/5
Cyanide	0.38 U	0.5 U	ND	ND		0/5
Sulfide	23.1 U	26.8 U	ND	ND		0/5

APPENDIX A-2.4
SITES 11 AND 17 - SUBSURFACE SOIL

FREQUENCY OF DETECTION SUMMARY
SUBSURFACE SOIL
CTO 348
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

SAMPLE ID	6SB01	6SB02	AOCBSB01-01	AOCBSB02	AOCBSB03
MATRIX	SOIL	SOIL	SOIL	SOIL	SOIL
% Solids	94.6	87.7	90.2	93.0	92.3
VOLATILES (ug/kg)					
Chloromethane	11 U	11 U	11 U	11 U	11 U
Bromomethane	11 U	11 U	11 U	11 U	11 U
Vinyl chloride	11 U	11 U	11 U	11 U	11 U
Chloroethane	11 U	11 U	11 U	11 U	11 U
Methylene Chloride	5 U	6 U	6 U	5 U	5 U
Acetone	14	11 U	11 U	11 U	11 U
Carbon Disulfide	5 U	6 U	6 U	5 U	5 U
1,1-Dichloroethene	5 U	6 U	6 U	5 U	5 U
1,1-Dichloroethane	5 U	6 U	6 U	5 U	5 U
1,2-Dichloroethene (total)	5 U	6 U	6 U	5 U	5 U
Chloroform	5 U	6 U	6 U	5 U	5 U
1,2-Dichloroethane	5 U	6 U	6 U	5 U	5 U
2-Butanone	11 U	11 U	11 U	11 U	11 U
1,1,1-Trichloroethane	5 U	6 U	6 U	5 U	5 U
Carbon Tetrachloride	5 U	6 U	6 U	5 U	5 U
Vinyl acetate	11 U	11 U	11 U	11 U	11 U
Bromodichloromethane	5 U	6 U	6 U	5 U	5 U
1,2-Dichloropropane	5 U	6 U	6 U	5 U	5 U
cis-1,3-Dichloropropene	5 U	6 U	6 U	5 U	5 U
Trichloroethene	5 U	6 U	6 U	5 U	5 U
Dibromochloromethane	5 U	6 U	6 U	5 U	5 U
1,1,2-Trichloroethane	5 U	6 U	6 U	5 U	5 U
Benzene	5 U	6 U	6 U	5 U	5 U
trans-1,3-Dichloropropene	5 U	6 U	6 U	5 U	5 U
Bromoform	5 U	6 U	6 U	5 U	5 U
4-Methyl-2-pentanone	11 U	11 U	11 U	11 U	11 U
2-Hexanone	11 U	11 U	11 U	11 U	11 U
Tetrachloroethene	5 U	6 U	6 U	5 U	5 U
1,1,2,2-Tetrachloroethane	5 U	6 U	6 U	5 U	5 U
Toluene	5 U	6 U	6 U	5 U	5 U
Chlorobenzene	5 U	6 U	6 U	5 U	5 U
Ethylbenzene	5 U	6 U	6 U	5 U	5 U
Styrene	5 U	6 U	6 U	5 U	5 U
Xylene (total)	5 U	6 U	6 U	5 U	5 U
Acrolein	530 U	570 U	560 U	540 U	540 U

FREQUENCY OF DETECTION SUMMARY
SUBSURFACE SOIL
CTO 348
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

SAMPLE ID	6SB01	6SB02	AOCBSB01-01	AOCBSB02	AOCBSB03
MATRIX	SOIL	SOIL	SOIL	SOIL	SOIL
% Solids	94.6	87.7	90.2	93.0	92.3
VOLATILES (ug/kg) cont.					
Acrylonitrile	110 U	110 U	110 U	110 U	110 U
Trichlorofluoromethane	11 U	11 U	11 U	11 U	11 U
Dichlorodifluoromethane	21 U	23 U	22 U	22 U	22 U
Acetonitrile	110 U	110 U	110 U	110 U	110 U
Iodomethane	11 U	11 U	11 U	11 U	11 U
Propionitrile (Ethyl Cyanide)	53 U	57 U	56 U	54 U	54 U
3-Chloropropene	21 U	23 U	22 U	22 U	22 U
Methacrylonitrile	21 U	23 U	22 U	22 U	22 U
Dibromomethane	11 U	11 U	11 U	11 U	11 U
Isobutyl alcohol	2100 U	2300 U	2200 U	2200 U	2200 U
1,2-Dibromoethane	21 U	23 U	22 U	22 U	22 U
1,1,1,2-Tetrachloroethane	11 U	11 U	11 U	11 U	11 U
1,2,3-Trichloropropane	11 U	11 U	11 U	11 U	11 U
trans-1,4-Dichloro-2-butene	21 U	23 U	22 U	22 U	22 U
1,2-Dibromo-3-chloropropane	21 U	23 U	22 U	22 U	22 U
2-Chloro-1,3-Butadiene	110 U	110 U	110 U	110 U	110 U
Methylmethacrylate	21 U	23 U	22 U	22 U	22 U
Ethylmethacrylate	21 U	23 U	22 U	22 U	22 U
Pentachloroethane	21 U	23 U	22 U	22 U	22 U

FREQUENCY OF DETECTION SUMMARY
SUBSURFACE SOIL
CTO 348
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

SAMPLE ID	6SB01	6SB02	AOCBSB01-01	AOCBSB02	AOCBSB03
MATRIX	SOIL	SOIL	SOIL	SOIL	SOIL
% Solids	94.6	87.7	90.2	93.0	92.3
SEMIVOLATILES (ug/kg)					
Phenol	47 J	370 U	360 U	360 U	360 U
bis(2-Chloroethyl)ether	350 U	370 U	360 U	360 U	360 U
2-Chlorophenol	350 U	370 U	360 U	360 U	360 U
1,3-Dichlorobenzene	350 U	370 U	360 U	360 U	360 U
1,4-Dichlorobenzene	350 U	370 U	360 U	360 U	360 U
Benzyl alcohol	350 U	370 U	360 U	360 U	360 U
1,2-Dichlorobenzene	350 U	370 U	360 U	360 U	360 U
o-Cresol	350 U	370 U	360 U	360 U	360 U
2,2'-oxybis(1-Chloropropane)	350 U	370 U	360 U	360 U	360 U
meta & para-Cresol	350 U	370 U	360 U	360 U	360 U
N-Nitroso-di-n-propylamine	350 U	370 U	360 U	360 U	360 U
Hexachloroethane	350 U	370 U	360 U	360 U	360 U
Nitrobenzene	350 U	370 U	360 U	360 U	360 U
Isophorone	350 U	370 U	360 U	360 U	360 U
2-Nitrophenol	350 U	370 U	360 U	360 U	360 U
2,4-Dimethylphenol	350 U	370 U	360 U	360 U	360 U
Benzoic acid	1800 U	1800 U	1800 U	1800 U	1800 U
bis(2-Chloroethoxy)methane	350 U	370 U	360 U	360 U	360 U
2,4-Dichlorophenol	350 U	370 U	360 U	360 U	360 U
1,2,4-Trichlorobenzene	350 U	370 U	360 U	360 U	360 U
Naphthalene	350 U	370 U	360 U	360 U	360 U
4-Chloroaniline	350 U	370 U	360 U	360 U	360 U
Hexachlorobutadiene	350 U	370 U	360 U	360 U	360 U
4-Chloro-3-methylphenol	350 U	370 U	360 U	360 U	360 U
2-Methylnaphthalene	350 U	370 U	360 U	360 U	360 U
Hexachlorocyclopentadiene	350 U	370 U	360 U	360 U	360 U
2,4,6-Trichlorophenol	350 U	370 U	360 U	360 U	360 U
2,4,5-Trichlorophenol	1800 U	1800 U	1800 U	1800 U	1800 U
2-Chloronaphthalene	350 U	370 U	360 U	360 U	360 U
2-Nitroaniline	1800 U	1800 U	1800 U	1800 U	1800 U
Dimethylphthalate	350 U	370 U	360 U	360 U	360 U
Acenaphthylene	350 U	370 U	360 U	360 U	360 U
2,6-Dinitrotoluene	350 U	370 U	360 U	360 U	360 U
3-Nitroaniline	1800 U	1800 U	1800 U	1800 U	1800 U
Acenaphthene	350 U	370 U	360 U	360 U	140 J

FREQUENCY OF DETECTION SUMMARY
SUBSURFACE SOIL
CTO 348
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

SAMPLE ID	6SB01	6SB02	AOCBSB01-01	AOCBSB02	AOCBSB03
MATRIX	SOIL	SOIL	SOIL	SOIL	SOIL
% Solids	94.6	87.7	90.2	93.0	92.3
SEMIVOLATILES (ug/kg) cont.					
2,4-Dinitrophenol	1800 U	1800 U	1800 U	1800 U	1800 U
4-Nitrophenol	1800 U	1800 U	1800 U	1800 U	1800 U
Dibenzofuran	350 U	370 U	360 U	360 U	37 J
2,4-Dinitrotoluene	350 U	370 U	360 U	360 U	360 U
Diethylphthalate	350 U	370 U	360 U	360 U	360 U
4-Chlorophenyl-phenylether	350 U	370 U	360 U	360 U	360 U
Fluorene	350 U	370 U	360 U	360 U	87 J
4-Nitroaniline	1800 U	1800 U	1800 U	1800 U	1800 U
4,6-Dinitro-2-methylphenol	1800 U	1800 U	1800 U	1800 U	1800 U
N-Nitrosodiphenylamine (1)	350 U	370 U	360 U	360 U	360 U
4-Bromophenyl-phenylether	350 U	370 U	360 U	360 U	360 U
Hexachlorobenzene	350 U	370 U	360 U	360 U	360 U
Pentachlorophenol	1800 U	1800 U	1800 U	1800 U	1800 U
Phenanthrene	350 U	370 U	360 U	360 U	800
Anthracene	350 U	370 U	360 U	360 U	190 J
Di-n-butylphthalate	190 JB	200 JB	200 JB	220 JB	240 JB
Fluoranthene	87 J	370 U	360 U	64 J	1300
Pyrene	120 J	370 U	360 U	83 J	1400
Butylbenzylphthalate	350 U	370 U	360 U	360 U	360 U
3,3'-Dichlorobenzidine	700 U	740 U	730 U	710 U	720 U
Benzo(a)anthracene	62 J	370 U	360 U	45 J	610
Chrysene	91 J	370 U	360 U	74 J	720
bis(2-Ethylhexyl)phthalate	350 U	370 U	360 U	360 U	360 U
Di-n-octyl phthalate	350 U	370 U	360 U	360 U	360 U
Benzo(b)fluoranthene	110 J	370 U	360 U	110 J	750
Benzo(k)fluoranthene	350 U	370 U	360 U	51 J	380
Benzo(a)pyrene	57 J	370 U	360 U	54 J	610
Indeno(1,2,3-cd)pyrene	45 J	370 U	360 U	360 U	380
Dibenzo(a,h)anthracene	350 U	370 U	360 U	360 U	94 J
Benzo(g,h,i)perylene	47 J	370 U	360 U	360 U	350 J
1,4-Dioxane	1400 U	1500 U	1500 U	1400 U	1400 J
Pyridine	700 U	740 U	730 U	710 U	720 U
N-Nitrosodimethylamine	350 U	370 U	360 U	360 U	360 U
2-Picoline	350 U	370 U	360 U	360 U	360 U
N-Nitrosomethylethylamine	350 U	370 U	360 U	360 U	360 U

FREQUENCY OF DETECTION SUMMARY
SUBSURFACE SOIL
CTO 348
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

SAMPLE ID	6SB01	6SB02	AOCBSB01-01	AOCBSB02	AOCBSB03
MATRIX	SOIL	SOIL	SOIL	SOIL	SOIL
% Solids	94.6	87.7	90.2	93.0	92.3
SEMIVOLATILES (ug/kg) cont.					
Methyl methanesulfonate	350 U	370 U	360 U	360 U	360 U
N-Nitrosodiethylamine	350 U	370 U	360 U	360 U	360 U
Ethyl methanesulfonate	350 U	370 U	360 U	360 U	360 U
Aniline	1800 U	1800 U	1800 U	1800 U	1800 U
N-Nitrosopyrrolidine	1800 U	1800 U	1800 U	1800 U	1800 U
Acetophenone	350 U	370 U	360 U	360 U	360 U
N-Nitrosomorpholine	700 U	740 U	730 U	710 U	720 U
o-Toluidine	350 U	370 U	360 U	360 U	360 U
N-Nitrosopiperidine	350 U	370 U	360 U	360 U	360 U
a,a-Dimethylphenethylamine	1800 U	1800 U	1800 U	1800 U	1800 U
2,6-Dichlorophenol	350 U	370 U	360 U	360 U	360 U
Hexachloropropene	700 U	740 U	730 U	710 U	720 U
p-Phenylenediamine	700 U	740 U	730 U	710 U	720 U
N-Nitroso-di-n-butylamine	350 U	370 U	360 U	360 U	360 U
Safrole	350 U	370 U	360 U	360 U	360 U
1,2,4,5-Tetrachlorobenzene	350 U	370 U	360 U	360 U	360 U
Isosafrole	350 U	370 U	360 U	360 U	360 U
1,4-Naphthoquinone	1800 U	1800 U	1800 U	1800 U	1800 U
1,3-Dinitrobenzene	700 U	740 U	730 U	710 U	720 U
Pentachlorobenzene	350 U	370 U	360 U	360 U	360 U
1-Naphthylamine	350 U	370 U	360 U	360 U	360 U
2-Naphthylamine	350 U	370 U	360 U	360 U	360 U
2,3,4,6-Tetrachlorophenol	350 U	370 U	360 U	360 U	360 U
1,3,5-Trinitrobenzene	3500 U	3700 U	3600 U	3600 U	3600 U
Diallate	350 U	370 U	360 U	360 U	360 U
Phenacetin	350 U	370 U	360 U	360 U	360 U
Diphenylamine	350 U	370 U	360 U	360 U	360 U
5-Nitro-o-toluidine	700 U	740 U	730 U	710 U	720 U
4-Aminobiphenyl	350 U	370 U	360 U	360 U	360 U
Pronamide	350 U	370 U	360 U	360 U	360 U
2-sec-Butyl-4,6-dinitrophenol	700 U	740 U	730 U	710 U	720 U
Pentachloronitrobenzene	350 U	370 U	360 U	360 U	360 U
4-Nitroquinoline-1-oxide	1800 U	1800 U	1800 U	1800 U	1800 U
Methapyrilene	880 U	920 U	910 U	890 U	900 U
Aramite	700 U	740 U	730 U	710 U	720 U

FREQUENCY OF DETECTION SUMMARY
SUBSURFACE SOIL
CTO 348
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

SAMPLE ID	6SB01	6SB02	AOCBSB01-01	AOCBSB02	AOCBSB03
MATRIX	SOIL	SOIL	SOIL	SOIL	SOIL
% Solids	94.6	87.7	90.2	93.0	92.3
SEMIVOLATILES (ug/kg) cont.					
Chlorobenzilate	350 U	370 U	360 U	360 U	360 U
p-Dimethylaminoazobenzene	700 U	740 U	730 U	710 U	720 U
3,3'-Dimethylbenzidine	700 U	740 U	730 U	710 U	720 U
2-Acetylaminofluorene	700 U	740 U	730 U	710 U	720 U
7,12-Dimethylbenz(a)anthracene	700 U	740 U	730 U	710 U	720 U
Hexachlorophene	3500 U	3700 U	3600 U	3600 U	3600 U
3-Methylcholanthrene	350 U	370 U	360 U	360 U	360 U
EPA METHOD 8141 (ug/kg)					
o,o,o-Triethyl phosphorothioate	28 U	30 U	29 U	28 U	28 U
Thionazin	28 U	30 U	29 U	28 U	28 U
Sulfotep	28 U	30 U	29 U	28 U	28 U
Phorate	63 U	67 U	65 U	64 U	64 U
Dimethoate	100 U	110 U	100 U	100 U	100 U
Disulfoton	70 U	75 U	72 U	71 U	71 U
Methyl parathion	70 U	75 U	72 U	71 U	71 U
Ethyl Parathion	70 U	75 U	72 U	71 U	71 U
Famphur	70 U	75 U	72 U	71 U	71 U

FREQUENCY OF DETECTION SUMMARY
SUBSURFACE SOIL
CTO 348
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

SAMPLE ID	6SB01	6SB02	AOCBSB01-01	AOCBSB02	AOCBSB03
MATRIX	SOIL	SOIL	SOIL	SOIL	SOIL
% Solids	94.6	87.7	90.2	93.0	92.3
PESTICIDE/PCBS (ug/kg)					
alpha-BHC	21 U	4.5 U	4.4 U	21 U	43 U
beta-BHC	21 U	4.5 U	4.4 U	21 U	43 U
delta-BHC	21 U	4.5 U	4.4 U	21 U	43 U
gamma-BHC (Lindane)	21 U	4.5 U	4.4 U	21 U	43 U
Heptachlor	21 U	4.5 U	4.4 U	21 U	43 U
Aldrin	21 U	4.5 U	4.4 U	21 U	43 U
Heptachlor epoxide	21 U	4.5 U	4.4 U	21 U	43 U
Endosulfan I	21 U	4.5 U	4.4 U	21 U	43 U
Dieldrin	42 U	9.1 U	8.8 U	42 U	86 U
4,4'-DDE	42 U	9.1 U	8.8 U	42 U	86 U
Endrin	42 U	9.1 U	8.8 U	42 U	86 U
Endosulfan II	42 U	9.1 U	8.8 U	42 U	86 U
4,4'-DDD	42 U	9.1 U	8.8 U	42 U	86 U
Endosulfan sulfate	42 U	9.1 U	8.8 U	42 U	86 U
4,4'-DDT	42 U	9.1 U	8.8 U	42 U	86 U
Methoxychlor	210 U	45 U	44 U	210 U	430 U
Endrin aldehyde	42 U	9.1 U	8.8 U	42 U	86 U
Isodrin	21 U	4.5 U	4.4 U	21 U	43 U
Kepone	42 U	9.1 U	8.8 U	42 U	86 U
alpha-Chlordane	210 U	45 U	44 U	210 U	430 U
gamma-Chlordane	210 U	45 U	44 U	210 U	430 U
Toxaphene	420 U	91 U	88 U	420 U	860 U
Aroclor-1016	210 U	45 U	44 U	210 U	430 U
Aroclor-1221	210 U	45 U	44 U	210 U	430 U
Aroclor-1232	210 U	45 U	44 U	210 U	430 U
Aroclor-1242	210 U	45 U	44 U	210 U	430 U
Aroclor-1248	210 U	45 U	44 U	210 U	430 U
Aroclor-1254	420 U	91 U	88 U	420 U	860 U
Aroclor-1260	420 U	91 U	88 U	420 U	860 U
HERBICIDES (ug/kg)					
2,4-D	350 U	370 U	360 U	360 U	360 U
2,4,5-TP (Silvex)	70 U	75 U	73 U	71 U	71 U
2,4,5-T	70 U	75 U	73 U	71 U	71 U

FREQUENCY OF DETECTION SUMMARY
SUBSURFACE SOIL
CTO 348
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

SAMPLE ID	6SB01	6SB02	AOCBSB01-01	AOCBSB02	AOCBSB03
MATRIX	SOIL	SOIL	SOIL	SOIL	SOIL
% Solids	94.6	87.7	90.2	93.0	92.3
PCDD/PCDF (ug/kg)					
2378-TCDD	0.16 U	0.06 U	0.10 U	0.11 U	0.11 U
Total TCDD	0.16 U	0.10 U	0.10 U	0.12 U	0.11 U
Total PECDD	0.15 U	0.14 U	0.10 U	0.13 U	0.14 U
Total HXCDD	0.22 U	0.12 U	0.14 U	0.15 U	0.14 U
Total TCDF	0.07 U	0.07 U	0.06 U	0.07 U	0.06 U
Total PECDF	0.11 U	0.10 U	0.07 U	0.12 U	0.11 U
Total HXCDF	0.19 U	0.09 U	0.14 U	0.16 U	0.08 U
TPH (ug/kg)					
Gasoline	NA	NA	33 U	33 U	33 U
Diesel Fuel	NA	NA	4.5 U	4.4 U	44 U

FREQUENCY OF DETECTION SUMMARY
SUBSURFACE SOIL
CTO 348
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

SAMPLE ID	6SB01	6SB02	AOCBSB01-01	AOCBSB02	AOCBSB03
MATRIX	SOIL	SOIL	SOIL	SOIL	SOIL
% Solids	94.6	87.7	90.2	93.0	92.3
TOTAL ANALYTES (mg/kg)					
Silver	0.18 U	0.27 U	0.25 U	0.24 U	0.24 U
Arsenic	1.1 U	1.4	1.4	0.46	2.0
Barium	80.2	33.6	98.8	81.1	52.8
Beryllium	0.11 U	0.16 U	0.14 U	0.14 U	0.14 U
Cadmium	0.56	0.30	0.69	1.0	0.51
Cobalt	14.3	9.0	12.3	13.6	15.0
Chromium	15.0	7.9	9.9	15.5	19.5
Copper	124	22.7	80.3	96.4	94.0
Mercury	2.2	0.084 U	0.11 U	0.14	0.077 U
Nickel	43.6	17.3	34.1	83.6	54.5
Lead	32.6	1.3	72.0	11.5	13.8
Antimony	1.3 U	1.9 U	1.7 U	1.7 U	1.7 U
Selenium	0.47 U	0.14 U	0.77 U	0.14 U	0.13 U
Tin	1.5	2.8	1.7 U	1.7 U	1.6 U
Thallium	0.094 U	0.14 U	0.15 U	0.14 U	0.67 U
Vanadium	89.5	43.1	76.6	79.2	82.9
Zinc	75.6	36.7	93.5	76.1	59.6
Cyanide	0.47 U	0.50 U	0.43 U	0.40 U	0.42 U
Sulfide	26.4 U	28.2 U	27.2 U	24.0 U	27.1 U

FREQUENCY OF DETECTION SUMMARY
SUBSURFACE SOIL
CTO 348
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

SAMPLE ID MATRIX % Solids	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
VOLATILES (ug/kg)						
Chloromethane	11 U	11 U	ND	ND		0/5
Bromomethane	11 U	11 U	ND	ND		0/5
Vinyl chloride	11 U	11 U	ND	ND		0/5
Chloroethane	11 U	11 U	ND	ND		0/5
Methylene Chloride	5 U	6 U	ND	ND		0/5
Acetone	11 U	11 U	14	14	6SB01	1/5
Carbon Disulfide	5 U	6 U	ND	ND		0/5
1,1-Dichloroethene	5 U	6 U	ND	ND		0/5
1,1-Dichloroethane	5 U	6 U	ND	ND		0/5
1,2-Dichloroethene (total)	5 U	6 U	ND	ND		0/5
Chloroform	5 U	6 U	ND	ND		0/5
1,2-Dichloroethane	5 U	6 U	ND	ND		0/5
2-Butanone	11 U	11 U	ND	ND		0/5
1,1,1-Trichloroethane	5 U	6 U	ND	ND		0/5
Carbon Tetrachloride	5 U	6 U	ND	ND		0/5
Vinyl acetate	11 U	11 U	ND	ND		0/5
Bromodichloromethane	5 U	6 U	ND	ND		0/5
1,2-Dichloropropane	5 U	6 U	ND	ND		0/5
cis-1,3-Dichloropropene	5 U	6 U	ND	ND		0/5
Trichloroethene	5 U	6 U	ND	ND		0/5
Dibromochloromethane	5 U	6 U	ND	ND		0/5
1,1,2-Trichloroethane	5 U	6 U	ND	ND		0/5
Benzene	5 U	6 U	ND	ND		0/5
trans-1,3-Dichloropropene	5 U	6 U	ND	ND		0/5
Bromoform	5 U	6 U	ND	ND		0/5
4-Methyl-2-pentanone	11 U	11 U	ND	ND		0/5
2-Hexanone	11 U	11 U	ND	ND		0/5
Tetrachloroethene	5 U	6 U	ND	ND		0/5
1,1,2,2-Tetrachloroethane	5 U	6 U	ND	ND		0/5
Toluene	5 U	6 U	ND	ND		0/5
Chlorobenzene	5 U	6 U	ND	ND		0/5
Ethylbenzene	5 U	6 U	ND	ND		0/5
Styrene	5 U	6 U	ND	ND		0/5
Xylene (total)	5 U	6 U	ND	ND		0/5
Acrolein	530 U	570 U	ND	ND		0/5

FREQUENCY OF DETECTION SUMMARY
SUBSURFACE SOIL
CTO 348
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

SAMPLE ID MATRIX % Solids	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
VOLATILES (ug/kg) cont.						
Acrylonitrile	110 U	110 U	ND	ND		0/5
Trichlorofluoromethane	11 U	11 U	ND	ND		0/5
Dichlorodifluoromethane	21 U	23 U	ND	ND		0/5
Acetonitrile	110 U	110 U	ND	ND		0/5
Iodomethane	11 U	11 U	ND	ND		0/5
Propionitrile (Ethyl Cyanide)	53 U	57 U	ND	ND		0/5
3-Chloropropene	21 U	23 U	ND	ND		0/5
Methacrylonitrile	21 U	23 U	ND	ND		0/5
Dibromomethane	11 U	11 U	ND	ND		0/5
Isobutyl alcohol	2100 U	2300 U	ND	ND		0/5
1,2-Dibromoethane	21 U	23 U	ND	ND		0/5
1,1,1,2-Tetrachloroethane	11 U	11 U	ND	ND		0/5
1,2,3-Trichloropropane	11 U	11 U	ND	ND		0/5
trans-1,4-Dichloro-2-butene	21 U	23 U	ND	ND		0/5
1,2-Dibromo-3-chloropropane	21 U	23 U	ND	ND		0/5
2-Chloro-1,3-Butadiene	110 U	110 U	ND	ND		0/5
Methylmethacrylate	21 U	23 U	ND	ND		0/5
Ethylmethacrylate	21 U	23 U	ND	ND		0/5
Pentachloroethane	21 U	23 U	ND	ND		0/5

FREQUENCY OF DETECTION SUMMARY
SUBSURFACE SOIL
CTO 348
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

SAMPLE ID MATRIX % Solids	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
SEMIVOLATILES (ug/kg)						
Phenol	360 U	370 U	47 J	47 J	6SB01	1/5
bis(2-Chloroethyl)ether	350 U	370 U	ND	ND		0/5
2-Chlorophenol	350 U	370 U	ND	ND		0/5
1,3-Dichlorobenzene	350 U	370 U	ND	ND		0/5
1,4-Dichlorobenzene	350 U	370 U	ND	ND		0/5
Benzyl alcohol	350 U	370 U	ND	ND		0/5
1,2-Dichlorobenzene	350 U	370 U	ND	ND		0/5
o-Cresol	350 U	370 U	ND	ND		0/5
2,2'-oxybis(1-Chloropropane)	350 U	370 U	ND	ND		0/5
meta & para-Cresol	350 U	370 U	ND	ND		0/5
N-Nitroso-di-n-propylamine	350 U	370 U	ND	ND		0/5
Hexachloroethane	350 U	370 U	ND	ND		0/5
Nitrobenzene	350 U	370 U	ND	ND		0/5
Isophorone	350 U	370 U	ND	ND		0/5
2-Nitrophenol	350 U	370 U	ND	ND		0/5
2,4-Dimethylphenol	350 U	370 U	ND	ND		0/5
Benzoic acid	1800 U	1800 U	ND	ND		0/5
bis(2-Chloroethoxy)methane	350 U	370 U	ND	ND		0/5
2,4-Dichlorophenol	350 U	370 U	ND	ND		0/5
1,2,4-Trichlorobenzene	350 U	370 U	ND	ND		0/5
Naphthalene	350 U	370 U	ND	ND		0/5
4-Chloroaniline	350 U	370 U	ND	ND		0/5
Hexachlorobutadiene	350 U	370 U	ND	ND		0/5
4-Chloro-3-methylphenol	350 U	370 U	ND	ND		0/5
2-Methylnaphthalene	350 U	370 U	ND	ND		0/5
Hexachlorocyclopentadiene	350 U	370 U	ND	ND		0/5
2,4,6-Trichlorophenol	350 U	370 U	ND	ND		0/5
2,4,5-Trichlorophenol	1800 U	1800 U	ND	ND		0/5
2-Chloronaphthalene	350 U	370 U	ND	ND		0/5
2-Nitroaniline	1800 U	1800 U	ND	ND		0/5
Dimethylphthalate	350 U	370 U	ND	ND		0/5
Acenaphthylene	350 U	370 U	ND	ND		0/5
2,6-Dinitrotoluene	350 U	370 U	ND	ND		0/5
3-Nitroaniline	1800 U	1800 U	ND	ND		0/5
Acenaphthene	350 U	370 U	140 J	140 J	AOCBSB03	1/5

FREQUENCY OF DETECTION SUMMARY
SUBSURFACE SOIL
CTO 348
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

SAMPLE ID MATRIX % Solids	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
SEMIVOLATILES (ug/kg) cont.						
2,4-Dinitrophenol	1800 U	1800 U	ND	ND		0/5
4-Nitrophenol	1800 U	1800 U	ND	ND		0/5
Dibenzofuran	350 U	370 U	37 J	37 J	AOCBSB03	1/5
2,4-Dinitrotoluene	350 U	370 U	ND	ND		0/5
Diethylphthalate	350 U	370 U	ND	ND		0/5
4-Chlorophenyl-phenylether	350 U	370 U	ND	ND		0/5
Fluorene	350 U	370 U	87 J	87 J	AOCBSB03	1/5
4-Nitroaniline	1800 U	1800 U	ND	ND		0/5
4,6-Dinitro-2-methylphenol	1800 U	1800 U	ND	ND		0/5
N-Nitrosodiphenylamine (1)	350 U	370 U	ND	ND		0/5
4-Bromophenyl-phenylether	350 U	370 U	ND	ND		0/5
Hexachlorobenzene	350 U	370 U	ND	ND		0/5
Pentachlorophenol	1800 U	1800 U	ND	ND		0/5
Phenanthrene	350 U	370 U	800	800	AOCBSB03	1/5
Anthracene	350 U	370 U	190 J	190 J	AOCBSB03	1/5
Di-n-butylphthalate	190 JB	240 JB	ND	ND		0/5
Fluoranthene	360 U	370 U	64 J	1300	AOCBSB03	3/5
Pyrene	360 U	370 U	83 J	1400	AOCBSB03	3/5
Butylbenzylphthalate	350 U	370 U	ND	ND		0/5
3,3'-Dichlorobenzidine	700 U	740 U	ND	ND		0/5
Benzo(a)anthracene	360 U	370 U	45 J	610	AOCBSB03	3/5
Chrysene	360 U	370 U	74 J	720	AOCBSB03	3/5
bis(2-Ethylhexyl)phthalate	350 U	370 U	ND	ND		0/5
Di-n-octyl phthalate	350 U	370 U	ND	ND		0/5
Benzo(b)fluoranthene	360 U	370 U	110 J	750	AOCBSB03	3/5
Benzo(k)fluoranthene	350 U	370 U	51 J	380	AOCBSB03	2/5
Benzo(a)pyrene	360 U	370 U	54 J	610	AOCBSB03	3/5
Indeno(1,2,3-cd)pyrene	360 U	370 U	45 J	380	AOCBSB03	2/5
Dibenzo(a,h)anthracene	350 U	370 U	94 J	94 J	AOCBSB03	1/5
Benzo(g,h,i)perylene	360 U	370 U	47 J	350 J	AOCBSB03	2/5
1,4-Dioxane	1400 U	1500 U	1400 J	1400 J	AOCBSB03	1/5
Pyridine	700 U	740 U	ND	ND		0/5
N-Nitrosodimethylamine	350 U	370 U	ND	ND		0/5
2-Picoline	350 U	370 U	ND	ND		0/5
N-Nitrosomethylethylamine	350 U	370 U	ND	ND		0/5

FREQUENCY OF DETECTION SUMMARY
SUBSURFACE SOIL
CTO 348
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

SAMPLE ID MATRIX % Solids	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
SEMIVOLATILES (ug/kg) cont.						
Methyl methanesulfonate	350 U	370 U	ND	ND		0/5
N-Nitrosodiethylamine	350 U	370 U	ND	ND		0/5
Ethyl methanesulfonate	350 U	370 U	ND	ND		0/5
Aniline	1800 U	1800 U	ND	ND		0/5
N-Nitrosopyrrolidine	1800 U	1800 U	ND	ND		0/5
Acetophenone	350 U	370 U	ND	ND		0/5
N-Nitrosomorpholine	700 U	740 U	ND	ND		0/5
o-Toluidine	350 U	370 U	ND	ND		0/5
N-Nitrosopiperidine	350 U	370 U	ND	ND		0/5
a,a-Dimethylphenethylamine	1800 U	1800 U	ND	ND		0/5
2,6-Dichlorophenol	350 U	370 U	ND	ND		0/5
Hexachloropropene	700 U	740 U	ND	ND		0/5
p-Phenylenediamine	700 U	740 U	ND	ND		0/5
N-Nitroso-di-n-butylamine	350 U	370 U	ND	ND		0/5
Safrole	350 U	370 U	ND	ND		0/5
1,2,4,5-Tetrachlorobenzene	350 U	370 U	ND	ND		0/5
Isosafrole	350 U	370 U	ND	ND		0/5
1,4-Naphthoquinone	1800 U	1800 U	ND	ND		0/5
1,3-Dinitrobenzene	700 U	740 U	ND	ND		0/5
Pentachlorobenzene	350 U	370 U	ND	ND		0/5
1-Naphthylamine	350 U	370 U	ND	ND		0/5
2-Naphthylamine	350 U	370 U	ND	ND		0/5
2,3,4,6-Tetrachlorophenol	350 U	370 U	ND	ND		0/5
1,3,5-Trinitrobenzene	3500 U	3700 U	ND	ND		0/5
Diallate	350 U	370 U	ND	ND		0/5
Phenacetin	350 U	370 U	ND	ND		0/5
Diphenylamine	350 U	370 U	ND	ND		0/5
5-Nitro-o-toluidine	700 U	740 U	ND	ND		0/5
4-Aminobiphenyl	350 U	370 U	ND	ND		0/5
Pronamide	350 U	370 U	ND	ND		0/5
2-sec-Butyl-4,6-dinitrophenol	700 U	740 U	ND	ND		0/5
Pentachloronitrobenzene	350 U	370 U	ND	ND		0/5
4-Nitroquinoline-1-oxide	1800 U	1800 U	ND	ND		0/5
Methapyrilene	880 U	920 U	ND	ND		0/5
Aramite	700 U	740 U	ND	ND		0/5

FREQUENCY OF DETECTION SUMMARY
SUBSURFACE SOIL
CTO 348
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

SAMPLE ID MATRIX % Solids	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
SEMIVOLATILES (ug/kg) cont.						
Chlorobenzilate	350 U	370 U	ND	ND		0/5
p-Dimethylaminoazobenzene	700 U	740 U	ND	ND		0/5
3,3'-Dimethylbenzidine	700 U	740 U	ND	ND		0/5
2-Acetylaminofluorene	700 U	740 U	ND	ND		0/5
7,12-Dimethylbenz(a)anthracene	700 U	740 U	ND	ND		0/5
Hexachlorophene	3500 U	3700 U	ND	ND		0/5
3-Methylcholanthrene	350 U	370 U	ND	ND		0/5
EPA METHOD 8141 (ug/kg)						
o,o,o-Triethyl phosphorothioate	28 U	30 U	ND	ND		0/5
Thionazin	28 U	30 U	ND	ND		0/5
Sulfotep	28 U	30 U	ND	ND		0/5
Phorate	63 U	67 U	ND	ND		0/5
Dimethoate	100 U	110 U	ND	ND		0/5
Disulfoton	70 U	75 U	ND	ND		0/5
Methyl parathion	70 U	75 U	ND	ND		0/5
Ethyl Parathion	70 U	75 U	ND	ND		0/5
Famphur	70 U	75 U	ND	ND		0/5

FREQUENCY OF DETECTION SUMMARY
SUBSURFACE SOIL
CTO 348
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

SAMPLE ID MATRIX % Solids	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
PESTICIDE/PCBS (ug/kg)						
alpha-BHC	4.4 U	43 U	ND	ND		0/5
beta-BHC	4.4 U	43 U	ND	ND		0/5
delta-BHC	4.4 U	43 U	ND	ND		0/5
gamma-BHC (Lindane)	4.4 U	43 U	ND	ND		0/5
Heptachlor	4.4 U	43 U	ND	ND		0/5
Aldrin	4.4 U	43 U	ND	ND		0/5
Heptachlor epoxide	4.4 U	43 U	ND	ND		0/5
Endosulfan I	4.4 U	43 U	ND	ND		0/5
Dieldrin	8.8 U	86 U	ND	ND		0/5
4,4'-DDE	8.8 U	86 U	ND	ND		0/5
Endrin	8.8 U	86 U	ND	ND		0/5
Endosulfan II	8.8 U	86 U	ND	ND		0/5
4,4'-DDD	8.8 U	86 U	ND	ND		0/5
Endosulfan sulfate	8.8 U	86 U	ND	ND		0/5
4,4'-DDT	8.8 U	86 U	ND	ND		0/5
Methoxychlor	44 U	430 U	ND	ND		0/5
Endrin aldehyde	8.8 U	86 U	ND	ND		0/5
Isodrin	4.4 U	43 U	ND	ND		0/5
Kepone	8.8 U	86 U	ND	ND		0/5
alpha-Chlordane	44 U	430 U	ND	ND		0/5
gamma-Chlordane	44 U	430 U	ND	ND		0/5
Toxaphene	88 U	860 U	ND	ND		0/5
Aroclor-1016	44 U	430 U	ND	ND		0/5
Aroclor-1221	44 U	430 U	ND	ND		0/5
Aroclor-1232	44 U	430 U	ND	ND		0/5
Aroclor-1242	44 U	430 U	ND	ND		0/5
Aroclor-1248	44 U	430 U	ND	ND		0/5
Aroclor-1254	88 U	860 U	ND	ND		0/5
Aroclor-1260	88 U	860 U	ND	ND		0/5
HERBICIDES (ug/kg)						
2,4-D	350 U	370 U	ND	ND		0/5
2,4,5-TP (Silvex)	70 U	75 U	ND	ND		0/5
2,4,5-T	70 U	75 U	ND	ND		0/5

FREQUENCY OF DETECTION SUMMARY
SUBSURFACE SOIL
CTO 348
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

SAMPLE ID MATRIX % Solids	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
PCDD/PCDF (ug/kg)						
2378-TCDD	0.06 U	0.16 U	ND	ND		0/5
Total TCDD	0.1 U	0.16 U	ND	ND		0/5
Total PECDD	0.1 U	0.15 U	ND	ND		0/5
Total HXCDD	0.12 U	0.22 U	ND	ND		0/5
Total TCDF	0.06 U	0.07 U	ND	ND		0/5
Total PECDF	0.07 U	0.12 U	ND	ND		0/5
Total HXCDF	0.08 U	0.19 U	ND	ND		0/5
TPH (ug/kg)						
Gasoline	33 U	33 U	ND	ND		0/3
Diesel Fuel	4.4 U	44 U	ND	ND		0/3

FREQUENCY OF DETECTION SUMMARY
SUBSURFACE SOIL
CTO 348
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

SAMPLE ID MATRIX % Solids	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
TOTAL ANALYTES (mg/kg)						
Silver	0.18 U	0.27 U	ND	ND		0/5
Arsenic	1.1 U	1.1 U	0.46	2	AOCBSB03	4/5
Barium	NA	NA	33.6	98.8	AOCBSB01-01	5/5
Beryllium	0.11 U	0.16 U	ND	ND		0/5
Cadmium	NA	NA	0.3	1	AOCBSB02	5/5
Cobalt	NA	NA	9	15	AOCBSB03	5/5
Chromium	NA	NA	7.9	19.5	AOCBSB03	5/5
Copper	NA	NA	22.7	124	6SB01	5/5
Mercury	0.077 U	0.11 U	0.14	2.2	6SB01	2/5
Nickel	NA	NA	17.3	83.6	AOCBSB02	5/5
Lead	NA	NA	1.3	72	AOCBSB01-01	5/5
Antimony	1.3 U	1.9 U	ND	ND		0/5
Selenium	0.13 U	0.77 U	ND	ND		0/5
Tin	1.6 U	1.7 U	1.5	2.8	6SB02	2/5
Thallium	0.094 U	0.67 U	ND	ND		0/5
Vanadium	NA	NA	43.1	89.5	6SB01	5/5
Zinc	NA	NA	36.7	93.5	AOCBSB01-01	5/5
Cyanide	0.4 U	0.5 U	ND	ND		0/5
Sulfide	24 U	28.2 U	ND	ND		0/5

APPENDIX A-2.5
SITES 11 AND 17 - GROUNDWATER

FREQUENCY OF DETECTION SUMMARY
GROUNDWATER
CTO 348
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

SAMPLE ID	AOCBHP01	AOCBHP02	AOCBHP03
MATRIX	WATER	WATER	WATER
VOLATILES (ug/L)			
Chloromethane	10 U	10 U	10 U
Bromomethane	10 U	10 U	10 U
Vinyl chloride	10 U	10 U	10 U
Chloroethane	10 U	10 U	10 U
Methylene Chloride	5 U	5 U	5 U
Acetone	10 U	10 U	10 U
Carbon Disulfide	5 U	5 U	5 U
1,1-Dichloroethene	5 U	5 U	5 U
1,1-Dichloroethane	5 U	5 U	5 U
1,2-Dichloroethene (total)	5 U	5 U	5 U
Chloroform	5 U	5 U	5 U
1,2-Dichloroethane	5 U	5 U	5 U
2-Butanone	10 U	10 U	10 U
1,1,1-Trichloroethane	5 U	5 U	5 U
Carbon Tetrachloride	5 U	5 U	5 U
Vinyl acetate	10 U	10 U	10 U
Bromodichloromethane	5 U	5 U	5 U
1,2-Dichloropropane	5 U	5 U	5 U
cis-1,3-Dichloropropene	5 U	5 U	5 U
Trichloroethene	5 U	5 U	5 U
Dibromochloromethane	5 U	5 U	5 U
1,1,2-Trichloroethane	5 U	5 U	5 U
Benzene	5 U	5 U	5 U
trans-1,3-Dichloropropene	5 U	5 U	5 U
Bromoform	5 U	5 U	5 U
4-Methyl-2-pentanone	10 U	10 U	10 U
2-Hexanone	10 U	10 U	10 U
Tetrachloroethene	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	5 U	5 U	5 U
Toluene	5 U	5 U	5 U
Chlorobenzene	5 U	5 U	5 U
Ethylbenzene	5 U	5 U	5 U
Styrene	5 U	5 U	5 U
Xylene (total)	5 U	5 U	5 U

FREQUENCY OF DETECTION SUMMARY
GROUNDWATER
CTO 348
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

SAMPLE ID	AOCBHP01	AOCBHP02	AOCBHP03
MATRIX	WATER	WATER	WATER
VOLATILES (ug/L) cont.			
Acrolein	500 U	500 U	500 U
Acrylonitrile	100 U	100 U	100 U
Trichlorofluoromethane	10 U	10 U	10 U
Dichlorodifluoromethane	20 U	20 U	20 U
Acetonitrile	100 U	100 U	100 U
Iodomethane	10 U	10 U	10 U
Propionitrile (Ethyl Cyanide)	50 U	50 U	50 U
3-Chloropropene	20 U	20 U	20 U
Methacrylonitrile	20 U	20 U	20 U
Dibromomethane	10 U	10 U	10 U
Isobutyl alcohol	2000 U	2000 U	2000 U
1,2-Dibromoethane	20 U	20 U	20 U
1,1,1,2-Tetrachloroethane	10 U	10 U	10 U
1,2,3-Trichloropropane	10 U	10 U	10 U
trans-1,4-Dichloro-2-butene	20 U	20 U	20 U
1,2-Dibromo-3-chloropropane	20 U	20 U	20 U
2-Chloro-1,3-Butadiene	100 U	100 U	100 U
Methylmethacrylate	20 U	20 U	20 U
Ethylmethacrylate	20 U	20 U	20 U
Pentachloroethane	20 U	20 U	20 U

FREQUENCY OF DETECTION SUMMARY
GROUNDWATER
CTO 348
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

SAMPLE ID	AOCBHP01	AOCBHP02	AOCBHP03
MATRIX	WATER	WATER	WATER
SEMIVOLATILES (ug/L)			
Phenol	10 U	10 U	10 U
bis(2-Chloroethyl)ether	10 U	10 U	10 U
2-Chlorophenol	10 U	10 U	10 U
1,3-Dichlorobenzene	10 U	10 U	10 U
1,4-Dichlorobenzene	10 U	10 U	10 U
Benzyl alcohol	10 U	10 U	10 U
1,2-Dichlorobenzene	10 U	10 U	10 U
o-Cresol	10 U	10 U	10 U
2,2'-oxybis(1-Chloropropane)	10 U	10 U	10 U
meta & para-Cresol	10 U	10 U	10 U
N-Nitroso-di-n-propylamine	10 U	10 U	10 U
Hexachloroethane	10 U	10 U	10 U
Nitrobenzene	10 U	10 U	10 U
Isophorone	10 U	10 U	10 U
2-Nitrophenol	10 U	10 U	10 U
2,4-Dimethylphenol	10 U	10 U	10 U
Benzoic acid	50 U	50 U	50 U
bis(2-Chloroethoxy)methane	10 U	10 U	10 U
2,4-Dichlorophenol	10 U	10 U	10 U
1,2,4-Trichlorobenzene	10 U	10 U	10 U
Naphthalene	10 U	10 U	10 U
4-Chloroaniline	10 U	10 U	10 U
Hexachlorobutadiene	10 U	10 U	10 U
4-Chloro-3-methylphenol	10 U	10 U	10 U
2-Methylnaphthalene	10 U	10 U	10 U
Hexachlorocyclopentadiene	10 U	10 U	10 U
2,4,6-Trichlorophenol	10 U	10 U	10 U
2,4,5-Trichlorophenol	50 U	50 U	50 U
2-Chloronaphthalene	10 U	10 U	10 U
2-Nitroaniline	50 U	50 U	50 U
Dimethylphthalate	10 U	10 U	10 U
Acenaphthylene	10 U	10 U	10 U
2,6-Dinitrotoluene	10 U	10 U	10 U
3-Nitroaniline	50 U	50 U	50 U
Acenaphthene	10 U	10 U	10 U

FREQUENCY OF DETECTION SUMMARY
GROUNDWATER
CTO 348
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

SAMPLE ID	AOCBHP01	AOCBHP02	AOCBHP03
MATRIX	WATER	WATER	WATER
SEMIVOLATILES (ug/L) cont.			
2,4-Dinitrophenol	50 U	50 U	50 U
4-Nitrophenol	50 U	50 U	50 U
Dibenzofuran	10 U	10 U	10 U
2,4-Dinitrotoluene	10 U	10 U	10 U
Diethylphthalate	10 U	10 U	10 U
4-Chlorophenyl-phenylether	10 U	10 U	10 U
Fluorene	10 U	10 U	10 U
4-Nitroaniline	50 U	50 U	50 U
4,6-Dinitro-2-methylphenol	50 U	50 U	50 U
N-Nitrosodiphenylamine (1)	10 U	10 U	10 U
4-Bromophenyl-phenylether	10 U	10 U	10 U
Hexachlorobenzene	10 U	10 U	10 U
Pentachlorophenol	50 U	50 U	50 U
Phenanthrene	10 U	10 U	10 U
Anthracene	10 U	10 U	10 U
Di-n-butylphthalate	10 U	10 U	10 U
Fluoranthene	10 U	10 U	10 U
Pyrene	10 U	10 U	10 U
Butylbenzylphthalate	10 U	10 U	10 U
3,3'-Dichlorobenzidine	20 U	20 U	20 U
Benzo(a)anthracene	10 U	10 U	10 U
Chrysene	10 U	10 U	10 U
bis(2-Ethylhexyl)phthalate	10 U	1 J	3 J
Di-n-octyl phthalate	10 U	10 U	10 U
Benzo(b)fluoranthene	10 U	10 U	10 U
Benzo(k)fluoranthene	10 U	10 U	10 U
Benzo(a)pyrene	10 U	10 U	10 U
Indeno(1,2,3-cd)pyrene	10 U	10 U	10 U
Dibenzo(a,h)anthracene	10 U	10 U	10 U
Benzo(g,h,i)perylene	10 U	10 U	10 U
1,4-Dioxane	20 U	20 U	20 U
Pyridine	20 U	20 U	20 U
N-Nitrosodimethylamine	10 U	10 U	10 U
2-Picoline	10 U	10 U	10 U
N-Nitrosomethylethylamine	10 U	10 U	10 U

FREQUENCY OF DETECTION SUMMARY
GROUNDWATER
CTO 348
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

SAMPLE ID	AOCBHP01	AOCBHP02	AOCBHP03
MATRIX	WATER	WATER	WATER
SEMIVOLATILES (ug/L) cont.			
Methyl methanesulfonate	10 U	10 U	10 U
N-Nitrosodiethylamine	10 U	10 U	10 U
Ethyl methanesulfonate	10 U	10 U	10 U
Aniline	50 U	50 U	50 U
N-Nitrosopyrrolidine	50 U	50 U	50 U
Acetophenone	10 U	10 U	10 U
N-Nitrosomorpholine	20 U	20 U	20 U
o-Toluidine	10 U	10 U	10 U
N-Nitrosopiperidine	10 U	10 U	10 U
a,a-Dimethylphenethylamine	50 U	50 U	50 U
2,6-Dichlorophenol	10 U	10 U	10 U
Hexachloropropene	20 U	20 U	20 U
p-Phenylenediamine	20 U	20 U	20 U
N-Nitroso-di-n-butylamine	10 U	10 U	10 U
Safrole	10 U	10 U	10 U
1,2,4,5-Tetrachlorobenzene	10 U	10 U	10 U
Isosafrole	10 U	10 U	10 U
1,4-Naphthoquinone	50 U	50 U	50 U
1,3-Dinitrobenzene	20 U	20 U	20 U
Pentachlorobenzene	10 U	10 U	10 U
1-Naphthylamine	10 U	10 U	10 U
2-Naphthylamine	10 U	10 U	10 U
2,3,4,6-Tetrachlorophenol	10 U	10 U	10 U
1,3,5-Trinitrobenzene	100 U	100 U	100 U
Diallate	10 U	10 U	10 U
Phenacetin	10 U	10 U	10 U
Diphenylamine	10 U	10 U	10 U
5-Nitro-o-toluidine	20 U	20 U	20 U
4-Aminobiphenyl	10 U	10 U	10 U
Pronamide	10 U	10 U	10 U
2-sec-Butyl-4,6-dinitrophenol	20 U	20 U	20 U
Pentachloronitrobenzene	10 U	10 U	10 U
4-Nitroquinoline-1-oxide	50 U	50 U	50 U
Methapyrilene	25 U	25 U	25 U
Aramite	20 U	20 U	20 U

FREQUENCY OF DETECTION SUMMARY
GROUNDWATER
CTO 348
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

SAMPLE ID	AOCBHP01	AOCBHP02	AOCBHP03
MATRIX	WATER	WATER	WATER
SEMIVOLATILES (ug/L) cont.			
Chlorobenzilate	10 U	10 U	10 U
p-Dimethylaminoazobenzene	20 U	20 U	20 U
3,3'-Dimethylbenzidine	20 U	20 U	20 U
2-Acetylaminofluorene	20 U	20 U	20 U
7,12-Dimethylbenz(a)anthracene	20 U	20 U	20 U
Hexachlorophene	100 U	100 U	100 U
3-Methylcholanthrene	10 U	10 U	10 U
EPA METHOD 8141 (ug/L)			
o,o,o-Triethyl phosphorothioate	0.82 U	0.85 U	0.86 U
Thionazin	0.82 U	0.85 U	0.86 U
Sulfotep	0.82 U	0.85 U	0.86 U
Phorate	1.8 U	1.9 U	1.9 U
Dimethoate	3.0 U	3.1 U	3.1 U
Disulfoton	2.0 U	2.1 U	2.2 U
Methyl parathion	2.0 U	2.1 U	2.2 U
Ethyl Parathion	2.0 U	2.1 U	2.2 U
Famphur	2.0 U	2.1 U	2.2 U

FREQUENCY OF DETECTION SUMMARY
GROUNDWATER
CTO 348
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

SAMPLE ID	AOCBHP01	AOCBHP02	AOCBHP03
MATRIX	WATER	WATER	WATER
PESTICIDE/PCBS (ug/L)			
alpha-BHC	0.050 U	0.050 U	0.050 U
beta-BHC	0.050 U	0.050 U	0.050 U
delta-BHC	0.050 U	0.050 U	0.050 U
gamma-BHC (Lindane)	0.050 U	0.050 U	0.050 U
Heptachlor	0.050 U	0.050 U	0.050 U
Aldrin	0.050 U	0.050 U	0.050 U
Heptachlor epoxide	0.050 U	0.050 U	0.050 U
Endosulfan I	0.050 U	0.050 U	0.050 U
Dieldrin	0.10 U	0.10 U	0.10 U
4,4'-DDE	0.10 U	0.10 U	0.10 U
Endrin	0.10 U	0.10 U	0.10 U
Endosulfan II	0.10 U	0.10 U	0.10 U
4,4'-DDD	0.10 U	0.10 U	0.10 U
Endosulfan sulfate	0.10 U	0.10 U	0.10 U
4,4'-DDT	0.10 U	0.10 U	0.10 U
Methoxychlor	0.50 U	0.50 U	0.50 U
Endrin aldehyde	0.10 U	0.10 U	0.10 U
Isodrin	0.050 U	0.050 U	0.050 U
Kepone	0.10 U	0.10 U	0.10 U
alpha-Chlordane	0.50 U	0.50 U	0.50 U
gamma-Chlordane	0.50 U	0.50 U	0.50 U
Toxaphene	1.0 U	1.0 U	1.0 U
Aroclor-1016	0.50 U	0.50 U	0.50 U
Aroclor-1221	0.50 U	0.50 U	0.50 U
Aroclor-1232	0.50 U	0.50 U	0.50 U
Aroclor-1242	0.50 U	0.50 U	0.50 U
Aroclor-1248	0.50 U	0.50 U	0.50 U
Aroclor-1254	1.0 U	1.0 U	1.0 U
Aroclor-1260	1.0 U	1.0 U	1.0 U
HERBICIDES (ug/L)			
2,4-D	1.1 U	1.1 U	1.2 U
2,4,5-TP (Silvex)	0.23 U	0.22 U	0.23 U
2,4,5-T	0.23 U	0.22 U	0.23 U

FREQUENCY OF DETECTION SUMMARY
GROUNDWATER
CTO 348
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

SAMPLE ID	AOCBHP01	AOCBHP02	AOCBHP03
MATRIX	WATER	WATER	WATER
PCDD/PCDF (ug/L)			
2378-TCDD	0.0012 U	0.0015 U	0.0011 U
Total TCDD	0.0012 U	0.0015 U	0.0013 U
Total PECDD	0.0012 U	0.0014 U	0.0014 U
Total HXCDD	0.0019 U	0.0013 U	0.0015 U
Total TCDF	0.00078 U	0.0010 U	0.00076 U
Total PECDF	0.0011 U	0.00094 U	0.0011 U
Total HXCDF	0.0013 U	0.0017 U	0.0011 U
TPH (ug/L)			
Gasoline	30 U	30 U	30 U
Diesel Fuel	0.13 U	0.14 U	0.16 U

FREQUENCY OF DETECTION SUMMARY
GROUNDWATER
CTO 348
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

SAMPLE ID	AOCBHP01	AOCBHP02	AOCBHP03
MATRIX	WATER	WATER	WATER
ANALYTES (ug/L)			
Silver	2.6 U	2.6 U	2.6 U
Arsenic	1.8 U	1.8 U	1.8 U
Barium	16.7	71.4	7.3
Beryllium	1.5 U	1.5 U	1.5 U
Cadmium	2.8 U	2.8 U	2.8 U
Cobalt	2.2 U	4.6	2.2 U
Chromium	2.4 U	4.0	4.9
Copper	9.6	54.4	4.1
Mercury	0.20 U	0.20 U	0.20 U
Nickel	11.6 U	11.6 U	11.6 U
Lead	7.7	10.4	2.4
Antimony	18.0 U	18.0 U	18.0 U
Selenium	1.6 U	1.6 U	3.5
Tin	17.8 U	17.8 U	17.8 U
Thallium	1.6 U	1.6 U	1.6 U
Vanadium	10.2	29.4	42.3
Zinc	6.3	21.9	5.2
Cyanide	10 U	10 U	10 U
GENERAL CHEMISTRY (mg/L)			
Sulfide	1.0 U	1.0 U	1.0 U

FREQUENCY OF DETECTION SUMMARY
GROUNDWATER
CTO 348
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

SAMPLE ID MATRIX	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
VOLATILES (ug/L)						
Chloromethane	10 U	10 U	ND	ND		0/3
Bromomethane	10 U	10 U	ND	ND		0/3
Vinyl chloride	10 U	10 U	ND	ND		0/3
Chloroethane	10 U	10 U	ND	ND		0/3
Methylene Chloride	5 U	5 U	ND	ND		0/3
Acetone	10 U	10 U	ND	ND		0/3
Carbon Disulfide	5 U	5 U	ND	ND		0/3
1,1-Dichloroethene	5 U	5 U	ND	ND		0/3
1,1-Dichloroethane	5 U	5 U	ND	ND		0/3
1,2-Dichloroethene (total)	5 U	5 U	ND	ND		0/3
Chloroform	5 U	5 U	ND	ND		0/3
1,2-Dichloroethane	5 U	5 U	ND	ND		0/3
2-Butanone	10 U	10 U	ND	ND		0/3
1,1,1-Trichloroethane	5 U	5 U	ND	ND		0/3
Carbon Tetrachloride	5 U	5 U	ND	ND		0/3
Vinyl acetate	10 U	10 U	ND	ND		0/3
Bromodichloromethane	5 U	5 U	ND	ND		0/3
1,2-Dichloropropane	5 U	5 U	ND	ND		0/3
cis-1,3-Dichloropropene	5 U	5 U	ND	ND		0/3
Trichloroethene	5 U	5 U	ND	ND		0/3
Dibromochloromethane	5 U	5 U	ND	ND		0/3
1,1,2-Trichloroethane	5 U	5 U	ND	ND		0/3
Benzene	5 U	5 U	ND	ND		0/3
trans-1,3-Dichloropropene	5 U	5 U	ND	ND		0/3
Bromoform	5 U	5 U	ND	ND		0/3
4-Methyl-2-pentanone	10 U	10 U	ND	ND		0/3
2-Hexanone	10 U	10 U	ND	ND		0/3
Tetrachloroethene	5 U	5 U	ND	ND		0/3
1,1,2,2-Tetrachloroethane	5 U	5 U	ND	ND		0/3
Toluene	5 U	5 U	ND	ND		0/3
Chlorobenzene	5 U	5 U	ND	ND		0/3
Ethylbenzene	5 U	5 U	ND	ND		0/3
Styrene	5 U	5 U	ND	ND		0/3
Xylene (total)	5 U	5 U	ND	ND		0/3

FREQUENCY OF DETECTION SUMMARY
GROUNDWATER
CTO 348
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

SAMPLE ID MATRIX	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
VOLATILES (ug/L) cont.						
Acrolein	500 U	500 U	ND	ND		0/3
Acrylonitrile	100 U	100 U	ND	ND		0/3
Trichlorofluoromethane	10 U	10 U	ND	ND		0/3
Dichlorodifluoromethane	20 U	20 U	ND	ND		0/3
Acetonitrile	100 U	100 U	ND	ND		0/3
Iodomethane	10 U	10 U	ND	ND		0/3
Propionitrile (Ethyl Cyanide)	50 U	50 U	ND	ND		0/3
3-Chloropropene	20 U	20 U	ND	ND		0/3
Methacrylonitrile	20 U	20 U	ND	ND		0/3
Dibromomethane	10 U	10 U	ND	ND		0/3
Isobutyl alcohol	2000 U	2000 U	ND	ND		0/3
1,2-Dibromoethane	20 U	20 U	ND	ND		0/3
1,1,1,2-Tetrachloroethane	10 U	10 U	ND	ND		0/3
1,2,3-Trichloropropane	10 U	10 U	ND	ND		0/3
trans-1,4-Dichloro-2-butene	20 U	20 U	ND	ND		0/3
1,2-Dibromo-3-chloropropane	20 U	20 U	ND	ND		0/3
2-Chloro-1,3-Butadiene	100 U	100 U	ND	ND		0/3
Methylmethacrylate	20 U	20 U	ND	ND		0/3
Ethylmethacrylate	20 U	20 U	ND	ND		0/3
Pentachloroethane	20 U	20 U	ND	ND		0/3

FREQUENCY OF DETECTION SUMMARY
GROUNDWATER
CTO 348
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

SAMPLE ID MATRIX	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
SEMIVOLATILES (ug/L)						
Phenol	10 U	10 U	ND	ND		0/3
bis(2-Chloroethyl)ether	10 U	10 U	ND	ND		0/3
2-Chlorophenol	10 U	10 U	ND	ND		0/3
1,3-Dichlorobenzene	10 U	10 U	ND	ND		0/3
1,4-Dichlorobenzene	10 U	10 U	ND	ND		0/3
Benzyl alcohol	10 U	10 U	ND	ND		0/3
1,2-Dichlorobenzene	10 U	10 U	ND	ND		0/3
o-Cresol	10 U	10 U	ND	ND		0/3
2,2'-oxybis(1-Chloropropane)	10 U	10 U	ND	ND		0/3
meta & para-Cresol	10 U	10 U	ND	ND		0/3
N-Nitroso-di-n-propylamine	10 U	10 U	ND	ND		0/3
Hexachloroethane	10 U	10 U	ND	ND		0/3
Nitrobenzene	10 U	10 U	ND	ND		0/3
Isophorone	10 U	10 U	ND	ND		0/3
2-Nitrophenol	10 U	10 U	ND	ND		0/3
2,4-Dimethylphenol	10 U	10 U	ND	ND		0/3
Benzoic acid	50 U	50 U	ND	ND		0/3
bis(2-Chloroethoxy)methane	10 U	10 U	ND	ND		0/3
2,4-Dichlorophenol	10 U	10 U	ND	ND		0/3
1,2,4-Trichlorobenzene	10 U	10 U	ND	ND		0/3
Naphthalene	10 U	10 U	ND	ND		0/3
4-Chloroaniline	10 U	10 U	ND	ND		0/3
Hexachlorobutadiene	10 U	10 U	ND	ND		0/3
4-Chloro-3-methylphenol	10 U	10 U	ND	ND		0/3
2-Methylnaphthalene	10 U	10 U	ND	ND		0/3
Hexachlorocyclopentadiene	10 U	10 U	ND	ND		0/3
2,4,6-Trichlorophenol	10 U	10 U	ND	ND		0/3
2,4,5-Trichlorophenol	50 U	50 U	ND	ND		0/3
2-Chloronaphthalene	10 U	10 U	ND	ND		0/3
2-Nitroaniline	50 U	50 U	ND	ND		0/3
Dimethylphthalate	10 U	10 U	ND	ND		0/3
Acenaphthylene	10 U	10 U	ND	ND		0/3
2,6-Dinitrotoluene	10 U	10 U	ND	ND		0/3
3-Nitroaniline	50 U	50 U	ND	ND		0/3
Acenaphthene	10 U	10 U	ND	ND		0/3

FREQUENCY OF DETECTION SUMMARY
GROUNDWATER
CTO 348
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

SAMPLE ID MATRIX	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
SEMIVOLATILES (ug/L) cont.						
2,4-Dinitrophenol	50 U	50 U	ND	ND		0/3
4-Nitrophenol	50 U	50 U	ND	ND		0/3
Dibenzofuran	10 U	10 U	ND	ND		0/3
2,4-Dinitrotoluene	10 U	10 U	ND	ND		0/3
Diethylphthalate	10 U	10 U	ND	ND		0/3
4-Chlorophenyl-phenylether	10 U	10 U	ND	ND		0/3
Fluorene	10 U	10 U	ND	ND		0/3
4-Nitroaniline	50 U	50 U	ND	ND		0/3
4,6-Dinitro-2-methylphenol	50 U	50 U	ND	ND		0/3
N-Nitrosodiphenylamine (1)	10 U	10 U	ND	ND		0/3
4-Bromophenyl-phenylether	10 U	10 U	ND	ND		0/3
Hexachlorobenzene	10 U	10 U	ND	ND		0/3
Pentachlorophenol	50 U	50 U	ND	ND		0/3
Phenanthrene	10 U	10 U	ND	ND		0/3
Anthracene	10 U	10 U	ND	ND		0/3
Di-n-butylphthalate	10 U	10 U	ND	ND		0/3
Fluoranthene	10 U	10 U	ND	ND		0/3
Pyrene	10 U	10 U	ND	ND		0/3
Butylbenzylphthalate	10 U	10 U	ND	ND		0/3
3,3'-Dichlorobenzidine	20 U	20 U	ND	ND		0/3
Benzo(a)anthracene	10 U	10 U	ND	ND		0/3
Chrysene	10 U	10 U	ND	ND		0/3
bis(2-Ethylhexyl)phthalate	10 U	10 U	1 J	3 J	AOCBHP03	2/3
Di-n-octyl phthalate	10 U	10 U	ND	ND		0/3
Benzo(b)fluoranthene	10 U	10 U	ND	ND		0/3
Benzo(k)fluoranthene	10 U	10 U	ND	ND		0/3
Benzo(a)pyrene	10 U	10 U	ND	ND		0/3
Indeno(1,2,3-cd)pyrene	10 U	10 U	ND	ND		0/3
Dibenzo(a,h)anthracene	10 U	10 U	ND	ND		0/3
Benzo(g,h,i)perylene	10 U	10 U	ND	ND		0/3
1,4-Dioxane	20 U	20 U	ND	ND		0/3
Pyridine	20 U	20 U	ND	ND		0/3
N-Nitrosodimethylamine	10 U	10 U	ND	ND		0/3
2-Picoline	10 U	10 U	ND	ND		0/3
N-Nitrosomethylethylamine	10 U	10 U	ND	ND		0/3

FREQUENCY OF DETECTION SUMMARY
GROUNDWATER
CTO 348
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

SAMPLE ID MATRIX	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
SEMIVOLATILES (ug/L) cont.						
2,4-Dinitrophenol	50 U	50 U	ND	ND		0/3
4-Nitrophenol	50 U	50 U	ND	ND		0/3
Dibenzofuran	10 U	10 U	ND	ND		0/3
2,4-Dinitrotoluene	10 U	10 U	ND	ND		0/3
Diethylphthalate	10 U	10 U	ND	ND		0/3
4-Chlorophenyl-phenylether	10 U	10 U	ND	ND		0/3
Fluorene	10 U	10 U	ND	ND		0/3
4-Nitroaniline	50 U	50 U	ND	ND		0/3
4,6-Dinitro-2-methylphenol	50 U	50 U	ND	ND		0/3
N-Nitrosodiphenylamine (1)	10 U	10 U	ND	ND		0/3
4-Bromophenyl-phenylether	10 U	10 U	ND	ND		0/3
Hexachlorobenzene	10 U	10 U	ND	ND		0/3
Pentachlorophenol	50 U	50 U	ND	ND		0/3
Phenanthrene	10 U	10 U	ND	ND		0/3
Anthracene	10 U	10 U	ND	ND		0/3
Di-n-butylphthalate	10 U	10 U	ND	ND		0/3
Fluoranthene	10 U	10 U	ND	ND		0/3
Pyrene	10 U	10 U	ND	ND		0/3
Butylbenzylphthalate	10 U	10 U	ND	ND		0/3
3,3'-Dichlorobenzidine	20 U	20 U	ND	ND		0/3
Benzo(a)anthracene	10 U	10 U	ND	ND		0/3
Chrysene	10 U	10 U	ND	ND		0/3
bis(2-Ethylhexyl)phthalate	10 U	10 U	1 J	3 J	AOCBHP03	2/3
Di-n-octyl phthalate	10 U	10 U	ND	ND		0/3
Benzo(b)fluoranthene	10 U	10 U	ND	ND		0/3
Benzo(k)fluoranthene	10 U	10 U	ND	ND		0/3
Benzo(a)pyrene	10 U	10 U	ND	ND		0/3
Indeno(1,2,3-cd)pyrene	10 U	10 U	ND	ND		0/3
Dibenzo(a,h)anthracene	10 U	10 U	ND	ND		0/3
Benzo(g,h,i)perylene	10 U	10 U	ND	ND		0/3
1,4-Dioxane	20 U	20 U	ND	ND		0/3
Pyridine	20 U	20 U	ND	ND		0/3
N-Nitrosodimethylamine	10 U	10 U	ND	ND		0/3
2-Picoline	10 U	10 U	ND	ND		0/3
N-Nitrosomethylethylamine	10 U	10 U	ND	ND		0/3

FREQUENCY OF DETECTION SUMMARY
GROUNDWATER
CTO 348
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

SAMPLE ID MATRIX	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
SEMIVOLATILES (ug/L) cont.						
Methyl methanesulfonate	10 U	10 U	ND	ND		0/3
N-Nitrosodiethylamine	10 U	10 U	ND	ND		0/3
Ethyl methanesulfonate	10 U	10 U	ND	ND		0/3
Aniline	50 U	50 U	ND	ND		0/3
N-Nitrosopyrrolidine	50 U	50 U	ND	ND		0/3
Acetophenone	10 U	10 U	ND	ND		0/3
N-Nitrosomorpholine	20 U	20 U	ND	ND		0/3
o-Toluidine	10 U	10 U	ND	ND		0/3
N-Nitrosopiperidine	10 U	10 U	ND	ND		0/3
a,a-Dimethylphenethylamine	50 U	50 U	ND	ND		0/3
2,6-Dichlorophenol	10 U	10 U	ND	ND		0/3
Hexachloropropene	20 U	20 U	ND	ND		0/3
p-Phenylenediamine	20 U	20 U	ND	ND		0/3
N-Nitroso-di-n-butylamine	10 U	10 U	ND	ND		0/3
Safrole	10 U	10 U	ND	ND		0/3
1,2,4,5-Tetrachlorobenzene	10 U	10 U	ND	ND		0/3
Isosafrole	10 U	10 U	ND	ND		0/3
1,4-Naphthoquinone	50 U	50 U	ND	ND		0/3
1,3-Dinitrobenzene	20 U	20 U	ND	ND		0/3
Pentachlorobenzene	10 U	10 U	ND	ND		0/3
1-Naphthylamine	10 U	10 U	ND	ND		0/3
2-Naphthylamine	10 U	10 U	ND	ND		0/3
2,3,4,6-Tetrachlorophenol	10 U	10 U	ND	ND		0/3
1,3,5-Trinitrobenzene	100 U	100 U	ND	ND		0/3
Diallate	10 U	10 U	ND	ND		0/3
Phenacetin	10 U	10 U	ND	ND		0/3
Diphenylamine	10 U	10 U	ND	ND		0/3
5-Nitro-o-toluidine	20 U	20 U	ND	ND		0/3
4-Aminobiphenyl	10 U	10 U	ND	ND		0/3
Pronamide	10 U	10 U	ND	ND		0/3
2-sec-Butyl-4,6-dinitrophenol	20 U	20 U	ND	ND		0/3
Pentachloronitrobenzene	10 U	10 U	ND	ND		0/3
4-Nitroquinoline-1-oxide	50 U	50 U	ND	ND		0/3
Methapyrilene	25 U	25 U	ND	ND		0/3
Aramite	20 U	20 U	ND	ND		0/3

FREQUENCY OF DETECTION SUMMARY
GROUNDWATER
CTO 348
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

SAMPLE ID MATRIX	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
SEMIVOLATILES (ug/L) cont.						
Chlorobenzilate	10 U	10 U	ND	ND		0/3
p-Dimethylaminoazobenzene	20 U	20 U	ND	ND		0/3
3,3'-Dimethylbenzidine	20 U	20 U	ND	ND		0/3
2-Acetylaminofluorene	20 U	20 U	ND	ND		0/3
7,12-Dimethylbenz(a)anthracene	20 U	20 U	ND	ND		0/3
Hexachlorophene	100 U	100 U	ND	ND		0/3
3-Methylcholanthrene	10 U	10 U	ND	ND		0/3
EPA METHOD 8141 (ug/L)						
o,o,o-Triethyl phosphorothioate	0.82 U	0.86 U	ND	ND		0/3
Thionazin	0.82 U	0.86 U	ND	ND		0/3
Sulfotep	0.82 U	0.86 U	ND	ND		0/3
Phorate	1.8 U	1.9 U	ND	ND		0/3
Dimethoate	3 U	3.1 U	ND	ND		0/3
Disulfoton	2 U	2.2 U	ND	ND		0/3
Methyl parathion	2 U	2.2 U	ND	ND		0/3
Ethyl Parathion	2 U	2.2 U	ND	ND		0/3
Famphur	2 U	2.2 U	ND	ND		0/3

FREQUENCY OF DETECTION SUMMARY
GROUNDWATER
CTO 348
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

SAMPLE ID MATRIX	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
PESTICIDE/PCBS (ug/L)						
alpha-BHC	0.05 U	0.05 U	ND	ND		0/3
beta-BHC	0.05 U	0.05 U	ND	ND		0/3
delta-BHC	0.05 U	0.05 U	ND	ND		0/3
gamma-BHC (Lindane)	0.05 U	0.05 U	ND	ND		0/3
Heptachlor	0.05 U	0.05 U	ND	ND		0/3
Aldrin	0.05 U	0.05 U	ND	ND		0/3
Heptachlor epoxide	0.05 U	0.05 U	ND	ND		0/3
Endosulfan I	0.05 U	0.05 U	ND	ND		0/3
Dieldrin	0.10 U	0.10 U	ND	ND		0/3
4,4'-DDE	0.10 U	0.10 U	ND	ND		0/3
Endrin	0.10 U	0.10 U	ND	ND		0/3
Endosulfan II	0.10 U	0.10 U	ND	ND		0/3
4,4'-DDD	0.10 U	0.10 U	ND	ND		0/3
Endosulfan sulfate	0.10 U	0.10 U	ND	ND		0/3
4,4'-DDT	0.10 U	0.10 U	ND	ND		0/3
Methoxychlor	0.50 U	0.50 U	ND	ND		0/3
Endrin aldehyde	0.10 U	0.10 U	ND	ND		0/3
Isodrin	0.05 U	0.05 U	ND	ND		0/3
Kepone	0.1 U	0.1 U	ND	ND		0/3
alpha-Chlordane	0.5 U	0.5 U	ND	ND		0/3
gamma-Chlordane	0.5 U	0.5 U	ND	ND		0/3
Toxaphene	1 U	1 U	ND	ND		0/3
Aroclor-1016	0.5 U	0.5 U	ND	ND		0/3
Aroclor-1221	0.5 U	0.5 U	ND	ND		0/3
Aroclor-1232	0.5 U	0.5 U	ND	ND		0/3
Aroclor-1242	0.5 U	0.5 U	ND	ND		0/3
Aroclor-1248	0.5 U	0.5 U	ND	ND		0/3
Aroclor-1254	1 U	1 U	ND	ND		0/3
Aroclor-1260	1 U	1 U	ND	ND		0/3
HERBICIDES (ug/L)						
2,4-D	1.1 U	1.2 U	ND	ND		0/3
2,4,5-TP (Silvex)	0.22 U	0.23 U	ND	ND		0/3
2,4,5-T	0.22 U	0.23 U	ND	ND		0/3

FREQUENCY OF DETECTION SUMMARY
GROUNDWATER
CTO 348
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

SAMPLE ID MATRIX	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
PCDD/PCDF (ug/L)						
2378-TCDD	0.0011 U	0.0015 U	ND	ND		0/3
Total TCDD	0.0012 U	0.0015 U	ND	ND		0/3
Total PECDD	0.0012 U	0.0014 U	ND	ND		0/3
Total HXCDD	0.0013 U	0.0019 U	ND	ND		0/3
Total TCDF	0.00076 U	0.001 U	ND	ND		0/3
Total PECDF	0.00094 U	0.0011 U	ND	ND		0/3
Total HXCDF	0.0011 U	0.0017 U	ND	ND		0/3
TPH (ug/L)						
Gasoline	30 U	30 U	ND	ND		0/3
Diesel Fuel	0.13 U	0.16 U	ND	ND		0/3

FREQUENCY OF DETECTION SUMMARY
GROUNDWATER
CTO 348
SITES 11 AND 17
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

SAMPLE ID MATRIX	MINIMUM NONDETECTED	MAXIMUM NONDETECTED	MINIMUM DETECTED	MAXIMUM DETECTED	LOCATION OF MAXIMUM DETECTED	FREQUENCY OF DETECTION
ANALYTES (ug/L)						
Silver	2.6 U	2.6 U	ND	ND		0/3
Arsenic	1.8 U	1.8 U	ND	ND		0/3
Barium	NA	NA	7.3	71.4	AOCBHP02	3/3
Beryllium	1.5 U	1.5 U	ND	ND		0/3
Cadmium	2.8 U	2.8 U	ND	ND		0/3
Cobalt	2.2 U	2.2 U	4.6	4.6	AOCBHP02	1/3
Chromium	2.4 U	2.4 U	4	4.9	AOCBHP03	2/3
Copper	NA	NA	4.1	54.4	AOCBHP02	3/3
Mercury	0.2 U	0.2 U	ND	ND		0/3
Nickel	11.6 U	11.6 U	ND	ND		0/3
Lead	NA	NA	2.4	10.4	AOCBHP02	3/3
Antimony	18 U	18 U	ND	ND		0/3
Selenium	1.6 U	1.6 U	3.5	3.5	AOCBHP03	1/3
Tin	17.8 U	17.8 U	ND	ND		0/3
Thallium	1.6 U	1.6 U	ND	ND		0/3
Vanadium	NA	NA	10.2	42.3	AOCBHP03	3/3
Zinc	NA	NA	5.2	21.9	AOCBHP02	3/3
Cyanide	10 U	10 U	ND	ND		0/3
GENERAL CHEMISTRY (mg/L)						
Sulfide	1 U	1 U	ND	ND		0/3

SECTION 3
SUMMARY OF CHANGES

The only change in the Corrective Action Program at NSRR occurring this period was the acceleration of the RFI schedule for OU 1 and OU 7. This change was discussed in Section 1.

SECTION 4
COMMUNITY RELATIONS SUMMARY

The fourth fact sheet was distributed to base employees during this period. A copy of this fact sheet is included as Attachment 4-1.

In October, 1995, the IR Program Manager (Ms. Madeline Rivera) made a formal presentation to the new Commanding Officer of NSRR (Captain K.W. Martello) regarding the RCRA Corrective Action Program. Included was a discussion of the history of the program (including pre-RCRA activities), the present status and the future plans.

A RAB meeting is presently being planned and will occur during the next reporting period.

Attachment 4-1

Fourth Fact Sheet

Installation Restoration Program/Programa de Restauración Ambiental de la Instalación

Naval Station Roosevelt Roads

September/septiembre 1995 Vol. II, No. 2

This is the fourth in a series of Naval Station Roosevelt Roads (NSRR) Restoration Advisory Board (RAB) Fact Sheets. Fact Sheets are published periodically to communicate the plans and accomplishments of the NSRR Installation Restoration (IR) Program and the results of the RAB activities. This Fact Sheet provides a brief summary of the current status of the IR Program at NSRR, of the activities at four Solid Waste Management Units (SWMUs), and of future cleanup efforts.

Esta es la cuarta Hoja de Datos de la Junta Consejera de Restauración Ambiental (Restoration Advisory Board) (RAB) de la Estación Naval Roosevelt Roads (Naval Station Roosevelt Roads). Las Hojas de Datos serán publicadas periódicamente para dar a conocer los planes y logros del Programa de Restauración Ambiental (Installation Restoration) (IR) de la Estación Naval y los resultados de las actividades de la Junta Consejera.

IR Program

The purpose of the IR Program is to investigate and, if necessary, clean up sites resulting from former waste disposal practices. NSRR's sites are regulated under the Resource Conservation and Recovery Act (RCRA). RCRA study involves several stages: RCRA Facility Assessment (RFA), RCRA Facility Investigation (RFI), Corrective Measures Study (CMS), and Corrective Measures Implementation (CMI). In 1983, 20 sites were identified for investigation under the IR Program. In 1988, an RFA was conducted to identify all waste-related operations and closed or closing RCRA-regulated facilities (for example landfills, waste storage areas, etc). In 1993, a reinspection was completed by a U.S. Environmental Protection Agency contractor. As a result of this RFA, additional areas were identified that would require investigation. The sites at the Station are grouped into either Solid Waste Management Units (SWMUs) or Areas of Concern (AOCs). SWMUs generally refer to specific areas where solid wastes were placed or routinely managed over time. SWMUs do not include areas where a one-time spill occurred. AOCs are general areas where actual waste management may not have occurred but where effects of activities at SWMUs could have a negative impact.

The Station has been issued a RCRA Part B permit, a portion of which contains provision for Corrective Action that requires investigation and cleanup of SWMUs and AOCs identified in the RFA. Continuing investigations are underway to gather information to either (1) remove SWMUs from further study by demonstrating that they do not pose a problem or (2) prepare detailed RFI work plans for the sites. Currently, 22 SWMUs and 3 AOCs are in the RFI stage at NSRR. Some of the SWMUs have been cleaned up or have had interim removal actions performed. These are described below.

Programa IR

El propósito del Programa de Restauración Ambiental es investigar y si es necesario, remediar las áreas contaminadas resultantes de la práctica de disposición de desperdicios realizadas en el pasado. Las áreas contaminadas en la Estación Naval están reguladas por la Ley de Conservación y Recuperación de Recursos (RCRA). Los estudios de remediación bajo RCRA envuelven varios pasos: Evaluación de la facilidad bajo RCRA (RFA), Investigación de la facilidad bajo RCRA (RFI), Estudio de Medidas Correctivas (CMS) e Implementación de Medidas Correctivas (CMI). En el año 1983, se identificaron 20 áreas para investigar bajo el Programa IR. En 1988, se realizó una investigación (RFA) para identificar todas las operaciones relacionadas con el manejo y la disposición de desperdicios, y las facilidades ya cerradas o que estaban cerrando (por ejemplo vertederos públicos, áreas para desperdicios, etc). En 1993 un contratista de la Agencia para la Protección del Medio Ambiente (EPA) de Estados Unidos reinspeccionó la Estación. Como resultado de esta inspección se identificaron áreas adicionales que requieren investigación. Las áreas en la Estación se agrupan en Unidades de Manejo de Desperdicios Sólidos (SWMU) o Areas de Preocupación (AOC). Un SWMU generalmente se refiere a áreas específicas donde se dispusieron desperdicios sólidos o donde éstos fueron manejados rutinariamente. El SWMU no incluyen las áreas en donde se colocaron desperdicios

sola vez. Generalmente las AOC son áreas donde no se manejaban desperdicios pero las cuales se pudieron haber afectado por las actividades que se llevaban a cabo en otros SWMU cercanas.

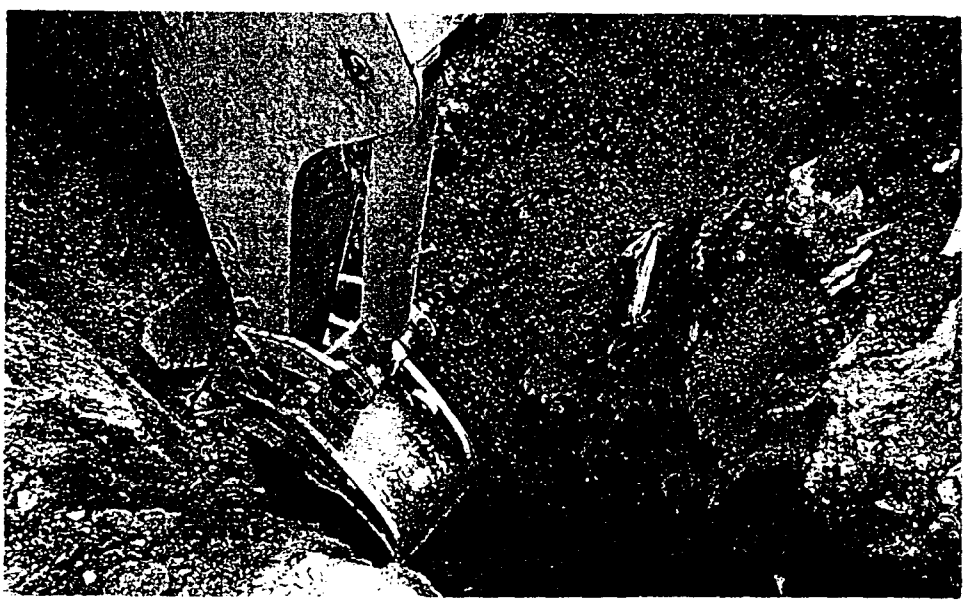
EPA le aprobó un permiso RCRA Parte B a la Estación Naval y como una condición al permiso, éste contiene provisiones para Acciones Correctivas que requieren la investigación y remediación de el SWMU y de las AOC identificadas durante la investigación RFA. Se están llevando a cabo investigaciones continuas para reunir información ya sea para: (1) eliminar el SWMU de otros estudios, demostrando que no constituyen un problema; o para (2) preparar planes de trabajo detallados para cada área. Actualmente, 22 SWMU y 3 AOC se encuentran en la etapa de investigación RFI. Algunas de los SWMU ya se han limpiado o se ha llevado a cabo una remediación interina en ellas. Las mismas se describen a continuación.

Removal Action

The removal action occured at SWMU 10 (Substation No. 2) and SWMU 45 (Area Surrounding Building 38, the Power Plant). From 1956 to 1964 NSRR has maintained and repaired electrical transformers at the Power Plant, Building 38 and from 1964 to the present at Substation No. 2, Building 90. As part of normal maintenance, transformer oil was drained from the units at Building 38. From 1964 to 1979, the oil at Substation No. 2 was routinely drained onto the ground surface. The transformer oil likely contained polychlorinated biphenyls (PCBs). PCBs are now classified as compounds that could contribute to the risk of developing cancer. Previous studies identified four areas at SWMU No. 10, and one area at SWMU 45, where soil was contaminated with PCBs. Several cleanup alternatives were proposed and evaluated. The accepted remedial alternative was to excavate the PCB- contaminated soil and dispose of it at a permitted, off-site landfill. The action level for the cleanup was 10 parts per million (ppm). The soil left at the site had to contain less than 10 ppm PCBs. Initially, soil was excavated at the identified areas to a depth of 1 foot.

SWMU 10 - Excavation to determine the extent of contamination

SWMU 10 - Excavación para determinar el alcance de la contaminación



Soil samples were analyzed following excavation. As necessary, additional soil was excavated to ensure that the remaining soil had less than 10 ppm PCBs. A total of 4,169 tons of material were excavated and disposed (see photograph at top of page 3). The sites were then backfilled with clean soil, seeded with grass, and mulched. In December 1994 the sites were accepted as restored (cleaned) by the Station.

Acción de remoción

Una acción de remoción de tierra contaminada se realizó en el SWMU 10 (subestación No. 2) y en el SWMU 45 (área alrededor del edificio 38, antigua planta de energía). Desde 1956 hasta 1964 la Estación Naval mantuvo y reparó transformadores eléctricos en el edificio 38, y desde 1964 hasta el presente en la subestación No. 2, edificio 90. Como parte del mantenimiento normal, el aceite del transformador se drenaba directamente al suelo alrededor del edificio 38. Desde 1964 hasta 1979, el aceite en la subestación No. 2 también se drenó rutinariamente al suelo. El aceite del transformador contenía bifenilos policlorados (PCB) Los PCB actualmente están clasificados como compuestos que podrían contribuir al riesgo de contraer cáncer.

Estudios previos identificaron cuatro áreas en el SWMU 10 y un área en el SWMU 45 donde la tierra estaba contaminada con PCB. Se propusieron y evaluaron varias alternativas de remediación. La alternativa escogida fue la de excavar la tierra contaminada con PCB y disponerla en un vertedero en los Estados Unidos autorizado para disponer PCB. El nivel de acción para la limpieza fue de 10 partes por millón (ppm). Esto quiere decir que la tierra dejada en el lugar debía contener menos de 10 ppm o miligramo por kilogramo (mg/kg) de PCB. En un principio, se excavó la tierra en las áreas identificadas hasta una profundidad de 1 pie (vea la fotografía en la página 2). Después de la excavación se analizaron muestras de tierra. Cuando fue necesario, se excavó más tierra para asegurarse que la tierra restante contenía menos de 10 ppm de PCB. Se excavaron y dispusieron 4,169 toneladas de tierra limpia y se sembró grama. En diciembre de 1994 la Estación Naval aceptó estas dos áreas como áreas limpias.

SWMU 45 - Additional excavation to remove contaminated soil

SWMU 45 - Excavación adicional para remover la tierra contaminada

Interim Corrective Measures

SWMU 7 is the Tow Way Road Fuels Farm. Fuel contamination was documented at the Tow Way Road Fuels Farm resulting from long term operations. Free product was discovered on top of the groundwater (water beneath the ground surface). The fuel is lighter than water and floats on the groundwater. Several cleanup alternatives were proposed and evaluated. A partial cleanup plan was devised to remove the floating fuel, which is the source of contamination. Seven wells were fitted with product recovery pumps, which operate on a continuous schedule, to pull the fuel off the top of the groundwater. As of May 1995, a total of 11,859 gallons of free product have been removed. This Interim Corrective Measure is removing the source of contamination; cleanup of potentially contaminated soil may occur later.

Medidas Correctivas Interinas

El SWMU 7 es el Area de Tanques en la calle Tow Way. Se ha documentado contaminación por combustible en esta área como resultado de los muchos años de operación de la misma. En la parte superior del agua subterránea (aguas por debajo de la superficie) se encontró combustible. El combustible es más liviano que el agua y flota en las aguas subterráneas. Se propusieron y evaluaron varias alternativas de remediación y se diseñó un plan de limpieza parcial para eliminar el combustible flotante, lo cual es la fuente de contaminación. Se instalaron bombas para recuperar el combustible en siete pozos. Las bombas operan de modo continuo para remover el combustible de la parte superior del agua subterránea. Hasta mayo de 1995 se habían recuperado unos 11,859 galones de combustible. Esta medida correctiva interina está eliminando la fuente de contaminación. En el futuro se evaluará la remediación de la tierra potencialmente contaminada.

RCRA Closure

SWMU 19 is Building 121. Building 121 is a windowless, one-story, concrete building measuring approximately 20 feet wide by 30 feet long. The building was used to store up to 23, 55-gallon drums of pesticides until 1980. Contaminants of concern included calcium cyanide, 2,4,D,-Chlordane, copper arsenite, ethylene bromide, and zinc phosphide. Several cleanup alternatives were proposed and evaluated. The chosen alternative consisted of decontaminating (cleaning) the walls and floor of the building, excavating the area soils, and sampling the inside concrete and outside soils to confirm that the contamination was removed. Cleanup began February 1, 1994 and was completed on March 1, 1994. Disposal of the contaminated wash water and soils was completed by June 1994. Samples of the remaining soil and of the concrete were taken. No additional cleanup efforts were required. The site fence was reinstalled and the site is now considered restored.

Cierre bajo RCRA

El SWMU 19 es el edificio 121. Este edificio es una estructura de cemento de un piso, sin ventanas, de aproximadamente unos 20 pies de ancho por 30 pies de largo. Hasta 1980, éste se usó para guardar hasta 23 envases de 55 galones de pesticidas. Los contaminantes concernientes incluían cianuro de calcio; 2,4,D, clordano; cobre arsénico; bromuro de etileno y fosfato de zinc. Varias alternativas de remediación fueron propuestas y evaluadas. La alternativa seleccionada fue la decontaminación (limpieza) de las paredes y los pisos del edificio, excavación de tierra del área, muestreo del cemento y de la tierra para confirmar que se había eliminado la contaminación. El 1 de febrero de 1994 comenzó la limpieza, la cual finalizó el 1ro de marzo del mismo año. El agua usada durante la limpieza de la tierra finalmente se dispuso en junio de 1994. Se tomaron muestras de la tierra restante y del cemento y se determinó que no era necesaria una limpieza adicional. Se volvió a colocar la verja alrededor del lugar y ahora el área se considera limpia.

Future Cleanup

Interim Corrective Measures are planned at SWMU 45. As previously described, a soil Removal Action was conducted at SWMU 45. The remaining petroleum and PCB contamination from fuel storage in the two underground storage tanks (USTs) at the power plant, the cooling water tunnel, and the cooling water intake tunnel will be addressed with an Interim Corrective Measures study. Three cleanup alternatives have been developed and evaluated including: (1) stabilizing the USTs and tunnels in-place; (2) demolishing the USTs and tunnels; and (3) pumping the tanks empty and treating/disposing of the fluids in an approved manner, decontaminating the structures and backfilling the USTs and tunnels. Option number three will provide efficient cleanup of the contamination by removing the waste and sealing off the tank and tunnels.

Remediación futura

Otras medidas correctivas interinas se están planeando para el SWMU 45. Como se describió anteriormente, en el SWMU 45 se llevó a cabo una acción de remoción de la tierra contaminada. En las medidas correctivas interinas se hará referencia a la contaminación restante a causa del petróleo almacenado en dos tanques soterrados, el PCB dentro de los tanques y dentro de los dos túneles de enfriamiento. Se desarrollaron y evaluaron tres alternativas de limpieza. Las mismas incluyen: (1) la estabilización de los tanques y los túneles, (2) la demolición de los tanques y los túneles y, (3) el bombeo y tratamiento del líquido que está dentro de los tanques y túneles, y decontaminar y rellenar los tanques y los túneles. La opción número tres proveerá una remediación eficiente de la contaminación, eliminando los desperdicios y sellando el tanque y los túneles.

Information Repositories/ Lugares para obtener información

- Naval Station Roosevelt Roads
  Public Works/Environmental
  Engineering Division
  Ceiba, PR 00735
  Contact/Contacto:
  Ms. Madeline Rivera (809) 865-4429
- Municipality of Vieques/Municipio de Vieques
  Public Library/Biblioteca Pública
  Vieques, PR 00765
  Contact/Contacto:
  Head Librarian/Bibliotecario
  (809) 741-3406
- Municipality of Ceiba/Municipio de Ceiba
  Municipal Building/Casa Alcadía
  Ceiba, PR 00735
  Contact/Contacto: Ms. Hilda Sofia Pedraza (809) 885-2180

Program Points of Contact/

For additional information about the IR Program or the RAB, please contact Ms. Madeline Rivera at the address listed above.

Puntos de contacto del programa

Para más información del Programa de Restauración o de la Junta Consejera de Restauración Ambiental, favor de comunicarse con la Sra. Madeline Rivera a la dirección antes mencionada.

SECTION 5
PROBLEMS ENCOUNTERED/RESPONSE TAKEN

There were no problems encountered during this period related to the corrective action provisions of the RCRA Final Permit.

SECTION 6
PERSONNEL CHANGES

Command of Naval Station Roosevelt Roads was changed during this period. Captain S.C. Wood was relieved in August by the new Commanding Officer, Captain K.W. Martello.

Captain Martello received a formal briefing on the IR program in October, 1995 which included program history, status and future plans.

SECTION 7
PLANNED WORK

The items which follow represent the work efforts planned for the next quarter.

1. A summary report of OU 1 and OU 7 investigations will be submitted to the Navy. Applicable information from this report will be provided in the next quarterly progress report.

2. Field investigations and reporting on the Free Product Recovery System of the Tow Way Fuel Farm will continue.

3. A field survey of the recently sampled OU 1 and OU 7 sampling points will be performed.

4. A response to EPA comments regarding data validation for the RFI will be provided.

5. Work will be started on a formal RFI report for OU 1 and OU 7.

6. A RAB meeting is planned for the upcoming quarter.

7. Additional work will be performed as dictated by any changes in the program.

SECTION 8
REPORTS/INFORMATION

All reports or other information which would be included in this miscellaneous category have been provided separately and discussed in the appropriate earlier section.