Final

Recharacterization Work Plan
SWMU 11

Naval Station Roosevelt Roads

RCRA/HSWA Permit No. PR2170027203

Ceiba, Puerto Rico

Prepared For

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Baker	Baker Environmental, Inc.
CLP	Contract Laboratory Protocols
CRQL	Contract Required Quantitation Limits
CTO	Contract Task Order
D	duplicate
EPA	United States Environmental Protection Agency
IDW	Investigative Derived Waste
LANTDIV	Atlantic Division, Naval Facilities Engineering Command
µg/100 cm^2	micrograms per 100 centimeters squared
MS/MSD	matrix spike/matrix spike duplicate
NFESC	Naval Facilities Engineering Service Center
NSRR	Naval Station Roosevelt Roads
NTR	Navy Technical Representative
PCB	polychlorinated biphenyl
ppm	parts per million
PREQB	Puerto Rico Environmental Quality Board
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
SOP	Standard Operating Procedure
SWMU	Solid Waste Management Unit
TSCA	Toxic Substance and Control Act

1.0 INTRODUCTION

This Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) Work Plan has been prepared by Baker Environmental, Inc. (Baker) under contract to the Atlantic Division, Naval Facilities Engineering Command (LANTDIV) Contract Number N62470-95-D-6007, Contract Task Order (CTO) 269. This work plan has been prepared to perform field investigation work at Solid Waste Management Unit (SWMU) 11 – Building 38 Interior at Naval Station Roosevelt Roads (NSRR), under the Corrective Action provisions of the Station's RCRA Part B Permit No. PR2170027203.

1.1 Site History

SWMU 11 at NSRR is the interior of Building 38 which is the "Old Power Plant." This building is located on the eastern side of the base just north of SWMU 30 as presented on Figure 1-1. The building was classified as a SWMU based on known releases of polychlorinated biphenyls (PCBs) to the soils outside the building (which have since been remediated through a soil removal action), and the fact that the front portion of the interior served as a Toxic Substance and Control Act (TSCA) regulated PCB storage area where spills and stains were noted. The approved RFI work plan (Baker, 1995) contained provisions for a wipe sampling program for the building's floor and walls. This resulted in 126 individual samples that were analyzed for PCBs.

In addition to the wipe sampling program, a field-screening program was performed for the samples collected in the pits/tunnels running under the floor of the building. This was done, although not required in the approved work plan, since the cooling water tunnels outside the building were known to have some sludge containing PCBs.

Prior to preparation of the report for this work, a fire occurred within the building. The fire was largely confined to debris and the planks that cover the floor pits in the northern portion of the building. No structural damage was done to the building and all firefighting water was contained within the pits. Because of the fire, the Navy considered the sampling data gathered to be unusable and, therefore, has not presented the results. In response to this incident, the Navy intends to recharacterize the building's interior and provide the new data to fulfill the requirements of the RFI.

1.2 Purpose

The primary purpose of this recharacterization work plan is to identify the investigative approach to be used to resample the interior of the building to delineate areas of contamination, as well as to perform an assessment of the pipe insulation. This work plan will describe the proposed sampling and data collection methods to confirm and delineate the areas of suspected contamination.

This work plan will help ensure that sampling and data collection activities are carried out in accordance with the United States Environmental Protection Agency (EPA), Naval Facilities Engineering Service Center (NFESC), Puerto Rico Environmental Quality Board (PREQB), and Baker Standard Operating Procedures (SOPs) as provided in the RCRA Facility Investigation Management Plans (Baker, 1995). The proposed sampling and collection methods have been designed to collect data during the field investigation in sufficient quantity and quality to evaluate the presence or absence of the contaminants of concern.

This document provides two key elements for completing characterization of releases within Building 38. The first portion provides the results of the initial sampling work performed in the building during the November 1996 field investigation. This information has been used to develop a recharacterization work plan that comprises the second portion of the document.

2.0 ORIGINAL INVESTIGATION RESULTS

The following subsections provide a discussion of the results from the November 1996 field investigation at this site, along with the corresponding conclusions and recommendations.

2.1 Wipe Sampling Program

A total of 126 wipe samples were taken in the building during November 1996. The locations of the samples are shown on Figure 2-1. Each of the samples was analyzed for PCBs the results of which are shown on Table 2-1.

A total of 122 of the 126 samples collected contained detections of PCBs, specifically Aroclor-1260, at concentrations ranging from 0.22 micrograms per 100 centimeters squared ($\mu g/100\ cm^2$) in wipe sample 11WS091, to 330,000 $\mu g/100\ cm^2$ in sample 11WS041. It should be noted that Aroclor-1260 is the PCB most commonly associated with electrical use.

Figure 2-1 is color coded to illustrate the pattern of contamination seen. As would be intuitively expected, the walls are generally much less contaminated than the floors. The northern half of the building shows generally higher concentrations than the southern half which again makes intuitive sense in that the TSCA regulated PCB storage area was in this half of the building.

2.2 Screening Sampling in Floor Pits

There are a number of interconnected pits and tunnels that are located beneath the floor generally covered with wooden planking. The collected flow from these features is eventually directed to the cooling water discharge tunnel. A schematic of the tunnels/pits is shown on Figure 2-2 as developed from field observation.

A total of 17 grab samples and two duplicate samples were obtained at the locations shown on Figure 2-2. These samples were analyzed for PCBs in the field using Ensys® kits calibrated to yield results of < 1 parts per million (ppm), ≥ 1 ppm < 10 ppm, ≥ 10 ppm < 50 ppm, ≥ 50 ppm, as presented in Table 2-2.

Sixteen of the samples collected showed detections of PCBs greater than 50 ppm, while three samples (1, 10, and 14) indicated PCBs present at levels between 10 and 50 ppm.

2.3 Conclusions and Recommendations

The floor and lower portion of the walls in the building show concentrations of Aroclor-1260; however, the results of the screening sampling in the tunnels/pits indicates potentially significant PCB contamination with levels in all but three samples above 50 ppm. Based on this, and the possible effects of the fire in the building's interior, recharacterization of the Building 38 interior is necessary.

3.0 FIELD INVESTIGATION AND SAMPLING PROGRAM

This section describes the field investigation and sampling program to be conducted at SWMU 11 following the EPA approval of this work plan. The procedures utilized in the field will follow the information listed in the EPA approved Baker Final RFI Management Plans (Baker 1995), as appropriate. Table 3-1 details the anticipated number of wipe and concrete chip samples, along with their corresponding sample identification and laboratory analysis that will be performed.

3.1 Overview

The field investigation tasks will consist of:

- Mobilization
- Collection of wipe and concrete chip samples from the walls and floors within the building
- Perform a condition assessment of the pipe insulation within the building
- Investigative Derived Waste (IDW) Management
- Demobilization

The following presents a general overview of the field activities that will be conducted at SWMU 11.

3.1.1 Mobilization/Demobilization

Mobilization consists of obtaining the necessary equipment and supplies to perform the field investigation tasks. For this project, minimal equipment/supplies will be required such as, but not limited to: digital camera, hammer, chisel, lighting equipment, health and safety equipment, and field log books. Demobilization consists of removing, packaging and shipping all of the non-disposable equipment and supplies back to the United States.

3.1.2 Wipe Sample Investigation

Based on the previous work performed at SWMU 11, and the possible effects of the fire, a sampling plan for the interior floors and walls has been developed. Over one-third (53 samples)

of the original (126) samples collected during the November 1996 field investigation will be recollected.

3.1.2.1 Wall Sampling

A total of 15 wipe samples will be collected along with two duplicate samples from areas on the walls where previous wipe samples have been collected as presented on Figure 3-1.

All of the samples will be collected at approximately five feet above the level of the floor and placed in an appropriate laboratory supplied container and stored in a cooler with ice pending transport to the laboratory. The locations of all proposed wipe samples on the walls will be established in the field based off of measurements presented along the walls on Figure 3-1.

All 17 wipe samples along the walls will be analyzed for PCBs using Contract Laboratory Protocols (CLP) with a 28-day turnaround time. These analytes were selected based on the results of the previous investigation, along with the occurrence of the fire.

3.1.2.2 Floor Sampling

A total of 19 wipe samples will be collected along with two duplicate samples from the floor of Building 38 in the areas where previous wipe samples have been collected as presented on Figure 3-2.

All of the samples will be collected along the floor and placed in an appropriate laboratory supplied container and stored in a cooler with ice pending transport to the laboratory. The proposed locations will be established in the field based off of measurements presented along the floors on Figure 3-2.

All 21 wipe samples will be analyzed for PCBs using CLP with a 28-day turnaround time. These analytes were selected based on the results of the previous investigation, along with the occurrence of the fire.

3.1.2.3 Dioxin/Furan Sampling

A total of 13 wipe samples will be collected along with two duplicate samples from either the floor and/or the walls inside the building. All samples will be collected based on visual signs of residue from the fire observed by the field crew, and analyzed for dioxins/furans. The visual signs that the field crew will be especially observant to are areas where black residue has built up from the fire. The burning of PCBs generates dioxins/furans, therefore, the areas containing black residue will be sampled to define the extent of dioxin/furan contamination within the building. These 13 samples may or may not be co-located along with the PCB wipe samples mentioned in the above sections. All of the sample locations will be measured in the field and recorded.

3.1.3 Concrete Chip Sample Investigation

Based on the previous work performed at SWMU 11, and the possible effects of the fire, a sampling plan utilizing bulk samples as requested by the EPA (EPA, 2002) for the interior floors and walls has been developed. The bulk samples were requested by the EPA in their comment letter dated March 8, 2002 (EPA, 2002). The EPA stated that the wipe samples are no longer acceptable for establishing clean-up levels for surfaces such as concrete. Therefore, bulk samples have been added to the field investigation to be able to evaluate the necessary clean up requirements for PCBs.

A total of 19 concrete chip samples along with two duplicate samples will be collected from various areas (walls and/or floors) that have been impacted by prior contamination based on visual observation (i.e. chemical and/or smoke staining on walls/floor). These areas have been tentatively established as presented on Figures 3-3 and 3-4, but most likely will change based on the areas observed in the field by the Baker field crew.

3.1.3.1 Wall Sampling

A total of five concrete chip samples along with one duplicate sample are proposed to be collected from the walls inside Building 38, as presented on Figure 3-3.

All concrete chip samples on the walls will be collected utilizing a clean hammer and chisel or other similar means that will be decontaminated prior to each sample collection. The

decontamination processes in the EPA approved RFI work plan for NSRR (Baker, 1995) will be followed during this investigation. The concrete chip samples will be collected to a depth of approximately ½ inch, and the wall samples will be collected within two feet of the floor, as requested by the EPA (EPA, 2002). If during the ½ inch deep sample collection procedure the field team has an indication that contamination may be below the top ½ inch, an additional sample will be collected from ½ inch to 1½ inches or deeper pending site conditions. The samples will be placed in the appropriate laboratory supplied containers and stored in a cooler pending transport to the laboratory. The locations will be established in the field based off of measurements along the walls as presented on Figure 3-3.

The samples on the walls will be analyzed for PCBs using CLP with a 28-day turnaround time. These analytes were selected based on the results of the previous investigation, along with the occurrence of the fire.

3.1.3.2 Floor Sampling

A total of 13 concrete chip samples and one duplicate sample are proposed to be collected from the floor inside Building 38, as presented on Figure 3-4.

All of the concrete chip samples on the floor will be collected utilizing a clean hammer and chisel or other similar means that will be decontaminated prior to each sample collection. The decontamination processes in the EPA approved RFI work plan for NSRR (Baker, 1995) will be followed during this investigation. The concrete chip samples will be collected to a depth of approximately ½ inch as requested by the EPA (EPA, 2002). If during the ½ inch deep sample collection procedure the field team has an indication that contamination may be below the top ½ inch, an additional sample will be collected from ½ inch to 1½ inches or deeper pending site conditions. The samples will be placed in the appropriate laboratory supplied containers and stored in a cooler pending transport to the laboratory. The locations will be established in the field based off of measurements along the floors as presented on Figure 3-4.

All 14 samples along the floor will be analyzed for PCBs using CLP with a 28-day turnaround. These analytes were selected based on the results of the previous investigation, along with the occurrence of the fire.

3.1.4 Tunnel/Pit Sample Investigation

A minimum of 17 sludge samples was originally proposed to be collected from the tunnels/pits shown on Figure 2-2. These samples were to be obtained at approximately the same locations that were used during the 1996 field-screening program since it is known that there are sampleable quantities of material at these sites. However, as per the EPA's comment letter dated March 8, 2002, the Navy will consider all the sludge and other materials located in the tunnels/pits to contain PCBs at concentrations of 50 ppm (EPA, 2002). Therefore, no additional sludge samples will be obtained during this investigation.

3.1.5 Assessment of the Pipe Insulation Inside the Building

There is extensive piping in the western portion of the building much of which is covered with suspected asbestos-containing insulation. There is concern that the insulation may have been contaminated with PCBs and/or dioxins by the smoke. A site condition assessment will be performed on the piping within Building 38 to assist in building management.

The condition assessment will investigate and document the current condition and integrity of the assumed asbestos-containing pipe insulation in the building. The field crew will follow detailed protocols mirroring accepted industry standard procedures and quality assurance procedures to ensure a complete and accurate survey. While no sample collection or analysis efforts will occur, the field crew will characterize all of the pipe insulation into distinct homogeneous materials. During the survey, the pipe insulation will be grouped into homogeneous sampling areas as based upon material use, material type, facility system, and uniformity of texture and appearance. Also, the field crew will document data for each building material, such as type of material, description, location, quantity, friability, and condition. All of this information will be collected on standardized forms as presented in Appendix A, and included in the Draft RFI Report for SWMU 11 as mentioned in Section 5.0. Based upon the gathered information and conditions present with the building, specific recommendations for overall management of the individual homogeneous pipe insulation will be made. Rough field sketches will be developed.

3.1.6 Investigation Derived Waste

It is anticipated that only minimal IDW will be generated during site investigation activities. This IDW will be associated with the decontamination fluids from the concrete chip equipment

decontamination procedures. All IDW will be containerized in a fifty five-gallon drum and labeled stating contents, date of generation, and consultant. The IDW will be sampled following completion of work and will be disposed of in accordance with local and federal regulations.

3.2 Quality Assurance/Quality Control Samples

Quality Assurance/Quality Control (QA/QC) requirements for the investigation are as follows and are identified in the sample matrix presented in Table 3-2.

3.2.1 Field Duplicate Samples

Field duplicates of the wipe and concrete chip samples from the walls and floor will be collected. One duplicate will be collected for every 10 wipe and concrete chip samples collected. Two duplicate wipe samples are to be collected during the wipe sampling of the walls (Section 3.1.2.1), while two duplicate wipe samples are to be collected during the wipe samples of the floor (Section 3.1.2.2). One duplicate sample is to be collected during the concrete chip sampling (Section 3.1.3). Two additional duplicate samples will be collected during the wipe sampling of the walls and/or floor once the field crew has established locations for the dioxin/furan sampling.

3.2.2 Matrix Spike/Matrix Spike Duplicates

Matrix Spike/Matrix Spike Duplicates (MS/MSDs) are laboratory derived and are collected to evaluate the matrix effect of the sample upon the analytical methodology. One MS/MSD will be collected for every 20 samples collected of a similar matrix. One MS/MSD will be collected during the wipe sampling of the walls, one MS/MSD sample will be collected during the wipe sampling of the floors, and one MS/MSD sample will be collected during the concrete chip sampling.

3.2.3 Equipment Rinsate Samples

Equipment rinsate samples are collected from analyte-free water rinse of decontaminated equipment. Equipment rinsate blanks will be collected and submitted to an analytical laboratory for analysis. The results from the blanks will be used to determine if the sampling equipment was free of contamination. The equipment rinsate samples are analyzed for the same parameters as the related samples.

It is anticipated that a total of two equipment rinsate samples will be collected. These samples will be associated with the concrete chip sampling. One of the samples will be obtained from the equipment utilized to obtain the concrete chip samples. These samples will be analyzed for PCBs and dioxins/furans as presented in Table 3-2.

3.2.4 Field Blank Samples

Field blank samples consist of the source water used in equipment decontamination procedures. At a minimum, one field blank for each event and each source of water must be collected and analyzed for the same parameters as the related samples. One field blank per source per event will be collected. It is anticipated that three different sources of water will be utilized for this investigation, and analyzed for PCBs as shown in Table 3-2.

3.3 Sample Designation

In order to identify and accurately track the samples, all samples collected during this investigation, including QA/QC samples, will be designated with a unique number. The number will serve to identify the sample media, sample location, and QA/QC qualifiers.

Many of the samples to be collected during this investigation will have the same sample identification as from the November 1996 field investigation except for the addition of an "R" at the end of the sample investigation. The reason for this is that some of these areas need to be reassessed due to the occurrence of the fire. Therefore, using the same sample identifications for both investigations where applicable, will ease in the development of the RFI report. The data containing the same sample identifications will be compared side by side in the RFI report for ease of review. The 1996 investigation also followed the sample designation format listed above.

The sample designation format will be as follows:

Wipe Sample and Concrete Chip Sample:

SWMU # - Type - Sequence - Location

SWMU # 11
Type WS or CC (Wipe Sample or Concrete Chip)

Sequence	Numbering resumes from previous sampling where appropriate. Otherwise 01 through completion of samples will be used, specifically for the concrete chip samples.
Resample	R = Resample
QA/QC	D = Duplicate MS/MSD = Matrix Spike/Matrix Spike Duplicate
Location	(F) or (W) (Floor Sample or Wall Sample) if applicable

Under this designation format, the example sample number 11WS32RD(W) refers to:

11WS32RD(W)	SWMU 11
11WS32RD(W)	Wipe Sample
11WS32RD(W)	Wipe Sample #32
11WS32RD(W)	Duplicate
11WS32RD(W)	Wall Sample (if applicable)

3.4 Analytical Requirements

As indicated in Section 3.1, the environmental wipe and concrete chip samples will be analyzed for one of the following; PCBs and/or dioxins/furans, as presented in Table 3-1. The analyses will be performed according to USEPA CLP protocols. STL Savannah Laboratories will perform the analysis at SWMU 11 since they have performed the analysis for many of the investigations conducted at NSRR over the years. All analyses at the laboratory will be performed using the current methodologies as presented in Table 3-3.

3.5 Data Validation

All laboratory data generated by this investigation will be subjected to independent, third party, validation. The EPA Region II Data Validation Standard Operating Procedures will be followed. Heartland Environmental Services, Inc. will perform the validation since they have performed the data validation for many of the investigations conducted at NSRR over the years. This will ensure that the same techniques are followed and that an equivalent review of the data is performed.

3.6 Chain-of-Custody

Chain-of-Custody procedures will be followed to ensure a documented, traceable link between measurement results and the sample/parameter that they represent. These procedures are intended to provide a legally acceptable record of sample preparation, storage, and analysis.

To track sample custody transfers before ultimate disposition, sample custody will be documented using the protocols listed in the EPA approved RFI work plan for NSRR (Baker, 1995).

A chain-of-custody form will be completed for each container in which the samples are shipped. The shipping containers for the samples will usually be coolers. After the samples are properly packaged, the shipping container will be sealed and prepared for shipment to the analytical laboratory.

3.7 Health and Safety Procedures

The Health and safety procedures to be utilized during this investigation are found in the EPA approved RFI work plan for NSRR (Baker, 1995).

4.0 DATA EVALUATION

The wipe and concrete chip PCB sample results obtained during this investigation, as well as the samples collected during the 1996 RFI investigation, will be presented on tables and figures within the RFI report to determine if PCBs are present and at what levels.

The wipe and concrete chip dioxin/furan sample results obtained during this investigation will be presented on tables and figures within the RFI report, as well as compared to EPA Residential and Industrial Risk Based Concentrations (RBCs) presented in Table 4-1.

These results of this investigation will help determine if the contamination within Building 38 has been adequately characterized as required under the RFI program due to the occurrence of the fire.

5.0 REPORTING

This section outlines the reporting activities that are associated with the field investigation. A Draft and Final RFI Report will be developed to discuss the findings of the recharacterization sampling effort. The report shall include at a minimum:

- Site History (including 1997 fire incident)
- Scope and Objectives
- Description of the building structure
- Sampling and Analysis Data
  - Re-Characterization Sampling and Analysis Results
  - Comparison of original RFI sampling effort (1996) with the Re-Characterization sampling effort
  - Comparison of dioxin/furan sample data to EPA Region III RBCs
- Laboratory sampling parameters and methods
- Human Health Risk Assessment
- Corrective Measures Alternatives
  - Restricted facility usage requiring Institutional Controls and Engineering Controls
  - Unrestricted facility usage for the industrial worker
- Conclusions and Recommendations

6.0 SCHEDULE

A schedule for the implementation of this work plan is provided as Figure 6-1.

7.0 PROPOSED STAFFING

An organizational chart presenting the proposed staffing for this project is provided on Figure 7-1. This section also outlines the responsibilities and reporting requirements of field personnel.

7.1 Project Team Responsibilities

Mr. Mark Kimes, P.E of Baker Environmental, Inc. who is the Activity Manager for all work in Puerto Rico, will manage the Baker Project Team. His responsibilities will be to direct the technical performance of the project staff, costs and schedule, ensuring that QA/QC procedures are followed during the course of the project. He will maintain communication with the LANTDIV Navy Technical Representative (NTR), Mr. Kevin Cloe, P.E.

The field portion of this project will consist of one field team managed by the Environmental Scientist, Mr. Jon C. Edel, Jr. Mr. Edel's responsibilities include directing the Baker field team and subcontractors.

7.2 Reporting Requirements

The Environmental Scientist will maintain a daily summary of each day's field activities. The following information will be included in this summary:

- Baker and subcontractor personnel on site
- Major activities of the day
- Samples collected
- Problems encountered
- Other pertinent site information

The Environmental Scientist will receive direction from the Activity Manager regarding any changes in scope of the investigation.

8.0 REFERENCES

Baker Environmental, Inc., (Baker) 1995. Final RCRA Facility Investigation, Naval Station Roosevelt Roads, Puerto Rico. September 14, 1995.

United States Environmental Protection Agency. (2002). EPA comment letter dated March 8, 2002 dealing with the Draft Re-characterization Sampling Work Plan for SWMU 11 (Interior Areas of Building 38 – Old Power Plant), and the Draft RFI Work Plan for SWMU 3 (Currently Operating Solid-Waste Landfill), EPA Region II. New York, New York.

TABLES

TABLE 2-1

SUMMARY OF WIPE SAMPLE POSITIVE DETECTIONS - PHASE I
SWMU 11/45 - BUILDING 38 OLD POWER PLANT
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

Sample ID	11WS001	11WS002	11WS003	11WS004	11WS005	11WS006	11WS007	11WS008	11WS009	11WS010	11WS011	11WS012	11WS013
Sample Date	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996
PCBs (ug/100 cm^2)													
Aroclor 1260	1.7	4.3	2	2.1	1.5	63	2.5	42	0.99	34	0.77	51	120

Sample ID	11WS014	11WS015	11WS016	11WS017	11WS018	11WS019	11WS020	11WS021	11WS022	11WS023	11WS024	11WS025	11WS026
Sample Date	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996
PCBs (ug/100 cm^2)													
Aroclor 1260	9.8	4.7	0.88	20	0.7	36	27	7.1	17	7.9	11	0.66	1.3

Sample ID	11WS027	11WS028	11WS029	11WS030	11WS031	11WS032	11WS033	11WS034	11WS035	11WS036	11WS037	11WS038	11WS039
Sample Date	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996
PCBs (ug/100 cm^2)													
Aroclor 1260	0.63	0.37	15	12	120	2.4 U	140	7.7	0.31	150	74	0.87	160

Sample ID	11WS040	11WS041	11WS042	11WS043	11WS044	11WS045	11WS046	11WS047	11WS048	11WS049	11WS050	11WS051	11WS052
Sample Date	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996
PCBs (ug/100 cm^2)													
Aroclor 1260	73	330,000	180	990	550	2	1,200	17	280	360	1,200	59	14

Sample ID	11WS053	11WS054	11WS055	11WS056	11WS057	11WS058	11WS059	11WS060	11WS061	11WS062	11WS063	11WS064	11WS065
Sample Date	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996
PCBs (ug/100 cm^2)													
Aroclor 1260	4,700	7.7	2,700	3.2	15	1.3	57	2.1	51	3.6	17	1.4	12

TABLE 2-1

SUMMARY OF WIPE SAMPLE POSITIVE DETECTIONS - PHASE I
SWMU 11/45 - BUILDING 38 OLD POWER PLANT
NAVAL STATION ROOSEVELT ROADS, PUERTO RICO

Sample ID	11WS066	11WS067	11WS068	11WS069	11WS070	11WS071	11WS072	11WS073	11WS074	11WS075	11WS076	11WS077	11WS078
Sample Date	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996
PCBs (ug/100 cm^2)													
Aroclor 1260	0.41	23	1.4	35	0.98	18	10	7	16	0.3	41	0.58	24

Sample ID	11WS079	11WS080	11WS081	11WS082	11WS083	11WS084	11WS085	11WS086	11WS087	11WS088	11WS089	11WS090	11WS091
Sample Date	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996
PCBs (ug/100 cm^2)													
Aroclor 1260	9.6	4.6	8.6	2.4 U	3.7	2.4 U	2.9	5	6.4	7.9	0.98	16	0.22

Sample ID	11WS092	11WS093	11WS094	11WS095	11WS096	11WS097	11WS098	11WS099	11WS100	11WS101	11WS102	11WS103	11WS104
Sample Date	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996
PCBs (ug/100 cm^2)													
Aroclor 1260	7.6	5.1	1.5	0.38	15	1.1	44	0.72	9.1	35	2.1	21	3

Sample ID	11WS105	11WS106	11WS107	11WS108	11WS109	11WS110	11WS111	11WS112	11WS113	11WS114	11WS115	11WS116	11WS117
Sample Date	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996
PCBs (ug/100 cm^2)													
Aroclor 1260	52	3.8	2.5	8.2	6.5	0.92	12	4.9	8.3	4.6	21	0.56	18

Sample ID	11WS118	11WS119	11WS120	11WS121	11WS122	11WS123	11WS124	11WS125	11WS126		Maximum Detected	Minimum Detected
Sample Date	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996	11/23/1996		11WS041	11WS091
PCBs (ug/100 cm^2)												
Aroclor 1260	7.2	96	20	1.4	0.46	1.2	5	2.4 U	4.1		330,000	0.22

TABLE 2-2

SWMU 11
ENSYS® PCB SCREENING SAMPLING RESULTS
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

Sample ID	Standard	1 ppm	10 ppm	50 ppm	Results
1	-.12	-.77	-.62	+.01	=10 <50
2	-.12	-.76	-.77	-.65	=50 ppm
3	-.12	-.77	-.77	-.76	=50
4	-.53	-.77	-.77	-.76	=50
5	-.16	-.77	-.65	-.23	=50
6	-.16	-.77	-.62	-.77	=50
7	-.05	-.76	-.76	-.77	=50
7D	-.05	-.77	-.76	-.77	=50
8	-.32	-.77	-.77	-.77	=50
9	-.16	-.68	-.67	-.63	=50
10	-.05	-.20	-.76	+.12	=10 <50
11	-.32	-.76	-.77	-.77	=50
11D	-.32	-.77	-.76	-.77	=50
12	-.16	-.34	-.77	-.77	=50
13	-.16	-.67	-.67	-.59	=50
14	-.05	-.21	-.75	+.17	=10 <50
15	-.05	-.17	-.76	-.12	=50
16	-.16	-.62	-.51	-.42	=50
17	-.53	-.77	-.76	-.58	=50

TABLE 3-1

SUMMARY OF WIPE AND CONCRETE CHIP SAMPLING AND ANALYTICAL PROGRAM
SWMU 11 - INSIDE BUILDING 38 (OLD POWER PLANT)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

	Fixed Base Analytical Lab Analysis Requested		
Sample Designation	PCBs	Dioxins/Furans	Comments
Wipe Samples - Walls			
11WS05R(W)	X		
11WS16R(W)	X	X(1)	
11WS18R(W)	X	X(1)	
11WS22R(W)	X	X(1)	
11WS27R(W)	X	X(1)	
11WS32R(W)	X	X(1)	
11WS32RD(W)	X	X(1)	Duplicate
11WS32RMS(W)	X	X(1)	Matrix Spike
11WS32RMSD(W)	X	X(1)	Matrix Spike Duplicate
11WS38R(W)	X		
11WS56(W)	X		
11WS64R(W)	X		
11WS70R(W)	X		
11WS77R(W)	X		
11WS77RD(W)	X		Duplicate
11WS82R(W)	X		
11WS84R(W)	X		
11WS91R(W)	X		
11WS110R(W)	X		
Wipe Samples - Floor			
11WS13R	X	X(1)	
11WS15R	X	X(1)	
11WS17R(F)	X		
11WS21R	X	X(1)	
11WS21RD	X	X(1)	Duplicate
11WS22R(F)	X	X(1)	
11WS23R	X	X(1)	
11WS24R	X		
11WS28R(F)	X	X(1)	
11WS32R(F)	X	X(1)	
11WS34R	X	X(1)	
11WS65R(F)	X		
11WS65RD(F)	X		Duplicate
11WS65RMS(F)	X		Matrix Spike
11WS65RMSD(F)	X		Matrix Spike Duplicate
11WS73R	X		
11WS78R(F)	X		

TABLE 3-1

SUMMARY OF WIPE AND CONCRETE CHIP SAMPLING AND ANALYTICAL PROGRAM
SWMU 11 - INSIDE BUILDING 38 (OLD POWER PLANT)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

	Fixed Base Analytical Lab		
	Analysis Requested		
Sample Designation	PCBs	Dioxins/Furans	Comments
Wipe Samples - Floor (Continued)			
11WS79R	X		
11WS85R(F)	X		
11WS86R	X		
11WS87R	X		
11WS92R(F)	X		
11WS115R	X		
Concrete Chip Samples			
11CC01(W)	X		
11CC02(W)	X		
11CC03(W)	X		
11CC04(W)	X		
11CC05(W)	X		
11CC05D(W)	X		Duplicate
11CC05MS/MSD(W)	X		Matrix Spike/Matrix Spike Duplicate
11CC06(W)	X		
11CC07(F)	X		
11CC08	X		
11CC09	X		
11CC10	X		
11CC11(F)	X		
11CC12(F)	X		
11CC13(F)	X		
11CC14(F)	X		
11CC14D(F)	X		Duplicate
11CC15	X		
11CC16(F)	X		
11CC17(F)	X		
11CC18(F)	X		
11CC19(F)	X		

Note:

(1) - Exact sample will be determined by the field crew based on visual obervation of contamination. The exact location of the dioxin/furan sample may or may not be co-located with a PCB wipe sample.

TABLE 3-2

SUMMARY OF FIELD SAMPLING AND ANALYTICAL PROGRAM - QA/QC
SWMU 11 - INSIDE BUILDING 38 (OLD POWER PLANT)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

	Aqueous Samples Fixed Base Analytical Lab Analysis Requested	
Sample ID	PCBs	Comments
FIELD BLANKS		
11FB01	X	Lab Grade DI Water
11FB02	X	Store Bought DI Water
11FB03	X	NSRR Potable Water Source
EQUIPMENT RINSATE		
11ER01	X	Concrete Chip Equipment
11ER02	X	Concrete Chip Equipment

Note:
PCBs - Polychlorinated biphenyls

TABLE 3-3

METHOD PERFORMANCE LIMITS
COMPOUND LIST AND CONTRACT
REQUIRED QUANTITATION LIMITS (CRQL)

PCBs	Quantitation Limits		Method Number
	Wipe Sample (µg/wipe)	Concrete Chip Sample (µg/kg)	
Aroclor 1016	1.0	33	8082(3550)
Aroclor 1221	2.0	67	8082(3550)
Aroclor 1232	1.0	33	8082(3550)
Aroclor 1242	1.0	33	8082(3550)
Aroclor 1248	1.0	33	8082(3550)
Aroclor 1254	1.0	33	8082(3550)
Aroclor 1260	1.0	33	8082(3550)
Aroclor 1268	1.0	33	8082(3550)

Dioxins/Furans (Low Resolution)	Quantitation Limits		Method Number
	Wipe Sample (µg/wipe)	Concrete Chip Sample (µg/kg)	
2,3,7,8-TCDD	0.005	0.5	8280
2,3,7,8-TCDF	0.005	0.5	8280
2,3,7,8-PCDD	0.005	0.5	8280
2,3,7,8-PCDF	0.005	0.5	8280
2,3,7,8-HCDD (Hexa)	0.005	0.5	8280
2,3,7,8-HCDF (Hexa)	0.005	0.5	8280
2,3,7,8-HCDD (Hepta)	0.005	0.5	8280
2,3,7,8-HCDF (Hepta)	0.010	1.0	8280
2,3,7,8-OCDD	0.010	1.0	8280
2,3,7,8-OCDF	0.010	1.0	8280

The data for the wipe and concrete chip samples have been extrapolated from soil values, the actual quantitaiton limits were not determined in wipe or concrete chip samples. The reporting limits for dioxins/furans are based on a sample weight of 10 grams.

Notes:
µg/wipe - micrograms per wipe.
µg/kg - micrograms per kilogram.

TABLE 4-1

SUMMARY OF USEPA REGION III RBCs FOR DIOXINS/FURANS
SWMU 11 - INTERIOR BUILDING 38 (OLD POWER PLANT)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO

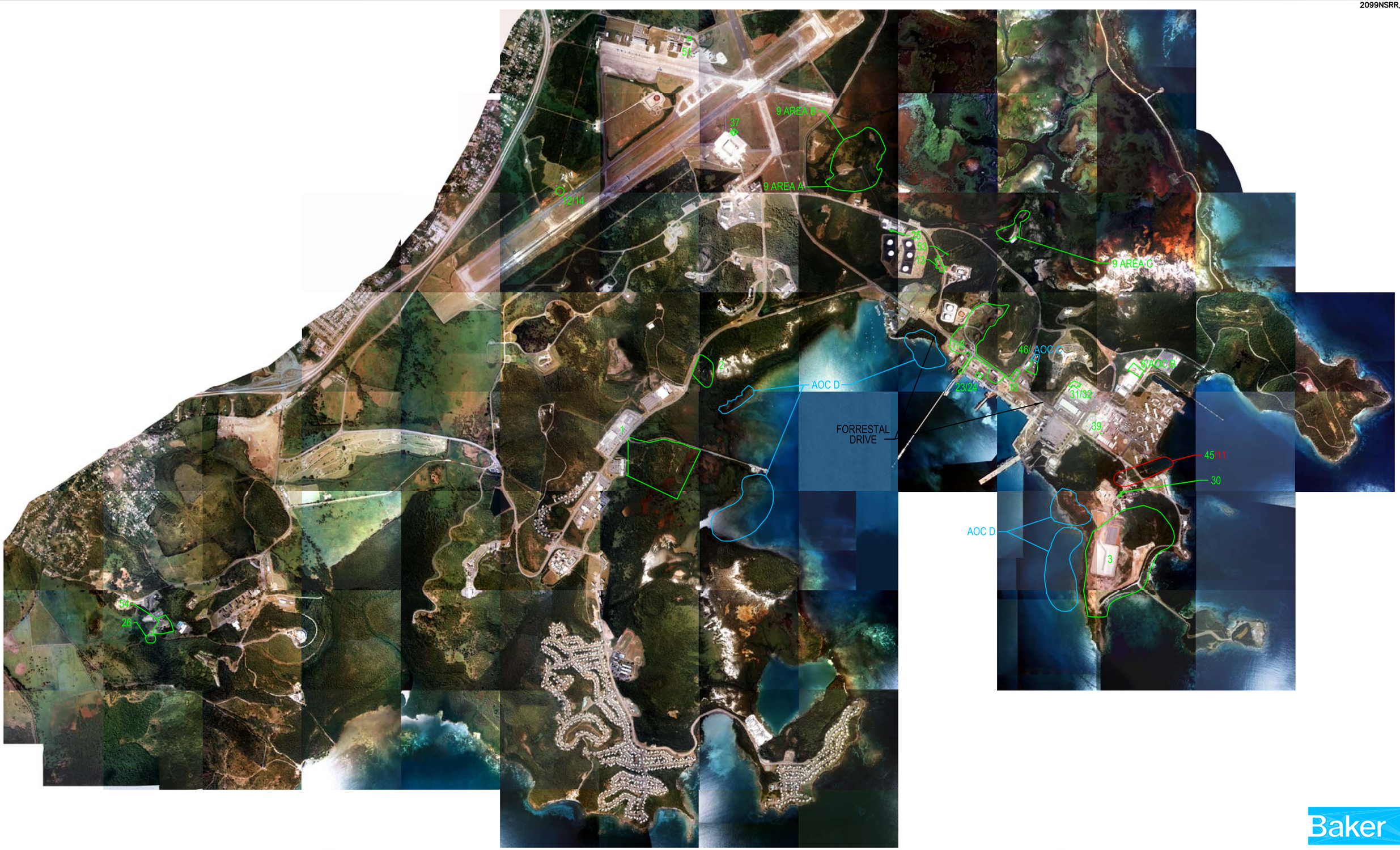
Congener	2,3,7,8-TCDD Toxic Equivalence Factor	USEPA Region III RBCs (2,3,7,8-TCDD Toxic Equivalence Concentrations)	
		Industrial Soil (ug/kg)	Residential Soil (ug/kg)
Dioxins			
2,3,7,8-and Total TCDDs	1	0.038	0.0043
2,3,7,8-and Total PeCDDs	0.5	0.076	0.0086
2,3,7,8-and Total HxCDDs	0.1	0.38	0.043
2,3,7,8-and Total HpCDDs	0.01	3.8	0.43
OCDD	0.001	38	4.3
Furans			
2,3,7,8-and Total TCDFs	0.1	0.38	0.043
2,3,7,8-and Total PeCDFs	0.5	0.076	0.0086
2,3,7,8-and Total HxCDFs	0.1	0.38	0.043
2,3,7,8-and Total HpCDFs	0.01	3.8	0.43
OCDF	0.001	38	4.3

Notes:
ug/kg - micrograms per kilogram.

Dioxins
TCDD - Tetrachlorodibenzo-p-dioxin
PeCDD - Pentachlorodibenzo-p-dioxin
HxCDD - Hexchlorodibenzo-p-dioxin
HpCDD - Heptachlorodibenzo-p-dioxin
OCDD - Octochlorodibenzo-p-dioxin

Furans
TCDF - Tetrachlorodibenzofuran
PeCDF - Pentachlorodibenzofuran
HxCDF - Hexchlorodibenzofuran
HpCDF - Heptachlorodibenzofuran
OCDF - Octochlorodibenzofuran

FIGURES



LEGEND

1 – SWMUs

11 – AREA OF WHICH THIS INVESTIGATION PERTAINS TO

AOC D – AOCs

SOURCE: GEO–MARINE, INC., SEPTEMBER 6, 2000.

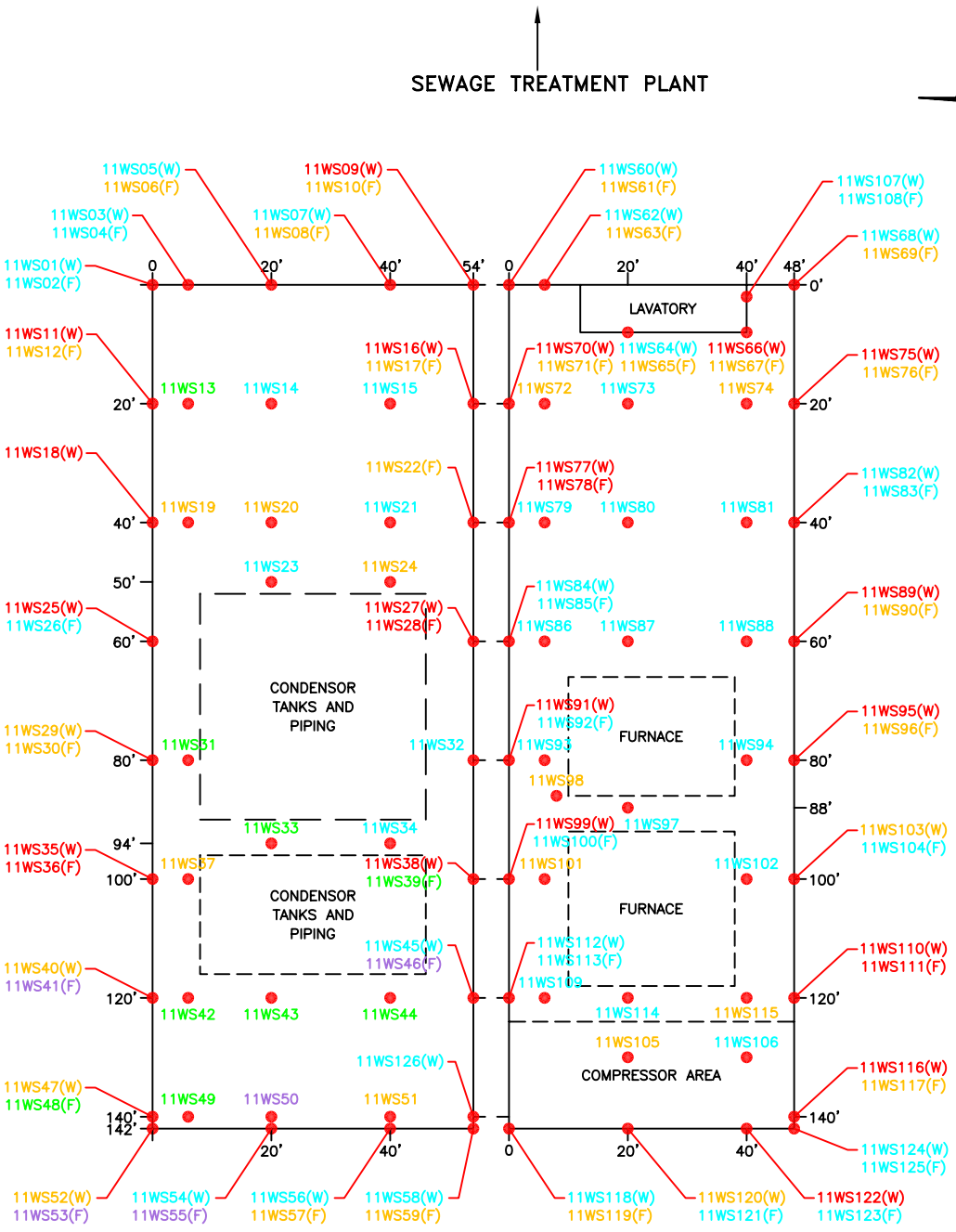
2500 0 1250 2500

1 inch = 2500 ft.

FIGURE 1–1
SWMU/AOC LOCATION MAP

NAVAL STATION ROOSEVELT ROADS
PUERTO RICO

Baker



30 0 15 30

1 inch = 30 ft.

Baker

LEGEND

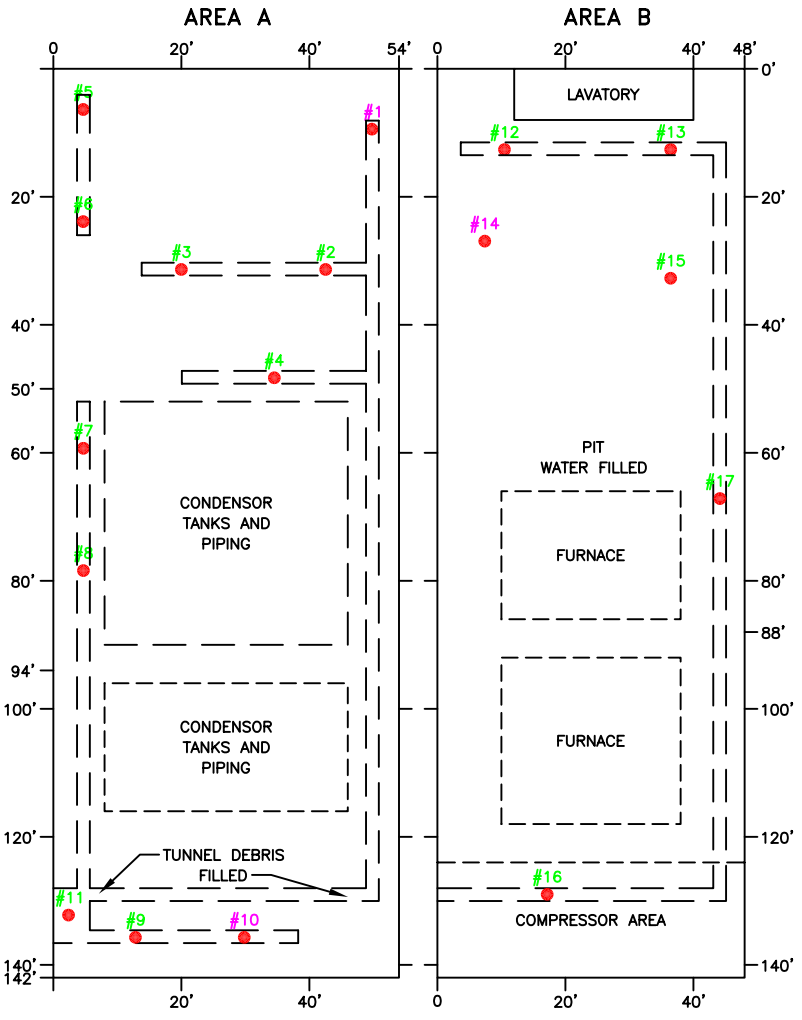
- ● – WIPE SAMPLE (NOVEMBER 1996)
- (W) – SAMPLE COLLECTED FROM WALL
- (F) – SAMPLE COLLECTED FROM FLOOR
- 11WS25(W) – LESS THAN 1 ppb
- 11WS14 – 1–10 ppb
- 11WS29(W) – 10–100 ppb
- 11SW33 – 100–1,000 ppb
- 11WS50 – OVER 1,000 ppb

FIGURE 2–1

PREVIOUS WIPE SAMPLING LOCATIONS SWMU 11 – BUILDING 38 INTERIOR

NAVAL STATION ROOSEVELT ROADS
PUERTO RICO

SEWAGE TREATMENT PLANT



30 0 15 30

1 inch = 30 ft.

Baker

LEGEND

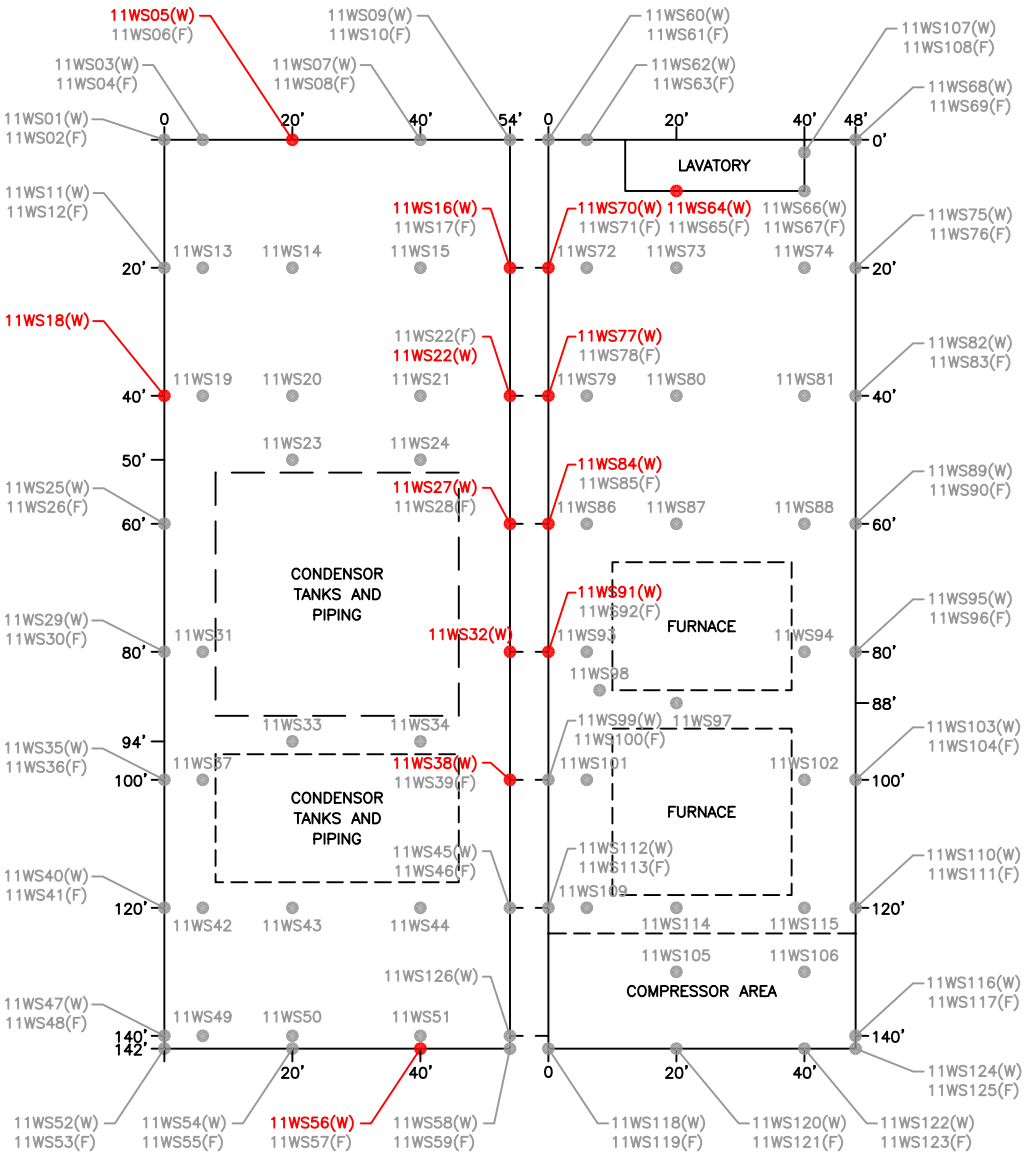
- SCREENING SAMPLE LOCATION (NOVEMBER 1996)
- #10 10–50 ppm
- #6 OVER 50 ppm
- TUNNELS/PITS

FIGURE 2–2

PREVIOUS PIT SCREENING SAMPLING LOCATIONS
SWMU 11 – BUILDING 38 INTERIOR

NAVAL STATION ROOSEVELT ROADS
PUERTO RICO

SEWAGE TREATMENT PLANT



30 0 15 30

1 inch = 30 ft.

Baker

LEGEND

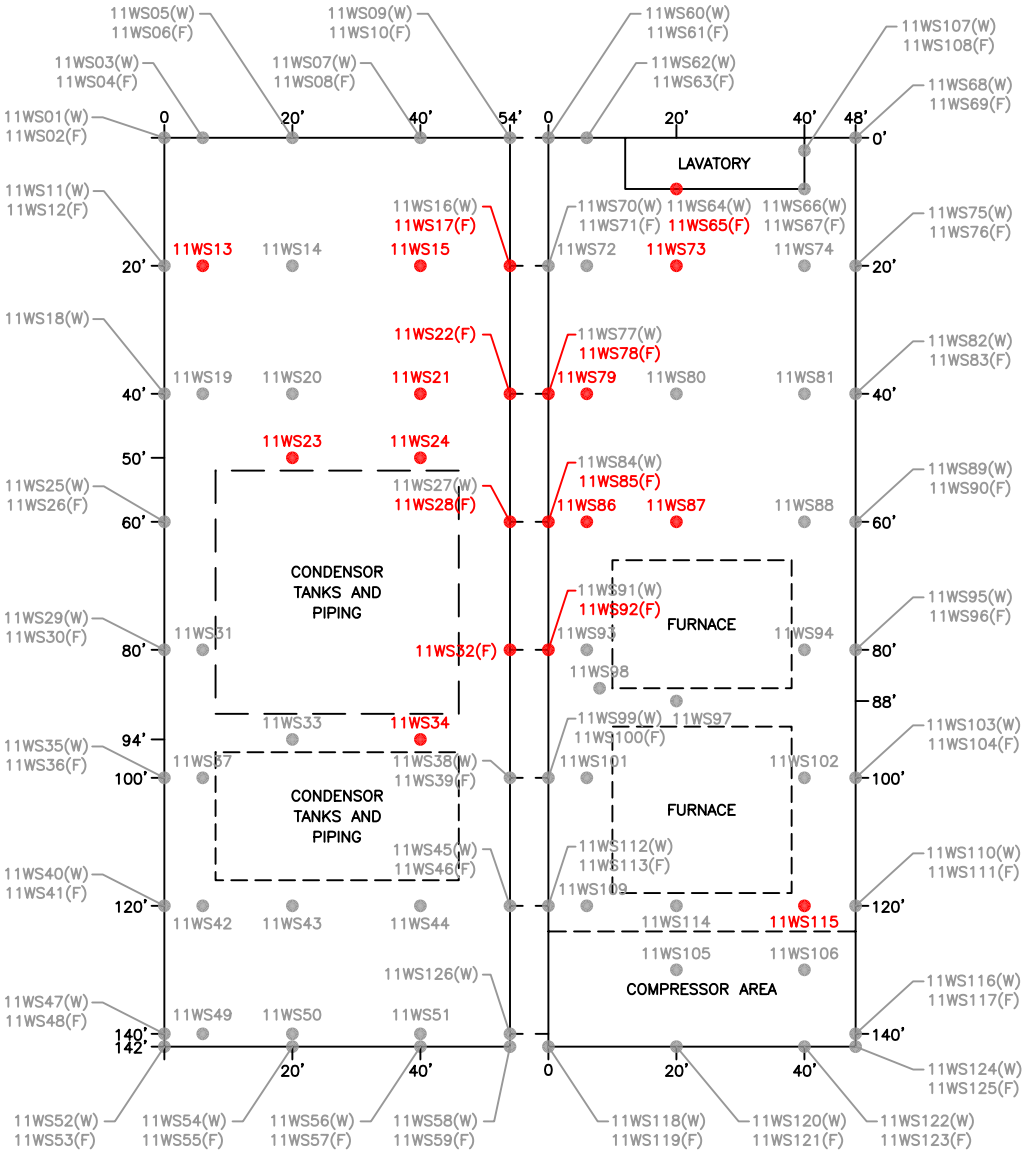
- ● – WIPE SAMPLE (NOVEMBER 1996)
- ● – PROPOSED WIPE SAMPLE ON WALL
- (W) – SAMPLE COLLECTED FROM WALL
- (F) – SAMPLE COLLECTED FROM FLOOR

FIGURE 3–1

PROPOSED WIPE SAMPLING LOCATIONS FOR WALLS SWMU 11 – BUILDING 38 INTERIOR

NAVAL STATION ROOSEVELT ROADS
PUERTO RICO

SEWAGE TREATMENT PLANT



30 0 15 30

1 inch = 30 ft.

Baker

LEGEND

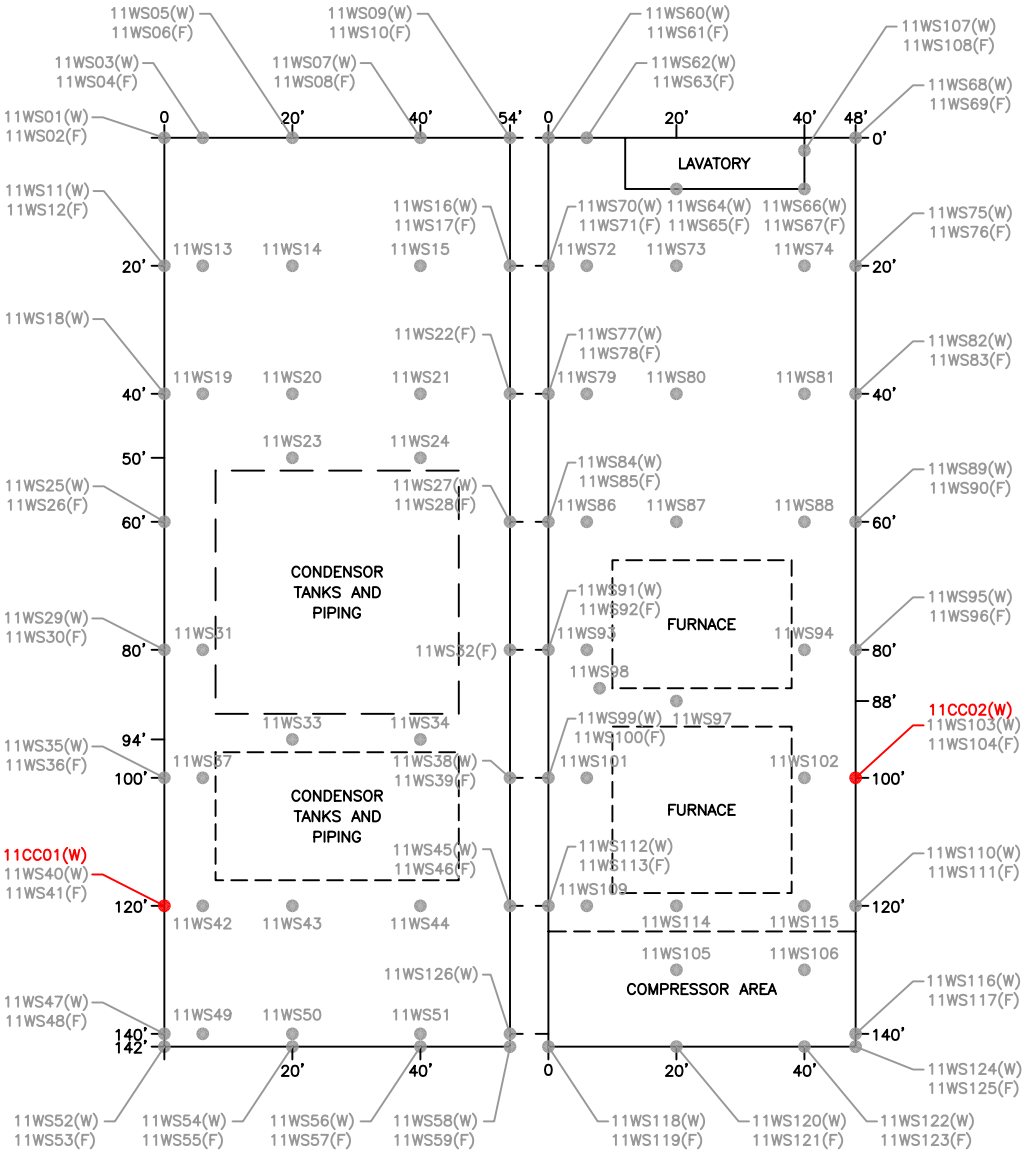
- – WIPE SAMPLE (NOVEMBER 1996)
- – PROPOSED WIPE SAMPLE ON FLOOR
- (W) – SAMPLE COLLECTED FROM WALL
- (F) – SAMPLE COLLECTED FROM FLOOR

FIGURE 3–2

PROPOSED WIPE SAMPLING LOCATIONS FOR FLOOR SWMU 11 – BUILDING 38 INTERIOR

NAVAL STATION ROOSEVELT ROADS
PUERTO RICO

SEWAGE TREATMENT PLANT



30 0 15 30

1 inch = 30 ft.

Baker

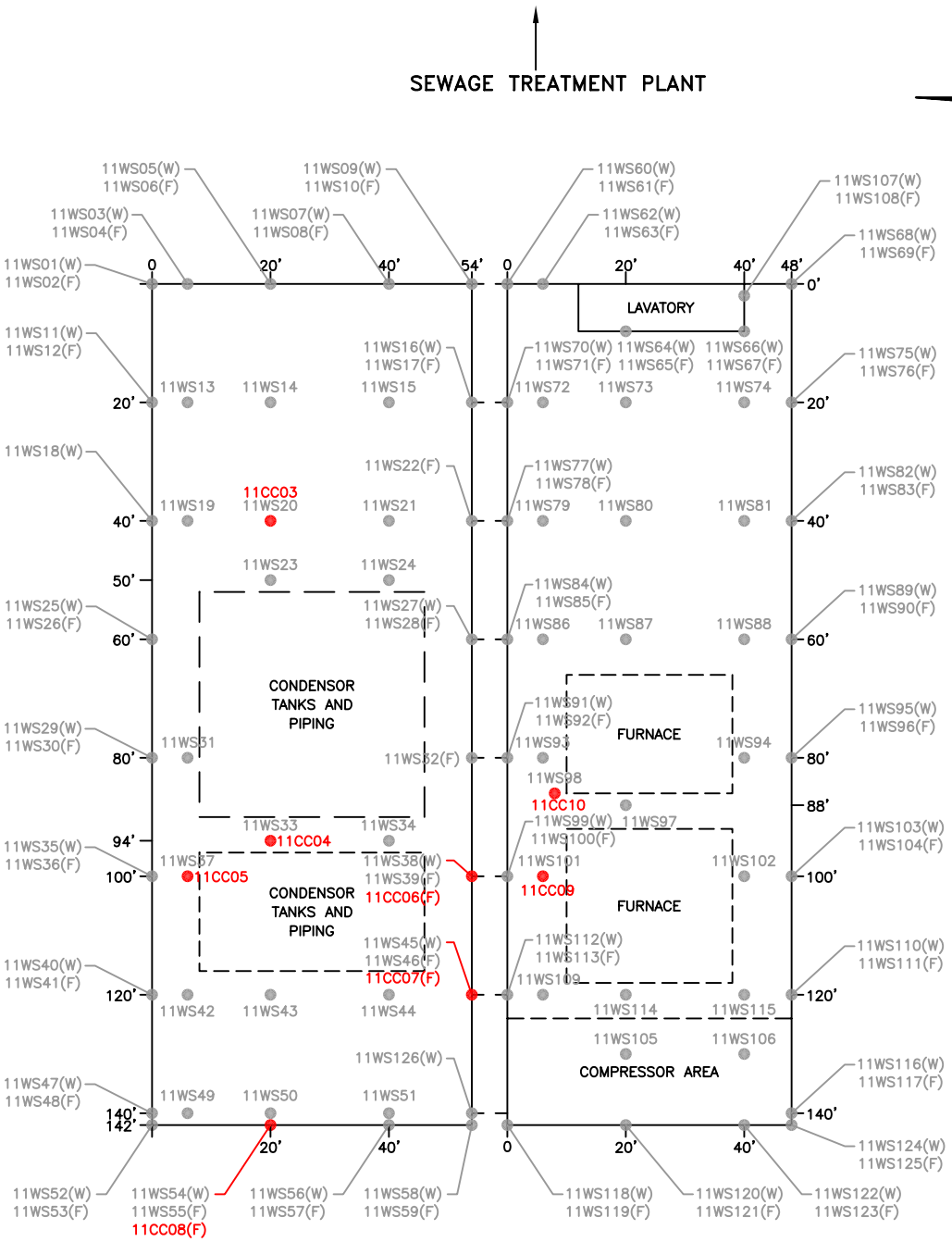
LEGEND

- – WIPE SAMPLE (NOVEMBER 1996)
- – PROPOSED WIPE SAMPLE ON FLOOR
- (W) – SAMPLE COLLECTED FROM WALL
- (F) – SAMPLE COLLECTED FROM FLOOR

FIGURE 3–3

PROPOSED CONCRETE CHIP SAMPLING LOCATIONS FOR WALLS SWMU 11 – BUILDING 38 INTERIOR

NAVAL STATION ROOSEVELT ROADS
PUERTO RICO



Baker

LEGEND

- – WIPE SAMPLE (NOVEMBER 1996)
- – PROPOSED WIPE SAMPLE ON FLOOR
- (W) – SAMPLE COLLECTED FROM WALL
- (F) – SAMPLE COLLECTED FROM FLOOR

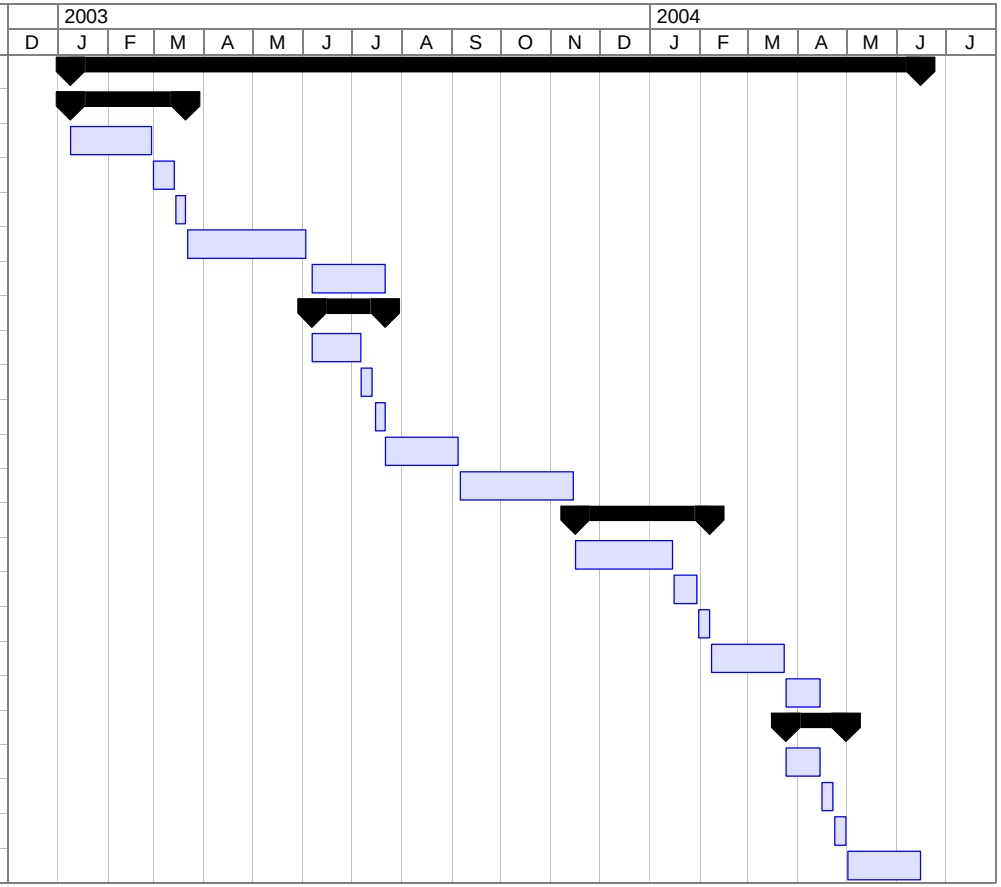
FIGURE 3–4

PROPOSED CONCRETE CHIP SAMPLING LOCATIONS FOR FLOOR SWMU 11 – BUILDING 38 INTERIOR

NAVAL STATION ROOSEVELT ROADS
PUERTO RICO

Figure 6-1
SWMU 11 RFI Schedule
Naval Station Roosevelt Roads, Ceiba, Puerto Rico

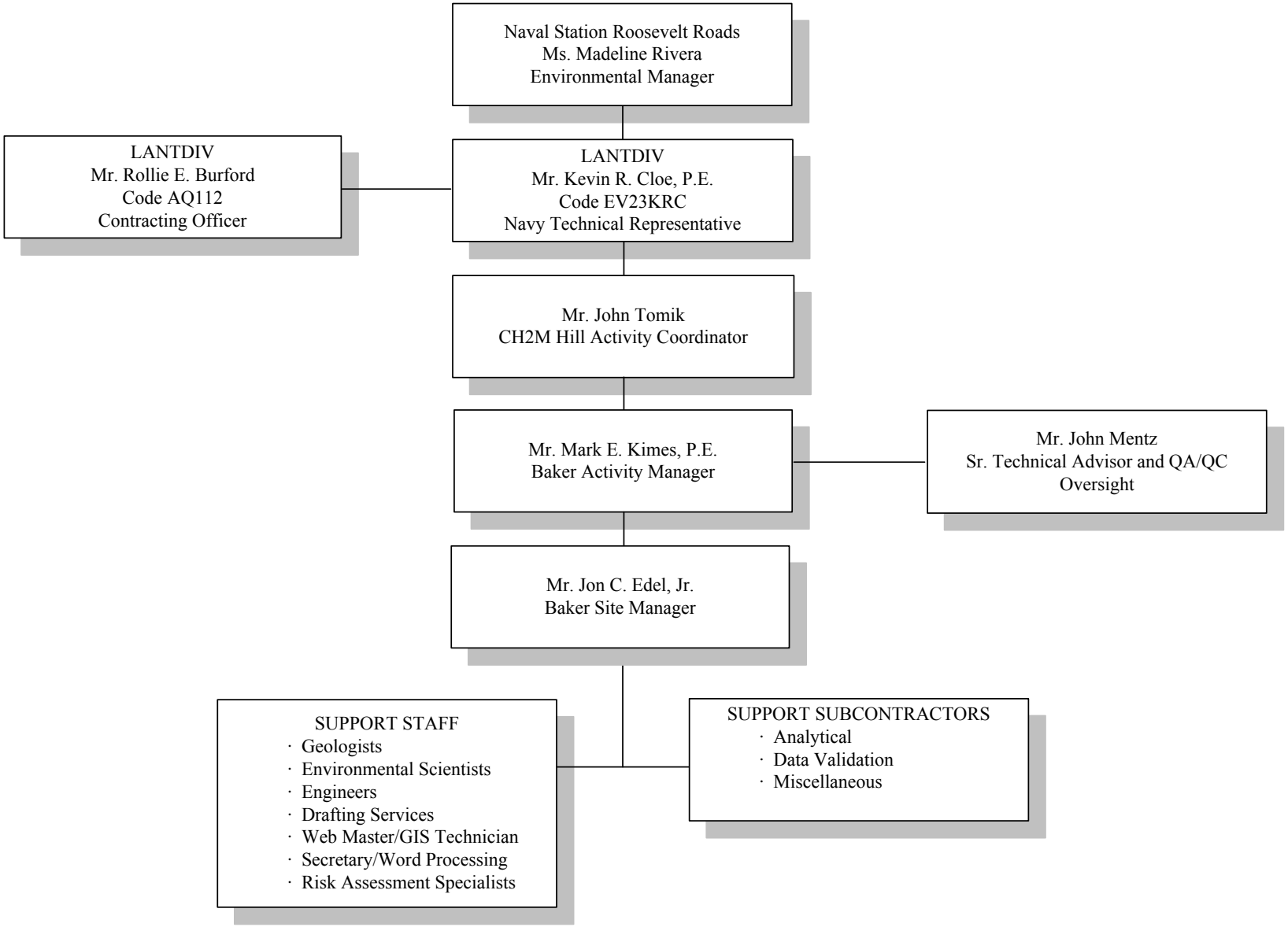
ID	Task Name	Duration	Start	Finish
1	***SWMU 11 RFI***	**375 days**	**1/9/03**	**6/16/04**
2	**Draft Recharacterization Work Plan**	**52 days**	**1/9/03**	**3/21/03**
3	Develop Work Plan	50 edays	1/9/03	2/28/03
4	Navy Review	13 edays	3/1/03	3/14/03
5	Address Navy Comments	6 edays	3/15/03	3/21/03
6	EPA Review	73 edays	3/22/03	6/3/03
7	Respond to EPA Comments	45 edays	6/6/03	7/21/03
8	**Final Recharacterization Work Plan**	**31 days**	**6/6/03**	**7/21/03**
9	Revise Draft Recharacterization Work Plan	30 edays	6/6/03	7/6/03
10	Navy Review	7 edays	7/7/03	7/14/03
11	Address Navy Comments	6 edays	7/15/03	7/21/03
12	EPA Review	45 edays	7/22/03	9/5/03
13	Fieldwork	70 edays	9/6/03	11/15/03
14	**Draft RFI Report**	**60 days**	**11/16/03**	**2/7/04**
15	Develop Draft RFI Report	60 edays	11/16/03	1/15/04
16	Navy Review	14 edays	1/16/04	1/30/04
17	Address Navy Comments	7 edays	1/31/04	2/7/04
18	EPA Review	45 edays	2/8/04	3/24/04
19	Respond to EPA Comments	21 edays	3/25/04	4/15/04
20	**Final RFI Report**	**27 days**	**3/25/04**	**5/1/04**
21	Revise Draft RFI Report	21 edays	3/25/04	4/15/04
22	Navy Review	7 edays	4/16/04	4/23/04
23	Address Navy Comments	7 edays	4/24/04	5/1/04
24	EPA Review	45 edays	5/2/04	6/16/04



Project: SWMU11-RFI-rev

Submittal dates are dependent upon Government review calendar days.

FIGURE 7-1
PROJECT ORGANIZATION
SWMU 11 - INSIDE BUILDING 38 (OLD POWER PLANT)
NAVAL STATION ROOSEVELT ROADS, CEIBA, PUERTO RICO



APPENDIX A
STANDARD CONDITIONAL ASSESSMENT FORM

Baker

ASBESTOS SURVEY NEW MATERIAL FORM

SCHOOL NAME: _____ BUILDING: _____ MATERIAL NO: _____

DODAAC NUMBER: _____ DATE: _____

Material Identification		AHERA Material Category	Material Location	Quantity	Sample Numbers	Friable	Type Damage	Damage Severity and Distrib.	Access	Inf. of Vibration	Inf. of Air Erosion	Overall Pot. for Damage	Recommended Action	Action Priority Number	Portion Related to Action
Code	Description		List all room numbers where material is located												
		SACM				YES	DETER	UNDAM	LOW	LOW	LOW	LOW. POT	Q&M	1 2 3	ALL
		TSIACM				NO	WATER	DAM.	MED.	MED.	MED.	POT.	REMOVE	1 2 3	PARTIAL ALL
		MACM					PHYS.	SIG. DAM.	HIGH	HIGH	HIGH	SIG. POT	REPAIR	1 2 3	PARTIAL ALL
							NONE						ENCAPS	1 2 3	PARTIAL ALL
								LOCAL					ENCLOSE	1 2 3	PARTIAL ALL
								DIST.							
				SF LF EA											

INITIAL CLEANING: YES NO O&M HOURS _____ REPAIR HOURS: _____ REMOVAL QUANTITY:

COMMENTS: The adhesive for this material is material # _____. This is the adhesive for material # _____.

The joint compound for this material is material # _____.. This is the joint compound for material # _____.

INSPECTORS: _____