UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II

① Finish RFI
② complete CMS, and CMI.
③ Interim Measure

In The Matter of	**ORDER TERMINATING ADMINISTRATIVE ORDER ON CONSENT**
PHILLIPS PUERTO RICO CORE INC. Guayama, Puerto Rico,	
EPA I.D. No. PRD991291972,	Docket No. II RCRA-89-3013-0307
Respondent.	
Proceeding under Section 3013 of the Resource Conservation and Recovery Act, as amended.	

WHEREAS, the parties to this matter, the United States Environmental Protection Agency (EPA or Agency), Region II, and Phillips Puerto Rico Core Inc. (Respondent), have been negotiating the issuance of an order under Section 3008(h) of the Resource Conservation and Recovery Act (RCRA), as amended, 42 U.S.C. § 6928(h),

WHEREAS, in September 1989, EPA issued an "ADMINISTRATIVE ORDER ON CONSENT" pursuant to Section 3013 of RCRA, 42 U.S.C. § 6934 (the September 1989 § 3013 Order), to Respondent for Respondent to conduct a RCRA Facility Investigation (RFI) for Respondent's petrochemical facility in Guayama, Puerto Rico (Respondent's facility),

WHEREAS, there exists a potential for overlap between work done and/or remaining to be done pursuant to the September 1989 § 3013 Order and work proposed to be done pursuant to the aforementioned Section 3008(h) Order (the Section 3008(h) Order), therefore, in an effort to expedite the completion of the study and concomitant clean-up of Respondent's facility, **IT IS HEREBY NOW:**

ORDERED, that all remaining work to be done pursuant to, and in compliance with, the September 1989 § 3013 Order is hereby incorporated into the Section 3008(h) Order as therein explicitly specified, and it is

works not under 3013 & 3008 one

FURTHER ORDERED, that all work required to be performed pursuant to, and in compliance with, the September 1989 § 3013 Order that is not explicitly required to be performed under the terms of the Section 3008(h) Order shall be deemed to have been completed, and it is

FURTHER ORDERED, that, notwithstanding any provision in the September 1989 § 3013 Order, upon issuance of the Section 3008(h) Order and its taking effect pursuant to the terms thereof, the September 1989 § 3013 Order shall be terminated upon the date the Section 3008(h) Order becomes effective, and it is

FURTHER ORDERED, that this "Order Terminating Administrative Order On Consent" is not to be construed, nor is it intended to be construed, to extinguish, supersede or otherwise limit the validity and effect of the Section 3008(h) Order or any of the terms, conditions and requirements thereof.

IT IS SO ORDERED.

Dated: September 8, 1995
New York, New York

JEANNE M. FOX
Regional Administrator
United States Environmental
Protection Agency - Region II

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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Respondent.	
Proceeding under Section 3008(h) of the Resource Conservation and Recovery Act, as amended.	

ADMINISTRATIVE ORDER ON CONSENT
Docket No. II RCRA-95-3008(h)-0307

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II

In The Matter of PHILLIPS PUERTO RICO CORE INC. Guayama, Puerto Rico EPA I.D. No. PRD991291972, Respondent. Proceeding under Section 3008(h) of the Resource Conservation and Recovery Act, as amended.	**ADMINISTRATIVE ORDER ON CONSENT** Docket No. II RCRA-95-3008(h)-0307

I. Preliminary Statement

1. This Administrative Order on Consent ("Order") is being issued to Phillips Puerto Rico Core Inc., a corporation that owns and operates a petrochemical plant located in Guayama, Puerto Rico ("Respondent"), pursuant to the Resource Conservation and Recovery Act of 1976 ("RCRA"), as amended by the Hazardous and Solid Waste Amendments of 1984 ("HSWA"), codified at 42 U.S.C. § 6901 et seq. (the "Act").

2. Section 3008(h) of the Act, 42 U.S.C. § 6928(h), authorizes the Administrator of the United States Environmental Protection Agency ("EPA") to issue an order requiring corrective action, or such other response which she deems necessary to protect human health or the environment, if, on the basis of any

information, she determines that there is or has been a release of hazardous waste or hazardous constituents into the environment from a facility that is or was authorized to operate under Section 3005(e) of the Act, 42 U.S.C. § 6925(e). The authority vested in the Administrator has been delegated to the Regional Administrators by EPA Delegation Number 8-31, dated April 16, 1985. This authority has been further delegated by the Regional Administrator of EPA, Region II, to the Director of the Air and Waste Management Division of EPA, Region II (hereinafter all references to the Director of the Air and Waste Management Division of EPA, Region II, include any successor(s) duly delegated the authority to carry out the duties and responsibilities presently vested in said Director), by Region II Delegation Number 8-32, effective July 1, 1987.

3. This Order is issued by EPA, Region II, pursuant to the authority of Section 3008(h) of RCRA, 42 U.S.C. § 6928(h).

4. To effectuate the mutual objectives of EPA and the Respondent, the Respondent agrees to undertake and complete all actions and measures required by the terms and conditions of this Order. Except as otherwise specifically provided for in this Order, Respondent does not admit or deny any findings of fact or conclusions of law in this Order.

II. Parties Bound

1. For the purposes of this Order, the term "Parties" shall be defined as the United States Environmental Protection Agency, Region II, and Phillips Puerto Rico Core Inc. of Guayama, Puerto Rico 00785.

2. This Order shall apply to and be binding upon the Respondent, and upon its officers, directors, employees, agents, trustees, successors, and/or assigns (hereinafter referred to in this paragraph collectively as "persons"). This Order shall also apply to and be binding upon all independent contractors, contractors, subcontractors and/or consultants (hereinafter in this paragraph referred to as "third-parties") who conduct, monitor, and/or perform any other work pursuant to, required by, or in furtherance of this Order, provided that such third-parties shall, however, only be responsible for the parts of this Order that such third-parties have been engaged, authorized and/or directed by Respondent to perform.

3. Regardless of Respondent's employ of, or contractual agreement with, any entity named in paragraph 2 of this section, above, Respondent remains ultimately liable for failure to carry out, or comply with, any term or condition imposed by this Order.

4. All contractual agreements entered into by Respondent aimed at satisfying its responsibilities or obligations under this Order shall comply with the terms and conditions of this Order. In addition, Respondent shall, within one week of the effective date of this Order or immediately upon hiring, whichever comes later, provide a copy of this Order, and any relevant attachments, to all contractors, subcontractors, laboratories, consultants, or any entity retained to conduct, monitor and/or perform any work pursuant to this Order.

5. Respondent shall give notice, and a copy, of this Order to any successor in interest prior to any transfer of ownership or operation of the Respondent's plant (as defined in IV.1. and described in IV.5., below) and shall notify EPA's designated contact thirty (30) days (hereinafter the term "day" or "days" shall refer to a calendar day(s)) prior to any such transfer.

6. No change in the Respondent's corporate form or in the ownership of the facility shall in any way alter, extinguish or otherwise affect Respondent's responsibility and obligation to carry out all the terms and conditions of this Order. Respondent may, however, transfer the obligations imposed by this Order to a new owner/operator of the plant if the new owner/operator demonstrates to EPA's satisfaction that the new owner/operator is capable of undertaking these obligations and has expressly agreed to do so in writing, provided that EPA has agreed in writing to

any such transfer prior to it being effected, and this Order has been modified to reflect the transfer.

7. All reviews, approvals, or other determinations by EPA pursuant to this Order shall follow a standard of reasonableness and shall not be arbitrary or capricious.

III. Statement of Purpose

1. This Order is being issued to protect human health and the environment from releases of "hazardous waste" and/or "hazardous constituents", as those terms have been defined by Section 1004(5) of the Act, 42 U.S.C. § 6903(5), 40 C.F.R. §§ 260.10, 261.3, and/or 40 C.F.R. Part 261 Appendix VIII, at or from Respondent's facility (all subsequent references to the terms "hazardous waste" and/or "hazardous waste constituents" are as they are defined in the applicable statutory or regulatory provision). This 3008(h) Order requires: **(1)** the completion by Respondent of the RCRA Facility Investigation ("RFI") initiated by the Respondent pursuant to the Section 3013 Administrative Order on Consent, bearing Docket No. II RCRA-89-3013-0307, issued by EPA in September 1989 (the "1989 § 3013 ACO"); **(2)** the initiation and completion of the Corrective Measures Study ("CMS") and Corrective Measure Implementation ("CMI"); and **(3)** the performance of such other and further steps identified pursuant to the terms of this Order as are necessary to insure

Respondent attains full compliance with the requirements hereof. The purpose of the RFI required by the 1989 § 3013 ACO was to determine fully the nature and extent of any release(s) of hazardous waste and/or hazardous constituents from the facility into the environment and to gather necessary data to support the CMS.

2. Based on the findings of the RFI work conducted to date pursuant to the 1989 § 3013 ACO, EPA determines that corrective measures at the facility are necessary. To this end, Respondent agrees that, pursuant to the provisions of this Order, it shall conduct a CMS to develop and evaluate corrective measures alternatives and to recommend a final corrective measure or measures. At the completion of the required CMS, the Respondent shall be required to perform CMI to design, construct, operate, maintain, and monitor the performance of the corrective measure or measures selected.

3. Respondent shall also implement Interim Measures as required by this Order.

IV. EPA Findings of Fact

1. Respondent:

a) Respondent is Phillips Puerto Rico Core Inc., a corporation transacting business in the Commonwealth of Puerto Rico.

b) Respondent is a corporation organized pursuant to, and existing under, the laws of the state of Delaware.

c) Respondent is a generator of hazardous waste and is the owner and operator of a petrochemical facility ("facility") located in Guayama, Puerto Rico.

2. Notification:

Pursuant to Section 3010 of the Act, 42 U.S.C. § 6930, on November 14, 1980, Respondent notified EPA of its "hazardous waste" activity, as that term is defined by Section 1004(5) of the Act, 42 U.S.C. § 6903(5), and in 40 C.F.R. § 261.3, at the facility located at Road #710 Km. 1.3 Guayama, Puerto Rico. In this notification, Respondent identified itself as a generator of hazardous wastes and owner and operator of a hazardous waste treatment, storage and land disposal facility (TSD). Respondent notified EPA that it produced at the facility petrochemicals

including, but not limited to, the following: gasoline; benzene; cyclohexane; toluene; para-xylene; ortho-xylene; and paraffinic stocks.

3. Part A And Part B Permit Applications:

a. Respondent submitted its original Part A Permit Application on November 17, 1980, and informed EPA that this submission was, in part, a protective filing. In this document, Respondent identified itself as generating, treating, storing and disposing of the following listed (defined at 40 C.F.R. §§ 261.10, 261.30, 261.31, 261.32 and 261.33) and characteristic wastes (D002 and EP Toxic metals) at the facility:

D002 - Corrosive wastes;

F003 - Spent non-halogenated solvents (i.e. xylene, ethyl-benzene);

F005 - Spent non-halogenated solvents (i.e. toluene);

K048 - DAF float;

K049 - Slop oil emulsion solids:

K050 - Heat exchanger bundle cleaning sludge;

K051 - API separator sludge;

K052 - Leaded tank bottoms;
U019 - Benzene;

U056 - Hexahydro benzene or cyclohexane;

U188 - Hydroxy benzene or phenol;

U220 - Methyl benzene or toluene; and

U239 - Dimethyl benzene or xylene.

b. Upon the timely submission of the notification and Part A Permit Application, Respondent received interim status, pursuant to Section 3005(e) of RCRA, 42 U.S.C. § 6925(e), 40 C.F.R. § 270.1(b) and 40 C.F.R. § 270.70(a). All interim status facilities were subject to the applicable regulations promulgated pursuant to Sections 3004 and 3005 of the Act, 42 U.S.C. §§ 6924 and 6925, respectively. These regulations are codified at 40 C.F.R. Parts 260 through 265, 268 and 270.

c. The Part A Permit Application, dated November 17, 1980, indicated that eight (8) hazardous waste units, subject to the applicable hazardous waste regulations at 40 C.F.R. Parts 260-265, 268 and 270, were present at the facility. Located in the southern one third of the facility, these hazardous waste units consisted of the following:

1) one (1) land treatment unit;
2) one (1) drum and bag (container) storage area;
3) three (3) lime ponds;
4) two (2) sludge pits; and
5) one (1) oxidation lagoon.

d. On January 25, 1983, Respondent submitted a revised Part A Permit Application. The revised application reflected the following changes:

1) Respondent no longer reported generating, treating, storing and/or disposing of U188 (phenol); F003 and F005 (spent non-halogenated solvents); K048 (dissolved air float); K049 (slop oil emulsion solids); and K051 (API separator sludge).

2) The hazardous wastes listed in ¶ 3.a. of this Section, above, as well as K050 (heat exchanger bundle cleaning sludge), K052 (leaded tank bottoms), asbestos, and unknown material had been disposed of in the land treatment unit present at the facility prior to 1980. The hazardous wastes were placed directly onto the ground, and the only treatment that occurred was that of the natural biological processes. In the 1983 Revised Part A Permit Application, land treatment was no longer listed as part of treatment, storage and/or disposal practices occurring at the facility (having ceased operations prior to the effective date of RCRA), and therefore the land treatment unit was no longer listed as a hazardous waste unit.

3) The only wastes treated at the facility, according to the 1983 Revised Part A Permit Application, were D002 characteristic wastes and certain aforementioned EP Toxic metals. Hazardous wastes were generated, drummed, stored and sent off-site to an authorized hazardous waste landfill.

4) Respondent reported in its 1983 Revised Part A Application that only the lime ponds and container storage area were regulated hazardous waste units. (Respondent reported storage at the container storage area and neutralization of acidic wastes and fixation of heavy metals in the ponds.) As discussed in sub-paragraph g., below, of this section, the lime ponds were certified as closed on March 24, 1988. EPA approved the closure of the lime ponds on July 11, 1988. Respondent submitted a closure plan for the Container Storage Area which EPA subsequently approved. The sludge pits and oxidation lagoon were included as part of the wastewater treatment system (NPDES permitted) and were not included in the 1983 Revised Part A Permit Application.

e. On September 25, 1990, the Respondent submitted a revised Part A Permit Application. The wastes in the Oxidation Pond, the Off-Spec Pond, the Old Ballast Water Basin and the New Ballast Water Basin exhibited the toxicity characteristic (TC) of benzene (D018).

f. On May 1, 1991, the Respondent submitted a revised Part A Permit Application. This revision was necessary to reflect the management and handling of a recently listed hazardous waste, F037 (primary sludges from petroleum refining), in the Off-Spec Pond. Other hazardous wastes listed in the revised application

included:

K050 - Heat exchanger bundle cleaning sludge;

K051 - API separator sludge;

U019 - Benzene;

U056 - Hexahydro benzene or cyclohexane;

U220 - Methyl benzene or toluene; and

U239 - Dimethyl benzene or xylene;

g. In response to a July 19, 1991 request by EPA, Respondent submitted a Part B permit application on September 17, 1991 for the Oxidation Pond, Off-Spec Pond, the Old Ballast Water Basin and the New Ballast Water Basin. A closure plan for the four hazardous waste units was included as Section VI to the Part B application.

h. On November 2, 1992, Respondent withdrew its RCRA Part B permit application and submitted a closure plan for the Off-Spec Pond, Oxidation Pond, the Old Ballast Water Basin and the New Ballast Water Basin.

i. On September 15, 1994, Respondent submitted revised closure plans for the Oxidation Pond, the Off-Spec Pond, the Old Ballast Water Basin, and the New Ballast Water Basin.

4. Interim Status:

a. Pursuant to Section 3005(e) of the Act, 42 U.S.C. § 6925, and 40 C.F.R. §§ 270.1(b) and 270.70(a), Respondent received "interim status" with the timely submission in 1980 of its:

1) Section 3010 notification; and

2) Part A Permit Application

b. Interim status facilities are subject to the regulations promulgated pursuant to Sections 3004 and 3005 of the Act, 42 U.S.C. §§ 6924 and 6925, respectively, which regulations were codified in 40 C.F.R. Parts 260-265, 268, and 270.

c. The facility is an interim status facility because it operated, as of November 19, 1980, eight (8) hazardous waste units subject to applicable hazardous waste regulations. These hazardous waste units are located in the southern one third of the facility. They consist of the following units:

1) one (1) land treatment unit;

2) drum and bag (container) storage area;

3) three (3) lime ponds;

4) two (2) sludge pits; and

5) an oxidation pond.

d. As of the date of this Order, all of the eight hazardous waste units listed above have been certified closed, with EPA approval, except for the Oxidation Pond. Three additional hazardous waste units were identified in the 1990 Revised Part A Permit. These units were the Off-Spec Pond, the Old Ballast Water Basin, and the New Ballast Water Basin. On May 1, 1990, a revised Part A Application was submitted to reflect the handling of F037, a newly listed waste, at the off-spec pond.

e. The Respondent has revised the Part A Permit Application three times, in 1983, 1990 and 1991, to reflect the changing operational and regulatory status of the facility. Since the Container Storage Area was certified as closed in 1990, the only hazardous waste units currently existing at the facility are:

1) the Oxidation Pond;

2) the Off-Spec Pond;

3) the Old Ballast Water Basin; and

4) the New Ballast Water Basin.

These units have been out of service since March 29, 1994, and are subject to RCRA closure requirements.

5. Plant Description

a. The Phillips Puerto Rico Core Inc. plant, located on Road #710 Km. 1.3, approximately 2.5 miles southwest of Guayama, Puerto Rico, and northeast of Las Mareas Harbor, is

formally known as the Durand/Learned Plant. The plant is southwest of the intersection between Road #710 and State Route No. 3 near Las Mareas, on a site bounded to the north and west by sugar cane fields, by the former town of Las Mareas to the south, and bounded on the east by Road #710. The Guamani River (Rio Guamani) crosses at a distance varying from approximately 1,000 to 3,000 feet from the east side of the plant property. The land on which the facility is located is owned by the Commonwealth of Puerto Rico.

b. The plant manufactures petrochemical products that include the following: gasoline; benzene; cyclohexane; toluene; para-xylene; ortho-xylene; and paraffinic stocks.

c. The facility takes petroleum naphtha as feedstock and, through various processes such as hydrodesulfurization, catalytic reforming, selective adsorption and distillation, produces benzene, cyclohexane, toluene, para-xylene, ortho-xylene, mixed xylenes, gasoline, and paraffinic stocks.

d. As a result of these operations, the facility generates hazardous waste. The majority of the hazardous wastes generated exhibit the hazardous waste toxicity characteristic (TC) of benzene (D018), which is considered hazardous under the RCRA Toxicity Characteristic based on the Toxicity Characteristic Leaching Procedure (TCLP). The remaining hazardous wastes are

requirements of 40 C.F.R. § 265.115 in 1988. Prior to 1983, these earthen ponds were used in the Waste Water Treatment Plant (WWTP) for settling of lime from wastewaters generated from operations that consisted of steam production, cooling tower side stream, boiler feedwater treatment, and wastewaters generated during occasional acid washing of production vessels and piping. These acid wastewaters were discharged to the Lime Sewer without neutralization. From 1983 to present, these latter wastewaters have been neutralized and analyzed to ensure they are no longer corrosive, then discharged to the Lime Sewer. The general function of the ponds is to permit gravity separation and subsequent drying of the entrained solids. The supernatant from the ponds is directed to the wastewater treatment system.

4) Sludge Tank At API Separator: Located in the product area of the facility, this concrete tank was used for storage of oil sludge generated in the adjacent API Oil Separator. When full, the tank was emptied with sludge disposed of as K051 hazardous waste. Sludge is currently drummed and disposed of off-site. This sludge tank was listed on the 1980 Part A Application but was not listed on the 1983 Revised Part A Application. It was not RCRA-regulated, as it was part of the National Pollution

2) Container Storage Area: This former hazardous waste unit was certified as closed in accordance with the requirements of 40 C.F.R. § 265.115 in 1990. Presently this unit, which has a concrete floor, is used for less than 90-day storage of hazardous wastes generated at the facility. The hazardous wastes managed at this unit include spent catalyst, heat exchanger sludge and unleaded tank bottoms. Wastes containing polychlorinated biphenyls (PCBs) are also managed at this unit.

The aforementioned hazardous wastes (spent catalyst, heat exchanger sludge and unleaded tank bottoms) are stored temporarily prior to off-site disposal. These wastes are consolidated and repacked, if necessary. Rainwater, which accumulates within the gunnite-covered caliche dike, is visually inspected for signs of contamination prior to drainage into the Storm Water Pond. From the Storm Water Pond, this water is routed through the Waste Water Treatment Plant or it is discharged through a permitted stormwater outfall (Permit No. PPR0A034). EPA has reason to believe that, prior to 1986, the accumulated rainwater was drained onto the ground west of the unit after having been visually inspected.

3) Lime Ponds (3): These three former hazardous waste units were certified as closed in accordance with the

releases of hazardous constituents from these units, such disagreement shall be resolved in accordance with the provisions of Section XXVIII of this Order, "Dispute Resolution".

The facility's SWMUs include the following:

1) the API oil/water separator system;
2) the storm water pond;
3) the holding pond;
4) the mix box;
5) the drum washing station;
6) the sludge pit;
7) the oxidation pond; and
8) the clarifier.

The following are descriptions of past and present hazardous and solid waste management units:

1) Land Treatment Unit: This earthen unit is located at the southeast corner of the facility. Prior to 1980, this unit received heat exchanger sludges, spilled fuel oil, fuel oil-impregnated sand, asbestos-containing materials and clean soil. Since 1980, the unit has been used for temporary storage of spent clay (montmorillonite clay), silica gel, and spent metal blasting grit. This unit was listed as a hazardous waste unit on the 1980 Part A Application but was not listed on the 1983 Revised Application.

sludges generated from cleaning the heat exchanger bundles (K050), and petroleum refinery primary oil/water/solids separation (F037), TCLP chromium (D007) and sludge generated from cleaning of the API oil/water separator (K051).

e. The Description of Current Conditions (DOCC), dated October 1990, identified eight (8) past or present hazardous waste units and eight (8) solid waste management units (SWMUs). Two of these units (the sludge pit at the Ballast Water Basin and the oxidation pond) were identified as both regulated (i.e. hazardous waste) units and SWMUs. All of the former hazardous waste units, except for the oxidation pond, have been certified as closed in accordance with the requirements of 40 C.F.R. § 265.115. Three additional hazardous waste units were identified in 1991. Currently, the facility's hazardous waste units include the following:

1) the Oxidation Pond;
2) the Off-Spec Pond;
3) the Old Ballast Water Basin; and
4) the New Ballast Water Basin.

The closure of these four units will be handled under a closure plan and/or post-closure permit. Contamination underlying but not specifically related to releases of hazardous constituents from these units shall be subject to the provisions of this Order. If the parties disagree as to whether contamination underlying these units is (or is not) specifically related to

Discharge Elimination System (NPDES) wastewater treatment system.

5) Sludge Pit At The Ballast Water Treatment Facility: Located at the Ballast Water Treatment Facility, this earthen impoundment was used until 1979 for storage of oily sludge generated in the adjacent API Oil Separator. The sludge pit at the ballast water treatment facility was listed on the 1980 Part A Application but was not listed on the 1983 Revised Part A Application, as it was part of the NPDES-permitted waste water treatment system.

6) API Oil Separator System: The API Oil Separator is a SWMU that was used to settle oily sludges and to skim floating oil from oily wastewaters generated from the process area, oily wastes trucked from various locations at the facility, and discharges from the Drum Washing Station. After 1986, water drawoffs from storage tanks and discharges from the cleaning of heat exchangers were piped directly to the API Separator. The floating oil was pumped to a slop oil tank while the supernatant was sent to the Mix Box.

7) Storm Water Pond: This SWMU is an earthen impoundment that receives stormwater runoff from the production areas and from areas not used for production. EPA has reason to believe that prior to 1977 this earthen impoundment received

sludge from the API Oil Separator; presently it does not receive such sludge. After the skimming of floating oils, water was pumped to the wastewater treatment system.

In the original operations, floating oil was skimmed with supernatant via NPDES outfall number 002, and API Oil Separator sludge, and solids from the Holding Pond effluent (accumulated in the Storm Water Pond prior to 1977) were periodically removed and spread in the nearby open areas. Presently, the stormwater collection consists of two segregated systems: (1) a non-contaminated runoff system, and (2) a contaminated runoff system. The non-contaminated runoff system is discharged directly to the harbor without treatment while the contaminated system drains to the stormwater pond. The two stormwater ponds are below-grade earthen impoundments with a total capacity of 3.6 MM gallons. The ponds are interconnected by a below-ground pipe. The primary pond is provided with oil retention baffles in the inlet and outlet sections.

8) Holding Pond: This SWMU is an earthen impoundment that was annexed in 1986 to the Storm Water Pond, which receives runoff from the Process Area. After the floating oils are skimmed at the Storm Water Pond, water is pumped to the wastewater treatment system. From 1967 to 1977, solids from the oxidation pond were allowed to settle prior to discharge

through NPDES outfall 001. Solids were periodically removed for use as fill material in adjacent open areas. From 1977 to 1986, off-spec effluent was discharged to Off-Spec Pond prior to recycling to the wastewater treatment system.

9) Mix Box: This SWMU is a small concrete tank which, until March 29, 1994, equalized flows and the quality of wastewaters that were discharged from the API Oil Separator, untreated sanitary sewage, Off-Spec Pond (through 1992), and (up to 1979) cooling tower blowdown.

Large solids were removed from wastewater by the bar screen. Floating oils were removed by skimming. Effluent was discharged to the Oxidation Pond, or by-passed the pond for ultimate piping to the Off-Spec Pond. Since March 29, 1994, the Mix Box only receives sanitary wastes for further treatment in the wastewater treatment system.

10) Drum Washing Station: This SWMU is a concrete unit, including 6-inch curbs and a metal roof, which is used for washing of drums which contain any of the hazardous materials used at the facility. Wastewaters generated during triple-rinsing activities flow to the API Separator.

11) Oxidation Pond: Wastewaters discharged from the Mix Box and supernatant from the Lime Pond were treated in this

gunnite-lined impoundment using aerobic biological degradation. Discharges from the Oxidation Pond were piped to the Clarifier. The Oxidation Pond is listed as a SWMU and is also listed as a RCRA-regulated Hazardous Waste Unit due to the presence of hazardous wastes, including benzene (D018). The pond has been out of operation since March 29, 1994.

12) Clarifier: This SWMU is a steel tank which is used to settle biological solids. Prior to March 29, 1994, it received effluent from the Oxidation Pond. Since that date, it has received effluent from a newly-installed aeration tank. Supernatant from the Clarifier is discharged through a NPDES-permitted point source discharge. Solids are allowed to settle, with clear supernatant discharged via NPDES outfall number 001. Polymer is added if supernatant clarity deteriorates. The Material Safety Data Sheets for the polymer indicated that it contains an amine polycondensate.

13) Off-Spec Pond: Located in the southeast portion of the facility, south of Basin K and north of the holding pond, this earthen impoundment received discharges from the Oxidation Pond and Clarifier, and previously received discharge from the Mix Box.

Prior to being recycled to the Mix Box, Off-Spec water was stored for additional treatment in the wastewater treatment system. Because this basin is unlined, the potential for releases to the groundwater exists. This SWMU was not originally listed as a RCRA-regulated hazardous waste unit as it is part of the NPDES-permitted wastewater treatment facility. Wastes in the Off-Spec Pond, however, exhibited the hazardous waste Toxicity Characteristic of benzene (D018), and thus this unit was listed as a RCRA-regulated unit in the September 25, 1990 Revised Part A Permit Application.

14) New and Old Ballast Water Basins: The water in the New and Old Ballast Water Basins, located southwest of the main plant, exhibits the hazardous waste toxicity characteristic of benzene (D018) and hence caused these units to be listed in the September 25, 1990 Revised part A Application as RCRA-regulated hazardous waste units.

6. Hydraulic Conditions:

a. Ground elevations range from five (5) to forty-five (45) feet above sea level in a southerly direction at the facility. Because of the low-lying topography and a high water table (two to 28 feet below grade), EPA has determined that the area surrounding the facility is not well drained. Sugar cane fields

and marshes indicate areas of the poorest drainage. The surface stream (Rio Guamani) intermittently flows sluggishly southward and discharges into the Caribbean Sea. A man-made water-course (outfall channel), transporting unregulated stormwater runoff and outfall from discharge 001 and 002 from the facility, flows to Las Mareas Harbor and eventually into the Caribbean Sea. Based on the elevation of the groundwater in the wells already present at the facility, the general direction of flow in the upper aquifer is southerly, towards the Caribbean Sea.

b. Groundwater wells, located in the northern-most section and along the north-western boundary of the facility, supply fresh water to the facility. Groundwater is the sole source of drinking water for the facility's personnel. Six (6) intake wells, one (1) drinking water well, and one (1) well that can be connected to either service (i.e. production or drinking water needs) are located on the facility's grounds. Drawdown, resulting from the pumping of groundwater at these well sites, may produce anomalies in the direction of groundwater flow.

c. A public groundwater well, located just southeast of the facility along State Route 710, at one time supplied the former village, Las Mareas, located south of the facility, with fresh water. This village no longer exists, its inhabitants and their former dwellings relocated and the well has been closed. This

well is located downgradient of the site relative to the direction of natural groundwater flow, which is generally to the south. Squatters have constructed, and some inhabit, temporary housing structures in place of the permanent structures that used to exist in Las Mareas. The squatters receive potable water from a separate PRASA (Puerto Rico Aqueduct and Sewer Authority) well, located north of the facility and which draws water upgradient of Respondent's facility.

7. Evidence of Releases and Actions Already Taken

a. The following documented and/or recorded releases at the facility have occurred:

Date	Location	Waste/product Released	Amount Released
10/1/90	Tank 170, Basin B	Hydrocarbons (BTEX)	Undetermined
9/28/90	Tank 40, Basin G	Motor Fuel Reformer Charge	100 barrels (bbls)
9/14/90	Las Mareas Harbor	Gasoline	30 gallons
6/20/90	Las Mareas Harbor	Para-Xylene	Undetermined
6/6/90	Las Mareas Harbor	Gasoline	Undetermined
5/21/90	Las Mareas Harbor	Gasoline	Undetermined

1/3/90	Las Mareas Harbor	Gasoline	Undetermined
10/22/89	Las Mareas Harbor	Unidentified Oil	Undetermined
10/31/89	Las Mareas Harbor	Unidentified Oil	Undetermined
9/30/89	Las Mareas Harbor	Gasoline	Undetermined
8/17/89	Las Mareas Harbor	Benzene	Undetermined
5/2/89	Tank 250, Basin H	Benzene	21 gallons
2/10/89	Las Mareas Harbor	Ortho-Xylene	42 gallons
2/4/89	Las Mareas Harbor	Gasoline	42 gallons
1/27/89	Shop Area	Mercury	1 cu. ft.
1/26/89	Tank 300, Basin H	Cyclohexane	85 gallons
8/13/88	Las Mareas Harbor	Fuel oil	160 gallons
5/6/88	Dock Pier	Para-Xylene	10 gallons
12/3/87	Tank 190, Basin C	Gasoline	200 gallons
11/24/87	Basin B & C, W. Tank 120	Xylene	30 gallons
11/13/87	Las Mareas Harbor	Para-Xylene	Undetermined
10/28/87	Tank 440, Basin F	Gasoline	175 bbls
10/4/87	Process Area (Area 2.1)	Toluene	85 bbls
8/5/87	Process Area (Area 3.3)	Acidic Waste	50 bbls

7/10/87	Tank 50, Basin G	Hydrocarbons (BTX)	86 bbls
12/29/86	Las Mareas Harbor	Unknown	60 bbls
12/30/85	Container Storage Area	Leaded Tank Bottoms	Undetermined
11/13/85	API Oil Separator	Oil	Undetermined
7/30/85	Transfer Line E. Tank 40	Mixed Xylene	100 gallons
12/20/83	Las Mareas harbor	Fuel Oil #6	80 gallons
2/10/81	Container Storage Area	Catalyst Fines	Undetermined
3/19/80	Tank 240, Basin H	Benzene	25 bbls
4/04/79, 4/11/79 & 4/18/79	Storm Water Pond	Oil	Undetermined
11/14/78	Tank 240, Basin H	Benzene	Undetermined

b. Respondent submitted a closure plan, dated March 17, 1983, for the lime ponds and the container storage area to EPA for approval; only these units were addressed in the plan.

c. The closure plan, written in accordance with 40 C.F.R. § 265.228(b), was approved, and Respondent certified the closure for the lime ponds and the container storage area on or about April 26, 1985. Three (3) days prior thereto, with the consent

of the EPA, Respondent commenced implementation thereof. Groundwater monitoring around the lime ponds, soil testing, and wastewater sampling in the ponds was conducted between April 23, 1985 and July 11, 1986, in accordance with the closure plan. One (1) upgradient and three (3) downgradient monitoring wells were established surrounding the three (3) areally connected impoundments. Testing revealed that the groundwater, soils and sediments in the ponds were below EP Toxicity levels for metals and that the wastewater in the ponds was not corrosive. These were the only tests required in the closure plan.

d. EPA conducted a site visit on April 3, 1986. During the site visit, EPA observed that leaks and spills of unidentified materials had occurred from drums stored at the scrap pile in the container storage area. The drums were stored directly upon the ground and were labeled that they contained xylene.

e. Between July 11, 1986 and the certification of closure on March 24, 1988, interviews, documents reviews and inspections of the units were conducted by the certifying engineer. The lime ponds were certified closed by the engineer in accordance with the approved closure plan on March 24, 1988 with the receipt of verification. EPA approved the closure on July 11, 1988. As a result of this closure and the submittal of the 1983 Revised Part A Permit Application, the sole regulated unit that remained in operation (at that time) at the facility was the container

storage area. This unit was subsequently closed with EPA approval and is currently considered a SWMU, and not a RCRA-regulated hazardous waste unit.

f. Respondent developed and installed a groundwater monitoring system in March 1985, as part of its closure plan for the lime ponds and container storage area. Subpart F of 40 C.F.R. Part 265 requires Respondent to have installed a groundwater monitoring system capable of detecting any migration of hazardous wastes in the groundwater from the regulated hazardous waste units.

g. EPA has determined that Respondent may not have met the clean closure requirements for surface impoundments set forth in the Federal Register, 52 Fed. Reg. 8712 (March 19, 1987). These regulations require that Appendix VIII constituents (defined at 40 C.F.R. Part 261) that could reasonably be derived from these units be tested for in groundwater samples from monitoring wells surrounding surface impoundments that have previously been clean closed.

h. On or about September 4, 1986, EPA representatives conducted an inspection of the facility pursuant to Section 3007 of RCRA, 42 U.S.C. § 6927, for the purpose of assessing Respondent's compliance with the EPA regulations for hazardous waste management, 40 C.F.R. Parts 260 through 265 and 270

(published in 45 Fed. Reg. 33073 (May 19, 1980), as later amended, promulgated pursuant to Subtitle C of the RCRA, 42 U.S.C. § 6921 et seq). During that inspection, groundwater sampling was conducted at monitoring wells 9, 10, 11, and 12. The EPA has determined that a chemical analysis conducted on samples from well 12 indicated the presence of the following hazardous wastes in the following concentrations:

benzene	1,200,000	parts per billion (ppb)
toluene	28,000	ppb.
xylene	12,000	ppb.
trimethylbenzene	1,500	ppb.
sulfolane	1,500	ppb.
ethylbenzene	990	ppb.
naphthalene	8.6	ppb.

i. On August 10, 1987, Lee Wan and Associates, an authorized representative of EPA, conducted a facility inspection and a sampling RCRA Facility Assessment (RFA). EPA has determined that the data obtained from this sampling event are consistent with the concentrations specified in paragraph h above, and indicated that contamination exists in the groundwater in well #12.

j. The Puerto Rico Environmental Quality Board (EQB) conducted an inspection of the facility on May 16, 1989 and found that the facility was at that time storing hazardous waste in

drums and asbestos-containing material in bags and shipping them off-site to a secure hazardous waste landfill.

k. From December, 1987 to June, 1989, Respondent undertook a voluntary investigation of the facility. This investigation included, but was not limited to, soil gas monitoring and sampling and testing of existing and newly installed wells within the shallow aquifer and, to some extent, the deeper aquifer. In December 1989, Respondent submitted to EPA a document entitled, "Results of 1988/1989 Hydrogeologic Investigations at Phillips Puerto Rico Core Inc.".

l. Groundwater supply wells are located approximately one half (0.5) mile upgradient of well #12 where contaminated water has been discovered. For this reason, EPA determined that an investigation was necessary to determine the nature and extent of contamination within the groundwater at the facility. To this end, EPA issued the 1989 § 3013 ACO which was signed by the Respondent and the Regional Administrator on September 25, 1989 and September 30, 1989, respectively. The 1989 § 3013 ACO identified Respondent's facility having interim status authority. The 1989 § 3013 ACO required a RCRA Facility Investigation (RFI) at the facility. The work undertaken by the Respondent pursuant to the 1989 § 3013 ACO is discussed further in paragraph n.

m. In response to the EPA's request of July 19, 1991, Respondent submitted a Part B Permit Application on September 17, 1991 for the Oxidation Pond, the Off-Spec Pond and the Old and New Ballast Water Basins. On November 2, 1992, Respondent requested that the RCRA Part B Permit Application be withdrawn and submitted a revised closure plan for the four (4) hazardous waste units. EPA reviewed this revised closure plan and submitted a Notice of Deficiency (NOD) for this closure plan. EPA requested that Respondent revise the closure plan. Respondent submitted a revised closure plan in October 1993. EPA returned comments concerning the revised closure plan in May 1994. In response to EPA's comments, revised closure plans for the Ballast Water Basins, the Oxidation Pond, and the Off-Spec Pond were submitted to EPA in September 1994. EPA returned comments concerning the revised closure plans in June 1995.

n. Respondent has undertaken RFI work required by the 1989 § 3013 ACO, and, pursuant to the terms thereof, Respondent has submitted the following documents:

1) "Description of Current Conditions, Phillips Puerto Rico Core Inc.", dated October 1990;

2) "Workplans, RCRA Facility Investigation, Phillips Puerto Rico Core Inc.", dated October, 1990;

3) "Sampling Plan for potentially PCB Contaminated Capacitor Discovery Area at Phillips Puerto Rico Core Inc.", dated October 21, 1992; and

4) Monthly progress reports from November 1989 to the present.

5) Respondent submitted a draft RFI under the 1989 § 3013 ACO on June 1, 1994.

6) Respondent submitted a redraft of the RFI under the 1989 § 3013 ACO on May 4, 1995.

In addition to the reports noted above, Respondent has voluntarily submitted to the EPA in June 1993 a Field Investigation Summary Report.

o. The ongoing field investigations at the facility and the submittals above have established the following:

1) To date, each of benzene, toluene, ethylbenzene, xylene, trichloroethylene and naphthalene, each of which constitutes a hazardous constituent, has been found in the groundwater and soil at the facility.

2) Releases of hazardous wastes and hazardous constituents have occurred at the facility. Details of these releases (summarized in ¶ 7.a. of this section) are documented in the description of the current conditions (DOCC) which was submitted by the facility in October 1990 pursuant to the 1989 § 3013 ACO.

3) Hazardous constituents have migrated off-site in the eastern area of the facility.

4) There is a potential contamination by polychlorinated biphenyls (PCBs) in an area at the facility extending approximately 100 x 20 feet. In a letter dated April 24, 1991, Respondent informed EPA of the discovery of six (6) electrical capacitors in the area.

8. Exposure Pathways

Details of the exposure pathways and the receptors are found in the October 1990 DOCC and the October 1990 RFI Workplan. Some of the findings made therein are presented below:

a. Soils: Hazardous constituents in the soil may migrate off-site either through run-off to surface water bodies, or through leaching into the groundwater. In addition, there is a potential for direct contact by workers at the facility, or direct contact by off-site exposure to soils contaminated by run-off.

b. Groundwater: Groundwater contamination can occur as a result of infiltration from contaminated soil on-site to groundwater, and subsequent migration of groundwater off-site can potentially result in an exposed human population. Initial groundwater monitoring in the vicinity indicates that groundwater flow in the shallow and deep aquifers is generally to the southwest of the facility. There are

squatters located southwest of the facility in the former Barrio Las Mareas area, about 0.3 miles south of the southern boundary. In November 1989, approximately twelve (12) houses were inhabited in the Las Mareas with three (3) others under construction. Contaminated groundwater that migrates off-site can ultimately be a water source for crops (which may potentially take up contaminants) that are then consumed by humans. Groundwater wells, located in the northern-most section of the facility and along the north-western boundary supply drinking water to the facility personnel.

c. Surface Water: Contaminated groundwater may intercept the surface water canal immediately south of the facility. Water may flow from this canal to Las Mareas harbor. Human contact of surface water, or consumption of aquatic biota at these locations, is possible. Surface water contaminated as a result of groundwater discharge and runoff from the facility may also be consumed by livestock. Lands immediately south of the facility are used as a pasture for livestock.

d. Air: Volatilization from contaminated soil to air on-site is a potential exposure pathway for on-site workers, and migration of the air off-site due to air movement

patterns can expose nearby residents or off-site workers, such as people in the cane field.

9. Need to Protect Human Health and Environment:

A number of hazardous wastes and/or hazardous constituents has been detected in the groundwater and soils at Respondent's facility. These include the following hazardous wastes and/or hazardous constituents, with these potential toxicological effects:

a. Benzene: a known human carcinogen, causing leukemia in individuals exposed to it for extended periods of time. Exposure to high concentrations of benzene in the air may cause nervous system and cardiovascular depression. Dermal and ocular exposure will cause immediate irritation.

b. Toluene: target areas in humans include the central nervous system, liver, kidneys and skin. In laboratory experiments, toluene has been shown to be toxic to developing embryos. Symptomatic effects associated with toluene exposure include fatigue, confusion, dizziness, insomnia and dermatitis.

c. Ethylbenzene: inhalation can cause irritation of the eyes and mucous membranes; ingestion can cause headaches, dermatitis, narcolepsy and coma.

d. Xylene: exposure can irritate the eyes, nose, and throat, and can cause dizziness, unconsciousness, and death. Xylene is mutagenic, and repeated exposure can damage bone marrow, causing low blood cell count.

V. EPA Determinations and Conclusions of Law

Based on the EPA Findings of Fact set out above, and the administrative record for this Order, the Director of the Air and Waste Management Division, EPA Region II, has determined as a matter of law, that:

1. Respondent, as a corporation, is a "person" as defined by Section 1004(15) of the Act, 42 U.S.C. § 6903(15) and 40 C.F.R. § 260.10.

2. Respondent, the owner and operator of a facility that generated, stored, treated and disposed of hazardous waste, has been, and continues to be, subject to the requirements of the Act, 42 U.S.C. § 6901 et seq., and the regulations duly promulgated under authority of the Act.

3. Respondent's facility has been authorized to operate pursuant to Section 3005(e) of the Act, 42 U.S.C. § 6925(e).

4. Certain wastes found at Respondent's facility are hazardous wastes and/or hazardous constituents as those terms are defined by Section 1004(5) of the Act, 42 U.S.C. § 6903(5) and 40 C.F.R. §§ 260.10, 261.3 and Appendix VIII of 40 C.F.R. Part 261.

5. There have occurred releases of hazardous wastes and/or hazardous constituents to the environment from Respondent's facility.

6. The actions required to be taken pursuant to this Order are necessary to protect human health and/or the environment.

VI. Order: Work To Be Performed

Pursuant to Section 3008(h) of the Act, 42 U.S.C. § 6928(h), the Director of the Air and Waste Management Division, EPA, Region II, hereby issues the following Order to the Respondent. All work undertaken pursuant to this Order shall be performed in a manner consistent with the plans, reports, and schedules approved by EPA. More specifically, Respondent shall perform the following, in the manner and by the dates, specified below:

1. RCRA Facility Investigation ("RFI")

a. General Requirements

Respondent shall undertake and complete the RCRA Facility Investigation program ("RFI"), set forth in Attachment I ("Scope of Work for a RCRA Facility Investigation"), as modified below, in accordance with the terms, procedures and schedules approved by EPA (except to the extent that such work has been completed and approved by EPA under the 1989 § 3013 ACO, discussed further in paragraph b below). This RFI program shall be implemented in accordance with the Act, its implementing regulations and relevant EPA guidance documents. The RFI program set forth in Attachment I is hereby incorporated by reference into this Order as if fully set forth in this Order.

b. Completing Work Already Performed

Respondent may incorporate and utilize on-going work and/or work already completed by Respondent that is consistent with the RFI program set forth in Attachment I and that is approved by EPA. Such work may, if EPA approves, include voluntary investigative and corrective activities undertaken by the Respondent, as well as investigations and corrective measures already completed by Respondent and approved by EPA pursuant to the 1989 § 3013 ACO.

Except as otherwise specifically discussed below, Respondent has satisfactorily completed the following provisions of the 1989 § 3013 ACO:

Description Of Current Conditions (TASK I)

Facility Background

RFI WORKPLAN (TASK II)

Project Management Plan
Data Collection QA Plan
Data Management Plan
Health & Safety Plan
Community Relations Plan

More specifically, the RFI program activities listed in Attachment I of the 1989 § 3013 ACO that have been partially or completely performed in response to the 1989 § 3013 ACO include the following:

1) Description of Current Conditions (DOCC), October 1990: The DOCC submitted in October 1990 in partial fulfillment of the requirements of the 1989 § 3013 ACO substantially meets the requirements of this Order. Certain sections of the DOCC, however, need to be amended to incorporate additional information that has come to light since the submittal of the October 1990 DOCC. Respondent must submit within thirty (30) days of the effective date of this Order the following addenda to the October 1990 DOCC:

i) Discussion of all SWMUs not identified in the May 1995 revised draft RFI report in order to amend sections 3.0 and 7.0; and

ii) If additional SWMUs are identified during the remainder of the RFI, or subsequent to its completion, Respondent shall, within thirty (30) days of identification, also submit to EPA for review and approval a SWMU Assessment Report as an addendum to the DOCC for all such newly identified SWMUs.

1) Any SWMU Assessment Report submitted for any newly identified SWMUs must include a determination as to whether a prior or continuing release of hazardous waste and/or hazardous constituents has occurred at each SWMU. The SWMU Assessment Report must also include the following information for each unit:

   (i) Type of unit;

   (ii) Location of each unit on a topographic map of appropriate scale;

   (iii) Dimensions and capacities;

   (iv) Function of unit;

   (v) Dates that the unit was operated;

   (vi) Description of the wastes that were placed in the unit; and

   (vii) Description of any known releases or spills (including groundwater data,

soil analyses, and/or surface water data).

If Respondent or EPA determines that additional investigations are required to complete the SWMU Assessment Report, described above, the Respondent shall, concurrent with submittal of the SWMU Assessment Report (or within sixty (60) days of receipt of EPA's determination), submit to EPA for approval a SWMU Assessment Workplan, with a schedule, describing any additional methods and specific actions to be undertaken to determine whether a prior or continuing release of hazardous waste and/or hazardous constituents has occurred at the SWMU(s) being investigated.

2) The RFI Workplan, October 1990:

The RFI Workplan submitted in October 1990 in partial fulfillment of the requirements of the 1989 § 3013 ACO substantially meets the requirements of this Order. Respondent must, however, amend certain sections:

a) Within thirty (30) days of the effective date of this Order, to incorporate proposed investigative steps for any SWMUs that were not part of a previously approved RFI Workplan. To effect this end, Respondent must specifically do the following: Any sections pertaining to SWMUs, such as Section 2.1, "Summaries of Waste Units, Possible Source Areas, and Releases" and Section 2.2, which discusses the segregation of SWMUs and source areas into Operable Units, must be amended to include a discussion of SWMUs that were not previously identified in the original or amended RFI Workplan or addressed in the June 1994 draft RFI report. Such SWMUs include the Old and New Ballast Water Basins and the Oxidation Pond and the Off-Spec Pond; the RFI Report will state that these four units will be closed pursuant to the

applicable closure and/or post-closure provisions of 40 C.F.R. Parts 264 and/or 265; and

b) Within sixty (60) days of the effective date of this Order, to provide requested information and/or to provide an RFI Workplan amendment to remedy the data gaps that have been or may be identified by EPA (including any other additional investigative steps required to delineate the nature and extent of any releases of hazardous wastes and/or hazardous constituents). To effect these ends, Respondent must resolve any outstanding issues arising from EPA's review of, and comments on, the revised draft RFI report that Respondent submitted in May 1995. If EPA identifies information or data gaps subsequent to the effective date of this Order, Respondent shall have sixty (60) days from the date of its receipt of EPA's notification of said information or data gaps to provide EPA with requested information and/or to provide an RFI Workplan amendment to remedy the data gaps that are identified by EPA (including any other additional investigative steps required to delineate the nature and extent of any releases of hazardous wastes and/or hazardous constituents).

EPA will review the proposed amendments to the 1990 RFI Workplan in accordance with the procedure set forth in Section XI, infra ("EPA Approvals"). Upon EPA's approval of the amendments, Respondent shall carry out the amendments to the RFI Workplan in accordance with the terms and schedules approved by EPA.

If Respondent or EPA determines that a prior or continuing release of hazardous waste and/or hazardous constituents has occurred at any newly identified SWMU (i.e. any SWMU not included in the RFI Workplan submitted in October 1990 or an amendment to the RFI Workplan submitted pursuant to this Order), Respondent shall submit a RFI Workplan for that

SWMU, developed in accordance with Attachment I to this Order, within sixty (60) days from the date of such determination.

Respondent shall implement any additional SWMU investigations as required by EPA.

c. Other Work Required To Complete RFI

Based upon a comprehensive review of previous submissions, EPA has determined that Respondent must submit the following documents (in addition to the DOCC and RFI work-plan addenda listed above) in order to complete the requirements for this Order.

1) Evaluation of Corrective Action Technologies;

2) Draft RFI and Final RFI Reports (as hereinafter described);

3) Quarterly Progress Report; and

4) Report on laboratory and Bench Scale Studies.

Respondent shall complete these above-listed requirements in accordance with the following provisions:

Evaluation of Corrective Measures Technology Report

Within thirty (30) days of the effective date of this order, Respondent shall submit to EPA for review and approval an Evaluation of Corrective Measure Technologies

Report, as discussed in Task II of Attachment I. This report shall identify the corrective measures technologies that may be used on-site or off-site for the containment, treatment, remediation and/or disposal of contamination. Corrective measures that might be limited by site specific conditions may be identified for subsequent field, laboratory and/or bench scale studies. This report is separate from the Interim Measures Report.

Revised Draft RFI Report for Tasks IV and V

The revised draft RFI report for the purpose of this Order is the draft RFI Report of May 1995, which was submitted under the 1989 § 3013 ACO. (In June 1994, Respondent submitted, pursuant to the 1989 § 3013 ACO, a draft RFI report, which Respondent revised so as to address the comments in EPA's January 27, 1995 "Technical Review of the Draft RCRA Facility Investigation Report". This latter revision was submitted in May 1995 and constitutes the revised draft RFI report for purposes of this Order.)

Within sixty (60) days of the completion of any additional investigations required for the RFI program under this Order, Respondent shall submit for EPA review an amendment to the aforementioned revised draft RFI report in accordance with Tasks IV and V of Attachment I, incorporating the

results of the additional investigations required to delineate the nature and extent of any releases of hazardous wastes and/or hazardous constituents.

Respondent's Preparation of Final RFI Report

In accordance with the procedure set forth in Section XI, infra ("EPA Approvals"), EPA will notify Respondent whether the revised draft RFI report has been completely or partially approved, or disapproved, or whether it needs to be modified. Upon Respondent's receipt of EPA's disapproval or EPA's comments requiring modification, Respondent shall prepare a final RFI report, incorporating changes responsive to EPA's comments on both the revised draft RFI report and the amendment thereto, in order to present the findings of all facility investigative studies and the investigation analysis. Unless EPA in writing approves another schedule, the final RFI Report shall be submitted to EPA no later than sixty (60) days following receipt of EPA's disapproval or EPA's comments on the amendment to the revised draft RFI report. EPA shall review the final RFI Report in accordance with Section XI. If the revised draft RFI report is approved by EPA, it will serve as the final RFI Report required by this Order. If Respondent disagrees with EPA's comments requiring modifications, Respondent may, consistent with the provisions thereof, seek redress pursuant to the

procedures set forth in Section XXVIII, "Dispute Resolution".

Laboratory, Field and Bench-Scale Studies Report

Concurrent with submittal of the Draft CMS Workplan, and after completion of the laboratory, field and/or bench scale studies on potential corrective measure technologies whose effectiveness might be limited by site specific conditions, specified in Task VI of Attachment I, Respondent shall submit a Laboratory, Field and Bench-Scale Studies Report. This report shall summarize the technologies studied with respect to the site-specific conditions that could limit their effectiveness and questions identified in the testing plan referred to in Task VI of Attachment I.

d. Reporting and Schedule

1. Respondent shall continue to submit to EPA signed quarterly progress reports containing the information specified in Task VIIC of Attachment I until Respondent's completion of the RFI, except no such report shall be due during periods when: (1) Respondent has submitted to EPA for its review an RFI-related document, and (2) Respondent is not obligated to conduct RFI-related work. Respondent shall submit such reports to EPA within forty-five (45) days following the end of a quarterly reporting period.

Quarterly reports shall, unless otherwise approved by EPA, consist of the information set forth in Attachment I, Task VIIC. For the purposes of this Order, quarterly reporting periods are as follows:

First (1st) Quarter - October 1 to December 31
Second (2nd) Quarter - January 1 to March 31
Third (3rd) Quarter - April 1 to June 30
Fourth (4th) Quarter - July 1 to September 30

2. If the Respondent determines that all work required pursuant to the RFI program (Attachment I) as part of this Order (that has not been completed pursuant to the 1989 § 3013 ACO) cannot be completed within the time periods specified by EPA, a request for an extension period must be submitted, in writing, to EPA for approval. This request shall be submitted no later than fifteen (15) days prior to the originally scheduled completion date and must be accompanied by a Project Progress Summary Report that describes all of the investigative work completed to date, describes the work which still must be accomplished, details the factors which have prevented adherence to the specified schedules, and justifies the duration of the specific extension period requested. EPA will notify the Respondent whether the request has been completely or partially approved, disapproved, or requires modification.

2. Interim Measures (IM)

a. Respondent has informed EPA that, since previous investigations have determined that there is off-site migration of a plume of groundwater hydrocarbon contamination (primarily benzene), Respondent has initiated a feasibility study of possible measures for management of this plume and has voluntarily installed interim measures to mitigate the off-site migration of the plume. Within thirty (30) days of the effective date of this Order, Respondent shall submit to EPA, in order to update documentation provided in the revised draft RFI report, a report or reports documenting the results of this feasibility study, the voluntary measures Respondent has undertaken, and the measures Respondent additionally proposes, for management of the plume of hydrocarbon contamination. The documentation to be provided consists of: 1) the results of the feasibility study, 2) a detailed description of the concept, design, construction, operation and maintenance of the measure(s) Respondent has installed, together with data obtained as a result of Respondent having installed said measure(s), 3) a detailed description of the concept, design, construction, operation and maintenance of the measure(s) Respondent additionally proposes, 4) a proposed schedule of

upcoming activities (including a suggested schedule for progress reports), and 5) a proposed plan for evaluating the effectiveness of the measures Respondent has installed.

Respondent shall continue to evaluate the feasibility of removing free product containing hazardous constituents in isolated pockets at or beneath the facility and shall submit a report to EPA on its evaluation within ninety (90) days of the effective date of this Order. Respondent shall advise EPA, in writing, of any activities it proposes for removal or abatement of any such free product and shall, when so advising EPA, submit a description of and a proposed schedule for any such activities.

If, after reviewing any of Respondent's submittals described above in this paragraph, EPA identifies interim measure(s) which it determines are necessary and which interim measure(s) Respondent is not implementing, then EPA shall consult with Respondent concerning such interim measure(s) so identified by EPA. Following such consultation, any formal determination shall be made in accordance with Section VI, ¶ 2.a.2) of this Order.

Unless otherwise provided by EPA, Respondent shall perform all interim measures undertaken subsequent to the effective date of this Order in accordance with the provisions of Attachment IV, which is hereby incorporated by reference into this Order as if fully set forth in this Order.

1) In the event Respondent identifies new or additional information concerning a threat or potential threat to human health or the environment at the facility or extending beyond the facility's boundaries, Respondent shall both within forty-eight (48) hours notify EPA verbally, and, within ten (10) days of having informed EPA of said new or additional information, summarize in writing the nature, estimate of the urgency, and magnitude of the threat or potential threat to human health and/or the environment and whether interim measures are necessary. Within twenty (20) days of notifying EPA, Respondent shall submit to EPA for approval an Interim Measures ("IM") Workplan that identifies any interim measures that Respondent proposes to prevent or mitigate this threat or potential threat to human health and/or the environment which are consistent with, and can be integrated into, any long-term

remediation at the facility. Similarly, if EPA determines that interim corrective measures are necessary to prevent or mitigate the potential threat to human health and the environment from any contamination extending beyond the facility's boundaries, and so notifies Respondent in writing, Respondent must submit an Interim Measures Workplan specifying the interim measures procedures to be implemented. The Interim Measures Workplan prompted by EPA's aforesaid notification to Respondent must be submitted within sixty (60) days of receipt of EPA's determination that Interim measures are necessary.

2) If on the basis of the reports provided pursuant to Section VI, ¶ 2.a., supra, or on the basis of other information, EPA determines that Interim Measures are necessary, it will notify Respondent in writing specifying the basis and reason for EPA's determination and the Interim Measures deemed necessary. Within twenty (20) days after receipt of any such notice, the Respondent may meet with EPA to discuss the Interim Measures required by EPA. Thereafter, Respondent shall perform any such Interim Measures in accordance with an IM Workplan approved by EPA.

3) Interim Measures must be developed and implemented in a manner that allows for integration of any interim corrective measures into any long term remedial actions Respondent might undertake at the facility. Interim measures shall be developed and implemented in a manner consistent with the requirements of Attachment IV. Any IM Workplan shall specify the procedures to be implemented by Respondent.

4) The IM Workplan shall comply and be consistent with the requirements for said Workplan set forth in Attachment IV. Any IM Workplan shall be submitted within sixty (60) days after receipt of EPA's determination that Interim Measures are necessary.

5) Upon receipt of written approval from EPA, Respondent shall implement the IM Workplan in accordance with the requirements and schedules approved by EPA.

6) In the event Respondent identifies surface areas or conditions that might result in further environmental degradation, and which areas or conditions are further amenable to expedited

remedial action, then Respondent shall notify EPA of said surface areas or conditions and bring the relevant information to the attention of EPA. Following consultation with EPA, if EPA approves the proposed expedited remedial action, Respondent shall, unless EPA indicates otherwise, submit to EPA for its approval a workplan for implementation of such expedited remedial action. Upon approval by EPA, Respondent shall implement the action in accordance with the terms and schedules approved by EPA. Within thirty (30) days after the completion of the implementation of actions referenced above in this paragraph, Respondent must submit to EPA a sampling plan. The purpose of said sampling plan will be either: **a)** to confirm that impacted areas have been remediated, or that removal has been completed, to the required cleanup levels, or **b)** to delineate the extent of further investigations that need to be performed for impacted areas. The sampling plan must conform to the requirements for sampling and analysis referenced in this Order, and said sampling plan may be incorporated into other on-going investigations of the facility. The sampling plan must conform to the requirements for sampling and analysis referenced in the Scope of

Work for Interim Measures implementation (Attachment IV).

7) Environmental emergency situations may require the Respondent to implement immediately actions necessary to mitigate the emergency. All emergencies and any situations arising from such emergencies must be dealt with pursuant to Section XIII of this order. Emergency measures shall in no way relieve Respondent from timely implementation of any work pursuant to this Order, except to the extent that any such emergency measures shall be deemed by EPA to be a force majeure within the meaning of Section XXVII of this Order.

8) Any action or work taken under or pursuant to Section VI., ¶ 2. ("Interim Measures") of this Order in no way should interfere with the implementation or scheduling of the RFI, CMS and CMI.

9) Respondent shall submit signed quarterly progress reports on the status of any interim measure(s) Respondent has undertaken.

3. Corrective Measures Study ("CMS") and Corrective Measures Implementation ("CMI")

a. EPA will review the Final RFI Report and will notify the Respondent whether there is a need for further investigative actions prior to initiating the CMS and CMI.

b. Based on the results of the investigations already carried out at the facility, EPA has determined that following the completion of the RFI, corrective measures will be needed to address the soil and groundwater contamination at the facility. Respondent shall submit to EPA the CMS workplan in accordance with the specifications and schedules contained in the Scope of Work for the Corrective Measures Study included as Attachment II to this Order, which is hereby incorporated by reference into this Order as if fully set forth in this Order. The CMS must include an evaluation of corrective action alternatives using technical, human health and environmental criteria, and media protection standards set by EPA, and the CMS must recommend one specific alternative or alternatives based upon the aforesaid criteria and the aforesaid media protection standards. EPA will, after public comment, select the corrective measure or measures to be implemented based on the results of the CMS.

Respondent shall have an opportunity to meet with appropriate representative(s) of EPA to discuss the corrective measures selected for implementation.

c) Upon EPA's selection of the corrective measure or measures to be implemented, the Respondent shall submit to EPA a Corrective Measures Implementation ("CMI") Program Plan in accordance with the specifications and schedule contained in Attachment III to this Order. Respondent shall thereafter undertake CMI in accordance with Attachment III, which is hereby incorporated by reference into this Order as if fully set forth in this Order.

4. Scope of Work, General Provisions

a. The RFI, CMS, CMI and IM shall meet the outstanding requirements set forth in Attachments I, II, III and IV to this Order, unless otherwise stated in this Order. As discussed above, some RFI requirements have been previously fulfilled and approved by EPA under the previous 1989 § 3013 ACO.

b. Respondent shall provide written justification for any omissions or deviations from the requirements set forth in this Order or in Attachments I, II, III and IV.

Any omissions or deviations are subject to EPA's approval as set forth in Section XI of this Order.

c. For purposes of completing the investigations required pursuant to this Order, the Respondent may combine solid waste management units that are adjacent to each other, manage similar wastes, or otherwise address identical critical remedial action issues together (e.g., ground water contaminated with the same constituents) into groups. In the 1990 RFI workplan submitted under the 1989 § 3013 ACO, Respondent listed ten (10) such groups or Operable Units.

d. To the extent permitted by applicable law, Respondent may propose to designate Corrective Action Management Units (CAMUs) for the management of remediation wastes (as that term has been defined in the Federal Register, 58 Fed. Reg. 8658, 8683 (February 16, 1993)). Respondent may also propose to designate regulated units that are undergoing closure as CAMUs or as a part of a larger CAMU in order to enhance implementation of an effective, protective and reliable remedy for the facility. For any regulated units designated by the Regional Administrator as a CAMU or as part of a CAMU, however, the applicable provisions of 40 C.F.R. Parts 264 and/or Part 265, concerning groundwater monitoring

closure and post closure requirements, will continue to apply as before. Specifically, while the four surface impoundments presently proposed for closure (the Off-Spec Pond, the Oxidation Pond, and the New and Old Ballast Basins) may be proposed for inclusion into a CAMU or CAMUs, closure activities for these units must be governed by the applicable provisions of 40 C.F.R. Parts 264 and/or 265 closure and post-closure requirements.

e. Upon approval of EPA, Respondent may conduct the remaining elements of the RFI and CMS and CMI in a phased approach, provided that the entire investigation is completed in accordance with the schedules contained in this Order and in Attachments I, II, III and IV.

f. The results of all plans and reports shall be submitted in accordance with the approved schedule. Extensions of the due date for submittals may be granted by EPA, pursuant to the modification provision of this Order, based on the Respondent's written demonstration that sufficient justification for the extension exists.

g. If Respondent believes any items required, in addition to those described in ¶ 1 b of Section VI of this Order, by this Order or by Attachments I, II, III and

IV have previously been completed and/or submitted, Respondent shall notify EPA of the following in writing:

1) A description of the items previously submitted and/or a summary of the previously completed investigations;
2) The date(s) of submission and/or completion; and

3) Any known changes or new information developed since the previous submission and/or completion.

EPA will determine the extent to which prior submissions and/or completions satisfy specific items required by this Order and reserves the right to require the amendment of any prior submissions.

VII. Additional Work

EPA may determine or Respondent may propose that certain tasks, including investigatory work, engineering evaluation, or procedure/methodology modifications, are necessary in addition to the tasks included in any EPA-approved workplan, when such additional work is necessary to meet the purposes set forth in Section III of this Order. If EPA determines that any such additional work is necessary, it shall notify the Respondent in

writing specifying the basis and reason for EPA's determination and the additional work deemed necessary. Within twenty (20) days after receipt of any such notice, Respondent shall be afforded an opportunity to meet with EPA to discuss the additional work required by EPA. If Respondent disagrees with EPA's determination that additional work is necessary, Respondent shall specify in its response the basis and reasons for disagreeing with EPA's determination. If, within ten (10) working days of Respondent's response, the Parties are unable to resolve a dispute concerning additional work, Respondent may invoke the Dispute Resolution provisions of Section XXVIII. Thereafter, the Respondent shall submit a workplan for such work determined to be necessary as a result of the dispute resolution process and shall perform any such additional work, in accordance with the standards, specifications, and schedules deemed necessary and approved by EPA. All approved additional work performed by the Respondent pursuant to this paragraph shall be performed subject to, and in a manner consistent with, the terms and conditions of this Order. Any requirements for additional work shall be deemed incorporated into this Order as if fully set forth herein.

VIII. Minimum Qualifications for Directors and Supervisors

All work performed by the Respondent pursuant to this Order shall be under the direction and supervision of an individual(s)

who has/have demonstrated expertise in hazardous waste site investigations and remediation. Before any work is performed, Respondent shall notify EPA in writing of the name, title, and qualifications of the supervisory personnel and contractors or subcontractors and their personnel to be used in carrying out the terms of this Order. In addition, the Respondent shall ensure that when a license is required, only licensed individuals shall be used to perform any work required by this Order.

IX. Project Coordinator/Information

1. On or before the effective date of this Order, EPA and Respondent shall each designate a Project Coordinator ("PC") and the name of at least one alternate who may function in the absence of the designated Project Coordinator. Both Project Coordinators shall be responsible for overseeing the implementation of this Order. The EPA Project Coordinator, or his/her designee, will be EPA's designated representative at the facility.

2. To the maximum extent possible, all communications between Respondent and EPA, and all documents, reports, approvals, and other correspondence concerning the activities performed pursuant to the terms and conditions of this Order, shall be directed to and through the respective Project Coordinators. Unless otherwise specified, reports,

correspondence, approvals, disapprovals, notices, or other submissions relating to or required under this Order shall be in writing and originals or copies shall be sent to the following personnel pursuant to the following listing:

2 copies:

Andrew Bellina
Hazardous Waste Facilities Branch
Environmental Protection Agency
290 Broadway, 22nd floor
New York, New York 10007-1866

1 copy:

Mr. Israel Torres
Acting Chief, Land Pollution Control Area
Puerto Rico Environmental Quality Board
P.O. Box 11488
Santurce, Puerto Rico 00910-1488

1 copy:

Mr. Carl Axel Soderberg
Environmental Protection Agency
Caribbean Field Office
Office 2A Podiatry Center Building
1413 Fernandez Juncos Avenue
Santurce, Puerto Rico 00909

1 copy:

Mike Hanson, Environmental Manager
Phillips Core Puerto Rico Inc.
Call Box 10003
Guayama, Puerto Rico 00785

3. Each party shall provide at least five (5) days written notice prior to changing the Project Coordinator(s) and shall immediately provide written notification once a new Project Coordinator is selected.

X. Quality Assurance/Quality Control

1. All sampling, monitoring, analytical, and chain-of-custody plans shall be developed in accordance with the standards and recommended procedures contained in SW-846 - "Test Methods for the Chemical and Physical Analysis of Solid Waste", third edition, as amended, and the EPA Region II Quality Assurance Manual. Any material deviations from these two documents must be accompanied by an appropriate written justification and a demonstration of the effectiveness and applicability of the proposed alternative. EPA must approve the use of such alternatives.

2. Respondent shall inform the EPA Project Coordinator in advance which laboratories will be used by Respondent and ensure that EPA personnel and EPA-authorized representatives have reasonable access to the laboratories and personnel performing any analyses. In the event that EPA or its representatives cannot satisfactorily obtain reasonable access to the laboratories for any reason for the purposes of auditing protocols and technical proficiency, then EPA shall so inform the Respondent in writing and the Respondent shall, within thirty (30) days, substitute another certified laboratory which provides reasonable access in a manner deemed satisfactory to EPA.

3. Respondent shall consult with EPA in planning for field sampling and laboratory analysis, including a description of the chain of custody procedures to be followed.

XI. EPA Approvals

1. Unless otherwise specified, EPA shall (with the exception of progress or status reports) review any plan, report, specification or schedule submitted pursuant to, or required by, this Order (hereinafter, for purposes of this paragraph, any such plan, report, specification or schedule referred to as "submittal"), and EPA shall provide its written approval, disapproval and/or comment(s) thereto. If EPA disapproves of the submittal, EPA shall so advise Respondent in writing. Unless otherwise specified by EPA, Respondent shall then submit a revised submittal within thirty (30) days of its receipt of EPA's written disapproval and/or comment(s) (hereinafter, for purposes of this paragraph, said revised submittal referred to as the "re-submittal"). EPA shall then, unless otherwise specified, review the re-submittal and provide its written approval, disapproval, comment(s) and/or modification(s) to Respondent. If EPA disapproves of the submittal and seeks modification(s), EPA shall so advise Respondent in writing. Unless otherwise specified by EPA, Respondent shall then revise the re-submittal (hereinafter, for purposes of this paragraph, the "revised re-submittal"), which revised re-submittal shall incorporate revision(s)

responsive to EPA's comments, and Respondent shall submit, within thirty (30) days of its receipt of EPA's written disapproval, comment(s) and/or modification(s), the revised re-submittal. EPA will then approve the revised re-submittal, or modify said revised re-submittal and then approve it with any such modification(s). If Respondent objects to EPA's modification(s), Respondent may invoke the provisions of Section XXVIII herein, "Dispute Resolution". Respondent's submittal (or re-submittal or revised re-submittal, as appropriate), shall become final if/when approved by EPA, or, if Respondent invokes the "Dispute Resolution" provision of this Order, the re-submittal or revised re-submittal, as appropriate, shall become final in accordance with the decision reached thereunder. EPA shall provide in writing all final approvals to Respondent.

2. Any material noncompliance with such EPA approved plan, report, specification, or schedule shall be considered a violation of this Order.

3. Any reports, plans, specifications, or schedules, submitted pursuant to, or required by this Order, are hereby incorporated by reference into this Order effective ten (10) days following the date written approval of such document is given by EPA. Prior to this written approval, no plan, report, specification or schedule shall be construed as finally approved. Verbal advice, suggestions, or comments given by EPA

representatives will not constitute an official approval, nor shall any verbal approval or verbal assurance of approval be considered binding.

XII. On-site and Off-site Access

1. Until this Order is terminated pursuant to Section XXI, Respondent shall permit EPA representatives, authorized designees, employees, agents, contractors, subcontractors, or consultants to enter and move about the facility at all reasonable times, including regular business hours, for the following (or related) purpose(s):

a) Interviewing facility personnel, contractors (including subcontractors and independent contractors), or any other entity or individual responsible for implementing any aspect or portion of this Order; inspecting records relating to the facility and this Order;

b. Conducting sampling, monitoring, or any other such activity which EPA or the Project Coordinator deems necessary with respect to work being undertaken pursuant to this Order; using a camera, sound recording, video or any other electronic documentary type equipment; or,

c. Verifying the reports and data submitted to EPA by the Respondent.

2. The Respondent shall make available to EPA, or any of the persons named in paragraph 1 of this section, for inspection, copying, or photographing, all records, files, photographs, documents, or any other writing or electronic data storage system, including monitoring and sampling data that pertain to any work undertaken pursuant to this Order.

3. All persons with access to the facility pursuant to Paragraphs 1 and 2 of this Section shall comply with reasonable health and safety plans.

4. To the extent that work required by this Order must be performed on property not owned or controlled by Respondent, Respondent shall use its best efforts (as a reasonably prudent person would evaluate all circumstances) to obtain a "Site Access Agreement" to perform such work within forty-eight (48) days of the date Respondent becomes aware or should be aware through the exercise of due diligence of a need to perform such work. Any such Access Agreement shall provide for reasonable access by EPA, the Puerto Rico Environmental Quality Board, and any of the persons listed in paragraph 1 of this section. In the event that a Site Access Agreement is not obtained within the 45-day period, Respondent shall notify EPA, in writing, documenting its best

efforts (as herein defined) to obtain such agreements and the results of such efforts. Notwithstanding any other provision of this paragraph, best efforts, as used in this paragraph, shall include, at a minimum, but shall not necessarily be limited to:

a) A certified letter from the Respondent to the present owner of such property requesting permission to allow the Respondent, EPA and any of their authorized representative(s) access to such property; and

b) The property owner's response, if any.

5. Nothing in this Order is intended or shall be construed to limit or otherwise affect EPA's right of access and entry pursuant to any applicable laws and regulations, including, but not limited to, the Act and the Comprehensive Environmental Response Compensation and Liability Act of 1980 "CERCLA", as amended, 42 U.S.C. § 9601 et seq.

6. Nothing in this section is intended or shall be construed to limit or otherwise affect the Respondent's liability and obligation to perform corrective action, including corrective action beyond the facility boundary, notwithstanding the lack of access. EPA may determine that additional on-site measures must be taken to address releases beyond the facility boundary if access to off-site areas cannot be obtained.

XIII. Emergency Provisions

1. In the event the Respondent identifies a current or imminent threat to human health or the environment at or on the facility and related to work undertaken or being performed pursuant to this Order or related to such work, Respondent shall immediately notify EPA orally and notify EPA in writing within ten (10) days summarizing, to the extent known, the nature, immediacy, and magnitude of the actual or potential threats to human health or the environment. The Respondent shall, as soon as possible, submit to EPA for its approval, a plan to mitigate such threat. EPA will approve or modify this plan, and the Respondent shall implement this plan as approved or modified by EPA. If EPA determines that quicker action is required, then the Director of the Air and Waste Management Division, Region II, or his designee, may orally authorize Respondent to act prior to Respondent's making any written submission to EPA. In the case of an extreme emergency, Respondent may act without prior EPA approval; any such unapproved action shall be taken at Respondent's own risk, and Respondent shall be responsible for any different or additional action subsequently required by EPA to mitigate the threat(s).

2. If EPA determines that activities in compliance or non-compliance with this Order, have caused or may cause a release of a hazardous waste or hazardous constituent, or may pose a threat

to human health or the environment, EPA may direct Respondent to stop further implementation of this Order, or a portion of this Order, for such period of time as may be needed to abate any such release or threat and/or undertake any action that EPA determines to be necessary. To the extent that this cessation affects any requirement in any approved plan or schedule, such action by EPA shall be considered a modification of this Order.

XIV. Availability of Information/Notification

1. Respondent shall give the EPA Project Coordinator twelve (12) days advance oral notice of the following activities undertaken pursuant to this Order: significant well monitoring activities (including drilling, installation and/or testing), and significant on-site and off-site field activities (including installation or removal of equipment, sampling events, geophysical studies, and/or soil gas monitoring). At the request of EPA, Respondent shall provide or allow EPA or its authorized representatives to take split samples of any or all samples collected by the Respondent pursuant to this Order.

2. All data, information, and records created for or maintained by the Respondent pursuant to this Order shall be made available to EPA upon request. Respondent shall use its best efforts to insure that all employees of the Respondent and all persons, including contractors and subcontractors who engage in

activities under this Order, are made available to, and cooperate with, EPA if information, whether written or oral, is sought.

3. All information, data, or records submitted to EPA by the Respondent shall be made available to the public including plans submitted by the Respondent pursuant to Attachments I and II. Respondent may assert a business confidentiality claim covering all or part of any information submitted to EPA. Any assertion of confidentiality shall be accompanied by sufficient documentation to satisfy the requirements of 40 C.F.R. § 2.204(e)(4). Information determined to be confidential by EPA shall be disclosed only to the extent permitted by 40 C.F.R. Part 2.

4. Respondent agrees not to assert any confidentiality claim with regard to any analytical data developed pursuant to this Order.

XV. Record Preservation

1. In an effort to preserve all materials and information generated pursuant to or in compliance with this Order, and to preserve all materials and information relevant to this Order, the parties agree to the following:

For Respondent and Its In-House Personnel

a) Respondent shall preserve and/or make arrangements for the preservation of, during the pendency of this Order and for a minimum of five (5) years after its termination (as specified in Section XXI of this Order), all data, records, information and documents [hereinafter, for purposes of this paragraph (¶ 1 of Section XV), collectively referred to as "recording materials"] that are at the time of the effective date of this Order and subsequent thereto in its possession or control, or in the possession or control of its officers, directors, divisions and employees, and that relate or otherwise pertain in any way to:

1) past and/or current on-site hazardous waste management practices at the facility;

2) any interim measure(s) and/or any work undertaken prior to the effective date of this Order relating to or otherwise pertaining to containment and/or removal of the hydrocarbon plume and any free product at or underneath the facility; and

3) the work that was required under 1989 § 3013 ACO.

Outside Consultants and Contractors

b) During the pendency of this Order and for a minimum of five (5) years after its termination (as specified in Section XXI of this Order):

1) Respondent shall preserve and/or make arrangements for the preservation of all recording materials that, pursuant to the 1989 § 3013 ACO, Respondent required its consultants and contractors to preserve (i.e. all recording materials in their possession or control that related or pertained in any way to work that was required under the 1989 § 3013 ACO, or that were created to help Respondent comply with the requirements of the 1989 § 3013 ACO).

2) Respondent shall require its consultants and contractors (including subcontractors

and independent contractors) to preserve, all recording materials in their possession or control that relate or otherwise pertain in any way to this Order, or that are created in response to the requirements of this Order, including its implementation and or any enforcement under this Order.

c) To the extent not covered by the above provisions of this section, Respondent shall undertake reasonable efforts to preserve and/or make arrangements for the preservation of all recording materials that are in the possession or control of Respondent's contractors (including subcontractors and independent contractors) that relate or in any other way pertain to this Order, its implementation, or any work done at the facility in conjunction with a condition of, or requirement in, this Order.

2. Within thirty (30) days of retaining or employing any agent, consultant and/or contractor for the purpose of carrying out the terms of this Order, Respondent shall enter into an agreement with any such agents, consultants and/or contractors whereby said agents, consultants and/or contractors shall be required to provide Respondent with a copy of all documents and other written records produced pursuant to, or in furtherance of, this Order.

3. All documents pertaining to this Order shall be stored in a location(s) to afford ease of access, and Respondent shall undertake measures to afford ease of access to said location(s).

XVI. Reservation of Rights

1. EPA reserves all of its statutory and regulatory powers, authorities, rights and remedies, both legal and equitable, that pertain or may pertain to Respondent's failure to comply with any of the requirements of this Order, including the assessment of penalties under Section 3008(h)(2) of RCRA, 42 U.S.C. § 6928(h)(2). This Order is not intended, and shall not be construed, as a covenant not to sue, as a release, as a waiver, or as a limitation of any rights, remedies, powers and/or authorities, civil or criminal, that EPA has under RCRA, the Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. § 9601 et seq. (CERCLA), or any other statutory, regulatory or common law authority of the United States.

2. EPA reserves the right to disapprove of work performed by Respondent pursuant to this Order and to order that Respondent perform additional tasks.

3. EPA reserves the right to perform any portion of the work consented to herein or any additional site characterization, feasibility study, and remedial work as it deems necessary to protect human health and/or the environment. EPA may exercise its authority under CERCLA to undertake response actions at any time. In any event, EPA reserves its right to seek reimbursement from Respondent for costs incurred by the United States.

Notwithstanding compliance with the terms of this Order, Respondent is not released from liability, if any, for the costs of any response action(s) taken or authorized by the United States.

4. If EPA determines that activities in compliance or noncompliance with this Order have caused or may cause a release of hazardous waste or hazardous constituent(s), or a threat to human health and/or the environment, or that Respondent is not capable of undertaking any of the work ordered, EPA may order Respondent to stop further implementation of this Order for such period of time as EPA determines may be needed to abate any such release or threat and/or to undertake any action that EPA determines is necessary to abate such release or threat.

5. This Order is not intended, nor shall it be construed, as a permit, or the functional equivalent thereof. Further, the parties acknowledge and agree that EPA's approval of any workplan(s) does not constitute a warranty or representation that any workplan(s) will achieve the required cleanup or performance standards. Compliance by Respondent with the terms of this Order shall not relieve Respondent of its obligations to comply with RCRA or any other applicable federal, Commonwealth and/or local laws and regulations. The terms of this Order shall not preclude Respondent from seeking approval for alternative corrective measures approaches in the event of modifications to RCRA or

other applicable federal laws or regulations, where such modifications pertain to work then still to be required under this Order.

6. Respondent has entered this Order in good faith without trial or adjudication of any issue of fact or law. While agreeing to perform the work set forth in this Order and not to challenge the terms thereof, Respondent does not admit any of the factual or legal findings or conclusions of EPA, including:

a. Any violation of or liability under any federal, state, commonwealth, local or common law, or any liability of any kind;

b. The existence of any actual or potential danger, hazard, harm to any person, property, political entity or agency, the environment, or the public health or welfare; and

c. The validity of or responsibility for any factual or legal conclusions or determinations stated herein.

7. Respondent reserves all rights and defenses it has or may have under applicable law regarding liability or responsibility for conditions at the facility, with the exception of its right to contest EPA's jurisdiction to issue or enforce this Order and its right to contest the terms of this Order. Respondent's reservation of rights hereunder includes:

a. Any rights Respondent had, has, or may have against any third party for contribution, indemnification, liability over, or for any other action for whole or partial responsibility for the work that Respondent has agreed to perform under this Order; and

b. The right in any action initiated by EPA to enforce any requirement(s) established under this Order, to argue to the

court that Respondent has fully complied with said requirement(s).

8. Notwithstanding any other provisions of this Order, no action or decision by EPA pursuant to this Order, including decisions by the Regional Administrator, the Director of the Air and Waste Management Division, or any authorized representative of EPA, shall constitute final agency action giving rise to any right of judicial review prior to EPA's initiation of a judicial action to enforce this Order, including an action for penalties or an action to compel Respondent's compliance with the terms and conditions of this Order.

9. In any subsequent administrative or judicial proceeding initiated by the United States against Respondent for injunctive or other appropriate relief relating to Respondent's facility, Respondent shall not assert, and may not maintain, any defense or claim based upon the principles of waiver, res judicata (claim preclusion), collateral estoppel (issue preclusion), claim splitting or other defenses based upon any contention that the claims raised by the United States, or any agency thereof, in the subsequent proceeding were or should have been raised in the present matter.

10. Respondent's consent to this Order shall not constitute consent to any subsequent order or waiver of appeal rights under 40 C.F.R. Part 24 for any subsequent order.

11. This Order is not intended, and shall not be construed, to confer any rights upon any entity not a signatory to this Order. This Order and Respondent's performance hereunder shall not create any private rights.

12. Nothing in this Order is intended to release or waive any claim, cause of action, demand or defense in law or equity that Respondent has or may have against the United States or any of its agencies (except EPA), departments or contractors with regard to the facility. With regard to EPA, nothing in this Order is intended or shall be construed to release or waive any claim, cause of action, demand or defense in law or equity that Respondent may have under CERCLA. Nothing in this Order is intended or shall be construed to constitute preauthorization under Section 111(a)(2) of CERCLA, 42 U.S.C. § 9611(a)(2), and 40 C.F.R. § 300.700(d).

XVII. Non-Release of Other Claims and Parties

Nothing in this Order shall constitute, or be construed to constitute, a release by EPA or Respondent from any claim, cause of action or demand in law or equity against any other person (as defined in 42 U.S.C. § 6903(15) and 40 C.F.R. 260.10) for any liability such other person had, has or may have arising out of, or relating in any way to, the generation, storage, treatment, handling, transportation, release, or disposal of any hazardous

constituent, hazardous substance, hazardous waste, pollutant, or contaminant found at, taken to, taken from, generated by and/or emanating from the facility.

XVIII. Public Participation

1. EPA will provide the public with an opportunity to review and comment on the final draft of the Corrective Measures Study Report and a description of the proposed corrective measure(s), including EPA's justification for proposing such corrective measure(s).

2. Following the public comment period, EPA may approve the Corrective Measures Study Report and select a final corrective measure(s) or require Respondent to revise the Report and/or perform additional corrective measures studies.

3. EPA will notify Respondent in writing of the final corrective measure selected by EPA in the Final Decision and Response to Comments (RTC). The notification shall include EPA's reasons for selecting the corrective measure.

XIX. Indemnification of the United States

Neither the United States nor any agency thereof, including the employees, agents or departments of the United States, shall

be liable for any injuries or damages related thereto, or any claims or causes of action relating thereto, resulting from the acts or omissions of Respondent, its employees, agents, contractors, successors, assigns or other representatives of Respondent, in carrying out the activities under this Order, nor shall the United States nor any agency thereof, including the employees, agents or departments of the United States, be deemed or construed to be a party to any contract entered into by Respondent in carrying out this Order or any part thereof, or in carrying out any activities undertaken pursuant to, or required by, this Order.

XX. Other Applicable Laws

Respondent shall undertake all actions required by this Order in accordance with the requirements of all applicable local, municipal, commonwealth and federal laws and regulations. Respondent shall obtain all permits or approvals necessary to perform the work required by this Order.

XXI. Termination and Satisfaction

1. The provisions of this Order shall be deemed satisfied and the obligations of the Respondent under this Order shall terminate upon Respondent's receipt of a written statement from EPA that Respondent has completed, to EPA's satisfaction, all the

terms and conditions of this Order, including any additional work which EPA may determine to be necessary pursuant to this Order. So long as the Respondent is performing work pursuant to, or required by this Order, this Order shall not be deemed terminated or satisfied.

2. At any time after Respondent completes all of the tasks required by this Order, Respondent may request in writing that EPA provide Respondent with this statement of completion. Within ninety (90) days after any such request by Respondent, EPA will use its best efforts to provide Respondent with this statement of completion, or a written statement as to the basis for a refusal to provide Respondent with such statement of completion. At any time after Respondent's receipt of a written statement of refusal to provide Respondent with a statement of completion, Respondent may submit a notice of dispute and trigger the dispute resolution procedures provided by Section XXVIII of this Order. If Respondent disagrees with the decision issued under the dispute resolution procedures of this Order and Respondent has completed Corrective Measure Implementation, Respondent may then seek judicial review of the EPA determination concerning Termination and Satisfaction. EPA and Respondent agree that, so long as Respondent has completed Corrective Measure Implementation, the determination of the dispute resolution proceeding concerning Termination and Satisfaction (i.e. whether Respondent has

completed all of the tasks required by this Order) may be deemed final agency action and subject to judicial review.

XXII. Survivability/Permit Integration

After the effective date of this Order, a RCRA/HSWA Permit may be issued to the facility incorporating the requirements of this Order by reference into the permit. Any requirements of this Order shall not terminate upon the issuance of a permit unless: **1)** the requirement(s) are expressly replaced by equivalent or more stringent requirements in the permit; **2)** all the provisions of the permit are in effect; and **3)** EPA approves such termination.

XXIII. Modification

1. This Order may be mutually amended by Respondent and EPA. Such amendment shall be in writing, shall first be signed by Respondent, and shall be effective ten (10) days after it is signed by the Director of the Air and Waste Management Division, Region II, EPA. EPA representatives will use their best efforts to determine when a modification has been signed and to give actual notice of such signing to Respondent.

2. Notwithstanding the above paragraph of this section, the EPA Project Coordinator and the Respondent may agree to changes

in the scheduling of events. Any such changes must be requested in writing by the Respondent and be approved in writing by the EPA Project Coordinator.

3. No informal advice, guidance, suggestions, or comments by EPA regarding reports, plans, specifications, schedules, and any other writing submitted by the Respondent will be construed as an amendment or modification to this Order.

XXIV. No Final Agency Action

1. Except as provided in Section XXI of this Order, no action or decision by EPA pursuant to this Order, including decisions of the Regional Administrator, the Director of the Air and Waste Management Division for Region II, or any authorized representative of EPA, shall constitute final agency action giving rise to any rights of judicial review prior to EPA's initiation of a judicial action for a violation of this Order, which may include an action for penalties or an action to compel Respondent's compliance with the terms and conditions of this Order.

2. In any action brought by EPA for a violation of this Order, Respondent shall bear the burden of proving by a preponderance of the evidence that EPA's action was unreasonable,

arbitrary and capricious and not in accordance with applicable law or with this Order.

XXV. Severability

If any provision or authority of this Order or the application of this Order to any party or circumstance is found to be invalid, or is stayed, temporarily or otherwise, the remainder of this Order shall remain in force and shall not be affected thereby.

XXVI. Stipulated Penalties

1. Unless there has been a written modification by EPA of a compliance date or a written modification by EPA of an approved workplan condition, or an excusable delay within the meaning of Section XXVII of this Order, if Respondent fails to comply with any term or condition set forth in this Order in the time or manner specified herein, Respondent shall, upon written demand from EPA, pay stipulated penalties for each violation as set forth below in this paragraph.

a) Except as otherwise provided in sub-paragraphs b) and c), below, for failure to commence, perform in accordance with the Workplan or amended Workplan approved by EPA, and/or complete field work in a manner acceptable to EPA or at the time required pursuant to this Order; for the failure to submit a draft RFI, CMS, or CMI Report as required by this Order; for the failure to

submit an RFI, CMS, CMI or IM Workplan as required by this Order; and/or the failure to commence or satisfactorily complete any other significant work required by this Order:

Amount per day of violation:	Extent of Period of Noncompliance:
$ 500	1st through 10th days
$2500	11th through 30th days
$5000	31st day and beyond

b) For failure to submit a SWMU Assessment Report and/or to submit any document revisions specified by this Order:

Amount per day of violation:	Extent of Period of Noncompliance:
$500	1st through 10th days
$1000	11th through 30th days
$3000	31st day and beyond

c) For failure to submit a progress report, status report, and/or sampling data required by this Order, or for any other failure not specifically identified in sub-¶s "a" or "b", above:

Amount per day of violation:	Extent of Period of Noncompliance:
$500	1st through 10th days
$1000	11th through 30th days
$1500	31st day and beyond

2. Stipulated penalties shall begin to accrue commencing on the date of Respondent's receipt of written notice from EPA that performance is due or that a violation has occurred, and such penalties shall continue to accrue through the day of correction of the violation. Nothing herein shall prevent the simultaneous accrual of separate stipulated penalties for separate violations

of this Order, provided, however, that where a single activity may be classified as one of two type of violations, stipulated penalties shall be due at the higher rate, but Respondent shall not be required to pay multiple penalties therefor.

3. All penalties owed to the United States under this section shall be due and payable within thirty (30) days of Respondent's receipt from EPA of a written demand ("demand letter") for payment of the penalties under this section, unless Respondent invokes the dispute resolution procedures of Section XXVIII of this Order. Such a written demand from EPA will describe the violation(s) and shall indicate the amount of penalties due.

4. Interest shall begin to accrue on any unpaid stipulated penalty balance beginning on the thirty-first (31st) day after Respondent's receipt of EPA's demand letter. Interest shall accrue at the Current Value of Funds Rate established by the Secretary of Treasury. Pursuant to 31 U.S.C. § 3717, an additional penalty of 6% per annum on any unpaid principal shall be assessed for any stipulated penalty payment that is overdue for ninety (90) days or more.

5. All penalties shall be made payable by cashier's or certified check to **"Treasurer of the United States"** and shall be

remitted to (unless another entity is designated by EPA in writing):

Regional Hearing Clerk
U.S. Environmental Protection Agency
P.O. Box 360188M
Pittsburgh, Pennsylvania 15251

The instrument of payment shall reference the name of the facility, Respondent's name and address, and the docket number of this Order. A copy of the instrument(s) of payment and a copy of letters accompanying any payment shall be mailed to the EPA Project Coordinator.

6. Respondent may dispute EPA's assessment of stipulated penalties by invoking the dispute resolution procedures under Section XXVIII of this Order. The stipulated penalties in dispute shall continue to accrue, but Respondent need not pay them, during the dispute resolution period. Respondent shall pay stipulated penalties and interest, if any, in accordance with the dispute resolution decision and/or agreement. Respondent shall submit such payment to EPA within fifteen (15) days of receipt of such resolution in accordance with ¶ 5 of the Dispute Resolution section.

7. Neither the invocation of dispute resolution nor the payment of penalties shall relieve or otherwise affect Respondent's obligation to comply with the terms and conditions of this Order.

8. The stipulated penalties set forth in this section do not preclude EPA from pursuing any other remedies or sanctions that may be available to EPA by reason of Respondent's failure to comply with any of the terms and conditions of this Order. All stipulated penalties which are paid by Respondent may be off-set against any and all penalties for the same violation that EPA may be entitled to collect as a result of other enforcement action.

9. No payments of stipulated penalties under this section shall be tax deductible for federal income tax purposes, and Respondent shall not claim any such payment(s) for a federal income tax deduction.

10. EPA may, in its discretion, exercise prosecutorial discretion and decline to proffer a demand for stipulated penalties, or waive payment of any stipulated penalty(ies), provided, however, that any such waiver shall be in writing.

11. If Respondent prevails in any dispute for which EPA has sought payment of a stipulated penalty, no stipulated penalty shall be payable for the specific alleged instance of noncompliance upon which Respondent has prevailed.

XXVII. Force Majeure and Excusable Delay

1. Respondent shall perform the requirements of this Order within the time limits set forth, approved, or established herein, unless the performance is prevented or delayed by an event(s) that constitute(s) a force majeure.

2. For purposes of this Order, force majeure is defined as any event arising from a cause(s) not foreseen and beyond the control of Respondent or any person or entity controlled by Respondent, including Respondent's contractors, which cause(s) delay(s) or prevent(s) the timely performance of any obligation under this Order despite Respondent's best efforts to fulfill such obligation. Examples of force majeure include extraordinary weather events; natural disasters, national emergencies; delays in obtaining access to property not owned or controlled by Respondent despite timely, best efforts to obtain such access; and delays in obtaining any required approval or permit from EPA or other entities that result despite Respondent's complete, timely and appropriate submission of all information and documentation required for approval or applications for permits within a time frame that would permit the work to proceed in a manner contemplated by the schedule in the Order. The requirement that Respondent exercise "best efforts to fulfill such obligation", as herein stated, shall include best efforts to anticipate any potential force majeure event and address it

before, during and after its occurrence, such that any delay or prevention of performance is minimized to the greatest extent possible. Force majeure does not include increased costs of the work to be performed under this Order, financial inability to compete the work, work stoppages or other labor disputes.

3. If any event occurs or has occurred that may delay the performance of any obligation under this Order, whether or not caused by a force majeure event, Respondent shall contact by telephone and communicate orally with EPA's Project Coordinator within seventy-two (72) hours of when Respondent first knew or should have known that the event(s) might cause a delay. If Respondent wishes to claim a force majeure event, then within five (5) days thereafter, Respondent shall provide to EPA's Project Coordinator in writing: **a)** the anticipated duration of the delay; **b)** all actions taken or to be taken to prevent or minimize the delay; **c)** all other obligations affected by the event and what measures, if any, taken or to be taken to minimize the effect of the event on those obligations; **d)** a schedule for implementation of any measures to be taken to prevent or mitigate the delay or the effect of the delay; **e)** Respondent's rationale for attributing such delay to a force majeure event if it intends to assert such a claim; and **f)** a statement as to whether, in the opinion of Respondent, such event may cause or contribute to an endangerment to public health or the environment. Respondent shall include with said written notice all available

documentation supporting its claim, if any such claim is made, that the delay was attributable to a force majeure.

4. Respondent's failure materially to comply with the requirements set forth in ¶ 3 of this section shall preclude Respondent from asserting any claim of force majeure for that event(s). Respondent shall be deemed to have notice of any circumstance of which its contractors had or should have had notice.

5. If EPA determines that the delay or anticipated delay is attributable to a force majeure event, the time for performance of such obligation under this Order that is affected by the force majeure event will be extended by EPA for such time as EPA determines is necessary to complete such obligation. An extension of the time for performance of such obligation affected by the force majeure event shall not, of itself, extend the time for performance of any other obligation, unless Respondent can demonstrate to EPA in the aforementioned writing (¶ 3 of this section) that more than one obligation was affected by the force majeure event. If EPA determines that the delay or anticipated delay has been or will be caused by a force majeure event, EPA will notify Respondent in writing of the length of the extension, if any, for performance of such obligations affected by the force majeure event.

6. If EPA disagrees with Respondent's assertion of a force majeure event, EPA will notify Respondent in writing and Respondent may elect to invoke the dispute resolution provision, and Respondent shall follow the time frames set forth in Section XXVIII of this Order. In any such proceeding, Respondent shall have the burden of demonstrating by a preponderance of the evidence that the delay or anticipated delay has been or will be caused by a force majeure event, that the duration of the delay or the extension sought was or will be warranted under the circumstances, that best efforts were exercised to avoid and mitigate the effects of the delay, and that Respondent complied with the requirements of this section. If Respondent satisfies this burden, the time for performance of such obligation shall be extended by EPA for such time as is necessary to complete such obligation.

XXVIII. Dispute Resolution

1. The parties shall use their best effort informally and in good faith to resolve all disputes or differences of opinion with regard to implementing the terms of this Order. The parties agree that the procedures contained in this section are the sole procedures for resolving disputes arising under this Order. If Respondent fails to follow any of the requirements contained in this section, then it shall have waived its right to further consideration of the disputed issue.

2. If Respondent disagrees, in whole or in part, with any written decision ("Initial Written Decision") by EPA pursuant to this Order, Respondent shall notify the EPA Project Coordinator of its disagreement. Respondent and the EPA Project Coordinator shall attempt to resolve the dispute informally.

3. If Respondent and EPA's Project Coordinator are unable to resolve the dispute informally, Respondent may pursue the matter formally by placing its objections in writing. Respondent's written objections must be sent to the EPA Project Coordinator, and these may be copied to the Director of the Air and Waste Management Division of EPA, Region II. This written notice must be mailed to the EPA Project Coordinator within fifteen (15) days of Respondent's receipt of the Initial Written Decision. Respondent's written objection(s) must set forth the specific points of the dispute, the position Respondent claims should be adopted as consistent with the requirements of this Order, the basis for Respondent's position, and any matters that Respondent deems necessary for EPA's determination.

4. EPA and Respondent shall have thirty (30) days from EPA's receipt of Respondent's written objections to attempt to resolve the dispute through formal negotiations. This time period may be extended by EPA for good cause. During such 30-day period (the "Negotiation Period"), Respondent may request a conference with the EPA Project Coordinator and other appropriate

EPA personnel to discuss the dispute and Respondent's objections. EPA agrees to confer in person or by telephone to resolve any such disagreement with Respondent as long as Respondent's request for a conference will not extend the Negotiation Period.

5. If the parties are unable to reach an agreement within the Negotiation Period, Respondent shall have the right to submit within twenty (20) days of the conclusion of the Negotiation Period any additional written documents and evidence, not previously submitted, to the relevant EPA, Region 2, Branch Chief. Following consultation with EPA personnel involved in the aforementioned negotiation, the Branch Chief will then endeavor to issue his/her decision within thirty (30) days and shall submit same in writing to Respondent. If Respondent continues to dispute said EPA decision, Respondent may, within twenty (20) days, request a conference with the relevant EPA, Region 2, decision-maker (i.e. the Region 2 EPA official who has been delegated authority to make final decisions on RCRA Section 3008(h) orders) and submit to such decision-maker such written arguments it deems appropriate. Said decision-maker shall then provide to Respondent EPA's written decision on the dispute (the "EPA Dispute Decision"). Such decision shall be dispositive and shall be incorporated into and become an enforceable element of this Order, but such decision will not be considered final Agency action for purposes of judicial review.

6. Except as provided in this Order in Section XXVI, "Stipulated Penalties", the existence of a dispute as defined in this section and EPA's consideration of matters placed into dispute shall not excuse, toll, or suspend any compliance obligation or deadline required pursuant to this Order during the pendency of the dispute resolution process.

XXIX. Effective Date

The effective date of this Order shall be thirty (30) days after the date on which the Director of the Air and Waste Management Division, Region II, signs this Order.

XXX. Consent

Respondent consents to and agrees not to contest EPA's jurisdiction to issue this Order. In addition, whether EPA commences an action to enforce or compel compliance with any term(s) of this Order in an administrative or judicial proceeding, the Respondent consents to and agrees not to contest EPA's jurisdiction to enforce or compel compliance with any term(s) of this Order.

Finding this Order to be accurate, Respondent consents to its issuance and its terms, and agrees to undertake all actions required by the terms and conditions of this Order, including any

portions of the Order incorporated by reference. Respondent consents to the issuance of this Order, as an Order, pursuant to Section 3008(h) of RCRA, 42 U.S.C. § 6928(h), and explicitly waives its right to request a hearing on this matter. Finally, the Respondent agrees not to contest, and waives any defense concerning, the validity of this Order, or any particular provision contained herein.

The signatory to this Order for Respondent certifies that he or she is fully authorized to enter into the terms and conditions of this Order and to bind Respondent thereto.

Phillips Puerto Rico Core Inc.
Respondent's Name

September 20, 1995
Date

James Scinta
Signatory's Name (Print)

James Scinta
Signature

President
Signatory's Title (Print)

IT IS SO ORDERED:

Conrad Simon, Director
Air and Waste Management Division
U.S. Environmental Protection Agency, Region II
New York, New York 10007-1866

Date: September 25, 1995

ATTACHMENT I

SCOPE OF WORK FOR A RCRA FACILITY INVESTIGATION (RFI)

RCRA FACILITY INVESTIGATION

Task I: Description of Current Conditions

Task II: Evaluation of Corrective Measure Technologies

Task III: RFI Workplan Requirements

Task IV: Facility Investigation

Task V: Investigation Analysis

Task VI: Laboratory, Field and Bench-Scale Studies

Task VII: Reports

SCOPE OF WORK FOR A RCRA FACILITY INVESTIGATION (RFI)

PURPOSE

The purpose of this RCRA Facility Investigation is to determine the nature and extent of releases of hazardous waste or hazardous constituents from regulated units, solid waste management units, and other source areas at the facility and to gather all necessary data to support the Corrective Measures Study. It is acknowledged that several of the tasks required for this RFI have been partially addressed under the previous September 1989 3013 Order RFI. These tasks include, but are not limited to, the Description of Current Conditions and the RFI Workplan. The Respondent shall furnish all personnel, materials, and services necessary for, or incidental to, performing the RCRA Facility Investigation.

SCOPE

The RCRA Facility Investigation consists of seven tasks:

Task I: Description of Current Conditions

Task II: Evaluation of Corrective Measure Technologies

Task III: RFI Workplan Requirements

- A. Project Management Plan
- B. Data Collection Quality Assurance Plan
- C. Data Management Plan
- D. Health and Safety Plan
- E. Community Relations Plan

Task IV: Facility Investigation

- A. Environmental Setting
- B. Source Characterization
- C. Contamination Characterization
- D. Potential Receptor Identification

Task V: Investigation Analysis

- A. Data Analysis
- B. Protection Standards

Task VI: Laboratory and Bench-Scale Studies

Task VII: Reports

A. Preliminary and Workplan

- Description of Current Conditions
- Interim Measures Report
- SWMU Assessment Report
- RFI Workplan

B. Evaluation of Corrective Measures Technology

C. Progress Report

D. Draft and Final RFI Report

E. Laboratory and Bench-Scale Studies Report

TASK I: DESCRIPTION OF CURRENT CONDITIONS

Respondent has submitted, and EPA has approved, a report providing the background information pertinent to the facility, contamination, and interim measures. This report, the Description of Current Conditions ("DOCC"), was submitted to EPA by the Respondent in October 1990, pursuant to the September 1989 3013 Order. The October 1990 DOCC included all of the required information and was subsequently approved by EPA. However, for the purposes of this Order, the DOCC should be updated to include information that has come to light since the submittal of the original DOCC. This information consists of a discussion of any SWMUs not previously identified through April 1995 and discussed in the May 1995 revised draft RFI report. This information should be presented in the following addenda to the DOCC, amended as set forth in Section VI of the Order.

- Interim Measures Documentation Update; and
- SWMU Assessment Report.

SWMU Assessment Report

Within thirty (30) days of the effective date of this Order, Respondent shall submit to EPA for its review and approval a SWMU Assessment Report for all SWMUs not identified in the May 1995 revised draft RFI report in order to amend sections 3.0 and 7.0, as specified in Section VI of this Order.

If it is determined that a prior or continuing release of hazardous constituents has occurred at any SWMU, Respondent shall, to the extent that it has not previously done so, submit an RFI Workplan for that SWMU, developed in accordance with the guidelines set forth in Task III of this Attachment.

TASK II: EVALUATION OF CORRECTIVE MEASURE TECHNOLOGIES

Within thirty (30) days of the effective date of this Order, the Respondent shall submit to EPA a report that identifies the applicable corrective measure technologies that may be used on-site or off-site for the containment, treatment, remediation, and/or disposal of contamination. This report shall also identify any field data that need to be collected in the facility investigation and may identify any field, laboratory and/or bench scale studies to facilitate the evaluation and selection of the final corrective measure or measures (e.g., compatibility of waste and construction materials, information to evaluate effectiveness, treatability of wastes, etc.).

This report should also present a discussion of the use of Corrective Action Management Units (CAMUs) as defined in 40 C.F.R. § 264.552 for the purpose of facilitating remediation waste management activities during corrective action, if Respondent proposes to use the CAMU designation during corrective actions. In addition, Respondent should present a discussion of any proposals to include regulated units into CAMUs. Regulated units proposed for closure (such as the Off-Spec Pond, Oxidation Pond, and the Old and New Ballast Water Basins) may be eligible for designation as part of a CAMU, and therefore Respondent may choose to propose this approach for EPA's review and approval.

TASK III: RFI WORKPLAN REQUIREMENTS

Respondent has prepared a RCRA Facility Investigation (RFI) Workplan as part of the requirements of the 1989 § 3013 ACO. This RFI Workplan included the development of several plans as described below. The RFI workplan was submitted to EPA for review in October 1990 and was subsequently approved in about February 1991. Since the submittal of the October 1990 RFI workplan, Respondent has submitted addenda to the RFI workplan, one dated March 25, 1991, the other dated December 20, 1991, and a Revised Addendum, dated April 2, 1992.

These addenda discussed additions and modifications to the original RFI workplan, including a discussion of potential sampling of oil and oil-stained soil from the capacitor discovery area. Any additional information or proposals for additional work that have come to light since the submittal of the original workplan and addenda or revised draft RFI should be included in an addendum to the RFI workplan. In particular, any sections pertaining to SWMUs should be amended to include a discussion of any SWMUs not previously identified. Any sections pertaining to the designation of Operable Units including, but not limited to, Section 2.1 and Section 2.2 should be amended to include a discussion of the potential use of CAMUs if such an approach is proposed by the Respondent (to the extent permitted by applicable law). Any other relevant information that has come to light since the submittal of the 1990 RFI workplan should be submitted as an amendment to the original workplan or addressed in the Draft RFI Report (within the meaning of that term as discussed in Task VII, ¶ D of this Attachment, infra). If a prior or continuing release of hazardous waste and/or hazardous constituents has occurred at any SWMU not previously identified, the Respondent shall submit an RFI workplan for that SWMU, developed in accordance with the outline below, within sixty (60) days from the date of such determination.

In general, the RFI Workplan should be developed in accordance with the RFI Workplan requirements listed below:

A. **Project Management Plan**

The Respondent shall prepare a Project Management Plan which will consist of a discussion of the technical approach, schedules, budget, and personnel. The Project Management Plan will also include a description of the qualifications of personnel performing or directing the RFI, including contractor personnel. This plan shall also document the overall management approach to the RCRA Facility Investigation.

B. **Data Collection Quality Assurance Plan**

The Respondent shall prepare a plan to document monitoring procedures: sampling, field measurements, and sample analysis performed during the investigation to characterize the environmental setting, source, and contamination, so as to ensure that the information, data and resulting decisions are technically sound, statistically valid, and properly documented.

1. Data Collection Strategy

The strategy section of the Data Collection Quality Assurance Plan shall consist of the following:

a. Description of the intended uses for the data, and the necessary level of precision and accuracy for these intended uses;

b. Description of methods and procedures to be used to assess the precision, accuracy, and completeness of the measurement data;

c. Description of the procedures used to assure that the data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, a process condition, or an environmental condition. Examples of factors which shall be considered and discussed include:

i) Environmental conditions at the time of sampling;

ii) Number of sampling points;

iii) Representativeness of selected media; and

iv) Representativeness of selected analytical parameters.

d. Description of the measures to be taken to assure that the following data sets can be compared to each other:

i) RFI data generated by the Respondent at different times;

ii) RFI data generated by an outside laboratory or consultant versus data generated by the Respondent;

iii) Data generated by separate consultants or laboratories; and

iv) Data generated by an outside consultant or laboratory over some time period.

e. Details relating to the schedule and information to be provided in quality assurance reports. The reports shall consist of:

i) Periodic assessment of measurement data accuracy, precision,and completeness;

ii) Results of performance audits;

iii) Results of system audits;

iv) Significant quality assurance problems and recommended solutions; and

v) Resolutions of previously stated problems.

2. Sampling

The Sampling section of the Data Collection Quality Assurance Plan shall discuss:

a. Selecting appropriate sampling locations, depths, etc.;

b. Providing a statistically sufficient number of sampling sites;

c. Measuring all necessary ancillary data;

d. Determining conditions under which sampling should be conducted;

e. Determining which media are to be sampled (e.g., ground water, air, soil, sediment, etc.);

f. Determining which parameters are to be measured and where;

g. Selecting the frequency of sampling and length of sampling period;

h. Selecting the types of sample (e.g., composites vs. grabs) and number of samples to be collected;

i. Measures to be taken to prevent contamination of the sampling equipment and cross contamination between sampling points;

j. Documenting field sampling operations and procedures, including;

   i) Documentation of procedures for preparation of reagents or supplies which become an integral part of the sample (e.g., filters, and adsorbing reagents);

   ii) Procedures and forms for recording the exact location and specific considerations associated with sample acquisition;

   iii) Documentation of specific sample preservation method;

   iv) Calibration of field devices;

   v) Collection of replicate samples;

   vi) Submission of field-biased blanks, where appropriate;

   vii) Potential interferences present at the facility;

   viii) Construction materials and techniques, associated with monitoring wells and piezometers;

   ix) Field equipment listing and sample containers;

   x) Sampling order; and

   xi) Decontamination procedures.

k. Selecting appropriate sample containers;

l. Sample preservation; and

m. Chain-of-custody, including:

   i) Standardized field tracking reporting forms to establish sample custody in the field prior to and during shipment; and

ii) Pre-prepared sample labels containing all information necessary for effective sample tracking.

3. Field Measurements

The Field Measurements section of the Data Collection Quality Assurance Plan shall discuss:

a. Selecting appropriate field measurement locations, depths, etc.;

b. Providing a statistically sufficient number of field measurements;

c. Measuring all necessary ancillary data;

d. Determining conditions under which field measurements should be conducted;

e. Determining which media are to be addressed by appropriate field measurements (e.g., ground water, air, soil, sediment, etc.);

f. Determining which parameters are to be measured and where;

g. Selecting the frequency of field measurement and length of field measurements period; and

h. Documenting field measurement operations and procedures, including:

i) Procedures and forms for recording raw data and the exact location, time, and facility-specific considerations associated with the data acquisition;

ii) Calibration of field devices;

iii) Collection of replicate measurements;

iv) Submission of field-biased blanks, where appropriate;

v) Potential interferences present at the facility;

vi) Construction materials and techniques associated with monitoring wells and piezometers used to collect field data;

vii) Field equipment listing;

viii) Order in which field measurements were made; and

ix) Decontamination procedures.

4. Sample Analysis

The Sample Analysis section of the Data Collection Quality Assurance Plan shall specify the following:

a. Chain-of-custody procedures, including:

i) Identification of a responsible party to act as sample custodian at the laboratory facility authorized to sign for incoming field samples, obtain documents of shipment, and verify the data entered onto the sample custody records;

ii) Provision for a laboratory sample custody log consisting of serially numbered standard lab-tracking report sheets; and

iii) Specification of laboratory sample custody procedures for sample handling, storage, and dispersement for analysis.

b. Sample storage procedures and storage times;

c. Sample preparation methods;

d. Analytical procedures, including:

i) Scope and application of the procedure;

ii) Sample matrix;

iii) Potential interferences;

iv) Precision and accuracy of the methodology; and

v) Method detection limits.

e. Calibration procedures and frequency;

f. Data reduction, validation and reporting;

g. Internal quality control checks, laboratory performance and systems audits and frequency, including:

i) Method blank(s);

ii) Laboratory control sample(s);

iii) Calibration check sample(s);

iv) Replicate sample(s);

v) Matrix-spiked sample(s);

vi) "Blind" quality control sample(s);

vii) Control charts;

viii) Surrogate samples;

ix) Zero and span gases; and

x) Reagent quality control checks.

h. Preventive maintenance procedures and schedules;

i. Corrective action (for laboratory problems); and

j. Turnaround time.

C. **Data Management Plan**

The Respondent shall develop and initiate a Data Management Plan to document and track investigation data and results. This plan shall identify and set up data documentation materials and procedures, project file requirements, and project-related progress reporting procedures and documents. The plan shall also provide the format to be used to present the raw data and conclusions of the investigation.

1. Data Record

The data record shall include the following:

a. Unique sample or field measurement code;

b. Sampling or field measurement location and sample or measurement type;

c. Sampling or field measurement raw data;

d. Laboratory analysis ID number;

e. Property or component measured; and

f. Result of analysis (e.g., concentration).

2. Tabular Displays

The following data shall be presented in tabular displays:

a. Unsorted (raw) data;

b. Results for each medium, or for each constituent monitored;

c. Data reduction for statistical analysis;

d. Sorting of data by potential stratification factors (e.g., location, soil layer, topography); and

e. Summary data.

3. Graphical Displays

The following data shall be presented in graphical formats (e.g., bar graphs, line graphs, area or plan maps, isopleth plots, cross-sectional plots or transects, three dimensional graphs, etc.):

a. Display sampling location and sampling grid;

b. Indicate boundaries of sampling area, and areas where more data are required;

c. Display levels of contamination at each sampling location;

d. Display geographical extent of contamination;

e. Display contamination levels, averages, and maxima;

f. Illustrate changes in concentration in relation to distance from the source, time, depth or other parameters; and

g. Indicate features affecting intramedia transport and show potential receptors.

D. **Health and Safety Plan**

The Respondent shall prepare a facility Health and Safety Plan.

1. Major elements of the Health and Safety Plan shall include:

   a. Facility description, including availability of resources such as roads, water supply, electricity and telephone service;

   b. Describe the known hazards and evaluate the risks associated with the incident and with each activity conducted;

   c. List key personnel and alternates responsible for site safety, response operations, and for protection of public health;

   d. Delineate work areas;

   e. Describe levels of protection to be worn by personnel in work areas;

   f. Establish procedures to control site access;

   g. Describe decontamination procedures for personnel and equipment;

   h. Establish site emergency procedures;

   i. Address emergency medical care for injuries and toxicological problems;

   j. Describe requirements for an environmental surveillance program;

   k. Specify any routine and special training required for responders; and

   l. Establish procedures for protecting workers from weather-related problems.

2. The Facility Health and Safety Plan shall be consistent with:

   a. NIOSH Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (1985);

   b. EPA Order 1440.1 - Respiratory Protection;

c. EPA Order 1440.3 - Health and Safety Requirements for Employees engaged in Field Activities;

d. Facility Contingency Plan;

e. EPA Standard Operating Safety Guide (1984);

f. OSHA regulations particularly in 29 CFR §§ 1910 and 1926;

g. State, local, and other federal agency (e.g., DOD, DOE) regulations; and

h. Other EPA guidance as provided.

E. **Community Relations Plan**

The Respondent shall prepare a plan, for the dissemination of information to the public regarding investigation activities and results.

TASK IV: RCRA FACILITY INVESTIGATION

The Respondent shall conduct those investigations necessary to: characterize the facility (Environmental Setting); define the source (Source Characterization); define the degree and extent of contamination (Contamination Characterization); and identify actual or potential receptors (Potential Receptors).

It is acknowledged that the Respondent has initiated the field investigations listed above. Respondent should insure that the investigations result in data of adequate technical quality to support the development and evaluation of the corrective measure alternative or alternatives during the Corrective Measures Study.

The site investigation activities shall follow the plans set forth in Task III. All sampling and analyses shall be conducted in accordance with the Data Collection Quality Assurance Plan. All sampling locations shall be documented in a log and identified on a detailed site map.

Respondent should continue the Facility Investigation until all requirements listed below have been satisfied.

A. **Environmental Setting**

The Respondent shall collect information to supplement and verify existing information on the environmental setting at the facility. The Respondent shall characterize the following:

1. Hydrogeology

The Respondent shall conduct a program to evaluate hydrogeologic conditions at the facility. This program shall provide the following information:

a. A description of the regional and facility specific geologic and hydrogeologic characteristics affecting ground water flow beneath the facility, including:

i) Regional and facility specific stratigraphy: description of strata including strike and dip, identification of stratigraphic contacts;

ii) Structural geology: description of local and regional structural features (e.g., folding, faulting, tilting, jointing, etc.);

iii) Depositional history;

iv) Identification and characterization of areas and amounts of recharge and discharge;

v) Regional and facility specific ground water flow patterns; and

vi) Characterize seasonal variations in the ground water flow regime.

b. An analysis of any topographic features that might influence the ground water flow system.

c. Based on field data, test, and cores, a representative and accurate classification and description of the hydrogeologic units which may be part of the migration pathways at the facility (i.e., the aquifers and any intervening saturated and unsaturated units), including:

i) Hydraulic conductivity and porosity (total and effective);

ii) Lithology, grain size, sorting, degree of cementation;

iii) An interpretation of hydraulic interconnections between saturated zones; and

iv) The attenuation capacity and mechanisms of the natural earth materials (e.g., ion exchange capacity, organic carbon content, mineral content etc.).

d. Based on field studies and cores, structural geology, and hydrogeologic cross sections showing the extent (depth, thickness, lateral extent) of hydrogeologic units which may be part of the migration pathways identifying:

i) Sand and gravel deposits in unconsolidated deposits;

ii) Zones of fracturing or channeling in consolidated or unconsolidated deposits;

iii) Zones of higher permeability or lower permeability that might direct and restrict the flow of contaminants;

iv) The uppermost aquifer: geologic formation, group of formations, or part of a formation

capable of yielding a significant amount of ground water to wells or springs; and

v) Water-bearing zones above the first confining layer that may serve as a pathway for contaminant migration including perched zones of saturation.

e. Based on data obtained from ground water monitoring wells and piezometers installed upgradient and downgradient of the potential contaminant source, provide a representative description of water level or fluid pressure monitoring including:

i) Water-level contour and/or potentiometric maps;

ii) Hydrologic cross sections showing vertical gradients;

iii) The flow system, including the vertical and horizontal components of flow; and

iv) Any temporal changes in hydraulic gradients, for example, due to tidal or seasonal influences.

f. A description of manmade influences that may affect the hydrogeology of the site, identifying:

i) Active and inactive local water-supply and production wells with an approximate schedule of pumping; and

ii) Manmade hydraulic structures (pipelines, french drains, ditches, unlined ponds, septic tanks, NPDES outfalls, retention areas, etc.).

2. Soils

The Respondent shall conduct a program to characterize the soil and rock units above the water table in the vicinity of the contaminant release(s). Such characterization shall include but not be limited to, the following information:

a. SCS soil classification;

b. Surface soil distribution;

c. Soil profile, including ASTM classification of soils;

d. Transects of soil stratigraphy;

e. Hydraulic conductivity (saturated and unsaturated);

f. Relative permeability;

g. Bulk density;

h. Porosity;

i. Soil sorptive capacity;

j. Cation exchange capacity (CEC);

k. Soil organic content;

l. Soil pH;

m. Particle size distribution;

n. Depth of water table;

o. Moisture content;

p. Effect of stratification on unsaturated flow;

q. Infiltration

r. Evapotranspiration;

s. Storage capacity;

t. Vertical flow rate; and

u. Mineral content.

3. Surface Water and Sediment

The Respondent shall conduct a program to characterize the surface water bodies in the vicinity of the facility. Such characterization shall include, but not be limited to, the following activities and information:

a. Description of the temporal and permanent surface water bodies including:

i) For lakes and estuaries: location, elevation, surface area, inflow, outflow, depth, temperature stratification, and volume;

ii) For impoundments: location, elevation, surface area, depth, volume, freeboard, and purpose of impoundment;

iii) For streams, ditches, drains, swamps and channels: location, elevation, flow, velocity, depth, width, seasonal fluctuations, and flooding tendencies (i.e., 100 year event);

iv) Drainage patterns; and

v) Evapotranspiration.

b. Description of the chemistry of the natural surface water and sediments. This includes determining the pH, total dissolved solids, total suspended solids, biological oxygen demand, alkalinity, conductivity, dissolved oxygen profiles, nutrients (NH_3, NO_3^-/NO_2^-, PO_4^{-3}), chemical oxygen demand, total organic carbon, specific contaminant concentrations, etc.

c. Description of sediment characteristics including:

i) Deposition area;

ii) Thickness profile; and

iii) Physical and chemical parameters (e.g., grain size, density, organic carbon content, ion exchange capacity, pH, etc.)

iv) Sediment size, sorting and packing; and

v) General mineralogy.

4. Air

The Respondent shall provide information characterizing the climate in the vicinity of the facility. Such information shall include, but not be limited to:

a. A description of the following parameters:

i) Annual and monthly rainfall averages;

ii) Monthly temperature averages and extremes;

iii) Wind speed and direction;

iv) Relative humidity/dew point;

v) Atmospheric pressure;

vi) Evaporation data;
vii) Development of inversions; and

viii) Climate extremes that have been known to occur in the vicinity of the facility, including frequency of occurrence.

b. A description of topographic and manmade features which affect air flow and emission patterns, including:

i) Ridges, hills or mountain areas;

ii) Canyons or valleys;

iii) Surface water bodies (e.g., rivers, lakes, bays, etc.);

iv) Wind breaks and forests; and

v) Buildings.

B. **Source Characterization**

The Respondent shall collect data completely to characterize the wastes and the areas where wastes have been placed, collected, or removed, including: type; quantity; physical form; disposition (containment or nature of deposits); and facility characteristics affecting release (e.g., facility security, and engineered barriers). This shall include quantification of the following specific characteristics at each source area:

1. Unit/Disposal Area characteristics:

a. Location of unit/disposal area;

b. Type of unit/disposal area;

c. Design features;

d. Operating practices (past and present);

e. Period of operation;

f. Age of unit/disposal area;

g. General physical conditions; and

h. Method used to close the unit/disposal area.

2. Waste Characteristics:

a. Type of waste placed in the unit;

i) Hazardous classification (e.g., flammable, reactive, corrosive, oxidizing, or reducing agent);

ii) Quantity; and

iii) Chemical composition.

b. Physical and chemical characteristics;

i) Physical form (solid, liquid, gas);

ii) Physical description (e.g., powder, oily sludge);

iii) Temperature;

iv) pH;

v) General chemical class (e.g., acid, base, solvent);

vi) Molecular weight;

vii) Density;

viii) Boiling point;

ix) Viscosity;

x) Solubility in water;

xi) Cohesiveness of the waste;

xii) Vapor pressure; and

xiii) Flash point.

c. Migration and dispersal characteristics of the waste;

i) Sorption;

ii) Biodegradability, bioconcentration, biotransformation;

iii) Photodegradation rates;

iv) Hydrolysis rates; and

v) Chemical transformations.

The Respondent shall document the procedures used in making the above determinations.

C. **Contamination Characterization**

The Respondent shall collect analytical data on ground water, soils, surface water, sediment, and subsurface gas contamination in the vicinity of the facility. This data shall be sufficient to define the extent, origin, direction, and rate of movement of contaminant plumes. Data shall include time and location of sampling, media sampled, concentrations found, conditions during sampling, and the identity of the individuals performing the sampling and analysis. The Respondent shall address the following types of contamination at the facility:

1. Ground Water Contamination

The Respondent shall conduct a Ground Water Investigation to characterize any plumes of contamination at the facility. This investigation shall, at a minimum, provide the following information:

a. A description of the horizontal and vertical extent of any immiscible or dissolved plume(s) originating from the facility;

b. The horizontal and vertical direction of contamination movement;

c. The velocity of contaminant movement;

d. The horizontal and vertical concentration profiles of Appendix IX constituents in the plume(s);

e. An evaluation of factors influencing the plume movement; and

f. An extrapolation of future contaminant movement.

Respondent shall document the procedures used in making the above determinations (e.g., well design, well construction, geophysics, modeling, etc.).

2. Soil Contamination

Respondent shall conduct an investigation to characterize the contamination of the soil and rock units above the water table in the vicinity of the contaminant release. The investigation shall include the following information:

a. A description of the vertical and horizontal extent of contamination.

b. A description of contaminant and soil chemical properties within the contaminant source area and plume. This includes contaminant solubility, speciation, adsorption, leachability, exchange capacity, biodegradability, hydrolysis, photolysis, oxidation, and other factors that might affect contaminant migration and transformation.

c. Specific contaminant concentrations.

d. The velocity and direction of contaminant movement.

e. An extrapolation of future contaminant movement.

Respondent shall document the procedures used in making the above determinations.

3. Surface Water and Sediment Contamination

Respondent shall conduct a surface water investigation to characterize contamination in surface water bodies resulting from contaminant releases at the facility. The investigation shall include, but not be limited to, the following information:

a. A description of the horizontal and vertical extent of any immiscible or dissolved plume(s) originating from the facility, and the extent of contamination in underlying sediments;

b. The horizontal and vertical direction of contaminant movement;

c. The contaminant velocity;

d. An evaluation of the physical, biological and chemical factors influencing contaminant movement;

e. An extrapolation of future contaminant movement; and

f. A description of the chemistry of the contaminated surface waters and sediments. This includes determining the pH, total dissolved solids, specific contaminant concentrations, etc.;

Respondent shall document the procedures used in making the above determinations.

4. Air Contamination

Respondent shall conduct an investigation to characterize the particulate and gaseous contaminants released into the atmosphere. This investigation shall provide the following information:

a. A description of the horizontal and vertical direction and velocity of contaminant movement;

b. The rate and amount of the release; and

c. The chemical and physical composition of the contaminants(s) released, including horizontal and vertical concentration profiles. The Respondent shall document the procedures used in making the above determinations.

5. Subsurface Gas Contamination

Respondent shall conduct an investigation to characterize subsurface gases emitted from buried hazardous waste and hazardous constituents in the ground water. This investigation shall include the following information:

a. A description of the horizontal and vertical extent of subsurface gas mitigation;

b. The chemical composition of the gases being emitted;

c. The rate, amount, and density of the gases being emitted; and

d. Horizontal and vertical concentration profiles of the subsurface gases emitted.

Respondent shall document the procedures used in making the above determinations.

D. **Potential Receptors**

Respondent shall collect data describing the human populations and environmental systems that are susceptible to contaminant exposure from the facility. Chemical analysis of biological samples may be needed. Data on observable effects in ecosystems may also be obtained. The following characteristics shall be identified:

1. Local uses and possible future uses of ground water:

   a. Type of use (e.g., drinking water source: municipal or residential, agricultural, domestic/non-potable, and industrial); and

   b. Location of ground water users including wells and discharge areas within a distance of two miles upgradient of the facility and five miles downgradient of the facility.

2. Local uses and possible future uses of surface waters draining the facility:

   a. Domestic and municipal (e.g., potable and lawn/garden watering);

   b. Recreational (e.g., swimming, fishing);

   c. Agricultural;

   d. Industrial; and

   e. Environmental (e.g., fish and wildlife propagation).

3. Human use of or access to the facility and adjacent lands, including but not limited to:

   a. Recreation;

   b. Hunting;

   c. Residential;

   d. Commercial;

   e. Zoning; and

   f. Relationship between population locations and prevailing wind direction.

4. A description of the biota in surface water bodies on, adjacent to, or affected by the facility.

5. A description of the ecology overlying and adjacent to the facility.

6. A demographic profile of the people who use or have access to the facility and adjacent land, including, but not limited to: age, sex, and sensitive subgroups.

7. A description of any endangered or threatened species near the facility.

TASK V: RCRA INVESTIGATION ANALYSIS

Respondent shall prepare an analysis and summary of all facility investigations and their results. The objective of this task shall be to ensure that the investigation data are sufficient in quality (e.g., quality assurance procedures have been followed) and quantity to describe the nature and extent of contamination, potential threat to human health and/or the environment, and to support the Corrective Measures Study. The information and reports described below shall be incorporated into the RFI Report.

A. **Data Analysis**

Respondent shall analyze the facility investigation data outlined in Task IV and prepare a report on the type and extent of contamination at the facility including sources and migration pathways. The report shall describe the extent of contamination (qualitative/quantitative) in relation to background levels representative for the area.

B. **Protection Standards**

1. Ground Water Protection Standards

For regulated units, Respondent shall provide information to support the Agency's selection/ development of Ground Water Protection Standards for the Appendix IX constituents (that were released or that might have been released from the facility) found in the ground water during the RCRA Facility Investigation (Task IV).

a. The Ground Water Protection Standards shall consist of:

i) for any constituents listed in Table 1 of 40 CFR § 264.94, the respective value given in that table (MCL) if the background level of the constituent is below the value given in Table 1; or

ii) the background level of that constituent in the ground water; or

iii) a U.S. EPA approved Alternate Concentration Limit (ACL).

b. Information to support the Agency's subsequent selection of Alternate Concentration Limits (ACLs) shall be developed by the Respondent in accordance with U.S. EPA guidance. For any proposed ACLs,

Respondent shall include a justification based upon the criteria set forth in 40 CFR § 264.94(b).

c. After receipt and review of any proposed ACLs, EPA shall notify Respondent in writing of approval, disapproval or modifications. EPA shall specify, in writing, the reason(s) for any disapproval or modification.

d. Within sixty (60) days of receipt of EPA's notification or disapproval of any proposed ACL, Respondent shall withdraw the application, amend the application or submit revisions thereof to EPA.

2. For all other units or areas of contamination, Respondent shall propose a ground water protection standard for each Appendix IX constituent (as defined in Task V.B.I., supra) found in the ground water and provide adequate information to support this proposal, including a justification based upon the criteria set forth in 40 CFR § 264.94(b)..

a. The proposed ground water protection standard will be reviewed by EPA in accordance with EPA guidance for ACLs.

b. After receipt and review of any proposed ground water protection standards, EPA shall notify Respondent in writing of approval, disapproval or modifications. EPA shall specify in writing the reason(s) for any disapproval or modification.

c. Within sixty (60) days of receipt of EPA's notification or disapproval of any proposed ACL, Respondent shall withdraw the proposal or amend and submit revisions to EPA.

3. Other Relevant Protection Standards

Respondent shall identify all relevant and applicable standards for the protection of human health and the environment (e.g., National Ambient Air Quality Standards, Federally-approved State water quality standards, etc.) relating to constituents that were, or that might have been, released, from the facility.

TASK VI: LABORATORY, FIELD AND BENCH-SCALE STUDIES

Respondent shall conduct laboratory, field and/or bench scale studies to determine the suitability and applicability of a corrective measure technology or technologies identified in Task II, above, to facility conditions. Respondent shall analyze the technologies, based on literature review, vendor contracts, and past experience to determine the testing requirements.

Respondent shall develop and implement a testing plan identifying the types(s) and goal(s) of the study(ies), the level of effort needed, and the procedures to be used for data management and interpretation.

Upon completion of the testing, Respondent shall evaluate the testing results to assess the technology or technologies with respect to the site-specific questions identified in the test plan.

Respondent shall prepare a report summarizing the testing program and its results, both positive and negative.

TASK VII: REPORTS

A. Preliminary and Workplan

Respondent shall submit to EPA all addenda necessary to update the October 1990 DOCC and RFI Workplan not previously submitted under the preceding RCRA § 3013 Order, consisting of the SWMU Assessment Report within thirty (30) days of the effective date of this Order. Respondent shall submit all addenda necessary to update the RFI Workplan within thirty (30) days of the effective date of this Order.

B. Evaluation of Corrective Measures Technology

Respondent shall submit to EPA a report that identifies the applicable corrective measure technologies that may be used on-site or off-site for the containment, treatment, remediation, and/or disposal of wastes or contaminated media. This report shall be prepared in accordance with the requirements discussed in Task II, and shall be submitted to the EPA within thirty (30) days of the effective date of this Order.

C. Progress Reports

Respondent shall at a minimum continue to provide EPA with signed, quarterly progress reports containing:

1. A description and estimate of the percentage of the RFI completed;

2. Summaries of the findings;

3. Summaries of the changes made in the execution of the RFI during the reporting period;

4. Summaries of the contacts pertaining to the RFI with representatives of the local community, public interest groups or Commonwealth government during the reporting period;

5. Summaries of the problems or potential problems encountered during the reporting period;

6. Actions being taken to rectify problems;

7. Changes in personnel during the reporting period; and

8. Projected work for the next reporting date, etc.

D. **Draft and Final RFI Report**

Within sixty (60) days of the completion of any additional investigations required for the RFI program under this Order, Respondent shall submit for EPA review an amendment to the aforementioned revised draft RFI report in accordance with Tasks IV and V of Attachment I, incorporating the results of the additional investigations required to delineate the nature and extent of any releases of hazardous wastes and/or hazardous constituents. In accordance with the procedure set forth in Section XI of the Order ("EPA Approvals"), EPA will notify Respondent whether the revised draft RFI report has been completely or partially approved, or disapproved, or whether it needs to be modified. Upon Respondent's receipt of EPA's disapproval or EPA's comments requiring modification, Respondent shall prepare a final RFI report, incorporating changes responsive to EPA's comments on both the revised draft RFI report and the amendment thereto, in order to present the findings of all facility investigative studies and the investigation analysis. Unless EPA in writing approves another schedule, the final RFI Report shall be submitted to EPA no later than sixty (60) days following receipt of EPA's disapproval or EPA's comments on the amendment to the revised draft RFI report. EPA shall review the final RFI Report in accordance with Section XI. If the revised draft RFI report is approved by EPA, it will serve as the final RFI Report required by this Order. If Respondent disagrees with EPA's comments requiring modifications, Respondent may, consistent with the provisions thereof, seek redress pursuant to the procedures set forth in Section XXVIII, "Dispute Resolution".

The RFI Report shall describe the nature and extent of contamination, source and migration pathway, the potential threat to human health and the environment, and it shall be used to support the Corrective Measure Study. The RFI Report shall describe the extent of contamination (quantitative and qualitative) in relation to background levels representative for the area, and Respondent shall identify applicable protection standards as discussed in Task V, above.

E. **Laboratory, Field and Bench-Scale Studies Report**

Respondent shall submit a report documenting the results of the studies of potential corrective measures technologies for the facility. The report shall be prepared in accordance with Task VI, and shall be submitted to EPA concurrent with the submittal of the Draft CMS Workplan.

A summary of the information reporting requirements contained in the RCRA Facility Investigation Scope of Work is presented below:

[NOTE: Due dates are calculated from the effective date of this Order, unless otherwise specified.]

Facility Submission	Due Date
Addenda to Description of Current Conditions, Including SWMU Assessment Report	Thirty (30) days
Evaluation of Corrective Measures Technologies (Task II)	Thirty (30) days
Amendment to RFI Workplan	Sixty (60) days
Amendment to Revised Draft RFI Report (Tasks IV and V)	Within sixty (60) days of completion of any additional investigations required for RFI program under the Order
Final RFI Report (Tasks IV and V)	Sixty (60) days after receipt of EPA's comments on Amendment to Revised Draft RFI Report, unless EPA in writing approves another schedule
Laboratory, Field and Bench-Scale Studies Report (Summary of Task VI)	Concurrent with submittal of Draft CMS Workplan
Progress Reports on Tasks I through VI	Quarterly

Interim Measures Reports	As provided in Attachment IV

ATTACHMENT II

SCOPE OF WORK FOR CORRECTIVE MEASURE STUDY

CORRECTIVE MEASURE STUDY

Task VIII: Identification and Development of the Corrective Measure Alternative or Alternatives

Task IX: Evaluation of the Corrective Measure Alternative or Alternatives

Task X: Justification and Recommendation of the Corrective Measure or Measures

Task XI: Reports

SCOPE OF WORK FOR A CORRECTIVE MEASURE STUDY

PURPOSE

The purpose of this Corrective Measure Study (CMS) is to develop and evaluate the corrective action alternative or alternatives and to recommend the corrective measure or measures to be taken at the Phillips Puerto Rico Core Inc. facility. Respondent will furnish the personnel, materials, and services necessary to prepare the corrective measure study, except as otherwise specified.

SCOPE

The Corrective Measure Study consists of four tasks:

Task VIII: Identification and Development of the Corrective Measure Alternative or Alternatives

- A. Description of Current Situation
- B. Establishment of Corrective Action Objectives
- C. Screening of Corrective Measures Technologies
- D. Identification of the Corrective Measure Alternative or Alternatives

Task IX: Evaluation of the Corrective Measure Alternative or Alternatives

- A. Technical/Environmental/Human Health/Institutional
- B. Cost Estimate

Task X: Justification and Recommendation of the Corrective Measure or Measures

- A. Technical
- B. Environmental
- C. Human Health

Task XI: Reports

- A. Progress
- B. Draft
- C. Final
- D. Schedule

TASK VIII: IDENTIFICATION AND DEVELOPMENT OF THE CORRECTIVE ACTION ALTERNATIVE OR ALTERNATIVES

Based on the results of the RCRA Facility Investigation and consideration of the Evaluation of Corrective Measure Technologies (Task II), the Respondent shall identify, screen, and develop the alternative or alternatives for removal, containment, treatment, and/or other remediation of the contamination based on the objectives established for the corrective action.

A. Corrective Measures Study (CMS) Workplan

The Draft Corrective Measures (CMS) Workplan shall include the following elements:

1. A site-specific description of the overall purpose of the Corrective Measures Study;

2. A description of the corrective measures objectives, including proposed target media cleanup standards (e.g., promulgated Federal and Commonwealth standards, risk-derived standards), and points of compliance or a description of how a risk assessment will be performed (e.g., guidance documents);

3. A description of the specific corrective measures technologies that will be studied;

4. A description of the general approach to investigating and evaluating potential corrective measures alternatives;

5. A proposed outline for the CMS Report, including a description of how information will be presented; and

6. A description of overall project management, including overall approach, levels of authority (including organization chart), lines of communication, project schedules, budget and personnel. The description to be provided pursuant to this provision shall include a description of the qualification for personnel directing or performing the work.

B. Final Corrective Measures Workplan

Respondent shall finalize the Corrective Measures Study Workplan incorporating comments received from EPA on the Draft Corrective Measures Study Workplan.

C. **Description of Current Situation**

Respondent shall submit an update of the known nature and extent of the contamination as documented by the RCRA Facility Investigation Report. Respondent shall also make a Facility-specific statement of the purpose for the response, based on the results of the RCRA Facility Investigation. The statement of purpose should identify the actual or potential exposure pathways that should be addressed by corrective measures.

D. **Establishment of Corrective Action Objectives**

After consultation with Respondent, EPA will establish site specific objectives for the corrective action. These objectives shall be based on public health and environmental criteria, information gathered during the RCRA Facility Investigation, EPA guidance, and the requirements of any applicable Federal statutes. Corrective actions concerning groundwater releases from regulated units must be consistent with, and as stringent as, those required under 40 CFR § 264.100.

E. **Screening of Corrective Measure Technologies**

Respondent shall review the results of the RCRA Facility Investigation and reassess the applicability of the technologies specified in Task II and identify additional technologies which are applicable at the Facility. Respondent shall screen the applicable preliminary corrective measure technologies identified in Task II of the RCRA Facility Investigation and additionally identified applicable technologies to eliminate those that may prove infeasible to implement, that rely on technologies unlikely to perform satisfactorily or reliably, or that do not achieve the corrective measure objective within a reasonable time period. This screening process focuses on eliminating those technologies which have severe limitations for a given set of waste and site-specific conditions. The screening step may also eliminate technologies based on inherent technology limitations. Site, waste, and technology characteristics which are used to screen inapplicable technologies are described in more detail below:

1. Site Characteristics

Site data should be reviewed to identify conditions that may limit or promote the use of certain technologies. Technologies whose use is clearly precluded by site characteristics should be eliminated from further consideration;

2. Waste Characteristics

Identification of waste characteristics that limit the effectiveness or feasibility of technologies is an important part of the screening process. Technologies clearly limited by these waste characteristics should be eliminated from consideration. Waste characteristics particularly affect the feasibility of in-situ methods, direct treatment methods, and land disposal (on/off-site); and

3. Technology Limitations

During the screening process, the level of technology development, performance record, and inherent construction, operation, and maintenance problems should be identified for each technology considered. Technologies that are unreliable, perform poorly, or are not fully demonstrated may be eliminated in the screening process. For example, certain treatment methods have been developed to a point where they can be implemented in the field without extensive technology transfer or development.

F. **Identification of the Corrective Measure Alternative or Alternatives**

Respondent shall develop the Corrective Measure alternative or alternatives based on the corrective action objectives and screening process of Task VIII.C. Respondent may identify any Interim Measure as, or as part of, a Corrective Measures Alternative. Respondent shall determine which of the previously identified technologies appear most suitable for the site. Technologies can be combined to form the overall corrective action alternative or alternatives. The alternative or alternatives developed should represent a workable number of option(s) that each appear to adequately address all site problems and corrective action objectives. Each alternative may consist of an individual technology or a combination of technologies. Respondent shall document the reasons for excluding technologies, identified in Task VIII.C., in the development of the alternative or alternatives.

TASK IX: EVALUATION OF THE CORRECTIVE MEASURE ALTERNATIVE OR ALTERNATIVES

Respondent shall describe each corrective measure alternative that is developed in Task VIII.D. and evaluate each corrective measure alternative and its components. The evaluation shall be based on technical, environmental, human health, and institutional concerns. The Respondent shall also develop cost estimates for each corrective measure alternative.

A. **Technical/Environmental/Human Health/Institutional**

Respondent shall provide an engineering description of each corrective measure alternative, which descriptions include (if necessary) the following: preliminary process flow sheets; preliminary sizing and type of construction for buildings and structures; and rough quantities of utilities required. Respondent shall evaluate each alternative in the four following areas:

1. Technical

Respondent shall evaluate each corrective measure alternative (as previously defined in Task VIII, ¶ D of this Attachment) based on performance, reliability, implementability and safety.

a. The Respondent shall evaluate performance based on the effectiveness and useful life of the corrective measure alternative:

i) Effectiveness shall be evaluated in terms of the ability to perform intended functions, such as containment, diversion, removal, destruction, or treatment. The effectiveness of each corrective measure shall be determined either through design specifications or by performance evaluation. Any specific waste or site characteristics which could potentially impede effectiveness shall be considered; and

ii) Useful life is defined as the length of time the level of effectiveness can be maintained. Most corrective measure technologies, with the exception of destruction, deteriorate with time. Often, deterioration can be slowed through proper system operation and maintenance, but the technology eventually may require replacement. Each corrective measure shall be evaluated in terms of the projected service lives of its component

technologies. Resource availability in the future life of the technology, as well as appropriateness of the technologies, must be considered in estimating the useful life of the project.

b. Respondent shall provide information on the reliability of the corrective measure alternative including its operation and maintenance requirements and its demonstrated reliability:

i) Operation and maintenance requirements include the frequency and complexity of necessary operation and maintenance. Technologies requiring frequent or complex operation and maintenance activities should be regarded as less reliable than technologies requiring little or straightforward operation and maintenance. The availability of labor and materials to meet these requirements shall also be considered; and

ii) Demonstrated and expected reliability is a way of measuring the risk and effect of failure. Respondent should evaluate whether the technologies have been used effectively under analogous conditions; whether the combination of technologies have been used together effectively; whether failure of any one technology has an immediate impact on receptors; and whether the corrective measure has the flexibility to deal with uncontrollable changes at the site.

c. Respondent shall describe the implementability of the corrective measure alternative including the relative ease of installation (constructability) and the time required to achieve a given level of response:

i) Constructability is determined by conditions both internal and external to the Facility conditions and include such items as location of underground utilities, depth to water table, heterogeneity of subsurface materials, and location of the Facility (i.e. remote location vs. a congested urban area). The Respondent shall evaluate what measures can be taken to facilitate construction under these conditions. External factors which affect implementation include the need for

special permits or agreements, equipment availability, and the location of suitable off-site treatment or disposal facilities; and

ii) Time has two components that shall be addressed: the time it takes to implement a corrective measure and the time it takes to actually see beneficial results. Beneficial results are defined as the reduction of contaminants to some acceptable, pre-established level.

d. Respondent shall evaluate each corrective measure alternative with regard to safety. This evaluation shall include threats to the safety of nearby communities and environments as well as those to workers during implementation. Factors to consider are fire, explosion, and exposure to hazardous substances.

2. Environmental

Respondent shall perform an Environmental Assessment for each corrective measure alternative. The Environmental Assessment shall focus on the Facility conditions and pathways of contamination actually addressed by each alternative. The Environmental Assessment for each alternative will include, at a minimum, an evaluation of: the short and long term beneficial and adverse effects of the response alternative; any adverse effects on environmentally sensitive areas; and an analysis of measures to mitigate adverse effects.

3. Human Health

Respondent shall assess each corrective measure alternative in terms of the extent to which it mitigates short and long term potential exposure to any residual contamination and protects human health both during and after implementation the corrective measure. The assessment will describe the levels and characterizations of contaminants on-site, potential exposure routes, and potentially affected populations. Each such alternative shall be evaluated to determine the level of exposure to contaminants and the reduction over time. For management of mitigation measures, the relative reduction of impact will be determined by comparing residual levels of each alternative with existing criteria, standards, or guidelines acceptable to EPA.

4. Institutional

Respondent shall assess relevant institutional needs for each corrective measure alternative. Specifically, the effects of Federal, State and local environmental and public health standards, regulations, guidance, advisories, ordinances, or community relations on the design, operation, and timing of each corrective measure alternative.

B. **Cost Estimate**

The Respondent shall develop an estimate of the cost of each corrective measure alternative (and for each phase or segment of the alternative). The cost estimate shall include both capital and operation and maintenance costs.

1. Capital costs consist of direct (construction) and indirect (non-construction and overhead) costs.

   a. Direct capital costs include:

      i) Construction costs: Costs of materials, labor (including fringe benefits and worker's compensation), and equipment required to install the corrective measure.

      ii) Equipment costs: Costs of treatment, containment, disposal, and/or service equipment necessary to implement the action; these materials remain until the corrective action is complete;

      iii) Land and site-development costs: Expenses associated with purchase of land and development of existing property; and

      iv) Buildings and services costs: Costs of process and non-process buildings, utility connections, purchased services, and disposal costs.

   b. Indirect capital costs include:

      i) Engineering expenses: Costs of administration, design, construction supervision, drafting, and testing of corrective measure alternatives;

      ii) Legal fees and license or permit costs: Administrative and technical costs necessary

to obtain licenses and permits for installation and operation;

iii) Start-up and shakedown costs: Costs incurred during corrective measure start-up; and

iv) Contingency allowances: Funds to cover costs resulting from unforeseen circumstances, such as adverse weather conditions, strikes, and inadequate Facility characterization.

2. Operation and maintenance costs are post-construction costs necessary to ensure continued effectiveness of a corrective measure. The Respondent shall consider the following operation and maintenance cost components:

a. Operating labor costs: Wages, salaries, training, overhead, and fringe benefits associated with the labor needed for post-construction operations;

b. Maintenance materials and labor costs: Costs for labor, parts, and other resources required for routine maintenance of facilities and equipment;

c. Auxiliary materials and energy: Costs of such items as chemicals and electricity for treatment plant operations, water and sewer service, and fuel;

d. Purchased services: Sampling costs, laboratory fees, and professional fees for which the need can be predicted;

e. Disposal and treatment costs: Costs of transporting, treating, and disposing of waste materials, such as treatment plant residues, generated during operations;

f. Administrative costs: Costs associated with administration of corrective measure operation and maintenance not included under other categories;

g. Insurance, taxes, and licensing costs: Costs of such items as liability and sudden accidental insurance; real estate taxes on purchased land or rights-of-way; licensing fees for certain technologies; and permit renewal and reporting costs;

h. Maintenance reserve and contingency funds: Annual payments into escrow funds to cover (1) costs of anticipated replacement or rebuilding of equipment

and (2) any large unanticipated operation and maintenance costs; and

i. Other costs: Items that do not fit any of the above categories.

TASK X: JUSTIFICATION AND RECOMMENDATION OF THE CORRECTIVE MEASURE OR MEASURES

Respondent shall justify and recommend a corrective measure alternative using technical, human health, environmental and cost criteria. This recommendation shall include summary tables which allow the alternative or alternatives to be understood easily. Tradeoffs between/among health risks, environmental effects, and other pertinent factors shall be highlighted. EPA will select the corrective measure alternative or alternatives to be implemented based on the results of Tasks IX and X. The following criteria will be used to justify the final corrective measure or measures.

A. **Technical**

1. Performance - corrective measure or measures which are most effective at performing their intended functions and maintaining the performance over extended periods of time will be given preference;

2. Reliability - corrective measure or measures which do not require frequent or complex operation and maintenance activities and that have proven effective under waste and Facility conditions similar to those anticipated will be given preference;

3. Implementability - corrective measure or measures which can be constructed and operated to reduce levels of contamination to attain or exceed applicable standards in the shortest period of time will be preferred; and

4. Safety - corrective measure or measures which pose the least threat to the safety of nearby residents and environments as well as workers during implementation will be preferred.

B. **Human Health**

The corrective measure or measures must comply with then-existing and applicable EPA criteria, standards, or guidelines for the protection of human health. Corrective measures that provide the minimum level of exposure to contaminants and the maximum reduction in exposure with time are preferred.

C. **Environmental**

The corrective measure or measures posing the least adverse impact (or greatest improvement) over the shortest period of time on the environment will be favored.

D. **Cost**

The corrective measure or measures providing the greatest benefit at the least incremental costs shall be favored, provided, however, Respondent, regardless of which corrective measure(s) it selects, satisfies all applicable EPA environmental standards.

TASK XI: REPORTS

Respondent shall prepare quarterly progress reports during the CMS phase and a draft and final CMS Report presenting the results of Tasks VIII through X and recommending a corrective measure alternative(s).

A. **Progress Reports**

Respondent shall provide EPA with signed, quarterly progress reports during the CMS phase (except no such report shall be due during periods when: (1) Respondent has submitted to EPA for its review an CMS-related document, and (2) Respondent is not obligated to conduct CMS-related work), and such reports shall contain:

1. A description and estimate of the percentage of the CMS completed;

2. Summaries of findings;

3. Summaries of changes made in the execution of the CMS during the reporting period;

4. Summaries of contacts with representatives of the local community, public interest groups or State government during the reporting period;

5. Summaries of problems or potential problems encountered during the reporting period;

6. Actions being taken to rectify problems;

7. Changes in personnel during reporting period;

8. Projected work for the next reporting period; and

B. **Draft Corrective Measures (CMS) Study Report**

Respondent shall prepare the draft Corrective Measures Study Report in accordance with the requirements of Tasks VIII, IX

and X of Attachment II. This Report shall include the following:

1. Description of Current Situation

   a. Update of the known nature and extent of the contamination as documented by the RCRA Facility Investigation Report; and

   b. Statement of purpose for corrective measures response.

2. Site-specific objective for the corrective action.

3. Description of the screening process for corrective measure technologies.

4. Identification of the potential Corrective Measure alternative or alternatives that adequately address site problems and corrective action objectives.

5. Description and evaluation of each corrective measure alternative: a) technical; b) environmental; c) human health; and d) institutional.

6. Capital and operating & maintenance cost estimate for each corrective measure alternative.

7. Justification and recommendation of corrective measure based upon technical, human health, environmental and cost criteria.

8. For the corrective measure or measures recommended, the following must be included:

   a. Description of the corrective measure or measures and rationale for selection;

   b. Performance expectations;

   c. Preliminary design criteria and rationale;

   d. General operation and maintenance requirements;

   e. Long-term monitoring requirements;

   f. Design and implementation precautions, including:

      -- Special technical problems;
      -- Additional engineering data required;

-- Permits and regulatory requirements;
-- Access, easements, right-of-way;
-- Health and safety requirements;
-- Community relations activities;

g. Cost estimates and schedules, including:

-- Capital cost estimate;
-- Operation and maintenance cost estimate;
-- Preliminary project schedule (design, construction, operation).

C. **Final Corrective Measures Study Report**

The Respondent shall finalize the Corrective Measure Study Report incorporating comments received from EPA on the Draft Corrective Measure Study Report.

D. **Schedule**

Facility Submission	**Due Date**
Draft CMS Workplan and Laboratory, Field and Bench Scale Studies Report	Ninety (90) days after acceptance of Final RFI Report
Final CMS Workplan	Sixty (60) days after EPA comments on Draft Workplan
Draft CMS Report	As approved in Final Workplan
Final CMS Report	Sixty (60) days after receipt of EPA comments on Draft CMS Report
Progress Reports on Tasks VIII, IX and X	Quarterly

ATTACHMENT III

SCOPE OF WORK FOR CORRECTIVE MEASURES IMPLEMENTATION

CORRECTIVE MEASURE IMPLEMENTATION

Task XII:	Corrective Measure Implementation Program Plan
Task XIII:	Corrective Measure Design
Task XIV:	Corrective Measure Construction
Task XV:	Reports

SCOPE OF WORK FOR A CORRECTIVE MEASURE IMPLEMENTATION AT PHILLIPS PUERTO RICO CORE INC., FACILITY

PURPOSE

The purpose of this Corrective Measure Implementation (CMI) program is to design, construct, operate, maintain, and monitor the performance of the corrective measure or measures selected to protect human health and the environment. The Respondent will furnish all personnel, materials and services necessary for the implementation of the corrective measure or measures.

SCOPE

The Corrective Measure Implementation program consists of four tasks:

Task XII: Corrective Measure Implementation Program Plan

- A. Program Management Plan
- B. Community Relations Plan

Task XIII: Corrective Measure Design

- A. Design Approach
- B. Design Plans and Specifications
- C. Operation and Maintenance Plan
- D. Cost Estimate
- E. Project Schedule
- F. Construction Quality Assurance Objectives
- G. Health and Safety Plan
- H. Design Phases

Task XIV: Corrective Measure Construction

- A. Responsibility and Authority
- B. Construction Quality Assurance
- C. Inspection Activities
- D. Sampling Requirements
- E. Documentation

Task XV: Reports

- A. Progress
- B. Draft
- C. Final

TASK XII: CORRECTIVE MEASURE IMPLEMENTATION PROGRAM PLAN

Respondent shall, within one hundred eighty (180) days of Respondent's receipt of written notice of selection of a remedy by EPA (unless another time period is agreed to by the parties), submit to EPA for approval a Draft Corrective Measure Implementation (CMI) Program Plan. EPA will review the Draft CMI Program Plan and provide comments to Respondent. Within thirty (30) days of receipt of EPA's comments, Respondent shall modify the Draft CMI Program Plan to incorporate such comments and shall submit the revised CMI Program Plan to EPA. The revised CMI Program Plan as approved by EPA shall become the Final CMI Program Plan. This program shall include the development and implementation of several plans, which require concurrent preparation. It may be necessary to revise plans as the work is performed to focus efforts on a particular problem. The CMI Program Plan includes the following:

A. Program Management Plan

Respondent shall prepare a Program Management Plan which will document the overall management strategy for performing the design, construction, operation, maintenance and monitoring of corrective measure(s). The plan shall document the responsibility and authority of all organizations and functions of key personnel (including the identification of key personnel, if known) involved with the implementation. The Program Management Plan will also include a description of qualifications of key personnel (if known) directing the Corrective Measure Implementation Program, including those for contractor personnel.

B. Community Relations Plan

Respondent shall amend the Community Relations Plan to include information to be provided to the community during the Corrective Measure Implementation.

1. Activities which must be conducted during the Corrective Measure Implementation are the following:

   a. Prepare and distribute a public notice and an updated fact sheet upon approval of the Final Design Approach (Task XIII, ¶ A, below) . Said public notice shall include a provision stating that all comments submitted in response to said public notice shall be submitted to EPA at the following address:

Andrew Bellina, Chief
Hazardous Waste Facilities Branch
U.S. Environmental Protection Agency
290 Broadway, 22nd Floor
New York, New York 10007

b. In consultation with EPA, Respondent shall consider citizen concerns in the Corrective Measure Implementation design stage.

2. Activities to be conducted during the CMI construction stage may range from group meetings to fact sheets on the technical status, depending on citizen interest in the facility.

TASK XIII: CORRECTIVE MEASURE DESIGN

Respondent shall prepare final construction plans and specifications to implement the corrective measure(s) at the facility as defined in the Corrective Measure Study.

A. Design Approach

Respondent shall develop a clear and comprehensive design approach consisting of the following:

1. Discussion of the design strategy and the design basis, including:

   a. Compliance with applicable environmental and public health standards; and

   b. Minimization of environmental and public impacts.

2. Discussion of the technical factors or importance including:

   a. Use of currently accepted environmental control measures and technology;

   b. The constructability of the design; and

   c. Use of currently acceptable construction practices and techniques.

3. Description of assumptions made and detailed justification of these assumptions.

4. A schedule for completion of the remainder of Task XIII activities.

B. Design Plans And Specifications

Respondent shall develop clear and comprehensive design plans and specifications consisting of the following:

1. Discussion of design factors that may cause significant operation and/or maintenance problems;

2. Detailed drawings of the proposed design consisting of:

   a. Qualitative flow sheets; and

   b. Quantitative flow sheets.

3. Tables listing equipment and specifications;

4. Tables giving material and energy balances;

5. Appendices consisting of:

   a. Sample calculations (one example presented and explained clearly for significant or unique design calculations) as necessary;

   b. Derivation of equations essential to understanding the report as necessary; and

   c. Results of laboratory or field tests.

C. Operation and Maintenance Plan

The Respondent shall prepare an Operation and Maintenance Plan to cover both implementation and long-term maintenance of the corrective measure. The plan shall be composed of the following elements:

1. Description of normal operation and maintenance (O&M);

   a. Description of tasks for operation;

   b. Description of tasks for maintenance;

   c. Description of prescribed treatment or operation conditions; and

   d. Schedule showing frequency of each O&M task.

2. Description of potential operating problems;

   a. Description and analysis of potential operation problems;

   b. Sources of information regarding problems; and

   c. Common and/or anticipated remedies.

3. Description of routine monitoring and laboratory testing;

   a. Description of monitoring tasks;

   b. Description of required laboratory tests and their interpretations;

c. Required QA/QC; and

d. Schedule of monitoring frequency and date, if appropriate, when monitoring may cease.

4. Description of alternate O&M;

a. Should systems fail, alternate procedures to prevent undue hazard; and

b. Analysis of vulnerability and additional resource requirements should a failure occur.

5. Safety plan;

a. Description of precautions, of necessary equipment, etc., for site personnel; and

b. Safety tasks required in event of systems failure.

6. Description of equipment; and

a. Equipment identification;

b. Installation of monitoring components;

c. Maintenance of site equipment; and

d. Replacement schedule for equipment and installed components.

7. Records and reporting procedures and forms.

a. Daily operating logs;

b. Laboratory records and forms;

c. Procedures for reporting emergencies;

d. Personnel and maintenance record forms; and

e. Monthly/annual reporting procedures to State agencies, if necessary.

An initial Draft Operation and Maintenance Plan shall be submitted simultaneously with the Prefinal Design Document submission and the Final Operation and Maintenance Plan with the Final Design Documents.

D. Cost Estimate

Respondent shall develop cost estimates for the purpose of assuring that the facility has the financial resources necessary to construct and implement the corrective measure. The cost estimate developed in the Corrective Measure Study shall be refined to reflect the more detailed/accurate design plans and specifications being developed. The cost estimate shall include both capital and operation and maintenance costs. An Initial Cost Estimate shall be submitted simultaneously with the Prefinal Design submission and the Final Cost Estimate with the Final Design Document.

E. Project Schedule

Respondent shall develop a Project Schedule for construction and implementation of the corrective measure or measures which identifies timing for initiation and completion of all critical path tasks. Respondent shall specifically identify dates for completion of the project and major interim milestones. An initial Project Schedule shall be submitted simultaneously with the Prefinal Design Document submission and the Final Project Schedule with the Final Design Document.

F. Construction Quality Assurance Objectives

Respondent shall identify and document the objectives and framework for the development of a construction quality assurance program consisting of the following: responsibility and authority; personnel qualifications; inspection activities; sampling requirements; and documentation.

G. Health and Safety Plan

Respondent shall amend or revise the Health Safety Plan developed for the RCRA Facility Investigation to address the activities to be performed at the facility to implement the corrective measure(s).

H. Design Phases

The design of the corrective measure(s) should include the phases outlined below.

1. Preliminary design

   Respondent shall submit the Preliminary design when the design effort is approximately 30% complete. At this stage the Respondent shall have field verified the existing conditions of the facility. The preliminary

design shall reflect a level of effort such that the technical requirements of the project have been addressed and outlined so that they may be reviewed to determine if the final design will provide an operable and usable corrective measure. Supporting data and documentation shall be provided with the design documents defining the functional aspects of the program. The preliminary construction drawings by Respondent shall reflect organization and clarity. The scope of the technical specifications shall be outlined in a manner reflecting the final specifications. Respondent shall include with the preliminary submission design calculations reflecting the same percentage of completion as the designs they support.

2. Intermediate design

Complex project design may necessitate review of the design documents and technical data between the preliminary and the prefinal/final design. At the discretion of the Agency, after consultation with Respondent, a design review may be required at 60% completion of the project.

The intermediate design submittal should include the same elements as the prefinal design.

3. Correlating plans and specifications

General correlation between drawings and technical specifications, is a basic requirement of any set of working construction plans and specifications. Before submitting the project specifications, the Respondent shall:

a. Coordinate and cross-check the specifications and drawings; and

b. Complete the proofing of the edited specifications and required cross-checking of all drawings and specifications.

These activities shall be completed prior to the 95% prefinal submittal to the Agency.

4. Equipment startup and operator training

Respondent shall prepare, and include in the technical specifications governing treatment systems, contractor requirements for providing: appropriate service visits by experienced personnel to supervise the installation, adjustment, startup and operation of the treatment

systems, and training covering appropriate operational procedures once the startup has been successfully accomplished.

5. Prefinal and final design

Respondent shall submit the prefinal/final design documents in two parts. The first submission shall be at 95% completion of design (i.e. prefinal). After approval of the prefinal submission, Respondent shall execute the required revisions and submit the final documents 100% complete with reproducible drawings and specifications.

The prefinal design submittal shall consist of the Design Plans and Specifications, Operation and Maintenance Plan, Capital and Operating and Maintenance Cost Estimate, Project Schedule, Quality Assurance Plan and Specifications for the Health and Safety Plan.

The final design submittal consists of the Final Design Plans and Specifications (100% complete), the Respondent's Final Construction Cost Estimate, the Final Operation and Maintenance Plan, Final Quality Assurance Plan, Final Project Schedule and Final Health and Safety Plan specifications. The quality of the design documents should be such that Respondent would be able to include them in a bid package and invite contractors to submit bids for the construction project.

TASK XIV: CORRECTIVE MEASURE CONSTRUCTION

Following EPA approval of the final design, Respondent shall develop and implement a construction quality assurance (CQA) program to ensure, with a reasonable degree of certainty, that a completed corrective measure(s) meets or exceeds all design criteria, plans and specifications. The CQA plan is a facility specific document which must be submitted to the Agency for approval prior to the start of construction. The CQA plan should consist of the elements which are summarized below. Upon EPA approval of the CQA plan, Respondent shall construct and implement the corrective measures in accordance with the approved design, schedule and the CQA plan. Respondent shall also implement the elements of the approved Operation and Maintenance plan.

A. Responsibility and Authority

The responsibility and authority of all organizations (i.e. technical consultants, construction firms, etc.) and key personnel involved in the construction of the corrective measure shall be described fully in the CQA plan. Respondent must identify a CQA officer and the necessary supporting inspection staff.

B. Construction Quality Assurance Personnel Qualifications

The qualifications of the CQA officer and supporting inspection personnel shall be presented in the CQA plan to demonstrate that they possess the training and experience necessary to fulfill their identified responsibilities.

C. Inspection Activities

The observations and tests that will be used to monitor the construction and/or installation of the components of the corrective measure(s) shall be summarized in the CQA plan. The plan shall include the scope and frequency of each type of inspection. Inspections shall verify compliance with all environmental requirements and include, but not be limited to air quality and emissions monitoring records, waste disposal records (e.g., RCRA transportation manifests), etc. The inspection should also ensure compliance with all health and safety procedures. In addition to oversight inspections, Respondent shall conduct the following activities:

1. Preconstruction inspection and meeting

   Respondent shall conduct a preconstruction inspection and meeting to:

a. Review methods for documenting and reporting inspection data;

b. Review methods for distributing and storing documents and reports;

c. Review work area security and safety protocol;

d. Discuss any appropriate modifications of the construction quality assurance plan to ensure that site-specific considerations are addressed; and

e. Conduct a site walk-around to verify that the design criteria, plans, and specifications are understood and to review material and equipment storage locations.

The preconstruction inspection and meeting shall be documented by a designated person and minutes should be transmitted to all parties.

2. Prefinal inspection

Upon preliminary project completion Respondent shall notify EPA for the purposes of conducting a prefinal inspection. The prefinal inspection will consist of a walk-through inspection of the entire project site. The inspection is to determine whether the project is complete and consistent with the contract documents and the EPA approved corrective measure. Any outstanding construction items discovered during the inspection will be identified and noted. Additionally, treatment equipment will be operationally tested by the Respondent. Respondent will certify that the equipment has performed to meet the purpose and intent of the specifications. Retesting will be completed where deficiencies are revealed. The prefinal inspection report should outline the outstanding construction items, actions required to resolve items, completion date for these items, and date for final inspection.

3. Final inspection

Upon completion of any outstanding construction items, Respondent shall notify EPA for the purposes of conducting a final inspection. The final inspection will consist of a walk-through inspection of the project site. The prefinal inspection report will be used as a checklist with the final inspection focusing on the outstanding construction items identified in the prefinal inspection. Confirmation shall be made that outstanding items have been resolved.

D. Sampling Requirements

The sampling activities, sample size, sample locations, frequency of testing, acceptance and rejection criteria, and plans for correcting problems as addressed in the project specifications should be presented in the CQA plan.

E. Documentation

Reporting requirements for CQA activities shall be described in detail in the CQA plan. This should include such items as daily summary reports, inspection data sheets, problem identification and corrective measures reports, design acceptance reports, and final documentation. Provisions for the final storage of all records also should be presented in the CQA plan.

TASK XV: REPORTS

Respondent shall prepare plans, specifications, and reports as set forth in Tasks XII through Task XV to document the design, construction, operation, maintenance, and monitoring of the corrective measure. Such documentation shall consist of the following:

A. Progress

Respondent shall provide the EPA with signed, monthly progress reports during the design and construction phases and semi-annual progress reports for operation and maintenance activities containing:

1. A description and estimate of the percentage of the CMI completed;

2. Summaries of findings;

3. Summaries of changes made in the CMI during the reporting period;

4. Summaries of contacts with representatives of the local community, public interest groups or State government during the reporting period;

5. Summaries of problems or potential problems encountered during the reporting period;

6. Actions being taken to rectify problems;

7. Changes in personnel serving key functions during the CMI during the reporting period;

8. Projected work for the next reporting period; and

9. Copies of daily reports, inspection reports, and laboratory/monitoring data shall be retained at the facility during the CMI.

B. Draft

1. Respondent shall submit a draft Corrective Measure Implementation Program Management Plan as outlined in Task XII, Paragraph A;

2. Respondent shall submit draft Design Plans and Specifications, Design Reports, Cost Estimates, Project Schedules, Operation and Maintenance Plans, Health and Safety Plans as outlined above in Task XIII;

3. Respondent shall prepare Construction Quality Assurance (CQA) objectives as outlined in Task XIII, above, and submit a draft CQA Program Plan as outlined in Task XIV, above; and

4. Within 45 days of completion of construction, or as otherwise agreed to by the parties, Respondent shall submit a Draft Corrective Measure Implementation Report to EPA. This Report shall document that the project is consistent with the design specifications, and that the corrective measure is performing adequately. This Report shall consist of the following elements:

   a. Synopsis of the corrective measure and certification of the design and construction;

   b. Explanation of any modifications to the plans and why these were necessary for the project;

   c. Listing of the criteria, established before the corrective measure was initiated, for judging the functioning of the corrective measure and also explaining any modification to these criteria;

   d. Results of facility monitoring, indicating that the corrective measure will meet or exceed the performance criteria; and

   e. Explanation of the operation and maintenance (including monitoring) to be undertaken at the facility.

At the completion of the construction of the project, Respondent shall submit a CQA document report. This report should include all of the daily inspection summary reports, inspection summary reports, inspection data sheets, problem identification and corrective measure reports, block evaluation reports, photographic reporting data sheets, design engineers' acceptance reports, deviations from design and material specifications (with justifying documentation) and as-built drawings.

C. <u>Final</u>

Respondent shall finalize the Corrective Measure Implementation Program Plan, Design Plans and Specifications, Design Reports, Cost Estimates, Project Schedule, Operation and Maintenance Plan, Study Reports, Construction Quality Assurance Program Plan/Documentation and the Corrective Measure Implementation Report incorporating changes responsive to comments received on draft submissions.

Submissions Summary

A summary of the information reporting requirements related to the Corrective Measure Implementation Scope of Work is presented below:

Facility Submission	Due Date
Draft CMI Program Plan (Task XII)	Within 180 days of Respondent's receipt of written notice of selection of a remedy by EPA (unless otherwise agreed to by the parties)
Final CMI Program Plan (Task XII)	30 days after receipt of EPA's comments on Draft CMI Program Plan
Draft Design Approach (Task XIII A)	As approved in the Final CMI Program Plan
Final Design Approach (Task XIII A)	30 days after receipt of EPA's comments on Draft Design Approach
Design Phases (Task XIII H)	
-Preliminary Design (30% completion)	***
-Intermediate Design (60% completion)	***
-Prefinal Design (95% completion)	***
-Final Design (100% completion)	***
(Tasks XIII B through G)	
-Draft Submittals	***
-Final Submittals	***
Draft Construction Quality Assurance Plan (Task XIII F)	***

Final Construction Quality Assurance Plan	30 days after receipt of EPA's comments on Draft Construction Quality Assurance Plan
Construction of Corrective Measure(s)	As approved in the Final Design
Prefinal Inspection Report (Task XIV)	30 days after Prefinal Inspection
Draft CMI Report (Task XV)	Within 45 days of completion of construction, or as otherwise agreed to by the parties
Final CMI Report (Task XV)	60 days after receipt of EPA's comments on Draft CMI Report
Progress Reports for Tasks XII through XIV	Monthly
Progress Reports During Operation and Maintenance	Semi-Annually

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*** As approved in the Final Design Approach

ATTACHMENT IV

SCOPE OF WORK FOR INTERIM MEASURES

Task A: Interim Measures Workplan

Task B: Interim Measures Operation and Maintenance Plan

Task C: Plans and Specifications

SCOPE OF WORK FOR INTERIM MEASURES

PURPOSE

Interim measures are actions to control and/or eliminate releases of hazardous waste and/or hazardous constituents from a facility prior to the implementation of a final corrective measure(s). Interim measures must be used whenever possible to control or abate threats to human health and/or the environment, and such measures are intended to prevent or minimize the spread of contaminants while long-term corrective action alternatives are being evaluated.

SCOPE

The documents required for Interim Measures (IM) are, unless EPA specifies otherwise, an IM Workplan, an Operation and Maintenance Plan and IM Plans and Specifications. The scope of work (SOW) for each document is specified below. The SOW's are intended to be flexible documents capable of addressing both simple and complex site situations. If Respondent can justify, to the satisfaction of EPA, that a plan or portions thereof are not needed in the given site-specific situation, then EPA may waive that requirement.

The scope and substance of interim measures should be focused to fit the site-specific situation and be balanced against the need to take quick action.

EPA may require Respondent to conduct additional studies beyond what is discussed in the SOW's in order to support the IM program. Respondent will furnish all personnel, materials and services necessary to conduct the additional tasks.

Interim measures implementation documentation consists of three tasks:

Task A: Interim Measures Workplan
Task B: Interim Measures Operation and Maintenance Plan
Task C: Plans and Specifications

A. Interim Measures Workplan

Respondent shall prepare an IM Workplan that evaluates interim measure options and clearly describes the proposed interim measure(s), the key components or elements that are needed, describes the designer's(s') vision of the interim measure in the

form of conceptual drawings and schematics, and includes procedures and schedules for implementing the interim measure(s). The IM Workplan must be approved by the EPA prior to implementation. The IM Workplan must, at a minimum, include the following elements:

1. Introduction/Purpose

   Describe the purpose of the document and provide a summary of the project.

2. Conceptual Model of Contaminant Migration

   It is important to know where the contaminants are and to understand how they are moving before an adequate interim measure(s) can be developed. To address this critical question, Respondent must present a conceptual model of the site and contaminant migration. The conceptual model consists of a working hypothesis of how the contaminants may move from the release source to the receptor population. The conceptual model is developed by looking at the applicable physical parameters (e.g., water solubility, density, Henry's Law Constant, etc.) for each contaminant and by assessing how the contaminant(s) may migrate given the existing site conditions (geologic features, depth to groundwater, etc.). The phase (water, soil, gas, non-aqueous) and location where contaminants are likely to be found must be described. This analysis may have already been done as part of earlier work (e.g., Current Conditions Report). If this is the case, then a summary of the conceptual model with a reference to the earlier document must be provided.

3. Evaluation of Interim Measure Alternatives

   List, describe and evaluate interim measure alternatives that have the potential to stabilize the facility. Propose interim measures for implementation and provide the rationale for the selection. Document the reasons for excluding any interim measure alternatives.

4. Description of Interim Measures

   Qualitatively describe what the proposed interim measure is supposed to do and how it will function at the facility.

5. Data Sufficiency

   Review existing data needed to support the design effort and establish whether or not there is sufficiently accurate data available for this purpose. Respondent must summarize the assessment findings and specify any additional data needed

to complete the interim measure design. EPA may require or Respondent may propose that sampling and analysis plans and/or treatability study workplans be developed to obtain the additional data. Submittal times for any new sampling and analysis plans and/or treatability study workplans must be included in the project schedule.

6. Project Management

Describe the levels of authority and responsibility (include organization chart), lines of communication and a description of the qualifications of key personnel who will direct the interim measure design and implementation effort (including contractor personnel).

7. Project Schedule

The project schedule must specify all significant steps in the process, when any key documents (e.g., plans and specifications, operation and maintenance plan) are to be submitted to EPA and when the interim measure(s) is/are to be implemented.

8. Design Basis

Discuss the process and methods used to design all major components of the interim measure(s). Discuss the significant assumptions made and possible sources of error. Provide justification for the assumptions.

9. Conceptual Process/Schematic Diagrams

10. Site Plan Showing Preliminary Plant Layout and/or Treatment Area

11. Tables Listing Number and Type of Major Components with Approximate Dimensions

12. Tables Giving Preliminary Mass Balances

13. Site Safety and Security Provisions (e.g., fences, fire control, etc.)

14. Waste Management Practices

Describe the wastes generated by the construction of the interim measure(s) and how such wastes will be managed. Also discuss drainage and indicate how rainwater runoff will be managed.

15. Required Permits

List and describe the permits needed to construct the interim measure(s). Indicate on the project schedule when the permit applications will be submitted to the applicable agencies and an estimate of the issuance dates of the permit(s).

16. Sampling and monitoring activities may be needed for design and during construction of the interim measure(s). If sampling activity(ies) is/are necessary, the IM Workplan must include a complete sampling and analysis section that specifies the following information:

a. Description and purpose of monitoring tasks;
b. Data quality objectives;
c. Analytical test methods and detection limits;
d. Name of analytical laboratory;
e. Laboratory quality control (include laboratory QA/QC procedures in appendices);
f. Sample collection procedures and equipment;
g. Field quality control procedures:

* duplicates (10% of all field samples)
* blanks (field, equipment, etc.)
* equipment calibration and maintenance
* equipment decontamination
* sample containers
* sample preservation
* sample holding times (must be specified)
* sample packaging and shipment
* sample documentation (field notebooks, sample labeling, etc.);

h. Criteria for data acceptance and rejection; and
i. Schedule of monitoring frequency.

Respondent shall follow all EPA guidance for sampling and analysis. EPA may request that the sampling and analysis section be a separate document.

17. Appendices including:

Design Data - Tabulations of significant data used in the design effort;

Equations - List and describe the source of major equations used in the design process;

Sample Calculations - Present and explain one example calculation for significant calculations; and

Laboratory or Field Test Results.

18. Construction Quality Assurance Objectives

Respondent shall identify and document the objectives and framework for the development of a construction quality assurance program consisting of the following: responsibility and authority; personnel qualifications; inspection activities; sampling requirements; and documentation.

19. Health and Safety Plan

Respondent shall amend or revise the Health Safety Plan developed for the RCRA Facility Investigation to address the activities to be performed at the facility to implement the interim measure(s).

20. Community Relations Plan

Respondent shall prepare a plan for the dissemination of information to the public regarding interim measures activities and results.

B. Interim Measures Operation and Maintenance Plan

Respondent shall, unless EPA specifies otherwise, prepare an Interim Measures Operation and Maintenance (O&M) Plan that includes a strategy and procedures for performing operations, maintenance, and monitoring of the interim measure(s). An Interim Measures Operation and Maintenance Plan shall be submitted to EPA simultaneously with the Plans and Specifications. The O&M plan shall include the following elements:

1. Purpose/Approach

Describe the purpose of the document and provide a summary of the project.

2. Project Management

Describe the levels of authority and responsibility (include organization chart), lines of communication and a description of the qualifications of key personnel who will operate and maintain the interim measure(s) (including contractor personnel).

3. System Description

Describe the interim measure(s) and identify significant equipment.

4. Personnel Training

Describe the training process for O&M personnel. Respondent shall prepare, and include in the technical specifications governing treatment systems, contractor requirements for providing: a) appropriate service visits by experienced personnel to supervise the installation, adjustment, start up and operation of the treatment systems, and b) training to cover appropriate operational procedures once the start-up has been successfully accomplished.

5. Start-Up Procedures

Describe system start-up procedures including any operational testing.

6. Operation and Maintenance Procedures

Describe normal operation and maintenance procedures, including:

a. Description of tasks for operation;
b. Description of tasks for maintenance;
c. Description of prescribed treatment or operation conditions; and
d. Schedule showing frequency of each O&M task.

7. Replacement schedule for equipment and installed components

8. Waste Management Practices

Describe the wastes generated by operation of the interim measure(s) and how it/they will be managed. Respondent shall also discuss drainage and indicate how rainwater runoff will be managed.

9. Sampling and monitoring activities may be needed for effective operation and maintenance of the interim measure(s). If sampling activities are necessary, the O&M plan must include a complete sampling and analysis section which specifies the following information:

a. Description and purpose of monitoring tasks;
b. Data quality objectives;
c. Analytical test methods and detection limits;
d. Name of analytical laboratory;
e. Laboratory quality control (include laboratory QA/QC procedures in appendices);
f. Sample collection procedures and equipment;
g. Field quality control procedures:
    * duplicates (10% of all field samples)
    * blanks (field, equipment, etc.)
    * equipment calibration and maintenance

* equipment decontamination
* sample containers
* sample preservation
* sample holding times (must be specified)
* sample packaging and shipment
* sample documentation (field notebooks, sample labeling, etc.);

h. Criteria for data acceptance and rejection; and
i. Schedule of monitoring frequency.

Respondent shall follow EPA guidance for sampling and analysis. EPA may request that the sampling and analysis section be a separate document.

10. O&M Contingency Procedures:

a. Procedures to address system breakdowns and operational problems including a list of redundant and emergency back-up equipment and procedures;

b. Should the interim measure(s) suffer complete failure, Respondent shall specify alternate procedures to prevent release(s) or threatened release(s) of hazardous substances, pollutants or contaminants that may endanger public health and/or the environment or exceed cleanup standards; and

c. The O&M Plan must specify that, in the event of a major breakdown and/or complete failure of the interim measure(s) (including emergency situations), Respondent shall orally notify EPA within 24 hours of the event and will notify EPA in writing within 72 hours of the event. The written notification must specify what happened, what response action(s) is/are being taken and/or is/are planned, and any potential impacts on human health and the environment.

11. Data Management and Documentation Requirements

Respondent shall describe how analytical data and results will be evaluated, documented and managed, including development of an analytical data-base. Respondent shall state the criteria that will be used by the project team to review and determine the quality of data.

The O&M Plan shall specify that the Respondent collect and maintain the following information:

a. Progress Report Information

* Work Accomplishments (e.g., performance levels achieved, hours of treatment operation, treated and/or excavated volumes, concentration of contaminants in treated and/or excavated volumes, nature and volume of wastes generated,

etc.)

* Record of significant activities (e.g., sampling events, inspections, problems encountered, action(s) taken to rectify problems, etc.)

b. Monitoring and laboratory data;
c. Records of operating costs; and
d. Personnel, maintenance and inspection records.

EPA may require that Respondent submit additional reports that evaluate the effectiveness of the interim measure(s) in meeting the stabilization goal.

C. IM Plans and Specifications

Respondent shall, unless EPA specifies otherwise, prepare plans and specifications for the interim measure(s) that are based on the conceptual design but that include additional detail. The plans and specifications shall be submitted to EPA simultaneously with the Operation and Maintenance Plan. The design package must include drawings and specifications needed to construct the interim measure(s). Depending on the nature of the interim measure(s), many different types of drawings and specifications may be needed. Some of the elements that may be required are:

General Site Plans
Process Flow Diagrams
Mechanical Drawings
Electrical Drawings
Structural Drawings
Piping and Instrumentation Diagrams
Excavation and Earthwork Drawings
Equipment Lists
Site Preparation and Field Work Standards
Preliminary Specifications for Equipment and Material

General correlation between drawings and technical specifications is a basic requirement of any set of working construction plans and specifications. Before submitting the project specifications to EPA, Respondent shall:

a. Proofread the specifications for accuracy and consistency with the conceptual design; and

b. Coordinate and cross-check the specifications and drawings.