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ADMINISTRATIVE ORDER ON CONSENT DOCKET NUMBER RCRA-02-2000-7301  
ATLANTIC FLEET WEAPONS TRAINING FACILITY VIEQUES ISLAND PUERTO RICO  
01/01/2000  
U S EPA REGION II

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION II

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IN THE MATTER OF:

United States  
Department of the Navy

Atlantic Fleet Weapons  
Training Facility  
Vieques Island, PR

EPA ID Number  
PRD980536221

Respondent  
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ADMINISTRATIVE ORDER  
ON CONSENT

DOCKET No. RCRA-02-2000-7301

Proceeding under Section 3008(h),  
of the Resource Conservation and  
Recovery Act, as amended.

TABLE OF CONTENTS

I	PRELIMINARY STATEMENT.....	p. 1
II	PARTIES BOUND.....	p. 2
III	STATEMENT OF PURPOSE.....	p. 3
IV	FINDINGS OF FACT.....	p. 4
V	CONCLUSIONS OF LAW.....	p. 13
VI	ORDER: WORK TO BE PERFORMED BY NAVY.....	p. 14
VII	REPORTING REQUIREMENTS.....	p. 27
VIII	MINIMUM QUALIFICATIONS FOR PERSONNEL.....	p. 28
IX	PROJECT COORDINATOR/INFORMATION.....	p. 28
X.	QUALITY ASSURANCE/QUALITY CONTROL.....	p. 29
XI.	EPA APPROVALS and ADDITIONAL WORK.....	p. 30
XII.	PUBLIC ACCESS TO DOCUMENTS.....	p. 31
XIII.	PROTECTED INFORMATION.....	p. 32
XIV.	RECORD PRESERVATION.....	p. 33
XV.	RESERVATION OF RIGHTS.....	p. 34
XVI.	NON-RELEASE of OTHER CLAIMS and PARTIES.....	p. 35
XVII.	PUBLIC PARTICIPATION.....	p. 36
XVIII.	OTHER APPLICABLE LAWS.....	p. 37
XIX.	DISPUTE RESOLUTION.....	p. 37
XX.	AVAILABILITY OF INFORMATION/NOTIFICATION.....	p. 40
XXI.	TERMINATION AND SATISFACTION.....	p. 41
XXII.	SURVIVABILITY/PERMIT INTEGRATION.....	p. 42

XXIII. SUBSEQUENT MODIFICATION.....	p. 42
XXIV. NO FINAL AGENCY ACTION.....	p. 42
XXV. SEVERABILITY.....	p. 43
XXVI. FORCE MAJEURE.....	p. 43
XXVII. ENFORCEMENT.....	p. 44
XXVIII. WAVER OF SOVEREIGN IMMUNITY.....	p. 45
XXIX. FUNDING.....	p. 45
XXX. STIPULATED PENALTIES.....	p. 46
XXXI. EFFECTIVE DATE.....	p. 47
XXXII. CONSENT.....	p. 47
APPENDIX A “SCOPE OF WORK FOR A [FULL] RCRA FACILITY INVESTIGATION (RFI)” .....	p. A-1
APPENDIX B “SCOPE OF WORK FOR A CORRECTIVE MEASURES STUDY (CMS)” .....	p. B-1

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and Recovery Act, as amended.

I. Preliminary Statement

This Administrative Order on Consent ("Order") is being issued on consent to United States Department of the Navy, (which hereinafter may be referred to as "Navy" or "Vieques") pursuant to the Solid Waste Disposal Act as amended by the Resource Conservation and Recovery Act of 1976, ("RCRA"), the Hazardous and Solid Waste Amendments of 1984, ("HSWA") and the Federal Facilities Compliance Act of 1992 codified at 42 U.S.C. § 6901 et seq. ("the Act").

Section 3008(h) of the Act, 42 U.S.C. § 6928(h), authorizes the Administrator of the

United States Environmental Protection Agency ("EPA") or her delegatee, 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 Division of Environmental Planning and Protection ("DEPP"), Region II, by Region II Delegation Number 8-32, effective July 1, 1995.

The Navy has also indicated that it is entering into this Order pursuant to its own authorities under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), 42 U.S.C. § 9601 *et. seq.*; *specifically* 42 U.S.C. § 9620, the Defense Environmental Restoration Act (DERA), 10 U.S.C. § 2701 *et. seq.*, and Executive Order 12580.

## II. Parties Bound

1. This Order, and the responsibilities and obligations it imposes, shall apply to and bind the Navy and, in their official capacity, the Navy's employees, agents, successors and assigns.

2. Regardless of Navy's employ of, or contractual agreement with, any entity, the Navy remains ultimately liable for failure to carry out, or comply with, any term or condition imposed by this Order. It shall not be a defense to any violation of this Consent Order that the supervisory personnel, contractor, laboratory or consultant committing the violation was not informed of the requirements of this Consent Order

3. All contractual agreements entered into by Navy aimed at satisfying its responsibilities or obligations under this Order shall strictly comply with the terms and conditions of this Order. In addition, Navy shall, within one week of the effective date of this order and immediately, upon hiring, provide a copy of this Order, and any relevant attachments, to all Navy project management personnel and prime contractors, retained to conduct, monitor or perform any work pursuant to this Order. All Navy personnel and prime contractors shall perform such work in accordance with the requirements of this Consent Order.

4. Navy shall give notice, and a copy, of this Order to any successor in interest prior to any transfer of ownership or operation of the Facility (as defined in Section IV below) and shall notify EPA's designated contact thirty (30) days prior to any such transfer. Nothing in this Order shall be read to waive any requirements of the Community Environmental Response Facilitation Act, Public Law 102-426.

5. No change in the Navy's organizational form or in the ownership of the "Facility" (as defined in Section IV below) shall in any way alter or alleviate Navy's responsibility and obligation to carry out all the terms and conditions of this Order.

### III. Statement of Purpose

1. This Order is being issued to protect human health and the environment from releases of hazardous waste, as defined by Section 1004(5) of the Act, 42 U.S.C. § 6903(5), 40 C.F.R. Part 261.3, and hazardous constituents, as listed in 40 C.F.R. Part 261 Appendix VIII, at or from Navy's Facility.

2. This Order is intended as an interim instrument for implementing certain requirements of RCRA corrective action at certain areas of the Navy's facility pending a RCRA permit

becoming effective for the Navy's Facility.

3. To achieve this purpose, Navy shall, among other things: (a) establish a procedural framework and schedule for developing, implementing and monitoring appropriate response actions at the Facility; (b) perform Interim Measures ("IM"), if necessary, at the Facility to prevent or mitigate threats to human health and/or the environment; (c) perform a RCRA Facility Investigation ("RFI") to determine fully the nature and extent of any release of hazardous wastes, solid wastes and/or hazardous constituents at or from the Facility; (d) perform a Corrective Measures Study ("CMS") to identify and evaluate alternatives for corrective action necessary to prevent or mitigate migration or releases of hazardous wastes, solid wastes and/or hazardous constituents at and/or from the Facility; and (e) implement appropriate corrective measures/remedial actions ("CMI"). All such work shall be conducted in accordance with this Order.

#### IV. Findings of Fact

1. Navy is an Owner/Operator of a Hazardous Waste Treatment Facility:

Navy is a "generator" of "hazardous waste" and the "owner" and "operator" of an interim status hazardous waste "treatment" "facility", which constituted an "existing Hazardous Waste Management facility" (HWMF), as those terms are defined at 40 C.F.R. § 260.10. The Navy facility that is the subject of this Order and that is more fully described in IV. 6 below is located on Vieques Island, Puerto Rico (hereinafter referred to as "Vieques", "the Facility", "Navy's Facility", or "Navy").

2. Navy is a "Person":

Navy is a "person" as defined by Section 1004(15) of the Act, 42 U.S.C. § 6903(15).

Pursuant to Section 6001 of the Act, 42 U.S.C. § 6961, Navy is subject to all federal, state, interstate, and local requirements, both substantive and procedural, to the same extent as any person is subject to such requirements.

3. Notification:

Pursuant to Section 3010 of the Act, 42 U.S.C. § 6930, on August 12, 1980, Navy 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 requested the issuance of an EPA Hazardous Waste Identification number. In this notification, Navy identified itself as a generator of hazardous waste and an owner and operator of a hazardous waste treatment, storage, and disposal facility; and Navy established itself as the owner of the Facility as the term "owner" is used under RCRA.

4. Part A Permit Application:

The Facility filed its original Part A of the Hazardous Waste Permit Application on November 7, 1980, and revised Part A's on June 28, 1993, November 9, 1998, and April 13, 1999. The April 1999 Part A lists two hazardous waste treatment units, identified as X01 process units, which are open burning/open detonation units. The 1999 Part A lists the following hazardous wastes as being treated in the two X01 units at the facility:

- D003 - a solid waste exhibiting the characteristic of reactivity pursuant to 40 CFR § 261.23.
- D008 - a solid waste exhibiting the toxicity characteristic for lead pursuant to 40 CFR § 261.24.
- D009 - a solid waste exhibiting the toxicity characteristic for mercury pursuant to 40 CFR § 261.24.

5. Interim Status:

The facility filed its original Part A of the Hazardous Waste Permit Application on November 7, 1980, and pursuant to 40 CFR § 270.10(e) constituted an “existing Hazardous Waste Management facility” (HWMF). Therefore, pursuant to 40 CFR § 270.70 the facility is subject to the requirement to have a RCRA permit, and has operated as an HWMF under interim status authorization pursuant to 40 CFR § 270.70 through 40 CFR § 270.73, since November 1980 until the present.

6. Facility Description:

Vieques Island has a land area of approximately 33,000 acres, and is located in the Caribbean Sea approximately seven miles southeast of the east coast of the island of Puerto Rico. The Navy’s facility is located on the eastern one-third of Vieques Island. For the purposes of this Order, the Facility, pursuant to 40 CFR § 260.10, includes both the Atlantic Fleet Weapons Training Facility (AFWTF) comprised of 3,600 acres, and the adjacent and wholly contiguous Eastern Maneuver Area (EMA) comprised of 11,000 acres. Both are under the command of U.S. Naval Station Roosevelt Roads (NSRR). A third Navy activity, Naval Ammunition Storage Detachment (NASD) is located on Vieques Island, but under RCRA is not part of the Facility, since it is not contiguous, and is not subject to the terms and conditions of this Order. In total, the Navy owns approximately 22,600 of Vieques Island’s 33,000 acres.

The AFWTF, located on the far eastern tip of the island, provides facilities and schedules naval gunfire support and air-to-ground ordnance delivery training for Atlantic Fleet ships, NATO ships, air wings, and smaller air units from other allied nations and the Puerto Rican National Guard. The Fleet Marine Force, Atlantic, conducts training for Marine amphibious units,

battalion landing teams and combat engineering units in the Eastern Maneuver Area. On occasion, naval units of allied nations having a presence in the Caribbean and the Puerto Rican National Guard also utilize the Eastern Maneuver Area.

The training areas have been in continuous use since World War II when the Navy acquired title to the land. Within the Inner Range, the Atlantic Fleet's ships, aircraft and marine forces carry out training in all aspects of naval gunfire support, air-to-ground ordnance delivery, air-to-surface mine delivery, amphibious landings, small arms, artillery and tank fire, and combat engineering. As part of its normal operations, unexploded ordnance are periodically cleared from the AFWTF's "inner Range" and destroyed by open burning/open detonation (OB/OD) at the Facility. In addition, unserviceable military munitions are periodically received off-site from NASD and/or Naval Station Roosevelt Roads (NSRR) for treatment/disposal by OB/OD at AFWTF.

## II Solid Waste Management Units and Areas of Concern at the Facility

(a) A RCRA Facility Assessment (RFA), was completed for EPA on October 13, 1988 by A.T. Kearney, Inc. The 1988 RFA identified 11 Solid Waste Management Units (SWMUs) and 8 Areas of Concern (AOCs). An updated RFA was prepared for EPA by the Puerto Rico Environmental Quality Board (PREQB) on September 27, 1995 ("Updated RFA"). The 1995 Updated RFA identified the same 11 Solid Waste Management Units (SWMUs) and 8 Areas of Concern (AOCs) as the 1988 RFA; however, the designations of certain AOCs in the Updated RFA are different than those used in the 1988 RFA.

(b) Subsequent to the RFA and updated RFA, EPA has determined that four of the

“AOCs” in the RFA and Updated RFA (“AOC” B [also referred to as ”AOC 2” in parts of Updated RFA], “AOC C”, “AOC D”, and “AOC” E [also referred to as ”AOC 4” in parts of Updated RFA], are in-fact waste management units, and constitute SWMUs pursuant to 40 CFR § 264.101. Therefore, “AOC B” as listed in the 1988 RFA and the 1995 updated RFA, has been determined to be a SWMU, and is identified in this Order as SWMU #12. However, [formerly designated] “AOC C”, “AOC D”, and “AOC E” as listed in the 1988 RFA and 1995 Updated RFA, which have also been determined to be SWMUs, have been included as part of SWMU #4 for the purposes of this Order since they are all located inside Building 303 at Camp Garcia, which contains SWMU #4. Therefore, for the purposes of this Order, SWMU #4 includes the four waste management areas inside Building 303 at Camp Garcia. Also, “AOC H” as described in the 1988 RFA and 1995 Updated RFA, consists of two areas essentially contiguous with SWMUs #6 and #7 respectively; therefore, for the purposes of this Order any releases from areas described as “AOC H” in the RFA and Updated RFA have been included with those two SWMUs.

(c) Therefore, 12 SWMUs and 3 AOCs are defined at the Facility, and are listed in Tables 1 and 2 below:

**Table 1  
List of Solid Waste Management Units (SWMUs)**

<b>SWMU #</b>	<b>Description</b>
1	Camp Garcia Landfill (Eastern Maneuver Area)
2***	Fuels Off-Loading Site
3**	Waste Explosive Ordnance Detonation Area

<b>SWMU #</b>	<b>Description</b>
4 */***	Waste Areas of Building 303 (Camp Garcia), including: - Spent Battery Accumulation Area, - Catch Basin for Hydraulic Oil (ex "AOC C"), - Cleaning/Degreasing Basin (ex "AOC D"), and - Rags, absorbent and grease storage area (ex. "AOC E")
5***	Spent Battery Accumulation Area (Inner Range)
6***	Waste Oil and Paint Accumulation Area (Seabees Area at Camp Garcia). To include any releases from the adjacent "Lubricating Oil Storage Area" (formerly part of "AOC H")
7***	Waste Oil Accumulation Area (outside building 303 at Camp Garcia). To include releases from the adjacent "Lubricating Oil Storage Area" (formerly part of "AOC H").
8***	Waste Oil Accumulation Area (Inner Range)
9**	Explosive Ordnance Firing Range
10	Sewage Treatment Lagoons (Camp Garcia)
11**	Non-Explosive Ordnance Firing Range
12 */***	Solid Waste Collection Unit Area [ex "AOC B"]

\* "AOC B" as listed in the 1988 RFA and the 1995 updated RFA, has been determined to be a waste management unit which constitutes a SWMU, and is identified in this Order as SWMU #12. "AOC C", "AOC D", and "AOC E" as listed in the 1988 RFA and 1995 Updated RFA, have also been determined to be SWMUs, and since they are all located inside Building 303 at Camp Garcia, which also contains SWMU #4, they have been included as part of SWMU #4, which for the purposes of this Order includes all four waste management areas. Also, "AOC H" as described in the 1988 RFA and 1995 Updated RFA, consists of two areas essentially contiguous with SWMUs #6 and #7 respectively; therefore, areas described as "AOC H" have been included with those two SWMUs.

\*\* Active military range area, excluded from any corrective action requirements under the terms and conditions of this Order, pursuant to Section IV.7.(d).

\*\*\* Although the 1988 RFA and 1995 Updated RFA recommended no environmental sampling, EPA has subsequently determined that based on unit design and/or past operational practices, past releases of hazardous wastes and/or solid wastes and hazardous constituents are possible, and Phase 1 RFIs (Release Assessments) are warranted.

**Table 2**  
**List of Areas of Concern (AOCs)**

<b>AOC</b>	<b>Description</b>
A */**	Diesel Fuel Fill Pipe Area (Observation Post 1)
F */**	Rock Quarry (Camp Garcia)

AOC	Description
G */**	Pump Station and Chlorination Building at Sewage Lagoons (Camp Garcia)

\* As discussed previously, “AOC B” as listed in the 1988 RFA and 1995 Updated RFA, has been determined to be a SWMU, and is identified in this Order as SWMU #12. AOCs “C”, “D”, and “E”, as listed in the 1988 RFA and 1995 Updated RFA, have also been determined to be SWMUs, and since they are all located inside Building 303 at Camp Garcia, along with SWMU #4, they have been included in this Order as part of SWMU #4. Also, “AOC H” as described in the 1988 RFA and 1995 Updated RFA, consists of two areas essentially contiguous with SWMUs #6 and #7 respectively; therefore, any releases from areas described as “AOC H” have been included with those two SWMUs. To be consistent with the AOC terminology utilized in the 1988 RFA and 1995 Updated RFA, the designation of other AOCs has remained as in those two documents.

\*\* Although the 1988 RFA and 1995 Updated RFA recommended no environmental sampling, EPA has subsequently determined that based on unit design and/or past operational practices, past releases of hazardous wastes and/or solid wastes and hazardous constituents are possible, and that Phase 1 RFIs (Release Assessments) are warranted.

(d) Three of the SWMUs listed in Table 1 above, SWMUs #3 (Waste Explosive Ordnance Detonation Area), #9 (Explosive Ordnance Firing Range), and #11 (Non-Explosive Ordnance Firing Range) are within active military ranges, and are expressly excluded from any corrective action requirements under the terms and conditions of this Order.

8. Documentation of Release:

Since environmental sampling has not been previously implemented at the SWMUs and AOCs subject to the requirements of this Order, no definitive releases have been confirmed at those SWMUs or AOCs. However, soil sampling has been implemented at certain of the active military range areas (SWMUs #3 and #9) of the facility, which are excluded from the corrective action requirements of this Order, under Section IV.7.d, above. Soil samples were collected in 1991 by the Navy in areas of SWMU #3 (Waste Explosive Ordnance Detonation Area) and SWMU #9 (Explosive Ordnance Firing Range), and analyzed for the Toxicity Characteristics (“TC”) of 40 CFR § 261.24 utilizing the Toxicity Characteristics Leaching Procedure (“TCLP”). Results of that sampling are included in the June 28, 1993 RCRA Part B Hazardous Waste Permit Application submitted for the facility by the Navy.

Those results show that ten TC constituents (eight metals, plus benzene and chloroform), out of the possible 40 included under 40 CFR § 261.24, were detected. Those results were then

used to assess whether any statistically significant differences were observed between the detected soil concentrations of the Primary Impact Areas (“PIAs”) [i.e., the bombing/target areas of SWMU #9] and the open burning/open detonation (“OB/OD”) areas [i.e., SWMU #3]. Three of the ten detected constituents (benzene, chloroform, and selenium) were found to be present in the soils at the OB/OD areas (i.e., SWMU #3) of the range in greater mean concentrations than were present in soils at the PIA areas of the range (i.e., SWMU #9). This statistically significant difference indicates that releases of those three hazardous constituents had occurred to the soils at the OB/OD areas (i.e., SWMU #3) of the facility.

In addition, based on the design and/or past operating practices, or visual indications (staining, etc.), releases of hazardous or solid wastes and/or hazardous constituents to the environment, are indicated at certain SWMUs and AOCs subject to this Order. At SWMU #2, the Fuels Off-Loading Site, the 1988 RFA and 1995 updated RFA both infer that approximately 100,000 gallons of fuel were likely released to the land and sea during the 25 year period this site was utilized. At SWMU #6, the 1988 RFA and 1995 updated RFA report that spills of oil to the soil were observed at this SWMU, indicating a release(s) had (have) occurred. Also, at SWMU #7, the Waste Oil Accumulation Area, the 1988 RFA and 1995 updated RFA report that the soils at that SWMU were severely stained, and describe past practices which included digging up visually stained soil at the SWMU, further indicating that releases occurred. Similarly, staining is reported in the 1988 RFA and 1995 updated RFA for the “Lubricating Oil Storage Area,” which is classified as part of SWMU #7 for the purposes of this Order. Likewise, at AOC “A,” the Diesel Fuel Fill Pipe, the 1988 RFA and 1995 updated RFA describe soils surrounding the fuel fill pipe as being severely stained, indicating a release(s).

9. Exposure Pathways and Possible Adverse Human Health or Environmental Impacts:

A. Although groundwater and surface waters are rarely utilized for municipal drinking water supply on Vieques Island, information received from the Puerto Rico Department of Health (DOH) indicates that public water supply wells are located on Vieques Island, for emergency usage as municipal water supply wells when drinking water supplies are not available via the normal source, which since the late 1970's, is an undersea pipeline from the island of Puerto Rico.

The most recent usage of public back-up wells on Vieques for obtaining municipal water supplies is reported to have occurred in 1998 after Hurricane Georges. In addition, private, non-permitted wells may exist, and groundwater from such wells may be utilized for human consumption; however, no cases of this are presently documented. Therefore, a potential exposure pathway may be present. If private well users are identified, EPA Region II has agreed to conduct some testing of such wells as a precautionary measure.

B. In addition, although the Facility has restricted access, the Navy allows routine access by the public for recreational swimming, picnicking, and possible recreational fishing, crabbing, etc., at Blue and Red beaches, which are within the facility's boundaries. Therefore, other possible pathways for potential exposure to contaminants include:

- II human consumption of faunal species that bio-accumulate potentially released hazardous constituents, that may occur as a result of either on-site recreational fishing, crabbing, etc., by public citizens visiting the Navy's facility or by on-site Navy personnel, or via off-site recreational and/or possibly commercial fishing, crabbing, etc. in the surface waters surrounding the facility;
- II accidental ingestion of, or dermal contact with, potentially contaminated surface waters and/or potentially contaminated soils, by either on-site workers, or public citizens visiting the Navy's Facility for on-site recreational swimming and picnicking at beaches within the facility limits;
- II possible inhalation of potentially contaminated fugative dust, by on-site workers, recreational users visiting on-site, or off-site residents in communities adjoining the western portion of the facility or;
- II possible flora and fauna exposure to potentially contaminated soils.

C. Potential pathways for adverse impacts to the environment include:

- II discharge of potentially contaminated groundwater to the surface waters of the surrounding Caribbean Sea and the associated bays,
- IX direct transport of stormwater run-off potentially contaminated with hazardous waste and/or constituents and/or potentially contaminated soils, to the surface waters of the surrounding Caribbean Sea and the associated bays, and
- III. fugative transport of dust potentially contaminated with hazardous waste and/or constituents and/or contaminated soils, to the surface waters of the surrounding Caribbean Sea and the associated bays.

#### V. Conclusions of Law

Based on the Findings of Fact set out above, and the administrative record, the Regional Administrator has determined, as a matter of law, that:

- IV The Facility (as defined in Section IV, Subsection 6, above) has been authorized to operate under Section 3005(e) of the Act, 42 U.S.C. § 6925(e).
- II Navy is the operator of the Vieques Facility. Pursuant to Section 6001 of the Act, 42 U.S.C. § 6961, Navy is subject to all applicable hazardous waste requirements to the same extent as any "person" as defined in Section 1004(15) of the Act, 42 U.S.C. § 6903(15).
- II Navy is the owner of the Facility as owner and facility are defined under the Act.

- II Certain wastes found at the 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. Part 261.
5. There is or has been a release 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 deemed to be necessary to protect human health and/or the environment.

#### VI. Order: Work To Be Performed by Navy

Pursuant to Section 3008(h) of the Act, 42 U.S.C. §6928(h), Navy is hereby ordered and consents to perform the tasks and follow the schedule set forth in this Order to identify and investigate fully the nature, and extent of contamination at each SWMU and AOC subject to the requirements of this Order, and perform the necessary corrective measures studies, corrective measures implementation, and interim corrective measures. This program shall be implemented in accordance with the Act, its implementing regulations and relevant EPA guidance documents. Schedules contained in this Order establishing work-related deadlines which are expressed in terms of "days," shall refer to calendar days. Deadlines falling on federal holidays or weekends shall be understood to extend to the first subsequent business day. All work undertaken pursuant to this Order shall be performed in a manner consistent with, and in accordance with the specifications of the plans, reports, and schedules approved by EPA. In setting and modifying schedules developed pursuant to this Order, the Parties agree to make good faith efforts to accommodate federal fiscal constraints. Any deviations to the plans, reports and schedules are subject to EPA's approval prior to implementation.

#### A. INTERIM MEASURES ("IM") and NEWLY DISCOVERED RELEASES

1. If at any time during the pendency of this Order Navy obtains or discovers information concerning a release of any hazardous waste or hazardous constituent at or from the Facility into the environment in addition to or different from that described in Section IV, "FINDINGS OF FACT" above, or in the Administrative Record, Navy shall:

- II notify EPA verbally of such a determination within three days of such determination;
  - II notify EPA in writing within twenty-one calendar days of the determination, of the nature, extent, location and amount of such release, the source or suspected source of the release, the endangerment posed by such release, and any interim measures recommended to be taken to address such release;
  - II if the release is from, or suspected to be from, a unit or area not previously classified as a SWMU or AOC in Table 1 and 2 of Section IV.7 of this Order, that unit or area shall be classified as a SWMU if solid wastes are/were managed at that unit, or an AOC if the unit or area is not a SWMU;
  - II undertake any immediate actions as necessary, and/or, as appropriate propose an expedited removal action to EPA. Following consultation with EPA, if EPA approves the proposed expedited removal action, Respondent shall, unless EPA indicates otherwise, submit to EPA for its approval a workplan for the implementation of such expedited removal action. Upon approval by EPA, Respondent shall implement the action in accordance with the terms and schedules approved by EPA; and
- (e) report any immediate actions taken under (d) above and their results to EPA in writing within twenty-one (21) calendar days of completion of said actions, or sixty (60) days after receipt of

validated analytical data.

2. Based on the information submitted under (a), (b), and (c) and (e) above, any other information available, EPA may require the Navy to:

(a) submit a workplan, including a schedule for implementation, for [additional] environmental sampling and other investigations to fully characterize the nature and extent of the release reported under 1 above. Upon receipt of the workplan, EPA will either approve the investigation(s) recommended by the Navy, or make comments on the workplan and recommended investigation(s), or select an alternative investigation, including a schedule for implementation; and/or

(b) submit a workplan, including a schedule for implementation, for [additional] interim measure(s), if appropriate, to protect human health and the environment. Upon receipt of the workplan, EPA will either approve the interim measure(s) recommended by the Navy, or make comments on the workplan and recommended interim measure(s), or select an alternative interim measure, including a schedule for implementation.

3. Unless another schedule is approved by EPA in writing, the Navy shall submit any workplans required under 2 above within 60 days of EPA's written notification that such workplans are required. Following EPA's review of such workplans in accordance with Section XI and its written approval or modification of any workplans required under 2 above, including a schedule for implementation, the Navy will implement the selected environmental sampling and other investigations, and/or interim measure pursuant to the terms and requirements of the approved workplan.

4. Expedited Removal of Waste, Contaminated Material, and Contaminated Soil and Sediments:

In situations where there are releases or potential for releases which if not addressed

could result in further environmental degradation or where site/contamination characteristics lend themselves to effective measures designed to control or abate the spread of contamination, the Respondent may take actions necessary to mitigate risks from wastes, visibly impacted material, surface soil or surface sediments regardless of whether the wastes, visibly impacted material, surface soil or surface sediments are related to known releases from any of the SWMUs or AOCs at the facility.

a. Prior to taking such action, the Navy must notify EPA of the situation. The notification must include, at a minimum:

- IV Location of impacted areas;
- IV Estimated amount of waste, material\media impacted;
- IV Physical characteristics of the waste, material, soil, groundwater, sludge, or mixture;
- IV Chemical characteristics that describe main chemical components in the waste, material, and/or media, based on information available to the Navy;
- IV Description as to how waste, material, and/or media is to be remediated and\or disposed of.

b. Following consultation with EPA, if EPA approves the proposed action, the Navy shall, unless EPA indicates otherwise, submit to EPA for its approval a workplan for the implementation of such action. Upon approval by EPA, the Navy shall implement the action in accordance with the terms and schedules approved by EPA.

c. Within thirty (30) calendar days after completion of the implementation of actions referenced above, the Navy must submit to EPA a sampling plan. The purpose of a sampling plan will be to confirm that impacted areas have been remediated to the cleanup levels or to delineate the extent of any remaining contamination or need for further investigations for impacted areas. The sampling plan must conform to the

requirements for sampling and analysis referenced in this Order and may be incorporated into other on-going investigations of the facility.

d. All transportation and disposal of waste and contaminated material, soil and sediments must comply with all applicable federal and commonwealth requirements.

## II. RCRA FACILITY INVESTIGATION ("RFI")

1. Within sixty (60) calendar days of the effective date of this Consent Order, Navy shall submit to EPA for its review and approval, a report on the Description of Current Conditions at the Facility covering all of the SWMUs and AOCs listed in Tables 1 and 2 of Section IV.7 except for SWMUs #3, #9, and #11, which are excluded from the corrective action requirements of this Order under Section IV.7.(d) of this Order. The report submitted shall address all items listed under Task I of Appendix A [Scope of Work for a RCRA Facility Investigation (RFI)] of this Order.

2. Within sixty (60) calendar days of EPA's written approval of the Description of Current Conditions report required under 1 above, but in no event earlier than 120 days from the effective date of this Order, Navy shall submit to EPA for its review and approval, a Workplan for a Phase 1 RCRA Facility Investigation ("Phase 1 RFI Workplan"), also referred to as a "Release Assessment", for each SWMU and AOC listed in Tables 1 and 2 of Section IV.7 of this Order, except for SWMUs #3 (Waste Explosive Ordnance Detonation Range), #9 (Explosive Ordnance firing Range), and #11 (Non-Explosive Ordnance Firing Range) which are excluded from the corrective action requirements of this Order under Section IV.7.(d) of this Order. These "Phase 1 RFI" ("Release Assessment") workplan(s) are to be prepared in accordance with applicable EPA guidance, including the "Release Assessment Scope of Work" set forth on pages 18 and 19 of the Final RCRA Corrective Action Plan (EPA publication EPA 520-R-94-004). In preparing these Workplans, the Navy will prepare one common workplan for all SWMUs and AOCs subject to this Order, and will prepare site specific supplements dealing with individual SWMUs and AOCs

to that common workplan. A schedule for implementation of the Phase 1 RFI at each SWMU or AOC where required shall be included as part of the workplan. Upon receipt, EPA shall, in accordance with the procedures in Section XI, review and approve, or comment upon the Phase 1 RFI Workplans. Upon EPA's final approval of the "Phase 1 RFI" ("Release Assessment") workplan(s) including schedule(s) for implementation, that (those) workplan(s) will be incorporated into this order as Appendix C.

3. The Phase 1 RFI Workplan shall be designed to determine whether or not releases of hazardous wastes, solid wastes, or hazardous constituents have occurred from each SWMU and AOC subject to the requirements of this Order. The Phase 1 RFI Workplans shall document the procedures Navy shall use to conduct those investigations necessary to: (a) identify the potential pathways of contaminant migration; (b) determine whether or not releases of hazardous wastes, or hazardous constituents have occurred; (c) identify actual or potential human and/or ecological receptors; and (d) support either a no further action recommendation, or a determination that a Full RFI is required. A schedule for implementation shall be included as part of the workplan. Unless otherwise agreed, priority will be given to those SWMUs or AOCs with the highest risk.

4. The Phase 1 RFI Workplan shall include: (A) a Description of Current Conditions for each SWMU and AOC subject to this Order; (B) a Project Description/Data Collection Plan; (C) a Data Management Plan; (D) a Quality Assurance/Quality Control (QA/QC) Project Plan; (E) a Health and Safety Plan; (F) a Community Relations Plan; (G) an implementation schedule; and (H) a reporting schedule, which shall provide for the submission of quarterly progress reports, and a draft and final RFI report.

5. Upon receipt of EPA approval of the Phase 1 RFI Workplan, Navy shall implement the EPA-approved Phase 1 RFI Workplan in accordance with the terms and schedule contained therein. Within ninety (90) days of completion of implementation of all work required under the Phase 1 RFI Workplan, Navy shall submit to EPA for review and approval a draft Final Phase 1 RFI Report, unless an alternative schedule for submission has been set in the EPA-approved

Phase 1 RFI Workplan. The draft Final Phase 1 RFI Report shall contain a recommendation for each SWMU and AOC investigated of either a no further action determination, or a determination that a Full RFI is required.

6. Following EPA's review of the final Phase 1 RFI report, and EPA's written notification that a Full RFI is required in accordance with Section XI of this Order, the Navy shall submit within 90 days following its receipt of EPA's written notification, workplans for a Full RFI ("Full RFI Workplans") for all SWMUs and AOCs which EPA indicates require a Full RFI, based on the Phase 1 RFI results.

7. The Full RFI Workplan(s) shall be designed to determine the presence, magnitude, extent, direction, and rate of movement of any hazardous wastes, solid wastes or hazardous constituents from each SWMU or AOC where a Full RFI is required. Unless an omission is mutually agreed upon by both Navy and EPA, the Full RFI Workplans shall address all items included under Appendix A [Scope of Work for a RCRA Facility Investigation (RFI)] of this Order, including: (A) a Project Management Plan; (B) a Data Collection Quality Assurance Plan; (C) a Data Management Plan; (D) a Health and Safety Plan; (E) a Quality Assurance/Quality Control (QA/QC) Project Plan; a (F) a Community Relations Plan; and (G) an implementation schedule and reporting schedule; and shall provide for the submission of quarterly progress reports, a draft and final RFI report. The Full RFI Workplan(s) shall document the procedures Navy shall use to conduct those investigations necessary to: (a) characterize the potential pathways of contaminant migration; (b) characterize the source(s) of contamination; (c) define the degree and extent of contamination; (d) identify actual or potential human and/or ecological receptors and assess the risk to such receptors, where exposure pathways are complete; and (e) support the development of alternatives from which a corrective measure(s) will be selected by EPA, if required. Upon EPA's review in accordance with Section XI and its final approval of the "Full RFI Workplan(s)", including schedule(s) for implementation, that (those) workplan(s) will be incorporated into this order as Appendix D.

8. Upon receipt of EPA approval of the Full RFI Workplan(s), Navy shall implement the EPA-approved Workplan(s) in accordance with the terms and schedule contained therein. Within ninety (90) days of completion of implementation of all work required under the Full RFI Workplan(s), Navy shall submit to EPA for review and approval a draft Final RFI Report(s), unless an alternative schedule for submission has been set in the EPA-approved Full RFI Workplan(s).

9. For any SWMUs and AOCs that EPA has determined to require a Full RFI, based on approval of the final Phase 1 RFI report for that SWMU or AOC, submission of Full RFI Workplan(s) for those SWMUs or AOCs shall be required pursuant to Section VI.B.6, regardless of the completion or approval status of the Phase I RFI at other SWMUs or AOCs, unless EPA approves in writing a delay in submission of the Full RFI Workplan(s). Likewise, implementation of the requirements of the Full RFI Workplan(s) for those SWMUs or AOCs shall commence in accordance with the requirements and schedule contained in the EPA-approved Full RFI Workplan(s) for those SWMUs and AOCs, regardless of the completion or approval status of the Phase I RFI Final Report at other SWMUs or AOCs, unless EPA approves in writing a delay.

#### C. CORRECTIVE MEASURES STUDY ("CMS") PLAN

1. Following EPA's written approval of the RFI Final Report, EPA shall notify the Navy in writing should a CMS be required for any of the SWMUs or AOCs investigated. This notice shall identify the hazardous constituent(s) which have exceeded health based levels, using a site-specific risk assessment or other appropriate, established EPA guidance, as well as those which have been determined to threaten human health and the environment given site specific exposure conditions or due to additive exposure risk. The notification shall specify target cleanup levels for hazardous constituents detected in each medium of concern, and may also specify corrective measure alternatives to be evaluated by the Navy during the CMS.

2. EPA may require a Corrective Measures Study ("CMS") under the following conditions:
  - (a) If the concentrations of hazardous constituents in groundwater, surface water/sediment, soil, or air exceed their corresponding individual health based levels;  
or
  - (b) If the concentrations of hazardous constituents in groundwater, surface water/sediment, soil, or air do not exceed individual health based levels, but still pose a threat to human health or the environment, given site-specific exposure conditions.
  
3. Within sixty (60) calendar days after the notification required by Section VI.C.1 of this Order, the Navy shall submit to EPA for its review and approval a CMS Plan and Task I report, based on Appendix B of this Order, "Scope of Work for a Corrective Measure Study".
  - (a) The CMS Plan shall provide:
    - (i) A description of the general approach to investigating and evaluating potential corrective measures;
    - (ii) A definition of the overall objectives of the study;
    - (iii) The specific plans for evaluating corrective measures to ensure compliance with corrective measure standards;
    - (iv) The schedule for conducting the study; and
    - (v) The proposed format for the presentation of information.

- (b) The CMS Plan must address, at a minimum, all necessary activities to complete Tasks II and III of Appendix B, “Scope of Work for a Corrective Measure Study”, of this Order.

4. No later than thirty (30) calendar days after the Navy has received written approval from EPA for the CMS Plan, the Navy shall begin to implement the CMS according to the schedule specified in the approved CMS Plan.

5. The CMS will be considered complete upon completion of Tasks I through VI of the Appendix B, “Scope of Work for a Corrective Measure Study”, of this Order.

6. Within forty-five (45) calendar days after the completion of the CMS, the Navy shall submit for EPA approval a draft CMS Final Report. The draft CMS Final Report (Task VI) must address, at a minimum, all items necessary to demonstrate completion of Task II and III required by the CMS Scope of Work included in Appendix B, “Scope of Work for a Corrective Measure Study”, of this Order. The draft CMS Final Report shall:

- (a) Summarize the results of the investigations and, if applicable, of any bench-scale or pilot tests conducted;
- (b) Provide a detailed description of the corrective measures evaluated and include an evaluation of how each corrective measure alternative meet the clean-up standards set;
- (c) Present all information gathered under the approved CMS Plan;  
and

IV. Contain any additional information to support the final

corrective measure selection process.

D. CORRECTIVE MEASURES SELECTION

- 1) Based on the draft CMS Final Report, EPA may require the Navy to evaluate additional corrective measure alternatives or particular elements of one or more the alternatives evaluated as part of the CMS.
- 2) Based on the results of the documents submitted pursuant to requirements under Sections VI.B [the RFI], and VI.C [the CMS] of this Order, and any further evaluations of additional corrective measure alternatives required under Section VI.D.1 above, EPA shall select the corrective measure(s) that will, at a minimum:
  - (a) Be protective of human health and the environment;
  - (b) Control the source(s) of release(s) so as to reduce or eliminate, to the maximum extent practicable, further releases of hazardous waste, including hazardous constituents, that might pose a threat to human health and the environment; and
  - (c) Meet all other applicable requirements of RCRA.
- 3) In selecting the corrective measure(s) to be implemented, EPA shall consider the following evaluation factors, as appropriate:
  - (i) Long-term reliability and effectiveness. Any potential corrective

measure(s) may be assessed for the long-term reliability and effectiveness it affords, along with the degree of certainty that the corrective measure(s) will prove successful. Factors that shall be considered in this evaluation include:

- (1) Magnitude of residual risks in terms of amounts and concentrations of hazardous waste, including hazardous constituents, remaining following implementation of the corrective measure(s), considering the persistence, toxicity, mobility and potential to bioaccumulate of such hazardous wastes, including hazardous constituents;
  - (2) The type and degree of long-term management required, including monitoring, operation and maintenance;
  - (3) Potential for exposure of humans and environmental receptors to remaining hazardous wastes, including hazardous constituents, considering the potential threat to human health and the environment associated with excavation, transportation, redisposal or containment;
  - (4) Long-term reliability of the engineering and institutional controls, including uncertainties associated with land disposal of untreated hazardous wastes, including hazardous constituents, and residuals; and
  - (5) Potential need for replacement of the corrective measure(s).
- (ii) Reduction of toxicity, mobility and volume. A potential remedy(ies) may be assessed as to the degree to which it employs treatment that reduces toxicity, mobility or volume of hazardous wastes and/or hazardous constituents.

Factors that shall be considered in such assessments include:

- (1) The treatment processes that the corrective measure(s) employs and materials it would treat;
  - (2) The amount of hazardous wastes, including hazardous constituents, that would be destroyed or treated;
  - (3) The degree to which the treatment is irreversible;
  - (4) The residuals that will remain following treatment, considering the persistence, toxicity, mobility and propensity to bioaccumulate of such hazardous wastes, including hazardous constituents; and
  - (5) All concentration levels of hazardous wastes, including hazardous constituents in each medium that corrective measure(s) must achieve to be protective of human health and the environment.
- (iii) The short-term effectiveness of a potential corrective measure(s) may be assessed by considering the following:
- (1) Magnitude of reduction of existing risks;
  - (2) Short-term risks that might be posed to the community, workers, or the environment during implementation of such a corrective measure(s), including potential threats to human health and the environment associated with excavation, transportation, and redisposal or containment; and

(3) Time until full protection is achieved.

(iv) Implementability. The ease or difficulty of implementing a potential corrective measure(s) may be assessed by considering the following types of factors:

(1) Degree of difficulty associated with constructing the technology;

(2) Expected operational reliability of the technologies;

(3) Need to coordinate with and obtain necessary approvals and permits from other agencies;

(4) Availability of necessary equipment and specialists;

(5) Available capacity and location of needed treatment, storage, disposal services; and

(6) Requirements for removal, decontamination, closure, or post-closure of units, equipment, devices or structures that will be used to implement the corrective measure(s).

(v) Cost. The types of costs that may be assessed include the following:

(1) Capital costs;

(2) Operational and maintenance costs;

(3) Net present value of capital, and operation and maintenance costs;  
and

(4) Potential future corrective action costs.

E. CORRECTIVE MEASURE(S) IMPLEMENTATION

1. Upon selection of the corrective measure(s) to be implemented as the final remedy, EPA will prepare a Statement of Basis for public notice to solicit public review and comment. The Statement of Basis will identify the proposed final corrective measure(s) selected and describe other alternatives that were evaluated in in the CMS report.

2. Following completion of Public Notice and Public Comment on the Statement of Basis regarding the proposed final corrective measure(s), this Order may be amended, as necessary, to implement the selected final corrective measure(s). Any modification of this Order shall specify the selected corrective measure(s) and include, at a minimum, the following:

- (i) Description of all technical features of the corrective measure(s) that are necessary for achieving the standards for corrective measure(s) established under Section VI.D of this Order, including length of time for which compliance must be demonstrated at specified points of compliance;
- (ii) All concentration levels of hazardous constituents in each medium, selected by the EPA, that the corrective measure(s) must achieve to be protective of human health and the environment;
- (iii) All requirements for achieving compliance with these concentration levels;

- (iv) All requirements for complying with the standards for management of wastes;
- (v) Requirements for removal, decontamination, closure, or post-closure of units, equipment, devices or structures that will be used to implement the corrective measure(s);
- (vi) A schedule for initiating and completing all major technical features and milestones of the corrective measure(s); and
- (vii) Requirements for submission of reports and other information.

#### F. WESTERN PERIMETER “BASELINE” GROUNDWATER INVESTIGATION

1. Within sixty (60) days of the effective date of this Order, the Navy shall submit to EPA, for its review and approval, a draft workplan for implementation of a “baseline” groundwater investigation program (“the groundwater baseline workplan”) along the western perimeter of the Navy’s Facility. The groundwater baseline workplan shall be designed to establish baseline groundwater quality, regional groundwater flow patterns along the western perimeter of the Navy’s Facility, and to determine whether activities at the Navy’s Facility have impacted groundwater at the western perimeter of the Facility, and if such impacts are indicated, are they currently, or in the future, likely to migrate off-site into the non-Navy owned areas of Vieques Island. The groundwater baseline workplan shall be in conformance with the following:

- a) the conceptual outline given in the Navy’s (Mr. Christopher Penny’s) letter of November 12, 1998 to Ms. Nicoletta DiForte of EPA,
- b) EPA Region 2’s Standard Operating Procedure “Groundwater Sampling Procedure Low Stress Purging and Sampling” (Draft Final dated November 4, 1997, or

subsequent edition), and

c) relevant EPA guidance documents such as “Handbook Ground Water, Volume I: Ground Water and Contamination”, September 1990 (EPA/625/6-90/016a) and “Handbook Ground Water, Volume II: Methodology”, July 1991 (EPA/625/6-90/016b), and/or “RCRA Ground-Water Monitoring: Draft Technical Guidance (EPA/530-R-93-001).

2. Within sixty (60) days of EPA’s written approval of the Final groundwater baseline workplan, or an alternative commencement date approved by EPA in the Final groundwater baseline workplan, the Navy shall commence implementation of that workplan.

3. Within 90 days of completion of all tasks in the approved Final groundwater baseline workplan, or an alternative date approved by EPA in the Final groundwater baseline workplan, the Navy shall submit to EPA, for its review and approval, a draft Final Report.

4. If the Navy wishes to submit documentation of work previously implemented, for usage in satisfying part or all of the above requirements of Section VI.F of this Order, such work must be submitted to EPA for its review and approval within sixty (60) days of the effective date of this Order, or an alternative date approved by EPA in writing. Subsequent to the Navy’s submission to EPA of the documentation on previously implemented work, if any, EPA shall notify the Navy in writing whether any or all of the submitted documentation on previously implemented work is acceptable in satisfying part or all of the above requirements of Section VI.F of this Order.

## VII. Reporting Requirements

1. The Navy will submit to EPA for its review and approval, in accordance with the procedures in Section XI, all documents required to be submitted under Section VI, such document shall hereinafter in this Section be referred to as "Submissions". However, the

quarterly progress reports (“Quarterly Progress Reports”), required under Section VII.2, are not subject to EPA approval. Upon completion of its review, except for the Quarterly Progress Reports, EPA shall either approve the Submission in writing, or specify in writing any deficiencies in the Submission.

2. Beginning with the first day of the fourth full month following the effective date of this Consent Order, and every three months thereafter, on the first day of the month, throughout the period that this Order is effective, Navy shall provide EPA with “quarterly progress reports”. The quarterly progress reports shall address the current status of work ongoing or planned for the Facility pursuant to the relevant approved Scope(s) of Work and Workplans developed under the terms of this Order. EPA may comment on the quarterly progress reports; however, they are not subject to approval or disapproval by EPA.

3. Any reports, plans, specifications or schedules, submitted pursuant to, or required by this Order, are hereby incorporated by reference into this Order on the date EPA's approval is received by Navy or the dispute resolution proceeding in Section XIX concerning such submittal, if any, has been concluded with notice to Navy. Prior to this approval determination or dispute resolution determination, no plan, report, specification or schedule shall be construed as a final approved plan. Oral advice, suggestions, or comments given by EPA and EPA's representatives shall not constitute an official approval, nor shall any oral approval or oral assurance of approval be considered binding.

#### VIII. Minimum Qualifications For Personnel

All work performed by Navy pursuant to this Order shall be under the direction and supervision of an individual(s) who has demonstrated experience and expertise in hazardous waste investigations and remediations. Before any work is performed, Navy shall notify EPA in writing giving the name, title and qualifications of the supervisory personnel and contractors or subcontractors and their key personnel to be used in carrying out the terms of this Order. In addition, Navy shall ensure that when necessary, it shall use licensed individuals for performing any work required by this Order.

Nothing herein shall be interpreted to affect or supersede Navy's authority over its personnel or contracting actions.

#### IX. Project Coordinator/Information

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

2. Unless otherwise specified, reports, correspondence, approvals, disapprovals, notices, or other submissions relating to or required under this Order shall be in writing and originals shall be sent as follows:

3 copies to: Mr. Raymond G. Basso  
Chief, RCRA Programs Branch  
U.S. EPA, Region II  
290 Broadway, 22nd Floor  
New York, N.Y. 10007

1 copy to: Mr. Carl A. Soderberg  
United States Environmental Protection Agency  
Caribbean Environmental Protection Division  
Centro Europa Building, Suite 417  
1492 Ponce de Leon Avenue  
Santurce, Puerto Rico 00907-4127

1 copy to: Puerto Rico Environmental Quality Board  
Attention Mr. Israel Torres  
Director, Land Pollution Regulation Program  
National Plaza Building  
431 Ponce De Leon Avenue  
Hato Rey, PR 00917

EPA may also request that additional copies be sent directly to other offices of EPA, EQB, or EPA contractors.

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

#### X. Quality Assurance/Quality Control

1. All sampling, monitoring, analytical, and chain-of-custody plans shall be developed in accordance with current EPA guidance. The Navy shall conduct a quality assurance program to ensure that the analytical data obtained are technically accurate and statistically representative. The quality assurance program shall be in accordance with Section 10 of Test Methods for Evaluating Solid Waste: Physical/Chemical Methods (EPA Publication SW-846, Third Edition, November 1986, as amended by Updates I (July 1992), II (September 1994), IIA (August 1993), and IIB (January 1995), and any subsequent updates), and Region 2's current "Laboratory Data Validation, Functional Guidelines for Evaluating Organics Analyses" and "Evaluation of Metals Data for the Contract Laboratory Program", or an alternative quality assurance program, subject to prior EPA written approval.

2. Any laboratory used by Navy to perform chemical analysis pursuant to this Order must be certified under EPA's National Contract Laboratory Program ("CLP"), or the Navy must obtain prior written approval from EPA for usage of a non-CLP laboratory by Navy to perform chemical analysis pursuant to this Order. Navy shall ensure that EPA personnel and authorized representatives have access to the laboratories and personnel performing any analyses. In the event that EPA or its representatives cannot satisfactorily obtain access to the laboratories for any reason for the purposes of auditing protocols and technical proficiency, then EPA shall so inform the Navy and the Navy shall, as soon as practicable thereafter, substitute another CLP certified, or EPA approved, laboratory which provides access in a manner deemed satisfactory to EPA.

#### XI. EPA APPROVALS and ADDITIONAL WORK

1. Unless otherwise specified, EPA shall review any plan, report, specification or schedule submitted pursuant to, or required by this Order, and provide EPA's written approval or disapproval, with comments and/or modifications, to the Navy. Navy may request, in the cover letters to its submittals, that EPA provide Navy with written approval or disapproval, with comments and/or modifications, within a specified period of time, not to be less than ninety (90) days. Within the specified period of time, EPA shall either: (1) provide Navy with written approval or disapproval, with comments and/or modifications; or (2) notify Navy when EPA expects to provide its approval or disapproval, with comments and/or modifications. EPA will

notify Navy whenever additional time is needed to provide its approval or disapproval, with comments and/or modifications, of any submittals required pursuant to this Order. The Parties agree that if during EPA's review of any submittals by Navy required by this Order, Navy's funding expires for work related to that submittal, then such expiration may constitute a delay under Section XXVI of this Order until such time as funding is secured, provided that Navy pursues all necessary funding at all times with due diligence.

Within fifteen (15) days of Navy's receipt of EPA's approval or disapproval, Navy may request a meeting with EPA to discuss the approval or disapproval. Within thirty (30) days of such meeting, or if no meeting is requested, within forty-five (45) days of receipt of EPA's approval or disapproval, Navy shall either: (1) notify EPA of its intention to amend or modify the submission to incorporate all of EPA's comments and proposed modifications and to submit the amended submittal to EPA within thirty (30) days thereafter or according to a mutually agreed schedule; or (2) provide EPA with a written notice of dispute, setting forth Navy's position, any actions which Navy considers necessary to resolve the dispute, and the basis for Navy's position. Any such written notice of dispute shall be subject to the dispute resolution procedures as set forth in Section XIX of this Order.

2. As part of the review of any workplan, report, specification or schedule submitted pursuant to, or required by this Order, EPA or Navy may determine that certain tasks and deliverables required pursuant to Section VI (Work to be Performed) of this Order including, but not limited to, the RFI, Interim Measures, Corrective Measures Study, Corrective Measures, and the "Western Perimeter Baseline Groundwater Investigation", may require additional work not identified in the approved workplan.

(a) If EPA determines that such additional work is necessary, EPA shall identify, in writing, the additional work required and shall specify the reasons for that determination, and the time period during which the additional work shall be performed.

(b) Within fifteen (15) calendar days after the receipt of such request, Navy shall have the opportunity to meet or confer with EPA to discuss the additional work requested, and if it deems it necessary it shall within thirty (30) calendar days invoke the dispute resolution provisions of this Order.

(c) In the event that Navy agrees to perform the additional work, such work shall be performed in accordance with the terms of this Order.

(d) Any additional work performed by Navy, whether at the request of EPA under (a) above, or voluntarily by the Navy, shall be subject to review and approval by EPA under the terms of this Order.

3. Any noncompliance with an EPA approved document or an EPA determination under the dispute resolution provision of this Order constitutes noncompliance with this Order.

#### XII. Public Access to Documents

Navy may assert, pursuant to 40 C.F.R. §2.203(b), a confidentiality claim, if appropriate, covering part or all of the information required by this Order. Such an assertion shall be adequately substantiated (e.g., data or other information related to facility production methods or processes). Information determined to be confidential by EPA and will be afforded the protection specified in 40 C.F.R. Part 2, Subpart B. If no such claim accompanies this information when it is submitted to EPA, it may be made available to the public by EPA, without further notice to Navy. No confidentiality claim shall be made with regard to any analytical data. EPA agrees that any information Navy submits to EPA under this Order that is sought pursuant to a request under the Freedom of Information Act, 5 U.S.C. § 552, *et seq.* shall be handled in accordance with the provisions of 40 C.F.R. § 2.111.

#### XIII. Protected Information

Any dispute concerning EPA access to national security information (“classified information”), as defined in Executive Order 12356, shall be resolved in accordance with Executive Order 12356 and 32 C.F.R. Part 159, including the opportunity to demonstrate that

EPA representatives have proper clearances and a need to know, appeal to the Information Security Oversight Office, and final appeal to the National Security Council.

Upon receipt from EPA of a request to meet with the classifying officer regarding access to classified information, the Navy shall, within ten (10) calendar days of such request, notify the requesting party of the identity of the classifying officer and the level of classification of the information sought. If the document was classified by the Navy, the classifying officer and the representative of the requesting Party shall meet within twenty-one (21) calendar days following receipt of the request.

The purpose to the meeting shall be to seek a means to accommodate the requesting Party's request for access to information without compromising national security or violating security regulations. If no resolution is reached at the meeting, the Navy shall notify the requesting Party of the classifying officer's decision within fourteen (14) calendar days following the meeting. Failure to render a timely decision shall be construed as a denial which is appealable in accordance with 32 C.F.R. Part 159. Failure to respond is subject to dispute resolution under this Agreement.

Nothing in this subsection is intended to, or should be construed as, superseding any law, regulation, or promulgated Navy directive regarding access to, release of, or protection of national security information.

#### XIV. Record Preservation

1. Navy shall preserve, during the pendency of this Order and for at least seven (7) years after its termination, all data, records and documents in its possession or in the possession of its divisions, employees, agents or consultants or contractors, which data, records and documents relate in any way to this Order, (or to hazardous waste management practices and/or disposal at its facility).
2. Navy shall, within five (5) days of the effective date of this Order or of retaining or employing an agent(s), consultant(s) or contractor(s), whichever comes second, make a good faith effort to enter into an agreement, to be confirmed in writing with its agent(s), consultant(s) and/or contractor(s) specifying that they will be required to maintain and preserve during the pendency of this Order and for at least seven (7) years after its termination, all records and

documents within their respective possession that relate in any way to this Order or to hazardous waste management practices and disposal at the facility. Navy shall send to EPA copies of documents indicating all such good faith efforts.

3. Except where Navy, and EPA otherwise agree, subsequent to the termination of the aforementioned seven (7) year period, Navy shall provide written notification to EPA sixty (60) days prior to the destruction of any data, records or documents that relate in any way to this Order, its implementation, or to hazardous waste management practices and/or disposal at its facility. At EPA's request, Navy shall then make such records available to EPA for inspection and/or EPA's retention or shall provide copies of any such records to EPA prior to discarding.

4. Navy shall make a good faith effort to preserve all documents pertaining to this Order in a centralized location to afford ease of access by EPA or its representatives. Where Navy finds such a requirement impossible, Navy shall minimize the number of locations used and shall maintain in a central location a list detailing the location of such documents.

5. All data, information, and records concerning, created for, or maintained by the Navy, in connection with this Order, shall be made available to EPA upon request in accordance with the provisions of Section XX. All employees of the Navy and all persons, including contractors and subcontractors who engage in activity under this Order, shall be made available to and shall cooperate with EPA if information is sought.

6. Nothing in this Section shall be read to shorten any document retention requirements otherwise applicable to the Navy.

#### XV. Reservation of Rights

1. EPA expressly reserves all of its statutory and regulatory powers, authorities, rights, remedies and defenses, both legal and equitable, including without limitation, those which may pertain to the Navy's failure to comply with any applicable law and regulations and with any of the requirements of this Order, including the right to both disapprove of work performed by the Navy and to request that the Navy perform tasks in addition to those stated in the workplans.

2. This Order and Navy's consent to its issuance shall not limit or otherwise preclude EPA from taking any additional legal action against Navy should EPA determine that any such additional legal action is necessary or warranted.

3. This Order shall not relieve Navy of its obligation to obtain and comply with any federal, commonwealth or local permit nor is this Order intended to be, nor shall it be construed to be, a ruling or determination on, or of, any issue related to any federal, commonwealth or local permit.

4. EPA reserves the right to perform any and all work required by this Order including, but not limited to, any additional site characterization, feasibility study, and/or response or corrective action deemed necessary to investigate the Facility thoroughly, or to protect human health or the environment

5. Notwithstanding compliance with the terms of this Order, Navy is not released from liability for the costs of any response actions taken by EPA. EPA reserves any rights it may have to seek reimbursement from the Navy for any such costs incurred by the EPA. Navy reserves any rights it may have to challenge such an action.

6. By entering into this Order, Navy does not waive any claim it may wish to assert of immunity from payment of fines or penalties.

7. Navy does not waive any defenses Navy may have or wish to pursue in any action

involving third parties.

8. Nothing in this Order and no determination made or action taken (including any failure to act) pursuant to the Order, including, without limitation, any determination or resolution resulting from Dispute Resolution under Section XIX, shall constitute an admission or evidence of an admission by Navy or otherwise constitute an adjudication of any fact or conclusion of law, except in an action or proceeding by EPA to enforce the terms of this Order.

9. Nothing herein shall preclude any actions by EPA to enforce the terms of this Order, or to address or bring any available legal or equitable claim for: (1) any pre-existing or current violations or conditions at the facility; (2) any emergency conditions or imminent hazard which may exist or arise at the facility; (3) any corrective action pursuant to the Act or state law; or (4) any response action pursuant to CERCLA as amended.

10. The Parties recognize that EPA may issue a hazardous waste management permit under the Act or commonwealth law to the owner or operator of the Facility which includes corrective action requirements and which may cover one or more of the same SWMUs addressed in this Order. EPA reserves the right to enforce the requirements of such permits, including corrective action.

11. Although this Order is issued under the Act (RCRA), Navy reserves any right it may have to exercise, pursuant to its own authority, or any other available right as provided by law (including CERCLA, as amended, DERA, or Executive Order 12580) to implement the provisions of this Order and nothing in this Order shall alter Navy's inherent authority with respect to removal actions it may independently conduct pursuant to its own legal authorities.

12. Except as otherwise specifically provided herein, both Parties reserve all rights and defenses they may have under law, executive orders, regulations, and this Order with respect to any person.

## XVI. Non-Release of Other Claims and Parties

Nothing in this Order shall constitute, or be construed to constitute, a release from any claim, cause of action or demand in law or equity against any person, firm, partnership or corporation, not a signatory to this Order, for any liability it 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, waste, pollutant or contaminant found at, taken to, taken from or emanating from the Facility.

## XVII. Public Participation

1. Public Participation procedures shall conform with guidance, given in EPA's Office of Solid Waste and Emergency Response Directives 9901.3 "Guidance for Public Involvement In RCRA Section 3008(h) Actions" (May 5, 1987) and 9902.6 "RCRA Corrective Action Decision Documents: The Statement of Basis and Response to Comments" (April 29, 1991), the RCRA Public Participation Manual, or other current EPA regulation or guidance, as applicable.

2. As requested by EPA, the Navy will make the RCRA Facility Investigation Work Plan(s) and Final Report(s), draft and Final Corrective Measures Study, and any other documents developed pursuant to the requirements of this Order available for public review and comment.

3. Following EPA's tentative approval, subject to public review and comment, of a Corrective Measure Study Final Report and the recommended final corrective measure(s), including a no further action recommendation(s), EPA shall issue a public notice on the chosen final corrective measure(s), including any no further action required determination(s), and make available to the public for review and comment for at least thirty (30) days, both the RCRA Facility Investigation Final Report (or summary of report) and the Corrective Measure Study Final Report (or summary of report), and EPA's Statement of Basis for its decision to tentatively select that corrective measure(s), including any no further action determination, subject to public review and comment.

4. Following the public review and comment period, EPA shall notify the Navy of the

corrective measures selected by EPA. If the corrective measures recommended in the Corrective Measure Study Final Report are not the corrective measures selected by EPA after consideration of public comments, EPA shall inform the Navy in writing of the reasons for such decision, and the Navy shall modify the RFI and/or CMS based upon public comment if directed to do so by EPA.

#### XVIII. Other Applicable Laws

All actions undertaken pursuant to this Order by Navy shall be done in accordance with all applicable local, commonwealth and federal laws, regulations, ordinances and Executive Orders. Navy retains the obligation and agrees to obtain all permits or approvals necessary to perform the work required by this Order.

#### XIX. Dispute Resolution

1. Except as specifically set forth elsewhere in this Order, if a dispute arises under this Order the procedures of this part shall apply. In addition, during the pendency of any dispute, Navy agrees that it shall continue to implement those portions of this Order which are not in dispute and which EPA determines can be reasonably implemented pending final resolution of the issue(s) in dispute. If EPA determines in writing that all or part of those portions of work which are affected by the dispute should stop during the pendency of the dispute, Navy shall discontinue implementing those portions of the work.

2. EPA and Navy shall make reasonable efforts to informally resolve disputes at the Project Coordinator or immediate supervisor level. If resolution cannot be achieved informally, the procedures of this part shall be implemented to resolve the dispute.

3. Within thirty (30) days of the date when Navy is informed of an action by EPA that leads to or generates a dispute, Navy shall submit to EPA a written statement of dispute setting forth the nature of the dispute including any elements of work, submittals, or actions affected by the dispute, Navy's position with respect to the dispute, and the information Navy is relying upon to support its position, and any impact such dispute may have on specified schedules, elements of work, submittals, or actions required by this Order. If Navy does not provide such written

statement to EPA within this thirty (30) day period, Navy shall be deemed to have agreed with the action taken by EPA which led to or generated the dispute.

4. Upon receipt of the written statement of dispute, EPA and Navy shall engage in dispute resolution among the Project Coordinators and/or their immediate supervisors. EPA and Navy shall have twenty (20) days from the receipt by EPA of the written statement of dispute to resolve the dispute. During this period the Project Coordinators shall meet as many times as are necessary to discuss and attempt resolution of the dispute. Any agreed resolution shall be in writing, signed by EPA and Navy. If agreement cannot be reached on any issue within this twenty (20) day period, Navy may, within ten (10) days of the conclusion of the twenty (20) day dispute resolution period, submit a written notice to EPA escalating the dispute to the Dispute Resolution Committee ("DRC") for resolution. If Navy does not elevate the dispute to the DRC within this ten (10) day escalation period, Navy shall be deemed to have agreed with EPA's position with respect to the dispute.

5. The EPA representative on the DRC is the Director, Division of Environmental Planning and Protection, EPA Region II. The Navy representative on the DRC is the Commander, Atlantic Division Naval Facility Engineering Command. These representatives may be changed and they may designate other individuals to act for them. Notice of any change in the representative and delegation of authority from a party's designated representative on the DRC shall be provided to the other parties

6. The DRC will serve as a forum for resolution of disputes for which agreement has not been reached informally. EPA and Navy shall each designate one individual and an alternate to serve on the DRC. Following escalation of a dispute to the DRC, the DRC shall have twenty (20) days to resolve the dispute. Any agreed resolution shall be in writing and signed by EPA and Navy. If the DRC is unable to resolve the dispute within this twenty (20) day period, Navy may, within ten (10) days of the conclusion of the twenty (20) day dispute resolution period, submit a written Notice of

Dispute to the Senior Executive Committee (SEC) for resolution. In the event that the dispute is not escalated to the SEC within the designated ten (10) day escalation period, Navy shall be deemed to have agreed with EPA's position with respect to the dispute.

7. The SEC will serve as the forum for resolution of disputes for which agreement has not been reached by the DRC. The EPA's representative on the SEC is the Regional Administrator of the EPA Region II. The Navy's representative on the SEC is the Assistant Secretary of the Navy ("ASN") for Environment and Safety. The members shall as appropriate confer, meet and exert their best efforts to resolve the dispute and issue a unanimous written decision signed by all the parties. If unanimous resolution of the dispute is not reached within twenty-one (21) days, the EPA Regional Administrator shall issue a written position on the dispute. The Secretary of the Navy may, within ten (10) days of the Regional Administrator's issuance of EPA's position, issue a written notice elevating the dispute to the Administrator of the U.S. EPA for resolution in accordance with all applicable laws and procedures. In the event that Navy elects not to elevate dispute to the Administrator within the designated ten day escalation period, the Regional Administrator's decision will become final and the work will proceed in accordance with the Regional Administrator's written position with respect to the dispute.

8. Upon escalation of a dispute to the Administrator of the EPA pursuant to paragraph 7, above, the Administrator will review and resolve the dispute within twenty-one (21) days. Upon request, and prior to resolving the dispute, the EPA Administrator shall meet and confer with the Secretary of the Navy to discuss the issues under dispute. Upon resolution, the Administrator shall provide the other Parties with a written final decision setting forth the resolution of the dispute. The duties of the Administrator set forth in this Section shall not be delegated.

9. The pendency of any dispute under this part shall not affect Navy's

responsibility for timely performance of the work required by this Order, except that the time period for completion of work affected by such dispute shall be extended for a period of time not to exceed the actual delay caused by the resolution of any good faith dispute in accordance with the procedures specified herein. All elements of the work required by this Order which are not affected by the dispute shall continue and be completed in accordance with the applicable schedule.

10. Within fourteen (14) days of resolution of a dispute pursuant to the procedures specified in this part, Navy shall incorporate the resolution and final determination into the appropriate plan, schedule or procedures and proceed to implement this Order according to the amended plan, schedule or procedure.

11. Resolution of a dispute pursuant to this part of the Order constitutes a final resolution of that dispute arising under this Order. The Parties shall abide by all terms and conditions of any final resolution of dispute obtained pursuant to this part of this Order.

12. The procedures of this section shall not apply to disputes about: (a) EPA's designation of project coordinator; or (b) any EPA enforcement actions.

13. Respondent expressly waives its opportunity to confer with the Administrator of the EPA under Section 6001(b)(2), 42 U.S.C. § 6961(b)(2) on any issue of law or fact set forth in this consent order.

#### XX. Availability of Information/Notification

1. To the maximum extent possible, Navy shall give the EPA Project Coordinator fifteen (15) days advance oral notice of the following activities undertaken pursuant to this Order: all on-site and off-site field activities, such as installation or removal of equipment or sampling events, geophysical studies, and soil gas monitoring. At the request of EPA, Navy shall provide or allow

EPA and/or its authorized representatives to take split samples of any or all samples collected by the Navy pursuant to this Order. EPA will, to the extent possible, give Navy notice of EPA's intentions to take samples and/or allow Navy to take split or duplicate samples of all samples collected by EPA under this Order.

2. All data, information, and other nonprivileged records concerning, created for or maintained by Navy pursuant to this Order shall be made available to EPA upon request. All employees of Navy and all persons, including contractors and subcontractors who engage in activities under this Order, shall be made reasonably available to and cooperate with EPA if information, whether written or oral, is sought.

3. All final reports, plans, studies, records, or other documents it submitted or otherwise in the possession of EPA under the terms of this Order shall be made available to the public pursuant to the requirements of the Freedom of Information Act, 5 U.S.C. § 552, et seq. EPA agrees that any information Navy submits to EPA under this Order that is sought pursuant to a request under the Freedom of Information Act, 5 U.S.C. § 552, et. seq. shall be handled in accordance with the provisions of 40 C.F.R. § 2.111. Navy may assert a confidentiality claim covering all or part of any information it submits to EPA. Any assertion of confidentiality shall be accompanied by a response to the questions listed at 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. Navy agrees not to assert any confidentiality claim with regard to any physical or analytical data that has been validated or otherwise evaluated using applicable quality assessment/quality control (QA/QC) methods. Nothing in this paragraph shall preclude the use of such information, records, or other documents in administrative proceedings.

4. Upon request by EPA, Navy shall make available to EPA copies of non-quality assured data or results and other documents, including sampling and monitoring data, which have been received by Navy, that EPA determines are necessary for oversight activities. Where appropriate, Navy reserves its right to assert a claim of confidentiality with respect to such records or

documents. Where EPA duplicates or removes non-quality assured data from the Facility, Navy shall attempt to complete quality assurance within sixty (60) days following the receipt of such data by Navy. The sixty day period provided for completing quality assurance is for the purposes of this section only.

#### XXI. Termination and Satisfaction

1. The provisions of this Order shall be deemed satisfied and the obligations of the Navy under this Order shall terminate upon Navy's receipt of a written statement from EPA stating that Navy 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 Navy is performing work pursuant to, or required by this Order, this Order shall not be deemed terminated or satisfied, unless a RCRA permit becomes effective for the Navy's facility, and EPA approves, in writing, such termination pursuant to Section XXII of this Order.

2. Upon the satisfactory completion of all required actions and upon written request by Navy, EPA shall endeavor to send to Navy a written notice of satisfaction of the terms of this Order as soon as practicable. The notice shall state that EPA considers Navy to have satisfied the terms of this Order.

#### XXII. Survivability/Permit Integration

1. After the effective date of this Order, a RCRA/HSWA Permit may be issued by EPA to the Facility incorporating the requirements of this Order by reference into the permit. The requirements of this Order shall not terminate upon the issuance of a permit unless the requirement(s) of this Order are expressly replaced by substantially equivalent corrective action requirements in the permit for all requirements of this Order which are not deemed satisfied at that point, and EPA approves, in writing, such termination.

2. After the effective date of this Order, if a RCRA/HSWA Permit is not issued to the Facility, either due to a withdrawal by the Facility of its permit application or a denial of the

permit by EPA, both parties may agree to modify the requirements of this Order to address any corrective action and/or closure activities at the facility.

#### XXIII. Subsequent Modification

1. This Order may be amended by the parties. Any such amendments, proposed by the parties, must be approved by EPA. Such amendment(s) shall be in writing and shall have as its effective date the date on which it is signed by the Regional Administrator or her designee the Director, Division of Environmental Planning and Protection, Region II. Any amendment is, on its effective date, hereby incorporated into this Order.

2. Notwithstanding the above, the EPA Project Coordinator and Navy may agree to changes in the scheduling of events. Any such changes must be requested in writing by the Navy and be approved in writing by EPA.

3. No informal advice, guidance, suggestions or comments by EPA regarding reports, plans, specification, schedules, and any other writing submitted by the Navy shall relieve Navy of its obligation to obtain written approval for modification of this Order.

4. The parties currently expect that this Order will be modified, to implement the final corrective measure(s).

#### XXIV. No Final Agency Action

1. Notwithstanding any other provision of this Order, no action or decision by EPA pursuant to this Order, including without limitation, decisions of the Administrator, the Regional Administrator and the Director Division of Environmental Planning and Protection 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 an action for a violation of this Order, including an action for penalties or an action to compel Navy's compliance with the terms and conditions of this Order.

#### XXV. Severability

1. 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 temporarily stayed, the remainder of this Order shall remain in force and shall not be affected thereby.

#### XXVI. Force Majeure

1. "Force majeure" for purposes of this Order is defined as any event arising from circumstances beyond the control of Navy that delays or prevents the performance of any obligation arising under Section VI (Work to be Performed) and/or Section VII (Reporting Requirements) of this Order. "Force majeure" specifically does not include increased costs or expenses of complying with the requirements of this Consent Decree.

2. When circumstances are occurring or have occurred that may be reasonably expected to cause a delay in the performance or completion of any requirement of Sections VI and VII of this Order, Navy shall notify EPA by telephone of said circumstances within four (4) working days. Such telephone call shall be made to the Chief of the EPA's (Region II) RCRA Program's Branch, whose telephone number at EPA Region II's current office location is (212) 637-4109. EPA will advise Navy in writing if this number changes.

3. Within ten (10) working days of the events or events that Navy contend are responsible for the delay, for which event Navy is asserting "force majeure", Navy shall deliver to EPA in writing the: (1) reasons for, and anticipated duration of such delay, (2) the measures taken and to be taken by Navy to prevent or minimize the delay, (3) the deadlines in the Order and the accompanying work plan that will be affected by the "force majeure", and (4) the timetable for implementation of the measures taken and to be taken by Navy to prevent or minimize the delay. Such written notification is to be sent to the addressees identified in Section IX (Project Coordinator/Information).

4. Navy's failure to give oral notice to EPA and/or to give written explanation to EPA as specified by this Section shall constitute a waiver by Settling Defendants of any claim of "force majeure".

5. If EPA and Navy are unable to agree on whether the reason for the delay or noncompliance was caused by a "force majeure" event, or whether the duration of the adjournment proposed by Navy is warranted under the circumstances, the parties shall resolve the dispute according to the provisions of this Section XXVI (Force Majeure). Navy shall have the burden of proving, by a preponderance of the evidence, "force majeure" as an explanation of any delay in or noncompliance with a requirement of Section VI (RCRA Work to be Performed) and/or Section VII (Reporting Requirements) of this Order.

6. Any failure or delay by Navy in complying with the terms of Sections VI and/or Section VII of this Order which delay or failure results from a "force majeure" event, shall not be deemed to be a violation of Navy's obligations and responsibilities under Section VI and/or Section VII of this Order. To the extent a delay is caused by a "force majeure" event, the schedule affected by the delay shall be extended, if necessary, for a period equal to only the number of days of actual delay resulting from such circumstances, and Navy shall not be liable for the number of days of actual delay caused by a "force majeure" event. Navy, however, shall exercise due diligence in taking all necessary measures to mitigate the period of any such delay.

7. If EPA agrees that a delay or noncompliance is or was attributable to a "force majeure" event and that defense has not been waived, the deadline at issue shall be extended by a length of time not to exceed the duration of the "force majeure" event.

#### XXVII. Enforcement

1. Navy recognizes its obligations to comply with the applicable federal and commonwealth laws and regulations, including the Act, as set forth in Section 6001 of the Act, 42 U.S.C. § 6961, and Section 102 of the Federal Facility Compliance Act, and to faithfully discharge the requirements of this Order.

#### XXVIII. Waiver of Sovereign Immunity

1. Pursuant to §6001 of RCRA, the Department of the Navy as a "department . . . of the Federal Government (1) having jurisdiction over any solid waste management facility or disposal site, or (2) engaged in any activity resulting, or which may result, in the disposal or management

of solid waste or hazardous waste shall be subject to and comply with, all Federal, State, interstate, and local requirements both substantive and procedural . . . in the same manner, and to the same extent, as any person is subject to such requirements . . . "

#### XXIX. Funding

1. It is the expectation of the Parties to this Agreement that all obligations of the Navy arising under this Agreement will be fully funded. The Navy agrees to seek sufficient funding through its budgetary process to fulfill its obligations under this Agreement. Failure to obtain adequate funds or appropriations from Congress does not, in any way, release Navy from its obligation under this Order to comply with RCRA, or any applicable law or regulation. If sufficient funds are not appropriated by the Congress as requested and existing funds are not available to achieve compliance with the schedules provided in this Order, EPA reserves its right to initiate any other action which would be appropriate absent this Order.

2. Any requirement for the payment or obligation of funds, including penalties, by the Navy established by the terms of this Agreement shall be subject to the availability of appropriated funds, and no provision herein shall be interpreted to require obligation or payment of funds in violation of the Anti-Deficiency Act, 31 U.S.C. Section 1341. In cases where payment or obligation of funds would constitute a violation of the Anti-Deficiency Act, the dates established requiring the payment or obligation of such funds shall be appropriately adjusted.

3. Navy has informed EPA that funding authorized and appropriated annually by Congress under the Environmental Restoration, Navy (ER, N) appropriation in the Department of Defense Appropriations Act will be the source of funds for activities required by this Agreement consistent with 10 U.S.C. Chapter 160. However, should the ER, N appropriation be inadequate in any year to meet the total Navy's implementation requirements under this Agreement, the Navy will prioritize and allocate that year's appropriation.

4. If appropriated funds are not available to fulfill the Navy's obligations under this Agreement, EPA reserves the right to initiate an action against any other person, or to take any response action, which would be appropriate absent this Agreement.

#### XXX. Stipulated Penalties

1. In the event that the Navy fails to submit any preliminary or final reports at the time required to EPA pursuant to the appropriate timetable or Deadlines in accordance with the requirements of this Order, fails to commence work as prescribed in this Consent Order, or, fails to comply with a term or condition of this Agreement which relates to an interim or final remedial action, EPA may assess a stipulated penalty against the Navy as set forth below. A stipulated penalty may be assessed in an amount not to exceed \$3,000.00 for the first week (or part thereof), and \$6,000.00 for each additional week (or part thereof) for which a failure set forth in this Paragraph occurs.

2. Upon determining that the Navy has failed in a manner set forth in Paragraph 1 above, EPA shall so notify the Navy in writing. If the failure in question is not already subject to dispute resolution at the time such notice is received, the Navy shall have fifteen (15) days after receipt of the notice to invoke dispute resolution on the question of whether the failure did in fact occur. The Navy shall not be liable for the stipulated penalty assessed by EPA if the failure is determined, through the dispute resolution process, not to have occurred. No assessment of a stipulated penalty shall be final until the conclusion of dispute resolution procedures related to the assessment of the stipulated penalty.

3. The annual reports required by RCRA Section 6005, 42 U.S.C. Section 6965, shall include, with respect to each final assessment of a stipulated penalty against the Navy under this Agreement, each of the following:

A. The Facility responsible for the failure;

- B. A statement of the facts and circumstances giving rise to the failure;
  - C. A statement of any administrative or other corrective action taken, or a statement of why such measures were determined to be inappropriate;
  - D. A statement of any additional action taken by or at the Facility to prevent recurrence of the same type of failure; and
  - E. The total dollar amount of the stipulated penalty assessed for the particular failure.
4. Stipulated penalties assessed pursuant to this Section shall be payable only in the manner and to the extent expressly provided for in this Agreement, and in Acts authorizing funds for, and appropriations to, the DOD.
5. In no event shall this Section give rise to a stipulated penalty in excess of the amount set forth in RCRA Section 3008, 42 U.S.C. Section 6928.
6. This Section shall not affect the Navy's ability to obtain an extension of a timetable, deadline or schedule, either pursuant to Section XXVI -- Force Majeure, or as otherwise negotiated between the Parties.
7. Nothing in this Agreement shall be construed to render any officer or employee of the Navy personally liable for the payment of any stipulated penalty assessed pursuant to this Section.

#### XXXI. Effective Date

1. The effective date of this Order shall be ten (10) days after the date on which the Regional Administrator, EPA Region II, signs this Order.

XXXII. Consent

1. Navy consents to the issuance of this Order, and agrees to undertake all actions required by the terms and conditions of this Order, including any portions of the Order incorporated by reference. Navy 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. In addition, Navy consents to and agrees not to contest either EPA's administrative jurisdiction to enforce or compel compliance with any term of this Order or the validity of this Order and all of its provisions.

2. Each undersigned signatory to this Order certifies that he or she is fully authorized to enter into the terms and conditions of this Order.

IT IS SO AGREED:

SIGNED: \_\_\_\_\_  
Deputy Assistant Secretary Navy  
Environmental and Safety

Date: \_\_\_\_\_

SIGNED: \_\_\_\_\_  
Jeanne M. Fox  
Regional Administrator  
U.S. Environmental Protection Agency - Region II

Date: \_\_\_\_\_

## APPENDIX A

### SCOPE OF WORK FOR A FULL RCRA FACILITY INVESTIGATION (RFI) ATLANTIC FLEET WEAPONS TRAINING FACILITY (AFWTF)

#### I. PURPOSE

The purpose of the Full RCRA Facility Investigation is to determine the nature, rate, direction and extent of releases of hazardous waste, including hazardous constituents, from solid waste management units and other source areas at the facility including areas off-site impacted by the release(s) from the facility, and to gather all necessary data to support the Corrective Measures Study. The Respondent shall furnish all personnel, materials, and services necessary for, or incidental to, performing the RCRA corrective measure.

#### II. SCOPE

The Full RCRA Facility Investigation consists of seven tasks:

Task I: Description of Current Conditions

- A. Facility Background
- B. Nature and Extent of Contamination
- C. Implementation of Interim Measures

Task II: Pre-Investigation Evaluation of Corrective Measure Technologies

Task III: RFI Management Plans

- 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. Progress
- B. Final

III. TASK I: DESCRIPTION OF CURRENT CONDITIONS

The Respondent shall submit for EPA approval a report providing the background information pertinent to the facility, contamination and interim measures as set forth below. The data gathered during any previous investigations or inspections and other relevant data shall be included. The report must include, at a minimum, the following information:

A. Facility Background

The Respondent's report shall summarize the regional location, pertinent boundary features, general facility physiography, hydrogeology, and historical use of the facility for the treatment, storage or disposal of solid and hazardous waste. The Respondent's report shall include:

1. Map(s) depicting the following:
  - (a) General geographic location;
  - (b) Property lines, with the owners of all adjacent property clearly indicated;
  - (c) Topography and surface drainage (with a contour interval of two (2) feet and a scale of 1 inch = 100 feet) depicting all waterways, wetlands, floodplains, water features, drainage patterns, and surface-water containment areas;
  - (d) All tanks, buildings, utilities, paved areas, easements, rights-of-way, and other features;
  - (e) All solid or hazardous waste treatment, storage or disposal areas active after November 19, 1980;
  - (f) All known past solid or hazardous waste treatment, storage or disposal areas regardless of whether they were active on or after November 19, 1980;
  - (g) All known past and present product and waste underground tanks or piping;
  - (h) Surrounding land uses (residential, commercial,

agricultural, recreational); and

- (i) The location of all production and groundwater monitoring wells. These wells shall be clearly labeled and ground and top of casing elevations and construction details included (these elevations and details may be included as an attachment).

All maps shall be consistent with the requirements set forth in 40 CFR 270.14 and be of sufficient detail and accuracy to locate and report all current and future work performed at the site;

2. A history and description of ownership and operation, solid and hazardous waste generation, treatment, storage and disposal activities at the facility;
3. Approximate dates or periods of past product and waste spills, identification of the materials spilled, the amount spilled, the location where spilled, and a description of the response actions conducted (local, state, or federal response units or private parties), including any inspection reports or technical reports generated as a result of the response; and
4. A summary of past permits requested and/or received, any enforcement actions and their subsequent responses and a list of documents and studies prepared for the facility.

B. Nature and Extent of Contamination

1. The Respondent's report shall summarize all possible source areas of contamination. This, at a minimum, should include all regulated units, solid waste management units, spill areas, and other suspected source areas of contamination. For each area, the Respondent shall identify the following:
  - (a) Location of unit/area (which shall be depicted on a facility map);
  - (b) Quantities of solid and hazardous wastes;
  - (c) Hazardous waste or constituents, to the extent known; and
  - (d) Identification of areas where additional information is necessary.
2. The Respondent shall prepare an assessment and description of the existing degree and extent of contamination. This should include:

- (a) Available monitoring data and qualitative information on locations and levels of contamination at the facility;
- (b) All potential migration pathways including information on geology, petrology, hydrogeology, physiography, hydrology, water quality, meteorology, and air quality; and
- (c) The potential impact(s) on human health and the environment, including demography, groundwater and surface-water use, and land use.

C. Implementation of Interim Corrective Measures

The Respondent's report shall document interim corrective measures which were or are being undertaken at the facility. This shall include:

- 1. Objectives of the interim corrective measures: how the measure is mitigating a potential threat to human health and the environment and/or is consistent with and integrated into any long term solution at the facility;
- 2. Design, construction, operation, and maintenance requirements;
- 3. Schedules for design, construction and monitoring; and
- 4. Schedule for progress reports.

IV. TASK II: PRE-INVESTIGATION EVALUATION OF CORRECTIVE MEASURE TECHNOLOGIES

The Respondent shall submit a report that identifies the potential 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 needs to be collected in the facility investigation 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.).

V. TASK III: RFI MANAGEMENT PLANS

The Respondent shall submit RFI Management Plans. These Plans shall be followed during the implementation of RFI, and will be part of the RFI Workplan. During the RFI, these Management Plans may be necessary for revisions depending on the detail of information collected to accommodate the facility specific situation. The RFI Management Plans include the following:

A. Project Management Plan

The Respondent shall prepare a Project Management Plan which will include a discussion of the technical approach, schedules, budget, and personnel. The Project Management Plan will also include a description of 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 all 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 all 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 include but not be limited to 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 rationale 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 over

some time period;

- (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 should include but not be limited to:
- (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., groundwater, 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., groundwater, 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 dispersment 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 transacts, 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.

VI. TASK IV: RCRA FACILITY INVESTIGATION (RFI)

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.

The RFI should 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 ("CMS").

The RFI 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.

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 groundwater 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 groundwater flow patterns; and
  - (vi) Characterize seasonal variations in the groundwater flow regime.
- (b) An analysis of any topographic features that might influence the groundwater flow system. (Note: Stereographic analysis of aerial photographs may aid in this analysis).
- (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 low 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 groundwater 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 groundwater monitoring wells and piezometers installed upgradient and downgradient of the potential contaminant source, 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) Transacts 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) Evapo-transpiration;

- (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 within 5 miles 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) Evapo-transpiration.
- (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<sub>3</sub>, NO<sub>3</sub><sup>-</sup>/NO<sub>2</sub><sup>-</sup>, PO<sub>4</sub><sup>-3</sup>), 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.)

B. Source Characterization

The Respondent shall collect analytical data to completely characterize the wastes and the areas where wastes have been placed, collected or removed including: type; quantity; physical form; disposition (contained 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.
  - (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 groundwater, soils, and/or surface water/sediment 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, and 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. Groundwater Contamination

The Respondent shall conduct a groundwater 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 chemical contaminants;
- (e) An evaluation of factors influencing the plume movement; and
- (f) An extrapolation of future contaminant movement.

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

## 2. Soil Contamination

The Respondent shall conduct an investigation to characterize the contamination of the soil above the water table in the vicinity of the contaminant release(s). 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, specification, 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.

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

## 3. Surface-Water and Sediment Contamination

The Respondent shall conduct a surface-water and sediment investigation to characterize potential contamination in surface-water bodies and sediments resulting from the contaminant release(s) by 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.;

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

D. Potential Receptors

The 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 groundwater:
  - (a) Type of use (e.g., drinking water source: municipal or residential, agricultural, domestic/non-potable, and industrial); and
  - (b) Location of groundwater users including wells and discharge areas.
2. Local uses and possible future uses of surface waters draining the facility:
  - (a) Domestic and municipal (e.g., potable and lawn/gardening 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.

VII. TASK V: RCRA FACILITY INVESTIGATION ANALYSIS

The 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.

A. Data Analysis

The Respondent shall analyze all 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 indicative for the area.

B. Protection Standards

The 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 water quality standards, etc.).

VIII. TASK VI: LABORATORY AND BENCH-SCALE STUDIES

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

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

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

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

IX. TASK VII: REPORTS

A. Progress

The Respondent shall provide the EPA with signed, quarterly progress reports as required by Section VII.2 of this Order.

B. Final

The Respondent shall prepare and submit a draft Final RCRA Facility Investigation ("RFI") Report as required by Section VI.B.8 of this Order. The RFI Report shall present all information gathered under the approved RFI Workplan. The draft Final report shall be deemed approved upon written notification of that determination by EPA.

## APPENDIX B

### SCOPE OF WORK FOR A CORRECTIVE MEASURE STUDY ATLANTIC FLEET WEAPONS TRAINING FACILITY (AFWTF)

#### I. PURPOSE

The purpose of the 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. The Respondent will furnish the personnel, materials, and services necessary to prepare the corrective measure study, except as otherwise specified.

#### II. SCOPE

The Corrective Measure Study consists of four tasks:

Task I: 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 II: Evaluation of the Corrective Measure Alternative or Alternatives

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

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

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

Task IV: Reports

- A. Progress
- B. Final

#### III. TASK I: IDENTIFICATION AND DEVELOPMENT OF THE CORRECTIVE ACTION ALTERNATIVE OR ALTERNATIVES

Based on the results of the RCRA Facility Investigation and

consideration of the identified Preliminary Corrective Measure Technologies (Task II of Appendix A of this Permit), 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. Description of Current Situation

The Respondent shall submit an update to the information describing the current situation at the facility and the known nature and extent of the contamination as documented by the RCRA Facility Investigation Report. The Respondent shall provide an update to information presented in Task I of the RFI to the Agency regarding previous response activities and any interim measures which have or are being implemented at the facility. The Respondent shall also make a facility-specific statement of the purpose for the response, based on the results of the RCRA Facility Investigation ("RFI"). The statement of purpose should identify the actual or potential exposure pathways that should be addressed by corrective measures.

B. Establishment of Corrective Action Objectives

The Respondent, in conjunction with EPA, shall establish site specific objectives for the corrective action. These objectives shall be based on public health and environmental criteria, information gathered during the RFI, EPA guidance, and the requirements of any applicable federal statutes. At a minimum, all corrective actions concerning groundwater releases from regulated units must be consistent with, and as stringent as, those required under 40 CFR §264.100.

C. Screening of Corrective Measure Technologies

The Respondent shall review the results of the RFI and reassess the technologies specified in Task II and identify additional technologies which are applicable at the facility. The Respondent shall screen the preliminary corrective measure technologies identified in Task II of the RFI and any supplemental 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.

D. Identification of the Corrective Measure Alternative or Alternatives

The Respondent shall develop the corrective measure alternative or alternatives based on the corrective action objectives and analysis of the Preliminary Corrective Measure Technologies, as presented in Task II of the RFI and as supplemented following the preparation of the RFI Final Report. The Respondent shall rely on engineering practice to 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. The Respondent shall document the reasons for excluding technologies, identified in Task II, as supplemented in the development of the alternative or alternatives.

IV. TASK II: EVALUATION OF THE CORRECTIVE MEASURE ALTERNATIVE OR

## ALTERNATIVES

The Respondent shall describe each corrective measure alternative that passes through the Initial Screening in Task I of this appendix 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 of each corrective measure.

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

The Respondent shall provide a description of each corrective measure alternative which includes but is not limited to the following: preliminary process flow sheets; preliminary sizing and type of construction for buildings and structures; and rough quantities of utilities required. The Respondent shall evaluate each alternative in the four following areas:

#### 1. Technical

The Respondent shall evaluate each corrective measure alternative based on performance, reliability, implementability and safety.

- (a) The Respondent shall evaluate performance based on the effectiveness and useful life of the corrective measure:
  - (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. The evaluation should also consider the effectiveness of combinations of technologies; 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) The Respondent shall provide information on there liability of each corrective measure including their operation and maintenance requirements and their 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 straight forward 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. The 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) The Respondent shall describe the implementability of each corrective measure 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: (1) the time it takes to implement a corrective measure and (2) 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) The 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. Among the factors to consider are fire, explosion, and exposure to hazardous substances.

2. Environmental

The Respondent shall perform an Environmental Assessment for each 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

The Respondent shall assess each 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 alternative will 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

The Respondent shall assess relevant institutional needs for each 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 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, operation and maintenance costs.

1. Capital costs consist of direct (construction) and indirect (nonconstruction 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;
  - (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) Startup and shakedown costs: Costs incurred during corrective measure startup; 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.

V. TASK III: JUSTIFICATION AND RECOMMENDATION OF THE CORRECTIVE MEASURE OR MEASURES

The Respondent shall justify and recommend a corrective measure alternative using technical, human health, and environmental criteria. This recommendation shall include summary tables which allow the alternative or alternatives to be understood easily. Tradeoffs among health risks, environmental effects, and other pertinent factors shall be highlighted. The EPA will select the corrective measure alternative or alternatives to be implemented based on the results of Tasks II and III of this appendix. At a minimum, 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 existing EPA criteria, standards, or guidelines for the protection of human health. Corrective measures which 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.

VI. TASK IV: REPORTS

A. Progress

The Respondent shall provide the EPA with signed, quarterly progress reports as required by Section VII.2 of this Order.

B. Corrective Measures Study ("CMS") Final Report

The Respondent shall prepare a draft CMS Final Report as required by Section VI.C.6 of this Order. The CMS Final Report shall include all information gathered under the approved CMS Workplan. The CMS Final Report shall at a minimum include:

1. A description of the facility;
  - (a) Site topographic map & preliminary layouts.
2. A summary of the corrective measure or measures;
  - (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;  
and
  - (e) Long-term monitoring requirements.
3. A summary of the RCRA Facility Investigation and impact on the selected corrective measure or measures;
- (a) Field studies (groundwater, surface-water, soil, air); and
  - (b) Laboratory studies (bench scale, pick scale).
4. Design and Implementation Precautions;
- (a) Special technical problems;
  - (b) Additional engineering data required;
  - (c) Permits and regulatory requirements;
  - (d) Access, easements, right-of-way;
  - (e) Health and safety requirements; and
  - (f) Community relations activities.
5. Cost Estimates and Schedules;
- (a) Capital cost estimate;
  - (b) Operation and maintenance cost estimate; and
  - (c) Project schedule (design, construction, operation).

C. The draft CMS Final Report shall be deemed approved upon written notification of that determination by EPA.