465-03

DEPARTMENT OF THE ARMY
HUNTSVILLE DIVISION, CORPS OF ENGINEERS
P.O. BOX 1600
HUNTSVILLE, ALABAMA 35807-4301

REPLY TO
ATTENTION OF:

S: 22 May 1987

HNDED-PM

30 April 1987

SUBJECT: Closure of Open Burning Pads at Seneca Army Depot (AD)

SEE DISTRIBUTION

1. The Statement of Work for subject project is enclosed for review. Request comments be provided to Huntsville Division, ATTN: HNDED-PM, not later than 22 May 1987.

2. The point of contact at Huntsville Division is Mr. J. Michael Jones, AUTOVON 742-5800 or commercial 205-895-5800.

FOR THE COMMANDER:

Encl

for H. O. EVERITT
Chief, Engineering Division

DISTRIBUTION:

Commander, U.S. Army Materiel Command, ATTN: AMCEN-A, 5001 Eisenhower Ave., Alexandria, VA 22333
Commander, AMC Installation and Services Activity, ATTN: AMXEN-IC, Rock Island, IL 61299
Commander, U.S. Army Depot Systems Command, ATTN: AMSDS-RM-EFD Chambersburg, PA 17201
Commander, U.S. Army Environmental Hygiene Agency, ATTN: HSHB-ES, Mr. Wayne Fox, Aberdeen Proving Ground, MD 21010
Commander, Seneca Army Depot, ATTN: SDSSE-ADE, Mr. Randy Battaglia, Romulus, NY 14541
Commander, U.S. Army Engineer District, Kansas City, ATTN: MRKED-MI, Mr. Paul Barber, 700 Federal Bldg. Kansas City, MO 64106-2896

DEPARTMENT OF THE ARMY
HEADQUARTERS, U. S. ARMY MATERIEL COMMAND
5001 EISENHOWER AVENUE, ALEXANDRIA, VA 22333-0001

AMCEN-A

20 MAY 1987

MEMORANDUM FOR: Commander, U.S. Army Engineer Division, Huntsville, ATTN: HNDED-PM, P.O. Box 1600, Huntsville, AL 35807-4301

SUBJECT: Closure of Open Burning Pads at Seneca Army Depot (SEAD)

1. Reference letter, U.S. Army Engineer Division, Huntsville, HNDED-PM, 30 April 1987, subject as above.

2. This office has reviewed the statement of work for the subject project and the following comments are provided:

a. Method of closure must take into account presence of surface and subsurface contamination of any reactive (explosive) residues. A "hybrid" approach of removal and disposal closure options may be necessary.

b. Because of pending promulgation of 40 CFR 264, Subpart X, hazardous waste management regulations applicable to open burning/open detonation facilities, the contractor preparing the closure and post closure plan must coordinate closely with EPA Region 2 and state of New York Department of Environmental Conservation to obtain latest regulatory requirements applicable to the project.

3. Point of Contact at this headquarters is MAJ Jessie B. Cabellon, AMCEN-A, at AUTOVON 284-9016.

4. AMC - Providing Soldiers the Decisive Edge.

FOR THE COMMANDER:

WILLIAM N. HASSELKUS
Chief, Environmental Quality Division
Office of the Deputy Chief of Staff
for Engineering, Housing and
Installation Logistics

CF:
COMMANDER:
DESCOM (AMSDS-RM-EFD)
SENECA AD (SDSSE-ADE)
AMC I&SA (AMXEN-IC)
USAEHA (HSHB-ME-S)
USAED, KANSAS CITY (MRKED-MI)

SEADCLOS.JD

MAR.1986

DRAFT

CLOSURE OF NINE BURNING PADS
AT
SENECA ARMY DEPOT
SENECA, NEW YORK

NOTE TO REVIEWERS:

THIS CONTRACT IS EXPECTED TO BE IMPLEMENTED IN FY 88. THE OBJECTIVE IS TO HAVE THE AE PREPARE CLOSURE AND POST CLOSURE PLANS TO PERMANENTLY CLOSE A RCRA HAZARDOUS WASTE MANAGEMENT FACILITY CONSISTING OF NINE BURNING PADS LOCATED IN THE DEMOLITION GROUNDS AT SENECA ARMY DEPOT, NEW YORK. REVIEWERS ARE REQUESTED TO PROVIDE ADDITIONAL INFORMATION KNOWN TO THEM IN THE FORMS OF CORRECTIONS, NOTES IN THE MARGINS, REVIEW COMMENTS ETC. AS THEY REVIEW THIS DRAFT STATEMENT OF WORK. AN OPTIONAL CONSTRUCTION BID PACKAGE IS ALSO INCLUDED IN THE CONTRACT.

TABLE OF CONTENTS

APPENDIX A

STATEMENT OF WORK

CLOSURE OF NINE BURNING PADS

SENECA ARMY DEPOT

1.1 Background. The US Army Corps of Engineers, Huntsville Division, is contracting on behalf of Seneca Army Depot (SEAD), for AE services to prepare a Closure and Post Closure Plan for permanent closure, with an option for a Construction Bid Package, for nine open burning pads located in the Demolition Grounds at the Seneca Army Depot.

1.2 Location. Seneca Army Depot is located near the town of Romulus, New York, east of Seneca Lake, west of Cayuga Lake and approximately fifty miles southeast of Rochester.

1.3 Waste Management Practices. The burning pads are a part of the ninety-acre Demolition Ground, located in the northwest section of the Installation. They have been in use since 1941, when SEAD was first activated. Seven of the pads are used for the open burning of pyrotechnics, explosives and propellants (PEP) which have been declared obsolete or off-specification. Two pads, Pads G and J, are used for the burning of explosives-contaminated packing material. Plans are being made to conduct future burnings in open steel pans. The ash will be tested and

disposed of by the Installation, according to its toxic content.

1.4 Previous Investigations. Several studies pertaining to soil and water quality have been performed at SEAD under the supervision of the US Army Environmental and Hygiene Agency (USAEHA). The emphasis of the studies was on soil and water quality resulting from activities around pads B, F, and H. Since seven of the pads have had identical operations, it may be assumed that study results from these three would be representative of conditions existing on the other four pads. Pads G and J were used for the burning of explosives-contaminated containers and are therefore believed to contain similar contaminants, but at slightly reduced levels. In 1985, a study contract was awarded to O'Brien & Gere Engineers Inc. to evaluate several methods of closure for Pads B and H. This contract was only partially completed. A preliminary report on alternative methods of closure was produced, in which several methods of closure were analyzed. In-place containment was tentatively recommended as optimum. Copies of this report and other data will be provided to the AE for use in completion of this contract.

1.5 Current Regulatory Status. The Open Burning/Open Detonation area is currently being operated under RCRA Interim Status; however, there is no current regulatory pressure to close the open burning pads. SEAD conducts Semiannual water quality monitoring at wells located around the Demolition Grounds and

results are sent to the State of New York regulators.

2.0 OBJECTIVE

The objective of this contract is to have the AE prepare a Closure and Post Closure Plan for submittal to the Regulators for approval, and as an option to the contract, a Construction Bid Package for a fixed-price construction-type contract for permanent closure of nine open burning pads located in the Demolition Grounds. The Closure and Post Closure Plan must be acceptable to the US Army, the Regulators at the USEPA and the State of New York. The design must meet the requirements of the Resources Conservation and Recovery Act (RCRA) of 1976 (including 1984 Amendments), 40 CFR Parts 264 and 265, Army guidelines, and applicable State of New York and USEPA regulations. It is the Army's intention that the pads will be permanently closed in the most environmental sound and economical manner, based on good engineering practices. Containment and closure-in-place is the Army's method of choice. If the AE determines that this is not the optimum method of closure, this shall be fully justified in the report submitted under Task 7.

3.0 DETAILED DESCRIPTION OF SERVICES

The AE shall be responsible for performance of the work described in Tasks 1 through 10 and optional Tasks 11 through 16 if the

Contracting Officer directs the AE to proceed with Option 1. Section 3.0 is divided into four subsections. Subsection 3.1 requires the AE to review and evaluate records, reports and existing data, prepare work plans and conduct field work. The AE is required to install six new shallow groundwater monitoring wells which will be used later for post-closure groundwater monitoring, and collect and analyze groundwater samples from these and other existing wells. Subsection 3.2 provides for the preparation and presentation of preliminary criteria fro design of the closure. Subsection 3.3. covers preparation of the Closure and Post Closure Plan. The Plan will be presented to State and Federal Regulators for review and approval prior to initiation of the optional Construction Bid Package which is covered in Subsection 3.4. All work in connection with this contract shall be performed under the supervision of a Professional Engineer registered in the State of New York, and in accordance with this Statement of Work.

3.1 Records Review, Plan Preparation, and Field Work.

3.1.1 (Task 1) Visual Inspection and Record Review. The AE shall perform a visual inspection of the site, review records and reports provided by the Government as published data and from other available sources such as New York Geological Survey. The purpose of this Task is to permit the AE's personnel sufficient time to become familiar with site conditions and past operations

and disposal practices. It is not intended for this to become a "discovery" process where new information concerning the site is developed.

3.1.2 (Task 2) Field Investigation Plan. The AE shall provide a Field Investigation Plan which addresses the installation of six shallow groundwater monitoring wells. These wells will be used for Post Closure groundwater monitoring. The Plan shall be comply with this Statement of Work, State of New York, USEPA and Army guidelines for monitoring well installation. In general, Quality Control/ Quality Assurance procedures, Standard Operating Procedures, methods, equipment, and specific personnel that the AE proposes to use for each work item shall be discussed at appropriate locations within the plans. No field work other than the initial site inspection may be performed until all plans are reviewed and approved by the Contracting Officer. All work shall be performed according to the approved plans. The Field Investigation plan shall include as a minimum, the following:

3.1.2.1 Safety Program Plan (SPP). The AE shall prepare and submit a Safety Program Plan that the AE's personnel, sub-contractors, and visitors to the site shall use while the field investigations are being conducted. The Plan shall be prepared according to the requirements of section 5 of this Scope of Work and Ref. 10.5, USEPA Health and Safety Plan, and requirements of the SEAD Health and Safety Office.

3.1.2.2 Monitoring Well Installation Plan. The AE shall prepare and submit a Monitoring Well Installation Plan according to the requirements of Section 7 of this Statement of Work. The plan shall provide for six shallow monitoring wells at locations proposed by the AE, downgradient from the open burning pads. This Plan shall describe the drilling equipment and decontamination procedures that will be employed, the identity and responsibilities of personnel working on the project shall also be included.

3.1.2.3. Sampling and Analysis Plan. The AE shall prepare and submit a Sampling and Analysis Plan according to Section 6 of this Statement of Work. The laboratory and field QA/QC shall be submitted as part of the Sampling and Analysis Plan. The AE shall propose specific analyses for the parameters listed in Tables I and II of this Scope of work, detailing analytical methods for specific samples.

3.1.3 (Task 3) Install Shallow Wells. The AE shall install six shallow groundwater monitoring wells down gradient from the open burning pads. These wells are to be used for continued groundwater monitoring after the burning pads have been permanently closed. The AE shall recommend and justify the location of each well in the Monitoring Well Installation Plan. The target depth is the contact between the glacial overburden and the underlying bedrock, estimated to be about 15 feet deep.

A maximum of ninety feet of drilling is provided for under this Task. These wells shall be constructed in accordance with the requirements of Section 7 of this Statement of Work and the approved Field Investigation Plan.

3.1.4. (Task 4) Surveying. Each new monitoring well shall be located according to the surveying requirements of Section 8 of this Statement of Work.

3.1.5 Chemical Sampling and Analysis. The AE shall perform following sampling and analyses in accordance with Section 6 of this Statement of Work. The results of the sampling and analysis program shall be included in the Criteria Development Report. The total number of samples to be collected and analyzed, along with required and approved methods are shown in Tables I and II. In estimating the cost for tasks requiring sampling and analyses of groundwater wells, laboratory charges shall be in terms of cost per sample and cost per analysis. The AE shall prepare cost estimates assuming that the full list of Table I will be performed for each sample. During contract negotiations the AE and Contracting Officer shall agree on a unit price for each method. If all analysis are not required on each sample, the price will be reduced according to the agreed unit price. If directed to do so by the Contracting Officer, the AE shall collect and send representative "split" samples to a contract Laboratory of the USEPA's choosing. The AE will not be

responsible for the analysis of the "split" samples or subsequent reporting results. The AE, however, will be required to defend his results if there is disagreement between the samples analyzed by the AE and the samples analyzed by the EPA contract laboratory. All wells should be sampled within a twenty-four hour time block

3.1.5.1 (Task 5) Sampling and Analysis of Groundwater Samples. AE shall collect and analyze one sample from each of the wells installed under Task 3, as well as one sample from each of the existing wells located around the burning pads. Specific analyses are shown in Table II. The total number of samples under this Task is thirteen (13).

3.1.5.2 (Task 6) Preparation and Analysis of QA/QC Samples. The AE shall collect and prepare groundwater samples for QC/QA analysis. The specific numbers of samples and types of analyses as shown in Tables I and II.

3.2. (Task 7) Criteria Development Report. The Army favors in-place containment and closure as the method of choice. The AE shall direct initial analysis and criteria development efforts towards meeting this method. If the AE determines that this method is not compatible with existing State and Federal Regulations, or that it is not economically feasible according to recent disposal/closure technology, this shall be so stated and justified in the Criteria Development Report.

3.2.1 Based on the information learned in preceding Tasks and interpretation of current State and Federal regulations, The AE shall develop preliminary engineering closure design criteria prior to actual preparation of the Closure and Post-Closure Plan. This will ensure that agreement is reached between the Army and the Regulators on any critical item that may need clarification.

3.2.2.1 The AE shall prepare and submit to the Contracting Officer a Criteria Development Report which addresses information learned from the preceding Tasks. It is not intended that this report be an entirely new and independent effort, but a verification of the preliminary alternatives presented in the O'brien & Gere report (Ref 10.26), based on additional test data and changes in applicable regulations governing hazardous waste disposal technology. The type of material to be used in closure construction, its ability to withstand vibrations from thirty-five pounds of explosive charge (when the Demolition Pad is in use), and the availability of such material are among the critical items which shall be considered. This report should be structured so that applicable sections may be incorporated into the Construction Bid Package to the maximum extent possible. This report shall be submitted in accordance with the schedule presented in Section 4 of this Statement of Work.

3.3 Closure and Post Closure Plan. The AE shall prepare a Closure and Post Closure Plan compatible with the work done under

Task 7, and as approved by the Contracting Officer.

3.3.1 (Task 8) - Draft Plan. A preliminary draft copy of the Plan shall be submitted to the Army for review and approval. It shall be the AE's responsibility to incorporate all information required by State and Federal regulations pertaining to closure and post closure of the open burning pads. Where the specific information does not exist, The AE shall be provide recommended interpretations applicable State and Federal Laws. After the Army's review of the submitted draft, the AE shall prepare a final draft of the Closure and Post Closure Plan, responding to all comments received from the Contracting Officer. This final draft shall be submitted according to the schedule in Section 4 of this Statement of Work. The Army will in turn submit the document to State and Federal regulators for approval.

3.3.2 (Task 9) Review Meeting. After sufficient time is allowed for the regulators to adequately review the document, a review meeting will be schedule to discuss comments generated on the draft final of the Plan. For the purposes of negotiations, the AE shall assume that the meeting will last two days, will take place at Seneca Army Depot and that three people from the AE firm will attend.

3.3.3 (Task 10)-Final Plan. The AE shall prepare a final Closure and Post Closure Plan incorporating comments generated by the Army and the Regulators and provided by the Contracting

Officer. The Final Plan shall be submitted according to the schedule in Section 4 of this Statement of Work.

3.4 Option 1- (Tasks 11 through 15) Construction Bid Package. Upon receipt of a Notice to Proceed from the Contracting Officer, the AE shall prepare a construction bid package for a fixed-price construction contract for permanent closure of the nine open burning pads. The AE shall provide all topographic maps, technical plans, engineering design drawings, design analyses, construction specifications, and cost estimates to safely and permanently close the pads. Final specifications shall be typed by the AE and submitted in the form of one camera ready manuscript and floppy discs that are readable and printable on the 8100 series CPT word processor. The AE shall perform the work in accordance with HNDM 1110-1-1, "Engineering Guidance Design Manual for Architect-Engineers," (Ref 10.27) and as follows:

3.4.1 (Task 11)-Prepare Technical Provisions for Specifications. The AE shall prepare specifications of work to be required as part of a construction contract. The specifications shall describe the type and quantity of construction, construction methods and materials, and shall use, where existing, Corps of Engineers' Guide Specifications, which will be provided.

3.4.2 (Task 12)-Prepare Contract Drawings. The AE shall prepare

contract drawings necessary for permanent closure of the pads. The drawings will include, but not necessarily be limited to the following:

a. Cover Sheet

b. Index Sheet

c. Vicinity Map

d. Location Map

e. Site Plan Sheet(s)

f. Environmental Protection Sheet(s)

g. Grading and Drainage Plan Sheet(s)

h. Cross-Sections of Excavation and Fill

i. Construction Details

3.4.3 (Task 13) Design Analysis. A design analysis will be required as part of the Construction Bid Package. The design analysis shall include a narrative discussion of the design philosophy and assumptions, reference sources, and the design calculations. In addition, it will document significant design choices. The design analysis shall be in sufficient detail to permit verification that the design complies with previously approved criteria and conforms with applicable codes, standards, and regulatory requirements.

3.4.4 (Task 14) Construction Quality Assurance Plan. The AE shall prepare the Construction Quality Assurance Plan based on the the requirements of "Construction Quality Assurance for

Hazardous Waste Disposal Facilities" (Ref.10.), and standard Corps of Engineers requirements. The plan shall identify specific tests, quantities, locations, and qualifications of QC and QA personnel necessary to meet the specified requirements.

3.4.5 (Task 15) Construction Cost Estimate. The AE shall prepare, using qualified estimators performing quantity surveys from the design drawings and specifications, a construction cost estimate. It shall be broken down as described in HNDM 1110-1-1.

3.4.6 (Task 16) Presentations and Meetings. The AE shall attend meetings to review work performed after the 35% and 90% submittals of the Construction Bid Package. The meetings shall be held at Seneca Army Depot. Each meeting will last no longer than one day. The AE shall assume, for purposes of negotiation, that two people from the AE firm will attend each of the two meetings. The AE shall make a brief presentation of the work accomplished, followed by open discussion of comments on the work submitted.

TABLE 1

Number of Samples to be Collected and Analyzed.

Sample Identification	Field Samples Collected and Analyzed by AE	Control Samples to be Analyzed by AE Lab	Control Samples to be Analyzed by QA Lab
Task 5 & 6			
Travel Blank	0	1	1
Sample Blank	0	1	1
Groundwater*	13	2	2
Total	13	4	4

*Triplicate QA/QC samples are counted as one sample in the field samples column, plus one sample in the AE analyzed control sample column plus one sample in the QA/QC lab. analyzed samples column.

TABLE 2

Required Analyses and Approved Methods

*Analysis	Analytical Method
Metals:	48.1* *
Petroleum Hydrocarbons	200.7* *
Explosives (RDX, HMX, DNT, TNT)	HPLC (Ref Am Ind Hyg Association Jour 45(4) 222-226 USAEHA

* All samples shall be analyzed for all parameters

** U.S. Environmental Protection Agency

*** U.S. Army Environmental Hygiene Agency

4.0 SUBMITTALS AND PRESENTATION

4.1 Report Format and Content. The Engineering Reports presenting all data, analyses, and recommendations shall be prepared in standard format for AE reports. All site drawings shall be of engineering quality with sufficient detail to show interrelations of major features on the installation site map. When drawings are required, data may be combined to reduce the number of drawings. The report shall consist of 8-1/2" x 11" pages with drawings folded, if necessary, to this size. A decimal paragraphing system shall be used. The report covers shall consist of durable three-ring binders which shall hold pages firmly while allowing easy removal, addition, or deletion of pages. A report title page shall identify the AE, the Corps of Engineers, Huntsville Division, and the date. The AE identification shall not dominate the title page. This Scope of Work shall be incorporated in the draft report only. Submittals shall include incorporation of all previous review comments as well as the disposition of each comment. Disposition of comments submitted with the final report shall be separate from the report document. All final submittals shall be sealed by the registered Professional Engineer-In-Charge.

4.2 Construction Bid Package Format and Content. The Construction Bid Package shall be prepared as required by HNDM 1110-1-1 (Ref. 10.27).

4.3 Minutes of Meeting. Following each meeting attended by the AE, the AE shall prepare and submit minutes of the meeting within 5 days to the Contracting Officer.

4.4 Correspondence. The AE shall keep a record of each phone conversation and written correspondence where information related to the performance of this contract is made. A summary of the phone conversations and written correspondence shall be submitted to the Contracting Officer monthly.

4.5 Completion Dates.

Notice to Proceed (NTP) shall be on TBD.

	DRAFT	DRAFT FINAL	FINAL
Submission of Field Inves. Plan	TBD	NA	TBD
Submission of Criteria Development Report	TBD	TBD	TBD
Submission of Closure and Post Closure Plan	TBD	TBD	TBD
Construction Bid Package			
35% Submittal	NA	NA	TBD
90% Submittal	NA	NA	TBD
100% Submittal	NA	NA	TBD

The overall completion date for this contract shall be TBD.

4.6 Submittals. The AE shall furnish copies of the reports as well as all technical submittals to each addressee listed below in the quantities indicated not later than the dates indicated in Paragraph 4.6. Following each submission, comments generated as a result of the Government's review shall be incorporated by the AE.

	DRAFT	DRAFT FINAL	FINAL
Commander U.S. Army Corps of Engineers ATTN: HNDED-PM PO Box 1600 Huntsville, AL 35807-4301	4	4	4 copies, plus reproducible and floppy disk of final submittal
Commander U.S. Army Environmental Hygiene Agency ATTN: HSHB-E Aberdeen Proving Ground, MD 21010-5422	2		
Commander U.S. Army Corps of Engineers New York District ATTN: NANEN- 26 Federal Plaza N.Y, NY 10007			
Commander Seneca Army Depot ATTN: SDSSE-ADE Romulus, NY 14541			
Commander US Army Materiel Command Installations & Service Activities ATTN: DRCIS-RI-IC Rock Island Il 61299-7190			

Commander
US Army Materiel Command
ATTN: AMCEN-A
5001 Eisenhower Ave.
Alexandria, VA 22333-0001

Commander
US Army Depot Systems Command
ATTN: AMSDS-RM-EFD
Chambersburg, PA 17201

5.0 SAFETY REQUIREMENTS.

The AE shall prepare and submit the Safety Program Plan(SPP) to the Contracting Officer (CO) for review and approval prior to commencement of any field work, according to the schedule in Paragraph . No field work (other than the initial visual inspection) may be performed until all plans are reviewed and approved by the CO. All work shall be performed according to the approved plan. The SPP shall be prepared in accordance with the requirements specified in this section.

5.1 The SPP must be administered by a qualified safety and health professional and shall comply with all federal, state, and local health and safety requirements, e.g., the Occupational Safety and Health Administration (OSHA) requirements (29 CFR 1910 and 1926), the U.S. Environmental Protection Agency (USEPA) hazardous waste requirements (40 CFR 260-270), the U.S. Army Corps of Engineers Safety and Health Requirements Manual (EM 385-1-1), and the U.S. Army Materiel Command Safety Manual, DARCOMR 385-100. The SPP shall include but not limited to:

5.2 Organization/Administration. The AE shall assign responsibilities for safety activities and procedures. A safety officer shall be designated to implement the SPP for all onsite activities.

5.3 Standard Operating Procedures (SOPs). The AE shall outline standing operating procedures (SOPs) for preventing accidents, and protecting personnel from injury and occupational illness for all operations having a significant accident potential. Approved SOPs will be made available to prime and subcontractor personnel for personnel information guidance and compliance.

5.4 Identification of Hazards. The AE shall review existing records and data to identify potential hazards associated with the designated drilling and sampling sites and to evaluate their impact on field operations. The AE shall develop action levels for controlling worker exposure to the identified hazards in accordance with appropriate requirements.

5.5 Personal Protective Equipment. The AE shall provide appropriate personal protective equipment (PPE) to insure workers, official visitors and government employees are not exposed to levels greater than the action level for identified hazards for each operation stated for each work zone. The level of protection shall be specified in the SOP for each operation. The AE shall provide and maintain all PPE.

5.6 Safety and Health Training. The AE shall develop a training program to inform employees, official visitors and government employees of the special hazards and procedures (including PPE, its use and inspection) to control these hazards during field operations. Employees shall be trained in emergency procedures, areas of restricted access, methods of decontamination, and general safety. All prime and subcontractor personnel shall complete this program prior to beginning on-site work. The AE shall keep individual training records on all workers associated with the project and submit a copy of these records in the draft SOP. Training shall meet the requirements of 29 CFR 1910.120.

5.7 Monitoring. The AE shall provide continuous monitoring of the identified hazards associated with the designated drilling sites for controlling worker exposure during field operation. When applicable, National Institute for

Occupational Safety and Health (NIOSH) approved sampling and analytical methods must be used.

5.8 Emergency Procedures. The AE shall establish procedures to take emergency action in the event of immediate hazards, i.e.,a chemical agent leak or spill, fire, or personal injury. The AE designated safety officer shall serve as the emergency coordinator. Personnel and facilities providing support in emergency procedures shall be identified.

5.9 Medical Surveillance. Prime and subcontractor personnel shall have medical examinations prior to commencement of work. The medical examination results shall be evaluated to determine if the individual is physically fit for the work to be performed and that no physical condition or disease would be aggravated by exposure to the identified hazards. Medical records shall be available for review by the CO upon request.

5.10 First Aid. The AE shall provide appropriate emergency first aid equipment suitable for treatment of exposure to identified hazards, including chemical agents. A vehicle shall be made available to transport injured workers to medical facilities identified in the SPP.

5.11 Accident Recording and Recordkeeping. The AE shall immediately notify the CO of any accident/incident. Within two working days of any reportable accident the AE shall complete and submit to the CO an Accident Report on ENG Form 3394 in accordance with AR 385-40 and supplement 1 to that regulation.

5.12 Safety Inspection. The AE shall conduct regular safety inspections to determine if operations are being conducted in accordance with established SOPs.

5.13 Site Layout. The AE will determine three areas; exclusion, contamination reduction and support, for each work site. No person shall be allowed entry into the exclusion and contamination reduction areas unless in compliance with Sections 5.5, 5.6, and 5.9.

5.14 Unexploded Ordnance. SEAD has been used for the storage, maintenance and disposal of ordnance and/or explosive materials. If explosives or unexploded ordnance is discovered at any time during operations at the site the contractor shall mark the location, immediately stop operations in the affected area, and notify the CO. The Government will make appropriate arrangements with the Depot for evaluation and proper disposal of the device. It is anticipated that in the unlikely event that such conditions arise, they will be overcome with only slight delays to the AE. It is the specific intention of the SOW that the AE is not to drill, dig, or otherwise disturb the subsurface in areas where munitions or explosives may reasonably be suspected unless specific permission to do so has been given by the Contracting Officer.

5.15 Safety Plan Format. The SPP shall address the following topics:

RESPONSIBILITIES

Principal Engineer

Corporate Safety and Health Officer

Program Manager

Site Safety and Health Coordinator

Field Personnel

Subcontractor Personnel

HAZARD COMMUNICATION AND TRAINING

Comprehensive Health and Safety Indoctrination

Specialized Training

Pre-Investigation Health and Safety Briefing

Morning Safety Meetings

Post-Investigation Health and Safety Briefing

MEDICAL SURVEILLANCE AND EXPOSURE MONITORING

Medical Surveillance

Environmental Monitoring

HEALTH AND SAFETY EQUIPMENT

Personal Protective Equipment

Environmental Monitoring Equipment

Emergency Equipment

Fire Extinguishers

First Aid Kits

Eye Wash

Emergency Shower

Communications

STANDARD OPERATING PROCEDURES

Health and Safety Site Plan

Responsibilities

Site Description

Hazard Evaluation

Work Zones

Levels of Protection

Environmental Monitoring

Safe Work Practices

Decontamination Procedures

Site Entry Procedures

Emergency Information

Site Security

Activity Hazard Analysis

Site Inspection

Well Installation/Logging

Sampling

Land Survey

Laboratory Analysis

6.0 SAMPLING/ANALYSIS-QUALITY CONTROL/QUALITY ASSURANCE(QC/QA) REQUIREMENTS

The AE shall prepare and submit the sampling/analysis - QC/QA plan according to the requirements of this section and the definitions given in Paragraph . The site specific field and laboratory QC/QA plan shall be included.

6.1 Approval. The work plan must be approved by the CO prior to performing any field work. In the event corrections or comments are made by the CO on the draft plan, any necessary changes shall be implemented by the AE before

final approval.

6.2 AE Responsibility for Chemical Analyses. It is the responsibility of the AE to properly collect, transport, and analyze the required samples and to present the data pertaining to chemical analysis. If the AE or his subcontractor does not follow the specified criteria and approved work plans and thereby jeopardizes the samples, the Contracting Officer will reject the samples and direct the AE to resample, analyze, and present the data at no additional cost to the Government.

6.2.1 The laboratory shall be responsible for meeting any personnel or performance certification requirements of cognizant Federal or State Agencies.

6.3 Content and Format. The plan shall address each of the topics in Paragraphs 6.4 through 6.8.4. The following outline shall be used as applicable.

SECTION 1.0 PROJECT ORGANIZATION AND RESPONSIBILITY
SECTION 2.0 SAMPLING
- 2.1 Selection of Sampling Locations
- 2.2 Samples to be Collected
  - 2.1.1 Groundwater Samples
  - 2.1.2 QC/QA Samples
- 2.3 Sample Collection Methods
- 2.4 Sample Containers
- 2.5 Sample Preservation
- 2.6 Identification
- 2.7 Transportation and Custody

SECTION 3.0 ANALYSES
- 3.1 Parameters
- 3.2 Analytical Methods
- 3.3 Laboratory QC/QA

SECTION 4.0 DATA ANALYSIS AND REPORTING
SECTION 5.0 PROGRAM CONTROLS

6.4 Project Organization and Responsibility. The project organization for the prime contractor and any subcontractors shall be clearly defined with a discussion of quality control responsibilities. The AE's Quality Control (QC) Officer shall report to a responsible senior officer of the company, that is, QC management shall be separate from project management. A list of key individuals shall be provided, including those with QC responsibilities. The project-related qualifications of the AE's analytical laboratory shall be addressed in terms of equipment, facilities, and personnel. Names of laboratory supervisors, chemists, technicians and QC officers shall be given with brief resumes chronologically listing education and experience. The project schedule and list of responsible persons shall be stated.

6.5 Sampling.

6.5.1 Selection of Sampling Locations. For sampling sites to be chosen in the field, the plan shall describe the rationale that will govern their selection. The plan shall provide the location of each known well a site map. The plan shall discuss geological and hydrological influences on sample location, and provisions to insure that samples are representative of the site through the use of appropriate field control samples. Table 1 presents the numbers of standards and triplicate to be taken.

6.5.2 Samples to be Collected. The plan shall list or tabulate the samples to be collected, showing the number of samples, types, locations and analytes. The list shall include field controls. Samples collected and prepared in the field shall include: groundwater samples, and field control samples, as described in succeeding paragraphs.

6.5.2.1 Groundwater Samples. Each of the groundwater monitoring wells shall be sampled as specified in Section 3 of this SOW, by the procedure specified in Paragraph 6.5.3.2. All sampling specified in any one Task shall be accomplished within a period not exceeding five consecutive days.
All samples to be analyzed for metals shall be filtered at the time of collection through filter membranes with a nominal pore size of 0.45 microns.

6.5.2.3 Field and Control Samples. Types and number of field and control samples required are listed in Table .

6.5.2.4 Summary. The types and numbers of samples required are summarized in Table .

6.5.3 Sample Collection Methods. Specific sampling procedures to be used and appropriate references or descriptions shall be given as needed including sample sizes, sampling equipment, etc. Collection and preservation methods shall be consistent with the specified analytical methods and other standards.

6.5.3.1 Prevention of Cross-Contamination. The plan will describe cleaning of equipment and precautions for preventing contamination of samples during collection.

6.5.3.2 Groundwater Sampling. Before a sample is collected from a well, the water level shall be measured and recorded. Then the well shall be pumped or bailed with clean equipment to remove a quantity of water equal to at least five times the submerged volume of the casing. If the well does not recharge fast enough to permit removing five casing volumes, the well shall be pumped or bailed dry, and sampled as soon as sufficient recharge has occurred.

Samples shall be collected using a bailer dedicated to the well. The sample taken from the well for chemical analyses shall be collected from the screened portion of the well and not from the overlying riser section or the underlying sand-sump section of the well. The plan shall describe details of the sample collection procedure.

6.5.3.3 Sample Containers. List the composition and volume of containers to be used according to sample type (soil, water, air, etc.) and analyte. Describe cleaning and other preparation of containers.

6.5.4 Sample Preservation. List or tabulate the required preservation methods and maximum holding times, by sample type and analyte.

6.5.6 Identification. Describe the proposed system for identifying, labeling and tracking samples. Include recording of field data in permanently bound notebooks, and the system for relating field data to the proper samples.

6.5.6 Transportation and Custody. Describe packing, shipping or other transportation and custody documentation, in accordance with "Sample Handling Procedures," HND Guideline, September, 1986.

6.6 Analyses.

6.6.1 Parameters. The plan shall tabulate the samples to be collected and analyses to be performed. Table 2 lists required analyses and approved methods. Analysis as listed in the Table shall be performed on each field sample as well as on field controls sent to the AE's laboratory or subcontract laboratory. Laboratory controls (internal QC samples) are not listed, but shall be included in the approved sampling/analysis - QC/QA plan. Alternate methods and variation in procedures to those in Table 2 may be used if

approved by the CO and described in the approved plan.

6.6.2 Analytical Methods. Each proposed method must be specified exactly and in detail by one of the following:

(1) Reference to an accepted published method, e.g., an EPA, SM, or ASTM method, if the published procedure is followed exactly, or (2) reference to an accepted published method with a description of any deviations from the published procedure, or (3) complete description of the procedure, e.g., copies of laboratory instructions. Descriptions of any pre-treatment or preparation of the sample required before the actual analysis shall be included. Include the required concentration ranges, and data on the sensitivity (detection limits), precision and accuracy, by analyte and sample matrix in the descriptions of methods. Detection limits shall correspond to the Contract Laboratory Program of the USEPA. Indicate how pre-existing data on sensitivity, precision and accuracy were determined, and procedures to be used to validate the methods for the matrices in question.

6.7 Data Analysis and Reporting. For each analytical method and major measurement parameter, the following information shall be provided:

6.7.1. The data analysis scheme including units and equations required to calculate concentrations or the value of the measured parameter.

6.7.2. Plans for treating results that appear unusual or questionable. Describe the feedback systems used to identify problems by means of the results obtained from control samples. Limits of data acceptability shall be included with the corrective action to be taken when these limits are exceeded. Personnel responsible for initiating and carrying out corrective

action shall be indicated. Describe how re-establishment of control is demonstrated. Unacceptable contamination levels in blanks, and the maximum acceptable disagreement between replicate samples and analyses shall be stated in the Sampling/Analysis-QC/QA Plan. These limits shall correspond to those required by the Contract Laboratory Program of the USEPA. Corrective action to be taken when these limits are exceeded shall be described, and the circumstances that require collection of new samples at no additional cost to the Government shall be specified.

6.7.3. Description of the data management systems, including the collection of raw data, data storage and data quality assurance documentation.

6.7.4. Identification of individuals to be involved in the reporting sequence.

6.7.5. Description or illustration of the proposed data reporting format. Only quantified concentrations of analytes shall be reported.

6.7.6. Procedures to assess the precision, accuracy and completeness of all measurement parameters. The AE shall report precision based on standards and known additions. If statistical procedures are used for data review before reporting, include descriptions.

6.8 Program Controls

6.8.1 Calibration Procedures and Frequency. List field and laboratory instrumentation, specifying manufacturers, models, accessories, etc., with procedures used for calibration and frequency of checks. The instrumentation and calibration should be consistent with the requirements of the contract and the analytical method requirements.

6.8.2 Internal Quality Control Checks. Internal quality control checks are necessary to evaluate performance reliability for each measurement parameter. The numbers and types of internal QC checks and samples proposed (e.g. blanks, duplicates, splits, "spiked" samples and reference standards, as applicable) shall be defined clearly in the work plan and summarized by methods and analytes. The laboratory's established practice for including control samples among the samples tested, and any additional controls required by the present project, shall be described.

6.8.3 Preventive Maintenance. A system for preventive maintenance for facilities and instrumentation shall be described. Preventive maintenance shall be performed by qualified personnel. Records shall be maintained and shall be available for inspection by the CO on request and subsequent repairs, adjustments and calibrations shall be recorded.

6.8.4 External Certification. List or describe any external certification or evaluation programs, conducted by states, other government agencies, or professional societies, in which the laboratory participates.

6.9 Definitions. The following terms and meanings are given as they are applied here, since usage and terminology in this field are not yet standardized.

6.9.1 Quality Control. As applied to chemical analysis, all procedures and precautions observed in the laboratory to generate valid results. Includes such routine matters as purity of reagents, cleaning of equipment and containers, and calibration of instruments, as well as the more specifically oriented activities of quality assurance.

6.9.2 Quality Assurance. As applied to chemical analysis, the demonstration and documentation of data quality. Includes the recording of all quality control activities, and the assessment of analytical performance by analysis of internal and external control and audit samples, and use of the results to evaluate such parameters as precision, accuracy and sensitivity.

6.9.3 Field Control Sample. A trip blank, sampling blank, split sample, field replicate or any other sample submitted with field samples for QC/QA purposes.

6.9.4 Trip Blank or Travel Blank. A container or set of containers filled with reagent water, transported to the sampling site, handled like a sample and returned to the laboratory for analysis, with the purpose of demonstrating that containers and samples are not contaminated in transit.

6.9.5 Sampling Blank or Sampling Equipment Blank. Reagent water which is passed through the sampling equipment, transferred to sample containers and returned to the laboratory for analysis, with the purpose of demonstrating that the sampling equipment is not causing contamination or cross contamination of samples.

6.9.6 Split Sample. A sample which after collection is divided into two or more parts that are sent to different laboratories for the same analyses, thus serving as an external QA sample. A sample may be split either in the field or after delivery to the laboratory, if its volume is sufficient.

6.9.7 Field Replicate Samples. Two or more samples collected at the same time and source, but submitted to one laboratory as separate samples, for the purpose of assessing the consistency of the overall sampling and analytical

system.

6.9.8 Internal QC Sample or Laboratory Control. A reference standard, standard addition, replicate sample, blank or other sample in which the analyte concentration is known or can be calculated, which is placed among the samples to be analyzed in order to evaluate or demonstrate validity of the analytical results.

6.9.9 Reference Standard. A sample prepared from pure reagents to contain one or more analytes at known concentrations.

6.9.10 Standard Addition or "Spiked" Sample. A field sample to which known concentrations of one or more analytes have been added.

6.9.11 Laboratory Replicate Samples. Subsamples of a single field sample which are divided at the laboratory and analyzed as separate samples.

6.9.12 Replicate Analyses. Multiple analyses performed on the same sample.

6.9.13 Laboratory Blank. A sample prepared at the laboratory from pure materials containing none of the analyte. Laboratory blanks include method blanks, reagent blanks and others.

7.0 MONITORING WELL DESIGN AND INSTALLATION REQUIREMENTS

The following requirements shall be incorporated into the AE's Well Installation Plan and followed in the field. The plan shall be prepared using the following outline as applicable:

SECTION 1.0 INTRODUCTION AND BACKGROUND
SECTION 2.0 WELL LOCATIONS AND DEPTHS
SECTION 3.0 DRILLING EQUIPMENT
SECTION 4.0 DRILLING PROCEDURES
SECTION 5.0 CONTAMINATION PREVENTION AND DECONTAMINATION PROCEDURES

SECTION 6.0 WELL DESIGN AND INSTALLATION
SECTION 7.0 WELL DEVELOPMENT
SECTION 8.0 IN-SITU PERMEABILITY
SECTION 9.0 PROJECT ASSIGNMENTS & PERSONNEL QUALIFICATIONS

7.1. Location. Monitoring well locations shall be proposed by the AE as part of the plan prior to commencement of drilling activities. The AE shall obtain written approval from the Facility Engineer, SEAD, to drill at each site to avoid disturbing buried utilities.

7.2. Design of Monitoring Wells. The design and construction of monitoring wells shall follow as closely as practical the design for properly installed, low-yield domestic water supply wells. Recommended practices for the construction of such wells are set forth in "Manual of Water Well Construction Practices," USEPA Publ. EPA 570/9-75-001 (Reference 10.2). Additional design recommendations are given in "Procedures Manual for Groundwater Monitoring at Solid Waste Disposal Facilities," USEPA Publ. No. EPA 530/SW-611 (Reference 11.1). State or local certification requirements shall be met. The AE shall be responsible for obtaining any boring or well drilling permits required by state or local authorities and for complying with state or local regulations concerning submission of well logs and samples.

7.3. Installation of Monitoring Wells.

7.3.1 General Requirements. The AE shall provide all drilling equipment, materials and personnel required to install the wells, as well as a qualified geologist or geotechnical engineer who shall be on-site for all drilling, installation, development and testing operations. The AE shall use dry, hollow stem or solid auger, or air-rotary methods. The AE shall submit proposed

drilling methods in his Monitoring Well Installation Plan. Any changes to the approved drilling methods must be submitted to the Contracting Officer for prior approval.

7.3.2. Protection of Water Yielding Zones. The use of any liquid, including water, is to be generally avoided during drilling and will only be permitted by the Contracting Officer in cases where it is determined, by the Government, to be absolutely necessary for successful installation of the well. If water is required during drilling or well installation, only non-chlorinated potable water will be permitted. Any proposed use of water must be approved by the Contracting Officer beforehand. Grease or oil on drill rod joints will not be permitted. Dispersing agents (such as phosphates) or acids shall not be used. There shall be no attempt made to chemically disinfect the well. The rigs, drill tools, and associated equipment shall be cleaned with steam and washed and rinsed with a decontaminating liquid prior to commencement of drilling at each well and boring location. It is expressly required that toxic and/or contaminating substances shall not be used during any part of the drilling, well installation or well development processes. All drilling activities and methods shall be sufficient to positively prohibit the introduction of contaminants from one water bearing stratum to another via the well bore.

7.3.3 Well Design.

7.3.3.1 Boring Diameter. The boring shall be of sufficient diameter to permit at least two (2) inches of annular space between the boring wall and all sides of the centered riser and screen.

7.3.3.2 Well Riser and Screen.

7.3.3.2.1 Riser. Well riser shall consist of new threaded, flush joint, Polyvinyl Chloride (PVC)) pipe with a nominal two (2) inches inside diameter. Well risers shall, as a minimum, conform to the requirements of ASTM-D 1785 Schedule 40 pipe and shall bear marking that will identify the material as that which is specified.

7.3.3.2.2 Screen. The well screen shall be five (5) feet in length and shall be constructed of PVC material similar to the well riser. The screen shall be noncontaminating, factory constructed and of "continuous wrap" or "mill-slot" design. Field slotted or cut screen is not permitted. The slot size shall be determined by the AE and designed to be compatible with aquifer and gravel pack material. The AE shall provide a sieve analysis of one or more representative samples of the aquifer material in which the screen is placed and which demonstrates that the screen is compatible with the aquifer material. The sieve analysis shall be conducted in accordance with ASTM C 117 and C 136 and results shall be submitted to the CO with the field boring logs.

7.3.3.2.3 Screen Location. The AE shall have the responsibility of placing the well screen in the appropriate location in the bore hole so that the completed monitoring well functions satisfactorily.

7.3.3.2.4 Sand-Sump. There shall be a 2-foot minimum length "sand-sump" placed below the base of the screen. The sand-sump shall be a blank section of riser conforming to the requirements of riser to be placed below the table as described in paragraph 7.3.3.2.1. The sand-sump will be installed only if the screen can be placed at the appropriate interval without the sand-sump

penetrating the aquitard.

7.3.3.2.5 Joining Screen and Riser. Screen and riser sections shall be joined by threaded, flush-joint couplings, to form watertight unions, that retain 100% of the strength of the screen. Solvent glue shall not be used at any time in construction of the wells. The bottom of the deepest screen or casing section shall be sealed with a threaded cap or plug of inert, noncorroding material similar in composition to the screen itself.

7.3.3.2.6 Well Plumbness and Alignment. All risers and screens shall be set round, plumb, and true to line. Centralizers shall be used to assure plumbness and alignment of the wells. Centralizers shall not be installed on the well screen.

7.3.3.3 Gravel Pack. The AE shall select and use clean, inert, noncarbonate materials to construct a uniform and continuous gravel pack designed to prevent migration of fines into the screen. The gravel pack shall be placed by tremie pipe from the bottom of the boring to approximately two (2) feet above the top of the well screen.

7.3.3.4 Bentonite Seal and Grout. A minimum two (2) foot seal, consisting of tamped bentonite pellets or bentonite slurry shall be placed into the annular space between the riser and boring wall at the top of the gravel pack. Non-shrinking cement grout shall then be placed from the top of the bentonite seal to the ground surface. The cement grout shall consist of a mixture of portland cement (ASTM-C 150), and water in the proportion of not more than seven (7) gallons of clean water per bag of cement (One cubic foot or 94 pounds). Additionally, 3% by weight of bentonite powder shall be added if

permitted by State regulations.

7.3.4 Soil Sampling for Geotechnical Analysis. During drilling of and monitoring wells, soil samples shall be collected and geotechnical analysis shall be performed as outlined below.

7.3.4.1 Dry, hollow stem or solid auger methods of drilling shall be used for the "shallow" borings and wells. Air rotary methods may be used for the "deep" borings and wells.

7.3.4.2 Soil samples shall be taken continuously until coring begins.

7.3.4.3 Sampling shall be done with a split-spoon sampler (ASTM-D 1586-67) or thin wall sampler (ASTM-D 1587-74) using standard sampling techniques in the auger borings. Where air rotary is used, samples will be collected from the discharge pipe at the intervals stated in Para. 7.3.4.2.

7.3.4.4 Samples shall be logged stored in labeled, air-tight plastic or glass containers by the AE until such time when the contract is complete.

7.3.4.5 All soil samples shall be visually classified by the Unified Soil Classification System. The AE shall verify the classification by laboratory analyses consisting of the following.

Test Description	# Required/ Well
a. Grain-size distribution (ASTM-D 421 & 422)	2
b. Atterburg limits (ASTM-D 423 & 424)	2
c. Moisture content (ASTM-D 2216)	2

Specific soil samples to be tested, along with type of test, will be determined by the AE after reviewing the boring logs. Laboratory analyses shall use equipment and methods described in EM-1110-2-1906 (Ref. 10.4), or

ASTM manuals (Referenced above).

7.3.5 Rock Sampling. Rock samples will be and logged continuously. Samples will be labeled and stored in wooden core boxes until the project is complete. Core size shall be a minimum of 2 inches in diameter. The core shall be photographed with 35mm color slides which shall be submitted as part of the final report.

7.3.6 Protection of Well. At all times during the progress of the work, precautions shall be used to prevent tampering with the well or the entrance of foreign material into it. Upon completion of the well, a suitable vented cap shall be installed to prevent material from entering the well. The well riser shall be surrounded by a larger diameter steel casing set into a concrete pad and rising 24" to 36" above ground level. The steel casing shall be provided with lock and cap. A minimum three foot square, four inch thick concrete pad, sloped away from the well shall be constructed around the well casing at the final ground level elevation. In accordance with Paragraph 8.2, a survey marker shall be permanently placed in each pad. Three, two-inch or larger diameter steel posts shall be equally spaced around the well and embedded in the concrete pad. The ground immediately surrounding the top of the well shall be sloped away from the well. There shall be no openings in the protective casing wall below its top.

7.3.7 Temporary Capping. Any well that is to be temporarily removed from service, or left incomplete due to delay in construction, shall be capped with a watertight cap and equipped with a "vandal proof" cover satisfying applicable state or local regulations or recommendations.

7.3.8 Field Logs. The field geologist or geotechnical engineer shall maintain suitable logs detailing drilling and well construction practices. Logs shall be submitted for both wells and the test borings. One copy of each field log including the required color slides, shall be submitted to the Contracting Officer not later than calendar days after each well is completed. The well will not be accepted by the Contracting Officer until the logs are received and approved. Information provided in the logs shall include but not be limited to the following:

7.3.8.1 Reference elevation for all depth measurements.

7.3.8.2 Depth of each change of stratum.

7.3.8.3 Thickness of each stratum.

7.3.8.4 Identification of the material of which each stratum is composed according to the Unified Soil Classification System, or standard rock nomenclature, as necessary.

7.3.8.5 Depth interval from which each formation sample was taken.

7.3.8.6 Depth at which hole diameter (bit sizes) change.

7.3.8.7 Depth at which groundwater is first encountered.

7.3.8.8 Depth to the static water level and changes in static water level with well depth.

7.3.8.9 Total depth of completed well.

7.3.8.10 Depth or location of any loss of drill water circulation, loss of tools or equipment.

7.3.8.11 Location of any fractures, joints, faults, cavities or weathered zones.

7.3.8.12 Depth of any grouting or sealing.

7.3.8.13 Nominal hole diameters.

7.3.8.14 Amount of cement used for grouting or sealing.

7.3.8.15 Depth and type of well casing.

7.3.8.16 Description (to include length, location, diameter, slot sizes, material, and manufacturer) of well screen(s).

7.3.8.17 Any sealing-off of water-bearing strata.

7.3.8.18 Static water level upon completion of the well and after development.

7.3.8.19 Drilling date or dates.

7.3.8.20 Construction details of monitoring well.

7.3.9 Final Logs. The field logs shall be edited and drafted for inclusion into the final report.

7.4. Well Development. After each well has been constructed, but no sooner than 48 hours after grouting is completed, the AE shall direct a program for the development of the well by pumping and/or surging, without the use of acids, dispersing agents or explosives. Development shall continue for a period of 4 hours (minimum), and until groundwater removed from the well is clear and free of sand and drilling fluids. No water or other liquid may be introduced into the well other than formation water from that well. After final development of the well, the AE shall collect approximately 1 liter of water from the well in a clear glass jar, label and photograph it with a 35mm color slide, and submit the slide as part of the well log. The photograph shall be a suitably back-lit close up which shows the clarity of the water.

7.5. In-Situ Permeabilities. After development of monitoring wells, the AE shall calculate for each, the in-situ permeabilities of the significant water bearing strata in accordance with "Methods of Determining Permeability, Transmissibility and Drawdown," (Reference 11.3.) or other equivalent methods. However, no water or other liquid may be introduced into the well other than formation water from that well.

7.6 Dedicated Samplers. Each new groundwater monitoring well completed by the AE shall be equipped by the AE with a dedicated bailer and lined composed type 304 stainless steel, which shall remain with the well after completion of the contract.

7.7 AE Responsibility for Monitoring Wells.

7.7.1 It is the responsibility of the AE to properly plan, design, install, develop, and test monitoring wells so that they are suitable to produce groundwater samples representative in quantity and quality of subsurface conditions. The AE shall ensure that the requirements of this scope of work and best construction practices are carried out.

7.7.2 If the AE, due to inadequate design or construction, installs monitoring wells that are not functional or not in accordance with specifications, the Contracting Officer will disapprove the well and direct the AE to repair or replace it at the Contacting Officer's discretion. This work shall be done at no additional cost to the Government.

7.7.3 If a monitoring well is rejected by the Contracting Officer, or is abandoned by the AE for any reason, the hole shall be backfilled with neat

cement grout from top to bottom by the AE at no additional cost to the Government.

8.0 BORING, WELL, AND MONUMENT LOCATIONS.

8.1 Location Surveys. A 3.5 inch diameter, domed survey marker, (cap) composed of brass, bronze or aluminum alloy shall be permanently set in the concrete pad surrounding each well. Each survey marker shall be stamped with the following data by using steel dies that are a minimum of 1/8 inch tall.

USAEDH, Huntsville, AL.
Identification Number or Name.
Month and Year Established.
Final Adjusted Coordinates.
Final Adjusted Elevation.

Coordinates and elevations shall be established for each monitoring well and soil boring. The coordinates shall be to the closest 1.0 foot and referenced to the State Plane Coordinate System. If the State Plane Coordinate System is not readily available, the existing local grid system shall be used. Elevations to the closest 0.01 foot shall be provided for the survey marker and the top of the casing at each well. These elevations shall be referenced to the National Geodetic Vertical Datum of 1929. The the 1929 Datum is not readily available, the existing local vertical datum shall be used.

8.2 The location, identification, coordinates and elevations of the wells and monuments shall be plotted on suitable maps to show their location with reference to all the surface features within the topo area. A tabulated list of the monitoring wells and monuments including their coordinates and elevations, all field books, and all computation sheets shall be prepared and submitted to the Huntsville Division (HND), ATTN: HNDED-CS. The tabulation shall consist of the designated number of the well or monument, the X and Y coordinates, and all the required elevations. These items shall be submitted to HND no later than the Draft Report Submission.

9.0 PUBLIC AFFAIRS

The AE shall not make available to the news media or publicly disclose, in general, any data generated or reviewed under this contract. The AE shall refer all requests for site information to Seneca Army Depot for comment. All request for contract information shall be directed to the Contracting Officer, Huntsville Division. Reports and data generated under this contract shall become the property of the Department of Defense and distribution to any other source by the AE, unless authorized by the Contracting Officer, is prohibited. The AE shall notify the Contracting Officer and Installation Representative prior to any meeting with regulatory agencies.

10.0 REFERENCE DOCUMENTS

10.1 "Procedures Manual for Groundwater Monitoring at Solid Waste Disposal Facilities," USEPA Publ. No. EPA/530/SW-611.

10.2 "Manual of Water Well construction Practices," USEPA Publ. No. EPA/570/9-75-001.

10.3 Methods of Determining Permeability, Transmissibility, and Drawdown," U.S. Geological Survey Water Supply Paper No. 1536-1, 1963.

10.4 "Laboratory Soils Testing," U.S. Army Engineering Manual No. EM-1110-2-1906, November 1970.

10.5 "U.S. Corps of Engineers Safety and Health Requirements Manual," U.S. Army Engineering Manual No. EM385-1-1, April 1981.

10.6 "Code of Federal Regulations, "Volume 40, Parts 260 through 265 plus 270, July 1986.

10.7 "American Society for Testing and Materials, " ASTM-D-421-, D-422, D-423, D-424, D-2216, and D-2436.

10.8 "U.S. Army Material Command Safety Manual, DARCOMR 385-100, 17 Aug 1981.

10.9 "Code of Federal Regulation," Volume 40, Part 300, July 1986.

10.10 "Handbook for Monitoring Industrial Waste Water," U.S. Environmental Protection Agency, Aug 1979.

10.11 "Methods for Chemical Analysis of Water and Wastes," U.S. Environmental Protection Agency, Publ. No. EPA/625/6-7-003a.

10.12 "Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater," USEPA Publ. No. EPA/5--/4-82-057, July 1982.

10.13 "Test Methods for Evaluating Solid Wastes," USEPA Publ. No. SW-846, July 1982.

10.14 "Standard Methods for the Examination of Water and Wastewater," 16th Ed., APHA, AWWA and WPCF, 1985.

10.15 "Annual Book of ASTM Standards, Vol. 11.01 and 11.02", "ASTM Current edition.

10.16 "Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act," 40 CFR 136, Federal Register, Oct 26, 1984.

10.17 "Standard Operating Procedures for Field Samplers," EPA Region VIII, Denver, CO: June 1982.

10.18 "RCRA Groundwater Monitoring Technical Enforcement Guidance Document: (Draft) Office of Waste Programs Enforcement, USEPA, August 1985.

10.19 "Handbook for Analytical Quality Control in Water and Wastewater Laboratories," EPA Manual 600/4-79-019, March 1979.

10.20 "Safety and Occupational Health Document Requirements for Hazardous Waste Site Remedial Actions," U.S. Army Engineering Regulation (ER) 385-1-192.

10.21 "Guidance on Remedial Investigations Under CERCLA, "USEPA Manual #EPA/540/G-85-002, June 1985.

10.22 "Guidance on Feasibility Studies Under CERCLA, "USEPA Manual #EPA/540/G-85/003, June, 1985.

10.23 U.S. Army Environmental Hygiene Agency. Hazardous Waste Study No# 37-26-0778-86. Closure of Open Burning /Open Detonation Pads Seneca Army Depot, Romulus, New York. Aberdeen Proving Ground, MD 1986.

10.24 United States Army Environmental Environmental Hygene Agency. Hazardous Waste Study No. 37-26-0593-86. Phase 5. Summary of AMC Open-burning/Open Detonation Grounds Evaluations. Aberdeen Proving Ground. Md (March 1981-March 1986)

10.25 United States Army Environmental Hygene Agency. Groundwater Monitoring Study No. 38-26-0457-86. AMC Open Burning/Oprn Detonation Facilities. Aberdeen Proving Ground. (February 1984 -March 1985).

10.26 O'brien & Gere. Burning Pads B and H Closure. Seneca Army Depot. Romulu, New York. Contract DACA87-84-C-0077 (May 1985).

10.27 US Army Corps of Engineers, Engineer Guidance Manual for Architect-Engineers. Huntsville, Alabama (1982).

EBASCO

March 8, 1993

U.S. Army Corps of Engineers
P.O. Box 2288
Mobile, AL 36628-001
Attn: CESAM-PD-ES (Blackman)

SUBJECT: THERMAL TREATMENT OF PM-NUC MK 74 MOD 1 SHAPED CHARGES IN SEAD OPEN BURNING/ OPEN DETONATION FACILITY (OB/OD)

Dear Mr. Blackman:

Charles Botti (PM-NUC) requested a regulatory compliance analysis of the thermal treatment of PM-NUC MK 74 Mod 1 Shaped Charges in the SEAD RCRA Subpart X regulated OB/OD facility. Mr. Botti's particular concern was whether the treatment of these shaped charges in the SEAD open detonation pit would be in compliance with current environmental permits and authorizations held by SEAD. Although the shaped charges at issue are currently being stored at SEAD, for the purposes of this discussion, they will be referred to as off-site materials as referenced in SEAD's RCRA permit application.

Ebasco Environmental obtained excerpts from the SEAD OB/OD RCRA Part B permit application (including Subpart X permit application) and discussed various compliance procedures concerning the SEAD OB/OD with Mr. Randall Battaglia, Environmental Coordinator, SEAD (See Attachment I). Based on these discussions and a review of the SEAD RCRA permit application excerpts, SEAD has flexibility in the acceptance of off-site hazardous wastes for treatment in the OB/OD. Furthermore, according to Mr. Battaglia, New York State (RCRA permitting authority) is aware that some of the off-site wastes, considered for acceptance for treatment by SEAD, must still be fully characterized on the SEAD Subpart X materials list. This list specifies the materials which are permitted for treatment by SEAD (See Attachment II).

New York State has given SEAD flexibility in determining whether off-site materials are appropriate for treatment in the SEAD open detonation pit. Mr. Battaglia stated that off-site propellant, explosive, and pyrotechnic (PEP) wastes (i.e. shaped charges) can be accepted by SEAD for treatment provided that notification concerning these activities is given to the State. If the off-site material prospect for treatment is similar to material characterized on the SEAD OB/OD Subpart X material list, no further hazardous waste compliance procedures, other than notification, are required. If the off-site material are not characterized on the SEAD OB/OD Subpart X material list, the State will allow for the list to be amended to include these materials by submitting a letter requesting this modification.

EBASCO ENVIRONMENTAL *A Division of Ebasco Services Incorporated*
160 CHUBB AVENUE • LYNDHURST, N.J. 07071-3586 • (201) 460-6500

Ebasco has concluded, based upon review of information provided by Charles Botti (PM-NUC) concerning the composition of the MK 74 Mod 1 Shaped Charge (See Attachment III), the hazardous material associated with the shaped charges is H-6 high blast explosive (HBX). According to Mr. Botti, H-6 HBX is also referred to as CH-6. As identified in Attachment III, H-6 HBX consists of RDX (nitro cellulose, calcium chloride, and calcium silicate), TNT, aluminum, wax and lecithin. The SEAD OB/OD Subpart X material list includes H-6 HBX as a material permitted for treatment in the SEAD open detonation pit. Although MK 74 Mod 1 Shaped Charges are not specifically identified on the OB/OD Subpart X material list, because the charges are composed of H-6 HBX, a listed material, we conclude that the shaped charges could be sent, in compliance with the existing SEAD Subpart X permit, to SEAD for treatment in the open detonation pit.

Air permitting concerns regarding the treatment of off-site waste in the SEAD OB/OD facility were also discussed with Mr. Battaglia. Mr. Battaglia stated that the SEAD OB/OD air permit is not limited to specific quantities or material compositions. Procedures for air permit compliance consist of listing the material and its composition on a standard air permit form and then submitting the form to the State. Mr. Battaglia stated that New York permitting authorities would not likely raise concerns unless large amounts of heavy metals or other hazardous substances were to be released into the air as a result of the detonation of the specified material. Since H-6 HBX has already been permitted for treatment in the SEAD OB/OD and detonation will likely occur underground, the treatment of MK 74 Mod 1 Shaped Charges composed of H-6 HBX should not trigger State air quality concerns.

Based on the above discussion, the PM-NUC MK 74 Mod 1 Shaped Charges can be treated in the SEAD open detonation pit in compliance with current SEAD OB/OD treatment facility environmental authorizations and permits. It is recommended that PM-NUC coordinate with SEAD on the treatment of the Shaped Changes to assure compliance with SEAD OB/OD procedures.

If you have any questions or comments concerning the above discussion, please feel free to contact me at (205) 830-4100.

Sincerely,

for

Arthur B. Holcomb, P.E., C.I.H.
Project Manager

cc: J. Wander
C. Botti
R. Battaglia
K. Fitzgerald
T. Griffin
W. Stepien
S. Cook

W0513.LYN

SECTION B

FACILITY DESCRIPTION

B-1 FACILITYDESCRIPTION [40 CFR 170.14(B)(1)]

The Seneca Army Depot (SEAD) is located in Seneca County, New York, approximately sixty miles southwest of Syracuse. The SEAD lies immediately west of the village of Romulus, NY. It is bounded by NYS Route 96A on the west and by NYS Route 96 on the east. NYS Route 336 is at the northern boundary and the southern boundary is near West Blaine Road. Seneca Lake, one of the Finger Lakes, is located approximately one mile west of SEAD (refer to **Figure B-1**).

The facilities's mailing address is:

Commander, Seneca Army Depot
Rte. 96
Romulus, New York 14541

The primary mission of the installation is the receipt, storage, maintenance and supply of ammunition. However, over the years SEAD's mission has broadened to include the receipt, storage, care and maintenance of general supplies, industrial plant equipment.

SEAD operates an open burning/open detonation OB/OD facility for the thermal treatment of propellants, explosives, and pyrotechnics, (PEPs). The OB/OD facility is located as shown on **Figure B-2** and on **Figure B-3, Appendix 1.**

B-2 TOPOGRAPHIC MAPS [*40 CFR 270.14(b)(19)*][*6NYCRR Part 373-1.5 (a)(2)(xix)*]

A topography map of the OB/OD area is presented in **Figure B-2.** This figure includes (1) 1-foot surface contours, (2) 1" - 200' scale, (3) an area within a 1,000-foot radius of the OB and OD areas, (4) tree lines, (5) protective dirt mounds, and (6) protective bunkers.

ATTACHMENT 1 (cont.)

Wastes generated off-site are not routinely accepted for treatment, storage, or disposal (TSD) at SEAD. SEAD desires to be allowed to accept off-site generated wastes. At this time, the purpose is not for planned, routine, or current acceptance for TSD, but to allow for potential circumstances where Seneca may be required to accept a pre-determined waste material. (These circumstances may involve any particular, presently unknown hazardous material or munition.) In these cases, SEAD has technical experts who determine whether or not material is a hazardous waste or not and the appropriate fate of the material. An outline of the procedure used to accept these materials and characterize them accordingly is located in the Waste Analysis Plan.

In general, the decision on whether a material or munition is determined to be a hazardous waste will be made at Seneca Army Depot. Seneca applied to modify its status to be permitted to accept off-site generated wastes if Seneca is ordered to accept such a material or waste from off-site, or such material or waste is sent to Seneca without proper coordination with the SEAD environmental office. Seneca does not intend or plan to routinely accept off-site generated hazardous wastes (but desires to be permitted to) in the event that this occurs by orders from other Department of Defense authorities (whether these are intentional or inadvertent shipments). The cases described as follows show examples of when or how this may occur:

Case 1: Overseas Shipments

An overseas host country, for military activities, does not want hazardous wastes disposed of in the host country (these could be munitions or chemical wastes generated from military operations). The Department of State, the Department of Defense, the Department of the Army or other higher levels of authority decides to send the wastes to Seneca Army Depot. Seneca, hence, is <u>required</u> to accept such wastes. If prior coordination is made, Seneca can perform appropriate environmental requirements to manifest, store, or dispose of the wastes prior to shipments; however, this prior coordination may not necessarily occur for security, political or technical reasons.

Case 2: Shipments from Inside the Continental United States

a. Manifested wastes without prior coordination will be refused.

b. Shipments of hazardous substances which may actually be unmanifested wastes; it is possible that an unuseable hazardous material or a munition may be sent to Seneca categorized or marked "for demilitarization." Seneca is required to accept such material, and applies to be permitted to accept it if it actually is a waste. Seneca will file an unmanifested waste report according to 6NYCRR 372.4(c) and 372.4(d)(2).

ATTACHMENT I (cont.)

Incinerator usage and bag dust generation are totally dependent upon mission workload. Dust is placed in 55-gallon drums and transferred to Building 307 for storage. Brass casings and lead are also by-products of this process. Baghouse residue (ash) is drummed as a hazardous waste. Full drums are transported to Building 307 for temporary storage prior to off-post disposal. Brass and steel casings, when cooled, will be drummed, covered, sealed and stencilled "Deactivation Furnace Scrap Metal." These drums will be stored on pallets under cover from precipitation. The open storage shed will be used for this. The open storage shed consists of a slightly sloped concrete floor with permeable expansion joints, a roof and no walls. The permeable expansion joints prevent water from accumulating and storage on pallets further prevents contact of the containers with possible accumulated liquid. Steel and brass casings are ultimately shipped off-site to be recycled as scrap metal.

Thermal treatment of certain waste units is provided at the Open Burning/Open Denotation (OB/OD) units. These units are covered by a separate Part B unit, as outlined under 40 CFR Part 264, Subpart X.

The contact and party responsible for hazardous waste management at SEAD is:

Randall W. Battaglia
Environmental Engineer
Duty Phone: (607) 869-1450
Home: (315) 549-7013

B-2 TOPOGRAPHIC MAP [*40 CFR 270.14(b)(19)*][*6NYCRR Part 373-1.5(a)(2)(xix)*]

A detailed Area Map of SEAD (ten-foot contour intervals) (Figure B-2) is located in Appendix 1 of this document. Two topographic maps defining the areas surrounding the hazardous waste management facilities (two-foot contour intervals) (Figures B-3 and B-3a) are also included in Appendix 1 of this document. Surface waters within 1,000 feet of the hazardous waste management facilities are located on these maps.

B-2.1 Land Use

The SEAD is a government-owned, government-operated installation under jurisdiction of the U.S. Army Depot System Command (DESCOM). The depot lies immediately west of the village of Romulus, NY, 12 miles south of the villages of Waterloo and Seneca Falls, and 2.5 miles north of the village of Ovid, NY. The nearest major cities are Rochester, NY, and Syracuse, NY, located 60 miles northwest and northeast, respectively. The total area of SEAD is 10,587 acres, of which 8,382 are designated storage areas for ammunition and storage and warehouse. On-post family housing is in two parcels, a 54-acre development adjacent to Route 96 and another 69-acres situated along Seneca Lake. Additionally, troop housing is available for 270 enlisted men (Buildings 703, 704, and 708). Bachelor officer quarters are located in

Attachment 1 (cont.)

EBASCO

INTEROFFICE CORRESPONDENCE

TO: A. HOLCOMB

FROM: S. COOK/W. STEPIEN #005-93

DATE: JANUARY 21, 1993

SUBJECT: RECORD OF TELEPHONE CONVERSATION
DISPOSITION OF PM-NUC SHAPED CHARGES

Discussion with: Randy Battaglia - SEAD/Environmental
(607) 869-1450

Discussion concerned the demolition of PM-NUC MK74 Mod 1 Shaped Charges in SEAD demolition pit. Mr. Battaglia stated that the SEAD Subpart X permit application and state air permit allowed the Army flexibility in handling various types of materials. SEAD has sent a list of materials as part of the Subpart X application to the State. This list is based more on the composition of material as opposed to specific items. Therefore, if the PM-NUC material is similar to the material on the list in composition, demolition of these materials would be consistent with SEAD's permit. If the material was substantially different in composition from any of the listed material, a letter would need to be sent to the State to amend the material list. Mr. Battaglia seemed to imply that this was a routine, easily accomplished procedure.

Mr. Battaglia also stated that the SEAD demolition pit air permit was not limited to material quantities as appears to be the case with the Western Depot's permit. He stated that the procedure would consist of listing the particular waste based on its composition on a standard air permit form and submitting it to the State. The only concern of the State would be if large amounts of heavy metals were to be released.

It was agreed that Ebasco would contact PM-NUC and inquire as to whether there were other materials to be demolished at SEAD, so that if a material list amendment was needed, it could be obtained for all PM-NUC materials at once as opposed to making several separate amendments. Ebasco requested a copy of the SEAD Subpart X application material list to determine if the PM-NUC shaped charges at issue would be covered or to determine if amendments to the SEAD material list will be required.

Mr. Battaglia stated that he would send Ebasco the SEAD Subpart X application material list, the SEAD air permit form and additional material stating how the SEAD demolition operations were conducted from a regulatory perspective. This material will be sent by the middle of the week ending 1/29/93.

ATTACHMENT 1 (Cont)

DEPARTMENT OF THE ARMY
SENECA ARMY DEPOT
ROMULUS, NEW YORK 14541-5001

January 26, 1993

REPLY TO ATTENTION OF
SDSSE-HE

Mr. Steven Cook
EBASCO Environmental
Division of EBASCO Services, Inc.
160 Chubb Avenue
Lyndhurst, NJ 07071-3586

Dear Mr. Cook:

As requested, enclosed please find the following information regarding Seneca Army Depot's Subpart X Application:

a.) Section B-1 through B-2.1 of Seneca's overall permit application, which discusses acceptance of off-site generated waste, entitled "SEADPARTB1" in the upper right corner (encl 1).
b.) Section B-1 through B-4d of Seneca's Subpart X application, entitled "SUBPART X" in the upper right corner (encl 2).
c.) Table D-11 of Seneca's Subpart X application, entitled "Composition and Properties of OB/OD Materials" (encl 3).
d.) Memorandums, dated August 30, 1990 and August 7, 1990 regarding waste compositions (encl 4).

Since Seneca's overall application (paragraph B-1 of enclosure 1) states that wastes may be accepted from off-site, although not routinely performed, notification (only) would be required if PEP wastes were to be sent to Seneca for purposes of demilitarization. Seneca included language in its overall application so that Seneca is permitted to accept such wastes from off-site if required. The state is also aware that some wastes may not be fully characterized, and is flexible for new or basically similar munition compositions.

If you need further information, contact the undersigned at 607-869-1450.

Sincerely,

R.W. Battaglia

Randall W. Battaglia
Environmental Coordinator

enclosures

Table D-11 (Cont'd)

COMPOSITION AND PROPERTY OF OB/OD MATERIALS

Material	Composition	Temperature (°K)		Combustion Product Volume (l/100g of Munition @ STP)	
		OD	OB	OD	OB
Comp-A3	RDX - 91.0% Candellia wax 9.0%	895	1230	203.569	203.615
C4	RDX - 91.0% Poly-isobutlene - 9.0%	876	1191	206.124	206.284
HBX-1	RDX - 39.8% TNT - 37.8% Aluminum - 16.9% Candellia wax - 5.0% Calcium chloride - 0.50%	1107	1497	193.595	193.605
Low Velocity Dynamite*	RDX - 17.4% TNT - 67.8% Pentaerithritol - 8.6% R-45M - 2.8% Droctyl sebacate - 1.3% Cellulose acetate - 8.0%	868	—	212.158	—
H6	RDX - 44.8% TNT - 29.9% Aluminum - 19.9% Candellia wax - 5.0% Calcium chloride - 0.50%	1205	1611	190.713	190.724
Medium Velocity Dynamite*	RDX - 75.0% TNT - 15.0% Sucrose - 5.0% JP-4 - 4.0% Poly-isobutlene - 1.0%	883	—	202.569	—

* Note: Temperature and combustion product data are derived from reported values calculated using computer programs (1986 Army Computer Program, 1988 Army Computer Program, and 1987 Navy Computer Program).

ATTACHMENT II

Attachment III

WS 3018E
17 March 1975
Superseding
WS 3018D
15 November 1972

CODE IDENT
10001

NAVAL SEA SYSTEMS COMMAND
DEPARTMENT OF THE NAVY

PRIME ITEM PRODUCT FUNCTION SPECIFICATION

CHARGE, DEMOLITION, SHAPED,
MK 45 MOD 0
MK 47 MODS 0 AND 1
MK 74 MODS 0 AND 1

1. SCOPE

1.1 This specification covers the manufacture, assembly and preparation for delivery of the Charge, Demolition, Shaped, Mk 45 Mod 0, Mk 47 Mods, and Mk 74 Mods and the methods of examination and tests upon which product acceptance shall be based. The charge consists of a glass-filled phenolic case and cap. The Mod 0 contains a 30° cone shaped waxed RDX pellet and RDX booster. The Mod 1 contains composition CH-6 in lieu of RDX. The Mk 47 or Mk 74 cap attaches to a glass-filled phenolic socket and canvas base by bayonet type attaching lugs. The base consists of a 1/8 inch thick canvas belting material with self adhering hook and pile tape for attaching to targets. The charge is classified as Class A Explosive (Code of Federal Regulations 49 CFR 171-178) and Class IXB Explosive (Coast Guard Rules and Regulations for Military Explosives and Hazardous Munitions CG 108).

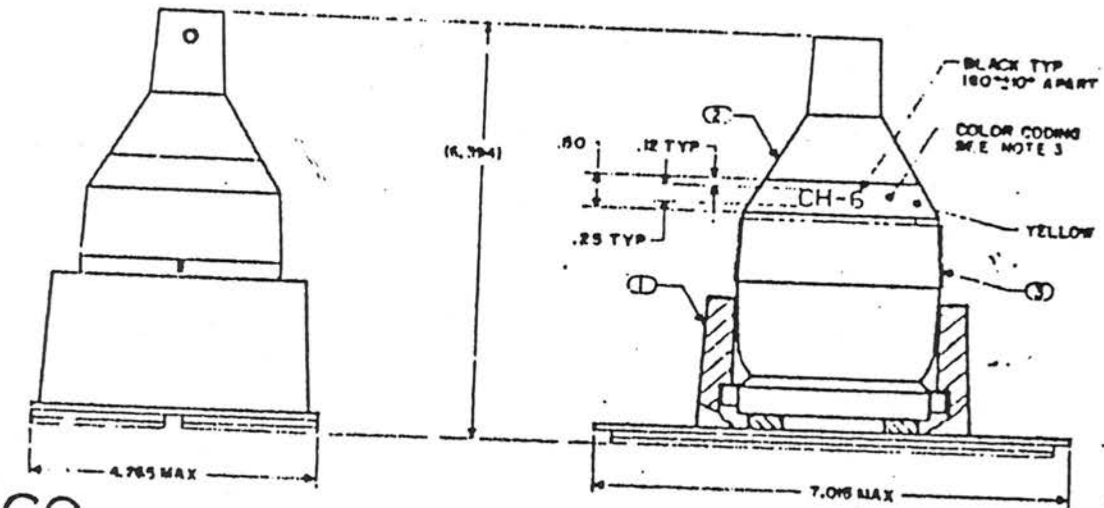
1.2 Definitions. The meaning of terms used in this specification shall be as listed in 6.4.

2. APPLICABLE DOCUMENTS

2.1 Government documents. The following documents, of the issue in effect on date of invitation for bids or request for proposal, form a part of this specification to the extent specified herein. In the event of conflict between this specification and other documents referenced herein, requirements of this specification shall apply.

ATTACHMENT III (cont.)

CLASSIFICATION OF CHARACTERISTICS
CRITICAL -
MAJOR -
MINOR - ALL OTHER CHARACTERISTICS



ACTION MFG. CO.
100 ... AVE.
PHILA., PA. 19134

J. O. # 4298

ITEM NO. 1

PARTS LIST

NAD CRANE

DEPARTMENT OF THE NAVY
NAVAL ORDNANCE SYSTEMS COMMAND
WASHINGTON, D.C.

CHARGE, DEMOLITION, SHAPED, MK 74 MOD

D | 10001 | 2128318

ATTACHMENT III (cont'd)

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH MIL-STD-100.

(C1) 2. LINER, ITEM 3, SHALL BE FREE OF ALL OIL, DIRT AND FOREIGN MATTER PRIOR TO APPLICATION OF EPOXY, ITEM 2.

(M101) 3. EXTERIOR SURFACE OF LINER, ITEM 3, SHALL BE COMPLETELY COATED WITH A LIGHT COATING OF EPOXY, ITEM 2, PRIOR TO CONSOLIDATION OF COMPOSITION CH-6, ITEM 1.

(M101) 4. COMPOSITION CH-6, ITEM 1, SHALL BE CONSOLIDATED INTO LINER, ITEM 3, IN ONE INCREMENT AT 10,000 ± 250 PSI PRESSURE. CH-6 WEIGHT: 140.0 ± 1 GRAMS.

(C2) 5. THE EPOXY, ITEM 2, SHALL BE COMPATIBLE WITH COMPOSITION CH-6, ITEM 1, WHEN TESTED BY TEST METHOD 7081 OF FED-STD-406, WITH THE REQUIREMENT FOR DRYING FOR ONE HOUR AND DISCARDING THE FIRST HOUR'S EVOLUTION DELETED. IN ADDITION THE FOLLOWING COMPATIBILITY EQUATION SHALL BE USED IN LIEU OF THE ONE STATED IN THE TEST METHOD.

$$\text{COMPATIBILITY} = E = \frac{(F + G)}{2}$$

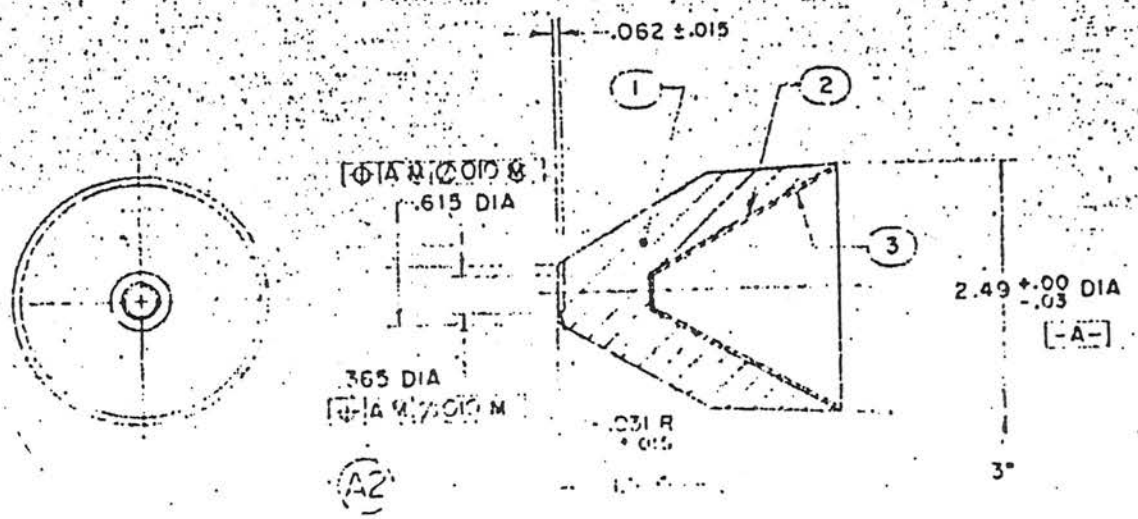
WHERE E = CC OF GAS EVOLVED BY THE EPOXY-EXPLOSIVE MIXTURE
F = CC OF GAS EVOLVED BY THE EPOXY ALONE
G = CC OF GAS EVOLVED BY THE EXPLOSIVE ALONE

THE EPOXY IS COMPATIBLE WHEN THE TOTAL GAS EVOLUTION DOES NOT EXCEED TWO CUBIC CENTIMETERS PER GRAM.

6. FOR LOADING AND ASSEMBLY PROCEDURES, SEE OD 47379.

ZONE	LTR	
MAJOR 2	A2	SEE NOR 2114060.A
MINOR ALL OTHER CHARACTERISTICS		

ALL MAJOR CHARACTERISTICS SHALL BE INSPECTED BY CLASS



ACTION MFG. CO.
100 E. ERIE AVE.
PHILA., PA. 19134

J.O.# 4298

ITEM NO. 18

ITEM NO	QTY REQ	CODE IDENT NO	PART OR IDENTIFYING NO	SPECIFICATION NO	NOMENCLATURE OR DESCRIPTION	SIZE AND DWG NO
3	1		2114059		LINER	
2	A1		5151056		EPOXY	SEE NOT
1	A2			MIL-C-71753	COMPOSITION CH-6	

PARTS LIST

DO NOT SCALE THIS DRAWING

MATERIAL:

NAVAL WEAPONS STATION

NWS APPROVAL DATE

NAVAL SEA SYSTEMS COMMAND

LINER-CHARGE ASSEMBL

SIZE	CODE IDENT NO	NAVSEA DWG NO.
C	10001	2114060

SCALE SHEET

ATTACHMENT III (cont.)

HBX-1, HBX-3 and H-6 Explosive Compositions US Military Specification Requirements and Tests, as described in MIL-E-22267A (31 May 1963)

Requirements:

3.2 Form. Unless otherwise specified the compns HBX-1, HBX-2 & H-6 shall be supplied in the form of buds or as strips 1.5 inches wide, 1 inch deep & 3 inches long

3.4 Components. The components used in the preparation of the Grade A HBX and H-6 composition shall comply with the specifications listed in 2.1 and shall be of the following grade or class as applicable

Composition B	Grade A
TNT	Grade 1
Al Powder	Type III, Grade F, Class 7

3.5 Grade A Compositions. The composition of the Grade A HBX composition shall conform to the nearest tenth percent as required in Table I when tested as specified in 4.4.3.2 or 4.4.3.3

Table I. Grade A Compositions

Ingredient	HBX-1 Percent by Weight	HBX-3 Percent by Weight	H-6 Percent by Weight
*RDX plus Nitrocellulose plus **Calcium Chloride plus ***Calcium Silicate	40.4 ± 3.0%	31.3 ± 3.0%	45.1 ± 3.0%
TNT	37.8 ± 3.0%	29.0 ± 3.0%	29.2 ± 3.0%
Aluminum	17.1 ± 3.0%	34.8 ± 3.0%	21.0 ± 3.0%
**** Wax plus lecithin	4.7 ± 1.0%	4.9 ± 1.0%	4.7 ± 1.0%

* *Note.* All of the RDX component and portions of the TNT and wax are added as Composition B.
** A separate calcium chloride determination need only be 9one if required in the contract or order (See 6.2). Percentage requirement of Calcium Chloride is 0.5% ± 0.1%
*** Calcium Silicate shall be determined as specified in 4.4.1.2 when used in the formulation of HBX compounds. The Calcium Silicate content shall be a minimum of 1.25 weight percent of the TNT content of the mixture and shall only be used in the HBX compositions when specified by the procuring agency (See 6.2). Calcium Silicate is designated for use only in Army formulations of HBX type explosive compositions.
**** The major portion of the wax and all of the Nitrocellulose and lecithin are added as Composition D-2

3.6 Grade B Compositions. The composition of the Grade B HBX & H-6 Composition shall conform to the nearest tenth percent as required in Table II when determined as specified in 4.4.3.4

Table II. Grade B Compositions

Ingredient	HBX-1 Percent by Weight	HBX-3 Percent by Weight	H-6 Percent by Weight
RDX plus Nitrocellulose plus Calcium Chloride plus *Calcium Silicate	40.4 ± 3.0%	31.3 ± 3.0%	45.1 ± 3.0%
TNT	37.8 ± 3.0%	29.0 ± 3.0%	29.2 ± 3.0%
Aluminum	17.1 ± 3.0%	34.8 ± 3.0%	21.0 ± 3.0%
Wax plus lecithin	4.7 ± 1.0%	4.9 ± 1.0%	4.7 ± 1.0%

Hot melt (asphaltic lining material) – maximum allowable 0.75%.

A separate Calcium Chloride detn need only be done if required in the contract or order. An additional one-half percent of Calcium Chloride shall be added whenever preparing the reclaimed explosive for re-use. Percentage requirement is 0.7% ± 0.3%

* The Calcium Silicate content shall be a minimum of 1.25 weight percent of the TNT content of the mixture and shall only be used in the HBX compositions when specified by the procuring agency (See 6.2). Calcium Silicate shall be determined as specified in 4.4.1.2

CH-6 = H-6

FEDERAL EXPRESS

QUESTIONS? CALL 800-238-5355 TOLL FREE.

AIRBILL
PACKAGE
TRACKING NUMBER 6677582332

6677582332

3004N

RECIPIENT'S COPY

1 Date: 3/8/93

From (Your Name) Please Print: MR. S. COOK
Your Phone Number (Very Important): (201) 460-6113
Company: EBASCO SERVICES INC
Department/Floor No.:
Street Address: 160 CHUBB AVE
City: LYNDHURST
State: NJ
ZIP Required: 0 7 0 7 1

2 To (Recipient's Name) Please Print: MR. RANDALL BATTAGLIA
Recipient's Phone Number (Very Important): ( )
Company: DEPARTMENT OF THE ARMY
Department/Floor No.:
Exact Street Address (We Cannot Deliver to P.O. Boxes or P.O. Zip Codes.):
City: SENECA ARMY DEPOT
State: ROMULUS, NEW YORK
ZIP Required: 14541-5001

YOUR INTERNAL BILLING REFERENCE INFORMATION (optional) (First 24 characters will appear on invoice.)
ACOE 3454.200-940

H IF HOLD FOR PICK-UP, Print FEDEX Address Here
Street Address:
City:
State:
ZIP Required:

3 PAYMENT 1 [X] Bill Sender 2 [ ] Bill Recipient's FedEx Acct. No. 3 [ ] Bill 3rd Party FedEx Acct. No. 4 [ ] Bill Credit Card
5 [ ] Cash/Check

4 SERVICES (Check only one box)

Priority Overnight (Delivery by next business morning†)	Standard Overnight (Delivery by next business afternoon. No Saturday delivery†)
11 [ ] OTHER PACKAGING	51 [ ] OTHER PACKAGING
16 [X] FEDEX LETTER*	56 [ ] FEDEX LETTER*
12 [ ] FEDEX PAK*	52 [ ] FEDEX PAK*
13 [ ] FEDEX BOX	53 [ ] FEDEX BOX
14 [ ] FEDEX TUBE	54 [ ] FEDEX TUBE
Economy Two-Day (Delivery by second business day †)	**Government Overnight** (Restricted for authorized users only)
30 [ ] ECONOMY	46 [ ] GOV'T LETTER
	41 [ ] GOV'T PACKAGE

Freight Service (for packages over 150 lbs.)
70 [ ] OVERNIGHT FREIGHT** (Confirmed reservation required)
80 [ ] TWO-DAY FREIGHT**
†Delivery commitment may be later in some areas.
*Declared Value Limit $500.
**Call for delivery schedule.

5 DELIVERY AND SPECIAL HANDLING (Check services required)

HOLD FOR PICK-UP (Fill in Box H) { 1 [ ] WEEKDAY or 31 [ ] SATURDAY
DELIVER { 2 [ ] WEEKDAY or 3 [ ] SATURDAY (Extra charge) (Not available to all locations)
4 [ ] DANGEROUS GOODS (Extra charge)
5 [ ]
6 [ ] DRY ICE Dangerous Goods Shipper's Declaration not required
Dry Ice, 9, UN 1845 ____ X ____ kg. III
7 [ ] OTHER SPECIAL SERVICE
9 [ ] SATURDAY PICK-UP (Extra charge)
[ ] ESIGNATION
12 [ ] HOLIDAY DELIVERY (If offered) (Extra charge)

6

PACKAGES	WEIGHT In Pounds Only	YOUR DECLARED VALUE (See right)
Total	Total	Total

DIM SHIPMENT (Chargeable Weight)
[ ] ____ lbs.
L x W x H
Received At
1 [ ] Regular Stop 3 [ ] Drop Box
2 [ ] On-Call Stop 4 [ ] B.S.C. 5 [ ] Station

7 Release Signature: 3/8/93

Emp. No. Date
[ ] Cash Received
[ ] Return Shipment
[ ] Third Party [ ] Chg. To Del. [ ] Chg. To Hold
Street Address
City State Zip
Received By: X
Date/Time Received FedEx Employee Number

Federal Express Use
Base Charges
Declared Value Charge
Other 1
Other 2
Total Charges

REVISION DATE 6/92
PART #137204 NCREC 10/
FORMAT #136
136