LONGHORN ARMY AMMUNITION PLANT KARNACK, TEXAS

ADMINISTRATIVE RECORD

CHRONOLOGICAL INDEX

Volume 2 of 9

2008

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Prepared for

Department of the Army
Longhorn Army Ammunition Plant

1976 – 2008

LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS
ADMINISTRATIVE RECORD – CHRONOLOGICAL INDEX

VOLUME 2 of 9

2008

Note: Volume 2, Year 2008, Letter A is listed Out of Date in Sequence and should have been inserted in Year 2004 update to the Administrative Record.

A. Title: ARC Abatement Documents – Work Procedures for Removal of Asbestos-Containing Materials at Longhorn Army Ammunition Plant
Author(s): Engineering and Fire Investigations, Inc.
Recipient: Army
Date: March 2003
Bate Stamp: 00063983 - 00064609

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B. Title: ARC Abatement Documents – Site-Specific Health & Safety Plan for Building Review and Condition Assessment for Explosive Materials
Author(s): Engineering and Fire Investigations, Inc.
Recipient: Army
Date: September 2003
Bate Stamp: 00064610 - 00065019

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WORK PROCEDURES

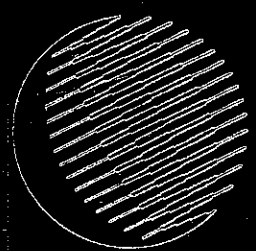
FOR

REMEDIATION AND DEMOLITION

AT

LONGHORN ARMY AMMUNITION PLANT

Karnack, Texas



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00063984

Engineering &
Investigations

WORK PROCEDURES
FOR
REMEDIATION AND DEMOLITION
AT
LONGHORN ARMY AMMUNITION PLANT

WORK PROCEDURES

FOR

REMOVAL OF ASBESTOS-CONTAINING MATERIALS

AT

LONGHORN ARMY AMMUNITION PLANT

Karnack, Texas

Prepared by:

Engineering and Fire investigations, Inc.
9700 Richmond
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March, 2003

CERTIFICATION PAGE

DISCLOSURE STATEMENT

THIS DOCUMENT HAS BEEN PREPARED ON BEHALF OF AND EXCLUSIVELY FOR THE USE OF U.S. ARMY INDUSTRIAL OPERATION – BRAC TECHNICAL SUPPORT OFFICE. IF THE DOCUMENT SHOULD BE REPRODUCED IT SHOULD BE REPRODUCED IN WHOLE, AND SUCH REPRODUCTION AND DISTRIBUTION SHALL BE AT U.S. ARMY INDUSTRIAL OPERATION – BRAC TECHNICAL SUPPORT OFFICE. ADDITIONALLY, U.S. ARMY INDUSTRIAL OPERATION – BRAC TECHNICAL SUPPORT OFFICE IS CAUTIONED THAT, SHOULD INTERPRETATIONS BE MADE, OPINIONS FORMED, AND CONCLUSIONS DRAWN AS A RESULT OF EXAMINING THE DOCUMENT, THESE INTERPRETATIONS, OPINIONS, AND CONCLUSIONS WILL BE THOSE MADE, FORMED AND DRAWN SOLELY BY THE PARTY REVIEWING THE DOCUMENT.

TDH Asbestos Consultant Name: Cuong Nguyen

TDH Asbestos Consultant Signature: _____

TDH Asbestos Consultant License No./Expiration: 10-5516 – 10/06/2003

By signing this document, the Asbestos Consultant for the project authorizes and delegates the visual observation requirements of these Work Procedures and the applicable federal, state and local regulations to the following EFI personnel and/or EFI Subcontractor:

END OF CERTIFICATION PAGE

PROJECT DIRECTORY

		Representative
Owner:	U.S. Army Industrial Operation BRAC Technical Support Office	Brian Gebhart
Owner's Representative:	U.S. Army Industrial Operation Hwy 43 @ Spur 449 Karnack, Texas 75671 (903) 679-3181	Lynn Muckelrath
Asbestos Abatement Contractor:	ARC Abatement, Inc. 6630 Roxburgh Drive, Suite 130 Houston, Texas 77041 (713) 896-0668, Fax (713) 896-1772	Michael Luczak
Engineer:	Engineering and Fire Investigations 9700 Richmond Avenue Houston, Texas 77042 (713) 975-7031, Fax (713) 975-7336	Lee A. Burckle, P.E. Cuong Nguyen
Testing Laboratory:	Engineering and Fire Investigations 9700 Richmond Avenue Houston, Texas 77042 (713) 975-7031, Fax (713) 975-7336	Lee A. Burckle, P.E.

END OF PROJECT DIRECTORY

1.0 SUMMARY OF WORK

PART 1 - GENERAL

1.01 DESCRIPTION

A. Project Description

The Longhorn Army Ammunition Plant is located on Hwy 43 @ Spur 449 in Karnack, Texas. The Longhorn Army Ammunition Plant is situated on an approximate 8,000 acres site, which contains of multiple process, warehouse, administrative, and ancillary buildings constructed in the 1950's and 1960's. The majority of the buildings contain interior and exterior transite siding and roofing and composition shingle/roll sheeting roofs. The building structures consist of metal stud and wood joist/roof framing. Typical administrative building interior finishes include carpet and tile/sheeting over concrete slabs, wall partitions constructed of gypsum wallboard with paint texture finishes and/or transite board, and suspended acoustical ceiling tile ceiling system.

B. The Scope of Work (SOW) will include, but not be limited to:

1. Removal and disposal of all Regulated Asbestos-Containing Material (RACM), which is currently RACM or may become RACM during demolition activities of the 41 identified buildings (see attached table in Appendix A). Generally, the RACM identified in the building to be removed is as listed below.
   a. Friable ACM - Thermal System Insulation (Steam - Block/Mudded).
   b. Friable ACM – Thermal System Insulation (Boiler Flue - Block).
   c. Category II, Non Friable – Exterior Corrugated Transite Sidings / Roofing.
   d. Category II, Non Friable - Interior Transite Siding.
2. Removal and disposal of loose and flaking lead-based paint from surfaces of identified buildings scheduled for demolition.
3. Testing of oil-fluids from identified buildings scheduled for demolition to determine if fluids contain PCB.
4. Removal and disposal of identified PCB and PCB contaminated equipment from identified buildings scheduled for demolition.
5. Erection of permanent security fencing and placement of warning barricade around buildings with open pit areas at completion of demolition.

C. Include all work listed in these specifications and incidentals thereto. Require that all phases of the Work be executed by skilled craftsman experienced in their respective trades.

D. Contractor may subcontract any phase or portion of the Work. However, such subcontract shall not relieve Contractor from enforcing the use of all required safety equipment by subcontractor and its employees providing any phase of the Work in contaminated areas. Require and verify that all materials and methods used by subcontractor are consistent with materials and methods for established

and safe asbestos, lead-based paint components, and PCB removal procedures and consistent with the Work Procedures.

1.02 WORK INCLUDED IN THE CONTRACT DOCUMENTS

A. General items include but are not necessarily limited to:

1. Isolation of all HVAC, electrical, fire alarm and security systems servicing the work area.
2. Coordination with Owner for use of building utilities (if feasible), or supply temporary power, water, etc. necessary to execute the Work.
3. Development of special fire protection and security procedures to be compatible with existing building systems and procedures.
4. Preparation of the work area as specified elsewhere.
5. Personal air monitoring for abatement workers and subcontractor's workers as required by regulatory agencies.
6. Removal of existing items that are in the work area to provide access to asbestos-containing materials.
7. Performance of incidental mechanical, electrical and plumbing work necessary for conducting the Work.
8. Removal of friable and Category II non-friable asbestos-containing materials prior to demolition of building structures and disposal of (friable) ACM waste to an approved off-site landfill, (Category II non-friable) to an on-site landfill.
9. Demolition of building structures with Category I non-friable ACM and disposal of ACM waste to an on-site landfill.
10. Removal and disposal of PCB containing transformers.
11. Removal of loose and flaking paint from building structures and characterization of lead waste prior to disposal.
12. Maintain security of Work Area (s) and buildings until Work is completed for each specific property.
13. Clean-up of the work area as specified elsewhere.

B. Mechanical/Plumbing items include but are not limited to:

1. Coordinate with Owner for isolation of any mechanical systems that are to be dismantled, and drain and purge piping systems to be dismantled.
2. Removal and disposal of asbestos-containing pipe/equipment insulation (block/mudded) and pipe/equipment insulation and all associated piping.

C. Electrical items include but are not limited to:

1. Installation of temporary electrical power panels with Ground Fault Circuit Interrupters (GFCI) for Contractor's and Testing Laboratory's equipment. All electrical tie-ins are to be performed by licensed electricians.
2. Installation of temporary lighting.
3. Installation of temporary electrical power as required by Testing Laboratory.
4. Isolate all electrical circuits that are within the work area.

5. Provide generators for source of power should existing utility/power are not available at the site.

1.03 WORK NOT INCLUDED IN THE CONTRACT DOCUMENTS

A. Re-installation of any removed items that are part of the removal work.

1.04 EXISTING CONDITIONS

A. Existing conditions are reflected correctly to the best of Owner's knowledge. Should minor conditions be encountered which are not exactly as indicated, modification to new work shall be made as required at no additional expense to Owner.

B. Results of tests of asbestos-containing materials (which are specifically excluded from these Contract Documents) taken from building surfaces within the scope of this Project are available for review at the office of the Engineer. However, Contractor is cautioned that, should interpretations be made, opinions be formed, and conclusions be drawn as a result of examining the test results, those interpretations, opinions, and conclusions will be those made, formed, and drawn solely by Contractor.

C. Inasmuch as randomly or arbitrarily selected areas were sampled, Engineer and Owner make no representation, warranty, or guaranty that the conditions indicated by the test reports either are representative of those conditions existing throughout the area, or that unforeseen developments may not occur, or that materials other than, or in proportions different from those indicated may not exist.

D. Contractor is advised that the locations of asbestos-containing materials are not clearly known and that the Contractor shall proceed with caution in all phases of the Work. Contractor shall verify all locations of asbestos-containing materials and shall remove similar associated materials that may exist at no extra cost to owner.

1.05 STORAGE

A. Storage space is available at the facility. Supply any additional temporary storage required for storage of equipment and materials for duration of Project. Contractor will be responsible for the security of the equipment and materials utilized for duration of Project.

1.06 BUILDING OCCUPANCY

A. Owner will occupy portions of the facility for the conduct of normal business operations during the abatement operations. Coordinate work with Owner and conduct activities so as to minimize disruption to the building occupants.

B. Predetermine and obtain approval, in advance from Owner, for horizontal transportation of contaminated waste materials, labor and construction materials into and out of building.

1.07 BUILDING SECURITY

A. Maintain personnel on the site at all times any portion of the work areas are open or not properly secured. Secure work areas completely at the end of each working day.

1.08 FIRE PREVENTION

A. Provide Type "A" fire extinguishers for temporary offices and similar spaces where there is minimal danger of electrical or grease-oil-flammable liquid fires. In other locations, provide type "ABC" dry chemical fire extinguishers, or a combination of several extinguishers per National Fire Protection Association (NFPA) recommendations and OSHA regulations.

B. Abatement Contractor's employees shall not enter building areas with cigarette lighters, matches, cigarettes, cigars, pipes or other flame emitting items. Abatement Contractor's employees shall not smoke cigarettes, cigars, pipes or the like within the building areas.

C. Flammable materials shall not be stored in the work area.

1.09 CONTINGENCY PLAN

A. Prepare a contingency plan for emergencies including fire, fire alarms, accident, power failure, or any other emergency event. Incorporate building's emergency procedures as required. Note that nothing in the Work Procedures should impede safe exiting or providing of adequate medical attention in the event of an emergency.

B. Post at the entrance to the work area telephone numbers and locations of emergency services including but not limited to the building security office.

1.10 PROJECT SUPERINTENDENT

A. Maintain a "competent" full-time superintendent as defined by OSHA and EPA, and necessary assistants who shall be in attendance at the building during the progress of the work. The superintendent shall be satisfactory to Owner's Representative and shall not be changed without prior approval by the Owner's Representative.

1.11 SEGREGATION OF WORK AREAS

A. Segregate the work areas from the surrounding occupied or unoccupied areas.
   1. Demarcate the work areas with asbestos and lead warning barrier tape (maintain a minimum clear distance of 15 feet from the work location and the demarcated perimeter) and post asbestos warning signage as required.

1.12 OBSERVATIONS

A. Engineer will observe the status and progress of the Work for completeness and general compliance with the requirements of the Work Procedures. At a minimum, the observations will be conducted at the following times during the Project:

1. Following pre-cleaning of work areas.
2. Following complete preparation of work areas and prior to proceeding with actual removal of asbestos-containing materials.
3. During removal of asbestos-containing materials.
4. At designated times during the cleaning phases.
5. At designated time during the demolition of building structures.
6. Following Demobilization of all equipment and materials.
7. As appropriate during the work outlined elsewhere in the Work Procedures.

1.13 SIGN-IN/OUT LOG

A. Maintain a Sign-In/Out Log in the immediate vicinity of the Change Room of the personnel decontamination enclosure. Maintain log from the time the first activity is performed involving the application of plastic sheeting until acceptance of the final air test results by Engineer. Require all persons entering the work areas, including the Contractor's workers, Engineer, Owner or agents of the Owner, government officials to register each time upon entering and leaving work areas. Indicate name, social security number, time, companies or agencies represented and reason for entering work area.

1.14 UTILITIES

A. Contractor may temporarily connect to existing permanent utilities during execution of the Work. Make connections in locations designated by Owner. The cost of utilities consumed will be paid by Owner.

1.15 SALVAGEABLE MATERIALS

A. Consider all materials and items demolished or removed in the execution of the Work unsalvageable unless specifically noted otherwise in the pre-job walkthrough.

1.16 CLEAN-UP

A. Dismantle and dispose of all temporary barriers erected to isolate the work areas at completion of Work.

B. Leave all areas visibly clean at completion of Work.

2.0 SUBMITTALS

2.01 DESCRIPTION

A. Make submittals required by the Work Procedures in a timely manner and at approximately times in the execution of the Work to allow fur sufficient and prompt review by Engineer. Revise and resubmit as necessary to establish compliance with the specified requirements.

2.02 WORK INCLUDED

A. Submit complete, bound sets of the submittals required herein. Submit separate sets entitled "Project Submittals".

B. Update submittals to Owner to account for all new equipment and employees used on the Project.

C. Project Submittals

1. Submit one complete set of "Project Submittals" to Engineer for review, of the completion of Work. Bind project submittals in a three-ring binder or cover with metal fasteners.

2.03 PROJECT SUBMITTALS

A. Notice of impending commencement of asbestos removal work, and any amendments if required, in writing via regular mail to:

Asbestos Notification and Information Section
P. O. Box 143538
Austin, Texas 78714-3538

Or overnight to:

Asbestos Notification and Information Section
8407 Wall Street
Suite N320
Austin, Texas 78754

and to comply with the applicable notice period set forth in 40 CFR 61.146. Include one copy of notifications in submittal package. Any required notification fees shall be paid by the Contractor.

B. Insurance certificate listing all coverages as required by Owner, listing Owner, and Testing Laboratory as additional insureds'.

C. Personnel Submittals (Asbestos).

1. General certificates from Contractor.
   a. Certification that each and every worker to be utilized on the Project by Contractor or subcontractor is actively involved in medial surveillance, respirator, and asbestos material hazard training programs.
   b. Certification that each and every employee to be utilized on the Project by Contractor or sub-contractor has had instruction on the hazards of asbestos exposure, protective dress, use of showers, entry to and exit from work areas on all aspects of work procedures and protective measures regarding asbestos removal, in an EPA approved course, as required by state and federal laws and regulations.
2. A copy of physician's written opinion per OSHA and TDH regulations for each person to be utilized on the Project.
3. Individually signed and notarized respiratory protection training certificate forms by each and every worker to be utilized on the Project by contractor or subcontractor, documenting that each is actively involved in a company employee Respirator Protection Program and has had appropriate training in respiratory protection.
4. A copy of Texas Department of Health license for each worker to be utilized on the Project or NESHAP accredited Training Certificates.
5. Individually signed and notarized Certificate of Worker's Release Form for each and every worker to be utilized on the project by Contractor or subcontractor.

D. Personnel Submittals (Lead)

1. "Worker Training Form" (SF-1) verifying workers to be utilized on the Project have received the proper training as specified by OSHA and all other pertinent regulatory agencies.
2. "Worker Training Certification Form" (SF-2) certifying that each and every employee has received instruction regarding the hazards of asbestos and lead-based paint exposure, protective dress, use of showers, entry and exit from a Work Area, and in all aspects of work procedures and protective measures regarding asbestos and lead-based paint removal. Employees utilized in asbestos abatement activities shall have successfully completed a course at least as stringent as that required under AHERA regulations for Asbestos Abatement Worker certification, Texas Department of Health regulations, and any other applicable and more stringent City, State, or Federal regulations. Employees utilized in lead abatement activities shall have successfully completed a Lead Abatement Worker training course as described by the Texas Department of Health regulations, and any other applicable more stringent City, State, or Federal regulations. Employees utilized shall have successfully completed all the required refresher training courses.

3. Copy of Blood Lead Determination for each and every worker to be utilized for lead-based paint abatement on the Project by the Contractor or Subcontractor and that each employee is involved in a Medical Surveillance Program in conformance with OSHA 29 CFR 1926.62.

E. Properly completed copies of the Uniform Hazardous Waste Manifest, Texas Natural Resource Conservation Commission form TNRCC-0311 (Current Edition) from the landfill, documenting the disposal of the asbestos containing/contaminated waste material (Off-Site Landfill Facility).

F. Copies of the chain of custody documenting the acceptance, transport, and delivery, by the waste transporter, of lead waste from the Work Site to the specified disposal or recycling facility. Chain of custody documentation should clearly correlate the quantity of material accepted by the transporter with the quantity of materials removed from the Work Site.

G. Copies of the lead waste manifest or Bill of Sale documenting the disposal of lead-based paint waste at the specified landfill or sale of material to a recycling facility. The waste manifest should clearly correlate the quantity of material accepted by the landfill with the quantity of material transported by the waste transporter.

H. A copy of the Sign In/Out Log showing the following: date, name, social security number, entering and leaving time, company or agency represented for asbestos & lead activities.

I. A copy of employee air monitoring results relative to Occupational Health and Safety Administration respiratory protection level compliance for asbestos & lead activities.

J. Physician opinion, training, TDH license and other required forms for each new employee used on the project for asbestos & lead activities..

K. Updated or renewed physicians opinion, training and licensing as necessary for personnel on Project.

2.04 ENGINEER'S REVIEW

A. Partial submittals may be rejected for non-compliance with the Work Procedures.
B. Review by Engineer does not relieve Contractor from responsibility for errors, which may exist in the submitted data.
C. Make revisions when required by Engineer and resubmit for review.

END OF SECTION

3.0 TESTING LABORATORY SERVICES

3.01 DESCRIPTION

A. Contractor will provide a qualified Testing Laboratory to perform routine and special testing of the Work performed under the Work Procedures.

B. Testing Laboratory representative will, in addition to performing routine and special testing necessary to determine general compliance with the Work Procedures, observe and document, on a daily basis, the execution and progress of the Work. Such observation and documentation shall be for the sole benefit of Owner and Contractor and shall not be construed in any way as to include responsibility for Contractor's means, methods, techniques, sequences or procedures involved with the execution of the Work. Nor shall such observation and documentation by Testing Laboratory be construed as to include responsibility for any safety programs or procedures either utilized or not utilized by Contractor during the Work.

3.02 QUALITY ASSURANCE

A. All environmental and final air testing shall be performed in general accordance with the procedures outlined in the National Institute for Occupational Safety and Health (NIOSH) Method No. 7400 and also will follow guidelines issued by Environmental Protection Agency regarding detection limits.

B. Final air samples will be analyzed in general accordance with the sample analysis procedures outlined in NIOSH Method No. 7400, as applicable.

3.03 PAYMENT FOR TESTING

A. Initial Services: Contractor will pay for Daily Environmental Air Testing, and initial Final Air Clearance testing required by the Work Procedures.

B. Retesting: When final air clearance tests indicate non-compliance with the Work Procedures, subsequent retesting will be performed by the same Testing Laboratory, and all associated costs will be paid by Contractor.

3.04 SCHEDULING

A. Testing Laboratory will perform tests in areas and at times during the Work as deemed necessary by the Testing Laboratory and as specified in the Work Procedures.

B. Should advance notice not be give to Engineer, Engineer will make reasonable effort to comply with time of required observations. Do no proceed until such observations by Engineer are made. Any delay in the completion of the Project

caused by lack of advance notice by Contractor to Engineer shall not be sufficient cause for any extension of time or extension of the Project completion deadline.

C. Notify Testing Laboratory of need for final air testing at least 4-hours prior to desired time of testing.

D. Coordinate other scheduling with Testing Laboratory as necessary.

3.05 SCHEDULE OF AIR SAMPLES

A. Before Start of Work (Background Level) per Work Area:

1. Testing Laboratory will collect, at a minimum, the following air samples to establish a base line before the start of work:

BASE LINE SAMPLES				
Sample Location	Number of Samples	Analysis Method	Minimum Volume (Liters)	Rate LPM*
Work Area	2 Minimum	PCM	1250	10-16

* LPM - Liters per Minutes

2. Base Line: An action level expressed in fibers per cubic centimeter, which is equal to the following:
   a. PCM: The greater of the average of the samples collected on mixed cellulose ester filters in the work area prior to abatement activities or 0.01 fibers per cubic centimeter.

B. During The Course of the Work / Final Air Clearance Samples: For Category II – Non Friable ACM.

1. Testing Laboratory will collect the following air samples to determine if the Contractor may remove critical barriers and demobilize from the site:

FINAL AIR CLEARANCE					
Sample Location	Number of Samples	Analysis Method	Minimum Volume (Liters)	Rate LPM *	F/cc
Upwind	1 Minimum Per Work Area	PCM	1250	4-16	$\leq$0.01 or $\leq$ Background
Downwind	1 Minimum Per Work Area	PCM	1250	4-16	$\leq$0.01 or $\leq$ Background

B. Daily During the Course of the Work: For Friable ACM.

1. Testing Laboratory will collect area samples in areas and at times during the work as deemed necessary by the Testing Laboratory, required by the Engineer, or as specified in the Contract Documents. Daily samples will be analyzed using Phase Contrast Microscopy.

C. Final Air Clearance Samples: For Friable ACM.

1. Testing Laboratory will collect the following air samples to determine if the Contractor may remove critical barriers and demobilize from the site:

FINAL AIR CLEARANCE					
Sample Location	Number of Samples	Analysis Method	Minimum Volume (Liters)	Rate LPM *	F/cc
Inside Work Area	1 Minimum Per Work Area Less Than 160 SQ. FT	PCM	1250	10-16	≤0.01
Inside Work Area	3 Minimum Per Work Area Greater Than Or Equal To 160 SQ. FT	PCM	1250	10-16	≤0.01

* Liters per Minutes
F/cc Fibers per cubic centimeter

3.06 RESULTS

A. Testing Laboratory will perform all testing and analysis promptly and issue results expeditiously in order to minimize any possible delay in the progress of the Work.

B. Test results shall be available to Owner and Contractor as follows:

1. Air clearance results: PCM - 4 hours following tests, TEM- 24 hours following receipt at laboratory.
2. Results of other tests deemed necessary by Engineer; as quickly as possible but not earlier than 4 hours following completion of tests.

C. Air tests will be made both inside, outside of work areas and OSHA personnel for the Contractor, as necessary. Contractor is cautioned, however, that should interpretations be made, opinions be formed and conclusions be drawn as a result of examining the test results, these interpretations, opinions and conclusions will be those made, formed and drawn solely by Contractor.

END OF SECTION

4.0 ASBESTOS ABATEMENT

4.01 DESCRIPTION

A. Perform all planning, administration, execution, and cleaning necessary to safely remove and dispose of asbestos-containing materials. Asbestos-containing materials to be removed for each project will be identified in a pre-job walkthrough.

B. Approval of or acceptance by Owner of various construction activities or methods proposed by Contractor does not constitute an assumption of liability either by the Engineer or Owner for inadequacy or adverse consequences of said activities or methods.

4.02 DEFINITIONS

The following definitions pertain to the work of this section.

A. Asbestos Definitions.

1. **Abatement** - procedures to decrease or eliminate fiber release from precast, spray- or trowel-applied asbestos-containing building materials. Includes encapsulation, enclosure and removal.
2. **Abatement Contractor** - the contractor designated in the contract documents as being responsible to the Owner for the control or abatement of asbestos-containing or contaminated materials, and other hazardous materials.
3. **Abatement Contractor's Testing Laboratory** - Testing Laboratory, designated herein as Abatement Contractor's Testing Laboratory, hired by Abatement Contractor to provide employee personal air monitoring services.
4. **ACM** - asbestos-containing material.
5. **Adequately Wet** - a term as defined in 40 CFR 61, Subpart M and EPA 340/1-90-019 that means to sufficiently mix or penetrate with liquid to prevent the release of particulates. If visible emissions are observed coming from asbestos-containing material (ACM), then that material has not been adequately wetted. However, the absence of visible emissions is not sufficient evidence of being adequately wetted.
6. **Airlock** - system for permitting ingress or egress of personnel without permitting air movement between a contaminated area and a uncontaminated area, typically consisting of two curtained doorways at least 3 feet apart.
7. **Air Monitoring** - the process of measuring the fiber content of a specific volume of air during a stated period of time.
8. **Amended Water** - water containing a wetting agent or surfactant with a surface tension of at least 29 dynes per square centimeter when tested in accordance with ASTM D 1331.
9. **Asbestos** - the general name given to a group of fibrous mineral forms including chrysotile, amosite, crocidolite, anthophyllite, tremolite, and actinolite.

10. **Asbestos Regulated Work Area** - An asbestos regulated work area is an area contained and controlled either by an enclosed containment (full containment area or mini-containment area), modified containment, glove bag or outdoor techniques, where asbestos-containing materials (ACM) operations are performed and isolated by physical boundaries to prevent the spread of ACM and control access to authorized persons. A full containment, mini-containment area, modified containment, and glove bag work area is isolated within a containment enclosure in which ACM operations are performed. An outdoor regulated work area is not isolated within a containment enclosure, but is otherwise secured by means of physical barriers, boundary warning tape, and signage, etc., to control access by unauthorized persons.

11. **Asbestos Consultant** - Asbestos Consultant hired by the Government to provide asbestos abatement consulting services as specified herein.

12. **Category I Non friable ACM** - A term as defined in 40 CFR 61, Subpart M and EPA 340/1-90-018 that means asbestos-containing packings, gaskets, resilient floor covering, and asphalt roofing products containing more than 1 percent asbestos as determined using the method specified in 40 CFR 763, Appendix A, Subpart F, Section 1, Polarized Light Microscopy.

13. **Category II Non friable ACM** - A term as defined in 40 CFR 61, Subpart M and EPA 340/1-90-018 that means any material, excluding Category I non friable ACM, containing more than 1 percent asbestos as determined using the methods specified in Appendix A, Subpart F, 40 CFR 763, Section 1, Polarized Light Microscopy, that when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure.

14. **Class I Asbestos Work** - Activities involving the removal of TSI and surfacing ACM and PACM.

15. **Class II Asbestos Work** - Activities involving the removal of ACM that is not TSI or surfacing material. This includes, but is not limited to, the removal of asbestos-containing wallboard, floor tile and sheeting, roofing and siding shingles, and construction mastics.

16. **Class III Asbestos Work** - Repair and maintenance operations, where ACM, including TSI and surfacing ACM and PACM, may be disturbed.

17. Class IV Asbestos Work - Maintenance and custodial activities during which employees handle but do not disturb ACM or PACM and activities to clean up dust, waste and debris resulting from Class I, II and III activities.

18. **Clean Room** - an uncontaminated area or room which is part of the worker decontamination enclosure system, with provisions for storage of workers' street clothes and protective equipment. Also known as the "Change Room".

19. **Contracting Officer's Representative (COR)** - the authorized representative of the Contracting Officer.

20. **Critical Barrier** - Seal applied to openings connecting the abatement area with adjacent spaces that will not be included in the containment. Critical barriers shall not be exposed to the gross removal environment. Examples of openings requiring critical barrjers include, but are not limited to: heating, ventilating and air conditioning (HVAC) vents and diffusers; doorways; windows; floor, wall, and ceiling penetrations; and air plenums.

21. **Curtained Doorway** - a device to allow ingress or egress from one room to another while minimizing air movement between the rooms. Two curtained doorways spaced a minimum of 3 feet apart form an airlock.

22. **Decontamination Enclosure System** - a series of connected rooms, with curtained doorways between any two adjacent rooms, for the decontamination of workers or of materials and equipment. A worker decontamination enclosure system typically contains five airlocks (rooms). An equipment decontamination system typically contains three airlocks (rooms).
23. **Encapsulation** - the sealing of asbestos surfaces involving application of a material (encapsulant) that will envelop or coat the fiber matrix and eliminate fiber fallout and protect against contact damage.
24. **Enclosure** - procedures necessary to completely enclose material containing asbestos behind airtight, impermeable, permanent barriers.
25. **Equipment Decontamination Enclosure System (or Load-Out Unit)** - a decontamination enclosure system for materials and equipment, typically consisting of an airlock, a washroom, and a holding area.
26. **Equipment Room** - a contaminated area or room which is part of the worker decontamination enclosure system, with provisions for storage of contaminated clothing and equipment.
27. **Fixed Object (Immoveable object)** - a unit of equipment or furniture in the work area which cannot be removed from the work area.
28. **Friable ACM** - A term as defined in 40 CFR 61, Subpart M and EPA 340/1-90-018 that means any material containing more than 1 percent asbestos as determined using the method specified in 40 CFR 763, Appendix A, Subpart F, Section 1, Polarized Light Microscopy, that when dry, can be crumbled, pulverized, or reduced to powder by hand pressure.
29. **Glove-Bag** - A 6 to 12-mil plastic bag fitted with long-sleeved gloves, a tool pouch and an opening for amended water and sealant application.
30. **Government's Testing Laboratory** - Testing Laboratory employed by the Government to provide area ambient monitoring, monitoring during removal, clearance monitoring and other special testing services.
31. **HEPA Filter** - a High Efficiency Particulate Absolute (HEPA) filter capable of trapping and retaining 99.97 percent of asbestos fibers greater than 0.3 microns in length.
32. **HEPA Vacuum Equipment** - vacuuming equipment equipped with a HEPA-filtration system.
33. **Holding Area** - a chamber between the washroom and uncontaminated area in the equipment decontamination enclosure system. The holding area comprises an airlock.
34. **Moveable Object** - a unit of equipment or furniture in the work area which can be removed from the work area.
35. **Non friable ACM** - A term as defined in 40 CFR 61, Subpart M and EPA 340/1-90-018 that means any material containing more than 1 percent asbestos as determined using the method specified in 40 CFR 763, Appendix A, Subpart F, Section 1, Polarized Light Microscopy, that, when dry, cannot be crumbled, pulverized or reduced to powder by hand pressure.
36. **Plastic Sheeting** - plastic sheet material of specified type and thickness used for protection of walls, floors, etc., and used to seal openings into the work area.
37. **Presumed ACM (PACM)** - Thermal system insulation, surfacing material and resilient flooring material found in buildings constructed no later than 1980.

38. **Procuring Contracting Officer (PCO)** - the authorized representative of the government.
39. **Removal** - the act of removing asbestos-containing or contaminated materials from the structure under properly controlled conditions to a suitable disposal site.
40. **Shower Room** - a room constituting an airlock, between the clean room and the equipment room in the worker decontamination enclosure system, with hot and cold or warm running water suitably arranged for complete showering during decontamination.
41. **Surfacing Material** - Material that is sprayed, troweled-on or otherwise applied to surfaces (such as acoustical plaster on ceilings and fireproofing materials on structural members, or other materials on surfaces for acoustical, fireproofing, and other purposes).
42. **Surfactant** - a chemical wetting agent added to water to improve penetrating ability, thus reducing the quantity of water required to saturate asbestos-containing materials.
43. **Thermal System Insulation (TSI)** - Material applied to pipes, fittings, boilers, breaching, tanks, ducts, or other structural components to prevent heat loss or gain.
44. **Time-Weighted Average (TWA)** - The TWA is an 8-hour time weighted average of airborne concentration of fibers (longer than 5 micrometers) per cubic centimeter of air which represents the employee's 8-hour workday as determined by Appendix A of 29 CFR 1926, Section 1926.1101.
45. **Washroom** - a room between the work area and the holding area in the equipment decontamination enclosure system. The washroom comprises an air lock.
46. **Wet Cleaning** - the process of eliminating asbestos contamination from building surfaces and objects by using cloths, mops, or other cleaning tools which have been dampened with amended water, disposing of these cleaning tools as asbestos-contaminated waste.
47. **Work Area** - area or areas of project which undergo abatement or are contaminated.
48. **Worker Decontamination Enclosure System** - a decontamination enclosure system for workers, typically consisting of a clean room, an airlock, a shower room, an airlock, and an equipment room.

4.03 REFERENCE STANDARDS

A. Acknowledge, by execution of the Contract, awareness and familiarity with the contents and requirements of the following regulations, codes, standards, and guidance documents. Assume responsibility for the performance of the Work in strict compliance with these documents and for every instance of failure to comply with these documents. The current issue of each document shall govern. Where conflict exists between these documents and the Work Procedures, the more stringent requirements shall apply.

1. EPA Regulations for Asbestos (40 CFR 61.140 - 61.157 and 40 CFR 763).
2. OSHA Asbestos Regulations (29 CFR 1910, 29 CFR 1926).

3. EPA Office of Toxic Substances Guidance Document, "Asbestos-Containing Materials in School Buildings", Part I and Part II.
4. U.S. Department of Education, Office of Elementary and Secondary Education (Code of Federal Regulations Title 34, Parts 230 and 231), Federal Register, Vol. 46, No. 11, January 16, 1981.
5. EPA Office of Pesticide and Toxic Substances Guidance Document, "Guidance for Controlling Friable Asbestos-Containing Materials in Buildings", EPA 560/5-85-024, June, 1985.
6. All state, county, and city codes and ordinances as applicable. Make available for review at the site one copy of EPA, OSHA, and applicable state, county and city regulations governing the Work.

4.04 WORKSITE CONDITIONS

A. Worker and Visitor Procedures: Contractor is hereby advised that asbestos has been determined by the U.S. Government to be a CANCER-CAUSING AGENT. Provide workers and visitors with respirators [which, as a minimum, meet the requirements of OSHA 29 CFR 1926.1101(h)(2)(i)] and protective clothing during all phases of the Work and until final air tests are accepted by Engineer.

4.05 PERSONNEL PROTECTION

A. Prior to commencement of work, instruct all workers in the appropriate procedures for personnel protection and asbestos removal. Ensure that workers are knowledgeable in these procedures.

B. Provide respiratory protection at all times, which is in compliance with OSHA requirements. When not in violation of the above, the minimum acceptable respiratory protection used for this project is half-face dual cartridge respirators, unless airborne fiber concentration inside the face mask exceed 0.01 fibers per cubic centimeter. In the event that airborne fiber concentrations inside the mask exceed 0.01 fibers per cubic centimeter, respiratory protection required to achieve 0.01 fibers per cubic centimeter shall be used. Provide additional "piggy-back" cartridges recommended by the product or solvent manufacturer whenever solvents are used.

C. Submit copies of personal air monitoring results to COR at completion of project.

D. Permit no visitors, except for governmental inspectors having jurisdiction, or as authorized by Engineer or Owner, in the work areas after commencement of asbestos disturbance or removal.

E. Provide workers sufficient sets of protective disposable clothing, consisting of full-body coveralls, head covers, gloves, and foot covers, of sizes to properly fit individual workers.

F. Leave reusable equipment, apparel and protection devices (excluding respirators) in the work area until the end of the asbestos abatement work, at which time such items shall be disposed of as contaminated waste or decontaminated for reuse.

G. Provide suitable respirators and protective equipment for use by authorized visitors, Owner, Engineer and Testing Laboratory's representatives. Furnish these in as many sets as required for full-time monitoring by Testing Laboratory.

H. Provide and post in the Clean Room the asbestos removal decontamination and work procedures to be followed by workers.

4.06 MATERIALS

A. **Mastic Remover** - Manufactured by a reputable, established manufacturer of floor mastic (adhesive) remover materials and approved specifically for use in asbestos-contaminated environments. Provide product compatibility for usage in confined areas. Flash Point shall be greater than 140 degrees Fahrenheit as determined by ASTM D 92. Product waste shall not meet the definition of hazardous waste under the EPA hazardous waste regulations 40 CFR 261.

B. **Glove-Bag** - Six-mil or greater thickness, in size sufficient to allow airtight seal around pipe. Separate tool pouch and openings for amended water or sealant and HEPA-vacuum must be present.

C. **Impermeable Containers** - suitable to receive and retain asbestos-containing or contaminated materials until disposal at an approved site and labeled. Containers shall be both air and water tight.

D. **Plastic Sheeting** - thickness as specified, in sizes to minimize the frequency of joints. Use of "spray-on poly" is not permitted without Owner's approval.

E. **Sealant (encapsulant)** - manufactured by reputable, established manufacturer of encapsulant/sealant materials and approved specifically for use in asbestos-contaminated environments. Determine compatibility of the sealant with the materials and conditions.

F. **Surfactant (Wetting Agent)** - mixture of "Dust-Set Amended Water Base: (Matheson Chemical Corporation) or equivalent and water, mixed to manufacturer's specifications.

G. **Tape** - glass fiber or other type capable of sealing joints of adjacent sheets of plastic and for attachment of plastic sheet to finished or unfinished surfaces under both dry and wet conditions.

H. **Warning Labels and Signs** - as required by OSHA 29 CFR 1926.58 and EPA 40 CFR 61.150.

I. **Other Materials** - provide all other materials, such as lumber, nails and hardware, which may be required to construct and dismantle the decontamination system and the barriers that isolate the work area. All lumber to be used shall be fire-retardant.

4.07 TOOLS AND EQUIPMENT

A. Provide suitable tools for asbestos-containing material removal.

1. **Air Purifying Equipment** (for internal recirculation in the work area) - HEPA Filtration Systems or Electronic Precipitators. Verify that no internal air movement system or purification equipment exhausts contaminated air from inside the work area into uncontaminated areas.
2. **Glove-Bag** - suitable for the removal of the pipe insulation.
3. **Scaffolding** - as required to accomplish the specified work and meet all applicable safety regulations.
4. **Transportation** - as required for loading, temporary storage, transit, and unloading of contaminated waste without exposure to persons or property. Use only enclosed or covered trucks to haul waste containers to prevent loss or damage of containers in route to the landfill.
5. **Water Sprayer** - utilize airless or other low pressure sprayer for amended water application.

4.08 PREPARATION

A. Coordinate sequence of work area preparation throughout the building with Owner and other trades to properly segregate work areas from areas that must remain fully or partially operational or in which other construction is being performed.

B. Preparation of Glovebag for Removal of Friable - Thermal System Insulation (Pipe and Equipment Insulation).

1. Coordinate with Owner for HVAC supplying work area to remain off during all abatement activities.
2. Install one layer 6-mil (true thickness) plastic sheeting on floor below work area extending at least 3 feet beyond the glove-bag in each direction.
3. Check pipe along entire length for damaged insulation. If damaged insulation is found, wrap the area with one layer of 6-mil plastic sheeting and seal with duct tape during the removal. If a large portion of the insulation is damaged wrap the entire length in one layer, 6-mil plastic sheeting and seal with duct tape.
4. Place all necessary tools for removal in glove-bag before attaching to pipe.
5. Place at least one layer of duct tape around the pipe at each location where the glove-bag will be attached to ensure an airtight seal. Secure glove-bag to pipe with sufficient duct tape to ensure the bag does not pull loose during removal.
6. Attach the HEPA-vacuum unit to the glove-bag to provide a negative pressure in the bag.

7. In the presence of Engineer, smoke test the glove-bag. If a leak is detected, reseal and retest bag. Turn on the HEPA-vacuum to clear the smoke and further test the seal.
8. Construct a three-stage worker/equipment decontamination unit consisting of an airlock, shower, and a clean room. Construct decontamination unit of appropriate materials (including plastic sheeting) to provide airtight barriers and allow continuous diminished pressure to be maintained in work areas. Provide proper decontamination equipment (water sprayer, towels, etc.) in the airlock to allow workers to properly decontaminate prior to exiting the airlock or removing materials from the work area. Post OSHA decontamination procedures in Change Room for duration of Project.
9. Use decontamination procedures, as described here, for personnel in work area.
   a. Two sets of protective disposable clothing will be work while in work area.
   b. Remove the outer set of protective clothing inside the work area, immediately before entering the airlock.
   c. HEPA-vacuum and remove the inner suit prior to leaving the airlock.
   d. Dispose of all used protective clothing as asbestos-contaminated waste.
10. Notify Engineer for observation of the completion of work area preparation prior to disturbing asbestos-containing material.

C. Preparation of Work Area for Removal of Transite (Interior & Exterior)

1. Remove movable and fixed objects from the work area as necessary to access asbestos-containing materials and dispose of as construction waste.
2. Install barriers of asbestos warning tape along the perimeter of the work area and post warning signs at 15 foot intervals around the perimeter. Maintain a minimum distance of 10 feet between where asbestos-containing materials are being removed and the work area perimeter.
3. Maintain a Sign In/Out Log near the work area to be utilized by every person, each time upon entering and leaving the work area.
4. Use "double-suit" decontamination procedures as follows:
   a. One set of protective disposable clothing will be worn while performing glove-bag removal.
   b. Remove the outer set of protective clothing in the work area and proceed to the centralized decontamination unit to complete the decontamination process.
   c. Inside the decontamination unit airlock, wet clean or HEPA-vacuum respirator and exposed portions of the body. Then HEPA-vacuum and remove the inner suit prior to entering shower.
   d. Maintain respiratory protection throughout the decontamination process. Dispose of all used protective clothing and disposable filter cartridges as asbestos-contaminated waste.
5. Install scaffolding as required to access the asbestos-containing materials.

6. Install one layer of 6-mil plastic sheeting on the floor below the work area extending at least 3 feet beyond the material to be removed in each direction.
7. Establish and maintain a Sign In/Out Log in the immediate vicinity of the work area to be utilized by every person, each time upon entering and leaving the work area.
8. Notify Engineer for observation of the completion of work area preparation prior to disturbing asbestos-containing material. Observation by Engineer must indicate substantial compliance with the preparation requirements to continue with the Work.

D. Preparation of Work Area Enclosure for Removal of Floor Tile. (RFCI) – Should walls enclosing Work Area not present

1. Remove movable and fixed objects from the work area as necessary to access asbestos-containing materials and clean and relocate to area designated by Owner for future disposal by demolition contractor as construction waste.
2. Install asbestos warning barrier tape and signs to segregate and demarcate work area from occupied or non-occupied areas. Maintain a minimum clear distance of 10 feet from the work location and the demarcated perimeter.
3. Maintain a Sign In/Out Log in the immediate area of the entrance to the work area to be utilized by every person, each time upon entering and leaving the work area.
4. Use decontamination procedures, as described here, for personnel in work area.
   a. Two sets of protective disposable clothing will be work while in work area.
   b. Remove the outer set of protective clothing inside the work area.
   c. HEPA-vacuum and remove the inner suit prior to leaving the work area.
   d. Dispose of all used protective clothing as asbestos-contaminated waste.
5. Place work area under diminished air pressure utilizing HEPA filtration systems which comply with ANSI Z9.2-79, local exhaust ventilation. Ensure that odors from solvents to be used do not permeate to other occupied or public areas of the facility.
6. Notify Asbestos Consultant for observation of the completion of work area preparation prior to disturbing asbestos-containing material.

E. Preparation of Work Area Enclosure for Removal of Floor Tile. (Walls remaining intact in Work Area)

1. Coordinate with Owner for HVAC inside or supplying work area to remain off during all abatement activities.
2. Install critical barriers and seal all openings and equipment within work area with a minimum of two layers of 6-mil (true thickness) plastic

sheeting. Where fire hazards exist install fire retardant plastic sheeting with the minimum of same thickness as stated above.
Notify Engineer for observation of the critical barriers prior to pre-cleaning work area.

4. Wet clean and HEPA-vacuum all immovable objects, equipment, walls and floor in the work area
5. Install two layers of 4-mil (true thickness) plastic sheeting on walls at a minimum height of 18 inches to serve as splashguard.. Where fire hazards exist install fire retardant plastic sheeting with the minimum of same thickness as stated above.
6. Should the ceiling not be intact, install two layers of 4-mil (true thickness) plastic sheeting to extend the wall sheeting up and over the work area to provide a complete, segregated work area enclosure. Provide at least 18 inches of overlap with wall sheeting. Where fire hazards exist install fire retardant plastic sheeting with the minimum of same thickness as stated above.
7. Construct a three-stage worker/equipment decontamination unit consisting of an airlock, shower, and a clean room. Construct decontamination unit of appropriate materials (including plastic sheeting) to provide airtight barriers and allow continuous diminished pressure to be maintained in work areas. Provide proper decontamination equipment (water sprayer, towels, etc.) in the airlock to allow workers to properly decontaminate prior to exiting the airlock or removing materials from the work area. Post OSHA decontamination procedures in Change Room for duration of Project.
8. Use decontamination procedures, as described here, for personnel in work area.
   a. Two sets of protective disposable clothing will be work while in work area.
   b. Remove the outer set of protective clothing inside the work area, immediately before entering the airlock.
   c. HEPA-vacuum and remove the inner suit prior to leaving the airlock.
   d. Dispose of all used protective clothing as asbestos-contaminated waste.
9. Place each work area under diminished air pressure utilizing HEPA filtration systems, which comply with ANSI Z9.2-79, local exhaust ventilation. Ensure that odors from solvents to be used do not permeate to other occupied or public areas of the facility.
10. Notify Engineer for observation of the completion of work area preparation prior to disturbing asbestos-containing material.

4.09 REMOVAL OF ASBESTOS-CONTAINING MATERIAL

A. Remove and properly dispose of all asbestos-containing materials scheduled for removal in the Work Procedures in accordance with the methods and procedures outlined in the OSHA 29 CFR 1926.1101 and as more stringently specified.

B. Removal of Thermal System Insulation (Pipe & Equipment Insulation)

1. Prepare work area as previously specified in Paragraph 4.08.B.
2. Use two people for glove-bag operation. One shall remove insulation, the other shall operate water sprayer and repair any leaks in bag.
3. At all times, keep insulation thoroughly wetted.
4. Care shall be taken not to puncture bag while cutting insulation.
5. Gently remove insulation from pipe and place it in bottom of bag.
6. After removal of insulation, brush and wet clean pipe or equipment to remove residual material. Continue wet cleaning until surfaces are free of visible material.
7. Spray all tools with water inside bag and place back in pouch.
8. Wet and double seal with plastic sheeting and duct tape, visible ends of remaining pipe insulation.
9. Spray the inside of the bag with amended water and remove the watering wand.
10. Insert the encapsulation wand and encapsulate all abated surfaces of the pipe and remaining pipe insulation. Remove the encapsulation wand and tape the bag opening closed.
11. Using the HEPA-vacuum, collapse the bag and seal off the lower portion containing the asbestos-containing material and gloves of the bag.
12. Remove the bag from the pipe, the tools from the pouch and the HEPA-vacuum from the bag.
13. Consider the glove-bag the first container for the material. Place the glove-bag in an appropriately labeled, 6-mil plastic bag and remove from work area. Dispose of sealed bags properly using appropriate disposal procedures.
14. After removal of the glove-bag, wet clean and HEPA-vacuum all surfaces in the work area to remove residual accumulated material. Continue wet cleaning until surfaces are visibly free of material.
15. Notify Engineer for observation of the completion of cleaning. Surfaces will be considered clean when free from dust, dirt, residue, film, or discoloration resultant from abatement operations or other activities subordinate to these operations.

C. Removal of Thermal System Insulation (Pipe & Equipment Insulation) as an Individual Component

1. Prepare work area as previously specified in Paragraph 4.08.B.
2. Drain and purge all piping to be removed.
3. Cut pipe hangers and piping safely to the ground prior to wrapping with plastic sheeting.
4. Wrap entire pipe or ductwork in 2 layers of 6-mil plastic sheeting, seal ends with duct tape.
5. Cut the pipe or ductwork at sealed ends.
6. Double seal with 6-mil plastic sheeting and duct tape, the exposed ends of cut piping or ductwork. Remove sealed material from the work area and dispose of using appropriate disposal procedures.

7. Notify Engineer for observation of the completion of removal of pipe and pipe insulation.

D. Removal of Transite Panels (Interior & Exterior)

1. Prepare work area as previously specified in Paragraph 4.08.C.
2. Utilize vertical lift equipment as necessary to access transite panels for removal.
3. Spray amended water to areas of transite where bolt/nail attachments are utilized to secure the panels to the building structure.
4. Remove bolt/nail attachments and detach the transite panels in whole pieces from the structure, lower to the ground and wrap in two layers of 6-mil properly labeled plastic sheeting. After removal of the asbestos-containing material, wet clean and HEPA-vacuum all surfaces in the work area to remove residual accumulated material. Continue wet cleaning until surfaces are visibly free of material.
5. Notify Engineer for observation of the completion of cleaning. Surfaces will be considered clean when free from dust, dirt, residue, film, or discoloration resultant from abatement operations or other activities subordinate to these operations.

E. Removal of Floor Tile and Mastic. (RFCI)

1. Prepare work area as previously specified.
2. Utilize a radiant heat source to reduce the adhesion strength of the floor tile with the mastic and floor substrate per manufacturer's recommendation.
3. Allow floor tile and mastic to cool prior to placing the material in a properly labeled sealable plastic bag of 6-mil minimum thickness, and remove from work area.
4. Spray amended water as necessary to keep the floor tile and mastic under a wet-condition to minimize fiber dispersion during the removal process.
5. As necessary, apply mastic remover to dissolve the mastic used to adhere the floor tile to the concrete slab. The mastic remover is to be used per the manufacturer's recommendations.
6. After removal of asbestos-containing material, wet-clean and HEPA-vacuum all surfaces in the work area to remove residual accumulated material. Continue wet-cleaning until surfaces are visibly free of material.
7. Notify Asbestos Consultant for observation of the completion of cleaning.

F. Removal of Floor Tile and Mastic. (Non – RFCI)

1. Prepare work area as previously specified.
2. Spray areas of asbestos-containing material with amended water using spray equipment capable of providing a "mist" application to reduce the release of fibers. Spray the asbestos-containing material repeatedly

during work process to maintain wet condition but do not use excessive amounts of water.

3. As necessary, apply mastic remover to dissolve the mastic used to adhere the floor tile or floor sheeting to the concrete slab. The mastic remover is to be used per the manufacturer's recommendations.
4. Remove floor tile or floor sheeting. As it is removed, place the material in a properly labeled sealable plastic bag of 6-mil minimum thickness, and remove from work area.
5. After removal of asbestos-containing material, wet-clean and HEPA-vacuum all surfaces in the work area to remove residual accumulated material. Continue wet-cleaning until surfaces are visibly free of material.
6. Notify Engineer for observation of the completion of cleaning.

4.10 CLEAN UP AND CLEARANCE TESTING

A. Provide general clean-up of work area concurrent with the removal of all asbestos-containing materials. Do not permit accumulation of debris on workspace floor.

B. Clean-Up Sequence

1. Remove all visible accumulations of asbestos-containing material and debris.
2. Wet clean and HEPA-vacuum all surfaces in the work area.
3. Clean all equipment and materials used in the work area and remove from work area.

C. Final Air Clearance Testing

1. Testing Laboratory will test for the final air clearance levels upon notice from Contractor that work areas are considered by Engineer as visually decontaminated. Final air clearance testing shall be performed using Phase Contrast Microscopy (PCM) analysis.
   a. If the final air clearance samples indicate a fiber level of less than or equal to background levels or 0.01 fibers per cubic centimeter, whichever is greater in the work will be considered completed.
   b. Re-clean and continue to clean at Contractor's expense, areas which do not comply with the specified final clearance level. Contractor to bear cost of all follow-up tests necessitated by the failure of the air tests to meet the specified clearance level.
2. Upon achieving final air clearance, dismantle Decontamination Enclosure Systems and thoroughly wet clean and HEPA-vacuum immediate areas.
3. Dispose of debris from removal operations, used cleaning materials, unsalvageable materials used for sturdy barriers, and any other remaining materials. Consider the materials to be contaminated, and dispose of accordingly.
4. Dispose of debris from removal operations, used cleaning materials, unsalvageable materials used for sturdy barriers, and any other remaining

materials. Consider the materials to be contaminated, and dispose of accordingly.

4.11 DISPOSAL OF ASBESTOS-CONTAMINATED WASTE

A. Perform bag decontamination procedures as follows:

1. As bags is moved out through the air lock, wet-wipe bags to remove all contamination from them before they are moved into an uncontaminated space.
2. Place bagged waste into appropriately labeled second 6-mil (true thickness) bag for transport to landfill.
3. Label asbestos-containing/contaminated waste in accordance with EPA 40 CFR 61.150.
4. Transport bagged waste on-site inside an enclosed dolly. Enclose and secure top of dolly with a minimum of 6-mil opaque plastic sheeting.

B. Transportation to landfill shall be performed in accordance with all federal, state, and local laws and regulations.

1. Place bags in the lockable, fully enclosed, metal waste disposal container, which has been lined with a minimum of one layer of 6-mil plastic sheeting.
2. Transport contaminated waste using a transporter licensed by the Texas Department of Health to transport asbestos waste.
3. Provide Texas Natural Resource Conservation Commission manifests for transportation of all contaminated waste to landfill.

C. Removal sealed and labeled bags of contaminated material and wastes and transport them for disposal to an approved landfill as follows:

1. Notify Engineer prior to removing each waste disposal container from the jobsite.
2. Notify Owner and Engineer not less than 48 hours prior to the proposed time of delivery of contaminated waste to the landfill. Owner and Engineer may elect to observe this operation.
3. Dispose of treated, packaged, labeled, asbestos-containing waste material in accordance with EPA 40CFR 61.150.
4. Allow only sealed plastic bags or impermeable containers to be deposited in landfill.
5. Ensure that there are no visible emissions to the outside air from site where materials and waste are deposited.
6. Submit copies of receipts from authorized representative of landfill operator for each delivery of waste material to Engineer after each delivery and a complete set of copies of receipts for all deliveries.

4.12 INSPECTION/FINAL ACCEPTANCE

A. Provide general clean-up of work area concurrent with the removal of all asbestos-containing materials and demolition waste. Do not permit accumulation of debris on workspace floor.

B. The COR will observe each work area and review the abatement documentation records for completeness.

C. Upon satisfactory review status by the COR, the COR will notify the cognizant HQ, JMC Procuring Contracting Officer (PCO) in writing to that effect.

END OF SECTION

5.0 LEAD ABATEMENT

5.01 DESCRIPTION

A. Perform all planning, administration, execution, and cleaning necessary to safely remove and dispose of loose and flaking lead-based paint. Loose and flaking lead-based paint are to be removed prior to demolition of building structures.

B. Approval of or acceptance by Owner of various construction activities or methods proposed by Contractor does not constitute an assumption of liability either by the Engineer or Owner for inadequacy or adverse consequences of said activities or methods.

5.02 WORK INCLUDED

A. The Work includes, but is not limited to, the following

1. Demolition of items as necessary to access lead materials.
2. Waste characterization of lead-containing materials for proper disposal.
3. Removal and containerization of lead materials identified.
5. Placement of all lead waste generated as a result of work activities in DOT approved drums.
6. Disposal of all lead materials and lead waste.

5.03 DEFINITIONS

A. The following definitions pertain to this section of these Contract Documents.

1. **Abatement** - the elimination of exposure to lead-containing substances that may result in lead toxicity or poisoning by the removal, encapsulation, or enclosure of lead-containing substances, by thorough cleanup procedures, and by post-cleanup treatment of surfaces.
2. **Air Monitoring** - the process of measuring the lead content of a specific volume of air during a stated period of time.
3. **ANSI** - American National Standards Institute.
4. **ASTM** - American Society for Testing and Materials.
5. **Clean Room** - an uncontaminated area of room which is part of the worker decontamination enclosure system, with provisions for storage of workers' street clothes and protective equipment. Also known as the "Change Room."
6. **Cleaning Solution** - TSP detergent and hot water mixed according to the manufacturer's recommendations.
7. **Decontamination Enclosure System** - a series of connected rooms, with curtained doorways between any two adjacent rooms, for the decontamination of workers or of materials and equipment. A worker decontamination enclosure system always contains at least five airlocks (rooms). An equipment decontamination system always contains at least three airlocks (rooms).
8. **Encapsulation** - to resurface or cover surfaces and to seal or caulk seams with durable material, so as to prevent or control chalking, flaking lead-containing substances from being reduced to dust.

9. **Enclosure** - procedures necessary to completely enclose material containing lead-containing substances behind airtight, impermeable, permanent barriers.
10. **EPA** - United States Environmental Protection Agency.
11. **Equipment Decontamination Enclosure System** - a decontamination enclosure system for materials and equipment, typically consisting of an airlock, a washroom, and a holding area.
12. **Equipment Room** - a contaminated area or room which is part of the worker decontamination enclosure system, with provisions for storage of contaminated clothing and equipment.
13. **Fixed Object (Immoveable object)** - a unit of equipment or furniture in the work area which cannot be removed from the work area.
14. **HEPA Filter** - a High Efficiency Particulate Absolute (HEPA) filter capable of trapping and retaining at least 99.97 percent of all monodispersed particles 0.3 microns in diameter or larger.
15. **HEPA Vacuum Equipment** - vacuuming equipment equipped with a HEPA-filtration system.
16. **Holding Area** - a chamber between the washroom and uncontaminated area in the equipment decontamination enclosure system. The holding area comprises an airlock.
17. **Lead Abatement Project** - any work performed in order to abate the presence of a lead-containing substance.
18. **Lead-Containing Substance** - any paint, plaster or other surface coating material containing more than 0.5 percent lead by weight calculated as lead metal in the dried solid, or more than 1.0 milligrams per square centimeter by X-ray fluorescence.
19. **Movable Object** - a unit of equipment or furniture in the work area which can be removed from the work area.
20. **MSHA** - Mine Safety and Health Administration.
21. **NEC** - National Electrical Code.
22. **NIOSH** - National Institute for Occupational Safety and Health.
23. **OSHA** - Occupational Safety and Health Administration.
24. **Plastic Sheeting** - plastic sheet material of specified thickness used for protection of walls, floors, etc., and used to seal openings into the work area.
25. **Removal** - the act of removing lead-containing or contaminated materials from the structure under properly controlled conditions to a suitable disposal site.
26. **Shower Room** - a room constituting an airlock, between the clean room and the equipment room in the worker decontamination enclosure system, with hot and cold or warm running water suitably arranged for complete showering during decontamination.
27. **TCLP** - EPA Toxic Characteristic Leaching Procedure (TCLP) for determining toxicity characteristics of waste materials.
28. **TSP** - Trisodium Phosphate.
29. **Wet Cleaning** - the process of eliminating lead contamination from building surfaces and objects by using cloths, mops, or other cleaning tools which have been dampened with cleaning solution, disposing of these cleaning tools as lead waste.

30. **Washroom** - a room between the work area and the holding area in the equipment decontamination enclosure system. The washroom comprises an air lock.
31. **Work Area** - area or areas of Project which undergo abatement or are contaminated.
32. **Worker Decontamination Enclosure System** - a decontamination enclosure system for workers, typically consisting of a clean room, an airlock, a shower room, an airlock, and an equipment room.

5.04 QUALIFICATIONS FOR PERFORMANCE OF WORK

A. Contractor (or subcontractor) engaged to perform the Work of this Section shall have a record of not less than three years successful experience in lead-based paint removal and related work similar in scope and magnitude to this Project.

B. Maintain on site a Superintendent and one Job Foreman. Superintendent and Job Foreman must be approved by Owner prior to the start of the Work of this Section and shall not be changed without prior approval from Owner. Job Foreman shall remain in the work area at all times work is in progress.

C. Use only trained and experienced lead-based paint removal workers to perform the Work in this Section.

5.05 REFERENCE STANDARDS

A. Acknowledge, by execution of the Contract, awareness and familiarity with the contents and requirements of the following regulations, codes, standards, and guidance documents. Assume responsibility for the performance of the Work in strict compliance with these documents and for every instance of failure to comply with these documents. The current issue of each document shall govern. Where conflict exists between these documents and the Contract Documents, the more stringent requirements shall apply.

1. Environmental Protection Agency (EPA) Regulations: Regulations Identifying Hazardous Waste (40CFR 261); Regulations for Hazardous Waste Generators (40CFR 262); Regulations for Hazardous Waste Transporters (40CFR 263).
2. Occupational Safety and Health Administration (OSHA) Regulations: Respiratory Protection Standard (29CFR 1910.134); General Industry Standards for Lead (29CFR 1910.1025); Hazard Communication Program (29CFR 1926.59); Construction Industry Standards for Lead (29CFR 1926.62)
3. Department of Housing and Urban Development (HUD) Lead-Based Paint Guidelines for Public and Indian Housing (55CFR 14556-14789).
4. U.S. Department of Transportation (DOT) Hazardous Material Regulations (49CFR 171-179).
5. EPA Resource and Recovery Act (RCRA).
6. National Institute of Occupational Safety and Health (NIOSH) Occupational Health Guidelines for Chemical Hazards (NIOSH 81-123).
7. American National Standard Institute (ANSI) Publication on Practices for Respiratory Protection (Z88.2-80).

8. All federal, state, county, and city codes and ordinances as applicable. Make available for review at the site one copy of EPA, OSHA, HUD, and applicable state, county and city regulations governing the Work.

5.06 PRODUCT HANDLING

A. Deliver all materials in the original packages, containers, or bundles bearing the name of the manufacturer and the brand name.

B. Store all materials subject to damage off the ground, away from wet or damp surfaces, and under cover sufficient to prevent damage or contamination.

C. Remove from the premises all damaged or deteriorated materials. Dispose of materials that become contaminated with lead-containing substances in accordance with applicable regulatory standards and these specifications.

5.07 WORKSITE CONDITIONS

A. Worker and Visitor Procedures: Contractor is hereby advised that lead has been determined by the U.S. Government to be a toxic substance. Provide workers and visitors with respirators [which, as a minimum, meet the requirements of OSHA 29CFR 1910.134] and protective clothing during all phases of the Work and until final observation and/or testing is completed.

5.08 PERSONNEL PROTECTION

A. Prior to commencement of work, instruct all workers in the appropriate procedures for personnel protection and lead removal. Ensure that workers are knowledgeable in these procedures.

B. Acknowledge and agree to sole responsibility for enforcing worker protection requirements at least equal to those specified in this Section.

C. Provide workers with personally issued and marked respiratory equipment approved by NIOSH and MSHA for the type of work being performed.

D. Where respirators with disposable filters are used, provide sufficient filters for replacement as necessary.

E. Provide respiratory protection at all times, which is in compliance with OSHA requirements. When not in violation of the above, the minimum acceptable respiratory protection used for this project shall be as follows:

1. Provide a minimum of half-face dual cartridge respirators for workers during pre-cleaning of work area, installation of plastic sheeting, and waste handling and disposal activities outside the work area.
2. Provide a minimum of Powered Air Purifying Respirator (PAPR) equipment for workers during all phases of the Work from the time of first disturbance of the lead materials until final observation or testing is performed.

3. Provide additional "piggy-back" cartridges recommended by the chemical manufacturer whenever chemicals are used, including but not limited to, chemical stripping.

F. Be solely responsible for scheduling necessary air sampling by an independent testing laboratory for compliance monitoring of own respiratory protection with OSHA regulations. Pay for all costs associated with such testing. In addition, submit copies of personal air monitoring results to Engineer daily.

G. Permit no visitors, except for governmental inspectors having jurisdiction, or as authorized by Engineer or Owner, in the work areas after commencement of lead disturbance or removal.

H. Provide workers with sufficient sets of protective disposal clothing, consisting of full-body coveralls, head covers, gloves, and foot covers, of sizes to properly fit individual workers.

I. Leave reusable equipment, apparel and protection devices (excluding respirators) in the contaminated equipment room until the end of the lead abatement work, at which time such items shall be disposed of as contaminated waste or decontaminated for reuse.

J. Provide suitable respirators and protective equipment for use by authorized visitors, Owner, Engineer and Testing Laboratory's representative.

K. Provide and post in an appropriately designated common area the lead removal decontamination and work procedures to be followed by workers.

5.09 MATERIALS

A. **Chemical Stripping Agents** - Shall be commercially available products intended for paint removal such as the "Peel Away Series" manufactured by Dumond Chemicals, or equivalent. Provide incidental products, such as neutralizers, as required by manufacturer's instructions and recommendations.

B. **Impermeable Containers** - Shall be suitable to receive and retain lead-containing or contaminated materials until disposal at an approved site and shall be labeled in accordance with U.S. DOT 49CFR 171-179. Containers shall be both air and water tight. As a minimum, utilize one of the following types of impermeable containers:

1. All lead-containing waste (lead-based paint debris) generated as a result of work activities shall be placed in 6-mil (true thickness), plastic bags. The bagged waste shall then be placed in sealed DOT 17C open top 55 gallon drums lined with 6-mil (true thickness) plastic bags sized to fit within each drum.
2. All loose flaking lead-based paint debris on surfaces of (walls, ceiling and floors) removed shall be stored in sealed DOT 17C open top 55 gallon drums lined with 6-mil (true thickness) plastic bags sized to fit within each drum.
3. All lead-contaminated disposable items used in the course of the work (rags, sorbents, protective clothing, plastic sheeting, etc.) shall be placed

in 6-mil (true thickness), plastic bags. The bagged waste shall then be placed in sealed DOT 17C open top 55 gallon drums lined with 6-mil (true thickness) plastic bags sized to fit within each drum. Contractor shall not place lead-containing waste in the same drum as the items described in this paragraph.

4. All liquids generated as a result of clean-up activities shall be disposed of in DOT 17E closed top drums.

C. **Plastic Sheeting** - thickness shall be six-mil or greater, in sizes to minimize the frequency of joints. Use of "spray-on poly" is not permitted without Owner's approval.

D. **Trisodium Phosphate Cleaning Solution** - Trisodium phosphate cleaning solution, such as Sentinel 805 (Sentinel Chemical Company) or equivalent and water, mixed to manufacturer's specifications.

E. **Tape** - glass fiber or other tape capable of sealing joints of adjacent sheets of plastic and for attachment of plastic sheet to finished or unfinished surfaces under both dry and wet conditions.

F. **Warning labels and signs** - Shall be as required by OSHA regulation 29CFR 1926.62 and U.S. DOT 49CFR 171-179 (for impermeable containers).

G. **Other Materials** - provide all other materials, such as lumber, nails and hardware, which may be required to construct and dismantle the decontamination system and the barriers that isolate the work area(s).

5.10 TOOLS AND EQUIPMENT

A. Provide suitable tools for asbestos-containing material removal.

1. **Air Purifying Equipment** - HEPA Filtration Systems. Verify that no internal air movement system or purification equipment exhausts contaminated air from inside the work area into uncontaminated areas.
2. **Half-Face Respirator Equipment** - negative pressure, half-face air purifying respirators approved by NIOSH and MSHA for lead removal work.
3. **Powered Air Purifying Respirator (PAPR) Equipment** - powered air purifying respirators (PAPRs) approved by NIOSH and MSHA for lead removal work.
4. **Scaffolding** - as required to accomplish the specified work and meet all applicable safety regulations.
5. **Transportation** - as required for loading, temporary storage, transit, and unloading of contaminated waste without exposure to persons or property. Use only enclosed vehicles or dumpsters to haul waste containers to prevent loss or damage of containers in route to the landfill.
6. **Water Sprayer** - utilize airless or other low pressure sprayer for cleaning solution application.

5.11 PREPARATION

A. Coordinate sequence of work area preparation throughout the site with Owner and other trades to properly segregate work areas from areas that must remain fully or partially operational or in which other construction is being performed.

B. Initial Work Area Preparation

1. Segregate the work area from other areas with lead abatement warning/barrier tape and caution signs. The warning/barrier tape and caution signs shall be placed a minimum of 25 feet away from each work area. The signs shall be at least 20" by 14" and include the phrase "Caution Lead Hazard, Keep Out" in bold lettering at least 2 inches high.
2. The following warning signs shall be posted immediately outside each work area.

"WARNING
LEAD WORK AREA
POISON
NO SMOKING OR EATING"

3. Maintain emergency and fire exits from the work areas, or establish alternative exits satisfactory to fire officials. Provide fire extinguishers inside and outside the work area.

C. Preparation of Work Area for Removal of Lead-Based Paint Coated Components

1. No further work area preparation is required as long as the lead coated components are removed intact and in their entirety.

5.12 REMOVAL OF LEAD-CONTAINING MATERIALS

A. Remove and properly dispose of lead-based paint scheduled for removal in the Contract Documents in accordance with the methods and procedures outlined in 40CFR 263, 49CFR 171-179, 55CFR 14556-14789 and as more stringently specified herein.

B. Clean Up and Disposal of Loose and Flaking Lead-Based Paint

1. Prepare work area as previously specified. Maintain diminished air pressure in the immediate vicinity of the stripping operation.
2. Spray areas where lead-based paint materials will be stripped with cleaning solution using spray equipment capable or providing a "mist" application to reduce the release of lead dust.
3. Carefully remove and place all paint chips and associated waste in 6-mil, plastic bags. The bagged waste shall then be placed in sealed DOT 17C open top 55 gallon drums lined with 6-mil plastic bags sized to fit within each drum.
4. Spray the lead-based paint materials repeatedly during the work process to control lead dust.
5. At the end of each work day, perform daily cleanup of the work area. The daily cleanup will include:

a. HEPA vacuum all surfaces in the work area.
b. Using disposable towels, wet clean all surfaces in the work area with TSP cleaning solution. To minimize recontamination, do not recycle TSP cleaning solution or reuse towels.

6. Notify Engineer for observation of the completion of cleaning. Surfaces will be considered clean when free from dust, dirt, and residue.

C. Removal of Lead-Based Paint Coated Components

1. Remove designated lead-based paint coated components and place in a secure area until TCLP tests are performed.
2. If lead-coated items are determined through TCLP testing to be non-hazardous, dispose of as construction waste. If items are determined to be hazardous, double-wrap items in two individually sealed layers of 6-mil (true thickness) plastic sheeting, appropriately labeled, and dispose as hazardous waste.
3. Notify Engineer for observation of the completion of the removal.

5.13 CLEAN UP OF WORK AREA

A. Consider work areas and all other decontaminated and cleaned areas clean when:

1. A visual observation of work area(s) has been performed by the Engineer and that the Engineer determines that the Abatement Contractor has met the specification requirements.
2. As deemed appropriate by the Engineer, wipe samples will be obtained on abated areas or adjacent surfaces during the project for Quality Control (QC) purposes. Sampled areas must have a lead residue level of 40 micrograms per square foot or less for floors and/or 100 micrograms per square foot or less for walls and ceilings to be considered decontaminated. If any wipe samples exceed the above allowable lead level, the Abatement Contractor will reclean these areas at his own expense.

5.14 LEAD RECYCLING/RECLAIMING

A. Lead materials may be sold to a recycler for reuse or a reclaimer for remelt that will accept the materials "as is". Lead materials that may be recycled or reclaimed include sheeting and window frames.

B. Alternatively, lead materials are to be containerized and disposed of as hazardous waste.

5.15 CONTAINERIZATION AND MARKING

A. All lead-containing waste (lead-based paint strippings and debris) generated as a result of work activities shall be placed in 6-mil (true thickness), plastic bags. The bagged waste shall then be placed in sealable DOT 17C open top 55 gallon drums lined with 6-mil (true thickness) plastic bags sized to fit within each drum.

B. All lead sheeting and window frames removed shall be stored in sealable DOT 17C open top 55 gallon drums lined with 6-mil (true thickness) plastic bags sized to fit within each drum.

C. All lead-contaminated disposable items used in the course of the work (rags, sorbents, protective clothing, plastic sheeting, etc.) shall be placed in 6-mil (true thickness), plastic bags. The bagged waste shall then be placed in sealable DOT 17C open top 55 gallon drums lined with 6-mil (true thickness) plastic bags sized to fit within each drum. Contractor shall not place lead-containing waste in the same drum as the items described in this paragraph.

D. All liquids generated as a result of clean-up activities shall be disposed of in DOT 17E closed top drums.

E. All drums shall be permanently marked as to specific contents and dated. In addition, each drum shall be marked with the standard EPA, PCB, M_L label, shown below:

CAUTION

CONTAINS
LEAD

A toxic environmental contaminant requiring
special handling and disposal in accordance with
US Environmental Protection Agency Regulations
40 CFR 761 - For Disposal Information contact
the nearest US EPA Office

In case of accident or spill call toll free the US
Coast Guard National Response Center
800 424-8802

Also Contact:
Tel. No.:

F. All drums shall be marked with the label (properly completed) shown below.

HAZARDOUS WASTE

FEDERAL LAW PROHIBITS IMPROPER DISPOSAL

IF FOUND, CONTACT THE NEAREST POLICE OF PUBLIC SAFETY AUTHORITY, OR THE U.S. ENVIRONMENTAL PROTECTION AGENCY

GENERATOR INFORMATION

NAME _____

ADDRESS _____ PHONE _____

CITY _____ STATE _____ ZIP _____

EPA MANIFEST
ID NO./DOCUMENT NO. _____/_____

ACCUMULATION
START DATE _____ EPA
WASTE NO. _____

_____

_____

_____

D.O.T. PROPER SHIPPING NAME AND UN OR NA NO. WITH PREFIX

HANDLE WITH CARE!

G. Notify Engineer for observation of the labeling of the drum(s) prior to moving the drum(s) to the storage area.

5.16 TEMPORARY ON-SITE STORAGE

A. All drums shall be sealed, secured and labeled before being moved to a temporary on-site storage location designated by the Owner. Handle drums with utmost care during transportation between removal area and storage area.

5.17 WASTE CHARACTERIZATION AND DISPOSAL

A. Lead waste materials (including strippings, wash water, protective clothing, plastic sheeting, etc.) from stripping and removal operations shall be

containerized separately by type of material and TCLP tested by Engineer to determine hazardous or non-hazardous toxicity characteristics prior to disposal. All non-hazardous waste shall be disposed as construction waste at a construction waste landfill. All hazardous waste shall be disposed at a Texas Natural Resource Conservation Commission registered hazardous waste facility.

B. All hazardous waste generated on this Project shall be disposed of at a registered hazardous waste disposal facility. Disposal facility to be used shall meet all Environmental Protection Agency and Texas Natural Resource Conservation Commission regulatory standards for disposal of hazardous waste.

C. Transportation to disposal facility shall be performed in accordance with all federal, state, and local laws and regulations.

1. Place sealed containers in enclosed truck, trailer or dumpster.
2. Transport hazardous waste using a transporter registered to transport hazardous materials.
3. Provide Uniform Hazardous Waste Manifests (Texas Natural Resource Conservation Commission form TNRCC-0311, current edition) for transportation of all hazardous waste to disposal facility.
4. Submit copies of waste manifests from authorized representative of disposal facility for each delivery of waste material to Engineer after each delivery and a complete set of copies of receipts for all deliveries.

5.18 PROCEDURE FOR DETERMINING COMPLIANCE

A. The Engineer will observe each work area during the lead abatement project to monitor compliance with regulations and specifications.

B. The observations performed shall be a visual observation to monitor whether surfaces requiring abatement have been abated.

C. As deemed appropriate by the Engineer, wipe samples will be obtained on abated areas or adjacent surfaces during the project for Quality Control (QC) purposes. If any wipe samples exceed the above allowable lead level, the contractor will reclean at his own expense these areas.

5.19 INSPECTION/FINAL ACCEPTANCE

A. Provide general clean-up of work area concurrent with the removal of all Lead-based paint materials and demolition waste. Do not permit accumulation of debris on workspace floor.

B. The COR will observe each work area and review the abatement documentation records for completeness.

C. Upon satisfactory review status by the COR, the COR will notify the cognizant HQ, JMC Procuring Contracting Officer (PCO) in writing to that effect.

END OF SECTION

6.0 SITE WORK - DEMOLITION

6.01 SUMMARY

6.01.1 This section specifies the requirements for demolition of facilities and structures.

6.01.2 Demolition may, but not necessarily, require removal and disposal, of the following:

6.01.2.1 Remove all facilities above the floor slab and dispose of legally.

6.01.2.2 Remove all grass, shrubs, vegetation, organic matter, and top soil in work areas, and stockpile topsoil at a location approved by the Owner.

6.01.2.3 Remove and dispose of shrubs and heavy vegetation hindering facilitation of demolition activities.

6.01.2.4 Abandon in place all utilities including, but not limited to: electrical, telephone, water, cable and gas safely and in accordance with the local governing agency. Nothing shall remain active or live on site.

6.01.2.5 Cap or plug each pipe, utility, and conduit left below ground.

6.01.2.6 Remove building structures, and other items not shown but which can be determined by visual inspection. Items indicated to be property of the Owner will be removed prior to start of work.

6.01.2.7 Provide site drainage during and at completion demolition of above ground structures.

6.01.2.8 Restore topsoil and evenly spread as required by Owner.

6.02 DEFINITIONS

6.02.1 Cap / Plug: Plug PVC plastic pipe with PVC cap glued to end of clean primered pipe.

6.02.2 Structures: All man-made facilities above and below ground.

6.03 SUBMITTALS

6.03.1 Submit demolition plan, proposed methods and operations of building demolition to Owner for review and approval prior to starting of work. Include required coordination by agencies for shut off, capping, and continuation of utility services

as required. Indicate site ingress/egress, haul roads, Pollution Prevention Plan (PPP), and provisions for protecting off site property.

6.03.2 Submit a drainage plan for demolition and completion of demolition.

6.03.3 Submit Notice of Intent for Pollution Prevention Plan by certified mail to appropriate governmental agencies at least 48 hours before Work begins.

6.04 QUALITY ASSURANCE

6.04.1 Unless they are modified or exceeded by the requirements of this Specification, conform to applicable parts of the following:

6.04.1.1 ANSI A10.6 "Safety Requirements for Demolition".

6.04.1.2 NFPA 30 Flammable and Combustible Liquids Code.

6.04.1.3 NFPA 241 Standard for Safeguarding Building Construction and Demolition Operations

6.04.2 Comply with applicable OSHA and EPA regulations and codes and local ordinances.

6.04.3 Occupancy: Structure on site may be utilized by contractor during a portion of the construction time for purposes of storage or offices.

6.04.4 Conditions of Structures: The owner assumes no responsibility for actual condition of structures to be demolished. Conditions existing at time of inspection for bidding purposes will be maintained by the Owner insofar as practicable. However, variations within structure and work site may occur prior to start of demolition work.

6.04.5 Salvaged Materials: Unless otherwise indicated, material and debris resulting from demolition operations is the property of the Contractor who shall remove them from the site often enough to prevent unsightly or unsafe accumulation. No sale of surplus materials shall be conducted on the site.

6.04.6 Traffic: Conduct demolition operations and removal of debris to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities. Do not close or obstruct streets, walks, or other occupied or used facilities without permission from authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.

6.04.6.1 Prepare traffic control plan.

6.04.7 Damages: Promptly repair damages caused to adjacent facilities by demolition operations.

6.04.8 Utility Services: Maintain existing utilities to stay in service and protect against damage during demolition operations. Make arrangements and pay the costs for disconnection, capping, and relocating services. Do not start demolition work until utility disconnections have been completed and verified in writing.

6.05 PROTECTION

6.05.1 General: Construct temporary dustproof barricades, walks, passage-ways, etc., that are necessary to protect persons and property from hazard or damage due to construction operations, and as required by applicable regulations. Design and construct such protections to have sufficient strength and of such materials as will accomplish their protective function.

6.05.2 Site: Offsite walks, lawns, other building, and other work on site, whether specifically indicated on the Project Drawings or not.

6.05.3 Streets and Sidewalks: Protect streets, sidewalks, curbs, etc., as necessary to prevent damage to them. Repair any damage caused by these operations. The entire section between expansion joints in which the damage occurs shall be replaced.

6.05.3.1 Patching of sidewalks or curbs shall be permitted.

6.05.3.2 Prevent soil, mud and debris from remaining on offsite property.

6.05.3.3 Clean offsite property daily.

6.05.4 Persons: Provide warning signs, hazard and service lights, etc., as necessary for the protection of persons from injury due to construction operations and as required by applicable regulations.

6.05.5 Remaining Structures - Fencing: Take precautions not to damage existing structures and perimeter fencing which are to remain. Promptly repair damages caused by demolition operations at no cost to Owner or adjacent property owners.

6.06 DEMOLITION SEQUENCE

6.06.1 Strip organic matter, topsoil and stockpile topsoil at location approved by Owner.

6.06.2 Demolish above slab as required.

6.06.3 Establish and maintain site drainage as required.

6.07 DEMOLITION

6.07.1 Pollution Controls: Use water sprinkling, temporary enclosures, and other suitable methods to limit dust and dirt rising and scattering in the air. Comply with governing EPA. OSHA, and local regulations pertaining to environmental protection. Do not create hazardous or objectionable conditions such as flooding and water pollution. Clean adjacent structure and improvements of dust, dirt, and debris caused by demolition operations, as directed by Owner's Representative, or governing authorities. Return adjacent areas to condition existing prior to start of work.

6.07.2 Existing Structures: Demolish building and structures to slab and remove from Work site. Use such methods as required to complete Work within limitations of governing regulations. Proceed with demolition in systematic manner, from top of structure to ground. Demolish concrete and masonry in small sections. Remove structural framing members and lower to ground by hoists, derricks, or other suitable methods. Break up and remove concrete slabs-on-grade, unless otherwise shown to remain. Locate demolition equipment throughout structure and remove materials so as to not impose excessive loads to supporting walls, floors, or framing. Demolish above grade structures to the level of existing grade.

6.08 DISPOSAL OF DEMOLISHED MATERIALS

3.3.1 General: Remove from work site debris, rubbish, and other materials resulting from demolition operations.

3.3.1.1 Burial of removed materials from demolished structures will be permitted at approved landfill location on site.

3.3.1.2 Dispose of legally.

3.3.2 Removal: Safely transport demolished materials and dispose of legally. Transportation and disposal shall be conducted by an authorized, licensed and insured transporter.

END OF SECTION

7.0 MECHANICAL WORK

5.01 DESCRIPTION

A. Coordinate with Owner to establish isolation and removal sequence and procedures to shutdown building HVAC and mechanical/domestic water pipe systems to the affected area.

B. Perform other incidental mechanical work not specified herein but necessary for the successful execution of the Work as set forth in the Work Procedures.

C. Install temporary mechanical work necessary to comply with Work Procedures.

D. Remove temporary mechanical work necessary to comply with Work Procedures at completion of Project and correct any damage to property.

END OF SECTION

6.01 DESCRIPTION

A.. Installation of temporary lighting and power necessary to perform the Work of the Work Procedures.

B. All materials and equipment required shall be:

1. Approved by Underwriters Laboratories and so labeled.
2. For wire and cable, marked as required by Article 310-10 National Electrical Code.
3. Installed by mechanics skilled in their trades, working under the direct supervision of competent experienced foremen or superintendents.
4. Installed in compliance with all applicable Occupational Safety and Health Administration and city electrical codes.

C. Perform and install items specified at the proper time during progress of construction. Coordinate work operations with other trades as necessary. Refer to Section 1.02.

D. Decontaminate and remove all temporary lighting and other electrical items after removal of asbestos-containing material operations.

END OF SECTION

RESPIRATOR TRAINING CERTIFICATION FORM

00064031

I hereby certify that I have been trained in the use of each type of respiratory protection equipment required for use on this project. The training included the following:

1. Explanation of dangers related to misuse.
2. Instruction on putting on, fitting, testing and wearing the respirator.
3. Instruction on inspection, cleaning and maintaining respirator.
4. Instruction on emergency situations.

I further certify that I understand the use, care and inspection of the respirator and have tested and worn the unit.

Name: _____

Signature: _____

Social Security Number: _____

Date: _____

Notary: _____
(Signature)

( )
( )
(Seal)
( )
( )

(Submit one copy for each employee prior to starting work)

CERTIFICATE OF WORKER'S RELEASE FORM

DATE: _____

TO: _____

RE: _____
(Insert Project Name and Address)

1. In consideration of my employment by _____ in conjunction with
(Contractor)
the removal and disposal of asbestos, or other work in asbestos-contaminated work area(s), and in consideration of the sum of ONE AND NO/100 ($1.00) DOLLAR and other good and valuable consideration in hand paid, at and before the sealing and delivery of these presents, the receipt , sufficiency, and adequacy of which are hereby acknowledged, the undersigned does hereby acknowledge, warrant, represent, covenant, and agree as follows:

(a) I acknowledge and understand that I have been or will be employed in connection with the removal of, disposal of, or other work in asbestos-contaminated work areas, and I acknowledge that I have been advised of and I understand the dangers inherent in handling asbestos and breathing asbestos dust, including, but not limited to, THE FACT THAT ASBESTOS CAN CAUSE ASBESTOSIS AND IS A KNOWN CARCINOGEN AND CAN, THEREFORE, CAUSE VARIOUS TYPES OF CANCER.

(b) I acknowledge and understand that ANY CONTACT WITH ASBESTOS, WHETHER IT CAN BE SEEN OR NOT, MAY CAUSE ASBESTOSIS AND VARIOUS FORMS OF CANCER, WHICH MAY NOT SHOW UP FOR MANY YEARS, and I covenant and agree faithfully to take all precautions required of me.

(c) I hereby warrant and represent that I have not been disabled, laid-off, or compensated in damages or otherwise, because of the disease of asbestosis or any other cancer disease.

(d) I represent that I can read the English language, or that I have had someone read this instrument to me, and that I understand the meaning of all the provisions contained herein.

Name: _____

Signature: _____

Social Security Number: _____

Signed in presence of: ____

Notary: _
(Signature)

( )
( )
(Seal)
( )
( )

APPENDIX A

UXO DECONTAMINATION PROCEDURES

UXO DECONTAMINATION PROCEDURES PROJECT SUBMITTAL LONGHORN ARMY AMMUNITION PLANT KARNACK, TEXAS

UXO Decontamination Procedures for Proposed Demolition

Prepared For:
ARC Abatement, Inc.
6630 Roxburgh Drive, Suite 130
Houston, Texas 77041

Prepared by:
EFI
9700 Richmond, Suite 210
Houston, Texas 77042

May 6, 2004
Document Number 98410-00810

SECTION 1.0: MUNITIONS CONSTITUENTS DECONTAMINATION PROCEDURES

1.01 DESCRIPTION

A. Perform all planning, administration, execution of work necessary to safely conduct the Work. The Work will consist of decontaminating munitions constituents from surfaces of building facilities and their components located at the Longhorn Army Ammunition Plant (LHAAP). Listing of Munitions Constituents Contaminated buildings are presented in Table I.

1.02 WORKSITE CONDITIONS

A. Worker and Visitor Procedures: Contractor is hereby advised that some of the buildings at the "LHAAP" have been determined to contain munitions constituents that may pose a chemical and or physical hazards. Prior to performing demo or removal of hazardous materials, contractor shall implement explosives decontamination procedures to remove surfaces contaminated with explosives residues. Provide workers and visitors with respirators (which, as a minimum, meet the requirements of OSHA 29 CFR 1926.1101) and protective clothing during all phases of the Work and until final testing (EXPRAY and or temperature sensitive pellets) determines that the buildings has been decontaminated to a **5X** level or an inert state.

1.03 PERSONNEL PROTECTION

A. Prior to commencement of work, instruct all workers in the appropriate procedures for personnel protection. Ensure that workers are knowledgeable in these procedures.

B. Provide respiratory protection at all times, which is in compliance with OSHA requirements. When not in violation of the above, the minimum acceptable respiratory protection used for this project shall be as follows, unless airborne fiber concentrations inside the face mask exceed 0.01 fibers per cubic centimeter (f/cc). In the event that airborne fiber concentrations inside the mask exceed 0.01 f/cc, respiratory protection required to achieve 0.01 f/cc shall be used.

1. Provide appropriate respirators based on respiratory protection factor and the potential hazards for workers during all phases of the decontamination work from the time of first disturbance of the munitions constituents contaminated material until acceptance of final EXPRAY tests by Consultant.
2. Provide additional "piggy-back" organic cartridges recommended by the manufacturer whenever organic vapors or fumes are present or likely to be generated during decontamination process.

C. Permit no visitors, except for governmental inspectors having jurisdiction, or as authorized by Owner or Consultant, in the work areas after commencement of explosive residue disturbance or removal.

D. Provide workers sufficient sets of protective disposable clothing, consisting of full-body coveralls, head covers, gloves, and foot covers, of sizes to properly fit individual workers, as required for the work being performed.

E. Leave reusable equipment, apparel and protection devices (excluding respirators) in the work area until the end of the munitions constituent decontamination work, at which time such items shall be disposed of as contaminated waste.

F. Provide suitable respirators and protective equipment for use by authorized visitors, Owner, Consultant and Testing Laboratory's representatives. Furnish these in as many sets as required.

1.04 DECONTAMINATION PREPARATION

A. Install warning barrier tape and signs stating "CAUTION EXPLOSIVE AREA" to segregate and demarcate work area from occupied or non-occupied areas.

B. Maintain a Sign In/Out Log in the immediate area of the entrance to the work area to be utilized by every person, each time upon entering and leaving the work area.

C. Construct a remote staging area (worker/equipment decontamination unit) work area utilizing scaffolding framing and plywood platform for top decking (as necessary).

D. Provide a worker/equipment decontamination unit in compliance with EPA guidelines concerning number, size and placement of airlocks, etc. Shower in worker decontamination unit to open into airlock on both contaminated and uncontaminated sides. Decontamination unit shall be constructed of appropriate materials (including plastic sheeting) to provide airtight barriers and allow continuous diminished pressure to be maintained in work areas. Post OSHA decontamination procedures in Change Room for duration of Project.

E. Trap shower waste water using filters having a maximum pore size of not larger than 1.0 micron, and drain into a sanitary sewer. Replace contaminated filters when they become clogged but not less than every third working day. Dispose of filters as contaminated waste.

F. Maintain emergency and fire exits from the Work Areas, or establish alternative exits satisfactory to fire officials. Provide fire extinguishers, as required, inside and outside the Work Area.

G. Provide temporary power and lighting as necessary to maintain safe and comfortable work environment.

H. Provide intrinsically safe equipment (e.g. HEPA Vacuum, temporary light, steam/power wash equipment) to be used during the work.

I. Personnel shall not enter building areas with cigarette lighters, matches, cigarettes, cigars, pipes or other flame emitting items. Personnel shall not smoke cigarettes, cigars, pipes or the like within the building areas.

J. Isolate power source by lock-out tag-out if power is operational.

K. Disconnect Lines (mechanical/electrical from adjacent structures).

L. Cap open drain/pipe.

M. Evacuate existing lines of products (if any), store in 50 Gallon Drums for waste characterization (lab test) for and proper disposal.

1.05 STEAMCLEANING/POWER WASHING

A. Munitions Constituents Decontamination

1. Prepare work area as previously specified.
2. At completion of work area preparation, HEPA-vacuum all contaminated non-porous surfaces in the work area to remove visible munitions constituents accumulated materials.
3. Munitions constituents dust and debris collected by HEPA-Vacuum process shall be placed in impermeable containers for proper disposal or incineration.
4. Use steam clean/power-washing equipment capable of removing residual munitions constituents but not damaging to or penetrating the contaminated surfaces. Minimize water migration to other areas by collecting excessive water and place in impermeable containers for proper disposal or incineration.
5. Use disposable towel to wipe power washed surfaces free of material. Dispose of towel in impermeable containers (labeled as HAZMAT) for proper disposal or incineration
6. Surfaces will be considered clean when EXPRAY retesting has confirmed that the work area is free of munitions constituents.

1.06 SPRINKLER PIPING/EQUIPMENT FLUSHING & DISASSEMBLY

A. Disassemble the ends of the sprinkler pipe/equipment items in a manner that does not pose an explosive safety hazard. Flush the sprinkler system with portable water and collect and store in 50 Gallon Drums for waste characterization (lab test) for and proper disposal.

B. Disassemble contaminated pipe/equipment items in a manner that does not pose an explosive safety hazard. Welding, drilling, sawing, etc. or any processes that generate enough heat, or spark to ignite residual contamination is prohibited.

C. Apply penetrating oil to nuts and bolts, allow sufficient time for oil to penetrate prior to loosening nuts and bolts. (Recommend two applications, twenty-four hours prior to disassembly operation and fifteen minutes prior to loosening nuts and bolts).

D. Non-sparking tools will be utilized during disassembly operation.

E. Pipe will be separated exposing both ends and offset, straight run of piping shall be uninterrupted by valves, tees, or other such fittings.

F. Sprinkler pipe system/equipment will be considered clean at completion of EXPRAY retesting confirming that munitions constituents has been remove from the surfaces (interior & exterior). Only then the sprinkler pipe system/equipment can be salvaged or disposed of.

5.11 CLEAN-UP AND CLEARANCE TESTING

A. Provide general clean-up of work area concurrent with the decontamination of munitions constituents contaminated materials. Do not permit accumulation of debris on workspace floor. Contaminated materials such as disposable suites, towels, waste containers, etc. generated as a result of the decontamination process shall be properly disposed of by incineration.

B. Clean all equipment used in the work area and remove from work area (excluding that which will be needed for further cleaning phases) via the Decontamination Enclosure System.

C. EXPRAY Final Clearance Testing (Thick Walled Items)

1. Testing Laboratory will test for the presence of munitions constituents based on EXPRAY clearance criteria, upon notice from Abatement Contractor that work areas are considered visually decontaminated. Final clearance testing shall be performed using bulk wipe sampling techniques and sprayed with EXPRAY reagents. If the EXPRAY test samples indicate no presence of munitions constituents (absence of visual color change), the decontamination work will be considered completed.
2. Re-clean areas/items, which do not comply with the specified EXPRAY final clearance criteria. Abatement Contractor to bear cost of all follow-up tests necessitated by the failure of the EXPRAY clearance criteria.
3. Upon achieving clearance, the building is ready for industry debris cleanup/disposal.

D. Power Washing and Flushing Rinsate Water Testing

1. Testing Laboratory will test for the presence of munitions constituents collected in 50 Gallon Drums for waste characterization and proper disposal, upon notice from Abatement Contractor that work areas are considered visually decontaminated.
2. Upon receiving test results, and based on the determination by the water quality jurisdiction for acceptance of disposal of the rinsate water, only then will the water be disposed of.

END OF SECTION

APPENDIX B

WORK PROCEDURES

FOR REMOVAL OF PCB LIGHT BALLASTS

WORK PROCEDURES

FOR

REMOVAL OF POLYCHLORINATED BIPHENYL (PCB) LIGHT BALLASTS

AT

LONGHORN ARMY AMMUNITION PLANT

Karnack, Texas

Prepared by:

Engineering and Fire investigations, Inc.
9700 Richmond
Houston, Texas 77042
(713) 975-7031

March, 2003

PCB LIGHT BALLAST REMOVAL

PART 1 - GENERAL

1.01 DESCRIPTION

A. Perform all planning, administration, execution, and cleaning necessary to safely remove and dispose of PCB-containing light ballasts.

1.02 WORK INCLUDED

A. The work includes, but is not limited to, the following:

1. Inspecting all light fixtures for PCB-containing light ballasts.
2. Partial dismantling of light fixtures to permit removal and separation of ballasts.
3. Cleaning of any PCB contamination on fixture surfaces.
4. Placement of all PCB or PCB-contaminated items generated as a result of work activities in DOT approved drums.
5. Marking and labeling of all PCB Containers for storage purposes.

1.03 DEFINITIONS

A. The following definitions pertain to this section of these Contract Documents.

1. **Capacitor -** A device for accumulating and holding a charge of electricity and consisting of conducting surfaces separated by a dielectric. A Small Capacitor is a capacitor which contains less than 1.36 kg (3 lbs.) of dielectric fluid.
2. **Fluorescent light ballast -** A device that electrically controls fluorescent light fixtures and includes a capacitor containing 0.1 kg or less of dielectric fluid.
3. **Leak, or leaking -** Any instance in which a PCB Article, PCB Container, or PCB Equipment has any PCBs on any portion of its external surface.
4. **Mark -** Means the descriptive name, instructions, cautions or any other information applied to PCBs and PCB Items, or other objects subject to these specifications.
5. **Marked -** The marking of PCB Items and PCB storage areas and transport vehicles be means of applying a legible mark by painting, fixation of an adhesive label, or by any other method that meets the requirements of these specifications.
6. **PCB and PCBS -** Any chemical substance that is limited to the biphenyl molecule that has been chlorinated to varying degrees or any combination of substances which contains such substance.
7. **PCB Article -** Any manufactured article, other than a PCB Container, that contains PCBs and whose surface(s) has been in direct contact with PCBs. PCB Article includes capacitors.
8. **PCB Article Container -** Any package, can, bottle, bag, barrel, drum, tank, or other device used to contain PCB Articles, or PCB Equipment, and whose surface(s) has not been in direct contact with PCBs.

9. **PCB Container** - Any package, can, bottle, bag, barrel, drum, tank, or other device that contains PCBs, or PCB Articles, and whose surface(s) has been in direct contact with PCBs.
10. **PCB Equipment** - Any manufactured item, other than a PCB Container or a PCB Article Container, which contains a PCB Article or other PCB Equipment, and includes fluorescent light ballasts and fixtures.
11. **PCB Item** - Any PCB Article Container, PCB Container, or PCB Equipment, that deliberately or unintentionally contains, or has a part of it, any PCB or PCBs.
12. **PCB-Contaminated Electrical Equipment** - Any electrical equipment (including capacitors), that contain 50 ppm or greater PCB, but less than 500 ppm PCB.

1.04 APPLICABLE REGULATIONS

A. The applicable sections, latest edition and addenda of the following government regulations, codes, industry standards and recommended practices, form a part of this specification.

1. Environmental Protection Agency (EPA), 40 CFR 761, Polychlorinated Biphenyls (PCBs), Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions.
2. National Electrical Code (NEC)
3. National Electrical Manufacturers Association (NEMA)
4. Resource Conservation and Recovery Act (RCRA)
5. Toxic Substances and Control Act (TSCA)
6. Department of Transportation (DOT), 40 CFR 178.08 - 178.50, Shipping Container Specifications.
7. All other applicable federal, state, county, and city codes, standards and regulations.

1.05 SAFETY PROCEDURES AND WORKER PROTECTION:

A. Take all precautions and measures required to protect employees, related trade employees, inspection personnel, and the general public from exposure to PCB solids, liquids and vapors.

B. All electrical equipment upon which PCB-related activities are to be performed shall be disconnected from any power source prior to commencing any work.

C. All equipment shall be confined to the work area until work is complete and containers are sealed and equipped properly and safely stored for transport.

1. Barricades: No additional PCB-related temporary enclosures need be constructed, except as needed in the event of a PCB-related emergency.

2. Signs: During the PCB work phase, the contractor shall place at intervals of approximately ten feet, warning signs. The warning signs for the work area shall comply with OSHA 1910.145, and shall have black letters on a white background, with the word "DANGER" in red. Signs shall read "**DANGER - KEEP OUT - TOXIC CHEMICAL WORK AREA**".

D. Protective measures shall be provided with the transporting of PCB materials within the building for the entire pathway.

E. Protective clothing and equipment: At all times when PCB materials in any volume are not sealed in drums, containers, or electrical equipment, workers shall wear:

1. Disposable neoprene, butyl or nitrile PVC, nonporous gloves.
2. Disposable whole body clothing (including booty) impermeable to PCBs. Saranex 23-P film on Tyvek coveralls is approved for use.
3. If asbestos abatement activities are being performed simultaneously the level of particulate respiratory protection must be at least the level required at the stage of work. The level of organic vapor respiratory protection is dependent upon particular solvent being used in spill cleanup/contamination procedures - refer to solvent Material Safety Data Sheet of specific solvent for respiratory protection requirements.
4. Eye protection.

F. The contractor shall provide protective clothing, eye protection and respiratory protection as required for Owner's and Engineer's personnel monitoring the work activities within the work area, and for fire fighters responding to incidents.

G. Workers with cuts or scratches shall seal and cover these wounds before entering the work area. Similarly, workers who incur cuts or scratches in the course of work activities shall leave the work area, cleanse the wound with medical grade soap, and seal and cover the wound before returning to the work area.

PART 2 - PRODUCTS

2.01 MATERIALS AND EQUIPMENT

A. STORAGE CONTAINERS

1. All ballasts containing PCB material shall be stored in sealed DOT 17C open top 55 gallon drums.
2. All PCB-contaminated solid wastes, including disposable items used in the course of the work (rags, sorbents, protective clothing, etc.) shall be stored in sealed DOT 17C open top drums, separate from the ballasts. Contractor shall not place ballasts in the same drum as the items described in this paragraph.
3. All liquids generated as a result of clean-up activities shall be disposed of in DOT 17E closed top drums.

B. SOLVENTS, SORBENTS, AND CLEANERS

1. Solvents: Diesel fuel, deodorized kerosene, turpentine, mineral spirits, rubbing alcohol, or other solvents recognized for a high degree of PCB solubility (minimum of 5 percent solubility by weight). Contractor shall not, at any time, mix solvents.
2. Sorbents: Vermiculite. Zono-Lite by Grace Company is approved for use.
3. Liquid Cleaners: Concentrated liquid alkaline base cleaner containing trisodium phosphate. Contractor shall not dilute this cleaner, and shall not flush down sanitary or storm sewers.

PART 3 - EXECUTION

3.01 BALLAST REMOVAL

A. Disconnect power from all light fixtures in the work area.

B. All ballasts without a label affixed stating the ballast does not contain PCBs shall be removed, assumed to contain PCBs, and placed in DOT 17C open top drums.

C. All leaking ballasts shall be treated as described above in paragraphs 3.01.B of this Section. All light troffers and other electrical equipment which has come in contact with leaking dielectric fluid shall be flushed clean with solvents as described in paragraph 3.02.B of this Section, and left on site in an area acceptable to the Owner.

D. Place sufficient vermiculite sorbent material in drums to absorb any leaking dielectric fluid.

E. Seal and label drums. Label shall comply with paragraph 3.03.D and 3.03.E of this Section.

3.02 CLEAN-UP OF WORK AREA, PCB ARTICLES, AND SPILLS

A. EQUIPMENT AND TOOLS: After the last ballast has been removed from the light fixture all tools and equipment used in the work shall be decontaminated. All tools that may have come in contact with PCBs at any concentration shall be thoroughly flushed with solvent, and wiped clean.

B. PCB ARTICLES (ELECTRICAL EQUIPMENT): All exterior surfaces of electrical equipment to be removed that may have come in contact with PCB-containing dielectric fluid either during the course of work activities or due to past leaks shall be thoroughly cleaned with solvent and wiped clean. At a minimum, solvent wash shall consist of a double wash, double rinse, and the clean-up area shall cover an area 20 percent greater than the spill area.

C. SLABS, FLOORS, AND WALLS: All non-absorbent surfaces which have come in contact with PCB-containing dielectric fluid or PCB-contaminated cleaning fluids or mixtures in the course of the work, or as a result of past leaks shall be thoroughly cleaned using a combination of sorbents, solvents, and cleaners. At a minimum, solvent wash shall consist of a double wash, double rinse, and the clean-up area shall extend one foot beyond spill area, or shall cover an area 20 percent greater than the spill area.

D. Absorbent materials, such as drapes, carpets, or cloths, shall be cut away at least 6 inches from outer edge of spill area, and disposed of as PCB-contaminated items in a drum separate from the ballasts.

3.03 CONTAINERIZATION AND MARKING

A. All liquids generated as a result of work activities and clean-up operations shall be placed in DOT 17E closed top drums and sealed.

B. All solids such as sorbents, rags, disposable protective clothing, and other incidentals shall be placed in DOT 17C open top drums separate from PCB light ballasts and sealed.

C. All PCB-containing light ballasts, including those which have leaked, shall be placed in DOT 17C open top 55 gallon drums with sufficient vermiculite sorbent to absorb any leaking dielectric fluid.

D. All drums shall be permanently marked as to specific contents and dated. In addition, each drum shall be marked with the standard EPA, PCB, M_L label, shown below:

CAUTION

CONTAINS
PCBs

(Polychlorinated Biphenyls)

A toxic environmental contaminant requiring special handling and disposal in accordance with US Environmental Protection Agency Regulations 40 CFR 761 - For Disposal Information contact the nearest US EPA Office

In case of accident or spill call toll free the US Coast Guard National Response Center
800 424-8802

Also Contact:
Tel. No.:

E. All drums shall be marked with the label (properly completed) shown below. 00064047

HAZARDOUS WASTE

FEDERAL LAW PROHIBITS IMPROPER DISPOSAL

IF FOUND, CONTACT THE NEAREST POLICE OF PUBLIC SAFETY AUTHORITY, OR THE U.S. ENVIRONMENTAL PROTECTION AGENCY

GENERATOR INFORMATION

NAME _____

ADDRESS _____ PHONE _____

CITY _____ STATE _____ ZIP _____

EPA MANIFEST
ID NO./DOCUMENT NO. _____/_____

ACCUMULATION
START DATE _____ EPA
WASTE NO. _____

_____

_____

_____

D.O.T. PROPER SHIPPING NAME AND UN OR NA NO. WITH PREFIX

HANDLE WITH CARE!

F. Notify Engineer for observation of the labeling of the drum(s) prior to moving the drum(s) to the storage area.

3.04 TEMPORARY ON-SITE STORAGE

A. All drums shall be sealed, secured and labeled before being moved to a temporary on-site storage location designated by the Owner. Handle drums with utmost care during transportation between removal area and storage area.

3.05 DISPOSAL OF PCB WASTE

A. All PCB light ballasts and PCB-contaminated waste generated on this Project shall be disposed of through incineration. Disposal site to be used shall meet all Environmental Protection Agency and Texas Natural Resource Conservation Commission regulatory standards for incineration of PCBs.

B. Transportation to incineration facility shall be performed in accordance with all federal, state, and local laws and regulations.

1. Place sealed containers in enclosed truck, trailer or dumpster.
2. Transport PCB waste using a transporter registered to transport hazardous materials.
3. Provide Uniform Hazardous Waste Manifests (Texas Natural Resource Conservation Commission form TNRCC-0311, current edition) for transportation of all PCB waste to incinerator facility.
4. Submit copies of waste manifests from authorized representative of incinerator facility for each delivery of waste material to Engineer after each delivery and a complete set of copies of receipts for all deliveries.
5. Submit copies of certificates of incineration from authorized representative of incinerator facility to Engineer following incineration of PCB waste.

END OF SECTION

APPENDIX C

PROGRESS SCHEDULE

TABLE 1
PROGRESS SCHEDULE
LONGHORN ARMY AMMUNITION PLANT

SECTIONS	LOCATIONS	DESCRIPTION	ASBESTOS / LEAD / PCB/ UXO-CONTAINING MATERIALS							
			Abatement Start Date	*Abatement End Date*	*Demolition Start Date*	*Demolition End Date*	*TCLP Sample Date*	*No. of TCLP Samples to be Obtained*	*Containing PCB (Yes/No)*	*UXO & Fire Sprinkler Expray Retest Date*
PLANT 2	TS-87	Portable Guard Shack						1		N/A
PLANT 2	TS-45	Portable Guard Shack						1		N/A
PLANT 2	TS-69	Portable Guard Shack						1		N/A
PLANT 2	TS-74	Portable Guard Shack						1		N/A
PLANT 2	TS-38	Portable Guard Shacks						1		N/A
PLANT 2	T-1	Toilet						1		FS
PLANT 2	T-2	Toilet						1		FS
PLANT 2	T-3	Toilet						1		UXO
PLANT 2	101	Admin Bldg.						1		N/A
PLANT 2	102	Change House						1		N/A
PLANT 2	102-R	Walkway						1		N/A
PLANT 2	103	Change House						1		N/A
PLANT 2	L-6	Transit Shed						1		N/A
PLANT 2	207	Production						1		N/A
PLANT 2	211-1	Lunch & Break Room						1		N/A
PLANT 2	211-2	Lunch & Break Room						1		N/A
PLANT 2	L-5	Transit Shed						1		N/A
PLANT 2	S-1	Warehouse, General Purpose						1		FS
PLANT 2	S-2	Warehouse, General Purpose						1		FS
PLANT 2	S-3	Warehouse, General Purpose						1		FS
PLANT 2	S-4	Warehouse, General Purpose						1		FS
PLANT 2	M-1	Admin., General Purpose						1		FS
PLANT 2	M-2	Admin., General Purpose						1		N/A

Shaded Areas Denotes Buildings with Sprinkler Pipes or 3X Contamination

00064050

TABLE 1
PROGRESS SCHEDULE
LONGHORN ARMY AMMUNITION PLANT

SECTIONS	LOCATIONS	DESCRIPTION	ASBESTOS / LEAD / PCB/ UXO-CONTAINING MATERIALS							
			Abatement Start Date	*Abatement End Date*	*Demolition Start Date*	*Demolition End Date*	*TCLP Sample Date*	*No. of TCLP Samples to be Obtained*	*Containing PCB (Yes/No)*	*UXO & Fire Sprinkler Expray Retest Date*
PLANT 2	LR-1	Lunch Room						1		N/A
PLANT 2	Shed C	Pyro Production						1		FS
PLANT 2	Shed D	Pyro Production						1		FS
PLANT 2	Shed J	Pyro Production						1		FS
PLANT 2	Shed L	Walkway						1		N/A
PLANT 2	Shed B	Walkway						1		N/A
PLANT 2	Shed A	Walkway						1		FS
PLANT 2	Shed E	Walkway						1		FS
PLANT 2	Shed F	Walkway						1		N/A
PLANT 2	Shed G	Walkway						1		N/A
PLANT 2	Shed H	Walkway						1		FS
PLANT 2	Shed K	Walkway						1		FS
PLANT 2	727-R	Toilet						1		N/A
PLANT 2	212-1	Mill House						10% of Mill House		N/A
PLANT 2	212-2	Mill House						10% of Mill House		N/A
PLANT 2	212-3	Mill House						10% of Mill House		N/A
PLANT 2	212-4	Mill House						10% of Mill House		N/A
PLANT 2	212-5	Mill House						10% of Mill House		N/A
PLANT 2	212-6	Mill House						10% of Mill House		N/A
PLANT 2	212-7	Mill House						10% of Mill House		N/A
PLANT 2	212-8	Mill House						10% of Mill House		N/A
PLANT 2	212-9	Mill House						10% of Mill House		N/A
PLANT 2	212-10	Mill House						10% of Mill House		N/A

Shaded Areas Denotes Buildings with Sprinkler Pipes or 3X Contamination

00064051

TABLE 1
PROGRESS SCHEDULE
LONGHORN ARMY AMMUNITION PLANT

SECTIONS	LOCATIONS	DESCRIPTION	ASBESTOS / LEAD / PCB/ UXO-CONTAINING MATERIALS							
			Abatement Start Date	*Abatement End Date*	*Demolition Start Date*	*Demolition End Date*	*TCLP Sample Date*	*No. of TCLP Samples to be Obtained*	*Containing PCB (Yes/No)*	*UXO & Fire Sprinkler Expray Retest Date*
PLANT 2	212-11	Mill House						10% of Mill House		N/A
PLANT 2	212-12	Mill House						10% of Mill House		FS
PLANT 2	212-13	Mill House						10% of Mill House		N/A
PLANT 2	212-14	Mill House						10% of Mill House		FS
PLANT 2	212-14-I	Mechanical/Electrical						1		N/A
PLANT 2	212-15	Mill House						10% of Mill House		N/A
PLANT 2	212-16	Mill House						10% of Mill House		FS&UXO
PLANT 2	212-17	Mill House						10% of Mill House		N/A
PLANT 2	212-18	Mill House						10% of Mill House		FS
PLANT 2	212-19	Mill House						10% of Mill House		N/A
PLANT 2	212-20	Mill House						10% of Mill House		FS
PLANT 2	212-21	Mill House						10% of Mill House		N/A
PLANT 2	212-23	Mill House						10% of Mill House		N/A
PLANT 2	212-25	Mill House						10% of Mill House		
PLANT 2	212-27	Mill House						10% of Mill House		N/A
PLANT 2	212-29	Mill House						10% of Mill House		UXO
PLANT 2	212-31	Mill House						10% of Mill House		UXO
PLANT 2	212-32	Mill House						10% of Mill House		UXO
PLANT 2	212-33	Mill House						10% of Mill House		FS&UXO
PLANT 2	212-34	Mill House						10% of Mill House		N/A
PLANT 2	212-35	Mill House						10% of Mill House		FS
PLANT 2	212-35R	Walkway						1		FS
PLANT 2	212-36	Mill House						10% of Mill House		FS&UXO

Shaded Areas Denotes Buildings with Sprinkler Pipes or 3X Contamination

00064052

TABLE 1
PROGRESS SCHEDULE
LONGHORN ARMY AMMUNITION PLANT

SECTIONS	LOCATIONS	DESCRIPTION	ASBESTOS / LEAD / PCB/ UXO-CONTAINING MATERIALS							
			Abatement Start Date	*Abatement End Date*	*Demolition Start Date*	*Demolition End Date*	*TCLP Sample Date*	*No. of TCLP Samples to be Obtained*	*Containing PCB (Yes/No)*	*UXO & Fire Sprinkler Expray Retest Date*
PLANT 2	212-37	Mill House						10% of Mill House		FS
PLANT 2	212-38	Mill House						10% of Mill House		FS
PLANT 2	212-38R	Walkway						10% of Mill House		N/A
PLANT 2	212-39	Mill House						10% of Mill House		N/A
PLANT 2	212-40	Mill House						10% of Mill House		N/A
PLANT 2	212-42	Mill House						10% of Mill House		N/A
PLANT 2	212-44	Mill House						10% of Mill House		N/A
PLANT 2	212-46	Mill House						10% of Mill House		N/A
PLANT 2	212-48	Mill House						10% of Mill House		UXO
PLANT 2	212-50	Mill House						10% of Mill House		UXO
PLANT 2	212-51	Mill House						10% of Mill House		N/A
PLANT 2	212-52	Mill House						10% of Mill House		N/A
PLANT 2	212-53	Mill House						10% of Mill House		N/A
PLANT 2	212-54	Mill House						10% of Mill House		N/A
PLANT 2	212-55	Mill House						10% of Mill House		N/A
PLANT 2	212-56	Mill House						10% of Mill House		N/A
PLANT 2	212-57	Mill House						10% of Mill House		N/A
PLANT 2	212-59	Mill House						10% of Mill House		N/A
PLANT 2	P-108	Pyro Production						1		FS
PLANT 2	P-112	Pyro Production						1		FS
PLANT 2	P-113	Pyro Production						1		FS&UXO
PLANT 2	P-116	Pyro Production						1		FS
PLANT 2	P-117	Pyro Production						1		FS&UXO

Shaded Areas Denotes Buildings with Sprinkler Pipes or 3X Contamination

00064053

TABLE 1
PROGRESS SCHEDULE
LONGHORN ARMY AMMUNITION PLANT

SECTIONS	LOCATIONS	DESCRIPTION	ASBESTOS / LEAD / PCB/ UXO-CONTAINING MATERIALS							
			Abatement Start Date	*Abatement End Date*	*Demolition Start Date*	*Demolition End Date*	*TCLP Sample Date*	*No. of TCLP Samples to be Obtained*	*Containing PCB (Yes/No)*	*UXO & Fire Sprinkler Expray Retest Date*
PLANT 2	P-118	Pyro Production						1		FS
PLANT 2	P-122	Pyro Production						1		FS
PLANT 2	P-123	Pyro Production						1		FS
PLANT 2	P-124	Tank Car Unloading						1		N/A
PLANT 2	S-5	Pyro Production						1		FS
PLANT 2	S-7	Pyro Production						1		N/A
PLANT 2	S-8	Pyro Production						1		N/A
PLANT 2	S-13	Pyro Production (Storage)						1		FS
PLANT 2	P-1	Pyro Production						1		FS
PLANT 2	P-1-R	Walkway						1		FS
PLANT 2	P-3	Pyro Production						1		FS&UXO
PLANT 2	P-9	Pyro Production						1		UXO
PLANT 2	P-10	Pyro Production						1		FS
PLANT 2	P-11	Pyro Production						1		FS
PLANT 2	P-13	Pyro Production						1		FS
PLANT 2	P-14	Pyro Production						1		FS
PLANT 2	S3-R	Walkway						1		FS
PLANT 2	P14-R	Walkway						1		FS
PLANT 2	B-10	Pyro Production						1		FS
PLANT 2	B-11	Pyro Production						1		FS
PLANT 2	B-12	Pyro Production						1		FS
PLANT 2	B-13	Pyro Production						1		FS
PLANT 2	B-14	Pyro Production						1		FS

Shaded Areas Denotes Buildings with Sprinkler Pipes or 3X Contamination

00064054

TABLE 1
PROGRESS SCHEDULE
LONGHORN ARMY AMMUNITION PLANT

SECTIONS	LOCATIONS	DESCRIPTION	ASBESTOS / LEAD / PCB/ UXO-CONTAINING MATERIALS							
			Abatement Start Date	*Abatement End Date*	*Demolition Start Date*	*Demolition End Date*	*TCLP Sample Date*	*No. of TCLP Samples to be Obtained*	*Containing PCB (Yes/No)*	*UXO & Fire Sprinkler Expray Retest Date*
PLANT 2	B-15	Pyro Production						1		FS
PLANT 2	B-16	Pyro Production						1		FS
PLANT 2	B-8	Pyro Production						1		FS
PLANT 2	B-7	Pyro Production						1		FS
PLANT 2	B-9	Pyro Production						1		N/A
PLANT 3	26-G	Change House						1		N/A
PLANT 3	25-G2	Clock House						1		N/A
PLANT 3	61-I	Compressor Bldg.						1		UXO
PLANT 3	60-I	Storage						1		N/A
PLANT 3	62-I	Inert Storage						1		UXO
PLANT 3	61-J	Change House						1		N/A
PLANT 3	61-J2	Clock House						1		N/A
PLANT 3	22-B	Inert Storage						1		N/A
PLANT 3	32-B	General Storage						1		N/A
PLANT 3	29-A	Plant Laboratory						1		FS&UXO
PLANT 3	31-A	Lab Storage Bldg.						1		N/A
PLANT 3	27-A	Admin. Bldg.						1		N/A
PLANT 3	21-A	Admin. Bldg.						1		N/A
PLANT 3	46-A	Propellant Plant						1		FS
PLANT 3	49-B	Propellant Plant						1		N/A
PLANT 3	47-B	Propellant Plant						1		N/A
PLANT 3	46-B	Propellant Plant						1		FS
PLANT 3	53-B	X-Ray Complex						1		FS

Shaded Areas Denotes Buildings with Sprinkler Pipes or 3X Contamination

00064055

TABLE 1
PROGRESS SCHEDULE
LONGHORN ARMY AMMUNITION PLANT

SECTIONS	LOCATIONS	DESCRIPTION	ASBESTOS / LEAD / PCB/ UXO-CONTAINING MATERIALS							
			Abatement Start Date	*Abatement End Date*	*Demolition Start Date*	*Demolition End Date*	*TCLP Sample Date*	*No. of TCLP Samples to be Obtained*	*Containing PCB (Yes/No)*	*UXO & Fire Sprinkler Expray Retest Date*
PLANT 3	54-B	X-Ray Complex						1		FS
PLANT 3	55-B	X-Ray Complex						1		N/A
PLANT 3	56-B	X-Ray Complex						1		N/A
PLANT 3	59-B	X-Ray Complex						1		FS
PLANT 3	60-B	X-Ray Complex						1		N/A
PLANT 3	68-C	Propellant Plant						1		FS
PLANT 3	69-C	Break Area						1		N/A
PLANT 3	68-G-1	Rest Rooms						1		N/A
PLANT 3	68-F	Production						1		FS&UXO
PLANT 3	68-F-1	Toilet						1		N/A
PLANT 3	26-E	Propellant Plant						1		FS
PLANT 3	26-E-1	Toilet						1		N/A
PLANT 3	32-E	Propellant Plant						1		FS
PLANT 3	25-D	Propellant Plant						1		FS
PLANT 3	27-F	Pyro Production						1		N/A
PLANT 3	35-B	Pyro Production						1		FS
PLANT 3	39-E	Covered Walkway						1		N/A
PLANT 3	40-D	Propellant Plant						1		N/A
PLANT 3	41-E	Propellant Plant						1		FS
PLANT 3	36-B	Propellant Plant						1		N/A
PLANT 3	38-B	Propellant Plant						1		N/A
PLANT 3	38-E	Mechanical/Electrical						1		N/A
PLANT 3	50-G	Propellant Plant						1		FS

Shaded Areas Denotes Buildings with Sprinkler Pipes or 3X Contamination

00064056

TABLE 1
PROGRESS SCHEDULE
LONGHORN ARMY AMMUNITION PLANT

SECTIONS	LOCATIONS	DESCRIPTION	ASBESTOS / LEAD / PCB/ UXO-CONTAINING MATERIALS							
			Abatement Start Date	*Abatement End Date*	*Demolition Start Date*	*Demolition End Date*	*TCLP Sample Date*	*No. of TCLP Samples to be Obtained*	*Containing PCB (Yes/No)*	*UXO & Fire Sprinkler Expray Retest Date*
PLANT 3	54-F	Propellant Plant						1		FS&UXO
PLANT 3	54-F-1	Toilet						1		UXO
PLANT 3	54-G	Propellant Plant						1		FS&UXO
PLANT 3	54-G-1	Toilet						1		N/A
PLANT 3	40-H	Power Shed						1		N/A
PLANT 3	31-G	Propellant Plant						1		FS
PLANT 3	38-D	Walkway/ Garage						1		N/A
PLANT 3	37E	Toilet/Mech. Room						1		FS
PLANT 3	29-D	Propellant Plant						1		FS
PLANT 3	29D-1	Toilet						1		N/A
PLANT 3	25D-1	Toilet						1		N/A
PLANT 3	42E	Propellant Plant						1		FS
PLANT 3	40E	Electrical Storage						1		N/A
PLANT 3	39F	Garage						1		N/A
PLANT 3	37F	Walkway/Garage						1		N/A
PLANT 3	49B-1	Toilet						1		N/A
PLANT 3	56B-1	Toilet						1		N/A
PLANT 3	53B-1	Toilet						1		N/A
PLANT 3	26B-1	Toilet						1		N/A
PLANT 3	65D	Electrical Storage						1		N/A
PLANT 3	90J	Guard House						1		N/A
PLANT 3	90J-1	Toilet						1		N/A
PLANT 3	75J	Storage						1		N/A

Shaded Areas Denotes Buildings with Sprinkler Pipes or 3X Contamination

00064057

TABLE 1
PROGRESS SCHEDULE
LONGHORN ARMY AMMUNITION PLANT

SECTIONS	LOCATIONS	DESCRIPTION	ASBESTOS / LEAD / PCB/ UXO-CONTAINING MATERIALS							
			Abatement Start Date	*Abatement End Date*	*Demolition Start Date*	*Demolition End Date*	*TCLP Sample Date*	*No. of TCLP Samples to be Obtained*	*Containing PCB (Yes/No)*	*UXO & Fire Sprinkler Expray Retest Date*
400 AREA	402	Lunch & Break Room						1		N/A
400 AREA	404	Toilet						1		N/A
400 AREA	405	Toilet						1		N/A
400 AREA	403	Pyro Production						1		FS
400 AREA	406	Pyro Production						1		FS
400 AREA	407	Pyro Production						1		N/A
400 AREA	408	Pyro Production						1		FS
400 AREA	409	Pyro Production						1		FS
400 AREA	410	Pyro Production						1		N/A
SEWAGE TREATMENT PLANT	18-G	Chlorination Bldg.						1		N/A
SEWAGE TREATMENT PLANT	15-G	Sewage Pump Station						1		N/A
SEWAGE TREATMENT PLANT	48G	Sewer Pumping Station						1		N/A
SEWAGE TREATMENT PLANT	39-M	Magazine Bldg.						1		N/A
SEWAGE TREATMENT PLANT	Unmarked	Bldg. S. of 40T						1		N/A
BURNING GROUND	20-X	Office						1		N/A
BURNING GROUND	21-X	General Purpose Magazine						1		UXO
BURNING GROUND	22-X	General Purpose Magazine						1		UXO
BURNING GROUND	22-X-1	Toilet						1		N/A
BURNING GROUND	24-X	General Purpose Magazine						1		N/A
BURNING GROUND	27-X	General Purpose Magazine						1		N/A

Shaded Areas Denotes Buildings with Sprinkler Pipes or 3X Contamination

00064058

TABLE 1
PROGRESS SCHEDULE
LONGHORN ARMY AMMUNITION PLANT

SECTIONS	LOCATIONS	DESCRIPTION	ASBESTOS / LEAD / PCB/ UXO-CONTAINING MATERIALS							
			Abatement Start Date	*Abatement End Date*	*Demolition Start Date*	*Demolition End Date*	*TCLP Sample Date*	*No. of TCLP Samples to be Obtained*	*Containing PCB (Yes/No)*	*UXO & Fire Sprinkler Expray Retest Date*
BURNING GROUND	37-X	Incinerator						1		N/A
BURNING GROUND	43-X	General Purpose Magazine						1		N/A

Shaded Areas Denotes Buildings with Sprinkler Pipes or 3X Contamination

00064059

APPENDIX D

EXPLOSIVE SAFETY SURVEY SUMMARY

Attac[illegible]A
Longl[illegible]P
Explosive Safety Survey
1/30/04 Update

Bldg. No.	Description	Square Footage	Surveyed	Fire Supression, Present	Previous UXO Rating	Current UXO Rating	Original Building, Present	Original Building, Not Present	Additional Building
	Plant 2								
TS-87	Portable Guard Shack	100	X	No	5X	5X			X
TS-45	Portable Guard Shack	36	X	No	3X	5X			X
TS-69	Portable Guard Shack	36	X	No	3X	5X			X
TS-74	Portable Guard Shack	36	X	No	3X	5X			X
TS Bldg. (TS-38)	Portable Guard Shacks	36	X	No	3X	5X	X		
T-1	Toilet	200	X	Yes	3X	5X			X
T-2	Toilet	200	X	Yes	3X	5X			X
T-3	Toilet	200	X	No	3X	**3X**			X
101	Admin Bldg.	2,175	X	No	5X	5X	X		
102	Change House	3,275	X	No	5X	5X	X		
102-R	Walkway	508	X	No	5X	5X	X		
103	Change House	4,929	X	No	5X	5X	X		
L-6	Transit Shed	8,491	X	No	5X	5X	X		
207	Production	5,543	X	No	5X	5X	X		
211-1	Lunch & Break Room	1,860	X	No	3X	5X	X		
211-2	Lunch & Break Room	1,860	X	No	5X	5X	X		
402	Lunch & Break Room	0						X	
L-5	Transit Shed	1,375	X	No	5X	5X	X		
S-1	Warehouse, General Purpose	28,243	X	Yes	5X	5X	X		
S-2	Warehouse, General Purpose	36,869	X	Yes	5X	5X	X		
S-3	Warehouse, General Purpose	36,869	X	Yes	5X	5X	X		
S-4	Warehouse, General Purpose	22,606	X	Yes	5X	5X	X		
M-1	Admin., General Purpose	750	X	Yes	5X	5X			X
M-2	Admin., General Purpose	768	X	No	5X	5X	X		
M-4	Admin., General Purpose	0						X	
LR-1	Lunch Room	3,734	X	No	5X	5X	X		
Shed C	Pyro Production	2,718	X	Yes	3X	5X	X		
Shed D	Pyro Production	2,718	X	Yes	3X	5X	X		
Shed J	Pyro Production	2,718	X	Yes	3X	5X	X		
Shed L	Walkway	2,195	X	No	5X	5X	X		

Shaded Areas Denotes Additional Buildings

00064061

Attac[illegible] A
Long[illegible] P
Explosive Safety Survey
1/30/04 Update

Bldg. No.	Description	Square Footage	Surveyed	Fire Supression, Present	Previous UXO Rating	Current UXO Rating	Original Building, Present	Original Building, Not Present	Additional Building
	Plant 2								
Shed B	Walkway	2,195	X	No	5X	5X	X		
Shed A	Walkway	2,000	X	Yes	3X	5X			X
Shed E	Walkway	2,200	X	Yes	3X	5X			X
Shed F	Walkway	2,200	X	No	3X	5X			X
Shed G	Walkway	2,200	X	No	3X	5X			X
Shed H	Walkway	1,000	X	Yes	3X	5X			X
Shed K	Walkway	2,200	X	Yes	3X	5X			X
727-R	Toilet	144	X	No	3X	3X			X
212-1	Mill House	300	X	No	3X	5X	X		
212-2	Mill House	300	X	No	3X	5X	X		
212-3	Mill House	300	X	No	3X	5X	X		
212-4	Mill House	300	X	No	3X	5X	X		
212-5	Mill House	300	X	No	3X	5X	X		
212-6	Mill House	300	X	No	3X	5X	X		
212-7	Mill House	300	X	No	3X	5X	X		
212-8	Mill House	300	X	No	3X	5X	X		
212-9	Mill House	300	X	No	3X	5X	X		
212-10	Mill House	300	X	No	3X	5X	X		
212-11	Mill House	300	X	No	3X	5X	X		
212-12	Mill House	800	X	Yes	3X	5X	X		
212-13	Mill House	300	X	No	3X	5X	X		
212-14	Mill House	500	X	Yes	3X	5X	X		
212-14-I	Mechanical/Electircal	100	X	No	3X	5X			X
212-15	Mill House	300	X	No	3X	5X	X		
212-16	Mill House	2,000	X	Yes	3X	**3X**	X		
212-17	Mill House	300	X	No	3X	5X	X		
212-18	Mill House	340	X	Yes	3X	5X	X		
212-19	Mill House	340	X	No	3X	5X	X		
212-20	Mill House	829	X	Yes	3X	5X	X		
212-21	Mill House	829	X	No	3X	5X	X		
212-23	Mill House	829	X	No	3X	5X	X		

Shaded Areas Denotes Additional Buildings

00064062

Attac[illegible]A
Long[illegible]P
Explosive Safety Survey
1/30/04 Update

Bldg. No.	Description	Square Footage	Surveyed	Fire Supression, Present	Previous UXO Rating	Current UXO Rating	Original Building, Present	Original Building, Not Present	Additional Building
	Plant 2								
212-25	Mill House	829	X	No	3X	**3X**	X		
212-27	Mill House	829	X	No	3X	5X	X		
212-29	Mill House	829	X	No	3X	**3X**	X		
212-31	Mill House	829	X	No	3X	**3X**	X		
212-32	Mill House	829	X	No	3X	**3X**	X		
212-33	Mill House	829	X	Yes	3X	**3X**	X		
212-34	Mill House	829	X	No	3X	5X	X		
212-35	Mill House	408	X	Yes	3X	5X	X		
212-35R	Walkway	2,200	X	Yes	3X	5X			X
212-36	Mill House	361	X	Yes	3X	**3X**	X		
212-37	Mill House	406	X	Yes	3X	5X	X		
212-38	Mill House	361	X	Yes	3X	5X	X		
212-38R	Walkway	2,200	X	No	3X	5X			X
212-39	Mill House	300	X	No	3X	5X	X		
212-40	Mill House	300	X	No	3X	5X	X		
212-42	Mill House	300	X	No	3X	5X	X		
212-44	Mill House	300	X	No	3X	5X	X		
212-46	Mill House	300	X	No	3X	5X	X		
212-48	Mill House	300	X	No	3X	**3X**	X		
212-50	Mill House	300	X	No	3X	**3X**	X		
212-51	Mill House	300	X	No	3X	5X	X		
212-52	Mill House	300	X	No	3X	5X	X		
212-53	Mill House	300	X	No	3X	5X	X		
212-54	Mill House	300	X	No	3X	5X	X		
212-55	Mill House	300	X	No	3X	5X	X		
212-56	Mill House	300	X	No	3X	5X	X		
212-57	Mill House	300	X	No	3X	5X	X		
212-58	Mill House	0			3X			X	
212-59	Mill House	200	X	No	3X	5X	X		
P-108	Pyro Production	5,000	X	Yes	3X	5X			X
P-112	Pyro Production	2,300	X	Yes	3X	5X			X

Shaded Areas Denotes Additional Buildings

00064063

Attac[illegible]A
Long[illegible]P
Explosive Safety Survey
1/30/04 Update

Bldg. No.	Description	Square Footage	Surveyed	Fire Supression, Present	Previous UXO Rating	Current UXO Rating	Original Building, Present	Original Building, Not Present	Additional Building
	Plant 2								
P-113	Pyro Production	2,290	X	Yes	3X	**3X**	X		
P-116	Pyro Production	3,520	X	Yes	3X	5X	X		
P-117	Pyro Production	3,520	X	Yes	3X	**3X**	X		
P-118	Pyro Production	19,204	X	Yes	3X	5X	X		
P-122	Pyro Production	2,500	X	Yes	3X	5X			X
P-123	Pyro Production	6,099	X	Yes	3X	5X	X		
P-124	Tank Car Unloading	1,728	X	No	3X	5X	X		
S-5	Pyro Production	120	X	Yes	3X	5X	X		
S-7	Pyro Production	168	X	No	3X	5X	X		
S-8	Pyro Production	168	X	No	3X	5X	X		
S-13	Pyro Production (Storage)	200	X	Yes	3X	5X			X
P-1	Pyro Production	1,950	X	Yes	3X	5X	X		
P-1-R	Walkway	300	X	Yes	3X	5X			X
P-3	Pyro Production	4,164	X	Yes	3X	**3X**	X		
P-9	Pyro Production	2,100	X	No	3X	**3X**			X
P-10	Pyro Production	1,764	X	Yes	3X	5X	X		
P-11	Pyro Production	1,935	X	Yes	3X	5X	X		
P-13	Pyro Production	1,777	X	Yes	3X	5X	X		
P-14	Pyro Production	1,777	X	Yes	3X	5X	X		
S3-R	Walkway	300	X	Yes	3X	5X			X
P14-R	Walkway	600	X	Yes	3X	5X			X
B-10	Pyro Production	4,133	X	Yes	3X	5X	X		
B-11	Pyro Production	4,389	X	Yes	3X	5X	X		
B-12	Pyro Production	4,133	X	Yes	3X	5X	X		
B-13	Pyro Production	4,133	X	Yes	3X	5X	X		
B-14	Pyro Production	4,133	X	Yes	3X	5X	X		
B-15	Pyro Production	3,265	X	Yes	3X	5X	X		
B-16	Pyro Production	3,265	X	Yes	3X	5X	X		
B-8	Pyro Production	6,374	X	Yes	3X	5X	X		
B-7	Pyro Production	3,368	X	Yes	3X	5X	X		
B-9	Pyro Production	1,632	X	No	3X	5X	X		

Shaded Areas Denotes Additional Buildings

0006404

Attac[illegible]A
Long[illegible]P
Explosive Safety Survey
1/30/04 Update

Bldg. No.	Description	Square Footage	Surveyed	Fire Supression, Present	Previous UXO Rating	Current UXO Rating	Original Building, Present	Original Building, Not Present	Additional Building
	Plant 3								
26-G	Change House	5,824	X	No	5X	5X	X		
25-G2	Clock House	117	X	No	5X	5X	X		
61-I	Compressor Bldg.	1,215	X	No	5X	**3X**	X		
60-I	Storage	136	X	No	5X	5X	X		
62-I	Inert Storage	4,292	X	No	5X	**3X**	X		
61-J	Change House	6,656	X	No	5X	5X	X		
61-J2	Clock House	117	X	No	5X	5X	X		
22-B	Inert Storage	6,629	X	No	5X	5X	X		
32-B	General Storage	6,905	X	No	5X	5X	X		
29-A	Plant Laboratory	12,750	X	Yes	5X	**3X**	X		
31-A	Lab Storage Bldg.	288	X	No	5X	5X	X		
27-A	Admin. Bldg.	2,562	X	No	5X	5X	X		
21-A	Admin. Bldg.	2,112	X	No	5X	5X	X		
46-A	Propellant Plant	6,376	X	Yes	3X	5X	X		
49-B	Propellant Plant	3,223	X	No	3X	5X	X		
47-B	Propellant Plant	674	X	No	3X	5X	X		
46-B	Propellant Plant	2,361	X	Yes	3X	5X	X		
53-B	X-Ray Complex	609	X	Yes	3X	5X	X		
54-B	X-Ray Complex	545	X	Yes	3X	5X	X		
55-B	X-Ray Complex	905	X	No	3X	5X	X		
56-B	X-Ray Complex	905	X	No	3X	5X	X		
59-B	X-Ray Complex	535	X	Yes	3X	5X	X		
60-B	X-Ray Complex	705	X	No	3X	5X	X		
68-C	Propellant Plant	4,064	X	Yes	3X	5X	X		
69-C	Break Area	144	X	No	3X	5X	X		
68-G-1	Rest Rooms	255	X	No	3X	5X	X		
68-F	Production	9,546	X	Yes	3X	**3X**	X		
68-F-1	Toilet	255	X	No	3X	5X	X		
26-E	Propellant Plant	10,551	X	Yes	3X	3X	X		
26-E-1	Toilet	255	X	No	3X	5X			X
32-E	Propellant Plant	1,830	X	Yes	3X	5X	X		

Shaded Areas Denotes Additional Buildings

0006040065

Attac[illegible]A
Long.[illegible]P

Explosive Safety Survey
1/30/04 Update

Bldg. No.	Description	Square Footage	Surveyed	Fire Supression, Present	Previous UXO Rating	Current UXO Rating	Original Building, Present	Original Building, Not Present	Additional Building
	Plant 3								
25-D	Propellant Plant	10,805	X	Yes	3X	5X	X		
25-C	Propellant Plant	0			3X	5X		X	
25-C-1	Toilet	0			3X	5X		X	
22-B	General Storage	0			3X	5X		X	
32-B	General Storage	0			3X	5X		X	
27-F	Pyro Production	150	X	No	3X	5X	X		
35-B	Pyro Production	680	X	Yes	3X	5X	X		
39-E	Covered Walkway	2,000	X	No	3X	5X	X		
40-D	Propellant Plant	228	X	No	3X	5X	X		
41-E	Propellant Plant	1,495	X	Yes	3X	5X	X		
36-B	Propellant Plant	680	X	No	3X	5X	X		
38-B	Propellant Plant	786	X	No	3X	5X	X		
38-E	Mechanical/Electrical	650	X	No	3X	5X			X
50-G	Propellant Plant	3,138	X	Yes	3X	5X	X		
54-F	Propellant Plant	9,563	X	Yes	3X	**3X**	X		
54-F-1	Toilet	100	X	No	3X	**3X**	X		
53-D	Propellant Plant	0			3X			X	
54-G	Propellant Plant	10,247	X	Yes	3X	**3X**	X		
54-G-1	Toilet	100	X	No	3X	5X	X		
40-H	Power Shed	125	X	No	3X	5X	X		
31-G	Propellant Plant	5,234	X	Yes	3X	5X	X		
38-D	Walkway/ Garage	1,700	X	No	3X	5X	X		
37E	Toilet/Mech. Room	650	X	Yes	3X	5X	X		
29-D	Propellant Plant	7,397	X	Yes	3X	5X			X
29D-1	Toilet	255	X	No	3X	5X			X
25D-1	Toilet	255	X	No	3X	5X			X
42E	Propellant Plant	1,500	X	Yes	3X	5X	X		
40E	Electrical Storage	1,600	X	No	3X	5X	X		
39F	Garage	200	X	No	3X	5X	X		

Shaded Areas Denotes Additional Buildings

0006406

Attac[illegible]A
Long[illegible]P
Explosive Safety Survey
1/30/04 Update

Bldg. No.	Description	Square Footage	Surveyed	Fire Supression, Present	Previous UXO Rating	Current UXO Rating	Original Building, Present	Original Building, Not Present	Additional Building
	Plant 3								
37F	Walkway/Garage	1,700	X	No	3X	5X	X		
49B-1	Toilet	250	X	No	3X	5X			X
56B-1	Toilet	250	X	No	3X	5X			X
53B-1	Toilet	250	X	No	3X	5X			X
26B-1	Toilet	250	X	No	3X	5X			X
65D	Electrical Storage	64	X	No	3X	5X			X
90J	Guard House	120	X	No	3X	5X			X
90J-1	Toilet	64	X	No	3X	5X			X
75J	Storage	300	X	No	3X	5X			X
	400 Area								
402	Lunch & Break Room	882	X	No	3X	5X	X		
404	Toilet	250	X	No	3X	5X	X		
405	Toilet	250	X	No	3X	5X	X		
403	Pyro Production	2,600	X	Yes	3X	5X	X		
406	Pyro Production	1,193	X	Yes	3X	5X	X		
407	Pyro Production	464	X	No	3X	5X	X		
408	Pyro Production	2,847	X	Yes	3X	5X	X		
409	Pyro Production	2,605	X	Yes	3X	5X	X		
410	Pyro Production	373	X	No	3X	5X	X		
	Y Area								
3Y	Production	2,240	X	No	5X	5X	X		
4Y	Change House	2,016	X	No	5X	5X	X		
4-Y-2	Clock House	64	X	No	5X	5X	X		
16-Y-2	Lunch Room	480	X	No	5X	5X	X		
16-Y-1	Toilet	170	X	No	5X	5X	X		
18-Y-1	Toilet	160	X	No	5X	**3X**	X		
16Y	Production	5,138	X	Yes	3X	**3X**	X		
18Y	Production	4,240	X	Yes	3X	5X	X		
29Y	General Purpose Magazine	793	X	No	3X	**3X**	X		
32Y	General Purpose Magazine	793	X	No	3X	5X	X		
13Y	Production	793	X	Yes	3X	**3X**			X

Shaded Areas Denotes Additional Buildings

0006406?

Attac[illegible] A
Long[illegible]P
Explosive Safety Survey
1/30/04 Update

Bldg. No.	Description	Square Footage	Surveyed	Fire Supression, Present	Previous UXO Rating	Current UXO Rating	Original Building, Present	Original Building, Not Present	Additional Building
	Y Area								
13-Y-1	General Purpose Magazine	0			3X			X	
48Y	General Purpose Magazine	195	X	No	3X	5X	X		
34Y	Production	2,906	X	Yes	3X	**3X**	X		
38Y	Production	2,546	X	Yes	3X	**3X**	X		
40Y	Production	1,760	X	No	3X	**3X**	X		
45Y	Production	1,051	X	Yes	3X	**3X**	X		
	Sewage Treatment Plant								
18-G	Chlorination Bldg.	224	X	No	5X	5X	X		
15-G	Sewage Pump Station	196	X	No	5X	5X	X		
9-G	Rotating Biodegradation Unit	0			5X			X	
10-G	Rotating Biodegradation Unit	0			5X			X	
11-G	Rotating Biodegradation Unit	0			5X			X	
48G	Sewer Pumping Station	800	X	Yes	3X	5X			X
	Test Area								
8T	Change House	3,876	X	No	3X	5X	X		
8-T-2	Clock House		X	No	3X	5X	X		
16T	Ammo. Quality	3,871	X	Yes	3X	5X	X		
16T-1	Toilet	121	X	No	3X	**3X**	X		
18T	Flammable Material Storage	0	X		3X			X	
20T	Ammo. Quality	8,513	X	Yes	3X	**3X**	X		
20T-1	Toilet	83	X	No	3X	5X	X		
35T	Ammo. Quality	1,784	X	No	3X	5X	X		
61T	Ammo. Quality	1,333	X	No	3X	5X	X		
31T	Constant Temp. Control Bldg.	2,738	X	No	3X	5X			
34T	Ammo. Quality	160	X	No	3X	5X	X		
34T-1	Toilet	0			3X			X	
36T	Ammo. Quality	0			3X			X	
36T-1	Ammo. Quality	708	X	Yes	3X	5X	X		
36T-2	Ammo. Quality	708	X	Yes	3X	5X	X		
36T-3	Ammo. Quality	708	X	Yes	3X	5X	X		
36T-4	Ammo. Quality	0	X		3X			X	

Shaded Areas Denotes Additional Buildings

0006406B

Attachment A
Long[illegible]P
Explosive Safety Survey
1/30/04 Update

Bldg. No.	Description	Square Footage	Surveyed	Fire Supression, Present	Previous UXO Rating	Current UXO Rating	Original Building, Present	Original Building, Not Present	Additional Building
	Test Area								
39T	Test Preparation	3,324	X	Yes	3X	**3X**			X
39T-1	Toilet	250	X	No	3X	5X			X
40T	Shed	58	X	No	3X	5X	X		
13T	Admin. Bldg.	2,594	X	No	3X	5X	X		
21T	General Purpose Magazine	114	X	No	3X	5X	X		
31-M	Magazine Bldg.	11,440	X	No	5X	5X	X		
35-M	Magazine Bldg.	11,440	X	No	5X	5X	X		
39-M	Magazine Bldg.	11,440	X	No	5X	5X	X		
Unmarked	Bldg. S. of 40T	2,400	X	No	3X	5X			X
	Burning Ground								
20-X	Office	300	X	No	3X	5X	X		
21-X	General Purpose Magazine	400	X	No	3X	**3X**			X
22-X	General Purpose Magazine	80	X	No	3X	**3X**	X		
22-X-1	Toilet	40	X	No	5X	5X			X
24-X	General Purpose Magazine	250	X	No	3X	5X			X
27-X	General Purpose Magazine	50	X	No	3X	5X			X
29-X	General Purpose Magazine	0	X		3X			X	
37-X	Incinerator	800	X	No	3X	5X			X
43-X	General Purpose Magazine	100	X	No	3X	5X			X
	800 Area								
813	Warehouse, General Purpose	40,000	X	Yes	3X	5X	X		
814	Warehouse, General Purpose	8,000	X	Yes	3X	5X	X		
815	Warehouse, General Purpose	0		No	3X			X	
800 SHED	Shed	100	X	No	3X	5X			X
813-I	Mechanical Building	100	X	No	3X	5X			X
TS-10	Mechanical /Storage Building	300	X	No	3X	5X			X
	Grand Total - Square Footage	626,741							
	Additional Building Square Footage (Portion of Grand Total)	51,369							

Shaded Areas Denotes Additional Buildings

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APPENDIX E

ASBESTOS-CONTAINING MATERIALS

SCOPE OF WORK SUMMARY

TABLE 1
SCOPE OF WORK (SOW)
LONGHORN ARMY AMMUNITION PLANT

SECTIONS	LOCATION	DESCRIPTION	ASBESTOS-CONTAINING MATERIALS										
			Transite Siding/Roof/ Ceiling/Wall	Tar Shingle Roof	Boiler/Heater Vent Insulation	Floor Tile & Mastic	Linoleum	TSI - Steam	TSI - Domestic	PCB	Ceiling Tile	Spray-On Insulation
PLANT 2	TS-87	Portable Guard Shack	180 S.F +/-	*	*	*	*	*	*	*	*	*
PLANT 2	TS-45	Portable Guard Shack	*	*	*	*	*	*	*	*	*	*
PLANT 2	TS-69	Portable Guard Shack	*	*	*	*	*	*	*	*	*	*
PLANT 2	TS-74	Portable Guard Shack	*	*	*	50 S.f +/-	*	*	*	*	*	*
PLANT 2	TS Bldg. (TS-38)	Portable Guard Shacks	*	*	*		*	*	*	*	*	*
PLANT 2	T-1	Toilet	*	*	*	420 S.F +/-	*	*	*	*	*	*
PLANT 2	T-2	Toilet	450 S.F +/- (Corrugated Transite); 736 S.F +/- (Transite Wall Panel)	*	*	*	*	*	*	*	*	*
PLANT 2	T-3	Toilet		*	*	120 S.F +/-	*	30 L.F +/-	*	*	*	*
PLANT 2	101	Admin Bldg.	100 S.F +/-	*	*	*	*		*	*	*	*
PLANT 2	102	Change House		*	*	*	*	1,750 S.F +/-	*	*	*	*
PLANT 2	102-R	Walkway	5,400 S.F +/- (Corrugated Transite); 450 S.F +/- (Transite Wall)	*	*	*	*		*	*	*	*
PLANT 2	103	Change House		*	*	*	*	3,400 S.F +/-	*	*	*	*
PLANT 2	L-6	Transit Shed	500 S.F +/-	*	*	*	*	*	*	*	*	*
PLANT 2	207	Production	3,300 S.F +/- (Corrugated Transite); 360 S.F +/- (Transite Wall)	*	*	540 S.F +/-	*	*	*	*	*	*
PLANT 2	211-1	Lunch & Break Room	*	*	*	*	*	*	*	*	*	*
PLANT 2	211-2	Lunch & Break Room	*	*	*	*	*	*	*	*	*	*
PLANT 2	L-5	Transit Shed	1,800 S.F +/-	*	*	*	*	*	*	*	*	*

00064071

TABLE 1
SCOPE OF WORK (SOW)
LONGHORN ARMY AMMUNITION PLANT

SECTIONS	LOCATION	DESCRIPTION	ASBESTOS-CONTAINING MATERIALS									
			Transite Siding/Roof/ Ceiling/Wall	Tar Shingle Roof	Boiler/Heater Vent Insulation	Floor Tile & Mastic	Linoleum	TSI - Steam	TSI - Domestic	PCB	Ceiling Tile	Spray-On Insulation
PLANT 2	S-1	Warehouse, General Purpose	10,900 S.F +/- (Corrugated Transite Siding); 5,036 S.F +/- (Transite Wall Panel)	*	*	240 S.F +/-	*	235 L.F +/-	*	*	*	*
PLANT 2	S-2	Warehouse, General Purpose	11,378 S.F +/- (Corrugated Transite); 3,780 S.F +/- (Transite Wall Panel)	*	*	*	*	338 L.F +/-	*	*	*	*
PLANT 2	S-3	Warehouse, General Purpose	6,950 S.F +/- (Corrugated Transite)	*	*	*	*	130 L.F +/-	*	*	*	*
PLANT 2	S-4	Warehouse, General Purpose	6,220 S.F +/- (Corrugated Transite)	*	*	*	*	640 L.F +/-	*	*	*	*
PLANT 2	M-1	Admin., General Purpose	2,015 S.F +/- (Corrugated Transite); 335 S.F +/- (Transite Wall)	*	*	*	*	100 L.F +/-	*	*	*	*
PLANT 2	M-2	Admin., General Purpose	1,078 S.F +/- (Corrugated Transite); 448 S.F +/- (Transite Wall)	*	*	*	*	140 L.F +/-	*	*	*	*
PLANT 2	LR-1	Lunch Room	2,615 S.F +/- (Corrugated Transite); 32 S.F +/- (Transite Wall)	*	*	*	*	*	*	*	*	*
PLANT 2	Shed C	Pyro Production	1,900 S.F +/- (Corrugated Transite)	*	*	*	*	*	*	*	*	*

00064072

TABLE 1
SCOPE OF WORK (SOW)
LONGHORN ARMY AMMUNITION PLANT

SECTIONS	LOCATION	DESCRIPTION	ASBESTOS-CONTAINING MATERIALS									
			Transite Siding/Roof/ Ceiling/Wall	Tar Shingle Roof	Boiler/Heater Vent Insulation	Floor Tile & Mastic	Linoleum	TSI - Steam	TSI - Domestic	PCB	Ceiling Tile	Spray-On Insulation
PLANT 2	Shed D	Pyro Production	2,600 S.F +/- (Corrugated Transite)	-	-	-	-	98 L.F +/-	-	-	-	-
PLANT 2	Shed J	Pyro Production	2,690 S.F +/- (Corrugated Transite)	-	-	-	-	-	-	-	-	-
PLANT 2	Shed L	Walkway	2050 S.F +/- (Corrugated Transite)	-	-	-	-	-	-	-	-	-
PLANT 2	Shed B	Walkway	2,500 S.F +/- (Corrugated Transite)	-	-	-	-	15 L.F +/-	-	-	-	-
PLANT 2	Shed A	Walkway	200 S.F +/- (Corrugated Transite)	-	-	-	-	-	-	-	-	-
PLANT 2	Shed E	Walkway	1,400 S.F +/- (Corrugated Transite)	-	-	-	-	12 L.F +/-	-	-	-	-
PLANT 2	Shed F	Walkway	1,410 S.F +/- (Corrugated Transite)	-	-	-	-	20 L.F +/-	-	-	-	-
PLANT 2	Shed G	Walkway	2,200 S.F +/- (Corrugated Transite)	-	-	-	-	25 L.F +/-	-	-	-	-
PLANT 2	Shed H	Walkway	1,200 S.F +/- (Corrugated Transite)	-	-	-	-	15 L.F +/-	-	-	-	-
PLANT 2	Shed K	Walkway	1,100 S.F +/- (Corrugated Transite)	-	-	-	-	-	-	-	-	-
PLANT 2	727-R	Toilet	-	-	-	-	-	-	-	-	-	-
PLANT 2	212-1	Mill House	300 S.F +/- (Corrugated Transite)	-	-	-	-	-	-	-	-	-
PLANT 2	212-2	Mill House	301 S.F +/- (Corrugated Transite)	-	-	-	-	-	-	-	-	-
PLANT 2	212-3	Mill House	302 S.F +/- (Corrugated Transite)	-	-	-	-	-	-	-	-	-

00064073

TABLE 1
SCOPE OF WORK (SOW)
LONGHORN ARMY AMMUNITION PLANT

SECTIONS	LOCATION	DESCRIPTION	ASBESTOS-CONTAINING MATERIALS									
			Transite Siding/Roof/ Ceiling/Wall	Tar Shingle Roof	Boiler/Heater Vent Insulation	Floor Tile & Mastic	Linoleum	TSI - Steam	TSI - Domestic	PCB	Ceiling Tile	Spray-On Insulation
PLANT 2	212-4	Mill House	303 S.F +/- (Corrugated Transite)	*	*	*	*	*	*	*	*	*
PLANT 2	212-5	Mill House	304 S.F +/- (Corrugated Transite)	*	*	*	*	*	*	*	*	*
PLANT 2	212-6	Mill House	305 S.F +/- (Corrugated Transite)	*	*	*	*	*	*	*	*	*
PLANT 2	212-7	Mill House	306 S.F +/- (Corrugated Transite)	*	*	*	*	*	*	*	*	*
PLANT 2	212-8	Mill House	307 S.F +/- (Corrugated Transite)	*	*	*	*	*	*	*	*	*
PLANT 2	212-9	Mill House	308 S.F +/- (Corrugated Transite)	*	*	*	*	*	*	*	*	*
PLANT 2	212-10	Mill House	309 S.F +/- (Corrugated Transite)	*	*	*	*	*	*	*	*	*
PLANT 2	212-11	Mill House	*	*	*	*	*	*	*	*	*	*
PLANT 2	212-12	Mill House	800 S.F +/- (Corrugated Transite)	*	*	*	*	*	*	*	*	*
PLANT 2	212-13	Mill House	*	*	*	*	*	*	*	*	*	*
PLANT 2	212-14	Mill House	500 S.F +/- (Corrugated Transite); 1,100 S.F +/- (Transite Wall)	*	*	*	*	32 L.F +/-	*	*	*	*
PLANT 2	212-14-I	Mechanical/Electrical	*	*	*	*	*	*	*	*	*	*
PLANT 2	212-15	Mill House	*	*	*	*	*	*	*	*	*	*

00064074

TABLE 1
SCOPE OF WORK (SOW)
LONGHORN ARMY AMMUNITION PLANT

SECTIONS	LOCATION	DESCRIPTION	ASBESTOS-CONTAINING MATERIALS									
			Transite Siding/Roof/ Ceiling/Wall	*Tar Shingle Roof*	*Boiler/Heater Vent Insulation*	*Floor Tile & Mastic*	*Linoleum*	*TSI - Steam*	*TSI - Domestic*	*PCB*	*Ceiling Tile*	*Spray-On Insulation*
PLANT 2	212-16	Mill House	1,600 S.F +/- (Corrugated Transite); 1,700 S.F +/- (Transite Wall)	*	*	150 S.F+/-	*	30 L.F +/-	*	*	*	*
PLANT 2	212-17	Mill House	*	*	*	*	*	*	*	*	*	*
PLANT 2	212-18	Mill House	350 S.F +/- (Corrugated Transite); 200 S.F +/- (Transite Wall)	*	*	*	*	*	*	*	*	*
PLANT 2	212-19	Mill House	*	*	*	*	*	*	*	*	*	*
PLANT 2	212-20	Mill House	850 S.F +/- (Corrugated Transite); 1,600 S.F +/- (Transite Wall)	*	*	*	*	4 L.F +/-	*	*	*	*
PLANT 2	212-21	Mill House	*	*	*	*	*	*	*	*	*	*
PLANT 2	212-23	Mill House	*	*	*	*	*	*	*	*	*	*
PLANT 2	212-25	Mill House	300 S.F +/- (Corrugated Transite)	*	*	*	*	*	*	*	*	*
PLANT 2	212-27	Mill House	301 S.F +/- (Corrugated Transite)	*	*	*	*	*	*	*	*	*
PLANT 2	212-29	Mill House	302 S.F +/- (Corrugated Transite)	*	*	*	*	*	*	*	*	*
PLANT 2	212-31	Mill House	303 S.F +/- (Corrugated Transite)	*	*	*	*	*	*	*	*	*
PLANT 2	212-32	Mill House	304 S.F +/- (Corrugated Transite)	*	*	*	*	*	*	*	*	*

00064075

TABLE 1
SCOPE OF WORK (SOW)
LONGHORN ARMY AMMUNITION PLANT

SECTIONS	LOCATION	DESCRIPTION	ASBESTOS-CONTAINING MATERIALS									
			Transite Siding/Roof/ Ceiling/Wall	Tar Shingle Roof	Boiler/Heater Vent Insulation	Floor Tile & Mastic	Linoleum	TSI - Steam	TSI - Domestic	PCB	Ceiling Tile	Spray-On Insulation
PLANT 2	212-33	Mill House	305 S.F +/- (Corrugated Transite)	*	*	*	*	*	*	*	*	*
PLANT 2	212-34	Mill House	306 S.F +/- (Corrugated Transite)	*	*	*	*	*	*	*	*	*
PLANT 2	212-35	Mill House	307 S.F +/- (Corrugated Transite)	*	*	*	*	*	*	*	*	*
PLANT 2	212-35R	Walkway	1,200 S.F +/- (Corrugated Transite); 550 S.F +/- (Transite Wall)	*	*	*	*	10 L.F +/-	*	*	*	*
PLANT 2	212-36	Mill House	800 S.F +/- (Corrugated Transite)	*	*	*	*	22 L.F +/-	*	*	*	*
PLANT 2	212-37	Mill House	400 S.F +/- (Corrugated Transite)	*	*	*	*	*	*	*	*	*
PLANT 2	212-38	Mill House	360 S.F +/- (Corrugated Transite)	*	*	*	*	10 L.F +/-	*	*	*	*
PLANT 2	212-38R	Walkway	1,600 S.F +/- (Corrugated Transite); 1,100 S.F +/- (Transite Wall)	*	*	*	*	15 L.F +/-	*	*	*	*
PLANT 2	212-39	Mill House	300 S.F +/- (Corrugated Transite)	*	*	*	*	*	*	*	*	*
PLANT 2	212-40	Mill House	300 S.F +/- (Corrugated Transite)	*	*	*	*	*	*	*	*	*
PLANT 2	212-42	Mill House	300 S.F +/- (Corrugated Transite)	*	*	*	*	*	*	*	*	*

00064076

TABLE 1
SCOPE OF WORK (SOW)
LONGHORN ARMY AMMUNITION PLANT

SECTIONS	LOCATION	DESCRIPTION	ASBESTOS-CONTAINING MATERIALS									
			Transite Siding/Roof/ Ceiling/Wall	Tar Shingle Roof	Boiler/Heater Vent Insulation	Floor Tile & Mastic	Linoleum	TSI - Steam	TSI - Domestic	PCB	Ceiling Tile	Spray-On Insulation
PLANT 2	212-44	Mill House	300 S.F +/- (Corrugated Transite)	*	*	*	*	*	*	*	*	*
PLANT 2	212-46	Mill House	300 S.F +/- (Corrugated Transite)	*	*	*	*	*	*	*	*	*
PLANT 2	212-48	Mill House	300 S.F +/- (Corrugated Transite)	*	*	*	*	*	*	*	*	*
PLANT 2	212-50	Mill House	300 S.F +/- (Corrugated Transite)	*	*	*	*	*	*	*	*	*
PLANT 2	212-51	Mill House	300 S.F +/- (Corrugated Transite)	*	*	*	*	*	*	*	*	*
PLANT 2	212-52	Mill House	300 S.F +/- (Corrugated Transite)	*	*	*	*	*	*	*	*	*
PLANT 2	212-53	Mill House	300 S.F +/- (Corrugated Transite)	*	*	*	*	*	*	*	*	*
PLANT 2	212-54	Mill House	300 S.F +/- (Corrugated Transite)	*	*	*	*	*	*	*	*	*
PLANT 2	212-55	Mill House	300 S.F +/- (Corrugated Transite)	*	*	*	*	*	*	*	*	*
PLANT 2	212-56	Mill House	300 S.F +/- (Corrugated Transite)	*	*	*	*	*	*	*	*	*
PLANT 2	212-57	Mill House	300 S.F +/- (Corrugated Transite)	*	*	*	*	*	*	*	*	*
PLANT 2	212-59	Mill House	200 S.F +/- (Corrugated Transite)	*	*	*	*	*	*	*	*	*
PLANT 2	P-108	Pyro Production	*	*	*	*	*	*	*	*	*	*
PLANT 2	P-112	Pyro Production	*	*	*	*	*	12 L.F +/-	4 L.F +/-	*	*	*
PLANT 2	P-113	Pyro Production	*	*	*	*	*	10 L.F +/-	*	*	*	*

00064077

TABLE 1
SCOPE OF WORK (SOW)
LONGHORN ARMY AMMUNITION PLANT

SECTIONS	LOCATION	DESCRIPTION	ASBESTOS-CONTAINING MATERIALS									
			Transite Siding/Roof/ Ceiling/Wall	Tar Shingle Roof	Boiler/Heater Vent Insulation	Floor Tile & Mastic	Linoleum	TSI - Steam	TSI - Domestic	PCB	Ceiling Tile	Spray-On Insulation
PLANT 2	P-116	Pyro Production	*	*	*	*	*	*	*	*	*	*
PLANT 2	P-117	Pyro Production	*	*	*	*	*	*	*	*	*	*
PLANT 2	P-118	Pyro Production	*	*	*	*	*	*	*	*	*	*
PLANT 2	P-122	Pyro Production	*	*	*	*	*	*	*	*	*	*
PLANT 2	P-123	Pyro Production	*	*	*	*	*	*	*	*	*	*
PLANT 2	P-124	Tank Car Unloading	*	*	*	*	*	*	*	*	*	*
PLANT 2	S-5	Pyro Production	*	*	*	*	*	*	*	*	*	*
PLANT 2	S-7	Pyro Production	* 100 S.F +/- (Transite Wall)	*	*	*	*	*	*	*	*	*
PLANT 2	S-8	Pyro Production	*	*	*	*	*	*	*	*	*	*
PLANT 2	S-13	Pyro Production (Storage)	200 S.F +/-	*	*	*	*	*	*	*	*	*
PLANT 2	P-1	Pyro Production	790 S.F +/- (Corrugated Transite Siding)	*	150 S.F +/- (Duct Insulation)	*	*	340 L.F +/-	*	*	*	*
PLANT 2	P-1-R	Walkway	650 S.F +/- (Transite Ceiling & Wall Panel); 1,300 S.F +/- (Corrugated Transite Siding)	*	*	300 S.F +/- (9"x9")	*	60 L.F +/-	*	*	*	*
PLANT 2	P-3	Pyro Production	2,590 S.F +/- (Corrugated Transite) 6,170 S.F +/- (Transite Wall)	*	*	120 S.F +/- (12'x12")	*	400 L.F +/-	*	*	*	*
PLANT 2	P-9	Pyro Production	1,570 S.F +/- (Corrugated Transite) 2,410 S.F +/- (Transite Wall)	*	*	*	*	105 L.F +/-	*	*	*	*

00064078

TABLE 1
SCOPE OF WORK (SOW)
LONGHORN ARMY AMMUNITION PLANT

SECTIONS	LOCATION	DESCRIPTION	ASBESTOS-CONTAINING MATERIALS									
			Transite Siding/Roof/ Ceiling/Wall	Tar Shingle Roof	Boiler/Heater Vent Insulation	Floor Tile & Mastic	Linoleum	TSI - Steam	TSI - Domestic	PCB	Ceiling Tile	Spray-On Insulation
PLANT 2	P-10	Pyro Production	1,066 S.F +/- (Corrugated Transite) 420 S.F +/- (Transite Wall)	*	*	*	350 S.F +/-	125 L.F +/-	*	*	*	*
PLANT 2	P-11	Pyro Production	1,770 S.F +/- (Corrugated Transite) 400 S.F +/- (Transite Wall)	*	*	*	200 S.F +/-	125 L.F +/-; 30 L.F +/- (@ R.R)	*	*	*	*
PLANT 2	P-13	Pyro Production	2,925 S.F +/- (Corrugated Transite)	*	*	264 S.F +/-	*	65 L.F +/-	*	*	*	*
PLANT 2	P-14	Pyro Production	1,122 S.F +/- (Corrugated Transite) 1,992 S.F +/- (Transite Wall)	*	*	*	*	34 L.F +/-	*	*	*	*
PLANT 2	S3-R	Walkway	500 S.F +/- (Corrugated Transite)	*	*	*	*	*	*	*	*	*
PLANT 2	P14-R	Walkway	500 S.F +/- (Corrugated Transite)	*	*	*	*	6 L.F +/-	*	*	*	*
PLANT 2	B-10	Pyro Production	1,900 S.F +/- (Corrugated Transite); 1,000 S.F +/- (Transite Wall)	*	*	*	*	120 L.F +/-	*	*	*	*
PLANT 2	B-11	Pyro Production	1,744 S.F +/- (Corrugated Transite); 2,267 S.F +/- (Transite Wall)	*	*	*	*	36 L.F +/-	*	*	*	*

00064079

TABLE 1
SCOPE OF WORK (SOW)
LONGHORN ARMY AMMUNITION PLANT

SECTIONS	LOCATION	DESCRIPTION	ASBESTOS-CONTAINING MATERIALS									
			Transite Siding/Roof/ Ceiling/Wall	Tar Shingle Roof	Boiler/Heater Vent Insulation	Floor Tile & Mastic	Linoleum	TSI - Steam	TSI - Domestic	PCB	Ceiling Tile	Spray-On Insulation
PLANT 2	B-12	Pyro Production	2,220 S.F +/- (Corrugated Transite); 1,508 S.F +/- (Transite Wall)	*	*	*	*	4 L.F +/-	*	*	*	*
PLANT 2	B-13	Pyro Production	1,845 S.F +/- (Corrugated Transite); 112 S.F +/- (Transite Wall)	*	*	*	*	74 L.F +/-	*	*	*	*
PLANT 2	B-14	Pyro Production	1,570 S.F +/- (Corrugated Transite); 1,480 S.F +/- (Transite Wall)	*	*	*	*	25 L.F +/-	*	*	*	*
PLANT 2	B-15	Pyro Production	1,316 S.F +/- (Corrugated Transite); 2,540 S.F +/- (Transite Wall)	*	25 S.F +/-	*	*	60 L.F +/-	*	*	*	*
PLANT 2	B-16	Pyro Production	1,725 S.F +/- (Corrugated Transite); 2,180 S.F +/- (Transite Wall)	*	*	*	*	146 LF +/-	*	*	*	*
PLANT 2	B-8	Pyro Production	*	*	*	*	*	*	*	*	*	*
PLANT 2	B-7	Pyro Production	*	*	*	*	*	*	*	*	*	*
PLANT 2	B-9	Pyro Production	745 S.F +/- (Corrugated Transite); 906 S.F +/- (Transite Wall)	*	*	*	*	*	*	*	*	*

00064080

TABLE 1
SCOPE OF WORK (SOW)
LONGHORN ARMY AMMUNITION PLANT

SECTIONS	LOCATION	DESCRIPTION	ASBESTOS-CONTAINING MATERIALS									
			Transite Siding/Roof/ Ceiling/Wall	Tar Shingle Roof	Boiler/Heater Vent Insulation	Floor Tile & Mastic	Linoleum	TSI - Steam	TSI - Domestic	PCB	Ceiling Tile	Spray-On Insulation
PLANT 3	26-G	Change House	2,400 S.F +/- (Corrugated)	*	*	1,200 S.F +/- (9"x9")	*	*	*	*	*	*
PLANT 3	25-G2	Clock House	320 S.F +/- (Corrugated Transite)	*	*	*	*	*	*	*	*	*
PLANT 3	61-I	Compressor Bldg.	1,496 S.F +/- (Corrugated Transite)	*	*	*	*	*	*	*	*	*
PLANT 3	60-I	Storage	*	*	*	*	*	*	*	*	*	*
PLANT 3	62-I	Inert Storage	1,800 S.F +/- (Corugated Transite); 314 S.F +/- (Transite Panel Ceiling & Wall)	*	*	470 S.F +/- (12"x12")	*	*	*	*	*	*
PLANT 3	61-J	Change House	2,296 S.F +/- (Corrugated Transite)	*	*	*	*	*	*	*	*	*
PLANT 3	61-J2	Clock House	400 S.F +/- (Corrugated Transite)	*	*	*	*	*	*	*	*	*
PLANT 3	22-B	Inert Storage	6,800 S.F +/- (Corrugated Transite)	*	*	*	*	*	*	*	*	*
PLANT 3	32-B	General Storage	4,610 S.F +/- (Corrugated Transite)	*	*	*	*	*	*	*	*	*
PLANT 3	29-A	Plant Laboratory	3,960 S.F +/- (Transite Ceiling)	*	*	3,375S.F +/- (9"x9")	1,100 S.F +/-	770 L.F. +/-	*	*	*	*
PLANT 3	31-A	Lab Storage Bldg.	400 S.F +/- (Roof/Eaves); 130 S.F +/- (Transite Panel Room Divider)	*	*	*	*	6 L.F +/- (Black Tar Wrap); 8 L.F +/-	*	*	*	*
PLANT 3	27-A	Admin. Bldg.	200 S. F +/- (Transite Wall Panel)	*	*	2,418 S.F +/- (9"x9")	*	*	*	*	*	*

00064081

TABLE 1
SCOPE OF WORK (SOW)
LONGHORN ARMY AMMUNITION PLANT

SECTIONS	LOCATION	DESCRIPTION	ASBESTOS-CONTAINING MATERIALS									
			Transite Siding/Roof/ Ceiling/Wall	Tar Shingle Roof	Boiler/Heater Vent Insulation	Floor Tile & Mastic	Linoleum	TSI - Steam	TSI - Domestic	PCB	Ceiling Tile	Spray-On Insulation
PLANT 3	21-A	Admin. Bldg.	362 S.F +/- (Transite Panel Wall)	*	*	1,922 S.F +/- (12"x12")	*	175 L.F +/-	*	*	*	*
PLANT 3	46-A	Propellant Plant	9,146 S.F +/- (Corrugated Transite); 2,240 S.F +/- (Transite Wall Panel)	*	*	*	*	240 L.F +/-	*	*	*	*
PLANT 3	49-B	Propellant Plant	1,700 S.F +/- (Corrugated Transite)	*	*	*	*	250 L.F +/-	*	*	*	*
PLANT 3	47-B	Propellant Plant	*	*	*	*	*	*	*	*	*	*
PLANT 3	46-B	Propellant Plant	2,100 S.F +/- (Corrugated Transite)	*	*	*	*	20 L.F +/-	*	*	*	*
PLANT 3	53-B	X-Ray Complex	252 S.F +/- (Corrugated Transite)	*	*	*	*	4 L.F +/-	*	*	*	*
PLANT 3	54-B	X-Ray Complex	600 S.F +/- (Corrugated Transite); 716 S.F +/- (Transite Wall)	*	*	*	*	5 L.F +/-	*	*	*	*
PLANT 3	55-B	X-Ray Complex	800 S.F +/- (Corrugated Transite); 736 S.F +/- (Transite Wall)	*	*	*	*	*	*	*	*	*
PLANT 3	56-B	X-Ray Complex	480 S.F +/- (Corrugated Transite); 1,200 S.F +/- (Transite Panel Ceiling & Walls)	*	*	*	*	*	*	*	*	*

00064082

TABLE 1
SCOPE OF WORK (SOW)
LONGHORN ARMY AMMUNITION PLANT

SECTIONS	LOCATION	DESCRIPTION	ASBESTOS-CONTAINING MATERIALS									
			Transite Siding/Roof/ Ceiling/Wall	Tar Shingle Roof	Boiler/Heater Vent Insulation	Floor Tile & Mastic	Linoleum	TSI - Steam	TSI - Domestic	PCB	Ceiling Tile	Spray-On Insulation
PLANT 3	59-B	X-Ray Complex	1120 S.F +/- (Corrugated Transite)	*	*	*	*	*	*	*	*	*
PLANT 3	60-B	X-Ray Complex	432 S.F +/- (Corrugated Transite)	*	*	*	*	102 L.F +/-	*	*	*	*
PLANT 3	68-C	Propellant Plant	*	*	*	*	*	30 L.F +/-	*	*	*	*
PLANT 3	69-C	Break Area	*	*	*	*	*	*	*	*	*	*
PLANT 3	68-G-1	Rest Rooms	*	*	*	*	*	*	*	*	*	*
PLANT 3	68-F	Production	6,455 S.F +/- (Corrugated Transite); 14,582 S.F +/- (Traniste Panel Ceiling & Walls)	*	*	*	*	120 L.F +/-	*	*	*	*
PLANT 3	68-F-1	Toilet	480 S.F +/- (Corrugated Transite)					40 L.F +/-				*
PLANT 3	26-E	Propellant Plant	14,000 S.F +/- (Corrugated Transite); 15,600 S.F +/- (Traniste Panel Ceiling & Walls)	*	*	*	*	740 L.F +/-	*	*	*	*
PLANT 3	26-E-1	Toilet	400 S.F +/- (corrugated Transite)	*	*	*	*	*	*	*	*	*
PLANT 3	32-E	Propellant Plant	840 S.F +/- (Corrugated Transite); 2,048 S.F +/- (Traniste Panel Ceiling & Walls)	*	*	*	*	*	*	*	*	*

00064083

TABLE 1
SCOPE OF WORK (SOW)
LONGHORN ARMY AMMUNITION PLANT

SECTIONS	LOCATION	DESCRIPTION	ASBESTOS-CONTAINING MATERIALS									
			Transite Siding/Roof/ Ceiling/Wall	*Tar Shingle Roof*	*Boiler/Heater Vent Insulation*	*Floor Tile & Mastic*	*Linoleum*	*TSI - Steam*	*TSI - Domestic*	*PCB*	*Ceiling Tile*	*Spray-On Insulation*
PLANT 3	25-D	Propellant Plant	9,748 S.F +/- (Corrugated Transite); 20,400 S.F +/- (Traniste Panel Ceiling & Walls)	*	*	*	*	160 L.F +/-	*	*	*	*
PLANT 3	27-F	Pyro Production	*	*	*	*	*	*	*	*	*	*
PLANT 3	35-B	Pyro Production	920 S.F +/- (Corrugated Roof)	*	*	*	*	*	*	*	*	*
PLANT 3	39-E	Covered Walkway	*	*	*	*	*	*	*	*	*	*
PLANT 3	40-D	Propellant Plant	*	*	*	*	*	*	*	*	*	*
PLANT 3	41-E	Propellant Plant	*	*	*	*	*	60 L.F +/-	*	*	*	*
PLANT 3	36-B	Propellant Plant	1,000 S.F +/- (Corrugated Transite); 240 S.F +/- (Transite Wall)	*	*	*	*	*	*	*	*	*
PLANT 3	38-B	Propellant Plant	680 S.F +/- (corrugated Transite); 2,440 S.F +/- (Transite Wall)	*	*	*	*	20 L.F +/-	*	*	*	*
PLANT 3	38-E	Mechanical/Electrical	112 S.F +/- (Transite Panel)	*	*	*	*	14 L.F +/-	*	*	*	*
PLANT 3	50-G	Propellant Plant	3,360 S.F +/- (Corrugated Transite); 1,896 S.F +/- (Transite Panel)	*	*	*	*	30 L.F +/-	*	*	*	*

00064084

TABLE 1
SCOPE OF WORK (SOW)
LONGHORN ARMY AMMUNITION PLANT

SECTIONS	LOCATION	DESCRIPTION	ASBESTOS-CONTAINING MATERIALS									
			Transite Siding/Roof/ Ceiling/Wall	Tar Shingle Roof	Boiler/Heater Vent Insulation	Floor Tile & Mastic	Linoleum	TSI - Steam	TSI - Domestic	PCB	Ceiling Tile	Spray-On Insulation
PLANT 3	54-F	Propellant Plant	1,780 S.F +/- (Corrugated Transite); 1,360 S.F +/- (Transite Panel)	*	*	*	*	200 L.F +/-	*	*	*	*
PLANT 3	54-F-1	Toilet	360 S.F +/- (Corrugated Transite)	*	*	*	*	20 L.F +/-	*	*	*	*
PLANT 3	54-G	Propellant Plant	4,066 S.F +/- (Corrugated Transite); 260 S.F +/- (Transite Wall Panel)	*	*	*	*	5 L.F +/-	*	*	*	*
PLANT 3	54-G-1	Toilet	320 S.F +/- (Corrugated Transite)	*	*	*	*	*	*	*	*	*
PLANT 3	40-H	Power Shed	*	*	*	*	*	*	*	*	*	*
PLANT 3	31-G	Propellant Plant	5,435 S.F +/- (Corrugated Transite); 13,850 S.F +/- (Transite Panel)	*	*	*	*	270 L.F +/-	*	*	*	*
PLANT 3	38-D	Walkway/ Garage	*	*	*	*	*	*	*	*	*	*
PLANT 3	37E	Toilet/Mech. Room	*	*	*	*	*	*	*	*	*	*
PLANT 3	29-D	Propellant Plant	5,564 S.F +/- (Corrugated Transite); 8,082 S.F +/- (Transite Panel)	*	*	*	*	34 L.F +/-	*	*	*	*
PLANT 3	29D-1	Toilet	320 S.F +/- (Corrugated Transite)	*	*	*	*	10 L.F +/-	*	*	*	*
PLANT 3	25D-1	Toilet	300 S.F +/- (Corrugated Transite)	*	*	*	*	*	*	*	*	*

00064085

TABLE 1
SCOPE OF WORK (SOW)
LONGHORN ARMY AMMUNITION PLANT

SECTIONS	LOCATION	DESCRIPTION	ASBESTOS-CONTAINING MATERIALS									
			Transite Siding/Roof/ Ceiling/Wall	*Tar Shingle Roof*	*Boiler/Heater Vent Insulation*	*Floor Tile & Mastic*	*Linoleum*	*TSI - Steam*	*TSI - Domestic*	*PCB*	*Ceiling Tile*	*Spray-On Insulation*
PLANT 3	42E	Propellant Plant	*	*	*	*	*	30 L.F +/-	*	*	*	*
PLANT 3	40E	Electrical Storage	*	*	*	*	*	*	*	*	*	*
PLANT 3	39F	Garage	*	*	*	*	*	*	*	*	*	*
PLANT 3	37F	Walkway/Garage	*	*	*	*	*	*	*	*	*	*
PLANT 3	49B-1	Toilet	*	*	*	*	*	*	*	*	*	*
PLANT 3	56B-1	Toilet	416 S.F +/- (Corrugated Transite); 248 S.F +/- (Transite Panel)	*	*	*	*	20 L.F +/-	*	*	*	*
PLANT 3	53B-1	Toilet	*	*	*	*	*	*	*	*	*	*
PLANT 3	26B-1	Toilet	*	*	*	*	*	*	*	*	*	*
PLANT 3	65D	Electrical Storage	*	*	*	*	*	*	*	*	*	*
PLANT 3	90J	Guard House	360 S.F +/- (Transite Shingle Siding)	*	*	*	*	*	*	*	*	*
PLANT 3	90J-1	Toilet	176 S.F +/- (Transite Shingle Siding)	*	*	*	*	*	*	*	*	*
PLANT 3	75J	Storage	100 S.F +/- (Corrugated Roof)	*	*	*	*	*	*	*	*	*

00064086

TABLE 1
SCOPE OF WORK (SOW)
LONGHORN ARMY AMMUNITION PLANT

SECTIONS	LOCATION	DESCRIPTION	ASBESTOS-CONTAINING MATERIALS									
			Transite Siding/Roof/ Ceiling/Wall	Tar Shingle Roof	Boiler/Heater Vent Insulation	Floor Tile & Mastic	Linoleum	TSI - Steam	TSI - Domestic	PCB	Ceiling Tile	Spray-On Insulation
400 AREA	402	Lunch & Break Room	2,372 S.F +/- (Corrugated Transite)	*	*	*	*	70 L.F +/-	*	*	*	*
400 AREA	404	Toilet	*	*	*	*	*	*	*	*	*	*
400 AREA	405	Toilet	150 S.F +/- (Transite Panel)	*	*	*	*	25 L.F +/-	*	*	*	*
400 AREA	403	Pyro Production	210 S.F +/- (Corrugated Transite)	*	*	*	*	150 L.F +/-	*	*	*	*
400 AREA	406	Pyro Production	790 S.F +/- (Corrugated Transite); 1,945 S.F +/- (Transite Panel)	*	*	*	*	75 L.F +/-	*	*	*	*
400 AREA	407	Pyro Production	880 S.F +/- (Corrugated Transite); 910 S.F +/- (Transite Panel)	*	*	*	*	*	*	*	*	*
400 AREA	408	Pyro Production	2,634 S.F +/- (Corrugated Transite); 1,860 S.F +/- (Transite Panel)	*	*	*	*	40 L.F +/-	*	*	*	*
400 AREA	409	Pyro Production	2,330 S.F +/- (Corrugated Transite)	*	*	*	*	*	*	*	*	*
400 AREA	410	Pyro Production	*	*	*	*	*	*	*	*	*	*

00064087

TABLE 1
SCOPE OF WORK (SOW)
LONGHORN ARMY AMMUNITION PLANT

SECTIONS	LOCATION	DESCRIPTION	ASBESTOS-CONTAINING MATERIALS									
			Transite Siding/Roof/ Ceiling/Wall	*Tar Shingle Roof*	*Boiler/Heater Vent Insulation*	*Floor Tile & Mastic*	*Linoleum*	*TSI - Steam*	*TSI - Domestic*	*PCB*	*Ceiling Tile*	*Spray-On Insulation*
SEWAGE TREATMENT PLANT	18-G	Chlorination Bldg.	848 S.F +/- (Corrugated Transite)	-	-	-	-	-	-	-	-	-
SEWAGE TREATMENT PLANT	15-G	Sewage Pump Station	760 S.F +/- (Corrugated Transite)	-	-	-	-	-	-	-	-	-
SEWAGE TREATMENT PLANT	48G	Sewer Pumping Station	96 S.F +/- (Corrugated Transite)	-	-	-	-	-	-	-	-	-
SEWAGE TREATMENT PLANT	39-M	Magazine Bldg.	20,560 S.F +/- (Corrugated Transite)	-	-	-	-	-	-	-	-	-
SEWAGE TREATMENT PLANT	Unmarked	Bldg. S. of 40T	-	-	-	-	-	-	-	-	-	-

00064088

TABLE 1
SCOPE OF WORK (SOW)
LONGHORN ARMY AMMUNITION PLANT

SECTIONS	LOCATION	DESCRIPTION	ASBESTOS-CONTAINING MATERIALS									
			Transite Siding/Roof/ Ceiling/Wall	*Tar Shingle Roof*	*Boiler/Heater Vent Insulation*	*Floor Tile & Mastic*	*Linoleum*	*TSI - Steam*	*TSI - Domestic*	*PCB*	*Ceiling Tile*	*Spray-On Insulation*
BURNING GROUND	20-X	Office	916 S.F +/- (Corrugated Transite)	*	*	*	*	*	*	*	*	*
BURNING GROUND	21-X	General Purpose Magazine	*	*	*	*	*	*	*	*	*	*
BURNING GROUND	22-X	General Purpose Magazine	*	*	*	*	*	*	*	*	*	*
BURNING GROUND	22-X-1	Toilet	240 S.F +/- (Corrugated Transite)	*	*	*	*	*	*	*	*	*
BURNING GROUND	24-X	General Purpose Magazine	120 S.F +/- (Corrugated Transite)	*	*	*	*	*	*	*	*	*
BURNING GROUND	27-X	General Purpose Magazine	*	*	*	*	*	*	*	*	*	*
BURNING GROUND	37-X	Incinerator	*	*	*	*	*	*	*	*	*	*
BURNING GROUND	43-X	General Purpose Magazine	*	*	*	*	*	*	*	*	*	*

00064089

APPENDIX F

FIELD REPORT

EFI®
Engineering and Fire Investigations

00064091

Field Report

DATE: / / 2004

Project Number: 98410-13709

Project Name: LONGHORN ARMY AMMUNITION PLANT

Contractor: ARC

Description

Site Representative (Print Name)

Signature/Date

APPENDIX G

AIR SAMPLE DOCUMENTATION

EFI
Engineering and Fire Investigations

AIR SAMPLE DOCUMENTATION

JOB NUMBER 98410-13709 PROJECT NAME: Longhorn Army Ammunition Plant CLIENT: US Gov. – Dept. of the Army

CONTRACTOR: ARC PROJECT MANAGER: CN TECHNICIAN:

SAMPLE NO.	DATE	PUMP# / CAL.	TIME ON TIME OFF	DURATION	VOLUME	LOCATION /	OPERATION	AFC - READER	QA/QC - READER

APPENDIX H

AIR SAMPLE ANALYSIS SHEETS

EFI®
Engineering and Fire Investigations

00064095

AIR SAMPLE ANALYSIS SHEET

PROJECT NO: 98410-13709	SAMPLE NO. A -	PROJECT NAME: LONGHORN ARMY AMMUNITION PLANT
DATE: , 2004	PUMP NO.	LOCATION / OPERATION:
CONTRACTOR: ARC		ANALYST NAME

					5
					10
					15
					20
					25
					30
					35
					40
					45
					50
					55
					60
					65
					70
					75
					80
					85
					90
					95
					100

Blank: _____ f/cc

Pump Calibration: _____ Lpm

Time On: _____

Time Off: _____

Duration: _____ minutes

Volume Collected: _____ liters

No. of Fibers: _____ fibers

No. of Fields: _____ fields

Fibers / Field: _____

ECA: 385 mm^2

Reticle Area: .00785 mm^2

Result: _____ fibers / cc

Detection Limit: _____ fibers / cc

Reported Value: _____ fibers / cc

$$\text{fibers / cc} = \frac{(\text{fibers} - \text{blank}) / 100 * \text{ECA}}{\text{Volume} * \text{Reticle Area} * 1000}$$

00064096

EFI®
Engineering and Fire Investigations

9700 Richmond, Suite 201
Houston, Texas 77046

Contractor Personnel Submittal Status

Date: | **Project No. 98410-13709**

Project Name: Longhorn Army Ammunition Plant -

Contractor: ARC

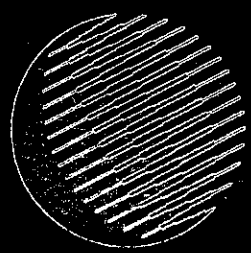
NAME	Social Security No.	Date Last Physical	W	T	F	S	C

LEGEND
W = Worker Release
T = Training
F.= Fit Test
S = Safety Instruction
C = State Certification/Registration

Notes:
1. "X" indicates compliance.
2. Blanks indicate insufficient, incomplete, or missing information.
3. Physicals are good for one year from the date issued, except as noted.
4. Fit tests are good for six months.

00064097

ABATEMENT OBSERVATIONS & AIR MONITORING REPORT LONGHORN ARMY AMMUNITION PLANT KARNACK, TEXAS



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ABATEMENT OBSERVATIONS & AIR MONITORING REPORT
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

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ABATEMENT OBSERVATIONS & AIR MONITORING REPORT LONGHORN ARMY AMMUNITION PLANT KARNACK, TEXAS

EFI Project No. 98410-13709

Prepared For:

ARC Abatement, Inc.
6630 Roxburgh Drive, Suite 130
Houston, Texas 77041

Prepared By:

Engineering and Fire Investigations (EFI)
9700 Richmond, Suite 201
Houston, Texas 77042

May 24, 2004

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Engineering and Fire
Investigations

00064100

9700 Richmond
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Houston, TX 77042
Tel: 866-464-2127
Fax: 713-975-7336
www.efiglobal.com

May 24, 2004

Mr. Michael Luczak
ARC Abatement, Inc.
6630 Roxburgh Drive, Suite 130
Houston, Texas 77041

Subject: **REPORT OF ABATEMENT OBSERVATIONS AND AIR MONITORING**
Longhorn Army Ammunition Plant
Hazardous Materials Removal Project
Houston, Texas
EFI PROJECT NO. 98410-13709

Dear Mr. Luczak:

Engineering and Fire Investigations (EFI) performed work at the Longhorn Army Ammunition Plant in general accordance with the "Proposal for Consulting Services Longhorn Army Ammunition Plant", dated February 27, 2003.

ARC Abatement, Inc. (ARC) was selected as the Asbestos/Demolition abatement contractor. ARC mobilized on site on March 17, 2003 and began setting up construction office. ARC performed asbestos and hazardous materials removal activities at various locations within the Longhorn Army Ammunition Plant.

This Asbestos Abatement Project Report includes, summary of completed work, and air sampling records. Thank you for allowing us to participate in this project. If you have any questions about this report or if we can assist you on any other matter please contact us at (713) 975-7031.

Sincerely,

Engineering and Fire Investigations

Cuong Nguyen
Project Manager

Lee A. Burckle, P.E.
Branch Manager

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2.0 BACKGROUND INFORMATION....2

3.0 ACM MONITORING ACTIVITIES....2

4.0 AIR SAMPLING AND ANALYSIS....5

5.0 CONCLUSION....6

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Appendix B - Asbestos Summary of Air Monitoring Results
Appendix C - Daily Field Notes
Appendix D - Texas Department of Health Notifications/Related Documents
Appendix E - Air Monitoring Certifications and Licenses & Work Procedures
Appendix F - Lead – Transmittal of Analytical Results
Appendix G - Building 451,TNT Production Area, PCB's – Transmittal of Analytical Results

1.0 EXECUTIVE SUMMARY

The ARMY contracted ARC as the abatement/demolition contractor to remove hazardous materials prior to demolishing structurally unsafe structures down to the concrete foundation. ARC retained Engineering and Fire Investigations (EFI) to provide hazardous materials consulting services including, but not limited to: on-site project monitoring, clearance activities, reporting requirements and final reporting.

As part of the proposed demolition, a scope of work summary (see Appendix A) listing the buildings and materials identified as Asbestos-Containing was issued in March 2003. In conjunction with the Work Procedures developed by EFI for removal and disposal and specified as hazardous materials, ARC addressed only those building components containing hazardous materials (ACM, lead & PCB) in the Scope of Work (SOW) which included the Administration Area, Magazine Area, Warehouse Area, Battery Shop Area, Scrap Yard, South Test Area, Signal Area, TNT Production Area, T Area and Y Area, or as required by change orders.

Generally, the asbestos-containing materials abated under the scope of work for this project included: transite siding and roofing (interior & exterior) panels, ceiling tile, vinyl sheet flooring, floor tile/mastic, thermal system insulation (piping & equipment), and roofing components.

ARC mobilized on site on March 17, 2003 to begin work area preparations. Asbestos removal activities concluded on April 15, 2004.

The activities monitored included area preparation, the abatement work, post removal visual survey, and clearance air sampling and analysis. Abatement of the asbestos -containing materials was completed in each of the work areas. Friable Asbestos-Containing Materials collected during the project were properly disposed in the BFI, McCarty Road landfill located at 11013 Old Beaumont Highway in Houston, Texas. ARC disposed of the Non-Friable Asbestos-Containing Materials in designated, on-site landfill at the Longhorn Army Ammunition Plant.

Our observations and air sampling collected and analyzed before, during, and after asbestos removal activities of each area indicates this project was accomplished in general accordance with the EFI's Work Procedures. Phased Contrast Microscopy (PCM) sampling was utilized to determine final clearance. PCM clearance was set at 0.01 fibers per cubic centimeter (f/cc) per sample for containment enclosure settings. For outdoors (open - air) settings down wind and upwind samples were evaluated utilizing Occupational Safety and Health Administration (OSHA) Permissible Exposure Limits (PEL) and surrounding ambient. ARC achieved air clearance levels in all work areas prior to the demolition of the buildings.

2.0 BACKGROUND INFORMATION

124 structures subjected to abatement and demolition are located within the Administration Area, Magazine Area, Warehouse Area, Battery Shop Area, Scrap Yard, South Test Area, Signal Area, TNT Production Area, T Area and Y Area of the Longhorn Army Ammunition Plant. Building materials that were found to contain asbestos content included, but, were not limited to: transite siding and roofing (interior & exterior) panels, ceiling tile, vinyl sheet flooring, floor tile/mastic, thermal system insulation (piping & equipment), and roofing components. Materials identified as asbestos, which impacted the demolition process, were scheduled for abatement.

Mr. Lee A. Burckle, PE of EFI served as the hazardous material consultant for this project. EFI's project manager overseeing the on-site operations for this abatement project was Mr. Cuong Nguyen. All personnel who monitored asbestos-related activities for EFI during this project are licensed by the Texas Department of Health and certifications including licenses are included in Appendices.

3.0 ACM MONITORING ACTIVITIES

Monitoring activities consisted of observations of the abatement contractor's work practices, containment barriers, and differential air pressure system operations. EFI also performed the following services during the course of the project:

- Asbestos Abatement Project Management,
- Pre-removal survey of environmental controls,
- Ambient air sampling and analyses,
- Post-removal visual clearance, and
- Final clearance air sampling.

Two phases of abatement activities essential for a successful asbestos abatement project are proper work area preparation and proper removal of asbestos-containing/contaminated materials. The following paragraphs describe the general preparation and removal activities accomplished by ARC. EFI's field technician(s) documented daily activities. A copy of the field reports are included in the appendices.

MUNITIONS RESIDUE DECONTAMINATION PROCESS

Work areas contaminated with explosive residues were decontaminated by use of pressure wash or steam cleaning. Environmental controls consisted of containment enclosure, decontamination facilities, differential air pressure, wet removal, and other controls described in the "Work Procedures". The controls were established to reduce the likelihood of explosives contaminants migrating outside the work area during the decontamination operations. This process was implemented for buildings contaminated with explosives prior to abatement of the asbestos-containing materials and subsequent demolition.

ASBESTOS WORK AREA PREPARATION

Preparation of the asbestos work areas included establishing proper environmental controls for the various materials scheduled for abatement. Depending upon the materials to be removed, controls may have consisted of containment enclosure, decontamination facilities, differential air pressure, wet removal, and other controls described in the "Work Procedures". The controls were established to reduce the likelihood of releasing asbestos fibers outside the work area during the abatement operations and to protect against unauthorized or accidental entry into the work area.

Containment Enclosures. In most cases, the enclosure(s) consisted of one layer of 6 mil thick plastic sheeting taped over critical barriers and one layer of 4-mil thick plastic sheeting taped and sealed to each of the walls and floor. More stringent requirements, as per TDH Texas Asbestos Health Protection Rules (TAHPR) and project specifications were met when required.

Decontamination Units. A decontamination unit for personnel and equipment was constructed adjacent to each containment as required. The decontamination unit consisted of a clean room, a shower room, and a dirty room, all separated by triple-flap airlocks. Shower wastewater was collected and filtered through a 5.0 micron filter prior to discharge into the sanitary sewer system.

Differential Air Pressure. The Work Procedures specified that the contractor maintain a reduced air pressure within the work areas of at least 0.02 inches of water. Differential air pressure within each of the work areas was achieved by setting up air machines equipped with High Efficiency Particulate Air (HEPA) filters. These specially manufactured filters are capable of collecting asbestos fibers that may become airborne during abatement activities. The filtered exhaust from the air machines was directed outside the building. The differential air pressure was maintained constantly until each containment achieved final air clearance.

ASBESTOS REMOVAL ACTIVITIES

ARC prepared each work area in accordance with applicable regulations and the procedures as described in the Work Procedures. This included, but was not limited to: decontamination units, appropriate signage, construction barriers, fire extinguishers, appropriate documentation available (on-site), etc. The work area was visually observed by an EFI representative to verify that preparatory procedures were adequate prior to removal activities.

The contractor's workers wore appropriate respiratory protection for the removal activity planned. The respiratory protection may have included either Powered Air-Purifying Respirators (PAPR) or half-face respirators. Appropriate body coverings including hooded suits, gloves, boots, etc. were also utilized for Personal Protective Equipment (PPE). The asbestos substrate was wetted prior to disturbance and kept wet during the removal process. The abatement process included gross removal, fine cleaning, and clearance activities, as detailed below.

Gross Removal. "Wet" techniques were employed during gross removal of asbestos-containing material in all containment(s) to reduce airborne fiber concentrations generated during the removal process in all areas. All asbestos-containing materials in each work area were thoroughly wetted, removed, and then double-bagged in asbestos disposal bags. The bags of regulated ACM were sealed, wet-wiped, and placed in plastic drums for transportation to an enclosed roll off dumpster located on site.

Fine Cleaning. After completing gross removal in a containment, the contractor brushed and wet-wiped surfaces from which the asbestos materials were removed. Where applicable, one layer of poly sheeting was removed, including the drop cloth layer on the floor. Waste bags and unnecessary equipment / supplies were wet-wiped and removed from the work area.

Clearance Activities. After completing the fine cleaning of the containment area(s), the contractor prepared the work area(s) for a visual observation by an EFI representative. The post-removal visual clearance of the work area was then performed. When no visual accumulations of debris were observed and all surfaces were observed to be clean, one coat of encapsulant was applied to lock down residual fibers. Clearance activities/protocols, as described in the Asbestos Abatement Package, were followed for each containment. Generally, following visual approval and after the encapsulant had dried, final air clearance samples were collected using aggressive air disturbance methods. The specified level for final air clearance samples is detailed as less than .01 Fibers /cc as analyzed by Phase Contrast Microscopy (PCM). A minimum of three samples was collected and each sample had to pass the clearance level before "clean air" for the work area is established. After clearance levels were met for each regulated area, all remaining plastic sheeting was then removed and disposed of as asbestos-contaminated waste.

DISPOSAL

Non-friable asbestos-containing and/or asbestos-contaminated waste was double-bagged, removed from the work area and transported and buried in a landfill located on-site at the Longhorn Army Ammunition Plant. Friable asbestos-containing waste was double-bagged, removed from the work area and transported to a dumpster lined with plastic sheeting. The dumpster and was kept locked to prohibit unauthorized access. Each dumpster was taken by Bayou City Waste, a Texas licensed Asbestos Transporter, to the BFI, McCarty Road Landfill in Houston, Texas.

WORK DEFICIENCIES

Because of the complex nature of an asbestos abatement project, various work area problems or deficiencies in work practices can occur. Most deficiencies were minor in nature and include negative pressure dropping below a specified limit, critical barriers coming loose due to heat-loss adhesion, keeping material wet enough, placing proper generator labels on asbestos waste, keeping waste dumpster locked, etc. There were no major deficiencies noted for this asbestos abatement project based upon visual observations gathered by EFI representative(s). Deficiencies noted during the course of work were brought to the contractor's attention and were corrected immediately.

4.0 AIR SAMPLING AND ANALYSIS

Air samples were collected to quantify airborne fiber concentrations before, during and after the abatement activities. Ambient air samples were taken for background concentrations, for verification of containment effectiveness, as a check on contractor work practices and for final air clearances. OSHA personal compliance sampling requirements are included as part of the Air Summary Data Table (See Appendix B).

PROCEDURES FOR COLLECTION AND ANALYSIS

ASBESTOS

Ambient, personnel samples and clearance samples were collected on 25-mm diameter, 0.8 micron mixed cellulose ester filters. Ambient and clearance samples were collected using high volume sampling pumps calibrated at about 10 liters per minute. Air sampling protocols utilizing Texas Department of Health Asbestos Health Protection Rules were followed. Air sample analyses are reported in Table 1 – Air Sample Summary.

Ambient air samples were analyzed by EFI personnel using Phase Contrast Microscopy (PCM) as described by the National Institute of Occupational Safety and Health (NIOSH) Method 7400, Asbestos Fibers in Air. A wedge from the filter cassette is mounted on a slide and viewed under the phase contrast microscope at 400 x power. This increases the contrast between the background and the fibers on the filter. Fibers longer than 5 microns, with an aspect ratio of 3:1 or greater, are counted. This method does not allow the analyst to distinguish between asbestos and non-asbestos fibers. The limit of quantification for Method 7400 is based on significant volumes to maintain 10 fibers in 100 fields. All EFI personnel who monitor abatement projects have been trained in NIOSH-approved courses and are proficient participates in the NIOSH PAT Program.

LEAD - TOXICITY CHARACTERISTIC LEACHING PROCEDURE (TCLP)

Prior to demolition and disposal of the structures, composite bulk materials of the buildings were sampled and analyze for Toxicity Characteristic Leaching Procedure (TCLP) for Lead to determine the hazardous waste characterization. The Bulk Sample analyses are reported in Appendix F of this report.

POLYCHLORINATED BIPHENYLS (PCBs)

Prior to demolition and disposal of the structures, ARC conducted a survey of materials (light ballasts & transformers) suspect of containing polychlorinated Biphenyls (PCBs) to determine the hazardous waste characterization. Determination of "PCB containing" light ballasts were achieved by the label on the light ballasts stating that it "contained PCB" or if no label was found on the light ballasts then they were assumed to contain PCB. The PCB containing light ballasts would then be segregated and placed in a 50-Gallon drum for proper disposal. If the label on the light ballasts stated that it did not contain PCB then the light ballasts would be disposed of as construction waste. Dielectric fluid oil suspect for Polychlorinated Biphenyls was found in a 6-gallon reservoir at Building 451 located in the TNT Production Area. The fluid was sampled for analysis. Based on the results the dielectric fluid collected from a 6-gallons transform reservoir located in the TNT Production Area (Building 451) is not considered to be PCB as defined by the Environmental Protection Agency (EPA). Transmittal of the analytical results is reported in Appendix G of this report.

5.0 CONCLUSION

Observations of the asbestos regulated containment's/areas, environmental engineering controls, and the contractor's work practices were utilized to confirm that the project would be accomplished in a manner generally consistent with the Work Procedures. Whenever a minor deficiency was noted, the contractor was informed and deficiency corrected.

Based on our observations and air sampling results, we believe the asbestos abatement performed by ARC Environmental, was accomplished in general accordance with the contract documents and the project specifications. Identified asbestos-containing materials were removed and disposed of prior to demolition activities. Final clearances were reported to meet all clearance criteria as established by the Work Procedures. Work areas were cleaned of all residual tape, plastic sheeting, tools, equipment, etc. PCM air samples were obtained to determine whether the airborne fiber concentration level met the specified criteria for air clearance. The criteria established for this phase of the project was 0.01 fibers per cubic centimeter (f/cc) or less for containment areas. ARC was required to re-clean the area when airborne fiber concentration were above the criteria of 0.01 f/cc. This process was repeated as necessary until the criteria was achieved. Once the abatement crew had demobilized from the work area, ARC'S non asbestos personnel were given authorization to proceed with demolition activities.

APPENDIX A
SCOPE OF WORK SUMMARY

TABLE 1
SCOPE OF WORK (SOW)
LONGHORN ARMY AMMUNITION PLANT

SECTIONS	LOCATIONS	DESCRIPTION	ASBESTOS-CONTAINING MATERIALS										
			Ext. Transite Siding/Roof/ Ceiling/Wall	Int. Transite Siding/Roof/ Ceiling/Wall	Corrugated Transite	Tar Shingle Roof	Floor Tile & Mastic	Linoleum	TSI - Steam	TSI- Domestic	PCB/Mercury	Ceiling Tile	Boiler Flue / Tank
N.W. SECTION	501 E	Radio Transmission Building	100 S.F +/-			-	-	-	-	-	-	-	-
N.W. SECTION	414	Water Pumping Station	5,200 S.F +/-			-	-	-	-	-	3 +/-	-	-
ADMIN. AREA	701	General Purpose Warehouse	2,640 S.F +/-			1,800 S.F +/-	-	-	-	-	-	-	-
ADMIN. AREA	703 & 703-A	Admin. General Purpose	21,000 S.F +/-			38,400 S.F +/-	38,000 S.F +/-	900 S.F +/-	2,300 L.F +/-	-	-	-	-
ADMIN. AREA	703-C	Heating Plant - Gas Fired Building	4,700 S.F +/-				-	-	-	-	-	-	80 S.F +/-
ADMIN. AREA	705	Personnel / Purchasing	5,300 S.F +/-			2,200 S.F +/-	3,000 S.F +/-	1,000 S.F +/-	-	-	-	-	-
ADMIN. AREA	707-E	Electronic Main Building	1,500 S.F +/-			2,600 S.F +/-	-	-	-	-	-	-	-
ADMIN. AREA	719	Medical Clinic	5,000 S.F +/-				-	-	-	-	-	8,100 S.F +/-	-
ADMIN. AREA	720-A	Admin. Old Security Building	5,300 S.F +/-			8,500 S.F +/-	-	-	-	-	-	-	-
ADMIN. AREA	730	Vehicle Parking	2 S.F +/-			-	-	-	-	-	-	-	-
MAGAZINE AREA	722-G	Dunnage Building	1,000 S.F +/-			-	-	-	-	-	-	-	-
MAGAZINE AREA	TS-84	Small Building on Slab	1,000 S.F +/-			-	-	-	-	-	-	-	-
MAGAZINE AREA	TS-Guard	3 Guard Shacks on Skids	-			-	-	-	-	-	-	-	-
MAGAZINE AREA	TS-64	Shack	-			-	50 S.F +/-	-	-	-	-	-	-
WAREHOUSE AREA	31-W	Flammable Material Storage	14,240 +/-			-	-	-	-	-	-	-	-
WAREHOUSE AREA	33-W	Flammable Material Storage	14,240 +/-			-	-	-	-	-	-	-	-
WAREHOUSE AREA	35- W	Flammable Material Storage	14,240 +/-			-	-	-	-	-	-	-	-

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TABLE 1
SCOPE OF WORK (SOW)
LONGHORN ARMY AMMUNITION PLANT

SECTIONS	LOCATIONS	DESCRIPTION	ASBESTOS-CONTAINING MATERIALS										
			Ext. Transite Siding/Roof/ Ceiling/Wall	Int. Transite Siding/Roof/ Ceiling/Wall	Corrugated Transite	Tar Shingle Roof	Floor Tile & Mastic	Linoleum	TSI - Steam	TSI- Domestic	PCB/Mercury	Ceiling Tile	Boiler Flue / Tank
WAREHOUSE AREA	41-W-2	Clock House	•			•	•	•	•	•	•	•	•
WAREHOUSE AREA	41-W-1	Public Toilet	550 S.F +/-			•	•	•	•	•	•	•	•
WAREHOUSE AREA	41-W	Quality Assurance Building	6,500 S.F +/-			•	2,700 S.F +/-	•	100 L.F +/-	•	•	•	•
WAREHOUSE AREA	42-W	General Purpose Warehouse	18,000 S.F +/-			•	•	•		•	•	•	•
WAREHOUSE AREA	44-W	General Purpose Warehouse	18,000 S.F +/-			•	•	•	100 L.F +/-	•	•	•	•
WAREHOUSE AREA	46-W	General Purpose Warehouse	22,000 S.F +/-			•	•	•	1,000 L.F +/	•	•	•	•
BATTERY SHOP AREA	18-K	Battery Charging Building	5,100 S.F +/-			•	•	•	200 L.F +/-	•	•	•	•
BATTERY SHOP AREA	18-K-1	Restroom	400 S.F +/-			•	•	•	•	•	•	•	•
SCRAP YARD	49-W	Loading Dock	2,000 S.F +/-			•	•	•	•	•	•	•	•
SCRAP YARD	TS_25	Restroom	100 S.F +/-			•	50 S.F +/-	•	•	•	•	•	•
SOUTH TEST AREA	IST-2	Ammunition Quality Buiding	300 S.F +/-			•	•	•	100 L.F +/-	•	•	•	•
SOUTH TEST AREA	DST-3	Earth Covered Magazine	•			•	•	•	•	•	•	•	•
SOUTH TEST AREA	BST-4	Earth Covered High Explosive Mag.	•			•	•	•	•	•	•	•	•
SOUTH TEST AREA	BST-2	Earth Covered High Explosive Mag.	•			•	•	•	•	•	•	•	•
SIGNAL AREA	TS-62	Shed	100 S.F +/-			•	60 S.F +/-	•	•	•	•	•	•
TNT PRODUCTION AREA	707-A	Change House	3,900 S.F +/-			2,900 S.F +/-	•	•	•	•	•	•	•

0006411111

TABLE 1
SCOPE OF WORK (SOW)
LONGHORN ARMY AMMUNITION PLANT

SECTIONS	LOCATIONS	DESCRIPTION	ASBESTOS-CONTAINING MATERIALS										
			Ext. Transite Siding/Roof/ Ceiling/Wall	Int. Transite Siding/Roof/ Ceiling/Wall	Corrugated Transite	Tar Shingle Roof	Floor Tile & Mastic	Linoleum	TSI - Steam	TSI- Domestic	PCB/Mercury	Ceiling Tile	Boiler Flue / Tank
TNT PRODUCTION AREA	704-A	Admin. Building	1,500 S.F +/-			1,800 S.F +/-	*	*	*	*	*	*	*
TNT PRODUCTION AREA	707-C	General Purpose Warehouse	2,900 S.F +/-			2,900 S.F +/-	*	*	*	*	*	*	*
TNT PRODUCTION AREA	451	Compressed Air Plant Building	10,400 S.F +/-			*	*	*	*	*	4 +/-	*	*
TNT PRODUCTION AREA	801F	Large Caliber Rocket Landing	800 S.F +/-			*	*	*	*	*	*	*	*
TNT PRODUCTION AREA	601 B	Truck Weigh Station	150 S.F +/-			*	*	*	*	*	*	*	*
MISC. BUILDING	25-G	Old Cafeteria	3,000 S.F +/-			*	4,950 S.F +/-	*	50 L.F +/-	*	*	*	*
MISC. BUILDING		Pistol Range Shack	100 S. F +/-			*	*	*	*	*	*	*	*
MISC. BUILDING	22-G	Sewage Pump Station	200 S. F +/-			*	*	*	*	*	*	*	*
MISC. BUILDING	22-A	Admin. Building - 51st. Street	*			*	3,000 S.F +/-	1,800 S.F +/-	*	*	*	*	*
PHASE II	709-A		3908 S.F +/-	*	*	*	3,500 S.F +/-	644 S.F +/-	*	*	*	*	*
PHASE II	TS-38		720 S.F. +/-	*	*	*	*	*	*	*	*	*	*
PHASE II	726		962 S.F. +/-	*	*	*	*	*	*	*	*	*	*
PHASE II	726-D		*	*	*	*	*	*	*	*	*	*	*
PHASE II	726-C		*	*	*	*	*	*	*	*	*	*	*
PHASE II	718-A		*	*	*	*	*	*	*	*	*	*	*
PHASE II	717		24,250 S.F +/-	120 S.F +/-	*	*	1,600 S.F +/-	*	490 L.F. +/-	*	2 Drum	*	*
PHASE II	734		3,250 S.F. +/-	*	*	*	*	*	*	*	*	*	*

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TABLE 1
SCOPE OF WORK (SOW)
LONGHORN ARMY AMMUNITION PLANT

SECTIONS	LOCATIONS	DESCRIPTION	ASBESTOS-CONTAINING MATERIALS										
			Ext. Transite Siding/Roof/ Ceiling/Wall	Int. Transite Siding/Roof/ Ceiling/Wall	Corrugated Transite	Tar Shingle Roof	Floor Tile & Mastic	Linoleum	TSI - Steam	TSI- Domestic	PCB/Mercury	Ceiling Tile	Boiler Flue / Tank
"T" AREA	8T		2,340 S.F +/-	8,415 S.F +/-	-	-	3,600 S.F +/-	-	240 L.F +/-	-	-	-	125 S.F +/-
"T" AREA	13T		1,746 S.F +/-	-	-	-	168 S.F +/-	-	246 L.F +/-	-	-	-	-
"T" AREA	16T-1		360 S.F +/-	260 S.F +/-	-	-	168 S.F +/- & 2,080 S.F +/- (Resisual Mastic Only)	-	80 L.F +/-	-	-	-	-
"T" AREA	16T		3,060 S.F +/-	3,800 S.F +/-	-	-	-	-	-	-	-	-	-
"T" AREA	20T-1		396 S.F+/-	-	-	-	-	-	-	-	-	-	-
"T" AREA	20T		3,645 S.F +/-	6,175 S.F +/-	-	-	-	-	135 L.F +/-	-	-	-	-
"T" AREA	18T-1		540 S.F +/-	-	-	-	-	-	-	-	-	-	-
"T" AREA	35T		-	-	-	-	-	-	-	-	-	-	-
"T" AREA	34T		-	-	-	-	-	-	-	-	-	-	-
"T" AREA	36T-1		400 S.F +/-	-	-	-	-	-	-	-	-	-	-
"T" AREA	36T-2		400 S.F +/-	-	-	-	-	-	-	-	-	-	-
"T" AREA	36T-3		400 S.F +/-	-	-	-	-	-	-	-	-	-	-
"T" AREA	36T-4		400 S.F +/-	-	-	-	-	-	-	-	-	-	-
"T" AREA	61T		-	-	-	-	-	-	-	-	-	-	-
"T" AREA	39T		2,470 S.F +/-	-	-	-	-	-	40 L.F +/-	-	-	-	-
"T" AREA	39T-1		432 S.F +/-	-	-	-	-	-	-	-	-	-	-
"T" AREA	21T		432 S.F +/-	-	-	-	-	-	-	-	-	-	-
"T" AREA	31T		4,855 S.F +/-	3,650 S.F +/-	-	-	-	-	-	-	-	-	-
"T" AREA	40T		58 S.F +/-	-	-	-	-	-	-	-	-	-	-

0006411 13

TABLE 1
SCOPE OF WORK (SOW)
LONGHORN ARMY AMMUNITION PLANT

SECTIONS	LOCATIONS	DESCRIPTION	ASBESTOS-CONTAINING MATERIALS										
			Ext. Transite Siding/Roof/ Ceiling/Wall	Int. Transite Siding/Roof/ Ceiling/Wall	Corrugated Transite	Tar Shingle Roof	Floor Tile & Mastic	Linoleum	TSI - Steam	TSI- Domestic	PCB/Mercury	Ceiling Tile	Boiler Flue / Tank
PHASE II	272		-	-	-	-	-	-	-	-	-	-	-
800's AREA	814		2,800 S.F +/-	-	-	-	-	-	160 L.F +/-	-	-	-	-
800's AREA	815		-	-	-	-	-	-	-	-	-	-	-
800's AREA	813		-	-	-	-	-	-	425 L.F +/-	-	-	-	-
800's AREA	TS-10		300 S.F +/-	-	-	-	-	-	-	-	-	-	-
MAGAZINE AREA	811-1 THRU 811-58 58 Each		24,476 S.F +/-	-	-	-	-	-	-	-	-	-	-
"Y" AREA	4Y-2		325 S.F +/-	-	-	-	-	-	-	-	-	-	-
"Y" AREA	4Y-2		-	2,080 S.F +/-	-	-	-	-	-	-	-	-	-
"Y" AREA	3Y		-	-	-	-	2,080 S.F +/-	-	-	-	-	-	-
"Y" AREA	29Y		-	-	-	-	-	-	-	-	-	-	-
"Y" AREA	32Y		-	-	-	-	-	-	-	-	-	-	-
"Y" AREA	48Y		330 S.F +/-	-	-	-	-	-	-	-	-	-	-
"Y" AREA	45Y		1,386 S.F +/-	2,090 S.F +/-	-	-	-	-	74 I.F +/-	-	-	-	-
"Y" AREA	34Y		8,445 S.F +/-	4,771 S.F +/-	-	-	-	-	-	-	-	-	-
"Y" AREA	38Y		1,800 S.F +/-	-	-	-	-	-	-	-	-	-	-
"Y" AREA	40Y		-	-	-	-	-	-	-	-	-	-	-
"Y" AREA	TS-87		-	-	-	-	-	-	-	-	-	-	-
"Y" AREA	18Y-1		576 S.F +/-	-	-	-	-	-	-	-	-	-	-
"Y" AREA	18Y		4,800 S.F +/-	8,160 S.F +/-	-	-	-	-	640 L.F +/-	-	-	-	-
"Y" AREA	16Y		2,205 S.F +/-	8,790 S.F +/-	-	-	-	-	200 L.F +/-	-	-	-	-
"Y" AREA	16Y-1		400 S.F +/-	-	-	-	-	-	20 L.F +/-	-	-	-	-
"Y" AREA	13Y-1		-	-	-	-	-	-	18 L.F +/-	-	-	-	-
"Y" AREA	Walkways		-	-	-	-	-	-	-	-	-	-	-
"Y" AREA	16Y-2		756 S.F +/-	-	-	-	-	-	-	-	-	-	-
"T" AREA	8T-2		288 S.F +/-	-	-	-	-	-	-	-	-	-	-

0000641114

TABLE 1
SCOPE OF WORK (SOW)
LONGHORN ARMY AMMUNITION PLANT

SECTIONS	LOCATIONS	DESCRIPTION	ASBESTOS-CONTAINING MATERIALS										
			Ext. Transite Siding/Roof/ Ceiling/Wall	Int. Transite Siding/Roof/ Ceiling/Wall	Corrugated Transite	Tar Shingle Roof	Floor Tile & Mastic	Linoleum	TSI - Steam	TSI- Domestic	PCB/Mercury	Ceiling Tile	Boiler Flue / Tank
PHASE II	723		2,124 S.F. +/-	2,336 S.F +/-	*	*	500 S.F. +/-	100 S.F +/-	800 L.F +/-	*	*	*	*
PHASE II	722-P		*	*	3,375 S.F +/-	*	*	*	100 L.F +/-	*	*	*	*
PHASE II	725		*	*	*	*	*	*	300 L.F +/-	*	*	*	*
PHASE II	206		*	1,888 S.F +/-	11,000 S.F +/	*	250 S.F. +/-	*	890 L.F +/-	*	*	*	*
PHASE II	205		*	*	*	*	*	*	12 L.F +/-	*	*	*	*
PHASE II	204		*	724 S.F. +/-	1,800 S.F. +/	*	*	*	186 L.F +/-	*	*	*	*
PHASE II	203		640 S.F +/-	*	*	*	*	*	*	*	*	*	*
PHASE II	713-B		*	*	*	*	*	*	*	*	*	*	*
PHASE II	201		*	*	20,441 S.F +/	*	1,725 S.F +/-	1,625 S.F +/-	100 L.F +/-	*	*	*	*
PHASE II	201-A		816 S.F +/-	*	*	*	1,240 S.F +/-	1,240 S.F +/-	*	*	*	*	*
PHASE II	201-R		*	*	640 S.F +/-	*	*	*	*	*	*	*	*
PHASE II	202		*	1,560 S.F +/-	9,284 S.F +/-	*	*	*	180 L.F +/-	*	*	*	*
PHASE II	707-F		1,260 S.F +/-	*	*	*	1,225 S.F +/-	*	*	*	*	*	*
PHASE II	707-G		1,260 S.F +/-	*	*	*	1,225 S.F +/-	*	*	*	*	*	*
PHASE II	707-J		1,260 S.F +/-	*	*	*	1,225 S.F +/-	*	*	*	*	*	*
PHASE II	704-D		2,712 S.F +/-	*	600 S.F +/-	*	*	4,800 S.F +/-	60 L.F +/-	*	*	*	*
PHASE II	413-A		*	80 S.F +/-	11,174 S.F +/	*	*		60 L.F +/-	*	3 +/-	*	*
PHASE II	713		5,760 S.F +/-	*	*	*	*	*	*	*	*	*	*
PHASE II	722-E		1,560 S.F +/-	*	*	*	900 S.F +/-	*	*	*	*	*	*
PHASE II	722-F		2,400 S.F +/-	*	*	*	2,400 S.F +/-	*	*	*	*	*	*
PHASE II	715		*	*	*	*	*	*	16 L.F +/-	*	*	*	*
PHASE II	744		10,624 S.F +/-	*	*	*	*	*	*	*	*	*	*
PHASE II	716		8,400 S.F +/-	*	*	*	730 S.F +/-	*	*	*	*	*	*
PHASE II	714		4,480 S.F +/-	*	*	*	*	*	*	*	*	*	*
PHASE II	632-A		315 S.F +/-	*	*	*	*	*	400 L.F +/-	*	*	*	*
PHASE II	630-A		64 S.F +/-	*	*	*	*	*	*	*	*	*	*
PHASE II	510-B-2		*	*	*	*	*	*	*	*	*	*	*
PHASE II	S36		*	*	*	*	*	*	*	*	*	*	*
PHASE II	TS-10		*	*	*	*	*	*	*	*	*	*	*
PHASE II	744-A		*	*	*	*	*	*	*	*	*	*	*

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APPENDIX B
ASBESTOS SUMMARY OF AIR MONITORING RESULTS

TABLE B.1
PCM ENVIRONMENTAL AIR MONITORING RESULTS
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS
EFI PROJECT NO. 98410-13709

Date	Sample Location	Type	Abatement Activity	Airborne Fiber Concentration (f/cc)	Volume (liters)
3/19/2003	Area 2 Personnel Saul Lopez	P	Removal	0.03	90
3/19/2003	Area 2	OWA	Prevalent Level	<=0.01	525
3/19/2003	Area 2	OWA	Prevalent Level	<=0.01	1452
3/19/2003	Area 8	OWA	Prevalent Level	<=0.01	1425
3/19/2003	Area 8	P/L	Prevalent Level	<=0.01	1425
3/20/2003	Area 2 bldg. 701 Personnel Saul Lopez	P	Personnel	<=0.01	1533
3/20/2003	Area 2 Bldg. 701 Upwind	IWA	Removal	<=0.01	1200
3/20/2003	Area 2 Bldg. 701Downwind	IWA	Removal	<=0.01	1203
3/20/2003	Area 7 Prevalent Level	IWA	N/A	<=0.01	1350
3/20/2003	Area 7 Prevalent Level	N/A	N/A	<=0.01	1356
3/20/2003	Area 7 Personnel Saul Lopez	N/A	Removal	<=0.01	1365
3/24/2003	Area 2 Bldg. 720A Upwind	IWA	Removal	<=0.01	1422
3/24/2003	Area 2 Bldg. 720A Downwind	IWA	Removal	<=0.01	1425
3/24/2003	Area 2 Bldg. 720A Personnel Saul Lope	P	Removal	<=0.01	1416
3/25/2003	Area 2 Bldg. 719 Upwind	IWA	Removal	<=0.01	1506
3/25/2003	Area 2 Bldg. 719Downwind	IWA	Removal	<=0.01	1509
3/25/2003	Area 2 Bldg. 719 Personnel Saul Lopez	IWA	Removal	<=0.01	1506
3/26/2003	Area 2 Bldg. 705 Downwind	IWA	Removal	<=0.01	1611
3/26/2003	Area 2 Bldg. 705 Upwind	IWA	Removal	<=0.01	1614
3/26/2003	Area 2 Bldg. 705 Personnel Saul Lopez	IWA	Removal	0.03	90
3/27/2003	Bldg. 707E Upwind	IWA	Removal	<=0.01	1551
3/27/2003	Bldg. 707E Downwind	IWA	Removal	<=0.01	1563
3/27/2003	Bldg. 707E Personnel	IWA	Removal	<=0.01	1551
3/31/2003	Bldg. 703 Upwind	IWA	Removal	<=0.01	1043
3/31/2003	Bldg. 703 Downwind	IWA	Removal	<=0.01	1190
3/31/2003	Bldg. 703 Personnel Aunilio Romero	IWA	Removal	<=0.01	982
3/31/2003	Bldg. 703 Personnel Alejandro Garcia	IWA	Removal	<=0.01	828
4/1/2003	Bldg. 703 Upwind	IWA	Removal	<=0.01	977
4/1/2003	Bldg. 703 Downwind	IWA	Removal	<=0.01	1375
4/1/2003	Bldg. 703 Personnel Alejandro Garcia	IWA	Removal	<=0.01	1166
4/1/2003	Bldg. 703 Personnel Jose Mendoza	IWA	Removal	<=0.01	918
4/1/2003	Bldg. 703 Personnel Jose Mendoza	IWA	Removal	0.04	61
4/2/2003	Bldg. 703 Upwind	IWA	Removal	<=0.01	846
4/2/2003	Bldg. 703 Downwind	IWA	Removal	<=0.01	1222
4/2/2003	Bldg. 703 Personnel Jose Aguilliar	IWA	Removal	<=0.01	1058
4/2/2003	Bldg. 703 Personnel Jose Aguilliar	IWA	Removal	0.04	61
4/3/2003	Bldg. 703 Upwind	IWA	Removal	<=0.01	495
4/3/2003	Bldg. 703 Downwind	IWA	Removal	<=0.01	424

Notes: IWA - Inside Work Area
OWA - Outside Work Area

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PCM ENVIRONMENTAL AIR MONITORING RESULTS
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS
EFI PROJECT NO. 98410-13709

Date	Sample Location	Type	Abatement Activity		Airborne Fiber Concentration (f/cc)	Volume (liters)
4/3/2003	Bldg. 707A/736 Pers.Rigoberto Hernandez	IWA	Removal		<=0.01	830
4/3/2003	Bldg. 736 Personnel Ramon Herrera	IWA	Removal		<=0.01	729
4/3/2003	Bldg. 707A	IWA	Removal		<=0.01	648
4/3/2003	Bldg. 451 lift	IWA	Removal		0.02	315
4/7/2003	Bldg. 707 C Upwind	IWA	Removal		<=0.01	1080
4/7/2003	Bldg. 707 C Downwind	IWA	Removal		<=0.01	1080
4/7/2003	Bldg. 451 Upwind	IWA	Removal		<=0.01	1080
4/7/2003	Bldg. 451 Personnel Rigoberto Hernandez	IWA	Removal		<=0.01	1080
4/8/2003	Bldg. 451 Upwind	IWA	Removal		<=0.01	753
4/9/2003	QA/QC recount A-047	IWA		0	<=0.01	753
4/8/2003	Bldg. 451 Downwind	IWA	Removal		<=0.01	744
4/8/2003	Bldg. 451 Upwind	IWA	Removal		<=0.01	681
4/8/2003	Bldg. 25G Downwind	IWA	Removal		<=0.01	681
4/8/2003	Bldg. 25G Personnel Rigoberto Hernandez	IWA	Removal		<=0.01	498
4/9/2003	Bldg. 801F Upwind	IWA	Removal		<=0.01	808
4/9/2003	Bldg. 801F Downwind	IWA	Removal		<=0.01	806
4/9/2003	Bldg. 18K Upwind	IWA	Removal		<=0.01	798
4/9/2003	Bldg. 18K Downwind	IWA	Removal		<=0.01	798
4/9/2003	Bldg. 18K Personnel	IWA	Removal		<=0.01	792
4/10/2003	Bldg. 18K/18K-1 Upwind	IWA	Removal		<=0.01	562
4/10/2003	Bldg. 18k/18K-1 downwind	IWA	Removal		<=0.01	568
4/10/2003	Bldg. 801F Upwind	IWA	Removal		<=0.01	554
4/10/2003	Bldg. 801F Downwind	IWA	Removal		<=0.01	552
4/10/2003	Bldg. 801F Personnel Aunilio Romero	IWA	Removal		0.04	60
4/14/2003	Bldg. 41W Upwind	IWA	Removal		<=0.01	880
4/14/2003	Bldg. 41W Downwind	IWA	Removal		<=0.01	878
4/14/2003	Bldg. 18K-1 Upwind	IWA	Removal		<=0.01	696
4/14/2003	Bldg. 18K-1 Downwind	IWA	Removal		<=0.01	696
4/14/2003	Bldg. 703 Upwind	IWA	Removal		<=0.01	832
4/14/2003	Bldg. 703 Downwind	IWA	Removal		<=0.01	834
4/14/2003	Bldg. 703 Personnel Jose Mendoza	IWA	Removal		<=0.01	694
4/15/2003	Bldg. 41W Upwind	IWA	Removal		<=0.01	880
4/15/2003	Bldg. 41W Downwind	IWA	Removal		<=0.01	880
4/15/2003	Bldg. 703 Upwind	IWA	Removal		<=0.01	848
4/15/2003	Bldg. 703 Downwind	IWA	Removal		<=0.01	846
4/15/2003	Bldg. 703 Personnel Rigoberto Hernandez	IWA	Removal		<=0.01	838

Notes: IWA - Inside Work Area
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TABLE B.1
PCM ENVIRONMENTAL AIR MONITORING RESULTS
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS
EFI PROJECT NO. 98410-13709

Date	Sample Location	Type	Abatement Activity	Airborne Fiber Concentration (f/cc)	Volume (liters)
4/15/2003	Bldg. 703 Fl 1 south	IWA	Removal	<=0.01	891
4/16/2003	Bldg. 41W Upwind	IWA	Removal	<=0.01	1000
4/16/2003	Bldg. 41W Downwind	IWA	Removal	<=0.01	1000
4/16/2003	Bldg. 703 Upwind	IWA	Removal	<=0.01	998
4/16/2003	Bldg. 703 Downwind	IWA	Removal	<=0.01	1002
4/16/2003	Bldg. 703 Fl 1 south	IWA	Removal	<=0.01	1497
4/16/2003	Bldg. 703 Personnel Jose Aguilliar	IWA	Removal	<=0.01	1000
4/17/2003	Bldg. 42W Upwind	IWA	Removal	<=0.01	462
4/17/2003	Bldg. 42W Downwind	IWA	Removal	<=0.01	460
4/17/2003	Bldg. 703 Upwind	IWA	Removal	<=0.01	468
4/17/2003	Bldg. 703 Downwind	IWA	Removal	<=0.01	466
4/17/2003	Bldg. 703 Personnel Saul Lopez	IWA	Removal	<=0.01	466
4/17/2003	Bldg. 703 Fl 1 south	IWA	Removal	<=0.01	705
4/21/2003	Bldg. 703 Downwind	IWA	Removal	<=0.01	872
4/21/2003	Bldg. 703 Upwind	IWA	Removal	<=0.01	928
4/21/2003	Bldg. 42W Downwind	IWA	Removal	<=0.01	722
4/21/2003	Bldg. 42W N E Work area	IWA	Removal	<=0.01	1038
4/21/2003	Bldg. 703B Personnel Ramon Herrera	IWA	Removal	<=0.01	770
4/21/2003	Bldg. 703B Personnel Ramon Herrera	IWA	Removal	0.04	68
4/22/2003	Bldg. 703 B North Area	IWA	Removal	<=0.01	1184
4/22/2003	Bldg. 703B Decon	IWA	Removal	<=0.01	1233
4/22/2003	Bldg. 42W North Area	IWA	Removal	<=0.01	1274
4/22/2003	Bldg42W on lift	IWA	Removal	<=0.01	1115
4/22/2003	Bldg. 42W South Area	IWA	Removal	<=0.01	1235
4/22/2003	Bldg. 703B Personnel Aunilio Romero	IWA	Removal	<=0.01	436
4/22/2003	Bldg. 703B Personnel Aunilio Romero	IWA	Removal	0.02	198
4/23/2003	Bldg. 703B IWA	IWA	Removal	<=0.01	746
4/23/2003	Bldg. 42W Downwind	IWA	Removal	<=0.01	1188
4/23/2003	Bldg. 42W North Area	IWA	Removal	<=0.01	1231
4/23/2003	Bldg. 42W Upwind	IWA	Removal	<=0.01	1124
4/23/2003	Bldg. 422G Upwind	IWA	Removal	0.02	473
4/23/2003	Bldg. 703B/422G Personnel A.Garcia	IWA	Removal	<=0.01	560
4/23/2003	Bldg. 422G Personnel A.Garcia	IWA	Removal	<=0.01	366
4/24/2003	Bldg. 1 St-1 Pipe & Flooring	IWA	Removal	<=0.01	348
4/24/2003	Bldg. 1 St-1 Personnel J.Aguilliar	IWA	Removal	<=0.01	363
4/24/2003	Bldg. 42W Upwind	IWA	Removal	<=0.01	823

Notes: IWA - Inside Work Area
OWA - Outside Work Area

TABLE B.1
PCM ENVIRONMENTAL AIR MONITORING RESULTS
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS
EFI PROJECT NO. 98410-13709

Date	Sample Location	Type	Abatement Activity	Airborne Fiber Concentration (f/cc)	Volume (liters)
4/24/2003	Bldg. 42W Downwind	IWA	Removal	<=0.01	785
4/24/2003	Bldg. 18K IWA	IWA	Removal	<=0.01	528
4/24/2003	Bldg. 18K IWA	IWA	Removal	<=0.01	418
4/24/2003	Bldg. 18K IWA	IWA	Removal	<=0.01	437
4/24/2003	Bldg. 18K Personnel R.Hernandez	IWA	Removal	<=0.01	414
4/24/2003	Bldg. 18K Personnel R.Hernandez	IWA	Removal	0.05	68
4/28/2003	Bldg. 44W/42W IWA	IWA	Removal	<=0.01	874
4/28/2003	Bldg. 42W/44W Downwind	IWA	Removal	<=0.01	760
4/28/2003	Bldg. 41W o/s decon	OWA	Removal	<=0.01	914
4/28/2003	Bldg. 41W IWA	IWA	Removal	<=0.01	953
4/28/2003	Bldg. 41W Personnel S.Lopez	IWA	Removal	<=0.01	363
4/28/2003	Bldg. 41W Personnel S.Lopez	IWA	Removal	0.04	73
4/28/2003	Bldg. 41W Personnel S.Lopez	IWA	Removal	<=0.01	345
4/29/2003	Bldg. 44W North	IWA	Removal	<=0.01	1008
4/29/2003	Bldg. 44W South	IWA	Removal	<=0.01	1104
4/29/2003	Bldg. 41W Clearance	IWA	Clearance	<=0.01	1308
4/29/2003	Bldg. 41W Decon	OWA	Bagout	<=0.01	1155
4/29/2003	Bldg. 703A demolition Downwind	IWA	Demo	<=0.01	760
4/29/2003	Bldg. 41W Clearance	IWA	Clearance	<=0.01	988
4/29/2003	Bldg. 41W Clearance	IWA	Clearance	<=0.01	1026
4/29/2003	Bldg. 42W Personnel A.Garcia	IWA	Removal	<=0.01	979
4/30/2003	Bldg. 44W South	IWA	Removal	<=0.01	1265
4/30/2003	Bldg. 44W North	IWA	Removal	<=0.01	1155
4/30/2003	Bldg. 703A demolition Downwind	IWA	Demo	<=0.01	1030
4/30/2003	Bldg. 41W IWA	IWA	Removal	<=0.01	1023
4/30/2003	Bldg. 41W IWA	IWA	Removal	0.02	930
4/30/2003	Bldg. 41W Personnel Braulio Monroy	IWA	Removal	<=0.01	990
4/30/2003	Bldg. 41W Personnel Braulio Monroy	IWA	Removal	0.06	66
5/1/2003	Bldg. 44W North Area	IWA	Removal	<=0.01	693
5/1/2003	Bldg. 44W South Area	IWA	Removal	<=0.01	725
5/1/2003	Bldg. 703A Demolition	OWA	Demolition	<=0.01	683
5/1/2003	Bldg. 41W-1 Upwind	IWA	Removal	<=0.01	540
5/1/2003	Bldg. 41W-1 Downwind	IWA	Removal	<=0.01	518
5/5/2003	Bldg. 44W North	IWA	Removal	<=0.01	939
5/5/2003	Bldg. 44W South	IWA	Removal	<=0.01	978
5/5/2003	Bldg. 44W Personnel J Mendoza	IWA	Removal	0.04	66
5/5/2003	Bldg. 44W Personnel J Mendoza	IWA	Removal	<=0.01	862
5/6/2003	Bldg. 44W North	IWA	Removal	<=0.01	1127
5/6/2003	Bldg. 44W South	IWA	Removal	<=0.01	1076

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PCM ENVIRONMENTAL AIR MONITORING RESULTS
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EFI PROJECT NO. 98410-13709

Date	Sample Location	Type	Abatement Activity	Airborne Fiber Concentration (f/cc)	Volume (liters)
5/6/2003	Bldg. 44W Personnel Saul Lopez	IWA	Removal	0.06	66
5/6/2003	Saul Lopez 467-89-3372	P	Removal	<=0.01	944
5/7/2003	Bldg. 44W North	IWA	Transite Removal	<=0.01	1196
5/7/2003	Bldg. 44W South	IWA	Transite Removal	<=0.01	1144
5/7/2003	Bldg. 44W Personnel Ramon Herrera	P	Transite Removal	0.08	66
5/7/2003	Bldg. 44W Personnel Ramon Herrera	P	Transite Removal	<=0.01	1078
5/8/2003	Bldg. 44W	IWA	Transite Removal	0.02	1180
5/8/2003	Bldg. 44W	IWA	Transite Removal	<=0.01	1182
5/8/2003	Personnel Alejandro Garcia	P	Transite Removal	<=0.01	1650
5/8/2003	Personnel Alejandro Garcia	P	Transite Removal	<=0.01	1065
5/12/2003	Bldg. 44W Upwind	IWA	Transite Removal	<=0.01	1230
5/12/2003	Bldg. 44W Downwind	IWA	Transite Removal	<=0.01	1230
5/12/2003	Bldg. 44W Personnel Saul Lopez	P	Transite Removal	<=0.01	1076
5/12/2003	Bldg. 44W Personnel Jose Aguilar	P	Transite Removal	0.05	58
5/13/2003	Bldg. TS 25&49W Downwind	IWA	Transite Removal	<=0.01	1122
5/13/2003	Bldg. TS 25&49W Upwind	IWA	Transite Removal	<=0.01	1137
5/13/2003	Personnel Jose Mendoza	P	Transite Removal	<=0.01	960
5/13/2003	Personnel Braulio Monroy	P	Transite Removal	0.04	60
5/14/2003	Bldg. 46W Upwind	IWA	Transite Removal	<=0.01	1199
5/14/2003	Bldg. 46W Downwind	IWA	Transite Removal	<=0.01	1135
5/14/2003	Bldg. 46W Personnel Santos Reyes	P	Transite Removal	0.04	60
5/14/2003	Bldg. 46W Personnel Rigoberto Hernandez	P	Transite Removal	<=0.01	962
5/15/2003	Bldg. 46W Upwind	IWA	Transite Removal	<=0.01	1124
5/15/2003	Bldg. 46W Downwind	IWA	Transite Removal	<=0.01	1133
5/15/2003	Bldg. 46W Personnel Jose Aguilar	P	Transite Removal	0.04	60
5/15/2003	Bldg. 46W Personnel Braulio Monroy	P	Transite Removal	<=0.01	960
5/19/2003	Bldg. 46W Upwind	IWA	Transite Removal	<=0.01	1016
5/19/2003	Bldg. 46W Downwind	IWA	Transite Removal	<=0.01	1023
5/19/2003	Bldg. 46W Personnel Saul Lopez	P	Transite Removal	<=0.01	960
5/19/2003	Bldg. 46W Personnel Ramon Herrera	P	Transite Removal	0.05	58
5/19/2003	Field Blank	N/A	N/A	#VALUE!	#######
5/20/2003	Bldg. 31W Upwind	IWA	Transite Removal	<=0.01	880
5/20/2003	Bldg. 31W Downwind	IWA	Transite Removal	<=0.01	1093
5/20/2003	Bldg. 31W Personnel Rigoberto Hernandez	P	Transite Removal	0.05	60
5/20/2003	Bldg. 31W Personnel Jose Aguilar	P	Transite Removal	<=0.01	1068

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Date	Sample Location	Type	Abatement Activity	Airborne Fiber Concentration (f/cc)	Volume (liters)
5/21/2003	Bldg. 31W Upwind	IWA	Transite Removal	<=0.01	1109
5/21/2003	Bldg. 31W Downwind	IWA	Transite Removal	<=0.01	1109
5/21/2003	Bldg. 31W Personnel Jose Aguilar	P	Transite Removal	<=0.01	966
5/21/2003	Bldg. 31W Personnel Brauilo Monroy	P	Transite Removal	0.04	60
5/21/2003	Field Blank	N/A	N/A	#VALUE!	#######
5/22/2003	Bldg. 31W Personnel Ramon Herrera	P	Transite Removal	<=0.01	978
5/22/2003	Bldg. 31W Downwind	IWA	Transite Removal	<=0.01	1056
5/27/2003	Bldg. 31W Upwind	IWA	Transite Removal	<=0.01	1109
5/27/2003	Bldg. 33W Downwind	IWA	Transite Removal	<=0.01	1111
5/27/2003	Bldg. 33W Personnel Saul Lopez	P	Transite Removal	<=0.01	992
5/27/2003	Bldg. 33W Personnel Ramon Herrera	P	Transite Removal	0.04	62
5/28/2003	Bldg. 33W Upwind	IWA	Transite Removal	<=0.01	1155
5/28/2003	Bldg. 33W Downwind	IWA	Transite Removal	<=0.01	1148
5/28/2003	Bldg. 33W Personnel Jose Aguilar	P	Transite Removal	<=0.01	1010
5/28/2003	Bldg. 33W Personnel Santos Reyes	P	Transite Removal	0.09	60
5/28/2003	Field Blank	N/A	N/A	#VALUE!	#######
5/29/2003	Bldg. 33W Upwind	IWA	Transite Removal	<=0.01	1047
5/29/2003	Bldg. 33W Downwind	IWA	Transite Removal	<=0.01	1049
5/29/2003	Bldg. 33W Personnel Alejandro Garcia	P	Transite Removal	<=0.01	960
5/29/2003	Bldg. 33W Personnel Aunilio Romero	P	Transite Removal	0.05	58
5/30/2003	Bldg. 35W Upwind	IWA	Transite Removal	<=0.01	1001
5/30/2003	Bldg. 35W Downwind	IWA	Transite Removal	<=0.01	1012
5/30/2003	Bldg. 35W Personnel Jose Mendoza	P	Transite Removal	<=0.01	944
6/2/2003	Bldg. 42W Upwind	IWA	Transite Removal	<=0.01	670
6/2/2003	Bldg. 42W Downwind	IWA	Transite Removal	<=0.01	670
6/2/2003	Bldg. 42W Personnel Saul Lopez	P	Transite Removal	0.03	90
6/2/2003	Bldg. 42W Personnel Saul Lopez	P	Transite Removal	<=0.01	930
6/3/2003	Bldg. 25G Inside Containment	IWA	Floor Tile Removal	<=0.01	1010
6/3/2003	Bldg. 25G Inside Containment	IWA	Floor Tile Removal	<=0.01	1010
6/3/2003	Bldg. 25G Outside Containment	OWA	Floor Tile Removal	<=0.01	990
6/3/2003	Bldg. 25G Personnel Braulio Monroy	P	Floor Tile Removal	<=0.01	960
6/4/2003	Bldg. 25G Inside Containment	IWA	Floor Tile Removal	<=0.01	820
6/4/2003	Bldg. 25G Inside Containment	IWA	Floor Tile Removal	<=0.01	822
6/4/2003	Bldg. 25G Outside Containment	OWA	Floor Tile Removal	<=0.01	860

Notes: IWA - Inside Work Area
OWA - Outside Work Area

TABLE B.1
PCM ENVIRONMENTAL AIR MONITORING RESULTS
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS
EFI PROJECT NO. 98410-13709

Date	Sample Location	Type	Abatement Activity	Airborne Fiber Concentration (f/cc)	Volume (liters)
6/4/2003	Bldg. 25G Personnel Santos Reyes	P	Floor Tile Removal	<=0.01	834
6/4/2003	Bldg. 25G Inside Containment	IWA	Final Clearance	<=0.01	1260
6/4/2003	Bldg. 25G Inside Containment	IWA	Final Clearance	<=0.01	1260
6/9/2003	Bldg. 22A Upwind	IWA	Floor Tile Removal	<=0.01	910
6/9/2003	Bldg. 22A Downwind	IWA	Floor Tile Removal	<=0.01	914
6/9/2003	Bldg. 22A Personnel Ramon Herrera	P	Floor Tile Removal	0.04	60
6/9/2003	Bldg. 22A Personnel Braulio Monroy	P	Floor Tile Removal	<=0.01	1040
6/10/2003	Bldg. 22A Upwind	IWA	Final Cleaning	<=0.01	1060
6/10/2003	Bldg. 22A Downwind	IWA	Final Cleaning	<=0.01	1060
6/10/2003	Bldg. 22A Personnel Santos Reyes	P	Final Cleaning	0.05	60
6/10/2003	Bldg. 22A Personnel Santos Reyes	P	Final Cleaning	<=0.01	972
6/11/2003	Bldg. 22A Upwind	IWA	Final Cleaning	<=0.01	1080
6/11/2003	Bldg. 22A Downwind	IWA	Final Cleaning	<=0.01	1086
6/11/2003	Bldg. 22A Inside Containment	IWA	Floor Mastic Removal	<=0.01	1070
6/11/2003	Bldg. 22A Santos Reyes	IWA	Floor Mastic Removal	<=0.01	1080
6/12/2003	Bldg. 22A Upwind	IWA	Floor Mastic Removal	<=0.01	650
6/12/2003	Bldg. 22A Downwind	IWA	Floor Mastic Removal	<=0.01	632
6/12/2003	Bldg. 22A	IWA	Floor Mastic Removal	<=0.01	650
6/12/2003	Bldg. 22A Personnel Braulio Monroy	P	Floor Mastic Removal	<=0.01	958
6/12/2003	Bldg. 22A Inside Containment	IWA	Final Clearance	<=0.01	1260
6/12/2003	Bldg. 22A Inside Containment	IWA	Final Clearance	<=0.01	1260
6/16/2003	Bldg. 716	IWA	Floor Tile Removal	<=0.01	310
6/16/2003	Bldg. 716	IWA	Floor Tile Removal	<=0.01	310
6/16/2003	Bldg. 716	IWA	Floor Tile Removal	<=0.01	306
6/16/2003	Bldg. 716,744,744A Saul Lopez	IWA	Floor Tile Removal	<=0.01	960
6/16/2003	Bldg. 716	IWA	Final Clearance	<=0.01	1284
6/16/2003	Bldg. 716	IWA	Final Clearance	<=0.01	1284
6/16/2003	Bldg. 744A	IWA	Glovebag Removal	0.01	180
6/16/2003	Bldg. 744A	OWA	Glovebag Removal	0.02	182
6/16/2003	Bldg. 744 Upwind	IWA	Transite Removal	<=0.01	620
6/16/2003	Bldg. 744 Downwind	IWA	Transite Removal	<=0.01	606
6/17/2003	Bldg. 744 Upwind	IWA	Transite Removal	<=0.01	400
6/17/2003	Bldg. 744 Downwind	IWA	Transite Removal	<=0.01	404
6/17/2003	Bldg. 716	IWA	Floor Tile Removal	0.02	200
6/17/2003	Bldg. 713	IWA	Floor Tile Removal	0.02	230
6/17/2003	Bldg. 713 Personnel Ramon Herrera	P	Floor Tile Removal	<=0.01	960
6/18/2003	Bldg. 717	IWA	Floor Tile Removal	<=0.01	980
6/18/2003	Bldg. 717	IWA	Floor Tile Removal	<=0.01	980
6/18/2003	Bldg. 717 Personnel Braulio Monroy	P	Floor Tile Removal	0.04	60
6/18/2003	Bldg. 717 Personnel Braulio Monroy	P	Floor Tile Removal	<=0.01	960
6/19/2003	Bldg. 717 Upwind	IWA	Floor Tile Removal	<=0.01	890

Notes: IWA - Inside Work Area
OWA - Outside Work Area

TABLE B.1
PCM ENVIRONMENTAL AIR MONITORING RESULTS
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS
EFI PROJECT NO. 98410-13709

Date	Sample Location	Type	Abatement Activity	Airborne Fiber Concentration (f/cc)	Volume (liters)
6/19/2003	Bldg. 717 Downwind	IWA	Floor Tile Removal	<=0.01	916
6/19/2003	Bldg. 717	IWA	Floor Tile Removal	<=0.01	910
6/19/2003	Bldg. 717 Personnel Saul Lopez	P	Floor Tile Removal	<=0.01	964
6/19/2003	Bldg. 717	IWA	Final Clearance	<=0.01	1260
6/19/2003	Bldg. 717	IWA	Final Clearance	<=0.01	1260
6/23/2003	Bldg. 704D Personnel Saul Lopez	P	Floor Tile Removal	<=0.01	960
6/23/2003	Bldg. 704D Personnel Ramon Herrera	P	Floor Tile Removal	0.04	60
6/23/2003	Bldg. 704D Outside Decon	OWA	Floor Tile Removal	<=0.01	1056
6/23/2003	Bldg. 704D Rear of Bldg.	OWA	Floor Tile Removal	<=0.01	1425
6/24/2003	Bldg. 704D Outside Decon	OWA	Floor Tile Removal	<=0.01	1200
6/24/2003	Bldg. 704D Personnel Ramon Herrera	P	Floor Tile Removal	<=0.01	880
6/24/2003	Bldg. 704D Personnel Ramon Herrera	P	Floor Tile Removal	0.06	66
6/25/2003	Bldg. 704D Personnel Braulio Monroy	P	Floor Mastic Removal	<=0.01	720
6/25/2003	Bldg. 704D Outside Decon	OWA	Floor Mastic Removal	<=0.01	792
6/25/2003	Bldg. 704D Personnel Saul Lopez	P	Floor Mastic Removal	0.04	60
6/25/2003	Bldg. 704D	IWA	Final Clearance	<=0.01	1300
6/26/2003	Bldg. 451 Personnel Ramon Herrera	P	Transite Removal	0.04	66
6/26/2003	Bldg. 451 Personnel Ramon Herrera	P	Transite Removal	<=0.01	990
6/26/2003	Bldg. 451 Upwind	IWA	Transite Removal	<=0.01	960
6/26/2003	Bldg. 451 Downwind	IWA	Transite Removal	<=0.01	1104
6/30/2003	Bldg. 414 Upwind	IWA	Transite Removal	<=0.01	1050
6/30/2003	Bldg. 414 Downwind	IWA	Transite Removal	<=0.01	1030
6/30/2003	Bldg. 414 Personnel Saul Lopez	IWA	Transite Removal	<=0.01	984
6/30/2003	Bldg. 414 Personnel Ramon Herrera	P	Transite Removal	0.09	60
6/30/2003	Bldg. 414 Upwind	IWA	Transite Removal	<=0.01	1110
7/1/2003	Bldg. 414 Downwind	IWA	Transite Removal	<=0.01	1114
7/1/2003	Bldg. 414 Personnel Brautio Monrey	P	Transite Removal	<=0.01	1112
7/1/2003	Bldg. 414 Personnel Roberto Sierra	P	Transite Removal	0.04	60
7/2/2003	Bldg. 811-1 Upwind	IWA	Transite Removal	<=0.01	1020
7/2/2003	Bldg. 811-8 Downwind	IWA	Transite Removal	<=0.01	1028
7/2/2003	Bldg. 811-1-811-8 Braulio Monrey	P	Transite Removal	<=0.01	1030
7/2/2003	Bldg. 811-1-811-8 Roberto Sierra	P	Transite Removal	0.10	60
7/3/2003	Bldg. 811-9 Upwind	IWA	Transite Removal	<=0.01	1014
7/3/2003	Bldg. 811-14 Downwind	IWA	Transite Removal	<=0.01	1026
7/3/2003	Bldg. 811-9-811-14 Saul Lopez	P	Transite Removal	<=0.01	1010
7/3/2003	Bldg. 811-9-811-14 Ramon Herrera	P	Transite Removal	0.07	60
7/14/2003	Bldg. 811-15-811-19 Upwind	IWA	Transite Removal	<=0.01	1060

Notes: IWA - Inside Work Area
OWA - Outside Work Area

TABLE B.1
PCM ENVIRONMENTAL AIR MONITORING RESULTS
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS
EFI PROJECT NO. 98410-13709

Date	Sample Location	Type	Abatement Activity	Airborne Fiber Concentration (f/cc)	Volume (liters)
7/14/2003	Bldg. 811-15-811-19 Downwind	IWA	Transite Removal	<=0.01	1072
7/14/2003	Bldg. 811-15-811-19 Saul Lopez	P	Transite Removal	<=0.01	1110
7/14/2003	Bldg. 811-15-811-19 Roberta Sierra	P	Transite Removal	0.04	60
7/15/2003	Bldg. 811-15-811-20 Upwind	IWA	Transite Removal	<=0.01	1070
7/15/2003	Bldg. 811-15-811-20 Downwind	IWA	Transite Removal	<=0.01	1072
7/15/2003	Bldg. 811-15-811-20 Ramon Herrera	P	Transite Removal	<=0.01	1064
7/15/2003	Bldg. 811-15-811-20 Roberta Sierra	P	Transite Removal	0.09	60
7/16/2003	Bldg. 811-21-811-25 Upwind	IWA	Transite Removal	<=0.01	1120
7/16/2003	Bldg. 811-21-811-25 Downwind	IWA	Transite Removal	<=0.01	1118
7/16/2003	Bldg. 811-21-811-25 Ramon Herrera	P	Transite Removal	<=0.01	1124
7/16/2003	Bldg. 811-21-811-25 Saul Lopez	P	Transite Removal	0.06	60
7/17/2003	Bldg. 811-25-811-30 Upwind	IWA	Transite Removal	<=0.01	1062
7/17/2003	Bldg. 811-26-811-30 Downwind	IWA	Transite Removal	<=0.01	1062
7/17/2003	Bldg. 811-26-811-30 Braulio Monroy	P	Transite Removal	<=0.01	1076
7/17/2003	Bldg. 811-26-811-30 Saul Lopez	P	Transite Removal	0.06	62
7/21/2003	Bldg. 811-31-811-35 Upwind	IWA	Transite Removal	<=0.01	1086
7/21/2003	Bldg. 811-31-811-35 Downwind	IWA	Transite Removal	<=0.01	1064
7/21/2003	Bldg 811-31-811-35 Braulio Monroy	P	Transite Removal	<=0.01	1062
7/21/2003	Bldg. 811-31-811-35 Ramon Herrera	P	Transite Removal	0.04	60
7/22/2003	Bldg. 811-36-811-40 Upwind	IWA	Transite Removal	<=0.01	1046
7/22/2003	Bldg. 811-36-811-40 Downwind	IWA	Transite Removal	<=0.01	1060
7/22/2003	Bldg. 811-36-811-40 Roberto Sierra	P	Transite Removal	<=0.01	1026
7/22/2003	Bldg. 811-36-811-40 Saul Lopez	P	Transite Removal	0.06	60
7/23/2003	Bldg. 811-41-811-47 Upwind	IWA	Transite Removal	<=0.01	1030
7/23/2003	Bldg. 811-41-811-47 Downwind	IWA	Transite Removal	<=0.01	1030
7/23/2003	Bldg. 811-41-811-47 Braulio Monroy	P	Transite Removal	<=0.01	1030
7/23/2003	Bldg. 811-41-811-47 Saul Lopez	P	Transite Removal	0.07	62
7/24/2003	Bldg. 811-48-811-58 Upwind	IWA	Transite Removal	<=0.01	1020
7/24/2003	Bldg. 811-48-811-58 Downwind	IWA	Transite Removal	<=0.01	1016
7/24/2003	Bldg. 811-48-811-58	P	Transite Removal	<=0.01	1014
7/24/2003	Bldg. 811-48-811-58	P	Transite Removal	0.04	60
7/28/2003	Bldg. 713 Upwind	IWA	Transite Removal	<=0.01	978
7/28/2003	Bldg. 713 Downwind	IWA	Transite Removal	<=0.01	1002
7/28/2003	Bldg. 713 Ramon Herrera	P	Transite Removal	<=0.01	998
7/28/2003	Bldg. 713 Roberto Sierra	P	Transite Removal	0.04	60
7/29/2003	Bldg. 713 Upwind	IWA	Transite Removal	<=0.01	1020
7/29/2003	Bldg. 713 Downwind	IWA	Transite Removal	<=0.01	1018
7/29/2003	Bldg. 713 Saul Lopez	P	Transite Removal	<=0.01	1010
7/29/2003	Bldg. 713 Braulio Monroy	P	Transite Removal	0.02	120
7/30/2003	Bldg. 713 & 722-E Upwind	IWA	Transite Removal	<=0.01	1024
7/30/2003	Bldg. 713 & 722-E Downwind	IWA	Transite Removal	<=0.01	1024

Notes: IWA - Inside Work Area
OWA - Outside Work Area

TABLE B.1
PCM ENVIRONMENTAL AIR MONITORING RESULTS
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS
EFI PROJECT NO. 98410-13709

Date	Sample Location	Type	Abatement Activity	Airborne Fiber Concentration (f/cc)	Volume (liters)
7/30/2003	Bldg. 713 & 722-E Roberto Sierra	P	Transite Removal	<=0.01	1036
7/30/2003	Bldg. 713 & 722-E Ramon Herrera	P	Transite Removal	<=0.01	1500
7/31/2003	Bldg. 718-A Upwind	IWA	Transite Removal	<=0.01	976
7/31/2003	Bldg. 718-A Downwind	IWA	Transite Removal	<=0.01	974
7/31/2003	Bldg. 718-A Braulio Monroy	P	Transite Removal	<=0.01	980
7/31/2003	Bldg. 713-A Roberto Sierra	P	Transite Removal	0.04	60
8/4/2003	Bldg. 718-A Upwind	IWA	Transite Removal	<=0.01	1040
8/4/2003	Bldg. 718-A Downwind	IWA	Transite Removal	<=0.01	1036
8/4/2003	Bldg. 718-A Saul Lopez	P	Transite Removal	<=0.01	1080
8/4/2003	Bldg. 718-A Braulio Monroy	P	Transite Removal	0.04	60
8/5/2003	Bldg. 718-A & 714 Upwind	IWA	Transite Removal	<=0.01	992
8/5/2003	Bldg. 718-A & 714 Downwind	IWA	Transite Removal	<=0.01	996
8/5/2003	Bldg. 718-A & 714 Ramon Herrera	P	Transite Removal	<=0.01	1000
8/5/2003	Bldg. 718-A & 714 Roberto Sierra	P	Transite Removal	0.04	60
8/6/2003	Bldg. 722-E Prep	IWA	Floor Tile Removal	<=0.01	720
8/6/2003	Bldg. 722-E O/S Decon	OWA	Floor Tile Removal	<=0.01	900
8/6/2003	Bldg. 722-E Clearance	IWA	Floor Tile Removal	<=0.01	1440
8/6/2003	Bldg. 722-E Clearance	IWA	Floor Tile Removal	<=0.01	1440
8/6/2003	Bldg. 722-E Clearance	IWA	Floor Tile Removal	<=0.01	1440
8/7/2003	Bldg. 717 Upwind	IWA	Transite Removal	<=0.01	900
8/7/2003	Bldg. 717 Downwind	IWA	Transite Removal	<=0.01	902
8/7/2003	Bldg. 717 Saul Lopez	P	Transite Removal	<=0.01	916
8/7/2003	Bldg. 717 Braulio Monroy	P	Transite Removal	0.04	60
8/11/2003	Bldg. 717 Upwind	IWA	Transite Removal	< .0049	910
8/11/2003	Bldg. 717 Downwind	IWA	Transite Removal	<=0.01	912
8/11/2003	Bldg. 717 Ramon Herrera	P	Transite Removal	<=0.01	938
8/11/2003	Bldg. 717 Braulio Monroy	P	Transite Removal	<.074	60
8/12/2003	Bldg. 206 Work Area	IWA	Baseline	<=0.01	1260
8/12/2003	Bldg. 206 Work Area	IWA	Baseline	<=0.01	1260
8/12/2003	Bldg. 206 Work Area	IWA	Prep.	<=0.01	720
8/12/2003	Bldg. 206 O/S Decon	IWA	Floor Tile Removal	<=0.01	840
8/12/2003	Bldg. 206 In-side Work Area	IWA	Clearance	<=0.01	1560
8/12/2003	Bldg. 206 In-side Work Area	IWA	Clearance	<=0.01	1560
8/12/2003	Bldg. 206 In-side Work Area	IWA	Clearance	<=0.01	1560
8/12/2003	Bldg. 206 Ramon Herrera	P	Floor Tile Removal	<=0.01	780
8/13/2003	Bldg. 206 In-side Work Area	IWA	Glovebag	<=0.01	960
8/13/2003	Bldg. 206 In-side Work Area	IWA	Glovebag	<=0.01	966
8/13/2003	Bldg. 206 Saul Lopez	P	Glovebag	<=0.01	976
8/13/2003	Bldg. 206 Braulio Monroy	P	Glovebag	0.05	60
8/14/2003	Bldg. 717 Upwind	IWA	Transite Removal	<=0.01	962
8/14/2003	Bldg. 717 Downwind	IWA	Transite Removal	<=0.01	962

Notes: IWA - Inside Work Area
OWA - Outside Work Area

TABLE B.1
PCM ENVIRONMENTAL AIR MONITORING RESULTS
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS
EFI PROJECT NO. 98410-13709

Date	Sample Location	Type	Abatement Activity	Airborne Fiber Concentration (f/cc)	Volume (liters)
8/14/2003	Bldg. 717 Saul Lopez	P	Transite Removal	<=0.01	966
8/14/2003	Bldg. 717 Ramon Herrera	P	Transite Removal	0.04	60
8/18/2003	Bldg. 717 Upwind	IWA	Transite Removal	<=0.01	1112
8/18/2003	Bldg. 717 Downwind	IWA	Transite Removal	<=0.01	2785
8/18/2003	Bldg. 717 Braulio Monroy	P	Transite Removal	<=0.01	1100
8/18/2003	Bldg. 717 Saul Lopez	P	Transite Removal	0.04	60
8/19/2003	Bldg. 717 / 707F / 707G Up wind	IWA	Transite Removal	<=0.01	910
8/19/2003	Bldg. 717 / 707F / 707G Down wind	IWA	Transite Removal	<=0.01	930
8/19/2003	Bldg. 717 / 707F / 707G Ramon Herrera	P	Transite Removal	<=0.01	948
8/19/2003	Bldg. 717 / 707F / 707G Roberto Sierra	P	Transite Removal	0.04	60
8/20/2003	Bldg. 707J Upwind	IWA	Transite Removal	<=0.01	710
8/20/2003	Bldg. 707J Down wind	IWA	Transite Removal	<=0.01	714
8/20/2003	Bldg. 723 In-side Work Area	IWA	Glovebag	<=0.01	360
8/20/2003	Bldg. 723 Saul Lopez	P	Transite Removal& Glovebag	<=0.01	1010
8/20/2003	Bldg. 723 Roberto Sierra	P	Glovebag Removal	0.04	60
8/21/2003	Bldg. 723 In-side Work Area	IWA	Glovebag	<=0.01	1000
8/21/2003	Bldg. 723 In-side Work Area	IWA	Glovebag	<=0.01	1000
8/21/2003	Bldg. 723 Braulio Monroy	P	Glovebag	<=0.01	946
8/21/2003	Bldg. 723 Ramon Herrera	P	Glovebag	0.07	60
8/25/2003	Bldg. 723 Upwind	IWA	Transite Removal	<=0.01	1030
8/25/2003	Bldg. 723 Downwind	IWA	Transite Removal	<=0.01	1036
8/25/2003	Bldg. 723 Ramon Herrera	P	Transite Removal	<=0.01	1044
8/25/2003	Bldg. 723 Saul Lopez	P	Transite Removal	0.09	60
8/26/2003	Bldg. 726C,726D,4-ST Upwind	IWA	Transite Removal	<=0.01	1040
8/26/2003	Bldg. 726C,726D,4-ST Downwind	IWA	Transite Removal	<=0.01	1034
8/26/2003	Bldg. 726C,726D,4-ST Ramon Herrera	P	Transite Removal	<=0.01	1040
8/26/2003	Bldg. 726C,726D,4-ST Braulio Monroy	P	Transite Removal	0.04	60
8/27/2003	Bldg. 723,722P	IWA	Glovebag Removal	<=0.01	1062
8/27/2003	Bldb. 723,722P	IWA	Glovebag Removal	<=0.01	1060
8/27/2003	Bldg. 723,722P Braulio Monroy	P	Glovebag Removal	<=0.01	1062
8/27/2003	Bldg. 723,722P Ramon Herrera	P	Glovebag Removal	0.11	60
8/28/2003	Bldg. 722P	IWA	Glovebag Removal	<=0.01	1050
8/28/2003	Bldg. 722P	IWA	Glovebag Removal	<=0.01	1044
8/28/2003	Bldg. 722P Saul Lopez	P	Glovebag Removal	<=0.01	1030
8/28/2003	Bldg. 722P Roberto Sierra	P	Glovebag Removal	0.11	60
9/2/2003	Bldg. 723 O/S water storage tank	OWA	Prep.	<=0.01	1500
9/2/2003	Bldg. 723 O/S water storage tank	OWA	Removal	<=0.01	1500

Notes: IWA - Inside Work Area
OWA - Outside Work Area

TABLE B.1
PCM ENVIRONMENTAL AIR MONITORING RESULTS
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS
EFI PROJECT NO. 98410-13709

Date	Sample Location	Type	Abatement Activity	Airborne Fiber Concentration (f/cc)	Volume (liters)
9/2/2003	Bldg. 723 O/S water storage tank	OWA	Removal	<=0.01	1700
9/2/2003	Bldg. 723 Braulio Monroy	P	Removal	<=0.01	720
9/2/2003	Bldg. 723 Clearance	IWA	Clearance	<=0.01	1378
9/2/2003	Blnd. 723 Clearance	IWA	Clearance	<=0.01	1363
9/3/2003	Bldg. 201 A Floor Tile Removal	IWA	Prep.	<=0.01	1500
9/3/2003	Bldg. 201 A Floor Tile Removal	OWA	Removal	<=0.01	1500
9/3/2003	Bldg. 201 A Floor Tile Removal	IWA	Removal	0.02	680
9/3/2003	Bldg. 201 A Floor Tile Removal	OWA	Removal	<=0.01	674
9/4/2003	Bldg. 201 A Floor Tile Removal	OWA	Removal	<=0.01	1313
9/4/2003	Bldg. 201 Rammon Herrera	P	Removal	<=0.01	996
9/4/2003	Bldg. 201 Saul Lopez	P	Removal	0.07	60
9/4/2003	Bldg. 201 A Mastic Removal	OWA	Removal	<=0.01	3250
9/4/2003	Bldg. 201 A Mastic Removal	IWA	Clearance	<=0.01	1313
9/4/2003	Bldg. 201 A Mastic Removal	IWA	Clearance	<=0.01	1300
9/4/2003	Bldg. 201 A Mastic Removal	IWA	Clearance	<=0.01	1313
9/5/2003	Bldg. 722 P	IWA	Upwind Transite Removal	<=0.01	840
9/5/2003	Bldg. 722 P	IWA	Downwind Transite Removal	<=0.01	838
9/5/2003	Bldg. 722 P Braulio Monroy	P	Removal	<=0.01	862
9/5/2003	Bldg. 722 P Saul Lopez	P	Removal	0.04	60
9/8/2003	Bldg. 722 P & 501B	IWA	Upwind Transite Removal	<=0.01	1048
9/8/2003	Bldg. 722 P & 501B	IWA	Downwind Transite Removal	<=0.01	1040
9/8/2003	Bldg. 722 P & 501B Ramon Herrera	P	Removal	<=0.01	1040
9/8/2003	Bldg. 722 P & 501B Saul Lopez	P	Removal	0.13	60
9/9/2003	Bldg. 204	IWA	Upwind Transite Removal	<=0.01	1092
9/9/2003	Bldg. 204	IWA	Downwind Transite Removal	<=0.01	1088
9/9/2003	Bldg. 204 Romon Herrera	P	Transite Removal	<=0.01	1084
9/9/2003	Bldg. 204 Braulio Monroy	P	Transite Removal	0.05	60
9/11/2003	Various Bldg. Area Clean-up	P	Transite Clean-up	<=0.01	980
9/11/2003	Various Bldg. Area Clean-up	P	Transite Clean-up	0.04	60
9/15/2003	Various Bldg. Area Clean-up	P	Transite Clean-up	<=0.01	1078
9/15/2003	Various Bldg. Area Clean-up	P	Transite Clean-up	0.04	60
9/16/2003	Bldg. 206 Braulio Monroy	P	Glovebag Removal	<=0.01	1060
9/16/2003	Bldg. 206 Roberto Sierra	P	Glovebag Removal	0.08	60
9/16/2003	Bldg. 206	IWA	Glovebag Removal	<=0.01	1070
9/16/2003	Bldg. 206	IWA	Glovebag Removal	<=0.01	1072
9/17/2003	Site Clean-up Saul Lopez	P	Demo Debri Clean-up	<=0.01	910
9/17/2003	Site Clean-up Roberto Sierra	P	Demo Debri Clean-up	0.04	60
9/17/2003	Site Clean-up Ramon Herrera	P	Demo Debri Clean-up	<=0.01	838
9/17/2003	Site Clean-up Braulio Monroy	P	Demo Debri Clean-up	0.04	60
9/22/2003	Bldg. 202	IWA	Glovebag Removal	<=0.01	806
9/22/2003	Bldg. 202	IWA	Glovebag Removal	0.02	804

Notes: IWA - Inside Work Area
OWA - Outside Work Area

TABLE B.1
PCM ENVIRONMENTAL AIR MONITORING RESULTS
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS
EFI PROJECT NO. 98410-13709

Date	Sample Location	Type	Abatement Activity	Airborne Fiber Concentration (f/cc)	Volume (liters)
9/22/2003	Bldg. 202 Robero Sierra	P	Glovebag Removal	<=0.01	1002
9/22/2003	Bldg. 202 Saul Lopez	P	Glovebag Removal	0.09	60
9/23/2003	Bldg. 202 Upwind	IWA	Transite Removal	<=0.01	840
9/23/2003	Bldg. 202 Downwind	IWA	Transite Removal	<=0.01	866
9/23/2003	Bldg. 202 Ramon Herrera	P	Transite Removal	<=0.01	1000
9/23/2003	Bldg. 202 Braulio Monroy	P	Transite Removal	<.074	60
9/23/2003	Site Clean-up Saul Lopez	P	Transite Removal	<=0.01	1082
9/24/2003	Site Clean-up Ramon Herrera	P	Transite Removal	0.04	60
9/25/2003	Site Clean-up Braulio Monroy	P	Transite Removal	<=0.01	1024
9/25/2003	Site Clean-up Roberto Sierra	P	Transite Removal	0.04	60
9/29/2003	BLDG 201R & 202 Upwind	IWA	Transite Removal	<=0.01	942
9/29/2003	BLDG 201R & 202 Downwind	IWA	Transite Removal	<=0.01	962
9/29/2003	BLDG 201R & 202 Ramon Herrera	P	Transite Removal	<=0.01	992
9/29/2003	BLDG 201R & 202 Braulio Monroy	P	Transite Removal	0.05	60
9/30/2003	BLDG 202 Upwind	IWA	Transite Removal	<=0.01	1040
9/30/2003	BLDG 202 Downwind	IWA	Transite Removal	<=0.01	1036
9/30/2003	BLDG 202 Saul Lopez	P	Transite Removal	<=0.01	1030
9/30/2003	BLDG 202 Roberto Sierra	P	Transite Removal	0.04	60
10/6/2003	BLDG 202 Upwind	IWA	Transite Removal	<=0.01	1030
10/6/2003	BLDG 202 Downwind	IWA	Transite Removal	<=0.01	1030
10/6/2003	BLDG 202 Saul Lopez	P	Transite Removal	<=0.01	1100
10/6/2003	BLDG 202 Ramon Herrera	P	Transite Removal	0.06	60
10/7/2003	BLDG 202	IWA	Glovebag Removal	<=0.01	850
10/7/2003	BLDG 202	IWA	Glovebag Removal	<=0.01	848
10/7/2003	BLDG 202 Braulio Monroy	P	Transite Removal	<=0.01	854
10/7/2003	BLDG 202 Roberto Sierra	P	Transite Removal	0.15	60
10/8/2003	BLDG 201 Upwind	IWA	Transite Removal	<=0.01	970
10/8/2003	BLDG 201 Downwind	IWA	Transite Removal	<=0.01	964
10/8/2003	BLDG 201 Roberto Sierra	P	Transite Removal	<=0.01	980
10/8/2003	BLDG 201 Braulio Monroy	P	Transite Removal	0.04	60
10/9/2003	BLDG 201 Upwind	IWA	Transite Removal	<=0.01	966
10/9/2003	BLDG 201 Downwind	IWA	Transite Removal	<=0.01	964
10/13/2003	BLDG 201 Upwind	IWA	Transite Removal	<=0.01	870
10/13/2003	BLDG 201 Downwind	IWA	Transite Removal	<=0.01	902
10/13/2003	BLDG 201 Saul Lopez	P	Transite Removal	<=0.01	1006
10/13/2003	BLDG 201 Ramon Herrera	P	Transite Removal	0.09	60
10/14/2003	Site Clean-up Roberto Sierra	P	Transite Removal	<=0.01	1078
10/14/2003	Site Clean-up Braulio Monroy	P	Transite Removal	0.04	60
0/15/2003	BLDG 201 Upwind	IWA	Transite Removal	<=0.01	1268
)/15/2003	BLDG 201 Downwind	IWA	Transite Removal	<=0.01	1030
10/15/2003	BLDG 201 Ramon Herrera	P	Transite Removal	<=0.01	1040

Notes: IWA - Inside Work Area
OWA - Outside Work Area

TABLE B.1
PCM ENVIRONMENTAL AIR MONITORING RESULTS
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS
EFI PROJECT NO. 98410-13709

Date	Sample Location	Type	Abatement Activity	Airborne Fiber Concentration (f/cc)	Volume (liters)
10/15/2003	BLDG 201 Saul Lopez	P	Transite Removal	0.04	60
10/16/2003	BLDG 201 Upwind	IWA	Transite Removal	<=0.01	918
10/16/2003	BLDG 201 Downwind	IWA	Transite Removal	<=0.01	922
10/16/2003	BLDG 201 Braulio Monroy	P	Transite Removal	<=0.01	936
10/16/2003	BLDG 201 Saul Lopez	P	Transite Removal	0.04	60
10/27/2003	BLDG 201 Upwind	IWA	Transite Removal	<=0.01	1002
10/27/2003	BLDG 201 Downwind	IWA	Transite Removal	<=0.01	1002
10/27/2003	BLDG 201 Saul Lopez	P	Transite Removal	<=0.01	1056
10/27/2003	BLDG 201 Braulio Monroy	P	Transite Removal	<=0.01	1500
10/28/2003	BLDG 201 Upwind	IWA	Transite Removal	<=0.01	1044
10/28/2003	BLDG 201 Downwind	IWA	Transite Removal	<=0.01	1042
10/28/2003	BLDG 201 Ramon Herrera	P	Transite Removal	<=0.01	1046
10/28/2003	BLDG 201 Saul Lopez	P	Transite Removal	0.04	60
10/29/2003	BLDG 201 Upwind	IWA	Transite Removal	<=0.01	1090
10/29/2003	BLDG 201 Downwind	IWA	Transite Removal	<=0.01	1088
10/29/2003	BLDG 201 Braulio Monroy	P	Transite Removal	<=0.01	1080
10/29/2003	BLDG 201 Ramon Herrera	P	Transite Removal	0.04	62
10/30/2003	BLDG 201 Upwind	IWA	Transite Removal	<=0.01	1020
10/30/2003	BLDG 201 Downwind	IWA	Transite Removal	<=0.01	1030
10/30/2003	BLDG 201 Saul Lopez	P	Transite Removal	<=0.01	1040
10/30/2003	BLDG 201 Ramon Herrera	P	Transite Removal	0.06	60
11/10/2003	BLDG 201 Upwind	IWA	Transite Removal	<=0.01	1000
11/10/2003	BLDG 201 Downwind	IWA	Transite Removal	<=0.01	1002
11/10/2003	BLDG 201 Ramon Herrera	P	Transite Removal	<=0.01	980
11/10/2003	BLDG 201 Roberto Sierra	P	Transite Removal	<=0.01	988
11/11/2003	BLDG 201 Upwind	IWA	Transite Removal	<=0.01	1070
11/11/2003	BLDG 201 Downwind	IWA	Transite Removal	<=0.01	1072
11/11/2003	BLDG 201 Saul Lopez	P	Transite Removal	<=0.01	1078
11/11/2003	BLDG 201 Braulio Monroy	P	Transite Removal	0.04	60
11/12/2003	BLDG 201 Upwind	IWA	Transite Removal	<=0.01	1072
11/12/2003	BLDG 201 Downwind	IWA	Transite Removal	<=0.01	1080
11/12/2003	BLDG 201 Ramon Herrera	P	Transite Removal	<=0.01	1050
11/12/2003	BLDG 201 Roberto Sierra	P	Transite Removal	0.04	60
11/13/2003	BLDG 709A Upwind	IWA	Transite Removal	<=0.01	1310
11/13/2003	BLDG 709A Downwind	IWA	Transite Removal	<=0.01	1056
11/13/2003	BLDG 709A Saul Lopez	P	Transite Removal	<=0.01	1080
11/13/2003	BLDG 709A Braulio Monroy	P	Transite Removal	0.04	60
11/17/2003	BLDG 206 Upwind	IWA	Transite Removal	<=0.01	1026
11/17/2003	BLDG 206 Downwind	IWA	Transite Removal	<=0.01	1036
11/17/2003	BLDG 206 Saul Lopez	P	Transite Removal	<=0.01	1062
11/17/2003	BLDG 206 Braulio Monroy	P	Transite Removal	<=0.01	1500

Notes: IWA - Inside Work Area
OWA - Outside Work Area

TABLE B.1
PCM ENVIRONMENTAL AIR MONITORING RESULTS
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS
EFI PROJECT NO. 98410-13709

Date	Sample Location	Type	Abatement Activity	Airborne Fiber Concentration (f/cc)	Volume (liters)
11/18/2003	BLDG 206 Upwind	IWA	Transite Removal	<=0.01	1048
11/18/2003	BLDG 206 Downwind	IWA	Transite Removal	<=0.01	1046
11/18/2003	BLDG 206 Roberto Sierra	P	Transite Removal	<=0.01	1038
11/18/2003	BLDG 206 Ramon Herrera	P	Transite Removal	0.04	60
11/19/2003	BLDG 206 Upwind	IWA	Transite Removal	<=0.01	1072
11/19/2003	BLDG 206 Downwind	IWA	Transite Removal	<=0.01	1090
11/19/2003	BLDG 206 Saul Lopez	P	Transite Removal	<=0.01	1086
11/19/2003	BLDG 206 Braulio Monroy	P	Transite Removal	0.04	60
11/20/2003	BLDG 413A Upwind	IWA	Transite Removal	<=0.01	520
11/20/2003	BLDG 413A Downwind	IWA	Transite Removal	<=0.01	528
11/21/2003	BLDG 413A Upwind	IWA	Transite Removal	<=0.01	1050
11/21/2003	BLDG 413A Downwind	IWA	Transite Removal	<=0.01	1052
11/21/2003	BLDG 413A Saul Lopez	P	Transite Removal	<=0.01	1080
11/21/2003	BLDG 413A Braulio Monroy	P	Transite Removal	0.04	60
11/24/2003	BLDG 413A Upwind	IWA	Transite Removal	<=0.01	1128
1/24/2003	BLDG 413A Downwind	IWA	Transite Removal	<=0.01	1100
11/24/2003	BLDG 413A Roberto Sierra	P	Transite Removal	<=0.01	1102
11/24/2003	BLDG 413A Ramon Herrera	P	Transite Removal	0.04	60
11/25/2003	BLDG 413A Upwind	IWA	Transite Removal	<=0.01	1064
11/25/2003	BLDG 413A Downwind	IWA	Transite Removal	<=0.01	1072
11/25/2003	BLDG 413A Saul Lopez	P	Transite Removal	<=0.01	1088
11/25/2003	BLDG 413A Braulio Monroy	P	Transite Removal	0.04	60
1/12/2004	BLDG 413A Upwind	IWA	Transite Removal	<=0.01	980
1/12/2004	BLDG 413A Downwind	IWA	Transite Removal	<=0.01	978
1/12/2004	BLDG 413A Saul Lopez	P	Transite Removal	<=0.01	982
1/12/2004	BLDG 413A Fernando Delgado	P	Transite Removal	0.04	60
1/13/2004	BLDG 413A Upwind	IWA	Transite Removal	<=0.01	974
1/13/2004	BLDG 413A Downwind	IWA	Transite Removal	<=0.01	974
1/13/2004	BLDG 413A Fernando Delgado	IWA	Transite Removal	<=0.01	992
1/13/2004	BLDG 413A Jesus Villanueva	IWA	Transite Removal	0.04	60
1/14/2004	BLDG 413A Upwind	IWA	Transite Removal	<=0.01	968
1/14/2004	BLDG 413A Downwind	IWA	Transite Removal	<=0.01	954
1/14/2004	BLDG 413A Jesus Villanueva	P	Transite Removal	<=0.01	988
1/14/2004	BLDG 413A Fernando Delgado	P	Transite Removal	0.04	60
1/15/2004	BLDG 413A Upwind	IWA	Transite Removal	<=0.01	1036
1/15/2004	BLDG 413A Downwind	IWA	Transite Removal	<=0.01	1032
1/15/2004	BLDG 413A Saul Lopez	P	Transite Removal	<=0.01	1032
1/15/2004	BLDG 413A Ramon Herrera	P	Transite Removal	0.04	60
1/19/2004	BLDG 413A Upwind	IWA	Transite Removal	<=0.01	540
1/19/2004	BLDG 413A Downwind	IWA	Transite Removal	<=0.01	536
1/20/2004	BLDG 413A Upwind	IWA	Transite Removal	<=0.01	450

Notes: IWA - Inside Work Area
OWA - Outside Work Area

TABLE B.1
PCM ENVIRONMENTAL AIR MONITORING RESULTS
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS
EFI PROJECT NO. 98410-13709

Date	Sample Location	Type	Abatement Activity	Airborne Fiber Concentration (f/cc)	Volume (liters)
1/20/2004	BLDG 814 Upwind	IWA	Transite Removal	<=0.01	452
1/21/2004	BLDG 814 & 813 Upwind	IWA	Transite Removal	<=0.01	1058
1/21/2004	BLDG 814 & 813 Downwind	IWA	Transite Removal	<=0.01	1056
1/21/2004	BLDG 814 & 813 Saul Lopez	P	Transite Removal	<=0.01	1090
1/21/2004	BLDG 814 & 813 Ramon Herrera	P	Transite Removal	0.04	60
1/22/2004	BLDG TS 10/800 Upwind	IWA	Transite Removal	<=0.01	1016
1/22/2004	BLDG TS 10/800 Downwind	IWA	Transite Removal	<=0.01	1020
1/22/2004	BLDG TS 10/800 Jesus Villanueva	P	Transite Removal	<=0.01	1038
1/22/2004	BLDG TS 10/800 Fernando Delgado	P	Transite Removal	0.04	60
1/26/2004	BLDG 4Y2 & 4Y Upwind	IWA	Transite Removal	<=0.01	870
1/26/2004	BLDG 4Y2 & 4Y Downwind	IWA	Transite Removal	<=0.01	870
1/26/2004	BLDG 4Y2 & 4Y Fernando Delgado	P	Transite Removal	<=0.01	910
1/26/2004	BLDG 4Y2 & 4Y Jesus Villanueva	P	Transite Removal	0.04	60
1/27/2004	BLDG 3Y-13Y-4Y2 Upwind	IWA	Transite Removal	<=0.01	1048
1/27/2004	BLDG 3Y-13Y-4Y2 Downwind	IWA	Transite Removal	<=0.01	1058
1/27/2004	BLDG 3Y-13Y-4Y2 Saul Lopez	P	Transite Removal	<=0.01	1072
1/27/2004	BLDG 3Y-13Y-4Y2 Ramon Herrera	P	Transite Removal	0.04	60
1/28/2004	BLDG 16Y UPWIND	IWA	Transite Removal	<=0.01	990
1/28/2004	BLDG 16Y Downwind	IWA	Transite Removal	<=0.01	960

Notes: IWA - Inside Work Area
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TABLE B.1
PCM ENVIRONMENTAL AIR MONITORING RESULTS
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS
EFI PROJECT NO. 98410-13709

Date	Sample Location	Type	Abatement Activity	Airborne Fiber Concentration (f/cc)	Volume (liters)
3/19/2003	Area 2 Personnel Saul Lopez	P	Removal	0.03	90
3/19/2003	Area 2	OWA	Prevalent Level	<=0.01	525
3/19/2003	Area 2	OWA	Prevalent Level	<=0.01	1452
3/19/2003	Area 8	OWA	Prevalent Level	<=0.01	1425
3/19/2003	Area 8	P/L	Prevalent Level	<=0.01	1425
3/20/2003	Area 2 bldg. 701 Personnel Saul Lopez	P	Personnel	<=0.01	1533
3/20/2003	Area 2 Bldg. 701 Upwind	IWA	Removal	<=0.01	1200
3/20/2003	Area 2 Bldg. 701Downwind	IWA	Removal	<=0.01	1203
3/20/2003	Area 7 Prevalent Level	IWA	N/A	<=0.01	1350
3/20/2003	Area 7 Prevalent Level	N/A	N/A	<=0.01	1356
3/20/2003	Area 7 Personnel Saul Lopez	N/A	Removal	<=0.01	1365
3/24/2003	Area 2 Bldg. 720A Upwind	IWA	Removal	<=0.01	1422
3/24/2003	Area 2 Bldg. 720A Downwind	IWA	Removal	<=0.01	1425
3/24/2003	Area 2 Bldg. 720A Personnel Saul Lope	P	Removal	<=0.01	1416
3/25/2003	Area 2 Bldg. 719 Upwind	IWA	Removal	<=0.01	1506
3/25/2003	Area 2 Bldg. 719Downwind	IWA	Removal	<=0.01	1509
3/25/2003	Area 2 Bldg. 719 Personnel Saul Lopez	IWA	Removal	<=0.01	1506
3/26/2003	Area 2 Bldg. 705 Downwind	IWA	Removal	<=0.01	1611
3/26/2003	Area 2 Bldg. 705 Upwind	IWA	Removal	<=0.01	1614
3/26/2003	Area 2 Bldg. 705 Personnel Saul Lopez	IWA	Removal	0.03	90
3/27/2003	Bldg. 707E Upwind	IWA	Removal	<=0.01	1551
3/27/2003	Bldg. 707E Downwind	IWA	Removal	<=0.01	1563
3/27/2003	Bldg. 707E Personnel	IWA	Removal	<=0.01	1551
3/31/2003	Bldg. 703 Upwind	IWA	Removal	<=0.01	1043
3/31/2003	Bldg. 703 Downwind	IWA	Removal	<=0.01	1190
3/31/2003	Bldg. 703 Personnel Aunilio Romero	IWA	Removal	<=0.01	982
3/31/2003	Bldg. 703 Personnel Alejandro Garcia	IWA	Removal	<=0.01	828
4/1/2003	Bldg. 703 Upwind	IWA	Removal	<=0.01	977
4/1/2003	Bldg. 703 Downwind	IWA	Removal	<=0.01	1375
4/1/2003	Bldg. 703 Personnel Alejandro Garcia	IWA	Removal	<=0.01	1166
4/1/2003	Bldg. 703 Personnel Jose Mendoza	IWA	Removal	<=0.01	918
4/1/2003	Bldg. 703 Personnel Jose Mendoza	IWA	Removal	0.04	61
4/2/2003	Bldg. 703 Upwind	IWA	Removal	<=0.01	846
4/2/2003	Bldg. 703 Downwind	IWA	Removal	<=0.01	1222
4/2/2003	Bldg. 703 Personnel Jose Aguilliar	IWA	Removal	<=0.01	1058
4/2/2003	Bldg. 703 Personnel Jose Aguilliar	IWA	Removal	0.04	61
4/3/2003	Bldg. 703 Upwind	IWA	Removal	<=0.01	495
4/3/2003	Bldg. 703 Downwind	IWA	Removal	<=0.01	424

Notes: IWA - Inside Work Area
OWA - Outside Work Area

TABLE B.1
PCM ENVIRONMENTAL AIR MONITORING RESULTS
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS
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Date	Sample Location	Type	Abatement Activity		Airborne Fiber Concentration (f/cc)	Volume (liters)
4/3/2003	Bldg. 707A/736 Pers.Rigoberto Hernandez	IWA	Removal		<=0.01	830
4/3/2003	Bldg. 736 Personnel Ramon Herrera	IWA	Removal		<=0.01	729
4/3/2003	Bldg. 707A	IWA	Removal		<=0.01	648
4/3/2003	Bldg. 451 lift	IWA	Removal		0.02	315
4/7/2003	Bldg. 707 C Upwind	IWA	Removal		<=0.01	1080
4/7/2003	Bldg. 707 C Downwind	IWA	Removal		<=0.01	1080
4/7/2003	Bldg. 451 Upwind	IWA	Removal		<=0.01	1080
4/7/2003	Bldg. 451 Personnel Rigoberto Hernandez	IWA	Removal		<=0.01	1080
4/8/2003	Bldg. 451 Upwind	IWA	Removal		<=0.01	753
4/9/2003	QA/QC recount A-047	IWA		0	<=0.01	753
4/8/2003	Bldg. 451 Downwind	IWA	Removal		<=0.01	744
4/8/2003	Bldg. 451 Upwind	IWA	Removal		<=0.01	681
4/8/2003	Bldg. 25G Downwind	IWA	Removal		<=0.01	681
4/8/2003	Bldg. 25G Personnel Rigoberto Hernandez	IWA	Removal		<=0.01	498
4/9/2003	Bldg. 801F Upwind	IWA	Removal		<=0.01	808
4/9/2003	Bldg. 801F Downwind	IWA	Removal		<=0.01	806
4/9/2003	Bldg. 18K Upwind	IWA	Removal		<=0.01	798
4/9/2003	Bldg. 18K Downwind	IWA	Removal		<=0.01	798
4/9/2003	Bldg. 18K Personnel	IWA	Removal		<=0.01	792
4/10/2003	Bldg. 18K/18K-1 Upwind	IWA	Removal		<=0.01	562
4/10/2003	Bldg. 18k/18K-1 downwind	IWA	Removal		<=0.01	568
4/10/2003	Bldg. 801F Upwind	IWA	Removal		<=0.01	554
4/10/2003	Bldg. 801F Downwind	IWA	Removal		<=0.01	552
4/10/2003	Bldg. 801F Personnel Aunilio Romero	IWA	Removal		0.04	60
4/14/2003	Bldg. 41W Upwind	IWA	Removal		<=0.01	880
4/14/2003	Bldg. 41W Downwind	IWA	Removal		<=0.01	878
4/14/2003	Bldg. 18K-1 Upwind	IWA	Removal		<=0.01	696
4/14/2003	Bldg. 18K-1 Downwind	IWA	Removal		<=0.01	696
4/14/2003	Bldg. 703 Upwind	IWA	Removal		<=0.01	832
4/14/2003	Bldg. 703 Downwind	IWA	Removal		<=0.01	834
4/14/2003	Bldg. 703 Personnel Jose Mendoza	IWA	Removal		<=0.01	694
4/15/2003	Bldg. 41W Upwind	IWA	Removal		<=0.01	880
4/15/2003	Bldg. 41W Downwind	IWA	Removal		<=0.01	880
4/15/2003	Bldg. 703 Upwind	IWA	Removal		<=0.01	848
4/15/2003	Bldg. 703 Downwind	IWA	Removal		<=0.01	846
4/15/2003	Bldg. 703 Personnel Rigoberto Hernandez	IWA	Removal		<=0.01	838

Notes: IWA - Inside Work Area
OWA - Outside Work Area

TABLE B.1
PCM ENVIRONMENTAL AIR MONITORING RESULTS
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS
EFI PROJECT NO. 98410-13709

Date	Sample Location	Type	Abatement Activity	Airborne Fiber Concentration (f/cc)	Volume (liters)
4/15/2003	Bldg. 703 Fl 1 south	IWA	Removal	<=0.01	891
4/16/2003	Bldg. 41W Upwind	IWA	Removal	<=0.01	1000
4/16/2003	Bldg. 41W Downwind	IWA	Removal	<=0.01	1000
4/16/2003	Bldg. 703 Upwind	IWA	Removal	<=0.01	998
4/16/2003	Bldg. 703 Downwind	IWA	Removal	<=0.01	1002
4/16/2003	Bldg. 703 Fl 1 south	IWA	Removal	<=0.01	1497
4/16/2003	Bldg. 703 Personnel Jose Aguilliar	IWA	Removal	<=0.01	1000
4/17/2003	Bldg. 42W Upwind	IWA	Removal	<=0.01	462
4/17/2003	Bldg. 42W Downwind	IWA	Removal	<=0.01	460
4/17/2003	Bldg. 703 Upwind	IWA	Removal	<=0.01	468
4/17/2003	Bldg. 703 Downwind	IWA	Removal	<=0.01	466
4/17/2003	Bldg. 703 Personnel Saul Lopez	IWA	Removal	<=0.01	466
4/17/2003	Bldg. 703 Fl 1 south	IWA	Removal	<=0.01	705
4/21/2003	Bldg. 703 Downwind	IWA	Removal	<=0.01	872
4/21/2003	Bldg. 703 Upwind	IWA	Removal	<=0.01	928
4/21/2003	Bldg. 42W Downwind	IWA	Removal	<=0.01	722
4/21/2003	Bldg. 42W N E Work area	IWA	Removal	<=0.01	1038
4/21/2003	Bldg. 703B Personnel Ramon Herrera	IWA	Removal	<=0.01	770
4/21/2003	Bldg. 703B Personnel Ramon Herrera	IWA	Removal	0.04	68
4/22/2003	Bldg. 703 B North Area	IWA	Removal	<=0.01	1184
4/22/2003	Bldg. 703B Decon	IWA	Removal	<=0.01	1233
4/22/2003	Bldg. 42W North Area	IWA	Removal	<=0.01	1274
4/22/2003	Bldg42W on lift	IWA	Removal	<=0.01	1115
4/22/2003	Bldg. 42W South Area	IWA	Removal	<=0.01	1235
4/22/2003	Bldg. 703B Personnel Aunilio Romero	IWA	Removal	<=0.01	436
4/22/2003	Bldg. 703B Personnel Aunilio Romero	IWA	Removal	0.02	198
4/23/2003	Bldg. 703B IWA	IWA	Removal	<=0.01	746
4/23/2003	Bldg. 42W Downwind	IWA	Removal	<=0.01	1188
4/23/2003	Bldg. 42W North Area	IWA	Removal	<=0.01	1231
4/23/2003	Bldg. 42W Upwind	IWA	Removal	<=0.01	1124
4/23/2003	Bldg. 422G Upwind	IWA	Removal	0.02	473
4/23/2003	Bldg. 703B/422G Personnel A.Garcia	IWA	Removal	<=0.01	560
4/23/2003	Bldg. 422G Personnel A.Garcia	IWA	Removal	<=0.01	366
4/24/2003	Bldg. 1 St-1 Pipe & Flooring	IWA	Removal	<=0.01	348
/24/2003	Bldg. 1 St-1 Personnel J.Aguilliar	IWA	Removal	<=0.01	363
4/24/2003	Bldg. 42W Upwind	IWA	Removal	<=0.01	823

Notes: IWA - Inside Work Area
OWA - Outside Work Area

TABLE B.1
PCM ENVIRONMENTAL AIR MONITORING RESULTS
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS
EFI PROJECT NO. 98410-13709

Date	Sample Location	Type	Abatement Activity	Airborne Fiber Concentration (f/cc)	Volume (liters)
4/24/2003	Bldg. 42W Downwind	IWA	Removal	<=0.01	785
4/24/2003	Bldg. 18K IWA	IWA	Removal	<=0.01	528
4/24/2003	Bldg. 18K IWA	IWA	Removal	<=0.01	418
4/24/2003	Bldg. 18K IWA	IWA	Removal	<=0.01	437
4/24/2003	Bldg. 18K Personnel R.Hernandez	IWA	Removal	<=0.01	414
4/24/2003	Bldg. 18K Personnel R.Hernandez	IWA	Removal	0.05	68
4/28/2003	Bldg. 44W/42W IWA	IWA	Removal	<=0.01	874
4/28/2003	Bldg. 42W/44W Downwind	IWA	Removal	<=0.01	760
4/28/2003	Bldg. 41W o/s decon	OWA	Removal	<=0.01	914
4/28/2003	Bldg. 41W IWA	IWA	Removal	<=0.01	953
4/28/2003	Bldg. 41W Personnel S.Lopez	IWA	Removal	<=0.01	363
4/28/2003	Bldg. 41W Personnel S.Lopez	IWA	Removal	0.04	73
4/28/2003	Bldg. 41W Personnel S.Lopez	IWA	Removal	<=0.01	345
4/29/2003	Bldg. 44W North	IWA	Removal	<=0.01	1008
4/29/2003	Bldg. 44W South	IWA	Removal	<=0.01	1104
4/29/2003	Bldg. 41W Clearance	IWA	Clearance	<=0.01	1308
4/29/2003	Bldg. 41W Decon	OWA	Bagout	<=0.01	1155
4/29/2003	Bldg. 703A demolition Downwind	IWA	Demo	<=0.01	760
4/29/2003	Bldg. 41W Clearance	IWA	Clearance	<=0.01	988
4/29/2003	Bldg. 41W Clearance	IWA	Clearance	<=0.01	1026
4/29/2003	Bldg. 42W Personnel A.Garcia	IWA	Removal	<=0.01	979
4/30/2003	Bldg. 44W South	IWA	Removal	<=0.01	1265
4/30/2003	Bldg. 44W North	IWA	Removal	<=0.01	1155
4/30/2003	Bldg. 703A demolition Downwind	IWA	Demo	<=0.01	1030
4/30/2003	Bldg. 41W IWA	IWA	Removal	<=0.01	1023
4/30/2003	Bldg. 41W IWA	IWA	Removal	0.02	930
4/30/2003	Bldg. 41W Personnel Braulio Monroy	IWA	Removal	<=0.01	990
4/30/2003	Bldg. 41W Personnel Braulio Monroy	IWA	Removal	0.06	66
5/1/2003	Bldg. 44W North Area	IWA	Removal	<=0.01	693
5/1/2003	Bldg. 44W South Area	IWA	Removal	<=0.01	725
5/1/2003	Bldg. 703A Demolition	OWA	Demolition	<=0.01	683
5/1/2003	Bldg. 41W-1 Upwind	IWA	Removal	<=0.01	540
5/1/2003	Bldg. 41W-1 Downwind	IWA	Removal	<=0.01	518
5/5/2003	Bldg. 44W North	IWA	Removal	<=0.01	939
5/5/2003	Bldg. 44W South	IWA	Removal	<=0.01	978
5/5/2003	Bldg. 44W Personnel J Mendoza	IWA	Removal	0.04	66
5/5/2003	Bldg. 44W Personnel J Mendoza	IWA	Removal	<=0.01	862
5/6/2003	Bldg. 44W North	IWA	Removal	<=0.01	1127
5/6/2003	Bldg. 44W South	IWA	Removal	<=0.01	1076

Notes: IWA - Inside Work Area
OWA - Outside Work Area

TABLE B.1
PCM ENVIRONMENTAL AIR MONITORING RESULTS
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS
EFI PROJECT NO. 98410-13709

Date	Sample Location	Type	Abatement Activity	Airborne Fiber Concentration (f/cc)	Volume (liters)
5/6/2003	Bldg. 44W Personnel Saul Lopez	IWA	Removal	0.06	66
5/6/2003	Saul Lopez 467-89-3372	P	Removal	<=0.01	944
5/7/2003	Bldg. 44W North	IWA	Transite Removal	<=0.01	1196
5/7/2003	Bldg. 44W South	IWA	Transite Removal	<=0.01	1144
5/7/2003	Bldg. 44W Personnel Ramon Herrera	P	Transite Removal	0.08	66
5/7/2003	Bldg. 44W Personnel Ramon Herrera	P	Transite Removal	<=0.01	1078
5/8/2003	Bldg. 44W	IWA	Transite Removal	0.02	1180
5/8/2003	Bldg. 44W	IWA	Transite Removal	<=0.01	1182
5/8/2003	Personnel Alejandro Garcia	P	Transite Removal	<=0.01	1650
5/8/2003	Personnel Alejandro Garcia	P	Transite Removal	<=0.01	1065
5/12/2003	Bldg. 44W Upwind	IWA	Transite Removal	<=0.01	1230
5/12/2003	Bldg. 44W Downwind	IWA	Transite Removal	<=0.01	1230
5/12/2003	Bldg. 44W Personnel Saul Lopez	P	Transite Removal	<=0.01	1076
5/12/2003	Bldg. 44W Personnel Jose Aguilar	P	Transite Removal	0.05	58
5/13/2003	Bldg. TS 25&49W Downwind	IWA	Transite Removal	<=0.01	1122
5/13/2003	Bldg. TS 25&49W Upwind	IWA	Transite Removal	<=0.01	1137
5/13/2003	Personnel Jose Mendoza	P	Transite Removal	<=0.01	960
5/13/2003	Personnel Braulio Monroy	P	Transite Removal	0.04	60
5/14/2003	Bldg. 46W Upwind	IWA	Transite Removal	<=0.01	1199
5/14/2003	Bldg. 46W Downwind	IWA	Transite Removal	<=0.01	1135
5/14/2003	Bldg. 46W Personnel Santos Reyes	P	Transite Removal	0.04	60
5/14/2003	Bldg. 46W Personnel Rigoberto Hernandez	P	Transite Removal	<=0.01	962
5/15/2003	Bldg. 46W Upwind	IWA	Transite Removal	<=0.01	1124
5/15/2003	Bldg. 46W Downwind	IWA	Transite Removal	<=0.01	1133
5/15/2003	Bldg. 46W Personnel Jose Aguilar	P	Transite Removal	0.04	60
5/15/2003	Bldg. 46W Personnel Braulio Monroy	P	Transite Removal	<=0.01	960
5/19/2003	Bldg. 46W Upwind	IWA	Transite Removal	<=0.01	1016
5/19/2003	Bldg. 46W Downwind	IWA	Transite Removal	<=0.01	1023
5/19/2003	Bldg. 46W Personnel Saul Lopez	P	Transite Removal	<=0.01	960
5/19/2003	Bldg. 46W Personnel Ramon Herrera	P	Transite Removal	0.05	58
5/19/2003	Field Blank	N/A	N/A	#VALUE!	#######
5/20/2003	Bldg. 31W Upwind	IWA	Transite Removal	<=0.01	880
5/20/2003	Bldg. 31W Downwind	IWA	Transite Removal	<=0.01	1093
5/20/2003	Bldg. 31W Personnel Rigoberto Hernandez	P	Transite Removal	0.05	60
5/20/2003	Bldg. 31W Personnel Jose Aguilar	P	Transite Removal	<=0.01	1068

Notes: IWA - Inside Work Area
OWA - Outside Work Area

TABLE B.1
PCM ENVIRONMENTAL AIR MONITORING RESULTS
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS
EFI PROJECT NO. 98410-13709

Date	Sample Location	Type	Abatement Activity	Airborne Fiber Concentration (f/cc)	Volume (liters)
5/21/2003	Bldg. 31W Upwind	IWA	Transite Removal	<=0.01	1109
5/21/2003	Bldg. 31W Downwind	IWA	Transite Removal	<=0.01	1109
5/21/2003	Bldg. 31W Personnel Jose Aguilar	P	Transite Removal	<=0.01	966
5/21/2003	Bldg. 31W Personnel Brauilo Monroy	P	Transite Removal	0.04	60
5/21/2003	Field Blank	N/A	N/A	#VALUE!	#######
5/22/2003	Bldg. 31W Personnel Ramon Herrera	P	Transite Removal	<=0.01	978
5/22/2003	Bldg. 31W Downwind	IWA	Transite Removal	<=0.01	1056
5/27/2003	Bldg. 31W Upwind	IWA	Transite Removal	<=0.01	1109
5/27/2003	Bldg. 33W Downwind	IWA	Transite Removal	<=0.01	1111
5/27/2003	Bldg. 33W Personnel Saul Lopez	P	Transite Removal	<=0.01	992
5/27/2003	Bldg. 33W Personnel Ramon Herrera	P	Transite Removal	0.04	62
5/28/2003	Bldg. 33W Upwind	IWA	Transite Removal	<=0.01	1155
5/28/2003	Bldg. 33W Downwind	IWA	Transite Removal	<=0.01	1148
5/28/2003	Bldg. 33W Personnel Jose Aguilar	P	Transite Removal	<=0.01	1010
5/28/2003	Bldg. 33W Personnel Santos Reyes	P	Transite Removal	0.09	60
5/28/2003	Field Blank	N/A	N/A	#VALUE!	#######
5/29/2003	Bldg. 33W Upwind	IWA	Transite Removal	<=0.01	1047
5/29/2003	Bldg. 33W Downwind	IWA	Transite Removal	<=0.01	1049
5/29/2003	Bldg. 33W Personnel Alejandro Garcia	P	Transite Removal	<=0.01	960
5/29/2003	Bldg. 33W Personnel Aunilio Romero	P	Transite Removal	0.05	58
5/30/2003	Bldg. 35W Upwind	IWA	Transite Removal	<=0.01	1001
5/30/2003	Bldg. 35W Downwind	IWA	Transite Removal	<=0.01	1012
5/30/2003	Bldg. 35W Personnel Jose Mendoza	P	Transite Removal	<=0.01	944
6/2/2003	Bldg. 42W Upwind	IWA	Transite Removal	<=0.01	670
6/2/2003	Bldg. 42W Downwind	IWA	Transite Removal	<=0.01	670
6/2/2003	Bldg. 42W Personnel Saul Lopez	P	Transite Removal	0.03	90
6/2/2003	Bldg. 42W Personnel Saul Lopez	P	Transite Removal	<=0.01	930
6/3/2003	Bldg. 25G Inside Containment	IWA	Floor Tile Removal	<=0.01	1010
6/3/2003	Bldg. 25G Inside Containment	IWA	Floor Tile Removal	<=0.01	1010
6/3/2003	Bldg. 25G Outside Containment	OWA	Floor Tile Removal	<=0.01	990
6/3/2003	Bldg. 25G Personnel Braulio Monroy	P	Floor Tile Removal	<=0.01	960
6/4/2003	Bldg. 25G Inside Containment	IWA	Floor Tile Removal	<=0.01	820
6/4/2003	Bldg. 25G Inside Containment	IWA	Floor Tile Removal	<=0.01	822
6/4/2003	Bldg. 25G Outside Containment	OWA	Floor Tile Removal	<=0.01	860

Notes: IWA - Inside Work Area
OWA - Outside Work Area

TABLE B.1
PCM ENVIRONMENTAL AIR MONITORING RESULTS
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS
EFI PROJECT NO. 98410-13709

Date	Sample Location	Type	Abatement Activity	Airborne Fiber Concentration (f/cc)	Volume (liters)
6/4/2003	Bldg. 25G Personnel Santos Reyes	P	Floor Tile Removal	<=0.01	834
6/4/2003	Bldg. 25G Inside Containment	IWA	Final Clearance	<=0.01	1260
6/4/2003	Bldg. 25G Inside Containment	IWA	Final Clearance	<=0.01	1260
6/9/2003	Bldg. 22A Upwind	IWA	Floor Tile Removal	<=0.01	910
6/9/2003	Bldg. 22A Downwind	IWA	Floor Tile Removal	<=0.01	914
6/9/2003	Bldg. 22A Personnel Ramon Herrera	P	Floor Tile Removal	0.04	60
6/9/2003	Bldg. 22A Personnel Braulio Monroy	P	Floor Tile Removal	<=0.01	1040
6/10/2003	Bldg. 22A Upwind	IWA	Final Cleaning	<=0.01	1060
6/10/2003	Bldg. 22A Downwind	IWA	Final Cleaning	<=0.01	1060
6/10/2003	Bldg. 22A Personnel Santos Reyes	P	Final Cleaning	0.05	60
6/10/2003	Bldg. 22A Personnel Santos Reyes	P	Final Cleaning	<=0.01	972
6/11/2003	Bldg. 22A Upwind	IWA	Final Cleaning	<=0.01	1080
6/11/2003	Bldg. 22A Downwind	IWA	Final Cleaning	<=0.01	1086
6/11/2003	Bldg. 22A Inside Containment	IWA	Floor Mastic Removal	<=0.01	1070
6/11/2003	Bldg. 22A Santos Reyes	IWA	Floor Mastic Removal	<=0.01	1080
6/12/2003	Bldg. 22A Upwind	IWA	Floor Mastic Removal	<=0.01	650
6/12/2003	Bldg. 22A Downwind	IWA	Floor Mastic Removal	<=0.01	632
6/12/2003	Bldg. 22A	IWA	Floor Mastic Removal	<=0.01	650
6/12/2003	Bldg. 22A Personnel Braulio Monroy	P	Floor Mastic Removal	<=0.01	958
6/12/2003	Bldg. 22A Inside Containment	IWA	Final Clearance	<=0.01	1260
6/12/2003	Bldg. 22A Inside Containment	IWA	Final Clearance	<=0.01	1260
6/16/2003	Bldg. 716	IWA	Floor Tile Removal	<=0.01	310
6/16/2003	Bldg. 716	IWA	Floor Tile Removal	<=0.01	310
6/16/2003	Bldg. 716	IWA	Floor Tile Removal	<=0.01	306
6/16/2003	Bldg. 716,744,744A Saul Lopez	IWA	Floor Tile Removal	<=0.01	960
6/16/2003	Bldg. 716	IWA	Final Clearance	<=0.01	1284
6/16/2003	Bldg. 716	IWA	Final Clearance	<=0.01	1284
6/16/2003	Bldg. 744A	IWA	Glovebag Removal	0.01	180
6/16/2003	Bldg. 744A	OWA	Glovebag Removal	0.02	182
6/16/2003	Bldg. 744 Upwind	IWA	Transite Removal	<=0.01	620
6/16/2003	Bldg. 744 Downwind	IWA	Transite Removal	<=0.01	606
6/17/2003	Bldg. 744 Upwind	IWA	Transite Removal	<=0.01	400
6/17/2003	Bldg. 744 Downwind	IWA	Transite Removal	<=0.01	404
6/17/2003	Bldg. 716	IWA	Floor Tile Removal	0.02	200
6/17/2003	Bldg. 713	IWA	Floor Tile Removal	0.02	230
6/17/2003	Bldg. 713 Personnel Ramon Herrera	P	Floor Tile Removal	<=0.01	960
6/18/2003	Bldg. 717	IWA	Floor Tile Removal	<=0.01	980
6/18/2003	Bldg. 717	IWA	Floor Tile Removal	<=0.01	980
6/18/2003	Bldg. 717 Personnel Braulio Monroy	P	Floor Tile Removal	0.04	60
6/18/2003	Bldg. 717 Personnel Braulio Monroy	P	Floor Tile Removal	<=0.01	960
6/19/2003	Bldg. 717 Upwind	IWA	Floor Tile Removal	<=0.01	890

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TABLE B.1
PCM ENVIRONMENTAL AIR MONITORING RESULTS
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS
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Date	Sample Location	Type	Abatement Activity	Airborne Fiber Concentration (f/cc)	Volume (liters)
6/19/2003	Bldg. 717 Downwind	IWA	Floor Tile Removal	<=0.01	916
6/19/2003	Bldg. 717	IWA	Floor Tile Removal	<=0.01	910
6/19/2003	Bldg. 717 Personnel Saul Lopez	P	Floor Tile Removal	<=0.01	964
6/19/2003	Bldg. 717	IWA	Final Clearance	<=0.01	1260
6/19/2003	Bldg. 717	IWA	Final Clearance	<=0.01	1260
6/23/2003	Bldg. 704D Personnel Saul Lopez	P	Floor Tile Removal	<=0.01	960
6/23/2003	Bldg. 704D Personnel Ramon Herrera	P	Floor Tile Removal	0.04	60
6/23/2003	Bldg. 704D Outside Decon	OWA	Floor Tile Removal	<=0.01	1056
6/23/2003	Bldg. 704D Rear of Bldg.	OWA	Floor Tile Removal	<=0.01	1425
6/24/2003	Bldg. 704D Outside Decon	OWA	Floor Tile Removal	<=0.01	1200
6/24/2003	Bldg. 704D Personnel Ramon Herrera	P	Floor Tile Removal	<=0.01	880
6/24/2003	Bldg. 704D Personnel Ramon Herrera	P	Floor Tile Removal	0.06	66
6/25/2003	Bldg. 704D Personnel Braulio Monroy	P	Floor Mastic Removal	<=0.01	720
6/25/2003	Bldg. 704D Outside Decon	OWA	Floor Mastic Removal	<=0.01	792
6/25/2003	Bldg. 704D Personnel Saul Lopez	P	Floor Mastic Removal	0.04	60
6/25/2003	Bldg. 704D	IWA	Final Clearance	<=0.01	1300
6/26/2003	Bldg. 451 Personnel Ramon Herrera	P	Transite Removal	0.04	66
6/26/2003	Bldg. 451 Personnel Ramon Herrera	P	Transite Removal	<=0.01	990
6/26/2003	Bldg. 451 Upwind	IWA	Transite Removal	<=0.01	960
6/26/2003	Bldg. 451 Downwind	IWA	Transite Removal	<=0.01	1104
6/30/2003	Bldg. 414 Upwind	IWA	Transite Removal	<=0.01	1050
6/30/2003	Bldg. 414 Downwind	IWA	Transite Removal	<=0.01	1030
6/30/2003	Bldg. 414 Personnel Saul Lopez	IWA	Transite Removal	<=0.01	984
6/30/2003	Bldg. 414 Personnel Ramon Herrera	P	Transite Removal	0.09	60
6/30/2003	Bldg. 414 Upwind	IWA	Transite Removal	<=0.01	1110
7/1/2003	Bldg. 414 Downwind	IWA	Transite Removal	<=0.01	1114
7/1/2003	Bldg. 414 Personnel Brautio Monrey	P	Transite Removal	<=0.01	1112
7/1/2003	Bldg. 414 Personnel Roberto Sierra	P	Transite Removal	0.04	60
7/2/2003	Bldg. 811-1 Upwind	IWA	Transite Removal	<=0.01	1020
7/2/2003	Bldg. 811-8 Downwind	IWA	Transite Removal	<=0.01	1028
7/2/2003	Bldg. 811-1-811-8 Braulio Monrey	P	Transite Removal	<=0.01	1030
7/2/2003	Bldg. 811-1-811-8 Roberto Sierra	P	Transite Removal	0.10	60
7/3/2003	Bldg. 811-9 Upwind	IWA	Transite Removal	<=0.01	1014
7/3/2003	Bldg. 811-14 Downwind	IWA	Transite Removal	<=0.01	1026
7/3/2003	Bldg. 811-9-811-14 Saul Lopez	P	Transite Removal	<=0.01	1010
7/3/2003	Bldg. 811-9-811-14 Ramon Herrera	P	Transite Removal	0.07	60
7/14/2003	Bldg. 811-15-811-19 Upwind	IWA	Transite Removal	<=0.01	1060

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TABLE B.1
PCM ENVIRONMENTAL AIR MONITORING RESULTS
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS
EFI PROJECT NO. 98410-13709

Date	Sample Location	Type	Abatement Activity	Airborne Fiber Concentration (f/cc)	Volume (liters)
7/14/2003	Bldg. 811-15-811-19 Downwind	IWA	Transite Removal	<=0.01	1072
7/14/2003	Bldg. 811-15-811-19 Saul Lopez	P	Transite Removal	<=0.01	1110
7/14/2003	Bldg. 811-15-811-19 Roberta Sierra	P	Transite Removal	0.04	60
7/15/2003	Bldg. 811-15-811-20 Upwind	IWA	Transite Removal	<=0.01	1070
7/15/2003	Bldg. 811-15-811-20 Downwind	IWA	Transite Removal	<=0.01	1072
7/15/2003	Bldg. 811-15-811-20 Ramon Herrera	P	Transite Removal	<=0.01	1064
7/15/2003	Bldg. 811-15-811-20 Roberta Sierra	P	Transite Removal	0.09	60
7/16/2003	Bldg. 811-21-811-25 Upwind	IWA	Transite Removal	<=0.01	1120
7/16/2003	Bldg. 811-21-811-25 Downwind	IWA	Transite Removal	<=0.01	1118
7/16/2003	Bldg. 811-21-811-25 Ramon Herrera	P	Transite Removal	<=0.01	1124
7/16/2003	Bldg. 811-21-811-25 Saul Lopez	P	Transite Removal	0.06	60
7/17/2003	Bldg. 811-25-811-30 Upwind	IWA	Transite Removal	<=0.01	1062
7/17/2003	Bldg. 811-26-811-30 Downwind	IWA	Transite Removal	<=0.01	1062
7/17/2003	Bldg. 811-26-811-30 Braulio Monroy	P	Transite Removal	<=0.01	1076
7/17/2003	Bldg. 811-26-811-30 Saul Lopez	P	Transite Removal	0.06	62
7/21/2003	Bldg. 811-31-811-35 Upwind	IWA	Transite Removal	<=0.01	1086
7/21/2003	Bldg. 811-31-811-35 Downwind	IWA	Transite Removal	<=0.01	1064
7/21/2003	Bldg 811-31-811-35 Braulio Monroy	P	Transite Removal	<=0.01	1062
7/21/2003	Bldg. 811-31-811-35 Ramon Herrera	P	Transite Removal	0.04	60
7/22/2003	Bldg. 811-36-811-40 Upwind	IWA	Transite Removal	<=0.01	1046
7/22/2003	Bldg. 811-36-811-40 Downwind	IWA	Transite Removal	<=0.01	1060
7/22/2003	Bldg. 811-36-811-40 Roberto Sierra	P	Transite Removal	<=0.01	1026
7/22/2003	Bldg. 811-36-811-40 Saul Lopez	P	Transite Removal	0.06	60
7/23/2003	Bldg. 811-41-811-47 Upwind	IWA	Transite Removal	<=0.01	1030
7/23/2003	Bldg. 811-41-811-47 Downwind	IWA	Transite Removal	<=0.01	1030
7/23/2003	Bldg. 811-41-811-47 Braulio Monroy	P	Transite Removal	<=0.01	1030
7/23/2003	Bldg. 811-41-811-47 Saul Lopez	P	Transite Removal	0.07	62
7/24/2003	Bldg. 811-48-811-58 Upwind	IWA	Transite Removal	<=0.01	1020
7/24/2003	Bldg. 811-48-811-58 Downwind	IWA	Transite Removal	<=0.01	1016
7/24/2003	Bldg. 811-48-811-58	P	Transite Removal	<=0.01	1014
7/24/2003	Bldg. 811-48-811-58	P	Transite Removal	0.04	60
7/28/2003	Bldg. 713 Upwind	IWA	Transite Removal	<=0.01	978
7/28/2003	Bldg. 713 Downwind	IWA	Transite Removal	<=0.01	1002
7/28/2003	Bldg. 713 Ramon Herrera	P	Transite Removal	<=0.01	998
7/28/2003	Bldg. 713 Roberto Sierra	P	Transite Removal	0.04	60
7/29/2003	Bldg. 713 Upwind	IWA	Transite Removal	<=0.01	1020
7/29/2003	Bldg. 713 Downwind	IWA	Transite Removal	<=0.01	1018
7/29/2003	Bldg. 713 Saul Lopez	P	Transite Removal	<=0.01	1010
7/29/2003	Bldg. 713 Braulio Monroy	P	Transite Removal	0.02	120
7/30/2003	Bldg. 713 & 722-E Upwind	IWA	Transite Removal	<=0.01	1024
7/30/2003	Bldg. 713 & 722-E Downwind	IWA	Transite Removal	<=0.01	1024

Notes: IWA - Inside Work Area
OWA - Outside Work Area

TABLE B.1
PCM ENVIRONMENTAL AIR MONITORING RESULTS
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS
EFI PROJECT NO. 98410-13709

Date	Sample Location	Type	Abatement Activity	Airborne Fiber Concentration (f/cc)	Volume (liters)
7/30/2003	Bldg. 713 & 722-E Roberto Sierra	P	Transite Removal	<=0.01	1036
7/30/2003	Bldg. 713 & 722-E Ramon Herrera	P	Transite Removal	<=0.01	1500
7/31/2003	Bldg. 718-A Upwind	IWA	Transite Removal	<=0.01	976
7/31/2003	Bldg. 718-A Downwind	IWA	Transite Removal	<=0.01	974
7/31/2003	Bldg. 718-A Braulio Monroy	P	Transite Removal	<=0.01	980
7/31/2003	Bldg. 713-A Roberto Sierra	P	Transite Removal	0.04	60
8/4/2003	Bldg. 718-A Upwind	IWA	Transite Removal	<=0.01	1040
8/4/2003	Bldg. 718-A Downwind	IWA	Transite Removal	<=0.01	1036
8/4/2003	Bldg. 718-A Saul Lopez	P	Transite Removal	<=0.01	1080
8/4/2003	Bldg. 718-A Braulio Monroy	P	Transite Removal	0.04	60
8/5/2003	Bldg. 718-A & 714 Upwind	IWA	Transite Removal	<=0.01	992
8/5/2003	Bldg. 718-A & 714 Downwind	IWA	Transite Removal	<=0.01	996
8/5/2003	Bldg. 718-A & 714 Ramon Herrera	P	Transite Removal	<=0.01	1000
8/5/2003	Bldg. 718-A & 714 Roberto Sierra	P	Transite Removal	0.04	60
8/6/2003	Bldg. 722-E Prep	IWA	Floor Tile Removal	<=0.01	720
8/6/2003	Bldg. 722-E O/S Decon	OWA	Floor Tile Removal	<=0.01	900
8/6/2003	Bldg. 722-E Clearance	IWA	Floor Tile Removal	<=0.01	1440
8/6/2003	Bldg. 722-E Clearance	IWA	Floor Tile Removal	<=0.01	1440
8/6/2003	Bldg. 722-E Clearance	IWA	Floor Tile Removal	<=0.01	1440
8/7/2003	Bldg. 717 Upwind	IWA	Transite Removal	<=0.01	900
8/7/2003	Bldg. 717 Downwind	IWA	Transite Removal	<=0.01	902
8/7/2003	Bldg. 717 Saul Lopez	P	Transite Removal	<=0.01	916
8/7/2003	Bldg. 717 Braulio Monroy	P	Transite Removal	0.04	60
8/11/2003	Bldg. 717 Upwind	IWA	Transite Removal	< .0049	910
8/11/2003	Bldg. 717 Downwind	IWA	Transite Removal	<=0.01	912
8/11/2003	Bldg. 717 Ramon Herrera	P	Transite Removal	<=0.01	938
8/11/2003	Bldg. 717 Braulio Monroy	P	Transite Removal	<.074	60
8/12/2003	Bldg. 206 Work Area	IWA	Baseline	<=0.01	1260
8/12/2003	Bldg. 206 Work Area	IWA	Baseline	<=0.01	1260
8/12/2003	Bldg. 206 Work Area	IWA	Prep.	<=0.01	720
8/12/2003	Bldg. 206 O/S Decon	IWA	Floor Tile Removal	<=0.01	840
8/12/2003	Bldg. 206 In-side Work Area	IWA	Clearance	<=0.01	1560
8/12/2003	Bldg. 206 In-side Work Area	IWA	Clearance	<=0.01	1560
8/12/2003	Bldg. 206 In-side Work Area	IWA	Clearance	<=0.01	1560
8/12/2003	Bldg. 206 Ramon Herrera	P	Floor Tile Removal	<=0.01	780
8/13/2003	Bldg. 206 In-side Work Area	IWA	Glovebag	<=0.01	960
8/13/2003	Bldg. 206 In-side Work Area	IWA	Glovebag	<=0.01	966
8/13/2003	Bldg. 206 Saul Lopez	P	Glovebag	<=0.01	976
8/13/2003	Bldg. 206 Braulio Monroy	P	Glovebag	0.05	60
8/14/2003	Bldg. 717 Upwind	IWA	Transite Removal	<=0.01	962
8/14/2003	Bldg. 717 Downwind	IWA	Transite Removal	<=0.01	962

Notes: IWA - Inside Work Area
OWA - Outside Work Area

TABLE B.1
PCM ENVIRONMENTAL AIR MONITORING RESULTS
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS
EFI PROJECT NO. 98410-13709

Date	Sample Location	Type	Abatement Activity	Airborne Fiber Concentration (f/cc)	Volume (liters)
8/14/2003	Bldg. 717 Saul Lopez	P	Transite Removal	<=0.01	966
8/14/2003	Bldg. 717 Ramon Herrera	P	Transite Removal	0.04	60
8/18/2003	Bldg. 717 Upwind	IWA	Transite Removal	<=0.01	1112
8/18/2003	Bldg. 717 Downwind	IWA	Transite Removal	<=0.01	2785
8/18/2003	Bldg. 717 Braulio Monroy	P	Transite Removal	<=0.01	1100
8/18/2003	Bldg. 717 Saul Lopez	P	Transite Removal	0.04	60
8/19/2003	Bldg. 717 / 707F / 707G Up wind	IWA	Transite Removal	<=0.01	910
8/19/2003	Bldg. 717 / 707F / 707G Down wind	IWA	Transite Removal	<=0.01	930
8/19/2003	Bldg. 717 / 707F / 707G Ramon Herrera	P	Transite Removal	<=0.01	948
8/19/2003	Bldg. 717 / 707F / 707G Roberto Sierra	P	Transite Removal	0.04	60
8/20/2003	Bldg. 707J Upwind	IWA	Transite Removal	<=0.01	710
8/20/2003	Bldg. 707J Down wind	IWA	Transite Removal	<=0.01	714
8/20/2003	Bldg. 723 In-side Work Area	IWA	Glovebag	<=0.01	360
8/20/2003	Bldg. 723 Saul Lopez	P	Transite Removal& Glovebag	<=0.01	1010
8/20/2003	Bldg. 723 Roberto Sierra	P	Glovebag Removal	0.04	60
8/21/2003	Bldg. 723 In-side Work Area	IWA	Glovebag	<=0.01	1000
8/21/2003	Bldg. 723 In-side Work Area	IWA	Glovebag	<=0.01	1000
8/21/2003	Bldg. 723 Braulio Monroy	P	Glovebag	<=0.01	946
8/21/2003	Bldg. 723 Ramon Herrera	P	Glovebag	0.07	60
8/25/2003	Bldg. 723 Upwind	IWA	Transite Removal	<=0.01	1030
8/25/2003	Bldg. 723 Downwind	IWA	Transite Removal	<=0.01	1036
8/25/2003	Bldg. 723 Ramon Herrera	P	Transite Removal	<=0.01	1044
8/25/2003	Bldg. 723 Saul Lopez	P	Transite Removal	0.09	60
8/26/2003	Bldg. 726C,726D,4-ST Upwind	IWA	Transite Removal	<=0.01	1040
8/26/2003	Bldg. 726C,726D,4-ST Downwind	IWA	Transite Removal	<=0.01	1034
8/26/2003	Bldg. 726C,726D,4-ST Ramon Herrera	P	Transite Removal	<=0.01	1040
8/26/2003	Bldg. 726C,726D,4-ST Braulio Monroy	P	Transite Removal	0.04	60
8/27/2003	Bldg. 723,722P	IWA	Glovebag Removal	<=0.01	1062
8/27/2003	Bldb. 723,722P	IWA	Glovebag Removal	<=0.01	1060
8/27/2003	Bldg. 723,722P Braulio Monroy	P	Glovebag Removal	<=0.01	1062
8/27/2003	Bldg. 723,722P Ramon Herrera	P	Glovebag Removal	0.11	60
8/28/2003	Bldg. 722P	IWA	Glovebag Removal	<=0.01	1050
8/28/2003	Bldg. 722P	IWA	Glovebag Removal	<=0.01	1044
8/28/2003	Bldg. 722P Saul Lopez	P	Glovebag Removal	<=0.01	1030
8/28/2003	Bldg. 722P Roberto Sierra	P	Glovebag Removal	0.11	60
9/2/2003	Bldg. 723 O/S water storage tank	OWA	Prep.	<=0.01	1500
9/2/2003	Bldg. 723 O/S water storage tank	OWA	Removal	<=0.01	1500

Notes: IWA - Inside Work Area
OWA - Outside Work Area

TABLE B.1
PCM ENVIRONMENTAL AIR MONITORING RESULTS
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS
EFI PROJECT NO. 98410-13709

Date	Sample Location	Type	Abatement Activity	Airborne Fiber Concentration (f/cc)	Volume (liters)
9/2/2003	Bldg. 723 O/S water storage tank	OWA	Removal	<=0.01	1700
9/2/2003	Bldg. 723 Braulio Monroy	P	Removal	<=0.01	720
9/2/2003	Bldg. 723 Clearance	IWA	Clearance	<=0.01	1378
9/2/2003	Blnd. 723 Clearance	IWA	Clearance	<=0.01	1363
9/3/2003	Bldg. 201 A Floor Tile Removal	IWA	Prep.	<=0.01	1500
9/3/2003	Bldg. 201 A Floor Tile Removal	OWA	Removal	<=0.01	1500
9/3/2003	Bldg. 201 A Floor Tile Removal	IWA	Removal	0.02	680
9/3/2003	Bldg. 201 A Floor Tile Removal	OWA	Removal	<=0.01	674
9/4/2003	Bldg. 201 A Floor Tile Removal	OWA	Removal	<=0.01	1313
9/4/2003	Bldg. 201 Rammon Herrera	P	Removal	<=0.01	996
9/4/2003	Bldg. 201 Saul Lopez	P	Removal	0.07	60
9/4/2003	Bldg. 201 A Mastic Removal	OWA	Removal	<=0.01	3250
9/4/2003	Bldg. 201 A Mastic Removal	IWA	Clearance	<=0.01	1313
9/4/2003	Bldg. 201 A Mastic Removal	IWA	Clearance	<=0.01	1300
9/4/2003	Bldg. 201 A Mastic Removal	IWA	Clearance	<=0.01	1313
9/5/2003	Bldg. 722 P	IWA	Upwind Transite Removal	<=0.01	840
9/5/2003	Bldg. 722 P	IWA	Downwind Transite Removal	<=0.01	838
9/5/2003	Bldg. 722 P Braulio Monroy	P	Removal	<=0.01	862
9/5/2003	Bldg. 722 P Saul Lopez	P	Removal	0.04	60
9/8/2003	Bldg. 722 P & 501B	IWA	Upwind Transite Removal	<=0.01	1048
9/8/2003	Bldg. 722 P & 501B	IWA	Downwind Transite Removal	<=0.01	1040
9/8/2003	Bldg. 722 P & 501B Ramon Herrera	P	Removal	<=0.01	1040
9/8/2003	Bldg. 722 P & 501B Saul Lopez	P	Removal	0.13	60
9/9/2003	Bldg. 204	IWA	Upwind Transite Removal	<=0.01	1092
9/9/2003	Bldg. 204	IWA	Downwind Transite Removal	<=0.01	1088
9/9/2003	Bldg. 204 Romon Herrera	P	Transite Removal	<=0.01	1084
9/9/2003	Bldg. 204 Braulio Monroy	P	Transite Removal	0.05	60
9/11/2003	Various Bldg. Area Clean-up	P	Transite Clean-up	<=0.01	980
9/11/2003	Various Bldg. Area Clean-up	P	Transite Clean-up	0.04	60
9/15/2003	Various Bldg. Area Clean-up	P	Transite Clean-up	<=0.01	1078
9/15/2003	Various Bldg. Area Clean-up	P	Transite Clean-up	0.04	60
9/16/2003	Bldg. 206 Braulio Monroy	P	Glovebag Removal	<=0.01	1060
9/16/2003	Bldg. 206 Roberto Sierra	P	Glovebag Removal	0.08	60
9/16/2003	Bldg. 206	IWA	Glovebag Removal	<=0.01	1070
9/16/2003	Bldg. 206	IWA	Glovebag Removal	<=0.01	1072
9/17/2003	Site Clean-up Saul Lopez	P	Demo Debri Clean-up	<=0.01	910
9/17/2003	Site Clean-up Roberto Sierra	P	Demo Debri Clean-up	0.04	60
9/17/2003	Site Clean-up Ramon Herrera	P	Demo Debri Clean-up	<=0.01	838
9/17/2003	Site Clean-up Braulio Monroy	P	Demo Debri Clean-up	0.04	60
9/22/2003	Bldg. 202	IWA	Glovebag Removal	<=0.01	806
9/22/2003	Bldg. 202	IWA	Glovebag Removal	0.02	804

Notes: IWA - Inside Work Area
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PCM ENVIRONMENTAL AIR MONITORING RESULTS
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS
EFI PROJECT NO. 98410-13709

Date	Sample Location	Type	Abatement Activity	Airborne Fiber Concentration (f/cc)	Volume (liters)
9/22/2003	Bldg. 202 Robero Sierra	P	Glovebag Removal	<=0.01	1002
9/22/2003	Bldg. 202 Saul Lopez	P	Glovebag Removal	0.09	60
9/23/2003	Bldg. 202 Upwind	IWA	Transite Removal	<=0.01	840
9/23/2003	Bldg. 202 Downwind	IWA	Transite Removal	<=0.01	866
9/23/2003	Bldg. 202 Ramon Herrera	P	Transite Removal	<=0.01	1000
9/23/2003	Bldg. 202 Braulio Monroy	P	Transite Removal	<.074	60
9/23/2003	Site Clean-up Saul Lopez	P	Transite Removal	<=0.01	1082
9/24/2003	Site Clean-up Ramon Herrera	P	Transite Removal	0.04	60
9/25/2003	Site Clean-up Braulio Monroy	P	Transite Removal	<=0.01	1024
9/25/2003	Site Clean-up Roberto Sierra	P	Transite Removal	0.04	60
9/29/2003	BLDG 201R & 202 Upwind	IWA	Transite Removal	<=0.01	942
9/29/2003	BLDG 201R & 202 Downwind	IWA	Transite Removal	<=0.01	962
9/29/2003	BLDG 201R & 202 Ramon Herrera	P	Transite Removal	<=0.01	992
9/29/2003	BLDG 201R & 202 Braulio Monroy	P	Transite Removal	0.05	60
9/30/2003	BLDG 202 Upwind	IWA	Transite Removal	<=0.01	1040
9/30/2003	BLDG 202 Downwind	IWA	Transite Removal	<=0.01	1036
9/30/2003	BLDG 202 Saul Lopez	P	Transite Removal	<=0.01	1030
9/30/2003	BLDG 202 Roberto Sierra	P	Transite Removal	0.04	60
10/6/2003	BLDG 202 Upwind	IWA	Transite Removal	<=0.01	1030
10/6/2003	BLDG 202 Downwind	IWA	Transite Removal	<=0.01	1030
10/6/2003	BLDG 202 Saul Lopez	P	Transite Removal	<=0.01	1100
10/6/2003	BLDG 202 Ramon Herrera	P	Transite Removal	0.06	60
10/7/2003	BLDG 202	IWA	Glovebag Removal	<=0.01	850
10/7/2003	BLDG 202	IWA	Glovebag Removal	<=0.01	848
10/7/2003	BLDG 202 Braulio Monroy	P	Transite Removal	<=0.01	854
10/7/2003	BLDG 202 Roberto Sierra	P	Transite Removal	0.15	60
10/8/2003	BLDG 201 Upwind	IWA	Transite Removal	<=0.01	970
10/8/2003	BLDG 201 Downwind	IWA	Transite Removal	<=0.01	964
10/8/2003	BLDG 201 Roberto Sierra	P	Transite Removal	<=0.01	980
10/8/2003	BLDG 201 Braulio Monroy	P	Transite Removal	0.04	60
10/9/2003	BLDG 201 Upwind	IWA	Transite Removal	<=0.01	966
10/9/2003	BLDG 201 Downwind	IWA	Transite Removal	<=0.01	964
10/13/2003	BLDG 201 Upwind	IWA	Transite Removal	<=0.01	870
10/13/2003	BLDG 201 Downwind	IWA	Transite Removal	<=0.01	902
10/13/2003	BLDG 201 Saul Lopez	P	Transite Removal	<=0.01	1006
10/13/2003	BLDG 201 Ramon Herrera	P	Transite Removal	0.09	60
10/14/2003	Site Clean-up Roberto Sierra	P	Transite Removal	<=0.01	1078
10/14/2003	Site Clean-up Braulio Monroy	P	Transite Removal	0.04	60
10/15/2003	BLDG 201 Upwind	IWA	Transite Removal	<=0.01	1268
0/15/2003	BLDG 201 Downwind	IWA	Transite Removal	<=0.01	1030
10/15/2003	BLDG 201 Ramon Herrera	P	Transite Removal	<=0.01	1040

Notes: IWA - Inside Work Area
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TABLE B.1
PCM ENVIRONMENTAL AIR MONITORING RESULTS
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS
EFI PROJECT NO. 98410-13709

Date	Sample Location	Type	Abatement Activity	Airborne Fiber Concentration (f/cc)	Volume (liters)
10/15/2003	BLDG 201 Saul Lopez	P	Transite Removal	0.04	60
10/16/2003	BLDG 201 Upwind	IWA	Transite Removal	<=0.01	918
10/16/2003	BLDG 201 Downwind	IWA	Transite Removal	<=0.01	922
10/16/2003	BLDG 201 Braulio Monroy	P	Transite Removal	<=0.01	936
10/16/2003	BLDG 201 Saul Lopez	P	Transite Removal	0.04	60
10/27/2003	BLDG 201 Upwind	IWA	Transite Removal	<=0.01	1002
10/27/2003	BLDG 201 Downwind	IWA	Transite Removal	<=0.01	1002
10/27/2003	BLDG 201 Saul Lopez	P	Transite Removal	<=0.01	1056
10/27/2003	BLDG 201 Braulio Monroy	P	Transite Removal	<=0.01	1500
10/28/2003	BLDG 201 Upwind	IWA	Transite Removal	<=0.01	1044
10/28/2003	BLDG 201 Downwind	IWA	Transite Removal	<=0.01	1042
10/28/2003	BLDG 201 Ramon Herrera	P	Transite Removal	<=0.01	1046
10/28/2003	BLDG 201 Saul Lopez	P	Transite Removal	0.04	60
10/29/2003	BLDG 201 Upwind	IWA	Transite Removal	<=0.01	1090
10/29/2003	BLDG 201 Downwind	IWA	Transite Removal	<=0.01	1088
0/29/2003	BLDG 201 Braulio Monroy	P	Transite Removal	<=0.01	1080
10/29/2003	BLDG 201 Ramon Herrera	P	Transite Removal	0.04	62
10/30/2003	BLDG 201 Upwind	IWA	Transite Removal	<=0.01	1020
10/30/2003	BLDG 201 Downwind	IWA	Transite Removal	<=0.01	1030
10/30/2003	BLDG 201 Saul Lopez	P	Transite Removal	<=0.01	1040
10/30/2003	BLDG 201 Ramon Herrera	P	Transite Removal	0.06	60
11/10/2003	BLDG 201 Upwind	IWA	Transite Removal	<=0.01	1000
11/10/2003	BLDG 201 Downwind	IWA	Transite Removal	<=0.01	1002
11/10/2003	BLDG 201 Ramon Herrera	P	Transite Removal	<=0.01	980
11/10/2003	BLDG 201 Roberto Sierra	P	Transite Removal	<=0.01	988
11/11/2003	BLDG 201 Upwind	IWA	Transite Removal	<=0.01	1070
11/11/2003	BLDG 201 Downwind	IWA	Transite Removal	<=0.01	1072
11/11/2003	BLDG 201 Saul Lopez	P	Transite Removal	<=0.01	1078
11/11/2003	BLDG 201 Braulio Monroy	P	Transite Removal	0.04	60
11/12/2003	BLDG 201 Upwind	IWA	Transite Removal	<=0.01	1072
11/12/2003	BLDG 201 Downwind	IWA	Transite Removal	<=0.01	1080
11/12/2003	BLDG 201 Ramon Herrera	P	Transite Removal	<=0.01	1050
11/12/2003	BLDG 201 Roberto Sierra	P	Transite Removal	0.04	60
11/13/2003	BLDG 709A Upwind	IWA	Transite Removal	<=0.01	1310
11/13/2003	BLDG 709A Downwind	IWA	Transite Removal	<=0.01	1056
11/13/2003	BLDG 709A Saul Lopez	P	Transite Removal	<=0.01	1080
11/13/2003	BLDG 709A Braulio Monroy	P	Transite Removal	0.04	60
11/17/2003	BLDG 206 Upwind	IWA	Transite Removal	<=0.01	1026
11/17/2003	BLDG 206 Downwind	IWA	Transite Removal	<=0.01	1036
1/17/2003	BLDG 206 Saul Lopez	P	Transite Removal	<=0.01	1062
11/17/2003	BLDG 206 Braulio Monroy	P	Transite Removal	<=0.01	1500

Notes: IWA - Inside Work Area
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TABLE B.1
PCM ENVIRONMENTAL AIR MONITORING RESULTS
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS
EFI PROJECT NO. 98410-13709

Date	Sample Location	Type	Abatement Activity	Airborne Fiber Concentration (f/cc)	Volume (liters)
11/18/2003	BLDG 206 Upwind	IWA	Transite Removal	<=0.01	1048
11/18/2003	BLDG 206 Downwind	IWA	Transite Removal	<=0.01	1046
11/18/2003	BLDG 206 Roberto Sierra	P	Transite Removal	<=0.01	1038
11/18/2003	BLDG 206 Ramon Herrera	P	Transite Removal	0.04	60
11/19/2003	BLDG 206 Upwind	IWA	Transite Removal	<=0.01	1072
11/19/2003	BLDG 206 Downwind	IWA	Transite Removal	<=0.01	1090
11/19/2003	BLDG 206 Saul Lopez	P	Transite Removal	<=0.01	1086
11/19/2003	BLDG 206 Braulio Monroy	P	Transite Removal	0.04	60
11/20/2003	BLDG 413A Upwind	IWA	Transite Removal	<=0.01	520
11/20/2003	BLDG 413A Downwind	IWA	Transite Removal	<=0.01	528
11/21/2003	BLDG 413A Upwind	IWA	Transite Removal	<=0.01	1050
11/21/2003	BLDG 413A Downwind	IWA	Transite Removal	<=0.01	1052
11/21/2003	BLDG 413A Saul Lopez	P	Transite Removal	<=0.01	1080
11/21/2003	BLDG 413A Braulio Monroy	P	Transite Removal	0.04	60
11/24/2003	BLDG 413A Upwind	IWA	Transite Removal	<=0.01	1128
11/24/2003	BLDG 413A Downwind	IWA	Transite Removal	<=0.01	1100
11/24/2003	BLDG 413A Roberto Sierra	P	Transite Removal	<=0.01	1102
11/24/2003	BLDG 413A Ramon Herrera	P	Transite Removal	0.04	60
11/25/2003	BLDG 413A Upwind	IWA	Transite Removal	<=0.01	1064
11/25/2003	BLDG 413A Downwind	IWA	Transite Removal	<=0.01	1072
11/25/2003	BLDG 413A Saul Lopez	P	Transite Removal	<=0.01	1088
11/25/2003	BLDG 413A Braulio Monroy	P	Transite Removal	0.04	60
1/12/2004	BLDG 413A Upwind	IWA	Transite Removal	<=0.01	980
1/12/2004	BLDG 413A Downwind	IWA	Transite Removal	<=0.01	978
1/12/2004	BLDG 413A Saul Lopez	P	Transite Removal	<=0.01	982
1/12/2004	BLDG 413A Fernando Delgado	P	Transite Removal	0.04	60
1/13/2004	BLDG 413A Upwind	IWA	Transite Removal	<=0.01	974
1/13/2004	BLDG 413A Downwind	IWA	Transite Removal	<=0.01	974
1/13/2004	BLDG 413A Fernando Delgado	IWA	Transite Removal	<=0.01	992
1/13/2004	BLDG 413A Jesus Villanueva	IWA	Transite Removal	0.04	60
1/14/2004	BLDG 413A Upwind	IWA	Transite Removal	<=0.01	968
1/14/2004	BLDG 413A Downwind	IWA	Transite Removal	<=0.01	954
1/14/2004	BLDG 413A Jesus Villanueva	P	Transite Removal	<=0.01	988
1/14/2004	BLDG 413A Fernando Delgado	P	Transite Removal	0.04	60
1/15/2004	BLDG 413A Upwind	IWA	Transite Removal	<=0.01	1036
1/15/2004	BLDG 413A Downwind	IWA	Transite Removal	<=0.01	1032
1/15/2004	BLDG 413A Saul Lopez	P	Transite Removal	<=0.01	1032
1/15/2004	BLDG 413A Ramon Herrera	P	Transite Removal	0.04	60
1/19/2004	BLDG 413A Upwind	IWA	Transite Removal	<=0.01	540
1/19/2004	BLDG 413A Downwind	IWA	Transite Removal	<=0.01	536
1/20/2004	BLDG 413A Upwind	IWA	Transite Removal	<=0.01	450

Notes: IWA - Inside Work Area
OWA - Outside Work Area

TABLE B.1
PCM ENVIRONMENTAL AIR MONITORING RESULTS
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS
EFI PROJECT NO. 98410-13709

Date	Sample Location	Type	Abatement Activity	Airborne Fiber Concentration (f/cc)	Volume (liters)
1/20/2004	BLDG 814 Upwind	IWA	Transite Removal	<=0.01	452
1/21/2004	BLDG 814 & 813 Upwind	IWA	Transite Removal	<=0.01	1058
1/21/2004	BLDG 814 & 813 Downwind	IWA	Transite Removal	<=0.01	1056
1/21/2004	BLDG 814 & 813 Saul Lopez	P	Transite Removal	<=0.01	1090
1/21/2004	BLDG 814 & 813 Ramon Herrera	P	Transite Removal	0.04	60
1/22/2004	BLDG TS 10/800 Upwind	IWA	Transite Removal	<=0.01	1016
1/22/2004	BLDG TS 10/800 Downwind	IWA	Transite Removal	<=0.01	1020
1/22/2004	BLDG TS 10/800 Jesus Villanueva	P	Transite Removal	<=0.01	1038
1/22/2004	BLDG TS 10/800 Fernando Delgado	P	Transite Removal	0.04	60
1/26/2004	BLDG 4Y2 & 4Y Upwind	IWA	Transite Removal	<=0.01	870
1/26/2004	BLDG 4Y2 & 4Y Downwind	IWA	Transite Removal	<=0.01	870
1/26/2004	BLDG 4Y2 & 4Y Fernando Delgado	P	Transite Removal	<=0.01	910
1/26/2004	BLDG 4Y2 & 4Y Jesus Villanueva	P	Transite Removal	0.04	60
1/27/2004	BLDG 3Y-13Y-4Y2 Upwind	IWA	Transite Removal	<=0.01	1048
1/27/2004	BLDG 3Y-13Y-4Y2 Downwind	IWA	Transite Removal	<=0.01	1058
1/27/2004	BLDG 3Y-13Y-4Y2 Saul Lopez	P	Transite Removal	<=0.01	1072
1/27/2004	BLDG 3Y-13Y-4Y2 Ramon Herrera	P	Transite Removal	0.04	60
1/28/2004	BLDG 16Y UPWIND	IWA	Transite Removal	<=0.01	990
1/28/2004	BLDG 16Y Downwind	IWA	Transite Removal	<=0.01	960

Notes: IWA - Inside Work Area
OWA - Outside Work Area

APPENDIX C
DAILY FIELD NOTES

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NOTES: Daily NOTES

EFI®

703 - 703A - MONDAY - General Debris clean up on 3/17/03

3/18/03 - 703 & 703A & 719 - General Brush clearing around Bldg.

- PRE-CON MTG. W/ BRAC REP., G.C; ARC & EFI
  - Discuss scope of work
  - Discuss addition scope
- Crew of 4 & 1 Supervisor - Review Crew's paper work. All in compliance
- NO ASBESTOS WORK TODAY - NOTIFICATION (TDH) will Go into effect Tomorrow
- Crew continued w/ Clearing Trees & Brush from Buildings
- RAIN all DAY - NO PREVALENT RUN

3/19/03

7:00 AM - Crew & EFI on-site

7:15 AM - Supervisor Helo Safety MTG.

7:35 AM - Supervisor informs EFI - That Crew will continue w/ Brush & Tree clearing and will have one worker clean / pick up Transite Debris to satisfy TDH Notification.

8:00 AM - Crew Begins clearing Brushes - EFI sets prevalent level in Area II (Admin. Area) - Sample #2 & #3

8:20 AM - Set prevalent level in Area III (TNT production Area) Sample # 4 & #5

9:30 AM - Crew Completes 1/2 of Brush & Tree clearing from Bldg. 719

11:15 AM - Crew mobile to Area III to clear Brushes in Bldgs. 707C, 704A & 707A

12:00 PM - Crew Breaks for 1/2 hr lunch

1:30 PM - Crew moved to Bldg 451 to clear brushes

4:00 PM - EFI collects Prevalent level samples - Crew Finish clearing brushes from Bldg 451 - will mobilize to Bldg 703A to build remote Decon & Pick up Transite Debris @ 703

4:05 PM - EFI set up 30 min steel

4:35 PM - EFI collects 30 min steel

5:10 PM - Crew will complete Buildup Decon Tomorrow

5:30 PM - EFI & ARC off-site

00064151

NOTES: Daily NOTES 3/20/03

EFI

3/20/03

7:00 AM - EFI & ARC ON-SITE - CREW will SPLIT up INTO 2 GROUPS - GROUP ONE will Build POWER DECON @ AREA II - BLDG. 703A. 2ND GROUP will BEGIN REMOVING TRANSITE FROM EXTERIOR of BLDG. 701 FROM AREA II

7:40 AM - CREW COMPLETES BARRICADE of BLDG. 701 - SET up SIGNS / LAY Floor Poly AROUND PERIMETER SUITED up & BEGAN TRANSITE REMOVAL PIECES.
- REMOVE NAIL HEADS / SPRAY AMENDED WATER
- DETACH EXTERIOR SIDING FROM BLDG. STRUCTURE IN WHOLE PIECES
- PLACE SIDINGS ON Floor poly FOR WRAP & DISPOSAL.

9:15 AM CHANGED OUT 30 MIN. STEL. - SET MICRO (PREVALENT) IN AREA VII

9:05 AM GROUP 2 COMPLETES CONSTRUCTION OF THE DECON UNIT & WILL MOBILIZE TO BLDG 701 TO ASSIST GROUP 1

9:30 AM CREW COMPLETES 30% OF REMOVAL OF EXTERIOR TRANSITE SIDING.

12:00 AM CREW BREAKS FOR LUNCH

2:30 PM CREW Completes 100% Removal @ BLDG. 701 will MOBILIZE TO BLDG. 719 TO REMOVE TRANSITE EXT. SIDING

3:50 PM EFI Collect CASSETTES - CREW CONTINUE W/ REMOVAL

5:15 PM ARC COMPLETES 15% of TRANSITE REMOVAL - will CONTINUE ON MONDAY.

5:30 PM ARC & EFI OFF-SITE

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00064152

Field Report

Date: 3-24 , 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

7:00A - EFI & ARC ON SITE. ARC WILL BEGIN ABATEMENT ON BUILDING 720-A. WORKER HAVE BARRIER TAPE AROUND PERIMETER OF BUILDING.

8:00A - WORKERS (4) IN SUITS & ½ FACE RESPIRATORS ARE REMOVING TRANSITE SHINGLES WITH MINIMAL DAMAGE at this time. EFI PLACES AIR SAMPLING EQUIPMENT AROUND THE WORK AREA.

11:30A - Workers Go to Lunch

12:30p - WORKERS MEET FOR SAFETY ORIENTATION ON LIFT EQUIPMENT.

2:30p - WORKER PRACTICE OPERATING LIFT EQUIPMENT.

3:30p - WORKERS RETURN TO BLDG 720A to CONTINUE REMOVAL

Owner: US Army Industrial Operation
DAIM-BO-O, 1 Rock Island Arsenal
Rock Island, IL 61299
Site: Longhorn Army Ammunition Plant
Hwy 43 @ Spur 449

↳ Generator Label to Be used on waste

Site Representative (Print Name) _____ Signature/Date _____

Contractor Supervisor (Print Name) _____ Signature/Date _____

EFI®
Engineering and Fire Investigations

00064153

Field Report

Date: 3-25, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

7:00A - ARC & EFI ON SITE. WORK WILL BEGIN ON BLDG. 719. WITH THE EXCEPTION OF THE GABLES WORK ON BLDG 720A IS COMPLETE.

8:00A - EFI CALIBRATES AIR SAMPLING PUMPS & PLACES THEM AROUND THE WORK AREA.

10:00A - EFI OBSERVES 4 WORKER IN SUITS & & MASKS REMOVING TRANSITE SIDING FROM BLDG. EFI ASKS ARC TO WET SIDING PRIOR TO REMOVAL.

11:00A - EFI OBSERVES WORKERS REMOVING TRANSITE SHINGLES. IT APPEARS THAT THE MAJORITY OF THE SHINGLES ARE BEING REMOVED INTACT. EFI ASKS ARC TO UTILIZE HOKE WATER.

12:00p. WORKERS GO TO LUNCH.

1:00p WORKERS RETURN to WORK. EFI ASKS WORKERS TO CAREFULLY LOWER SHINGLES to GROUND TO PREVENT DAMAGE.

Site Representative (Print Name) _____ Signature/Date _____

Contractor Supervisor (Print Name) _____ Signature/Date _____

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Engineering and Fire Investigations

00064154

Field Report

Date: 3.25, 2003

Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

3:00p - WORKERS COUTINUE TO REMOVE SIDING SHINGLES FROM BLDG. 719. WORKERS ARE ASKED TO USE WATER TO KEEP SHINGLES WET DURING REMOVAL.

4:00p - EFI PICKS UP ~~AIR~~ AIR SAMPLING EQUIP. ARC WORKERS HAVE COMPLETE REMOVAL ON THE EAST SIDE OF BUILDING 719 AND ARE STARTING ON EAST SIDE OF BUILDING 705. BLDG 705 & 719 ARE CONNECTED.

5:00p - EFI & ARC LEAVE AREA FOR DAY

Site Representative (Print Name) _____ Signature/Date _____

Contractor Supervisor (Print Name) _____ Signature/Date _____

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00064155

Field Report

Date: 3-26, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

7:00A - EFI & ARC ON SITE.

8:00A - EFI CALIBRATES AIR SAMPLING EQUIPMENT AND PLACES THEM AROUND WORK AREA. EFI OBSERVES WORKER DROPPING SIDING TILES FROM top OF LADDER. EFI ASKS ARC TO CAREFULLY LOWER SHINGLES TO PREVENT DAMAGE.

9:00A - ARC HAS SAFETY TRAINING FOR USE OF HIGH LIFTS ON JOB.

11:00A - SAFETY TRAINING COMPLETED

11:30A - WORKERS GO TO LUNCH.

12:30p - WORKERS RETURN TO WORK AREA. WORKERS CONTINUE to REMOVE SIDING FROM THE 705 BUILDING. FOUR WORKERS IN SUITS & RESPIRATORS (½ FACE) ARE PERFORMING THE WORK.

2:30p - WORKERS CONTINUE REMOVAL OF SIDING SHINGLES ON BUILDING ~~705~~ 705.

5:00p - EFI & ARC OFF SITE.

Site Representative (Print Name) _____ Signature/Date _____

Contractor Supervisor (Print Name) _____ Signature/Date _____

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Engineering and Fire Investigations

00064156

Field Report

Date: 3-27 , 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

7:00A - EFI & ARC ON SITE.

8:00A - EFI CALIBRATES AIR SAMPLING EQUIPMENT AND PLACES AROUND WORK AREA. IT APPEARS THAT ARC WILL BEGIN WORK ON BLDG 719 AND THEN MOVE TO BLDG. 707-E

10:00A - ARC HAS COMPLETED WORK ON THE EXTERIOR OF BLDG 719 AND HAVE MOVED TO BLDG 707E. FOUR WORKERS WILL REMOVE THE SIDING ON THIS BLDG. THE WORKERS ARE WEARING SUITS & ½ FACE RESPIRATORS.

11:30A - WORKERS LEAVE WORK AREA FOR LUNCH.

12:30p - WORKERS RETURN to WORK AREA, to CONTINUE REMOVAL OF SIDING SHINGLES

2:00p - WORKERS CONTINUE REMOVAL ON BLDG. 707E.

4:00p - WORKERS COMPLETE REMOVAL ON BLDG 707E. WORKERS LEAVE SITE.

5:00p - EFI & ARC LEAVE SITE.

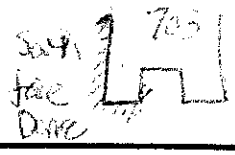
Site Representative (Print Name) _____ Signature/Date _____

Contractor Supervisor (Print Name) _____ Signature/Date _____

00064157

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Engineering and Fire Investigations

CLEAR cool Sunny



Field Report

Date: 3/31, 2003 MONDAY | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0700 - @ gate; workers (5) already 1/5 ?
- 0715 - Guard shows sign in; workers to start on Admin. Bldg. 703 South face - set up barrier tape, poly on ground; JLG's running
- 0815 - Workers prepped; 1/2 masks; coveralls & lanyards. Begin removal of metal soffitt; Pumps set - Begin abate of transite panels in whole pieces.
- 0915 - operations - OK - removed in whole pieces.
- 1000 - OP's OK; < 1/4 done with South face 2 more workers have showed up 7 + 1 supv.
- 1100 - OP's OK > 1/2 done w/ south face; minor breaks - small pieces placed in bag - wetted first.
- 1145 - Workers break for lunch
- 1240 - workers suit up 1/2 face/ hard hats, coveralls resume operations on South face
- 1400 - South face done except minor clean-up 2 other workers on 719 top eaves 705 finish up
- 1435 - Workers on JLG on east face & around corner on north face - whole pieces
- 1530 - Workers on 2NP Interior east face & ~~south~~ north face operations OK.
- 1600 - Workers to start shut down for day; bag-up all waste.
- 1630 - Workers stop for day decon & areas cleaned up
- 1705 - Workers departing site for day.

ADAM Saiterfield
Site Representative (Print Name)

Adam Saiterfield 3/31/03
Signature/Date

Contractor Supervisor (Print Name)

Signature/Date

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Sunny Warming up Breezy

BLDG 719

00064158

Field Report

Date: APRIL 1, 2003

Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

workers: 7+ SUPV.

Description 0655 - Train debg 0710 - Access through gate, Workers will continue transite panel removal on 703 - Main Admin Bldg + TOP ^ eaves of 719. Workers already suited up ½ Masks, coveralls, hardhat etc for work.
- 0800 - operations on east Center court under way - Barrier tape up and workers on lifts doing removal - whole Pieces.
- 0900 - operations ok ; 2 other workers have finished eaves on 719 will do others as well. Waste stacked on pallets
- 1000 - operations OK - done w/east ½ face of 703 on South ½ face.
- 1045 - Workers OK start NE face removal by stairs. Operations OK ; Waste stacked
- 1140 - Workers have stopped to clean-up for lunch.
- 1230 - Workers prepare to resume operations.
- 1300 - Workers almost done w/ NE face
- 1330 - Hertz here to fix one of lifts - done in hour. Complete NE - Move other lift to west section - prep poly + barrier tape
- 1415 - Lift fixed. Move over to west face
- 1330 - operations on west area - OK . Put labels on Transite Pallets.
- 1630 - Workers cleaning up for day ; on west section: Crew removed ~ 1/4+ of panels Waste bagged and whole pieces placed on pallets.
- 1650 - Crew has decon'd cleaned up and preparing to leave
- 1705 - Crew departing site; trailer locked up.

Adam Satterfield
Site Representative (Print Name)

Adam Satterfield 4/1/03
Signature/Date

Contractor Supervisor (Print Name)

Signature/Date

00064159

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Sunny/Windy to 80° BLDG 719

Field Report

Date: 4/2, 2003 WED. | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC 7 workers + 1 supv.

Description

0645 - crew & I on site
- 0700 - Trailer unlocked; Crew to continue on 703 WEST face transite panels today - when finished - to north face.
- 0800 operations OK; Workers in 1/2 face; hard hats coveralls removing pieces whole; poly on ground - pieces stacked.
- 0900 - Marianne - Supv. of DOD on site w/ J. Chavez discuss scope and invoices and disposal.
- 0935 - They depart site; workers continue both lifts.
- 1030 - 2 workers start lower panels on N. face work in WEST U section >75%. ops's ok.
- 1130 - Crew breaks for lunch.
- 1230 - Crew back from lunch - will final west U area.
- 1335 - Crew done w/ west U Section except minor area by S. stairs and clean-up.
- 1415 - Clean up almost complete; lifts are at N. face. Removing panels whole - op's ok.
- 1515 - Area of west U done. All 7 on North face operations ok - barrier tape, etc. WET methods.
- 1600 - operations OK; removal panels whole pieces.
- 1630 - one LIFT GETS STUCK in MUD; work has stopped to free machine. Clean-up
- 1700 - T. Pilgrim can't get unit out - Workers have cleaned up general area - will leave for the day
- 1710 - ARC & EFI Depart

Adam Satterfield
Site Representative (Print Name)

Adam Satterfield
Signature/Date

Contractor Supervisor (Print Name)

Signature/Date

00064160

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Engineering and Fire Investigations

CLOUDY AM
TO ~78°

703 Done 451 - start lg. Panels Roof
736-A - Done
707-A - 1/3

Field Report

Date: 4/3, 2003 Thurs.

Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description 0600-615 - Workers have arrived - will set up and finish BLD6. 703 Exterior Panels and then start BLD6: #736A
* NOTE 703 Admin still has friable TSI - Linoleum & TSI *
- 0700 - Workers in north face zone of Bldg. 703 LIFT is still stuck; 1/2 face, hard hats, coveralls, safety etc. & wet removal of whole pieces; poly under on ground & barrier tape
- 0750 - Lift removed out of mud hole - continue removal
- 0830 - Workers have cleared brush from 736 - this
* Bldg. is an ADD to contract. Chainsaw + bushes.
- 0900 - Bldg. 707A is in Area VIII Prep - barrier tape & workers to start transite removal.
Bldg. 736-A & workers start transite removal
Work on 703 Admin - removal on last 10% Clean-up.
- 1000 - Workers on 736A - one side done; Workers on 707A on northeast face - stack panels on pallets - o'k
- 1045 - lift done on 703 - clean-up operations
- 1100 - 703 is complete; work on other 2 Bldg's - OK.
- 1120 - Workers cleaning up for lunch
- 1130-1230 - Lunch for Crew
- 1245 - Workers set up for Bldg. 451 others to finish 736A then move to 707A.
- 1300 - Mike Huczak on site; Watch removal of roof on 451. Whole Pieces lowered to ground.
- 1400 - Removal @ 736A Complete - Minor clean-up; Operations @ 707A have resumed w/ 2 workers - Panels @ 451 from W. Roof
- 1530 - Operations being shut down for week; 1/3 done on 707A ON 451 ~> 1/4 of front n. roof slope is complete Workers clean-up
- 1610 - ARC + EFI depart site

Adam Satterfield
Site Representative (Print Name)

Adam Satterfield 4/3/03
Signature/Date

Contractor Supervisor (Print Name)

Signature/Date

00064161

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Engineering and Fire Investigations

BLDG. 722-G
BLDG-451
704-A
601-B
25-G

Field Report

Date: 4-8 , 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC | PAGE

Description

7:00A - EFI & ARC ON SITE. EFI IS INFORMED that WORKERS WILL BE COMPLETING WORK ON BLDGS 722G, 704A ~~@~~ at MID MORNING AND MOVING to BLDGS. 601-B and 25G. ONE CREW WILL CONTINUE to WORK ON BLDG 451.

8:00A - BECAUSE OF POWER OUTAGE DURING NITE. EFI WILL ALLOW PUMPS TO CHARGE PRIOR TO SETTING. EFI CALIBRATES PUMPS AND PREPARES CASSETTES.

9:00A - EFI OBSERVES THAT TWO WORKERS IN SUITS & ½ RESPIRATORS ARE FINISHING WORK @ BLDG 722-G. 2 WORKERS IN SUITS & ½ FACE RESPIRATORS ARE FINISHING WORK @ BLDG 704-A. THREE WORKERS IN SUITS & ½ FACE RESPIRATORS ARE WORKING ON BLDG 451 and 3 WORKERS ARE CUTTING TREES & BRUSH FROM AROUND BLDG 25G.

10:00A - WORKERS HAVE COMPLETED WORK @ BLDG 704A AND ARE MOVED TO BLDG 601-B.

10:30A - WORKERS HAVE COMPLETED TRIMMING TREES AND BRUSH AROUND BLDG. 25G & HAVE MOVED to BLDG.

11:00A - WORKERS HAVE COMPLETED WORK @ BLDG 722G AND HAVE MOVED to BLDG. 25G.

12:00p - WORKERS GO TO LUNCH

1:00p - WORKERS RETURN TO WORK. FOUR WORKERS WILL WORK @ BLDG 25G & FIVE WILL WORK AT BLDG 451

2:00p - EFI ASKS ARC TO USE WATER WHEN REMOVING TRANSITE SHEETS. IN AN EFFORT TO MINIMIZE POTENTIAL FIBER RELEASE.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064162

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Engineering and Fire Investigations

Field Report

Date: 4-8, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

3:00p - EFI SPEAKS WITH ARC ABOUT BREAKING SIDING SINGLES ON BLDG 25G. ARC WILL SPEAK TO WORKERS.

4:00p - WORKERS ARE FINISHING REMOVAL ON BLDG 25G. WORKERS CONTINUE REMOVING ROOF PANELS ON BLDG. 451. EFI COLLECTS AIR SAMPLING EQUIPMENT.

5:00p - EFI & ARC OFF-SITE

Site Representative (Print Name) _____ Signature/Date _____

Contractor Supervisor (Print Name) _____ Signature/Date _____

EFI®
Engineering and Fire Investigations

BLDG. 801F 18K 18K-1 25G-1

00064163

Field Report

Date: 4-9 , 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

7:00A - EFI & ARC ON SITE. EFI IS INFORMED THAT WORKERS WILL BE WORKING ON BLDGS. 25G-1, 18-K, 18K-1 & 801F. BECAUSE OF DIFFCULTIES WITH ACLESS THE BACKSIDE OF BUILDING 451 WILL WAIT UNTIL DRYER WEATHER.

8:00A - EFI CALIBRATES AIR SAMPLING EQUIPMENT AND PLACES IT AROUND THE WORK AREA. EFI OBSERVES THAT IT APPEARS THAT THREE WORKERS IN SUITS AND ½ FACE RESPIRATORS ARE PICKING UP AROUND BLDG 451 PREPARING TO MOVE TO BLDG 801F. FOUR WORKERS IN SUITS & ½ FACE RESPIRATORS ARE REMOVING TRANSITE SIDING ON BLDG 25G-1 (A SMALL OUT BLDG) AND WILL MOVE TO 18K WHEN COMPLETE. ~~FFFR~~ THREE WORKERS ARE CLEANING AROUND THE WAREHOUSE BLDGS. 44W - 46W.

9:00A - WORK CONTINUES AS ABOVE. EFI OBSERVES ARC BREAKING SMALL PIECES OF PANEL DURING REMOVAL EFI ASKS ARC TO USE WATER AS NECESSARY TO CONTROL POSSIBLE FIBER MIGRATION.

10:00A - WORK CONTINUES. AS NOTED EARLIER. WORK ON THE 18K BUILDING APPOX. 10% COMPLETE. WORK ON THE 801F BLDG IS ALSO ABOUT 10-15% COMPLETE

11:00A - REMOVAL OF TRANSITE BUILDING PANELS CONTINUES.

12:00p - WORKERS GO TO LUNCH.

12:30p - WORKERS RETURN TO WORK. WORK CONTINUES IN AREAS NOTED ABOVE.

2:00p - WORKERS CONTINUE TO REMOVE TRANSITE PANELS FROM BLDGS 18K & 801F WORKERS ARE APPROX.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064164

EFI®
Engineering and Fire Investigations

Field Report

Date: 4-9, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

2:00p - WORKERS ARE ~~AT~~ APPROX. 40% COMPLETE ON EACH BLDG.

3:00p - EFI COLLECTS PUMPS. FROM AROUND WORK AREA. WORKERS IN BOTH AREAS ARE APPROX. 50% COMPLETE.

5:00p - ~~ARC~~ & EFI LEAVE SITE.

Site Representative (Print Name) _____ Signature/Date _____

Contractor Supervisor (Print Name) _____ Signature/Date _____

EFI®
Engineering and Fire Investigations

BLDG. 18K
18K-1
801F
451

00064165

Field Report

Date: 4-10, 2003

Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

6:00A - EFI & ARC ON SITE. ARC HAS SAFETY MEETING WITH WORKERS. ARC TALKS ABOUT PERSONAL SAFETY EQUIPMENT & LIFT SAFETY.

7:00A - ARC INFORMS EFI THAT THEY WILL BEGIN WORK ON BLDGS. 18K & 801F. WHEN THEY COMPLETE WORK ON THESE BLDGS. THEY WILL MOVE TO 18K1 & THE ROOF OF 451.

8:00A - EFI CALIBRATES AIR SAMPLING EQUIPMENT & PREPARES CASSETTES. EFI PLACES AIR SAMPLING EQUIPMENT AROUND THE WORK AREAS. EFI OBSERVES THAT 4 WORKERS ARE IN THE PROCESS OF REMOVING SIDING PANELS ON THE BACK SIDE OF BLDG. 18K & 4 WORKERS ARE IN THE PROCESS OF REMOVING SIDING PANELS FROM BLDG 801F.

9:00A - WORKERS CONTINUE SIDING REMOVAL IN BOTH LOCATIONS. EFI IS ASKED BY ARC TO BEGIN COLLECTING TCLP SAMPLES ON BLDGS TO BE DEMO. EFI WILL BEGIN COLLECTING SAMPLES IN THE ADMIN AREA.

11:00A - WORKERS ARE COMPLETING WORK IN THE 801F AREA AND WILL MOVE TO 451.

12:00p - EFI & ARC GO TO LUNCH.

1:00p - WORKERS RETURN TO WORK AREA. EFI CONTINUES COLLECTION of TCLP SAMPLES.

3:00p - WORKERS CONTINUE. SIDING REMOVAL WORKERS ARE ABOUT COMPLETE WITH 18K BLDG & THE ROOF OF THE 451 BLDG.

4:00p - ARC & EFI OFF SITE.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

EFI®
Engineering and Fire Investigations

BLDG 18K-1 703 41W

00064166

Field Report

Date: 4.14 , 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

7:00A - EFI & ARC ON SITE. ARC INFORMS EFI THAT THEY WILL BE FINISHING WORK ON 18K & 18K-1, STARTING IN THE WAREHOUSE AREA & BEGINNING PIPE REMOVAL IN THE ADMIN BLDGS.

9:00A - EFI VISITS WORK AREAS. EFI OBSERVES THAT THERE ARE 3 WORKERS IN SUITS & ½ FACE MASKS ARE REMOVING SIDING PANELS. FROM BLDG 18K-1, 3 WORKERS ~~ARE~~ IN SUITS & ½ FACE MASKS ARE REMOVING SIDING PANELS FROM ~~FROM~~ BLDG 41W, AND 3 WORKER IN SUITS & ½ FACE MASKS ARE DEMOING COLUMN ENCLOSURES IN BLDG. 703 IN PREPARATION TO REMOVE PIPE INSULATION.

10:00A - EFI CALIBRATES AIR SAMPLING EQUIPMENT & PREPARES CASSETTES. EFI PLACES AIR SAMPLING EQUIPMENT ~~AROUND~~ THE THREE WORK AREAS

12:00p - ARC WORKERS COMPLETE WORK ON BLDG 18K-1 AND MOVE TO BLDG. 703 TO ASSIST THE WORKERS IN THE AREA. WORKER GO to LUNCH.

12:30p - WORKERS RETURN TO WORKER IN BLDG 703 AND BLDG 41W. EFI CONTINUES COLLETION OF TCLP SAMPLES.

2:00p - EFI VISITS THE BLDG 703 WORK AREA. EFI OBSERVES THAT WORKERS IN SUITS & ½ FACE MASKS ARE REMOVING PIPE INSULATION FROM THE VERTICAL RUNS OF PIPE. ARC IS ASKED TO ~~BE~~ EITHER GLOVE BAG THE INSULATION OR CUT & WRAP THE PIPE.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

EFI®
Engineering and Fire Investigations

BLDG 18K-1
41W
703

00064167

Field Report

Date: 4-14, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

3:30p - WORKERS CONTINUE TO REMOVE SIDING FROM BLDG 41W. EFI REQUESTS THAT WORKER WET AREAS AROUND LAG BOLT, IN THE EVENT THE PANELS CRACK, THE WATER SHOULD MINIMIZE POTENTIAL FOR FIBER RELEASE. WORKERS IN BLDG 703 ARE CUTTING & WRAPPING PIPE W/ INSULATION.

4:00p - EFI COLLECTS AIR SAMPLING EQUIPMENT. WORK CONTINUES AS STATED EARLIER.

5:00p - EFI & ARC OFF SITE.

Site Representative (Print Name) _____ Signature/Date _____

Contractor Supervisor (Print Name) _____ Signature/Date _____

EFI®
Engineering and Fire Investigations

BLDG. 41W 703

00064168

Field Report

Date: 4-15, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

7:00A - EFI & ARC ON SITE. EFI IS INFORMED THAT WORKERS WILL CONTINUE TO WORK ON BLDG. 41W & 703.

8:00A - EFI CALIBRATES PUMP & PREPARES CASSETTES EFI PLACES AIR SAMPLING EQUIPMENT AROUND THE WORK AREA. EFI OBSERVES THAT THREE WORKERS ARE IN THE PROCESS OF REMOVING SIDING PANELS IN THE BLDG 41W AREA & REMOVING PIPE INSULATION IN THE OFFICE AREA ON THE SOUTH SIDE OF BLDG 703. TWO other WORKERS ARE PREPPING the BATHROOM ON FLOOR 1, SOUTH TO REMOVE THE LINOLEUM FLOOR TILE.

10:00A - PREP WORK COMPLETE IN THE BLDG 703 SOUTH, FLOOR 1 BATHROOM. ALL WORKERS (6) IN THE 703 WORK AREA. WILL BEGIN CUTTING & WRAPPING PIPE UNDER THE BLDG. TRANSITE PANEL REMOVAL CONTINUES ON BLDG 41W.

11:00A - WORK CONTINUES AS INDICATED EARLIER. EFI REQUESTS ARE to USE ADDITION WATER DURING THE REMOVAL PROCESS. EFI OBSERVES THE CENTRAL DECON AREA TO BE DAMAGED ARC REQUESTED TO MAKE REPAIRS.

12:00p - WORKERS GO to LUNCH.

~~12:30p~~ 12:30p - WORKERS RETURN to WORK AREAS

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

EFI®
Engineering and Fire Investigations

00064169

Field Report

Date: 4-15, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

2:00p - EFI VISITS WORK AREAS. IN THE WAREHOUSE AREA WORKERS HAVE COMPLETED THE FRONT FACE & HAVE MOVED TO THE SOUTH SIDE. AT BLDG. 703 WORKERS CONTINUE TO CUT & WRAP PIPE UNDER THE SOUTH BLDG.

3:00p - EFI VISITS WORK AREAS. WORK CONTINUES AS STATED EARLIER. IT DOES NOT APPEAR THAT THE LINOLEUM REMOVAL WILL HAPPEN TODAY.

4:00p - EFI VISITS WORK AREAS. EFI AGAIN OBSERVES LITTLE WATER BEING USED. EFI REQUEST WORKERS USE WATER DURING REMOVAL OF TRANSITE PANEL. EFI COLLECTS AIR SAMPLING EQUIPMENT.

5:00p - EFI & ARC OFF SITE.

Site Representative (Print Name) _____ Signature/Date _____

Contractor Supervisor (Print Name) _____ Signature/Date _____

EFI®
Engineering and Fire Investigations

BLDGS. 41W & 703

00064170

Field Report

Date: 4-16, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

6:30A - EFI & ARC ON SITE. EFI INFORMED WORK WILL CONTINUE ON BLDGS. 41W & 703.

7:00 A - EFI CALIBRATES PUMPS & PREPARES CASSETTES.

8:00 A - EFI BEGINS PLACING AIR SAMPLING EQUIPMENT IN AND AROUND THE WORK AREAS. EFI OBSERVES THAT THERE ARE THREE WORKERS IN SUITS & RESPIRATORS REMOVING SIDING PANELS FROM BLDG 41W IT APPEARS THAT THEY MAY FINISH REMOVING THE EXTERIOR PANELS ON THIS BLDG TODAY. FIVE WORKERS IN SUITS AND ½ FACE RESPIRATORS ARE IN THE PROCESS ON REMOVING (CUT & WRAPPING) PIPE AND INSULATION FROM UNDER BLDG 703 SOUTH.

9:00A - ARC RECEIVES AN ACM WASTE CONTAINER. THE CONTAINER IS SPOTTED NEAR BLDG 703.

10:00A - WORK CONTINUES AS NOTED EARLIER.

12:00 p - WORKERS BREAK FOR LUNCH.

12:30 p - WORKERS RETURN TO WORK AREAS.

2:00 p - EFI VISITS WORK AREAS. WORKERS CONTINUE TO REMOVE SIDING ON THE WESTSIDE OF BLDG 41W & ARE CUTTING & WRAPPING PIPE ON BLDG 703 NORTH. EFI ASKS ARC TO REPAIR REMOTE DECON NEAR BLDG 703.

4:00p - EFI COLLECT AIR SAMPLING EQUIPMENT.

5:15p - EFI & ARC OFF SITE

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

EFI®
Engineering and Fire Investigations

BLDG 42W
BLDG 703

00064171

Field Report

Date: 4-17, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

6:30A- EFI & ARC ON SITE. EFI IS INFORMED THAT WORKERS WILL BE REMOVING LINOLEUM FROM SEVERAL BATHROOM IN BLDG 703 & WILL BE STARTING ON BLDG 42W

7:00A- EFI CALIBRATES AIR SAMPLING EQUIPMENT & PREPARES CASSETTES.

8:00A- EFI BEGINS TO PLACE AIR SAMPLING EQUIPMENT AROUND THE WORK AREAS. EFI OBSERVES THAT WORKERS HAVE MOVED TO BLDG 42W, TWO WORKERS IN SUITS AND RESPIRATORS HAVE STARTED WORKING ON THE BACKSIDE OF BLDG. 42W, ANOTHER WORKER IN A SUIT & RESPIRATOR PICKING UP WASTE (NON-HAZARDOUS), DOUBLE BAGGING THE ACM WASTE, AND WRAPPING THE TRANSITE SIDING PANELS. AT BLDG 703 WORKERS ARE IN THE PROCESS OF REMOVING LINOLEUM FLOOR COVERINGS FROM THE 1st FLOOR OF THE SOUTH BLDG. EFI OBSERVES THAT CRITICAL BARRIERS ARE IN PLACE, A CURTAINED DOOR WAY AND A NEG. AIR MACHINE IN PLACE.

9:00A- EFI VISITS WORK AREAS. WORK CONTINUES AS NOTED EARLIER.

10:00A- EFI OBSERVES THAT WORKERS IN 703 HAVE COMPLETE LINOLEUM REMOVAL ON THE TWO SOUTH BLDG BATHROOMS & HAVE MOVED TO THE NORTH BLDG.

1:00p- EFI & ARC LEAVE SITE.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064172

EFI®
Engineering and Fire Investigations

TO 78° Sun Pt. Cloud

44W - SIDING WAREHOUSE
703A - PIPE, Linoleum
703B - PIPE

Field Report

Date: 4/21, 2003 | **Project Number:** 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC — 10 workers + 1 SUPV. (BISHOP)

Description 0410 - W. Houston for Karnack

-0830 - on site ; site - workers in 1/2 MASK, Coveralls, PPE Will start PIPE under 703A. - on 44W - Panels on west of Warehouse started.

-0930 - Removal of pipe on 703A - OK - WET - Have to demo wood base to Access pipe. Some of pipe on ground. & picked up - bagged. Workers prep restrooms for linoleum Removal of 44W Panels - OK bottom nails - break-outs

-1030 - operations OK ; Talk w/ BISHOP on week's scope - 2 More bldgs in original scope + MISC. Minor to finish

-1115 - Lunch for crew 703A Bldg. North face done.

-1215 - 1230 - Crew returning to work zones. PPE T looking for more barrier tape.

-1330 - Crew removing pipe in 703B ; PIPE wrapped and loaded in dumpster behind 703A - OK ; Panels removed on 1/4 of 44W ; 703A Linoleum removed - WET ; only one link glued to wood floor cut out. wrapped.

-1430 - operations of pipe 703A perim. wrapped - waste loaded into dumpster. 44W ared - OK Whole pieces stacked. 703A PIPE Done

-1530 - operations OK 44W 1/3 of west panels Crew in 703B glovebag cut pipe after wrapin plastic & labels - to dumpster

-1640 - Crew cleaning up for day. Decon. Areas secured.

-1700 - ARC & EFI Departing site.

Adam Satterfield
Site Representative (Print Name)

Adam Satterfield 4/21/03
Signature/Date

Contractor Supervisor (Print Name)

Signature/Date

EFI®
Engineering and Fire Investigations

78°

42W - Panels
703B-

00064173

Field Report

Date: 4/22, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC 9 + 1 Misc. + 1 supt.

Description

0630- Workers on site; Today crew to continue the panel removal on 42 W and on 703B (Pipe + Panels).
-0730 - Workers in PPE ½ mask, coveralls, hard hat, etc. to work in 2 areas. Panels come off whole pieces and placed on pallets. 703B cut pipe after glovebag.
-0830 - operations OK
-0900- Lynn USFW Mgr. looked at Bldg. 44W - still have panels on NE office/lab area to do - found out that crew waiting for rain day to do that.
-1030- operations OK; Bldg. 42W - on north face panels the west side done. on 703B - Panels started - cleaning up the pipe abatement.
-1115- Crew cleaning up for lunch. Decon out.
1130- Noon - Lunch for crew
-1230 - Workers back in PPE continue work.
-1300 - West face panels on 703B done; North panels on 42 W done; All panels removed in whole pieces.
-1400 - operations OK; PANELS started on east face 42W North panels on 703B. Review of completed bldg's with Lynn & Bishop - 16 Bldgs of 42 Complete.
-1500- operations OK - 42W & 703 B on going.
-1600- operations OK - start S. face of 703B & on NE corner of 42 W
-1640 - Workers cleaning up for day. Secure areas - To rain tomorrow
-1700 - Depart site for day.

Adam Satterfield
Site Representative (Print Name)

Signature/Date 4/22/03.

Contractor Supervisor (Print Name)

Signature/Date

00064174

EFI® Engineering and Fire Investigations

P.M. RAIN Expected 72° — 42W Panels 7226 703B 41W FLOOR 1ST-1

Field Report

Date: 4-23, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description - 0630 - on site; crew showing up - TO WORK on 42W 703 B - only S. face Panels; 42W East & South face. EFI is to collect TCLP SAMPLES on ±15 Bldg's. today
- 0715 - Workers in PPE @ bldgs. started work
- EFI collects TCLP
- 0900 - Workers on 703 B almost done; Work on 42W on E. face ~ 1/3 done.
- 1000 - Operations OK; collecting TCLP samples.
- 1100 - 703 B was completed and workers go to 7226 to start that shack.
- 1115 - 1130 - Workers decon for lunch.
- 1235 - workers back from lunch. PPE; Continue TCLP Sampling misc. bldgs.
- 1330 - Workers 3/4 done w/ 722G; Work on 42W on east face > 1/2 of E. Panels. using lift. Panels on ground wrapped with poly.
- 1430 - RAIN! 7226 Done; crew go to 1ST-1 for work in there; 42W work stops - will work 1/3 of 41W floor tile - 1/3 panels.
- 1330 - Crews in both areas - OK; TCLP done for day. Have to do 720A Again.
- 1615 - TCLP done for day - Crew back on 42W Panels Stop rain; will STOP & clean up soon - Suppose to storm tonight
- 1645 - Workers stopped for day
- 1700 - Departing site for day.

ADAM Satterfield — Site Representative (Print Name)

Signature/Date 4/23/03

Contractor Supervisor (Print Name)

Signature/Date

00064175

EFI Engineering and Fire Investigations

TCLP Sampling

Field Report

Date: 4/23, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

- 31W + 33W + 35 = Waste Warehouses = Transite sides + Roof on Struct. Steel (Red Primer) with only Red Paint on wood Extng. Boards (2) @ 12"x20" - Sampled. Gray Paint on steel handrails 780% gone - flaked.
- 41W-2 Small shack - METAL skin corr. on 2'x4' FRAME Painted cream door + overhang & lime green base + on int. frame boards & window. Sampled Painted Wood
- 41W-1 Restroom N. of Warehouses. Transite S/R interior. LT. GRAY over LT. Green + Beige WOOD WINS + doors + MISC. Trim.
- 41W Warehouse Receive + N. LAB WOOD DOORS + TRIM + work stations All white - some over LT. Green + Beige @ S. office areas.
- 42W Warehouse + N. office wood doors, wins. + CAGE LT. GRAY + Beige over lime green Multiple Wood on N. areas. S. areas - All warehouse - only Wood overhead doors.
- 44W + 46W - LT. GRAY on Door frames only & red on extinguisher boards Min. Wood.
- 49W - Recycle Area - OPEN SIDE w/ LT. GRAY PAINT WOOD framing; Green TBL + Red Extinguish Area VI
- TS 39 Pistol Shack 8'x8' white wood frame
- 801F 2-story loader METAL UP WOOD SIDE LIME + LT. GRAY on eaves and stairs. Struct. Steel on remainder
- 501E 1-story 8'x10' S/R 1/S LIME steel EXT. White + LIME WOOD
- 22A - 1 story CMU Insp. offices S/R w/ WOOD TRIM FRAME on WIN/DOORS LIME + Beige + White Wood

Site Representative (Print Name) ADAM Satterfield — Signature/Date 4/23/03

Contractor Supervisor (Print Name) — Signature/Date

00064176

EFI
Engineering and Fire Investigations

42W - E. PANELS - S. PANELS
1ST-1 - done 9:15 20' PIPE done @1340
18K 20' PIPE + PANELS

Field Report

Date: 4/24, 2003

Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description - 0635 - on site; supv. waiting on workers;
- 0640 - Workers on site; Today 42W - FINISH E. Panels 1ST-1 - 1/5 PIPE - FLOOR TILE - 18K - Panels and ±20' of thermal pipe.
- 0715 - Workers in PPE both in 42W (LIFT) and 1ST-1 Removal has started. WET removal - CUT - ENTIRE PIPE @ flange of steam pipe to heater WRAP in plastic. PANELS removed in whole pieces. - OK
- 0830 - 1ST-1 workers done - waste on pallet - will move to 18K; work on 42W - Panels - eastside @ ~85% - whole pieces. - OK.
- 0930 - Workers have started on 18K Panels - on pipe sawzall used to cut metal flange - pipe removed intact and wrapped in poly for disposal. Panels removed in whole pieces - placed on pallet and poly wrapped.
- 1030 - operations @ both 18K & 42W - OK.
- 1115 - Workers cleaning up for lunch.
- 1135 - 1215 - Lunch for crew
- 1230 - Crew to finish east face of 42W; finish 18K before storm to hit ~ 3pm. Leave early MAybe.
- 1300 - Removal of 18K Complete - Friable waste taken to dumpster and locked; Clean-up of area. The pipe was double wrap with poly bags. Crew clean area - load trailer, etc.
At 42W East panels are complete - only the South face remains. of transite panels - Crew cleans up area.
- 1500 - Departing site for weekend

ADAM Satterfield
Site Representative (Print Name)

Adam Satterfield 4/24/03
Signature/Date

Contractor Supervisor (Print Name)

Signature/Date

00064177

Getting HOT Sunny + ~80° 20%

EFI® Engineering and Fire Investigations

41W FLOOR TILE + PANELS
42W PANELS - FINISH → BIG PANELS
44W - ROOF & SIDE

Field Report

Date: 4/28, 2003 MONDAY

Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description 0630 - 6 workers + 1 misc. + 1 supt.
Today work on 41W FLOOR TILE + Panels + finish ext. panels on 42W - then start 44W.
- 0800 - 2 crews one is prepping 41W north office area for floor tile abatement. other crew is using lift to remove S. wall EXT. Panels (whole - pieces - lowered-stacked)
- 0900 - operations OK - Prep in 41W one 1/2 wall demod and tossed. Decon, criticals, neg-airs, etc. Work on 42 - 1/2 done w/ south ext. wall.
- 1000 - Removal of Panels continues; 41W Prep continues
- 1100 - Removal of S. EXT PANELS FINISH BLDG. 42W Transite; Prep continues on 41W S. office lab. Move lift to 44W Bldg.
- 1120 - Crew cleaning up for lunch
1220 - Crew back - find prep on 41W and will wet entire floor and begin VFT abate. PPE, signs, extins, etc. in place @ 1300. other crew on 44W undoing roof bolts for Roof Panels.
- 1330 - Abatement of VFT - OK in 41W use more H_2O. 44W area OK
- 1500 - Abatement of VFT - more water - waste placed in bags. on 2/44W Panels removed whole - lowered and stacked. Supposedly water problem @ landfill pit - HIT adjacent waste disposal area.
- 1600 - All VFT up and being bagged. 3 piles. Roof of 44W ~ 12+ Panels removed.
- 1640 - Work stops - workers cleaning up
- 1700 - Depart site

ADAM Satterfield
Site Representative (Print Name)

Adam Satterfield 4/28/03
Signature/Date

Contractor Supervisor (Print Name)

Signature/Date

00064178

EFI® Engineering and Fire Investigations

84° Warm

44W Roof Panels
41W - Floor Tile/Mastic

Start Demo 703A

Field Report

Date: 4/29, 2003 Tues. | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC 6 Workers + 1 Supt.

Description 0630 - ARC + EFI on site; Crews to work in the 2 areas listed abae. Demo to start today - Bldg. 703A
-0700 - Abate crews in PPE to start work.
-0800 - Removal of panels on Roof of 44W N. section. Crew 1's 41W N. VFT area - FINAL Abate of Mastic.
-0900 - Abate of mastic - using buffer & solvent - OK Removal of panels whole and lowered from Roof. Demo of 703A North section has begun - water sprayed during demo.
-1000 - Demo going fine - no signs of Wall cavity TSI - only VFT - water used. At 41W Mastic removal complete - clean-up and visual - OK set pumps for working clearance. 44W Panels - OK
-1100 - Operations OK
-1130 - Abate crew decon out for lunch. Done w/ VFT area in 41W. 44W ~ 1/4+ of N. section Roof is done. Noon - lunch for demo crew.
-1230 - Crew back from lunch. PPE - Crew to get transite panels in NW section of 42W, others to 44W Roof.
-1330 - operations OK; clearances run in 41W. [will still have transite 1's panels on N. end].
-1430 - operations OK; water used on demo of 703A Now on S. section @ T.
-1545 - Demo of S. wing of 703A almost complete. Abate crew still working 42W & 44W.
-1640 - Crews cleaning up for day.
-1700 - ARC + EFI depart site

Adam Satterfield — Adam Satterfield 4/29/03

Site Representative (Print Name) — Signature/Date

Contractor Supervisor (Print Name) — Signature/Date

00064179

EFI® Engineering and Fire Investigations

DEMO: 703A
Abate; 41W 1/s Panels
44W ROOF + WALL PANELS

TO 84°
AM. Sprinkles

Field Report

Date: 4/30, 2003 WED.

Project Number: **98410-13709**

Project Name: **Longhorn Army Ammunition Plant**

Contractor: **ARC** Ce + 1 MISC. + 1 Supt. + 3 Demo.

Description 0640 - on site; workers show - TODAY crew to work in areas listed above; DEMO crew to work in front areas.
- 0715 - Abate crews in PPE in 2 areas - ON 44W Roof Panels NW coming up - down in whole pieces. on 42 W crew cleaning last 60' of panels - stacked pallet.
- 0845 - Demo of 703A complete; other areas - 41W crew to start 1/s Transite Panels 44W - OK. EFI to collect more TCLP samples.
- 1000 - Waste Trailer arrives for DEMO - haul - still Collecting TCLP's.
- 1045 - TCLP's complete; operations @ 2 abate areas - OK. DEMO of 703A done except for center core brick area 20'x25'.
- 1120 - Workers break for lunch. Decon clean-up.
- 1230 - Workers back in PPE for Abatement on 41W 1/s PANELS + 44W EXT. PANELS. DEMO to load 703A.
- 1330 - operations OK @ Abate areas - WALLS of 41W coming down - 1ST DEMO LOAD of 703A to landfill.
- 1430 - 2ND LOAD to landfill along w/ Asb. Panels - some loose tiles fall off & tossed back into loader. Workers for demo crew are asbestos awareness trained. @ dump - waste pushed into 125'x 100' hole 20' H.
- 1530 - Ceiling down in 41W - BAG-up - Clean; 44W ROOF Panels 3/4 of North section done.
- 1630 - 41W FINAL BAG up of waste being done. 44W - work stops to clean waste. DEMO crew done for day.
- 1700 - ARC + EFI Depart.

Adam Satterfield
Site Representative (Print Name)

Signature/Date

Contractor Supervisor (Print Name)

Signature/Date

00064180

EFI®
Engineering and Fire Investigations

TCLP Sampling

Field Report

Date: 4/30, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description 25

- TS-~~[illegible]~~ @ ~~[illegible]~~ TS-25 @ Recycle Sm. Restrm. Bldg. Yellow wood plank ext w/ White T/S. ~8'x8'
- 1ST-1 1 story sm. bunker type CMU - steel door/wins. only painted wood is door (2) + 2 door frames - rest is CMU or 2'x4'
- 414 Pump hs. Ext. Transite - T/S wood doors, frame work White All over Time

★TS 62 - Signal area Shed PAST LANDFILL METAL EXT. W/ WOOD DOOR, TRIM, WINDOWS shelves NOT Sampled - WASPS! ★ Leave for C.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064181

EFI®
Engineering and Fire Investigations

LANDFILL Info.

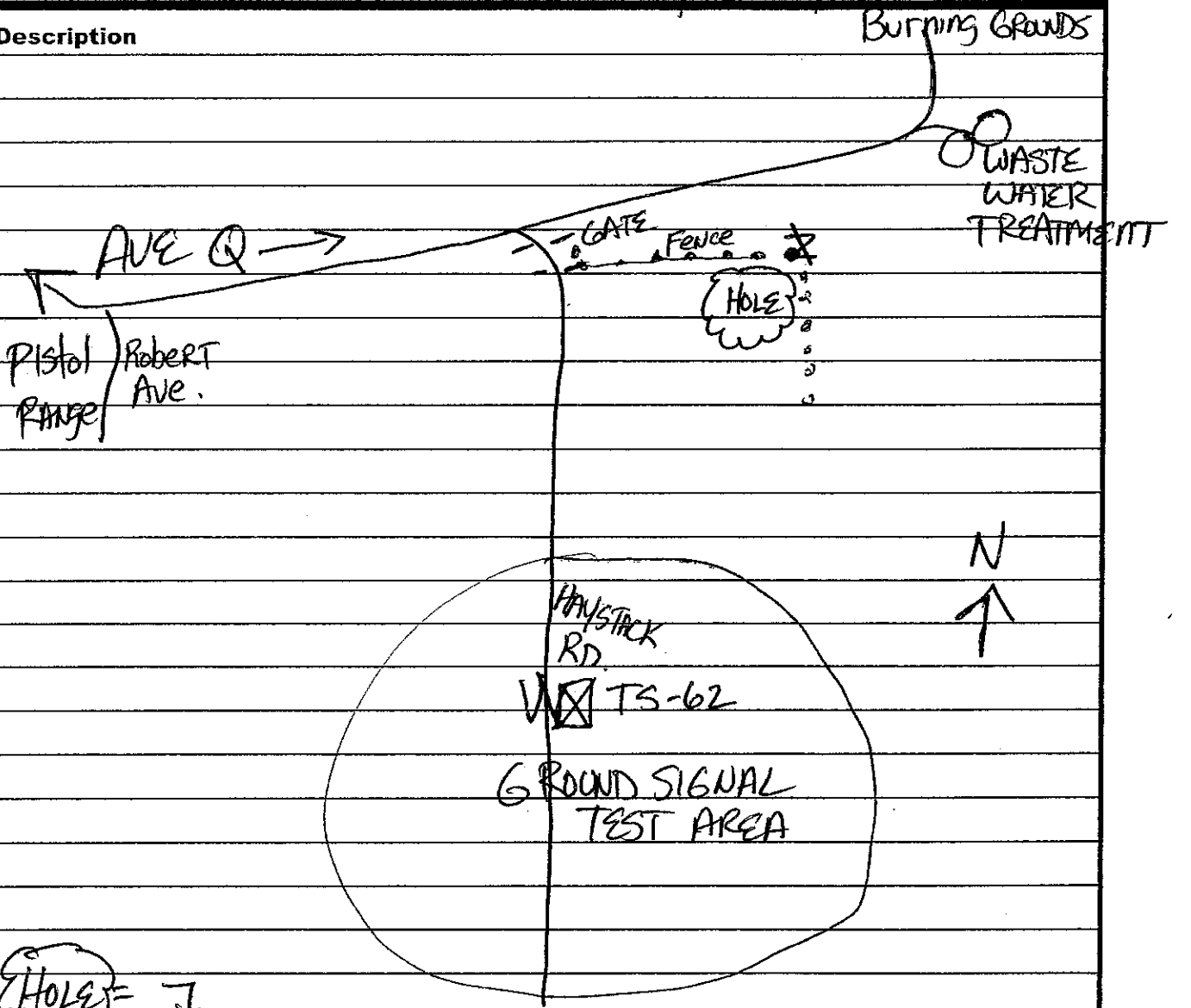
Field Report

Date: 4/30, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC A-1 Demolition of WACO, TX.

Description



(HOLE) = Demolition Debris + Non-Friable ACM

LANDFILL Area: 125' WEST 100' SOUTH

~ 30' off fence line ± 20' Deep

ADJACENT DEBRIS LANDFILL JUST WEST @ 130' W of fence line

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

EFI
Engineering and Fire Investigations

80° 44W - Roof
Overcast 41W-1 Ext. Panels
41W - FINAL CLEAN-UP

DEMO-WASTE 00064182
703A

Field Report

Date: 5- , 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description 0635 - workers on site; crews to finish North section roof panels of 44W; final clean-bag-out of 41W panels and remove panels off 41W-1 small restroom North of 41W. Demo crew to load waste - trips to landfill of 703A.
- 0715 - Workers in areas. operations start.
- 0830 - Abate operations OK - 41W almost done.
- 0930 - 41W done - crew to work on 41W-1 Crew on roof of 44W - 85% done a/n. roof panels lowered to ground - intact.
- 1030 - operations OK; 41W-1 panels intact & stacked. 44W almost done w/n. section.
- 1130 - Crew to work thru lunch. - operations ok. Removal continues - workers clearing up areas. Demo crew to lunch.
- 1215 - Crews done w/ Removal on 41W-1 & 44 for day - clean-up areas.
- 1245 - Crew stops for day. Areas cleaned for weekend will depart soon.

Demo crew to work until 5PM. Supv. + 1 worker to stay.
- 1700 - ARC Departing site along w/ Demo crew.

ADam Satterfield — Site Representative (Print Name)

Adam Satterfield 5/1/03 — Signature/Date

Contractor Supervisor (Print Name)

Signature/Date

00064183

EFI®
Engineering and Fire Investigations

Field Report

Date: 5/5, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

6:30 Am. ARC & EFI on-site - Crew of 4 To work in Bldg 44W Removing Ext. Transite Panel from The Roof Area

8:00 Am. EFI set Area Monitors (upwind & Downwind) & 1 personal.

10:20 Am - EFI collected Tclp Sample from Block T562

11:15 AM - EFI observed workers wearing ½ Half Face Respirator while Transite @ Bolt Head Prior To Taking off Bolts & loosening Transite panels To Be Wrapped

12:00 Am Workers Breaks For Lunch

1:40 pm Crews Completes ~ 60% of Roof Removal

3:00 pm EFI Collects Area & Personal Samples For Analysis. - Crew Continues w/ Removal & Wrapping of Transite panels.

4:30 pm Crew Completes 90% of Roof Removal & will Shut Down & Begin Clean-up of Area & Start Again Tomorrow.

5:25 pm ARC's Crew & EFI off-site

Chung Nguyen
Site Representative (Print Name)

Signature/Date

Contractor Supervisor (Print Name)

Signature/Date

00064184

EFI®
Engineering and Fire Investigations

Field Report

Date: 5/6, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

6:30 A - EFI & ARC on-site - Crew of 5 will continue to remove ext. transite panels from Bldg 44-W 10% of remaining roof & 3 sides of Bldg

7:30 A - EFI set area & present JSA - Crew suiting up to work

10:45 A - Crew removed 100% of roof & continue removal with sides of Bldg. (Note Pb nail is segregated & placed in 55-Gallon Drum)

12:00 A - Crew breaks for lunch

1:05 P - 3 workers will mobilize to load & transport stacked ACM transite ext. & interior to landfill @ Bldgs. 703A, 703B other 3 will continue w/ Bldg. 44-W

3:40 P - Workers completed loading stack ACM transite from Bldgs 703A & 703B & will return to Bldg 44W to help other - EFI collects samples for Analysis

5:05 P - Demo Crew crushed down Bldg 709 & 719 will haul debris to landfill tomorrow.

5:15 P - EFI & ARC off-site

Chang Nguyen
Site Representative (Print Name)

Signature/Date

Contractor Supervisor (Print Name)

Signature/Date

00064185

EFI®
Engineering and Fire Investigations

Field Report

Date: 5/7 , 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

6:30 AM - ARC + EFI ON-SITE - CREW OF 4 will CONTINUE W/ ABATEMENT OF BLDG 44W, WHILE OTHER 2 WILL GO TO BUILDING 25A TO CLEAN CONSTRUCTION DEBRIS FROM INSIDE PRIOR TO PREP + Floor Tile Removal.

7:10 Am EFI SET AREA MONITOR @ BLDG 44-W. CREW DONE ON SUITS, RESPIRATOR, SAFETY GLASSES + HARD HATS PRIOR TO BEGINNING TRANSIZE OF PANEL REMOVAL

10:40 Am. CREW COMPLETES WEST ~~END~~ DUCT OF BLDG 44W & will CONTINUE W/ REMOVAL ON NORTH WALL OF BLDG. 44W.

12:00 A.M. CREW BREAKS FOR LUNCH

2:15 PM EFI OBSERVED CREW SPRAY AMEN HEP ON THE BOLTS USED TO ATTACH PANELS PRIOR TO REMOVAL FOR LEAD WASHER SEGREGATION. PANELS WERE LOWER TO GROUND BY ROPE + PULLEY SYSTEM + THEN STACKED & WRAPPED IN 2 - LAYERS OF 6-mil PLASTIC

3:50 pm EFI COLLECTED AREA + PERSONAL CASETTE FOR ANALYSIS OBSERVED THE DEMO CREW CRUSHING DOWN BRICK IN NEAR TO TO A & B

5:15 P CREW COMPLETES 100% OF NORTH WALL + EAST WALL + will REMOVE SOUTH WALL TOMMORROW.

DEMO CREW DID NOT HAVE CHANCE TO LOAD DEMO DEBRIS TO LANDFILL DUE TO SOAK GROUND CONDITION CAUSED BY LAST NIGHT RAIN. ARC + EFI OFF-SITE.

Craig Mayor
Site Representative (Print Name)

Signature/Date

Contractor Supervisor (Print Name)

Signature/Date

00064186

EFI®
Engineering and Fire Investigations

Field Report

Date: 5/8, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

6:30 A - ARC & EFI ON-SITE - CREW WILL CONTINUE W/ TRANSITE REMOVAL & DEBRIS CLEAN UP OF ADMIN BLDG. 22A

8:25 A - CREW CONTINUES W/ TRANSITE REMOVAL 25% COMPLETED OF EAST WALL @ BLDG. 44W

10:45 A - EFI OBSERVED CREW REMOVING TRANSITE PANELS UTILIZING WET METHOD, SEGREGATING NAIL (PB) & WRAPPING PANELS)

12:00 AM - CREW BREAK FOR LUNCH.

2:00 PM - 75% OF WEST WALL COMPLETED & 100% OF SOUTH WALL STILL REMAINS - CREW IS 50% COMPLETE W/ DEBRIS CLEAN UP @ BLDG. 22A

3:35 PM - EFI COLLECTION CASSETTE FOR ANALYSIS -

5:15 PM CREW COMPLETED 100% OF DEBRIS DEMO CLEAN UP @ BLDG 22A & STILL HAS REMAIN SOUTH WALL ON BLDG. 44W WILL CONTINUE WORK ON MONDAY.

CUONG NGUYEN
Site Representative (Print Name)

Signature/Date

Contractor Supervisor (Print Name)

Signature/Date

00064187

EFI®
Engineering and Fire Investigations

Field Report

Date: 5-12, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 – ARC and EFI on site
– Work this shift will be on Bldg 44W

0830 – TRANSITE REMOVAL underway, wetting and wrapping PANELS

1030 – Work continues on BACKside of Bldg No. 44W AND 49W Along with TS 25.

1200 – ALL work stops FOR Lunch BREAK.

1300 – Work RESUMES AS DESCRIBED. DEMO only HAULING MATERIAL FROM Bldgs they HAVE ALREADY TORN DOWN. No NEW Bldg DEMO this SHIFT.

1600 – ARC will NEARLY complete TRANSITE REMOVAL on Bldg. 44W this SHIFT.

1730 – SHIFT ENDS

D. Pope
Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064188

EFI®
Engineering and Fire Investigations

Field Report

Date: 5-13, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 – ARC and EFI on site.
– Work this shift will finish TOANSITE Removal on Bldg. 44W and start Bldg. 46W.
– Also this shift TOANSITE Removal will be completed on Bldg's 49W and TS25.

0830 – Bldg list faxed to site from EFI Houston from Alex Nguyen showing Ph. I and Ph. II.
– Work continues as described.

1030 – light rain, work continues as planned.

1200 – Work stops for lunch break at this time.

1300 – ARC moving one crew to Bldg 501E to remove 120 sq. ft of Fl. tile.

1530 – Work complete on 49W and TS25

1700 – Work complete on 501E signal area and Piston Range shack.

DR

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064189

EFI®
Engineering and Fire Investigations

Field Report

Date: 5-14, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - ARC & EFI on site. Work this shift is on Bldg No. 46W at this time. TRANSITE REMOVAL.

0830 - Looks like it may rain but work continuing at this time.

1030 - ARC has 1 supervisor, 1 foreman and 6 workers on site.

1200 - All work stops for lunch break at this time.

1400 - TRANSITE REMOVAL continues on Bldg 46W.

1600 - Removal stopping for the day to allow workers time to wrap TRANSITE and label.

1730 - ARC and EFI departing site, END OF SHIFT.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064190

EFI®
Engineering and Fire Investigations

Field Report

Date: 5-15, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - ARC AND EFI ON SITE

0800 - WORK HAS RESUMED ON TRANSITE REMOVAL ON Bldg. 46 W.
- STORM LAST NIGHT WITH LOTS OF RAIN HAS CAUSED ARC TO WORK OFF OF THE ROAD SIDE OF THE Bldg. TOO WET TO GET THE LIFT ON THE BACK SIDE.

1000 - WORK CONTINUES AS DESCRIBED.

1200 - WORK STOPS FOR LUNCH BREAK AT THIS TIME.

1400 - NO RAIN SO FAR TODAY, WORK RESUMED AFTER LUNCH.

1600 - ARC MAY COMPLETE REMOVAL ON TRANSITE SIDING OF Bldg 46 W TODAY.

1730 - ARC REQUESTED ACM BULK SAMPLES OF PIPE FITTING ON STEAM LINE OF Bldg. 46 W EFI COLLECTED THEM.
- SHIFT COMPLETE, ARC, EFI DEPART SITE FOR THE DAY.

JP

Site Representative (Print Name) | Signature/Date

Contractor Supervisor (Print Name) | Signature/Date

00064191

EFI®
Engineering and Fire Investigations

Field Report

Date: 5-19, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 – ARC and EFI on site

0830 – Work continuing on removal of transite on Bldg. 46W

1030 – Removal continues as planned at this time.

1200 – All work stops for lunch at this time.

1300 – Work resumes, same location Bldg. 46W.

1500 – ARC may complete transite removal on Bldg. 46W this shift. Work continues.

1600 – Lead based samples collected on Bldg. 718-A and 717

1730 – Shift ends.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064192

EFI®
Engineering and Fire Investigations

Field Report

Date: 5-20, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - ARC and EFI on site

0800 - ARC Beginning work on Bldg 31 W this shift. TRANSITE REMOVAL.

1000 - Weather Beginning to lightly rain but work continuing at this time.

1200 - Work stops for lunch BREAK at this time.

1300 - Work resumes as described. ARC is cuting of the bolt head and driving it BACK through to RELEASE the sheets and lower them to the ground for wrapping

1500 - ARC Removing TRANSITE ROOF PANELS at this time.

1700 - REMOVAL stopped to allow workers to WRAP ALL REMOVED PANELS.

1730 - Shift ENDS

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064193

EFI®
Engineering and Fire Investigations

Field Report

Date: 5-21, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 — ARC on site, EFI on site.

0730 — Works resumes on transite removal on Bldg 31 W.

0930 — Method continues on grinding off bolt heads and knocking bolt down through the panels.

1100 — Workers lower each panel to the ground with [redacted]. ropes.

1200 — All work stops for lunch.

1300 — ARC will nearly complete transite removal on Bldg 31 W today. A little will be left to complete next shift.

1500 — Removal continues as described at this time.

1730 — All work has ended for the day. ARC, EFI depart site

Site Representative (Print Name) _____ Signature/Date _____

Contractor Supervisor (Print Name) _____ Signature/Date _____

00064194

EFI®
Engineering and Fire Investigations

Field Report

Date: 5-22, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - ARC, EFI on site.

0730 - Work resumes on Bldg 31 W
- ONE END REMAINING TO BE REMOVED.

0930 - Work continues as planned on Bldg. 31 W TRANSITE REMOVAL.

1130 - Work stopping for lunch at this time.

1230 - Work resumes on the last few sheets of transite on Bldg 31W.

1430 - REMOVAL complete on transite Bldg 31 W
- Workers wrapping transite in poly at this time.

1630 - Work complete for this shift. ARC moving supplies and equipment back to their storage area.

1730 - ARC, EFI Depart site.

D. Pope
Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064195

EFI®
Engineering and Fire Investigations

Field Report

Date: 5-27, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 – EFi on site, ARC on site

0800 – Work this shift is on transite removal Bldg. 33 W

0930 – ARC has full crew, All working at Bldg. 33 W.

1130 – Very dry around Bldg, no rain extra caution being used on controling fine.

1200 – All work stops for lunch break At this time.

1300 – Work resumes as described on Bldg 33 W.

1500 – Approx 40% of the transite will likley be removed on Bldg 33W this shift.

1700 – Work stopped for workers to wrap transite in Poly that the removed this shift.

1730 – Shift ends, All depart site

JP

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064196

EFI®
Engineering and Fire Investigations

Field Report

Date: 5-28, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFI AND ARC ON SITE SAME CREW.

0800 - WORK THIS SHIFT WILL CONTINUE WITH TRANSITE REMOVAL OF Bldg. 33 W.

1000 - ARC CONTINUES WITH Bldg 33 W AS DESCRIBED.

1200 - WORK STOPS FOR LUNCH AT THIS TIME.

1300 - ARC RESUMES TRANSITE REMOVAL ON Bldg. 33 W.

1500 - Bldg 33 W HAS ONLY THE BACK SIDE TRANSITE REMAINING, ALL OF THE ROOF AND SIDES ARE DOWN.

1700 - WORK STOPS FOR THIS SHIFT AND THE WORKERS COVER TRANSITE WITH POLY SHEETING.

1730 - ARC, EFI DEPART SITE FOR SHIFT END

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064197

EFI®
Engineering and Fire Investigations

Field Report

Date: 5-29, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 – EFI on site, ARC on site same crew.

0800 – Work will continue on 33W and will be complete by noon.

1000 – ARC will be moving to Bldg 35W

1130 – Conditions very dry ARC using extra caution on fire control.

1200 – All work stops for lunch break.

1300 – Work resumes

1500 – ARC has completed work on Bldg 33W and moving to 35W At this time.

1700 – Work began on Bldg 35W on grinding bolt heads no removal – Shift nearly over, workers cleaning up and wrapping tools in poly.

1730 – ARC, EFI depart site.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064198

EFI®
Engineering and Fire Investigations

Field Report

Date: 5-30, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFI, ARC on site with same crew.

0800 - Work continues on Bldg 35W as planned. Transite removal.

1030 - ARC continuing with entire crew on Bldg 35W.

1200 - Work stops for lunch break.

1300 - Work resumes.

1500 - Approx. 50% of the roof sheets will be removed this shift.

1700 - Work stops for clean up at this time.

1730 - EFI, ARC depart site.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064199

EFI®
Engineering and Fire Investigations

Continue BLDG 42W

Field Report

Date: 6/2/, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 – ARC & EFI ARRIVED ON SITE. ARC HAS 4 WORKERS TODAY AND THEY EXPECT TO WORK ON BUILDING 42W AS THEY CONTINUE REMOVAL OF TRANSITE SIDING FROM THE BACK SIDE.

0730 – EFI CALIBRATES PUMPS AND SETS AIR SAMPLES AT THE WORK SITE OF 42W.
EFI OBSERVES 4 ARC WORKERS WEARING ½ FACE RESPIRATORS, DISPOSABLE PROTECTIVE COVERALLS, RUBBER BOOTS AND WORK GLOVES AS THEY REMOVE BOLTS & FASTENERS FROM THE TRANSITE PANELS TO REMOVE THE PANELS FROM THE BUILDING.

0950 – ARC WORKERS ARE OBSERVED STACKING PANELS ON THE GROUND NEAR THE BUILDING. THE PANELS HAVE BEEN DOUBLE WRAPPED WITH 6 mil poly SHEETING AND ALL BOLTS AND FASTENERS HAVE BEEN REMOVED.

1130 – ARC BREAKS for LUNCH.

1230 – ARC RETURNS TO WORK AS THEY CONTINUE REMOVAL of TRANSITE PANELS from BUILDING 42W.

1355 – ARC WORKERS ARE OBSERVED USING A MAN LIFT BUCKET TO ACCESS THE SIDES of THE BUILDING AND REMOVE THE TRANSITE PANELS.

1510 – ARC WORKERS ARE WRAPPING TRANSITE PANELS WITH 6 mil poly FOR TRANSPORT LATER.

1700 – ARC WORKERS CLEAN UP THE WORK AREA AND COLLECT THEIR TOOLS AND SUPPLIES AS THEY COMPLETE THE WORK ON BUILDING 42W.

1730 – ARC AND EFI LEAVE THE SITE.

Joe Ponterella — Joe Ponterella — 6/2/03
Site Representative (Print Name) — Signature/Date

Contractor Supervisor (Print Name) — Signature/Date

00064200

EFI®
Engineering and Fire Investigations

Comp. BLDG 42W BLDG 25G (Floor Tile Removal)

Field Report

Date: 6 / 3 / , 2003 ~~TUESDAY~~ Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFI AND ARC ARRIVE ON SITE. ARC HAS 4 WORKERS TODAY AND THEY EXPECT TO CONTINUE WITH FLOOR TILE REMOVAL FROM BUILDING 25 G. THEY HAVE COMPLETED ABATEMENT IN 42W YESTERDAY AND STARTED FLOOR TILE REMOVAL IN 25G.

0740 - EFI CALIBRATES AIR PUMPS AND SETS AIR SAMPLES IN THE WORK AREA OF 25G BUILDING. ARC WORKERS ARE OBSERVED WEARING ½ FACE RESPIRATORS, 2 SETS OF DISPOSABLE PROTECTIVE COVERALLS, RUBBER BOOTS AND WORK GLOVES AS THEY CONTINUE FLOOR TILE REMOVAL USING SPUD BARS AND SCRAPERS. THE WORK AREA APPEARS TO BE ISOLATED, NEGATIVE PRESSURE IS ADEQUATE AND A DECON IS AT THE ENTRANCE OF THE BUILDING. EFI OBSERVES SIGNS PLACED OUTSIDE THE BUILDING IN COMPLIANCE WITH TDH REGULATIONS.

1000 - ARC WORKERS ARE USING SOLVENT TO REMOVE THE BLACK MASTIC. THE MASTIC RESIDUE IS WIPED WITH RAGS FROM THE CONCRETE FLOOR AND SAWDUST IS USED TO DRY THE FLOOR.

1200 - ARC BREAKS FOR LUNCH.

1230 - ARC WORKERS RETURN TO CONTINUE FLOOR TILE AND MASTIC. THEY ALSO WILL REMOVE TRANSITE PANELS FROM THE WALLS AND CEILING IN SELECTED AREAS SPECIFICALLY THE RESTROOMS AND KITCHEN OR "WET AREAS".

1505 - ARC WORKERS ARE OBSERVED PLACING TILES INTO BAGS FOR DISPOSAL.

1700 - ARC WORKERS CLEAN UP THE AREA AND LEAVE THE SITE EFI LEAVES THE SITE.

Joseph Ponterello JR. Joseph Ponterello J 6/3/03

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

EFI®
Engineering and Fire Investigations

BLDG. 25G Floor Tile & Transite (interior) Removal

00064201

Field Report

Date: 6/4/, 2003 WEDNESDAY | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description BUILDING 25G. Floor Tile + MASTIC + TRANSITE (INTERIOR) Removal

0630 – EFI AND ARC ARRIVES ON SITE. ARC HAS 4 WORKERS AND EXPECTS TO CONTINUE REMOVAL of FLOOR TILE + MASTIC AND TRANSITE FROM THE INTERIOR of BUILDING 25G.

0700 – EFI CALIBRATES PUMPS AND SETS AIR SAMPLES IN AND AROUND THE WORK AREA.

0740 – EFI OBSERVES ARC WORKERS HAVE 2 AIR MACHINES IN OPERATION. THE WORKERS ARE WEARING ½ FACE RESPIRATORS, 2 SETS OF DISPOSABLE COVERALLS, RUBBER BOOTS AND WORK GLOVES AS THEY CONTINUE CLEANING BLACK FLOOR MASTIC AND REMOVING TRANSITE PANELS FROM THE KITCHEN AREA CEILING of BLDG. 25G

1050 – EFI HAS 2 AIR MACHINES IN OPERATION AS THEY PLACE FLOOR TILE AND TRANSITE IN 6 MIL POLY BAGS FOR DISPOSAL.

1130 – ARC WORKERS BREAK FOR LUNCH.

1200 – ARC RETURNS TO 25G WORK AREA TO CONTINUE. THEY WILL BE DETAIL CLEANING AND EXPECT A VISUAL FOR COMPLETENESS AROUND 2 PM.

1430 – ARC REQUESTS A VISUAL OBSERVATION TO CONFIRM COMPLETION OF CLEANING AND REMOVAL IN BUILDING 25G. EFI MAKES A VISUAL OBSERVATION AND FINDS THE WORK TO BE IN GENERAL COMPLIANCE WITH THE SPECIFICATION.

1500 – EFI BEGINS FINAL AIR CLEARANCES IN BUILDING 25G.

1650 – AIR SAMPLE RESULTS INDICATE THAT 25G AREA HAS PASSED THE CRITERIA FOR FINAL AIR CLEARANCE. ARC WORKERS DISMANTLE THE DECON.

1700 – EFI AND ARC LEAVES THE SITE.

(TCLP SAMPLES from BLDGS 201, 203, 204, 713-B)

Joseph Ponterello JR — Joseph Ponterello 6/4/03
Site Representative (Print Name) — Signature/Date

Contractor Supervisor (Print Name) — Signature/Date

00064202

EFI®
Engineering and Fire Investigations

PREP. BLDG. 22A

Field Report

Date: 6 / 5 / , 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 – EFI AND ARC ARE ON SITE. ARC HAS 4 WORKERS AND THEY WILL BE TEARING DOWN THE POLY FROM BUILDING 25 G SINCE YESTERDAY'S COMPLETION, AND PREPARING FOR ACM REMOVAL IN BUILDING 22A.

0830 – ARC WORKERS ARE MOVING SUPPLIES FROM BUILDING 25 G TO BUILDING 22A.

1050 – ARC WORKERS ARE USING 6 mil poly TO PREP AROUND BUILDING 22A FOR ACM REMOVAL

1200 – ARC WORKERS BREAK FOR LUNCH.

1230 – ARC WORKERS RETURN FROM LUNCH AND WILL CONTINUE POLY PREP ON BUILDING 22A.

1430 – ARC CONTINUES poly PREP FOR THE REMOVAL OF TRANSITE EXTERIOR PANELS, FLOOR TILE & MASTIC AND TSI.

1600 – ARC WORKERS BEGAN TO CLEAN UP WASTE DEBRIS AND PREPARE TO LEAVE THE SITE.

1700 – ARC AND EFI LEAVE THE SITE.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

EFI®
Engineering and Fire Investigations

BLDG 22A Floor Tile/Linoleum

00064203

Field Report

Date: 6/10/2003	Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 – EFI AND ARC ABATEMENT ARRIVE ON SITE. ARC HAS 4 WORKERS AND THEY EXPECT TO CONTINUE FLOOR TILE/LINOLEUM REMOVAL INSIDE BUILDING 22A.

0735 – EFI OBSERVES ARC WORKERS WEARING 1/2 FACE RESPIRATORS 2 SETS OF DISPOSABLE PROTECTIVE COVERALLS, RUBBER BOOTS AND WORK GLOVES. THE WORKERS ARE USING SPUD BARS AND SCRAPERS TO REMOVE LINOLEUM AND TILE FROM THE CONCRETE SLAB INSIDE BUILDING 22A.

0915 – EFI OBSERVES ARC USING SOLVENT TO REMOVE THE MASTIC FROM THE CONCRETE SLAB AFTER REMOVAL OF FLOOR TILE. THE TILES AND LINOLEUM ARE PLACED IN 2 LAYERS OF 6 mil POLY AND 6 mil POLY BAGS FOR DISPOSAL. GENERATOR LABELS HAVE BEEN PLACED ON EACH BAG.

1155 – ARC WORKERS CLEAN UP FOR LUNCH BREAK.

1230 – ARC RETURNS FROM LUNCH TO CONTINUE CLEANING MASTIC FROM BUILDING 22A.

1445 – ARC WORKERS ARE HAULING OUT ACM AND STAGING IT OUTSIDE THE BUILDING FOR TRANSFER TO THE LANDFILL.

1700 – ARC AND EFI LEAVE THE SITE

Joseph Ponterella Jr.
Site Representative (Print Name)

Joseph Ponterella J 6/10/03
Signature/Date

Contractor Supervisor (Print Name)

Signature/Date

EFI
Engineering and Fire Investigations

BLDG. 22-A REMOVAL - CLEANING

00064204

Field Report

Date: 6/11/, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - ARC AND EFI ARRIVE ON SITE. ARC HAS 4 WORKERS AND THEY EXPECT TO CONTINUE CLEANING INSIDE BUILDING 22A.

0750 - EFI OBSERVES ARC WORKERS WEARING 1/2 FACE RESPIRATORS, 2 SETS OF DISPOSABLE PROTECTIVE COVERALLS, RUBBER BOOTS AND WORK GLOVES AS THEY REMOVE MASTIC FROM THE FLOOR.
EFI SETS AIR SAMPLES IN AND AROUND THE WORK AREA.

1000 - ARC WORKERS CONTINUE CLEANING MASTIC INSIDE THE BUILDING.

1100 - ARC BEGAN TO HAUL OUT BAGS FOR DISPOSAL AS ACM.

1200 - ARC BREAKS FOR LUNCH.

1230 - ARC WORKERS RETURN TO BUILDING 22A TO CONTINUE CLEANING MASTIC FROM THE FLOOR.

1400 - ARC WORKERS ARE STILL CLEANING THE FLOOR WITH SOLVENT, MARINE SAWDUST AND RAGS. THEY DO NOT EXPECT TO COMPLETE THE WORK IN BUILDING 22A TODAY.

1635 - ARC WORKERS BEGAN TO CLEAN UP AND BAG ALL WASTE.

1700 - ARC AND EFI LEAVE THE SITE.

COLLECTED TCLP SAMPLES FROM BLDGS:
201-A
202
707F
201R

Joe Ponterello Jr.
Site Representative (Print Name)

Joe Ponterello 6/11/03
Signature/Date

Contractor Supervisor (Print Name)

Signature/Date

EFI®
Engineering and Fire Investigations

BLDG. 22-A CLEANING & TILE MASTIC
COMPLETED

00064205

Field Report

Date: 6/12/2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - ARC AND EFI ARRIVE ON SITE. ARC HAS 4 WORKERS AND THEY EXPECT TO CONTINUE CLEANING BLDG. 22-A FOR POSSIBLE COMPLETION THIS AFTERNOON.

0750 - EFI OBSERVES ARC WORKERS WEARING 1/2 FACE RESPIRATORS 2 SETS OF DISPOSABLE COVERALLS, RUBBER BOOTS AND WORK GLOVES AS THEY REMOVE MASTIC AND USE SOLVENT AND BRUSHES.

0840 - EFI OBSERVES ARC WORKERS APPEAR TO BE NEAR COMPLETION OF CLEANING THE MASTIC. THEY WILL PROBABLY BE READY FOR A VISUAL OBSERVATION FOR COMPLETION. LATER TODAY.

1000 - EFI OBSERVES ARC WORKERS HAULING OUT ACM WASTE IN DOUBLE BAGS FOR DISPOSAL.

1150 - ARC WORKERS CLEAN UP FOR LUNCH BREAK.

1200 - ARC BREAKS FOR LUNCH.

1230 - ARC WORKERS RETURN TO BUILDING 22-A AND REQUEST EFI TO PERFORM A VISUAL OF THE COMPLETION OF CLEANING. EFI OBSERVES THE WORK APPEARS COMPLETE IN ACCORDANCE WITH THE SPECIFICATION.

1330 - EFI BEGAN FINAL AIR CLEARANCE SAMPLING INSIDE BUILDING 22-A

1515 - EFI COLLECTS AIR SAMPLES FROM BUILDING 22-A FOR PCM ANALYSIS ON SITE. ARC WORKERS ARE MOVING EQUIPMENT AND SUPPLIES TO THE NEXT LOCATION.

1530 - EFI DETERMINES BUILDING 22-A HAS PASSED FINAL AIR CLEARANCE ARE IS INFORMED AND THE WORKERS ARE DIRECTED BY THEIR SUPERVISOR TO BEGIN TEARING DOWN THE ENCLOSURE.

1600 - ARC WORKERS DISPOSE OF BAGGED WASTE AND CONTINUE TO DISASSEMBLE THE ENCLOSURE FROM BUILDING 22-A.

1700 - TEAR DOWN IS COMPLETE. THE AREA IS CLEANED UP AND ARC LEAVES THE SITE.

JOE PONTERELLO JR
Site Representative (Print Name)

Joe Ponterello Jr 6/12/03
Signature/Date

Contractor Supervisor (Print Name)

Signature/Date

EFI
Engineering and Fire Investigations

BLDGS: 716 A. TILE + MASTIC ~400 S.F (Completed)
744 SIDING
744A SIDING + TSI (Completed)

00064206

Field Report

Date: 6/16/2003 MONDAY

Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - ARC AND EEI ARE ON SITE. ARC HAS 3 WORKERS TODAY. SANTOS REYES IS NOT HERE. ARC PLANS TO START A SMALL FLOOR TILE REMOVAL OPERATION IN BUILDING 716 AND MOVE ON TO 744 AND 744A TO REMOVE SIDING AND SOME T.S.I.

0710 - EEI OBSERVES ARC WORKERS ENCLOSING THE FLOOR TILE AREA IN BUILDING 716 (ABOUT 400 S.F. OF TILE) AND APPEAR NEARE READY FOR REMOVAL.

0845 - EEI ~~WORKER~~ OBSERVES ARC WORKERS WEARING ½ FACE RESPIRATORS, RUBBER BOOTS, WORK GLOVES AND DISPOSABLE COVERALLS AS THEY USE SPUD BARS TO REMOVE THE FLOOR TILE INTACT.

0930 - THE FLOOR TILE AND MASTIC HAS BEEN REMOVED FROM BUILDING 716 AS ARC WORKERS CLEAN THE AREA.
EEI MAKES A VISUAL OBSERVATION AND FINDS 716 WORK AREA APPEARS TO BE CLEAN AND COMPLETED IN GENERAL ACCORDANCE WITH THE SPECIFICATION.

0940 - EEI BEGAN FINAL CLEARANCE SAMPLES IN BUILDING 716 WORK AREA. ARC WORKERS MOVE TO BUILDING 744 AND WILL START THE REMOVAL OF TRANSITE SIDING

1125 - EEI collects THE CLEARANCE SAMPLES FROM BUILDING 716 FOR PCM ~~ANALYSIS~~ ANALYSIS ON SITE. ARC WORKERS CONTINUE IN BUILDING 744

1200 - ARC BREAKS FOR LUNCH. BUILDING 716 HAS ACHIEVED FINAL AIR CLEARANCE. ARC SUPERVISOR ASSIGNS 1 WORKER TO TEAR DOWN. ~~ASSIGNS~~ AFTER LUNCH.

1250 - ARC HAS 2 WORKERS IN BUILDING 744-A USING GLOVE BAGS TO REMOVE THE PIPE INSULATION.

1400 - ARC COMPLETES THE T.S.I. REMOVAL IN BUILDING 744-A AND MOVES TO 744 TO START REMOVAL OF TRANSITE SIDING.

1535 - ARC WORKERS CONTINUE SIDING REMOVAL FROM BUILDINGS: 744 AND 744-A. 744 WILL NOT BE COMPLETED TODAY.

1700 - ARC COMPLETES THE WORK IN BUILDING 744A AND ENDS THE SHIFT.

JOE PONTORELLO JR. — Joe Pontorello 6/16/03
Site Representative (Print Name) — Signature/Date

Contractor Supervisor (Print Name) — Signature/Date

EFI
Engineering and Fire Investigations

BLDG. 717 FL. TILE REMOVAL
TRANSITE "
GLOVE BAG - TSI "

00064207

Field Report

Date: 6/18/2003

Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - ARC AND EEI ARE ON SITE. EEI OBSERVES ARC HAS 3 WORKERS AS THEY PLAN TO WORK INSIDE BUILDING 717 TODAY REMOVING FLOOR TILE AND ASSOCIATED MASTIC.

0715 - EEI OBSERVES ARC WORKERS WEARING 1/2 FACE RESPIRATORS, RUBBER BOOTS, 2 SETS of DISPOSABLE COVERALLS, AND WORK GLOVES, AS THEY REMOVE FLOOR TILE FROM BUILDING 717 USING LONG HANDLE SPUD BARS AND SCRAPERS.

0930 - EEI OBSERVES ARC WORKERS BAGING FLOOR TILE AND SEALING THE BAGS FOR DISPOSAL.

1125 - ARC WORKERS ARE OBSERVED USING SOLVENT TO REMOVE THE MASTIC FROM THE CONCRETE FLOOR.

1200 - ARC BREAKS for LUNCH.

1230 - ARC WORKERS RETURN TO BUILDING 717 TO CONTINUE FLOOR TILE AND MASTIC REMOVAL from VARIOUS ROOMS INSIDE.

1455 - ARC WORKERS ARE NOW USING GLOVE BAGS TO REMOVE TSI FROM A PIPE RUN ACROSS THE ENCLOSURE WHERE FLOOR TILE WAS REMOVED.

1600 - ARC WORKERS CONTINUE FLOOR TILE REMOVAL IN ANOTHER ROOM IN BUILDING 717.

1700 - ARC WORKERS CLEAN UP DEBRIS AND LEAVE THE SITE. EEI LEAVES THE SITE

Joe Contarello JR
Site Representative (Print Name)

Joe Contarello J 6/18/03
Signature/Date

Contractor Supervisor (Print Name)

Signature/Date

EFI®
Engineering and Fire Investigations

BLDG 717 ~~FLOOR~~ TRANSITE TSI (GLOVEBAG) (INCOMPLETE)

00064208

Field Report

Date: 6/19/2003 THURSDAY

Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - ARC AND EFI ARE ON SITE. ARC HAS 3 WORKERS AND THEY ANTICIPATE COMPLETING THE WORK IN BUILDING 717 TODAY.

0730 - ARC WORKERS ARE OBSERVED WEARING ½ FACE RESPITATORS, 2 SETS OF DISPOSABLE COVERALLS, RUBBER BOOTS AND WORK GLOVES AS THEY USE GLOVE BAGS TO REMOVE PIPE INSULATION WITH MASTIC FROM OVERHEAD PIPES. THE FLOOR TILE HAS BEEN REMOVED ALONG WITH ~~THE~~ MOST OF THE ASSOCIATED MASTIC. FINAL CLEANING WILL BE DONE LATER.

1015 - ARC WORKERS CONTINUE REMOVING T.S.I. WITH MASTIC AND ARE OBSERVED ATTACHING GLOVE BAGS TO THE OVERHEAD PIPE.

1030 - EFI IS REQUESTED TO OBSERVE THE WORK AREA FOR COMPLETION OF CLEANING IN ~~THE~~ THE FLOOR TILE AND MASTIC AREA. EFI FINDS THE FLOOR TILE AND MASTIC REMOVAL IS COMPLETED AND CLEANED IN ACCORDANCE WITH THE SPECIFICATION. EFI INFORMS ARE SUPERVISOR AND BEGINS FINAL AIR CLEARANCE SAMPLES IN THE AREA OF FLOOR TILE ONLY. ARE WORKERS WILL CONTINUE REMOVING TSI WITH GLOVE BAGS.

10:50 - EFI SETS FINAL AIR CLEARANCE SAMPLES INSIDE THE WORK AREA OF BUILDING 717.

1200 - ARC WORKERS BREAK FOR LUNCH.

1235 - EFI COLLECTS THE FINAL AIR CLEARANCE SAMPLES FOR PCM ANALYSIS ON SITE.

1250 - AIR SAMPLE ANALYSIS INDICATES THAT THE FLOOR TILE AREA PASSES CLEARANCE.

1325 - ARC WORKERS CONTINUE TSI REMOVAL INSIDE OTHER AREAS OF THE BUILDING

1500 - ARC CONTINUES REMOVAL OF TSI AND BEGINS TO CLEAN UP THE AREA.

1700 - ARC AND EFI LEAVE THE SITE. ARC DID NOT COMPLETE THE WORK IN BUILDING 717 AS THE TRANSITE STILL REMAINS IN PLACE.

Joe Ponterella JR
Site Representative (Print Name)

Joseph Ponterella Jr 6/19/03
Signature/Date

Contractor Supervisor (Print Name)

Signature/Date

00064209

EFI®
Engineering and Fire Investigations

Field Report

Date: 6 - 23 , 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC 1 OF 1

Description

0630- CW ONSite. 4 MEN & 1 SUPV, CW will
- Prep Bldg 704 D Po- RT Removal.
0730- Prep continues For R.T & MAGNETIC PW
- 704 D.
0830- CW Begins R.T Removal ON 704D.
0930- SAME AS ABOVE NOTED. UNIT FACE RESP
- TYVEK SUIT & RUBBER BOOTS IN USE.
1030- R.T Removal continues IN 704D.
1200- LUNCH.
1230- CW BACK TO WORK W/ RT IN 704D.
1330- R.T Removal CONTINUES IN 704 D.
1430- CW continues W/ R.T. Removal ON
- 704D.
1530- SAME AS ABOVE NOTED
1630- CW SIGNED OUT
1700- OFFSITE.

JOHN A. ROBAU
Site Representative (Print Name)

Signature/Date 6-23-0

Contractor Supervisor (Print Name)

Signature/Date

00064210

EFI
Engineering and Fire Investigations

Field Report

Date: 6-24, 2003

Project Number: 98-110-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

1 of 1

Description

0630- SW ONSITE. 4 MEN & 1 SUPV. SW WILL
- CONTINUE W/ F.T REMOVAL ON BLDG 704D.
- HALF FACE RESP, TYVEK SUITS & RUBBER
- BOOTS TO USE.

0800- SW CONTINUES W/ F.T REMOVAL ON 704D.

0900- SAME AS ABOVE NOTED.

1000- SW CONTINUES W/ F.T REMOVAL ON 704D.

1120- F.T REMOVAL CONTINUES ON 704D.

1200- LUNCH.

1300- SW CONTINUES W/ F.T REMOVAL.

1430- SW OFFSITE.

JANA A. REAVIS

Site Representative (Print Name)

Signature/Date 6-24-03

Contractor Supervisor (Print Name)

Signature/Date

00064211

EFI
Engineering and Fire Investigations

Field Report

Date: 6-25, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

1 OF 1

Description

0630- CW ONSITE. CW 4 MEN & 1 SUPV. CW
- WILL BEGIN MASTIC REMOVAL ON 704D.
- HALF FACE RESP/ TYVEK SUITS & RUBBER
- BOOTS TO USE.
0730- CW CONTINUES W/ MASTIC REMOVAL ON 704D.
0830- SAME AS ABOVE NOTED.
0930- MASTIC REMOVAL CONTINUES ON 704D.
1030- CW CONTINUES W/ MASTIC REMOVAL
- ON 704D.
1200- LUNCH.
1230- CW BACK TO WORK W/ WASTE DEBRIS.
1300- VISUAL PASSES ON 704D.
1330- E.F.I STARTS RINGS ON 704D.
1540- E.F.I REMOVES RINGS ON 704D.
1600- CW WRAP NOW TEAR DOWN CNT.
- ON 704D. RINGS PASS.
1700- OFFSITE.

JOHN W. ROBINSON 6-25-03

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064212

EFI
Engineering and Fire Investigations

Field Report

Date: 6-30 , 2003

Project Number: 98410 - 13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0330 - EFI INROUTE TO SITE

0730 - EFI ON SITE, ARC ON SITE.

0830 - Work this shift is TRANSITE REMOVAL on Bldg 414 (WATER PUMPING STATION).

1030 - ARC moving TRANSITE PANELS to Disposal Site.

1130 - Approx. 25% of the TRANSITE on this Bldg. has BEEN TAKEN DOWN AT this time. WORKERS STOPPING AND CLEANING UP FOR LUNCH BREAK.

1200 - Lunch.

1300 - Work RESUMES on TRANSITE REMOVAL Bldg 414.

1500 - ARC ADVISES THAT Approx 50% OF the TRANSITE REMOVAL will BE COMPLETE by SHIFT END.

1700 - REMOVAL STOPS AND WORKERS CLEAN UP FOR END OF SHIFT.

1730 - EFI ARC DEPART SITE.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064213

EFI
Engineering and Fire Investigations

Field Report

Date: 7-1, 2003

Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 – EFI AND ARC ON SITE.

0730 – Work this shift will continue with transite removal on Bldg. 414

0930 – Work continues as planned at this time.

1030 – ARC advises that they will be 75% complete with transite removal by lunch break.

1200 – Lunch.

1300 – Work resumes as planned. One supervisor and 4 workers.

1600 – ARC is complete with transite removal and is hauling it to the disposal site.

1700 – ARC will move to another location next shift.

1730 – EFI, ARC depart site.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064214

EFI
Engineering and Fire Investigations

Field Report

Date: 7-2, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFI, ADC on site.
- Work this shift will be Transite removal in the Richmond Magazines area.

0800 - Buildings have Transite siding on the front and rear.

0930 - Removal underway. Bush clearing moving ahead of demoval.

1100 - Work as described continues as planned. ADC hauling waste to disposal site.

1200 - Work Stops for Lunch break.

1300 - Work resumes on Transite removal on the Richmond Magazines.

1500 - ADC advises EFI that they will compleat Transite removal on Magazine Bldg 811-1 thru 811-8 this shift

1630 - Another load of waste being hauled by ADC to the disposal site.

Site Representative (Print Name) _____ Signature/Date _____

Contractor Supervisor (Print Name) _____ Signature/Date _____

00064215

EFI
Engineering and Fire Investigations

Field Report

Date: 7-2, 2003

Project Number: 98410 -13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

1730- ARC advises EFI that next week July 7-11 they will not have any abatement work going on but will resume on Monday July 14.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064216

EFI
Engineering and Fire Investigations

Field Report

Date: 7-3, 2003

Project Number: 98410 - 13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFI on site, ARC on site ONE Supervisor 4 workers.

0830 - TRANSITE REMOVAL continuing AS PLANNED on the Richmond MAGAZINES.

1030 - VERY hot working conditions, Ample Drinking WATER AND Drinks on SITE.

1130 - ARC hauling truck load of WASTE to the DISPOSAL SITE.

1200 - Work stops for Lunch at this TIME.

1300 - TRANSITE REMOVAL RESUMES AS PLANNED.

1430 - ARC advises EFI, that they will complete TRANSITE REMOVAL on Richmond MAGAZINES 811-9 thru. 811-14 this shift.

1600 - REMOVAL complete for this shift and CREW CLEANING up while WASTE is HAULED to the DISPOSAL SITE.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064217

EFI®
Engineering and Fire Investigations

Field Report

Date: 7-3, 2003

Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

1700 – ARC EFI departing site as planned.

D. Pope
Site Representative (Print Name)

Signature/Date

Contractor Supervisor (Print Name)

Signature/Date

EFI
Engineering and Fire Investigations

00064218

Field Report

Date: 7-14 , 2003 | Project Number: 98410 - 13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFI on site
- ARC on site. Work this shift will continue with transite sidding removal on the Richmond Magazines.

0830 - ARC starting on Bldg. 811-15 with transite removal.

1000 - Work continues as planned at this time.

1130 - ARC continuing to haul transite to the disposal site as they planned.

1200 - Work stops for lunch break at this time.

1300 - ARC resumes on transite removal.

1500 - ARC will complet Bldg. Numbers 811-15 through 811-19. This shift.

1700 - Work stops for this shift.

1730 - ARC and EFI depart site.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064219

EFI®
Engineering and Fire Investigations

Field Report

Date: 7-15, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 — EFI and ARC on site.

0830 — Work began on transite removal with Richmond Magazine Bldg. No. 811-15

1000 — As planned ARC is going to haul waste to the on site disposal site.

1130 — Work stops for lunch break and ARC hauls a load to the disposal site.

1230 — ARC returns to work. Conditions are hot and a light wind as transite removal about to resume.

1430 — ARC will complete Richmond Magazine Bldgs 811-15 through 811-20 this shift.

1630 — Transite removal has stopped for this shift to allow ARC to clean up last work site and move all equipment to

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064220

EFI
Engineering and Fire Investigations

Field Report

Date: 7-15, 2003

Project Number:

Project Name: Longhorn Army Ammunition Plant 98410 - 13709

Contractor: ARC

Description

- The starting location for tomorrow.

1730 — Shift ENDS, ARC and EFI departing site.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064221

EFI
Engineering and Fire Investigations

Field Report

Date: 7-16, 2003 | Project Number: 98410 - 13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFi, ARC ON SITE.

0730 - Work this shift will continue with TRANSITE REMOVAL ON the Richmond MAGAZINES

0900 - ARC STARTED ON Bldg NO. 811-21 this shift.

1000 - WEATHER Hot, little or no wind. Work continues.

1100 - Work continues AS PLANNED AT this time.

1200 - ALL work stops For Lunch BREAK.

1300 - EFi collected LBP SAMPLES ON Bldgs. 630-A, 510-B-2, 536, TS-10.

1430 - ARC will complete TRANSITE REMOVAL ON Bldgs. 811-21 through 811-25 this shift

1630 - ARC hauling A Load OF TRANSITE to the Disposal SITE.

1730 - Shift ENDS

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064222

EFI
Engineering and Fire Investigations

Field Report

Date: 7-17, 2003 | Project Number: 98410 - 13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFI AND ARC ON SITE.

0730 - Work this shift will BE TRANSITE SIDDING REMOVAL ON THE Richmond MAGAZINES Bldgs.

0900 - ARC UNDERWAY with REMOVAL AS PLANNED.

1030 - Work slowed slightly do to the MAN LIFT BEING STUCK.

1200 - Work stops for Lunch BREAK AT this TIME.

1300 - ARC RESUMES WORK AS DESCRIBED.

1500 - ARC ADVISES EFI that they will COMPLETE TRANSITE REMOVAL ON Bldgs, 811-26 THRU 811-30 this SHIFT.

1600 - ARC HAULING ACM WASTE to the DISPOSAL SITE.

1700 - ALL work STOPPED AND SHIFT

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064223

EFI®
Engineering and Fire Investigations

MONDAY 7-21-03

Field Report

Date: 7-21 , 2003

31-35

98410-13709

Project Name: Longhorn Army An

Contractor: ARC

Description

0630 - EFi ON SITE.

0745 - Work this shift will RESUME TRANSITE REMOVAL ON THE Richmond MAGAZINE Bldgs.

0945 - Hot, no wind, work under way.

1130 - ARC will continue hauling ACM FROM EACH REMOVAL SITE to the Disposal site on property.

1200 - All work Stops For Lunch.

1300 - Work RESUMES AS DESCRIBED ON TRANSITE REMOVAL.

1500 - Access to EACH Bldg is the hardest work, cutting trees out of the way.

1700 - Work Stops For This shift. TRANSITE REMOVAL WAS completed ON Bldgs 811-31 to 811-35. ARC AND EFi DEPART SITE.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064224

EFI
Engineering and Fire Investigations

Field Report

Date: 7-22, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFI, ARC on site.

0730 - Work again this shift will be transite removal on the Richmond Magazine area.

0930 - Weather is Hot with light wind. Removal underway.

1045 - ARC hauling ACM waste to the disposal site.

1200 - All work stopping for Lunch at this time!

1300 - Work resumes, as planned. ARC has one worker and John moving ahead of the removal crew clearing trees and brush.

1500 - ARC will complete transite removal on Bldgs 811-36 → 811-40 this shift.

1700 - Work stops for this shift.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064225

EFI
Engineering and Fire Investigations

Field Report

Date: 7-23, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFi And ARC on site.
Rain last Night May Effect work.

0830 - ARC still able to Access the work areas of the Richmond Magazines.

1030 - Hot And Humid this shift, Work continues.

1200 - Transite Reno stops for Lunch Break.

1300 - ARC Returns to work. ARC advises EFi that they are trying to complete the Richmond Magazine Bldgs this week.

1430 - Another load of ACM waste being hauled to the Disposal site.

1630 - ARC will complete Bldgs 811-40 thru 811-47 this shift.

1730 - ARC, EFi Depart site.

Site Representative (Print Name) _____ Signature/Date _____

Contractor Supervisor (Print Name) _____ Signature/Date _____

00064226

EFI
Engineering and Fire Investigations

Field Report

Date: 7-24, 2003 | Project Number:

Project Name: Longhorn Army Ammunition Plant 98410 - 13709

Contractor: ARC

Description

0630 - ARC AND EFI ON SITE

0730 - Work this shift will continue with transite removal on the Richmond Magazine area.

0900 - Work underway as planned. ARC pushing to complete 10 Bldgs this shift. Brush was cleared on 5 of these Bldgs. Last shift.

1100 - Exterior Transite removal continues on Bldgs 811-48 and up. →

1200 - Lunch Break.

1300 - ARC hauling ACM to on site Disposal Site.

1500 - ARC advises that they will be able to complete Bldgs 811-48 through 811-58 with transite removal this shift.

1700 - Another load taken to Disposal Site.

1730 - Shift Ends.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064227

EFI
Engineering and Fire Investigations

Field Report

Date: 7-28, 2003 | Project Number: 9X410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFI AND ARC ON SITE.

0730 - ARC will BEGIN TRANSITE REMOVAL ON Bldg. 713 GENERAL PURPOSE WAREHOUSE this shift.

0930 - REMOVAL UNDERWAY AFTER ARC COMPLETED MOVING EQUIPMENT AND SUPPLIES TO CURRENT LOCATION.
- LEE BUCKLE, MICHAEL LUCZAK ON SITE.

1130 - LARGE Bldg. MAY TAKE 2-3 DAYS.

1200 - ALL WORK STOPS FOR LUNCH BREAK.

1300 - WORK RESUMES. VERY HOT CONDITIONS AND WORKERS TAKING FREQUENT BREAKS TO DRINK WATER.

1500 - ARC HAS A LOAD OF TRANSITE ENROUTE TO THE DISPOSAL SITE.
- ARC'S TRANSPORTER FOR FRIABLE ACM, HAS NOT SHOWN UP TO SWAP OUT THE 40 CU. YD. CONTAINER ON SITE.
- BUCKLE AND LUCZAK DEPART SITE

1700 - WORK STOPS FOR THIS SHIFT.

1730 - ARC, EFI DEPART SITE.

Site Representative (Print Name) | Signature/Date

Contractor Supervisor (Print Name) | Signature/Date

00064228

EFI
Engineering and Fire Investigations

Field Report

Date: 7-29, 2003 | Project Number: 9840-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 – EFI on site as is ARC.

0800 – Work this shift will continue transite removal on Bldg. 713.

1000 – Work continues as planned.

1200 – ARC stops for lunch break at this time.

1300 – Work resumes on transite removal on Bldg 713.

1430 – Very Hot conditions, workers taking frequent water breaks.

1600 – ARC will continue on Bldg. 713 next shift.

1700 – Shift ends ARC, EFI departing site.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064229

EFI
Engineering and Fire Investigations

Field Report

Date: 7-30 , 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFI on site. ARC on site.

0800 - ARC DESuming with TRANSITE REMOVAL on Bldg. 713 AT this time.

1000 - ARC will complete Bldg 713 with TRANSITE REMOVAL by Lunch AND MOVE to Bldg. 722F.

1200 - Work Stops FOR Lunch AT this time.

1300 - ARC completed Bldg 713 AND is in process of moving to Bldg 722F which is A SMALL Bldg.

1430 - REMOVAL underway on TRANSITE Bldg 722E

1600 - ARC will complete TRANSITE REMOVAL on Bldg 722E By shift END.

1700 - REMOVAL complete on Bldg 722E AND shift ENDS.

1730 - EFI AND ARC DEPART site.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064230

EFI
Engineering and Fire Investigations

Field Report

Date: 7-31, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFI on site, ARC on site.

0730 - ARC moving to Bldg. 718-A, A LARGE Bldg.

0900 - ARC starting TRANSITE REMOVAL on Bldg. 718-A.

1100 - ARC hauling ANOTHER LOAD OF TRANSITE SIDDING to the DISPOSAL SITE.

1200 - Work stops FOR LUNCH BREAK AT this TIME.

1300 - Work RESUMES AS DESCRIBED on Bldg 718-A.

1500 - Work continues, VERY hot conditions AND, workers CHANGE side OF the Bldg to get in the SHADE.

1700 - ARC stopping FOR this shift AND cleaning up.

1730 - EFI AND ARC DEPART SITE.

Site Representative (Print Name) _____ Signature/Date _____

Contractor Supervisor (Print Name) _____ Signature/Date _____

00064231

EFI
Engineering and Fire Investigations

Field Report

Date: 8-4, 2003

Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 – EFI, ARC on site.

0800 – Work has resumed on transite removal on Bldg 718-A

1000 – Weather heating up quickly. Workers taking frequent water breaks.

1200 – Work stops for lunch break at this time.

1300 – Work resumes, ARC hauling a load of transite to the disposal site.

1430 – Transite removal continues as planned.

1630 – Work continues as described at this time.

1730 – Shift ends ARC and EFI are departing site.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064232

EFI
Engineering and Fire Investigations

Field Report

Date: 8-5 , 2003

Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 – EFI, ARC on site.

0830 – ARC resumed transite removal on Bldg 718-A and will be complete with it by 10:30.

1030 – Bldg 718-A transite removal complete. Workers moving supplies and equipment to Bldg 714 which is ARC's storage area. They will be moving all of their supplies and equipment to Bldg. 50G

1200 – All work stops for lunch break at this time.

1300 – Work resumes on transite removal at Bldg 714.

1500 – ARC will finish transite removal on Bldg 714 by shift end.

1700 – ARC sent another load of transite to the disposal site.

1730 – All work stops for shift end.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064233

EFI
Engineering and Fire Investigations

Field Report

Date: 8-6 , 2003 | Project Number: 98410 - 13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFI ON SITE, ARC ON SITE.

0730 - ARC ADVISES THAT THE FRIABLE ACM 40 yd. CONTAINER IS SCHEDULED TO BE PICKED UP TODAY.

0830 - BAYOU CITY WASTE ON SITE TO DELIVER ANOTHER ACM 40 yd. BOX AND TRANSPORT THE FULL CONTAINER.

0930 - ARC HAS BEEN WORKING ON MOVING THEIR WAREHOUSE FROM Bldg 714 to Bldg. 50 G.

1030 - WORK AREA IS PREP ON Bldg 722-E 800 Sq. FT OF FL. TILE AND MASTIC TO REMOVE.

1200 - PREP VISUAL PASSED AND ARC BEGAN FL. TILE AND MASTIC REMOVAL.

1300 - ARC ASK FOR VISUAL ON REMOVAL AREA.

1330 - VISUAL PASSED AND EFI CONDUCTS PCM AIR CLEARANCE.

1530 - PCM AIR CLEARANCE PASSES AND

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064234

EFI®
Engineering and Fire Investigations

Field Report

Date: 8-6 , 2003 | Project Number:

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

- ARC is tearing down remaining poly.

1700 – Shift Ends.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064235

EFI
Engineering and Fire Investigations

Field Report

Date: 8-7, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - ARC, EFi ON SITE.

0730 - ARC SETting up to START TRANSITE REMOVAL ON Bldg 717.

0930 - TRANSITE REMOVAL underway AT this TIME.

1100 - Work CONTINUES AS PLANNED AT this TIME.

1200 - All work STOPS FOR Lunch.

1300 - ARC RESUMES TRANSITE REMOVAL ON Bldg 717

1500 - Work CONTINUES AS DESCRIBED ON Bldg 717

1700 - Work STOPS FOR SHIFT END

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064236

EFI
Engineering and Fire Investigations

Field Report

Date: 8-11, 2003 | Project Number: 98410 - 13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFI on site. ARC on site.

0730 - Work this shift is continuing with Bldg 717 transite removal.

0930 - ARC has a load of ACM waste hauling it to the disposal site.

1100 - Transite removal continues as planned at this time.

1200 - Work stops for lunch break at this time.

1300 - ARC resumes transite removal as described.

1500 - Weather starting to rain, ARC continuing removal.

1600 - Lighting has stopped transite removal and ARC cleaning up for shift end.

1700 - EFI, ARC depart site for the day.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064237

EFI
Engineering and Fire Investigations

Field Report

Date: 8-12, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 – EFI, ADC on site.

0830 – WEATHER LOTS OF RAIN AT THIS TIME. ADC MOVED TO Bldg 206 TO WORK ON FL. TILE & MASTIC REMOVAL DURING RAIN.

1000 – ADC IS PREPING AREA FOR FL. TILE AND MASTIC REMOVAL.

1130 – AREA READY PREP VISUAL PASSED AND ADC TAKING LUNCH PRIOR TO STARTING REMOVAL.

1230 – ADC BEGINS REMOVAL ON FL. TILE AND MASTIC.

1400 – WORK ON FL. TILE & MASTIC REMOVAL COMPLETE. VISUAL PASSES AND EFI SETS UP AIR CLEARANCE.

1630 – EFI stopped and analysied PCM AIR CLEARANCE SAMPLES.

1700 – AIR CLEARANCE PASSED AND EFI AND ADC DEPART SITE.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

8-13-03

00064238

ALEX

IF you HAVE A List OF the Bldg NUMBERS OF the TCLP SAMPLES you HAVE HAD TESTED, WE Could us it HERE. The lists OF Bldgs HERE ON SITE HAVE BEEN MARKED up BY DIFFERENT PEOPLE, [redacted] it is HAD to TELL WHITCH Bldgs, other than the ones I SAMPLED HAVE BEEN DONE.

Pope

PLEASE FAX it TO ME IF you HAVE somethings.

00064239

EFI
Engineering and Fire Investigations

Field Report

Date: 8-13, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 – EFi and ARC on site.

0730 – Work this shift will be to glovebag pipe in Bldg 206

0930 – ARC using neg. pressure Glovebag method. Removal underway.

1100 – Work continues as described with 2 men on each bag.

1200 – All work stops for lunch break. ARC has a remote decon setup in Bldg. 206.

1330 – ARC has resumed Glovebag Removal as described.

1500 – Work continues as planned, this area may take a couple of day's to complete.

1630 – ARC is hauling their second load of ACM waste to the disposal site.

1730 – Shift ends and ARC and EFi are departing site.

Site Representative (Print Name) _____ Signature/Date _____

Contractor Supervisor (Print Name) _____ Signature/Date _____

00064240

EFI
Engineering and Fire Investigations

Field Report

Date: 8-14 , 2003 | Project Number: 98416-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 – EFI, ARC on site.

0730 – ARC has moved back to Bldg 717 to resume transite removal where they left off due to the rain.

0930 – Work on removal going as planned.
– ARC meeting on site with A-1 Demo, ARC – Michael Lucal, Jenny Fields A-1, Bill

1130 – Very Hot conditions, workers continue to drink lots of water. Removal pace slows as heat increases.

1200 – Lunch.

1300 – Work resumes on transite removal as planned.

1500 – Note Saul Lopez is now a licensed TDH supervisor.

1700 – Work stops for the day.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064241

EFI®
Engineering and Fire Investigations

Field Report

Date: 8-18, 2003 | Project Number: 98410 - 13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFI on site.
ARC on site, same crew.

0800 - Work this shift will resume on transite removal at Bldg. 717.

1000 - ARC continues transite removal as planned at this time.

1200 - Work stops for lunch break.

1300 - Transite removal resumes as planned.
- ARC hauls a load of ACM to the disposal site.

1500 - All work continues as described.

1600 - Another load of ACM being hauled to the disposal site.

1700 - Work stopped. Crew cleaning up.

1730 - EFI, ARC depart site.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064242

EFI
Engineering and Fire Investigations

Field Report

Date: 8-19, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFI on site.
- ARC on site

0800 - ARC has resumed transite removal on Bldg. 717
- ARC is using a CAT 977 track loaded at this time to clear brush and trees away from other Bldgs in the area.

1000 - Transite removal on Bldg 717 complete and crew moved over to Bldg. 707F and 707G

1200 - All work stops for lunch at this time.

1300 - Bldgs 707F and 707G are small Bldgs for transite removal

1500 - ARC hauling another load of ACM to the Disposal site. A-1 has covered the 1ST hole with soil cap.

1700 - Work stops for this shift and crew shower. ARC, EFI off plant site.

Site Representative (Print Name) _____ Signature/Date _____

Contractor Supervisor (Print Name) _____ Signature/Date _____

00064243

EFI
Engineering and Fire Investigations

Field Report

Date: 8-20, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFI on site, ARC on site with same crew.

0830 - ARC removing transite on Bldg 707J and [redacted]723 this shift - Laundry Bldg.

1000 - Work continues [redacted] as described.

1200 - Very Hot conditions. Work stops for lunch break.

1300 - Work resumes. Workers moving to Bldg. 734 to continue with transite removal.

1500 - ARC hauling a load of ACM to the disposal site.

1600 - Work continues as planned. ARC will not finish transite removal on Bldg. 734 this shift.

1700 - Work stops for end of shift.

1730 - ARC, EFI depart site.

Site Representative (Print Name) _____ Signature/Date _____

Contractor Supervisor (Print Name) _____ Signature/Date _____

00064244

EFI®
Engineering and Fire Investigations

Field Report

Date: 8-21, 2003 | Project Number: 98410 - 13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFI ON SITE ARC ON SITE. ARC ON SITE, SAME CREW.

0730 - WORK THIS SHIFT WILL BE INSIDE BLDG. 723 LAUNDRY BLDG. ON GLOVEBAG REMOVAL OF TSI.

0900 - GLOVE BAG REMOVAL UNDERWAY AS PLANNED AT THIS TIME.

1030 - ARC HAS 2 MEN PER GLOVEBAG DOING REMOVAL.

1200 - WORK STOPS FOR LUNCH BREAK.

1300 - ARC RESUMES GLOVEBAG REMOVAL INSIDE BLDG. 723.

1500 - ARC STOPPING REMOVAL TO CLEAN UP WORK AREA AND MOVE GLOVEBAGS TO THE ACM WASTE CONTAINER

1600 - ACM BAGS ALL LOADED AND CONTAINER IS LOCKED.

1700 - ARC AND EFI DEPART SITE.

Site Representative (Print Name) _____ Signature/Date _____

Contractor Supervisor (Print Name) _____ Signature/Date _____

00064245

EFI®
Engineering and Fire Investigations

Field Report

Date: 8-25, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFi on site. ARC on site.

0800 - Work this shift is TRANSITE REMOVAL on Bldg. 723.

0930 - ARC hauling A load of TRANSITE to the DISPOSAL SITE.

1030 - ARC has ordered more glovebags but they may not arrive this shift.

1200 - Work stops for lunch break At this time.

1300 - ARC RESUMES TRANSITE REMOVAL AS DESCRIBED.

1500 - ARC will complete the large sheet TRANSITE REMOVAL on Bldg. 723 this shift. SMALL TRANSITE SHINGLE REMOVAL will BE DONE ANOTHER SHIFT.

1700 - ARC HAULED ANOTHER LOAD OF WASTE TO THE DISPOSAL SITE.

1730 - ARC AND EFI DEPART SITE.

Site Representative (Print Name) _____ Signature/Date _____

Contractor Supervisor (Print Name) _____ Signature/Date _____

00064246

EFI®
Engineering and Fire Investigations

Field Report

Date: 8-26, 2003

Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 – EFI AND ADC ON SITE.

0730 – ADC ADVISES THAT THEY WERE GOING TO REMOVE TRANSITE SIDING THIS SHIFT ON BLDGS 726-C, 726-D AND 4-ST.

0930 – TRANSITE REMOVAL UNDERWAY. ADC HAULS LOAD OF WASTE FROM LAST SHIFT TO THE DISPOSAL SITE.

1100 – ADC RECEIVES DELIVERY AND HAS GLOVE BAGS ON SITE SO THEY CAN RESUME GLOVEBAG REMOVAL WHENEVER THEY DECIDE TO.

1200 – ALL WORK STOPS FOR LUNCH.

1300 – ADC RESUMES TRANSITE REMOVAL AS MENTIONED ABOVE.

1500 – WORK CONTINUING AS DESCRIBED. ADC HAULING ANOTHER LOAD OF ACM WASTE TO THE DISPOSAL SITE.

1700 – ALL WORK STOPS, SHIFT ENDS.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064247

EFI
Engineering and Fire Investigations

Field Report

Date: 8-27, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFI ON SITE. ARC ON SITE.

0800 - ARC will be conducting GLOVEBAG REMOVAL INSIDE 723 TO START this morning.

1000 - Work continues on glovebag REMOVAL AT this TIME.

1200 - ARC stops for lunch break AT this time.

1300 - GLOVEBAG REMOVAL WAS COMPLEATED ON BLDG 723 AND ARC HAS MOVED TO 722-P to continue GLOVEBAG REMOVAL.

1500 - ARC is hauling A load of ACM to the DISPOSAL SITE AS CREW continues work.

1630 - Work stops for the DAY AND CREW moving GLOVEBAGS to the ACM CONTAINER.

1730 - CREW showered AT REMOTE DECON AND ARC AND EFI DEPART SITE.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064248

EFI
Engineering and Fire Investigations

Field Report

Date: 8-28, 2003

Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFi and ARC on site.

0800 - Work this shift, will be. Glovebag removal inside Bldg 722P.

0930 - Glovebag removal on 722P will be complete this shift.

1100 - ARC will be putting all glovebag removal ACM into the on site, ACM friable container on site.

1200 - All work stops for lunch.

1300 - Work resumes as described, Glovebag removal.

1500 - ARC nearly complete with all pipe in Bldg. 722P

1600 - Removal complete. Workers loading ACM bags in to the waste container.

1700 - Shift ends.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064249

EFI
Engineering and Fire Investigations

Field Report

Date: 9-2, 2003

Project Number: 98410 - 13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFI on site. (BULLSHIT)
- ARC on site.

0800 - Work this week will be Tuesday thru Friday.

1000 - ARC conducting removal on Bldg. 723 exterior Hot water tank. RSEP underway.

1100 - RSEP complete RSEP visual passes. ARC will break for lunch and then begin insolation removal.

1200 - Removal begins on tank insolation.

1330 - Tank dusty, Removal easy.

1430 - Removal complete all material bagged up and bagged out. Detail underway.

1500 - Removal visual called for.

1530 - Removal visual passed and EFI starts PCM air clearance

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064250

EFI
Engineering and Fire Investigations

Field Report

Date: 9-2, 2003

Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

1700 – EFI STOPPED PCM AIR SAMPLES AND ANALYSIED THEM.

1730 – CLEARANCE PASSED AND ARC WILL TEARDOWN AREA NEXT SHIFT.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064251

EFI
Engineering and Fire Investigations

Field Report

Date: 9-3 , 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description ← BULLSHIT

0630 - EFI ON SITE. ARC ON SITE.

0730 - RAIN AT THIS TIME SO ARC IS MOVING TO Bldg 201A to PREP THE AREA WITH FLOOR TILE FOR REMOVAL.
WENT TO GET DONUTS @ 9:00AM

0930 - PREP WORK CONTINUES AS PLANNED AT THIS TIME.

1100 - ARC will BEGIN FL. TILE REMOVAL AS SOON AS THE PREP VISUAL PASSES. This AREA HAS CARPET OVER TILE WHITCH MAY BE ABLE TO BE PULLED UP PRIOR TO REMOVING FL. TILE.
- JERRY FIELDS AND MICHAEL LUCZAK ON SITE.

1200 - WORK STOPS FOR LUNCH BREAK

1300 - WORK RESUMES ON FL. TILE REMOVAL.

1500 - WORK ON FL. TILE REMOVAL IS VERY TOUGH. ARC MAY NOT

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064252

EFI®
Engineering and Fire Investigations

Field Report

Date: 9-3 , 2003

Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

- Finish this AREA today.

1200 - Work stops for shift END.
ARC will resume work here NEXT shift.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064253

EFI
Engineering and Fire Investigations

Field Report

Date: 9-4, 2003 | Project Number: 98410 - 13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 – EFI and ARC on site.

0730 – Work resumes on Bldg. 201A Fl. tile removal.

0900 – ARC hauling a load of non-friable ACM to the disposal site.

1100 – ARC completed Fl. tile removal and is conducting mastic removal at this time.

1200 – All work stops for lunch at this time.

1300 – ARC resumes work and EFI conducts visual on Fl. tile area

1500 – Work continues on outside transite shingles while clearance was collected on the inside Fl. tile area.

1700 – Bldg. 201A Fl. tile area clearance passed EFI and ARC depart site.

Site Representative (Print Name) _____ Signature/Date _____

Contractor Supervisor (Print Name) _____ Signature/Date _____

00064254

EFI
Engineering and Fire Investigations

Field Report

Date: 9-5, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFI AND ARC ON SITE

0730 - Work this shift will BE ON Bldg. 722-P O/S TRANSITE AND ROOF.

0930 - ARC grinding OFF bolt heads, AS BEFORE TO ALLOW TRANSITE ROOFING TO BE REMOVED IN WHOLE SHEETS.

1100 - Work continues AS DESCRIBED. AT THIS TIME.

1200 - ALL work STOPS FOR Lunch.

1300 - Work RESUMES ON Bldg 722-P TRANSITE REMOVAL.

1500 - ARC has completed grinding the Bolts ON ONE SIDE AND REMOVING OF ~~OF~~ THE SHEETS.

1600 - ARC hauling LAST LOAD OF ACM TO THE WASTE DISPOSAL SITE FOR THIS SHIFT.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064255

EFI®
Engineering and Fire Investigations

Field Report

Date: 9-8, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFI on site, ARC on site.

0730 - ARC will resume Transite removal on Bldg. 722-P this shift.

0930 - Transite roof sheet being [redacted] removed in tact[redacted], and loaded on to ARCs truck for disposal.

1100 - ARC hauling a truck load of Transite to the land fill.

1200 - All work stops for lunch.

1300 - Work resumes, ARC completed Bldg. 722-P and moving to Bldg. 501-B.

1430 - Bldg. 501-B has Transite roof and sides that ARC will be removing.

1600 - Removal stops for this shift. ARC hauling another load of ACM waste to the disposal site.

1700 - Shift ends, ARC, EFI departing site.

Site Representative (Print Name) _____ Signature/Date _____

Contractor Supervisor (Print Name) _____ Signature/Date _____

00064256

EFI
Engineering and Fire Investigations

Field Report

Date: 9-9 , 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFi and ARC on site.

0730 - ARC will be continuing with transite removal this shift.

0930 - Removal is on Bldg. 204 at this time.

1100 - Work continues on transite removal as described.
- ARC hauling a load to the on-site disposal area.

1200 - All work stops for lunch at this time

1300 - Work resumes as planned. Light wind, FAir skys

1500 - ARC will complete transite removal on Bldg 204 this shift.

1630 - Removal on Bldg. 204 complete. ARC hauling another load of ACM waste to the disposal site.
- Crew cleaning up for shift

1700 - EFi, ARC depart site

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064257

EFI
Engineering and Fire Investigations

Field Report

Date: 9-10, 2003 | Project Number: 98410 - 13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 – EFi, ARC on site.

0730 – ARC is not conducting ANY REMOVAL this shift and they will BE REPAIRING AND CLEANING up EQUIPMENT AT this time.

0930 – ARC continues to clean up LEFT OVER TRASH and REGULAR DEBRI AROUND WORK SITES. LEFT OVER POLY, TAPE BAGS ECT.

1100 – CLEAN up continues AT this time.

1200 – Work stops FOR Lunch.

1300 – ARC RESUMES, SAME WORK AS DESCRIBED ABOVE.

1500 – ARC ADVISES that they will COMPLETE this shift AND NOT DO ANY REMOVAL.

1700 – shift ENDS ARC AND EFI DEPART SIT

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064258

EFI®
Engineering and Fire Investigations

Field Report

Date: 9-11, 2003 | Project Number: 98410 - 13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFI on site, ARC on site.

0730 - ARC advises that they were going to continue clean up work at this time.

0930 - Michael Luszak with ARC on site. ARC continuing with cleanup and maintenance

1130 - Work stopping for lunch at this time.

1230 - ARC resumes work, same operation.

1430 - All work continues as described at this time.

1630 - ARC advises that they would resume removal on Monday 9-15-03.

1700 - Shift ends

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064259

EFI
Engineering and Fire Investigations

Field Report

Date: 9-15, 2003

Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 – EFI on site, ARC on site.

0730 – ARC resumes BCEA clean up on sites.

0930 – EFI conducting personnel monitoring while workers pick up some broken transite pieces at various site.

1130 – ARC stops work for lunch break.

1230 – Work resumes as described on various locations

1430 – Transite clean up continues at this time.

1630 – Work stops for this shift. ARC makes a load of waste to the disposal site.

1730 – ARC and EFI depart site.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064260

EFI
Engineering and Fire Investigations

Field Report

Date: 9-16, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFI AND ARC ON SITE.

0730 - WORK WILL CONTINUE THIS SHIFT AT THIS TIME ON, SMALL BROKEN PIECES OF TRANSITE AROUND VARIOUS SITES.

1030 - ARC HAS CREW STOP WITH AREA CLEAN UP AND MOVE TO BLDG 206 TO START GLOVEBAG REMOVAL ON INTERIOR PIPING.

1200 - ALL WORK STOPS FOR LUNCH AT THIS TIME.

1300 - ARC RESUMES WORK ON GLOVEBAG REMOVAL.

1530 - ARC HAS HUNG A NUMBER OF BAGS FOR NEG. PRESSURE REMOVAL BUT HAS NOT STARTED REMOVAL AT THIS TIME.

1700 - ARC AND CREW, EFI DEPART SITE FOR THE DAY.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064261

EFI
Engineering and Fire Investigations

Field Report

Date: 9-17, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFI AND ARC ON SITE.

0730 - ARC will BE BAGging out ACM BAGS AND PIPE THAT WAS WRAPPED AND cut this morning.

0930 - upon BAG MOVEMENT ARC will RESUME AREA CLEANUP OF SOME SITES.

1100 - Work continues on site clean up at this time.

1200 - ALL work stops for Lunch

1300 - ARC RESUMES with DEMO DEBRI CLEANUP AS MENTIONED ABOVE.

1500 - ARC continues cleaning up boards bricks and such.

1700 - Shift ENDS

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064262

EFI
Engineering and Fire Investigations

Field Report

Date: 9-18, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFI AND ARC ON SITE.

0730 - ARC is going to continue with site cleanup at this time.

1000 - AREA CLEAN UP IS IN AREAS WHERE THE DEMO CONTRACTOR LEFT DEMO DEBRI.

1100 - WORK CONTINUES AS DESCRIBED.

1200 - ARC STOPS ALL WORK FOR LUNCH BREAK.

1300 - WORK RESUMES. EFI will have PEOPLE ON SITE MONDAY 9-22-03 to conduct ~~EXPLOTION~~ SAFETY TESTING.

1530 - ARC ADVISES THAT they will BE CONDUCTING ASH REMOVAL ON MONDAY 9-22-03.

1700 - SHIFT ENDS. ARC, EFI DEPART SITE.

Site Representative (Print Name) _____ Signature/Date _____

Contractor Supervisor (Print Name) _____ Signature/Date _____

00064263

EFI
Engineering and Fire Investigations

Field Report

Date: 9-22, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFI on site. ARC on site.

0730 - ARC setting up to conduct GloveBag removal in Bldg. 202

0930 - ARC begins hanging GloveBags on pipe insulation to be removed.

1100 - ARC stops for lunch break and will be ready to start neg. adequate GloveBag removal after lunch.

1200 - Work resumes. Bldg. 202 GloveBag removal.

1400 - ARC advises that they may complete the GloveBag removal portion of Bldg. 202 this shift.

1600 - GloveBag removal in Bldg 202 is complete and workers moving wrapped pipe and bags to the ACM container

1700 - Work stops shift ends.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064264

EFI
Engineering and Fire Investigations

Field Report

Date: 9-23, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFI on Site, ARC on Site.

0730 - Work this shift will be TRANSITE REMOVAL on Bldg 202.

0930 - Work underway on on TRANSITE Sidding REMOVAL.

1100 - TRANSITE REMOVAL going well. ARC hauls a load of WASTE to the Disposal Site.

1200 - All work stops for lunch At this time.

1300 - Work RESUMES on TRANSITE REMOVAL of Bldg. 202.

1500 - ARC will continue with TRANSITE REMOVAL until shift END.

1630 - Work stopped And ARC hauled ANOTHER load of TRANSITE to THE Disposal

1700 - Shift ENDS

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064265

EFI
Engineering and Fire Investigations

Field Report

Date: 9-24, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - ARC AND EFI ON SITE.

0730 - ARC will BE TEARING DOWN SOME SHELVING to ACCESS TRANSITE PANELS.

0930 - ARC WILL RESUME SITE CLEAN UP AT this TIME.

1100 - Work CONTINUES AS PLANNED At this TIME.

1200 - ALL work [redacted] STOPS FOR LUNCH BREAK

1300 - Work RESUMES AS DESCRIBED ON SITE CLEAN UP.
ARC ADVISES THAT NEXT WEEK THE NEW DEMO PEOPLE WILL START AND ARC will go BACK to ACM REMOVAL AT THE MORE REGULAR SCHEDULE.

1500 - SITE CLEAN UP CONTINUES At this TIME

1700 - ALL Work STOPS, END OF SHIFT.

Site Representative (Print Name) _____ Signature/Date _____

Contractor Supervisor (Print Name) _____ Signature/Date _____

00064266

EFI
Engineering and Fire Investigations

Field Report

Date: 9-25, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 — EFi, ARC on site.

0730 — ARC moving some material to allow demo to resome.

0930 — A couple areas still need clean up and ARC is sending crew to address areas.

1130 — ARC stopping for lunch at this time.

1230 — Work resumes as described on site clean up.

1430 — ARC hauling a load of demo clean up to the disposal site.

1630 — Stoping work at this time to envintory supplies.

1700 — ARC and EFi depart site.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064267

EFI
Engineering and Fire Investigations

Field Report

Date: 9-29, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 – EFI on site.
ARC on site.
– EFI has Alex and Don on site to begin Exp. safety survey.

0830 – ARC will be conducting transite removal on walkway 201R and on Bldg. 202 this shift.

1030 – Transite removal continues with workers stacking large panels in a pile for disposal later.

1200 – All work stops for lunch at this time.

1300 – Work resumes on transite removal.

1500 – Work continues on Bldg 202 with transite removal.

1700 – ARC stacked transite panels for disposal later.
– Shift ends.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064268

EFI
Engineering and Fire Investigations

Field Report

Date: 9-30, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 – EFI ON SITE, ARC ON SITE.

0800 – ARC RESUMES TRANSITE REMOVAL ON BLDG 202

1000 – THIS IS A LARGE BLDG AND WILL LIKLEY TAKE SEVERAL DAYS.

1100 – ARC ALSO REMOVING TRANSITE ON THE 201R WALKWAY.

1200 – ALL WORK STOPS FOR LUNCH AT THIS TIME.

1300 – WORK RESUMES AS TRANSITE REMOVAL CONTINUES.

1500 – ARC HAULING A LOAD OF WASTE TO THE LAND FILL

1700 – SHIFT ENDS ARC AND EFI DEPART SITE

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064269

EFI
Engineering and Fire Investigations

Field Report

Date: 10-6 , 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFI on site.
- ARC on site with DEMO CREW.

0830 - ARC continuing with TRANSITE REMOVAL on Bldg. 202

1030 - LARGE Bldg with A high ROOF, TRANSITE REMOVAL going slow FOR SAFTY REASONS.

1200 - Work stops FOR Lunch AT this time.

1300 - ARC RESUMES WORK AS PLANNED on Bldg. 202 TRANSITE

1430 - Work continues AS planned AT this time.

1630 - ARC stopping REMOVAL FOR this Shift TO STACK TRANSITE SHEETS THAT WERE REMOVED this SHIFT.

1730 - ARC, EFI DEPART SITE.
Shift END

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064270

EFI
Engineering and Fire Investigations

Field Report

Date: 10 - 7 , 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFi and ARC on site.

0800 - Work this shift will be to GloveBag TSi in Bldg. 202 At this time.

1000 - GloveBag Prep complete and ARC Beginning to Remove with GloveBags.

1200 - Work stops for Lunch At this time.

1300 - ARC Resumes GloveBag work At this time

1530 - GloveBag Removal on tsi is complete in Bldg 202 and ARC is Cleaning up the work Area and Hauling ACM Bags to the Waste container.

1700 - Shift Ends ARC and EFi Depart site.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064271

EFI
Engineering and Fire Investigations

Field Report

Date: 10 - 8 , 2003

Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 – EFI on site.
– ARC on site.

0730 – Work this shift will be transite removal on Bldg 201

0900 – Transite removal underway as planned. Another large and tall Bldg.

1100 – ARC hauling a load of waste to the land fill.

1200 – Work stops for lunch break

1300 – ARC resumes transite removal

1500 – Work continues on Bldg 201 as planned.

1630 – ARC stops work for the day to clean up work area.

1730 – Shift ends

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064272

EFI
Engineering and Fire Investigations

Field Report

Date: 10-13, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 – EFI on site
– ARC on site

0800 – Work this shift will be on Bldg 201

1000 – ARC continuing with transite removal on Bldg. 201

1200 – Work stops for lunch break at this time.

1300 – ARC resumes transite demo on Bldg 201

1500 – ARC hauling a load of transite sheets to the land fill at this time
– A small area of floor tile is in Bldg 201 that ARC is about to remove.

1700 – Work stops for this shift to resume tomorrow.
– ARC and EFI depart site.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064273

EFI
Engineering and Fire Investigations

Field Report

Date: 10 - 14 , 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 – EFI ON SITE.
– ARC ON SITE.

0730 – ARC HAS A COUPLE WORKERS FINISHING UP THE 201 Bldg FL. TILE AND MASTIC WHILE THE OTHERS HELP IN CLEAN UP ON THE MAG. AREA. DEMO CLEAN UP.

0930 – FL. TILE VISUAL Bldg. 201 PASSED AND AIR CLEARANCE COLLECTED.

1030 – Bldg. 201 FL. TILE AREA PASSED AIR CLEARANCE.

1200 – ALL WORK STOPS FOR LUNCH AT THIS TIME.

1300 – WORK RESUMES. ARC HAVING ENTIRE CREW GO TO THE Richmond MAG. AREA TO CONT. DEBRIS PICK UP FROM DEMO WORK.

1700 – SHIFT ENDS.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064274

EFI
Engineering and Fire Investigations

Field Report

Date: 10-15, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 – EFI on site
– ARC on site

0830 – ARC continuing with transite removal on Bldg. 201.

1000 – ARC hauling a load of transite to the disposal site.

1200 – All work stops for lunch
At this time.

1300 – Work resumes as described
conditions clear and cool.

1500 – ARC will be continuing with transite removal on this Bldg. 201 for several more days.

1630 – Work stops and ARC loading transite to haul another load to the disposal site.

1730 – Shift ends.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064275

EFI
Engineering and Fire Investigations

Field Report

Date: 10-16, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFi on site.
- ARC on site.

0830 - Work continues on transite removal on Bldg 201.

1030 - ARC loading transite sheets for disposal at the on site area.

1200 - All work stops for lunch at this time.

1300 - ARC resumes transite removal on Bldg 201.

1500 - Another load of transite being hauled to the disposal site.

1630 - ARC stopping work for this shift to clean up work area for shift end.

1700 - Shift ends.

Site Representative (Print Name) _____ Signature/Date _____

Contractor Supervisor (Print Name) _____ Signature/Date _____

00064276

EFI
Engineering and Fire Investigations

Field Report

Date: 10-27, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFI on site, ARC on site

0730 - ARC conducting transite removal on Bldg. 201

0930 - Removal underway, but slow do to the large size of the Bldg.

1130 - ARC has loaded another load of transite sheets and is hauling it to the disposal site.

1200 - All work stops for lunch.

1300 - ARC resumes work as described.

1500 - Transite removal continues as described.

1700 - Work stops for shift end.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064277

EFI
Engineering and Fire Investigations

Field Report

Date: 10-28, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFI on site, ARC on site.

0730 - ARC will continue with the exterior transite removal on Bldg. 201.

0930 - ARC hauling another load of ACM waste to the disposal site.

1130 - North side of this Bldg may be difficult to access due to a large ditch next to the Bldg.

1200 - All work stops for lunch.

1300 - ARC resumes work as described.

1500 - Work continues as planned.

1700 - All work stops for shift. END.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064278

EFI
Engineering and Fire Investigations

Field Report

Date: 10-29, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFI on site.
- ARC on site

0830 - Work this shift will continue with transite removal on Bldg 201

1030 - ARC hauling a load of transite to the disposal site.

1200 - Work stops for lunch break

1300 - Work resumes on removal on Bldg 201

1430 - ARC will continue with transite removal on this Bldg 201 for several more days.

1630 - Removal stops so workers can wrap removed transite sheets with plastic.

1730 - Shift end ARC and EFI depart site.

Site Representative (Print Name) _____ Signature/Date _____

Contractor Supervisor (Print Name) _____ Signature/Date _____

00064279

EFI
Engineering and Fire Investigations

Field Report

Date: 10-30, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFI and ARC on site.

0800 - ARC continuing with DEMOAL on Bldg 201 of TRANSITE SHEET

1000 - Another load of TRANSITE sidding being hauled to the DISPOSAL site.

1200 - Work stops for lunch break At this time.

1300 - ARC RESUMES work on TRANSITE SHEET REMOVAL ON Bldg 201

1500 - ARC has completed the high section of REMOVAL on Bldg 201 and is continuing with work.

1700 - Work stops for shift end ARC and EFI DEPART site.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064280

EFI
Engineering and Fire Investigations

Field Report

Date: 11-3, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 – EFI ON SITE

0730 – ARC HAS REDIRECTED THEIR CREW TO HOUSTON TO COMPLETE ANOTHER PROJECT THAT THEY STARTED LAST FRIDAY. EFI WAS NOT GIVEN ANY NOTICE THAT THIS CHANGE WAS PENDING.

– ARC APPROVED FOR EFI TO REMAIN ON SITE THIS WEEK, IN THE EVENT THAT THEIR WORKERS FINISHED IN HOUSTON AND ARE SENT HERE TO CONDUCT REMOVAL HERE AT THIS SITE.

11-3-03 —— 11-6-03

Site Representative (Print Name) _____ Signature/Date _____

Contractor Supervisor (Print Name) _____ Signature/Date _____

00064281

EFI
Engineering and Fire Investigations

Field Report

Date: 11-6, 2003

Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0930 – PHONE CALL FROM THOMAS PILGRAM TO NOTIFY EFI THAT ARC MAY NOT WORK AT THE LONGHORN AMMO PLANT THE WEEK OF NOVEMBER 10TH THRU THE 13.
– THOMAS WILL CALL BACK WITH ANY MORE INFORMATION.

1230 – NOTE ARC WILL BE ON SITE THE WEEK OF NOVEMBER 10TH THRU NOVEMBER 13.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064282

EFI
Engineering and Fire Investigations

Field Report

Date: 11-10, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFI on site, ARC on site.

0800 - Work this shift will continue with transite removal on Bldg. 201. The removal on this Bldg may be completed this week.

1000 - Removal continues as planned at this time.

1200 - All work stops for lunch break.

1300 - ARC resumes transite removal as described.

1500 - ARC has loaded their truck and is hauling a load of transite to the disposal site.

1630 - ARC stops removal to load the truck for disposal next shift.

1730 - All work stops for shift end.

Site Representative (Print Name) _____ Signature/Date _____

Contractor Supervisor (Print Name) _____ Signature/Date _____

00064283

EFI
Engineering and Fire Investigations

Field Report

Date: 11-11, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 – EFI ON SITE, ARC ON SITE.

0730 – ARC will RESUME TRANSITE REMOVAL on Bldg. 201 AT this TIME.

0930 – ARC hauling ANOTHER load of TRANSITE to the DISPOSAL SITE.

1100 – WORK CONTINUES ON Bldg. 201 AT this TIME.

1200 – ALL work stops FOR lunch BREAK AT this TIME.

1300 – REMOVAL RESUMES on Bldg 201

1500 – A DEEP AND WET Ditch on the NORTH SIDE OF the Bldg is MAKING REMOVAL SLOWER.

1700 – WORK STOPS FOR the Day. Workers WRAPPING DOLY ON TRANSITE NOT BEING HAULED to the DISPOSAL SITE this SHIFT.

1730 – ARC AND EFI DEPART SITE.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064284

EFI
Engineering and Fire Investigations

Field Report

Date: 11 - 12 , 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFI on site.
- ARC on site to continue with transite removal on Bldg. 201

0800 — Transite removal resumes as planned on Bldg 201. This Bldg. should be finished by noon.

1000 — Removal complete on 201 and the workers are loading the transite to be disposed of at the on site landfill.

1200 — Work stops for lunch break.

1300 - ARC resumes work and moves to Bldg. 709 A (the old fire station)

1430 - Transite removal underway on Bldg 709 A.

1600 — Bldg 709 A has one small area of fl. tile to be addressed next shift.

1700 — Work stops for shift end.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064285

EFI
Engineering and Fire Investigations

Field Report

Date: 11-13, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 – EFI on site. ARC on site.

0800 – Removal underway as planned on Bldg. 709A.

1000 – This Bldg has the small transide shingles and is quick to remove.
– FL. tile area is < 160 sq. ft. bathroom.

1200 – Work stops for lunch break.

1300 – ARC resumes on Bldg. 709A. Two workers conducting RFCI removal on the FL. tile area.

1500 – Removal continues as planned at this time.

1630 – ARC will complete all removal on Bldg. 709A this shift.

1700 – Shift ends, ARC and EFI are departing site.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064286

EFI
Engineering and Fire Investigations

Field Report

Date: 11-17, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFI on site, ARC on site.

0730 - Work this shift will start TRANSITE REMOVAL on Bldg 206

0930 - TRANSITE REMOVAL underway at this time.

1100 - REMOVAL CONTINUES AS PLANNED. REMOVAL going quickly since this is a single story Bldg.

1200 - ALL work stops for lunch break.

1300 - TRANSITE REMOVAL RESUMES AS DESCRIBED

1500 - ARC hauling another load of TRANSITE to the DISPOSAL SITE.

1700 - Approx 3/4 of the TRANSITE REMOVAL is complete on Bldg. 206 at this time.

1730 - ARC and EFI DEPART SITE

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064287

EFI
Engineering and Fire Investigations

Field Report

Date: 11-18, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFI on site.
- ARC on site.

0800 - Transite removal has resumed on Bldg 206, on the back side. This area more difficult do to piping and conduit in the way.

1000 - Work continues as planned.

1100 - ARC hauling another load of transite to the land fill.

1200 - All work stops for lunch break

1300 - Work resumes as described on transite removal.

1500 - Transite removal going well. Large sheets in good shape, not breaking.

1700 - Work stopped for this shift. ARC and EFI depart site.

Site Representative (Print Name) _____ Signature/Date _____

Contractor Supervisor (Print Name) _____ Signature/Date _____

00064288

EFI
Engineering and Fire Investigations

Field Report

Date: 11-19, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 — EFI ON SITE.
— ARC ON SITE.

0830 — ARC HAS RESUMED TRANSITE REMOVAL ON Bldg. 206.

1030 — ANOTHER LOAD OF TRANSITE LOADED AND BEING HAULED TO THE DISPOSAL SITE.

1200 — ALL WORK STOPS FOR THE LUNCH BREAK.

1300 — ARC RESUMES ON Bldg. 206 WITH TRANSITE REMOVAL.

1500 — TRANSITE REMOVAL ON Bldg 206 IS COMPLETE. WORKERS ARE LOADING TRANSITE FOR DISPOSAL.

1700 — WORK STOPS FOR THIS SHIFT. ARC AND EFI DEPARTING SITE.

Site Representative (Print Name) _____ Signature/Date _____

Contractor Supervisor (Print Name) _____ Signature/Date _____

00064289

EFI
Engineering and Fire Investigations

Field Report

Date: 11-20, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 – EFI on site.
– ARC on site. Work this shift will begin transite removal on the old water treatment plant Bldg. 413A.

0830 – ARC removing some sheet metal to access transite panels.

1030 – ARC continues taking sheet metal down to access transite.

1200 – All work stops for lunch.

1300 – ARC is beginning to remove transite panels from Bldg 413A

1500 – One area of the Bldg on the east will be demolished to allow ARC access to the transite panels.

1700 – Work stops for shift end.
ARC will be working five days this week to make up for a three day week next week.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064290

EFI
Engineering and Fire Investigations

Field Report

Date: 11-21, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFI ON SITE.
- ARC ON SITE

0830 - ARC HAS RESUMED TRANSITE REMOVAL ON Bldg. 413A

1000 - ARC hauling A load of TRANSITE REMOVED LAST SHIFT to THE DISPOSAL SITE.

1030 - TRANSITE REMOVAL CONTINUES AS PLANNED.

1200 - ALL work STOPS FOR LUNCH AT this TIME.

1300 - ARC RESUMES TRANSITE REMOVAL ON Bldg. 413A.

1500 - TRANSITE REMOVAL MAY TAKE SEVERAL DAYS, this is ANOTHER LARGE Bldg.

1600 - ARC hauling ANOTHER LOAD OF TRANSITE to the DISPOSAL SITE.

1700 - WORK STOPS FOR SHIFT END.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064291

EFI
Engineering and Fire Investigations

Field Report

Date: 11-24, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFI on site.
- ADC on site to continue transite removal on Bldg 413A.

0830 - ADC is only working 3 day's this week due to the Thanksgiving holiday's on Thursday and Friday.

1030 - Work continues on exterior transite removal.

1130 - ADC is hauling a large load of the long transite sheets to the disposal site. EFI checks the route to assure no debri fell out of the truck.

1200 - Work stops for lunch

1300 - Transite removal resumes.

1500 - ADC receives the clearance to do abatement and demo on any Bldg. labeled 5X by EFI explosion survey of 2003.

1700 - Shift ends, ADC and EFI are departing site.

Site Representative (Print Name) _____ Signature/Date _____

Contractor Supervisor (Print Name) _____ Signature/Date _____

00064292

EFI
Engineering and Fire Investigations

Field Report

Date: 11-25, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFI ON SITE
- ARC ON SITE.

0800 - ARC HAS BEGUN REMOVING SHEET METAL SO A PORTION OF THE EAST SIDE OF THE Bldg. 413A CAN BE DEMOED TO ACCESS THE TRANSITE SIDING ON THE ORGINAL Bldg.

1100 - ARC STOPS WORK TO ALLOW FOR DEMO.

1200 - DEMO ON EAST PORTION OF Bldg 413A COMPLETE AND ALL WORK STOPS FOR LUNCH.

1300 - ARC RESUMES TRANSITE REMOVAL ON Bldg. 413 A.

1500 - ANOTHER LOAD OF LONG TRANSITE SHEETS BEING HAULED TO THE DISPOSAL SITE.

1700 - ANOTHER SHIFT ENDS. ARC AND EFI DEPART SITE. RETURN TO WORK AFTER THANKSGIVING

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064293

EFI
Engineering and Fire Investigations

Field Report

Date: 12-01, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

— Note, ARC has pulled off the Longhorn Project this week on Asbestos work and will resume on Dec. 8, 2003.

Site Representative (Print Name) _____ Signature/Date _____

Contractor Supervisor (Print Name) _____ Signature/Date _____

00064294

EFI
Engineering and Fire Investigations

Field Report

Date: 12-4, 2003

Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

— ARC HAS NOTIFIED EFI THAT THEY HAVE CHANGED THEIR PLANS AND ARE NOT GOING TO CONDUCT ANY ASBESTOS REMOVAL THROUGH THE END OF DECEMBER 2003.
— THEIR PLAN AS WE UNDERSTAND IS TO RESUME ASBESTOS REMOVAL JANUARY 5 2004.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064295

EFI
Engineering and Fire Investigations

Field Report

Date: 01-12, 2004 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFI on site, ARC on site.

0800 - Saul Lopez is the ABATEMENT Supervisor and John Jordon site Superintendent.

0900 - Work this shift is TRANSITE REMOVAL on Bldg 413A, picking up where they LEFT OFF.

1030 - AREA OF WORK is on the high SECTION 3rd STORY AND the BACK or north side.

1130 - DECON WAS LOCATED ADJACENT TO the work AREA AND WORK is now stopping FOR lunch BREAK.

1200 - Lunch.

1300 - Work RESUMED AS DESCRIBED ABOVE.

1430 - TRANSITE PANELS BEING STACKED on the ground until the DISPOSAL SITE is READY FOR USE.

1530 - Work continues AS PLANNED.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064296

EFI
Engineering and Fire Investigations

Field Report

Date: 01-12, 2004 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

1630 – Work stops for this shift. Workers Decon for shift end.

1700 – ADC, EFI Depart site.

Site Representative (Print Name) _____ Signature/Date _____

Contractor Supervisor (Print Name) _____ Signature/Date _____

00064297

EFI
Engineering and Fire Investigations

Field Report

Date: 01-13, 2004 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 – EFI on site, ARC on site

0730 – Work this shift will be transite removal on Bldg. 413A.

0830 – Removal underway as described on exterior transite panels.

0930 – Removal is on the north side this date.

1030 – Work continues on digging additional space at the disposal site. Area may be ready today to begin hauling ACM "transite" to dispose of.

1200 – All work stops for lunch break.

1300 – Work resumes as described.

1430 – No transite will be hauled to the disposal site this shift.

1530 – ARC is continuing removal and stacking sheets on the ground.

1630 – Removal stopping for the day and area clean up underway.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064298

EFI
Engineering and Fire Investigations

Field Report

Date: 01-13, 2004 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

1700 - ARC and EFI Departing site.

Site Representative (Print Name) _____ Signature/Date _____

Contractor Supervisor (Print Name) _____ Signature/Date _____

00064299

EFI
Engineering and Fire Investigations

Field Report

Date: 01-14, 2004 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 – EFi on site. ARC on site.

0730 – Work this shift will BE TRANSITE REMOVAL on Bldg. 413A.

0830 – Very damp and Foggy conditions this morning.

0930 – Work BEGINNING on TRANSITE REMOVAL AT this TIME

1100 – ARC loading their truck with TRANSITE to haul it to the Disposal site.

1200 – Work stops For Lunch.

1300 – All work RESUMES AS PLANNED At this time.

1500 – Third Load OF TRANSITE going to the Disposal site.

1630 – REMOVAL stops For the Day And the WORKERS CLEANING UP FOR SHIFT END.

1500 – ARC And EFi DEPART SITE.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064300

EFI
Engineering and Fire Investigations

Field Report

Date: 01-15, 2004 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 – EFI on site. ARC on site.

0730 – Work this shift will be on Bldg. 413A, transite removal.

0830 – Removal underway as planned. ARC advises that they will not finish Bldg. 413A this shift.

1000 – Transite removal continues as planned at this time

1200 – Work stops for lunch.

1300 – ARC resumes work.
– A load of transite being sent to the disposal site.

1430 – Removal has stopped and the workers are cleaning up the work area at this time.

1600 – All poly picked up and site cleaned up.

1700 – Shift ends, ARC and EFI depart site.

Site Representative (Print Name) _____ Signature/Date _____

Contractor Supervisor (Print Name) _____ Signature/Date _____

00064301

EFI
Engineering and Fire Investigations

Field Report

Date: 01-19, 2004 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 – EFI on site, ARC on site.

0730 – Work this shift will be on Bldg 413A and is likley to finish removal on this Bldg today.

0900 – Transite removal underway. Area very wet, Do to A lot of Rain.

1030 – Removal nearly complete on Bldg 413A. ARC will stack transite until the Disposal site is accessable.

1200 – Bldg 413A Removal complete. Work stops for Lunch At this time.

1300 – Work resumes. ARC Moving all of the equipment and supplies to the 800 area.

1600 – ARC set up in the 800 area to begin glovebag removal next shift.

Site Representative (Print Name) _____ Signature/Date _____

Contractor Supervisor (Print Name) _____ Signature/Date _____

00064302

EFI
Engineering and Fire Investigations

Field Report

Date: 1-20, 2004 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFI on site, ARC on site.

0700 - ARC is going to pick up and load the transite sheet at Bldg 413A this morning and get them out of the Demo contractors way.

0900 - Transite loads and out of Demo contractors way.

1000 - ARC continues moving supplies and Equipment ie; Manlift to the 800 Area.

1200 - Work stops for lunch at this time.

1300 - All Equipment in place and work Ready to Begin on transite Removal on Bldg 814

1400 - Removal underway on transite sheeting and a couple of Glovebags.

1530 - Disposal site still too wet to gain access.

1630 - Removal stops for this shift.

Site Representative (Print Name) _____ Signature/Date _____

Contractor Supervisor (Print Name) _____ Signature/Date _____

00064303

EFI
Engineering and Fire Investigations

Field Report

Date: 1-20 , 2004 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

1700 - Little Amount of Demo'd was done this shift.

- ARC and EFI Departing Site.

Site Representative (Print Name) _____ Signature/Date _____

Contractor Supervisor (Print Name) _____ Signature/Date _____

00064304

EFI
Engineering and Fire Investigations

Field Report

Date: 1-21, 2004 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFI on site., ARC on Site.

0730 - Work this shift will be on Bldg. 814 TRANSITE REMOVAL And A COUPLE MORE GLOVE BAGS.

0900 - Work on REMOVAL underway AT this time.

1030 - ARC Loading TRANSITE And hauling it to the Disposal Site AS the truck gets Full.

1200 - Work stops For Lunch BREAK.

1300 - Work RESUMES on TRANSITE REMOVAL.

1430 - REMOVAL OF TRANSITE COMPLETE And ARC working on GLOVEBAG REMOVAL to cut And WRAP THE PIPE.

1600 - Work on 814 complete And moves to 813.

1700 - Work stops For this shift And ARC And EFI DEPART SITE.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064305

EFI
Engineering and Fire Investigations

Field Report

Date: 1-22, 2004 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFI on site, ARC on site.

0730 - Work this shift will continue with transite removal in the 800 area.

0900 - ARC advises that they will likely complete the 800 bldg area this shift.

1030 - Work continues as planned at this time.

1200 - Work stops for lunch break.

1300 - Work resumes. Removal in the 800 area complete. Workers loading ACM bags into the ACM dumpster and the transite sheets being loaded for disposal at the disposal site.

1430 - ARC hauling transite to the disposal site.

1600 - Work complet for this shift.

1700 - ARC, EFI depart site.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064306

EFI
Engineering and Fire Investigations

Field Report

Date: 1-26, 2004 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFi on site. ARC on site. Same crew with John as the superintendant and Saul as the Asbestos Supervisor.

0730 - Work this shift is moving to the "Y" AREA. This morning may consist of clearing brush away from Bldgs to Access transite siding.

0900 - ARC clearing brush as planned at this time.

1000 - Recon set up and ARC prepairs to begin transite removal in the 'Y AREA on Bldg. 4Y2 and 4Y

1200 - All work stops for lunch break

1300 - Removal resumes on transite panel removal.

1500 - Removal on 4Y and 4Y2 is complete. Transite loaded and ready to haul to the Disposal site.

1600 - Workers cleaning out around Bldg.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064307

EFI
Engineering and Fire Investigations

Field Report

Date: 1-26, 2004 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

-38V AT this time.
1700 - Work complete for this shift And ARC and EFI DEPARTING SITE.

Site Representative (Print Name) _____ Signature/Date _____

Contractor Supervisor (Print Name) _____ Signature/Date _____

00064308

EFI
Engineering and Fire Investigations

Field Report

Date: 1-27, 2004 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 – EFI on site, ARC on site with the same crew.

0730 – Work this shift will be transite removal on Bldg. 3Y, 4Y2, 13Y 16Y

0900 – Removal underway as planned At this time.

1030 – Arc hauling a load of transite to the disposal site.

1200 – Work stops for lunch break.

1300 – Work resumes on transite removal.

1430 – ARC continuing to clear brush as to access the Y area Bldgs.

1600 – Another load of transite being hauled to the disposal site.
– ARC has ordered their ACM Dumpster to be hauled, but has not received the swap for and empty as yet.

1700 – Work stops for the day

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064309

EFI
Engineering and Fire Investigations

Field Report

Date: 1-28, 2004 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFi on site, ARC on site.

0730 - ARC Beginning work on Bldg. 16Y this shift.

6800 - Demo crew stayed in the office until now before they went to work. ARC has already begun transite removal on Bldg. 16Y.

0930 - Alex called and advised they Lee and Alex would be on site next week for the meeting.

1100 - Work continues as planned at this time. Bldg 16Y will take several day.

1200 - All work stops for lunch.

1300 - Work resumes as described on Bldg. 16Y.

1500 - Work continues as described on transite removal.

1700 - Work stops for this shift. Workers shoved out and ARC and EFi depart site

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064310

EFI
Engineering and Fire Investigations

Field Report

Date: 1-29, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 – EFI and ASC on site.

0730 – Work this shift will continue on Bldg. 16Y transite removal

0900 – Removal continues.
– ARC hauling another load of transite panels to the disposal site.

1030 – Work continues as planned on Bldg. 16Y.

1200 – All work stops for lunch break.

1300 – Work resumes on transite removal on Bldg. 16Y.

1500 – ARC hauling another load of transite to the disposal site.
– Removal stops for the day to complete area clean up.

1630 – All work stops for the day.
1700 – ASC and EFI depart site.

Site Representative (Print Name) _____ Signature/Date _____

Contractor Supervisor (Print Name) _____ Signature/Date _____

00064311

EFI
Engineering and Fire Investigations

Field Report

Date: 02-02, 2004 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 – EFi on site.
ARC on site, John, Superintendant with SAUL Asbestos Supervisor.

0830 – Removal this shift is continuing with transite removal on Bldg. 16y.

0930 – WET conditions today will limit any disposal this shift.

1030 – ARC stacking transite in locations around Bldg. 16y at this time.

1200 – Work stops for lunch break.

1300 – Work Resumes on transite removal as planned.

1430 – ARC will be approx. 50% complete on removal on Bldg 16y by shift end.

1630 – Removal stops to allow for area cleanup.

1730 – ARC and EFi depart site.

Site Representative (Print Name) _____ Signature/Date _____

Contractor Supervisor (Print Name) _____ Signature/Date _____

00064312

EFI
Engineering and Fire Investigations

Field Report

Date: 02-03, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 – EFI on site, ARC on site.

0730 – Work this shift will be transite removal on Bldg. 16Y.

0830 – Transite removal underway. Apparently there is a large project meeting scheduled on site today.

0930 – Work continues as described on transite removal.

1030 – Lee Burckle and Alex on site to review project status.

1100 – Removal on transite continues as planned at this time.

1200 – All work stops for lunch.

1300 – Work resumes. Crew beginning to remove transite sheets from the back side of Bldg. 16Y

1500 – Still "not" hauling to the disposal site. ARC stacking transite sheets on the ground at this time.

Site Representative (Print Name) _____ Signature/Date _____

Contractor Supervisor (Print Name) _____ Signature/Date _____

00064313

EFI
Engineering and Fire Investigations

Field Report

Date: 02-03 , 2004 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

1600 - LEE AND ALEX DEPART SITE AFTER CONDUCTING A MATERIAL REVIEW ON QUANTITYS OF WOOD TO BE BURNED ON 3X BLDGS.

1700 - SHIFT ENDS

Site Representative (Print Name) _____ Signature/Date _____

Contractor Supervisor (Print Name) _____ Signature/Date _____

00064314

EFI
Engineering and Fire Investigations

Field Report

Date: 02 - 04 , 2004

Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFI on site. ARC on site.

0730 - Depending on rain this date removal will start out on transite panels and may change to glovebag removal.

0830 - Removal continuing on transite on Bldg. 16Y at this time.

0930 - Michael w/ ARC on site observing all operations underway.

1030 - Transite removal continues on Bldg. 16Y

1200 - All work stops for lunch.

1300 - Work resumes as described on Bldg. 16Y.
- Michael w/ ARC departs site.

1500 - ARC hauls one load of transite to the disposal site.

1600 - Removal stops for this shift to allow for area clean up.

1700 - ARC and EFI depart site.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064315

EFI
Engineering and Fire Investigations

Field Report

Date: 02-05, 2004 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFI ON SITE. ARC ON SITE.
- A GOOD BIT OF RAIN OVER NIGHT AND MORE THIS MORNING MAY SLOW WORK THIS SHIFT.

0730 - WORK WILL BE GLOVEBAG REMOVAL IN Bldg. 16Y

0900 - ONLY GLOVEBAG REMOVAL BEING DONE IS TO GIVE A CLEAN ACCESS POINT TO [redacted] WRAP THE REMAINING INSULATION, IN PLACE THEN CUT THE PIPE AND DISPOSE OF PIPE AND ACM INSULATION TOGETHER.

1100 - WORK CONTINUES AS DESCRIBED.

1200 - ALL WORK STOPS FOR LUNCH.

1300 - WORK AT THIS TIME IS CUTTING PIPE. GLOVEBAGS COMPLETED, PIPE IS WRAPPED IN 2 LAYERS OF 6MIL POLY AND LABELED.

1500 - WORK STOPS FOR THIS SHIFT. ACM BOX IS FULL AND A CHANGE OUT OF THE BOX IS SCHEDULED FOR MON. 2-9-04.

Site Representative (Print Name) _____ Signature/Date _____

Contractor Supervisor (Print Name) _____ Signature/Date _____

00064316

EFI
Engineering and Fire Investigations

Field Report

Date: 02-05, 2004 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

1630 - AREA ALL CLEANED UP. ARC MOVING EQUIPMENT TO THE WAREHOUSE BLDG. 50 G FOR THE WEEKEND.

1730 - ARC AND EFI DEPART SITE.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064317

EFI
Engineering and Fire Investigations

Field Report

Date: 02-09, 2004 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFI on site, ARC on site.

0730 - Work this shift will Begin TRANSITE REMOVAL on Bldg. 18Y.

0830 - TRANSITE REMOVAL underway. Work will continue on TRANSITE REMOVAL as long as the RAIN holds OFF.

1000 - Work continues as described on TRANSITE REMOVAL.

1200 - No RAIN as of this time. Work stops for LUNCH BREAK.

1300 - ARC RESUMES WORK on TRANSITE REMOVAL on Bldg. 18Y.

1500 - light RAIN, CREW STOPPED REMOVAL and STACKING TRANSITE SHEETS.

1630 - AREA CLEANED UP AND READY FOR NEXT SHIFT.

1700 - ARC AND EFI DEPART SITE.

Site Representative (Print Name) _____ Signature/Date _____

Contractor Supervisor (Print Name) _____ Signature/Date _____

00064318

EFI
Engineering and Fire Investigations

Field Report

Date: 2-10, 2008 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFI ON SITE
- ARC ON SITE, SAME CREW.

0730 - WORK THIS SHIFT WILL BE ON BLDG. 18Y

0830 - WORKERS REMOVING TRANSITE SHEETS ON BLDG. 18Y

0930 - BAYOU CITY WASTE IS ON SITE TO PICK UP THE FULL ACM 40 CU YD. CONTAINER. THEY DID NOT BRING AND EMPTY BOX. JOHN CALLED MICHAEL TO ADVISE. THIS POSES A PROBLEM FOR FRIABLE ACM REMOVAL. NO MORE FRIABLE REMOVAL WILL BE DONE UNTIL ANOTHER ACM WASTE CONTAINER IS ON SITE.

1030 - TRANSITE SHEET REMOVAL CONTINUES AT THIS TIME.

1200 - ALL WORK STOPS FOR LUNCH.

1300 - WORK RESUMES

1400 - WORK CONTINUES AS DESCRIBED.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064319

EFI
Engineering and Fire Investigations

Field Report

Date: 2-10, 2004 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

1600 – RAIN continues to hamper access to the Disposal AREA.

1700 – Shift ends, ARC and EFI are departing site.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064320

EFI
Engineering and Fire Investigations

Field Report

Date: 2-11, 2008 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFi on site, ARC on site.

0730 - Work this shift will continue on transite removal of Bldg 18Y.

0930 - Transite removal underway at this time.

1030 - Workers stacking transite as planned untill access to the Disposal site is possable.

1200 - Work stops for lunch break.

1300 - Work resumes as planned on Bldg 18Y.

1430 - Work continues as planned at this time

1600 - Removal stops for the day for crew to stack transite in locations to load for transport to Disposal site.

1700 - Shift ends

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064321

EFI
Engineering and Fire Investigations

Field Report

Date: 2-16, 2004 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 – EFI ON SITE. ADC ON SITE. SAME CREW.

0730 – Work this shift will continue transite REMOVAL on Bldg. 18Y.

0830 – WEATHER cold BUT NO RAIN this DATE. ADC MAY BE ABLE TO haul ACM to the Disposal site.

1000 – Work continues on transite REMOVAL.

– ADC having to CLEAR AWAY heavy brush to ACCESS the BACK SIDE of Bldg. 18Y.

1200 – ALL work STOPS FOR lunch BREAK.

– ADC hauled A load OF transite to THE Disposal site.

1300 – Work RESUMES AS planned AT this time.

1400 – EFI RECEIVES ACM SURVEY on Bldg. 703 FROM LAST WEEK.

1600 – REMOVAL STOPS FOR this SHIFT SO AREA CAN BE CLEANED UP.

1700 – ADC AND EFI DEPART SITE.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064322

EFI
Engineering and Fire Investigations

Field Report

Date: 2-17, 2004 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFI on site. ARC on site.

0730 - Work this shift will continue with transite removal on Bldg. 18Y.

0830 - ARC will need to conduct several glovebags to remove pipe on the outside of Bldg. 18Y this shift.

1000 - Work continues as planned at this time.

1100 - ARC hauling a load of transite to the disposal site.

1200 - Work stops for lunch break.

1300 - Work resumes as described.

1400 - Transite removal will reach approx. 60% complete

1600 - Second load of transite loaded and being hauled to the disposal site.

1700 - Shift ends, ARC and EFI depart site.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064323

EFI
Engineering and Fire Investigations

Field Report

Date: 2-18, 2004 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFI on site, ARC on site.

0730 - Work this shift will continue with brush clearing and transite removal on Bldg. 18Y.

0830 - Bayou City waste told ARC that they would deliver and ACM waste container this morning.

1000 - Work continues on transite removal at this time.

1200 - All work stops for lunch, No ACM box as yet.

1300 - Work resumes on transite removal Bldg. 18Y

1500 - ARC hauling another load of transite to the land fill.

1630 - ARC completed transite removal on Bldg. 18Y

1700 - Shift ends.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064324

EFI
Engineering and Fire Investigations

Field Report

Date: 2-19, 2004 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFI on site, ARC on site.

0730 - Work this shift will be to Glovebag and cut and wrap pipe in Bldg. 16V

0830 - Removal underway.
- Bayou City Waste "did not" deliver and empty box

0930 - ARC is hauling one load of tarps/site from yesterdays removal to the disposal site.

1100 - ARC has completed 6 glovebags at this time and are wrapping and cutting pipe.

1200 - Work stops for lunch break.

1300 - ARC resumes work as described. No ACM contained on site as yet.

1500 - Bayou City Delivered and empty box for ACM waste.

1700 - Shift ends ARC and EFI depart site.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064325

EFI
Engineering and Fire Investigations

Field Report

Date: 2-23, 2004 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 – EFI on site, ARC on site.

0730 – Bldg 18Y will continue with removal this shift.

0930 – ARC receives a delivery of consumeables, ie poly, tap, suits ect.

1030 – Work has shifted to Bldg 601A which is near the front gate. Small transite shingles. Approx 2000 sq. Foot Bldg. Old RR Schale. Bldg.

1200 – Work stops for lunch break.

1300 – Work resumes on transite as planned.

1430 – Bldg 601-A is complete. Workers hauling transite to the disposal site.

1600 – Crew moves equipment and supplies back to the Y area.

1700 – Shift ends.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064326

EFI
Engineering and Fire Investigations

Field Report

Date: 7-24, 2004 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 – EFi on site. ARC on site

0730 – Work this shift will be Transite Removal on Bldgs 32Y and 38Y

0930 – Rain again this shift may slow progress.

1030 – Work continues as described At this time.

1200 – All work stops for Lunch Break.

1300 – ARC Bought A Power Washer to use on Decontamination of the 3X Bldgs Prior to ABATEMENT.

1400 – ARC Testing Powerwasher.
– Transite Removal continues As planned.

1600 – Too wet at the Disposal site to haul Transite so ARC is stacking sheet for later transport.

1700 – Shift Ends, ARC and EFi Depart site.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064327

EFI
Engineering and Fire Investigations

Field Report

Date: 2-25, 2004 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 – EFI on site ARC on site.
– HEAVY RAIN during the night and moderate rain at this time. May slow work this shift.

0730 – Work begins on Glovebag removal in Bldg. 45Y

0830 – Work continues on [redacted] Glovebag removal as planned.

1000 – Paul w/ US Fish & Wildlife and another visitor drove through and walked around the Y area. [redacted] on known reason.

1200 – All work stops for lunch at this time.

1300 – ARC resumes work on Bldg. 45Y Glovebag removal and wrap and cut pipe run sections.

1500 – ARC is going to try and dump the load of transite that they loaded yesterday.

1700 – Shift ends, ARC and EFI depart site.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064328

EFI
Engineering and Fire Investigations

Field Report

Date: 2-26, 2001 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 – EFi on site. ARC on site.

0730 – Work this shift will continue with removal on Bldg 45Y

0900 – Transite removal continues as planned at this time.

1030 – Steady rain forcing slow production at this time.

1200 – Work stops for Lunch break

1300 – Work resumes, rain continues. ARC was able to dump one load of transite at the disposal site.

1430 – Transite removal stops for this shift and six glovebags hung and ready for removal.

1600 – Glovebag removal complete and pipe wrapped in 2 layers of poly labeled asbestos to cut down.

1700 – Shift ends, ARC and EFi depart site.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064329

EFI
Engineering and Fire Investigations

Field Report

Date: 2-26, 2004 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFI on site. ARC on site.

0730 - Work this shift will be to remove transite from Bldg. 34Y

0930 - Weather clear this shift work conditions much better.

1100 - Transite removal continues as planned.
- ARC may complete the Y area next week.

1200 - All work stops for lunch at this time.

1300 - Work resumes as described.

1400 - Removal stops for this shift so workers can stack transite for disposal next shift.

1600 - Work complete for this shift. Crew moving equipment to safe storage area, office, warehouse.

1700 - ARC and EFI depart site.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064330

EFI
Engineering and Fire Investigations

Field Report

Date: 3-[redacted]1, 2003 4 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 – EFI on site, ARC on site.

0730 – Work this shift will continue with TRANSITE REMOVAL on Bldg. 34Y.

0930 – Phoned EFI office to check in And talked with LEE Boockle.

1030 – TRANSITE REMOVAL continues AS PLANNED on the 34Y Bldg.

1200 – All work stops For lunch BREAK At this time.

1300 – Work RESUMES AS DESCRIBED on TRANSITE REMOVAL.

1430 – WEATHER Dry today AND ACCESS to TRANSITE much EASYER.

1600 – ARC HAS the TRUCK Loaded AND READY to HAUL to the Disposal SITE.

1700 – Shift ENDS ARC AND EFI DEPART SITE.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064331

EFI
Engineering and Fire Investigations

Field Report

Date: 3-2, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFI on site. ARC on site.

0730 - Work this shift will continue with TRANSITE REMOVAL on Bldg. 34Y at this time.

0830 - WEATHER 30% CHANCE OF RAIN work continues AS PLANNED.

1000 - Work continues on TRANSITE REMOVAL AT Bldg. 34Y.

1200 - ALL work stops FOR lunch AT this time

1300 - ARC RESUMES WORK ON TRANSITE REMOVAL ON THE ROOF OF Bldg. 34Y

1500 - ARC hauling A load OF TRANSITE to the DISPOSAL SITE.

1600 - Work stops FOR this shift FOR site clean up.

1700 - Shift END

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064332

EFI
Engineering and Fire Investigations

Field Report

Date: 3-3, 2003 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 – EFI on site, ARC on site.

0730 – Work this shift will continue on Bldg 34Y.

0830 – Weather not raining at this time but heavy rain predicted for the afternoon.

1000 – ARC will likley finish in the Y area this week and will be moving to the T area next week.

1200 – All work stops for lunch at this time.

1300 – Work resumes as planned transite removal at Bldg 34Y.

1500 – ARC hauls another load of transite to the disposal site

1600 – Work stops on Remoal for this shift to clean up the work area.

1700 – Shift ends, ARC and EFI depart site.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064333

EFI
Engineering and Fire Investigations

Field Report

Date: 3-4, 2008 4 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFI ON SITE ARC ON SITE.

0730 - WORK THIS SHIFT WILL CONTINUE WITH AND COMPLETE THE TRANSITE REMOVAL IN THE Y AREA. WORK TODAY IS ON Bldg. 34Y

0900 - WEATHER TODAY CALLING FOR A LOT OF RAIN, POSSABLY SEVIER STORMS.

1000 - WORK CONTINUES AT THIS TIME AND ON SCHEDULE.

1200 - ALL WORK STOPS FOR LUNCH BREAK AT THIS TIME.

1300 - WORK RESUMES AS DESCRIBED ON Bldg 34Y.

1430 - ARC HAULING THE LAST LOAD OF TRANSITE TO THE DISPOSAL SITE FROM THE Y AREA.

1530 - ARC MOVING EQUIPMENT AND SUPPLIES TO THE T AREA FOR STARTUP THEIR ON MONDAY.

1700 - SHIFT ENDS.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064334

EFI
Engineering and Fire Investigations

Field Report

Date: 3-8 , 2004 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 – EFI on site,
– ARC on site.
0730 – Work this shift will be clearing around and moving inside of Bldg. 8T.
0930 – Work continues as described at this time.
1030 – ARC moving more supplies out of the Y AREA over to the T AREA.
1200 – Work stops for lunch at this time.
1300 – ARC resumes work in the T AREA on Bldg. 8T.
1430 – Work continues as described.
1630 – ARC will continue with MEC and mag start FL. Tile removal next shift in Bldg. 8T.
1700 – Shift ends.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064335

EFI
Engineering and Fire Investigations

Field Report

Date: 3-9, 2004 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFI ON SITE. ARC ON SITE.

0730 - Work this shift will continue at this time on Bldg. 8T with prep for FL. tile removal. Outside cleaning also will continue.

1030 - Work continues as planned. FL. tile removal has begun.

1200 - Work stops for lunch break.

1300 - Talked with Alex and advised him that Ph. II work on asbestos is likley to be by the end of April 04.

1500 - FL. tile removal continues in Bldg. 8T

1600 - Work stops for this shift to clean up.

1700 - Shift ends

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064336

EFI
Engineering and Fire Investigations

Field Report

Date: 3-10, 2004 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 – EFI on site. ARC on site.

0730 – Work continues on Bldg 8T at this time.

0830 – Work on REMOVAL is on TRANSITE at this time.

10:00 – Work on REMOVAL continues on Bldg 8T AS PLANNED.

11:00 – FL. TILE REMOVAL is complete AND TRANSITE REMOVAL underway.

1200 – ALL work stops FOR LUNCH BREAK At this TIME.

1300 – Work RESUMES AS DESCRIBED on TRANSITE REMOVAL.

1500 – Work continues at this time.

1600 – ARC stops work FOR AREA CLEAN up.

1700 – Work will continue on this Bldg NEXT [redacted] shift, ARC AND EFI depart site.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064337

EFI
Engineering and Fire Investigations

Field Report

Date: 3-11, 2004 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFI on site. ARC on site.

0730 - Work this shift is continuing on Bldg 8T.

0930 - TNT/site removal continuing as planned at this time.

1030 - ARC hauling a load of TNT/site to the disposal site.

1200 - All work stops for lunch at this time.

1300 - Work resumes on Bldg 8T as described.

1500 - Another load of TNT/site loaded but will not go to the disposal site until Monday.

1600 - Work stops for the shift and crew cleaning of work area.

1700 - Shift ends.

Site Representative (Print Name) _____ Signature/Date _____

Contractor Supervisor (Print Name) _____ Signature/Date _____

00064338

EFI
Engineering and Fire Investigations

Field Report

Date: 3-15, 2004 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFI on site, ARC on site.

0730 - Work this shift will continue with transite removal on Bldg. 8T.

0900 - Area received a lot of rain over night and ARC will be stacking transite that they remove until which time they can access the Disposal site.

1030 - Transite removal continues as planned at this time.

1200 - All work stops for lunch break.

1300 - Work resumes as described on Bldg. 8T.

1500 - Workers continue to stack the transite panels for disposal at a later time.

1700 - Shift Ends.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064339

EFI
Engineering and Fire Investigations

Field Report

Date: 3-16, 2004 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

06:30 – EFI ON SITE, ARC ON SITE. SAME CREW.

07:30 – WORK this shift will continue with REMOVAL ON BLdg. 8T.

0930 – ARC talking about adding two additional workers to the crew. Not confirmed at this time.

1030 – Disposal site may be accessable later today. No rain yesterday or last night.

1200 – All work stops for lunch break at this time.

1300 – Work resumes on transite removal of Bldg 8T.

1400 – ARC hauling a load of transite to the disposal site.

1600 – Removal stops for this shift to allow for work area clean up.

1700 – Shift ends

Site Representative (Print Name) _____ Signature/Date _____

Contractor Supervisor (Print Name) _____ Signature/Date _____

00064340

EFI
Engineering and Fire Investigations

Field Report

Date: 3-17, 2004 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFI on site. ARC on site.

0730 - ARC continues with transite removal on Bldg 8T this shift.

0830 - ARC also cleaning around Bldg.
- Dump truck has a flat tire which will slow removal for repair.

1030 - Tire repair complete and work resumes as planned.

1200 - ARC hauling a load of transite to the disposal site.

1300 - Work resumes.

1400 - Removal of transite is complete on Bldg. 8T and crew moving supplies & equipment to Bldg 13T.

1600 - ARC setting up to start Bldg. 13T.

1700 - Shift ends

Site Representative (Print Name) _____ Signature/Date _____

Contractor Supervisor (Print Name) _____ Signature/Date _____

00064341

EFI
Engineering and Fire Investigations

Field Report

Date: 3-18, 2004 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFI on site. ARC on site.

0730 - TRANSITE REMOVAL BEGINS ON Bldg. 13T At this time.

0830 - ARC hauling A load of TRANSITE TO the Disposal SITE.
- ARC advises they are keeping the SAME CREW SIZE until Further notice.

1000 - Work continues AS PLANNED At this time.

1200 - All work stops For lunch

1300 - Work RESUMES on Bldg 13T with TRANSITE REMOVAL.

1400 - ARC hauling their last load of TRANSITE to the Disposal site For this shift.

1600 - ARC stopping to clean up work AREA

1700 - Shift ENDS.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064342

EFI
Engineering and Fire Investigations

Field Report

Date: 3-22, 2004 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFI on site, ARC on site.

0730 - Work this shift will be to remove transite on Bldg. 13T.

0930 - Work underway as described. Weather

1100 - Work continues as planned at this time.

1200 - All work stops for lunch break.

1300 - Work resumes.

1500 - ARC will likely complete the transite removal on Bldg. 13T this shift.

1600 - ARC hauling final load for this shift to the disposal site.

1700 - Shift ends.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064343

EFI
Engineering and Fire Investigations

Field Report

Date: 3-23, 2004 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFI on site, ARC on site.

0730 - Work this shift will continue on Bldg. 13T, to clean up and complete.

0930 - Work on Bldg 13T complete. ARC has been cleaning around 16T to access work area.

1030 - ARC moving equipment and supplies to Bldg. 16T to start. Work will be transite removal.

1200 - All work stops for lunch break at this time.

1300 - Work resumes as described on Bldg. 16T.

1430 - ARC loading a load of transite to the disposal site.

1530 - Work continues as described.

1700 - Work stops for shift end.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064344

EFI
Engineering and Fire Investigations

Field Report

Date: 3-24, 2004 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFI on site, ARC on site.

0730 - Work this shift will be on Bldg 16T Transite Removal.

0830 - Weather clear at this time and ARC hauling a load of transite to the disposal site.

1000 - Light rain, ARC continues to work on Bldg. 16T.

1200 - All work stops for Lunch at this time.

1300 - ARC resumes work as planned on Bldg. 16T.

1430 - ARC hauling a load of transite to the disposal site.

1600 - Work continues on Bldg 16T as planned.

1700 - Shift ends.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064345

EFI
Engineering and Fire Investigations

Field Report

Date: 3-25, 2004 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 – EFI on site, ARC on site.
– Light rain at this time

0730 – Work this shift will continue on Bldg 16T.

0930 – ARC hauling a load of transite to the disposal site.

1030 – Work beginning on Bldg 16T2 at this time on transite.

1130 – Removal continues as planned at this time.

1200 – All work stops for lunch break.

1300 – Work resumes as described on Bldg 16T

1500 – Work stopping to clean up work area.

1700 – Shift ends.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064346

EFI
Engineering and Fire Investigations

Field Report

Date: 3-29, 2004 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 – EFI on site. ARC on site with same crew.

0730 – Work this shift will begin with brush cleaning around Bldg. 20T

0930 – ARC beginning to prepair for transite removal on Bldg. 20T

1100 – Transite demoval on Bldg 20T underway.

1200 – All work stops for lunch at this time.

1300 – Work resumes as described on Bldg. 20T.

1430 – ARC's dumptruck for hauling the transite to the disposal site is broken down at this time. Repair will take place at the beginning of next shift.

1600 – Work stops for area cleanup.

1700 – Shift ends.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064347

EFI
Engineering and Fire Investigations

Field Report

Date: 3-30, 2004 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFI on site, ARC on site, same crew.

0730 - ARC prepairs to do repair on dump truck while crew continues transite removal on Bldg 20T.

0900 - Transite removal underway. Crew stacking sheets until the dump truck is ready for service.

1100 - Dump truck repair complete and haul loading transite sheets at this time.

1200 - All work stops for lunch break.

1300 - Work resumes on Bldg 20T transite removal.

1500 - ARC hauling a load of transite to the disposal site.

1700 - Work stops for shift end.

Site Representative (Print Name) _____ Signature/Date _____

Contractor Supervisor (Print Name) _____ Signature/Date _____

00064348

EFI
Engineering and Fire Investigations

Field Report

Date: 3-31, 2008 4 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 – EFI on site, ARC on site.

0730 – Work this shift will be to continue transite removal on Bldg. 20T, 35T & 39T

0930 – ARC ready to haul another load of transite to the disposal site.

1030 – Work continues as described at this time.

1130 – ARC is likely to finish the TMEA next week.

1200 – All work stops for lunch at this time.

1300 – Work resumes as described. These are small Bldgs and ARC is also going to get 39T1 this shift.

1500 – Work continues as planned. Michael called from ARC and requested John and I to gather square footage info on all of the Bldgs in Plant 2 and Plant 3,

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064349

EFI
Engineering and Fire Investigations

Field Report

Date: 3.31, 2004

Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

- ON THE TRANSITE AND ANY FLOOD TILE REMOVAL. LINER FOOT QUANTITIES ON ANY SIDE ALSO TO BE NOTED.

1700 - SHIFT ENDS.

Site Representative (Print Name) _____ Signature/Date _____

Contractor Supervisor (Print Name) _____ Signature/Date _____

00064350

EFI
Engineering and Fire Investigations

Field Report

Date: 4 - 1 , 2004 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 – Work this shift will begin on Bldg. 39T to complete and move to Bldg. 21T

0730 – Transite removal underway. ARC also going to do removal on ~~[illegible]~~ another small bldg this shift Bldg. 101

0930 – Weather clear this entire week.

1100 – ARC hauling a load of transite to the land fill.

1200 – All work stops for lunch.

1300 – Work resumes as described above.

1500 – Work is on Bldg 101 at this time.

1700 – All transite removal on the bldgs listed has been completed for this date.
– Shift ends, ARC and EFI depart site.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064351

EFI
Engineering and Fire Investigations

Field Report

Date: 4-05, 2004 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 – EFI on site. ARC on site. Same crew.

0730 – Work this shift will be transite removal on Bldg. 31T. Weather good, work begins.

0900 – Transite removal underway as planned.

1030 – ARC hauling a load of transite to the Disposal site.

1130 – Demo equipment for digging the disposal site has been broke down for a couple of weeks now. Present site approaching full. Known resolution.

1200 – All work stops for lunch.

1300 – Work resumes.

1400 – EFI calls Lee Buckle to advise on work shut down.

1600 – Another load of transite going to the Disposal site.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064352

EFI
Engineering and Fire Investigations

Field Report

Date: 4-5 , 2004 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

— EFI And JohnW/ARC have been collecting quantity est. on Removal in Plant 2 and Plant 3 Areas

1700 — Demo crew did not work this shift due to equipment problems.
— ARC and EFI Depart site shift end.

Site Representative (Print Name) Signature/Date

Contractor Supervisor (Print Name) Signature/Date

00064353

EFI
Engineering and Fire Investigations

Field Report

Date: 4-6, 2004 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFI on site. ARC on site.

0730 - Work this shift will continue with transite removal on Bldg. 31 T.

0930 - Transite removal continues as planned.
- ARC hauling a load of transite to the disposal site.

1100 - EFI talked with Lee Cockle and he talked with Michal Luzcak and ~~the~~ there will be no work on abatement during the weeks of April 12 thru 16 or 19th thru. 23. As EFI understands at this time.

1200 - All work stops for lunch at this time.

1300 - Work resumes on transite removal at Bldg. 31 T.

1500 - Transite removal going well at this time.

Site Representative (Print Name) _____ Signature/Date _____

Contractor Supervisor (Print Name) _____ Signature/Date _____

00064354

EFI
Engineering and Fire Investigations

Field Report

Date: 4-6, 2004

Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

1700 – Work stops for shift end.
ARC will finish the T Area Bldgs with ABATEMENT this week.

– ARC and EFI DEPART site.

Site Representative (Print Name) _____ Signature/Date _____

Contractor Supervisor (Print Name) _____ Signature/Date _____

00064355

EFI
Engineering and Fire Investigations

Field Report

Date: 4-7, 2004 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 - EFI on site, ARC on site same crew.

0730 - Work this shift will continue with transite removal on Bldg. 31T this shift.

0930 - ARC hauling a load of transite to the disposal site.

1030 - Work continues as described on transite removal at Bldg 31T.

1200 - Work stops for lunch at this time

1300 - Work resumes as described on 31T

1500 - ARC will complete removal of Bldg. 31T this shift.

1700 - Shift ends, ARC and EFI depart site

Site Representative (Print Name) _____ Signature/Date _____

Contractor Supervisor (Print Name) _____ Signature/Date _____

00064356

EFI
Engineering and Fire Investigations

Field Report

Date: 4-8, 2008 4 | Project Number: 98410-13709

Project Name: Longhorn Army Ammunition Plant

Contractor: ARC

Description

0630 – EFI on site. ADC on site.

0730 – Only work ADC has to do this shift is haul ACM transite panels to the Disposal site.

0930 – Second load of transite going to the Disposal site.

1200 – Work stops for lunch.

1300 – Asbestos work in the T Area is complete.

– – Crew advised they would be off for the next 2 weeks.

Site Representative (Print Name) _____ Signature/Date _____

Contractor Supervisor (Print Name) _____ Signature/Date _____

APPENDIX D
TEXAS DEPARTMENT OF HEALTH NOTIFICATIONS/RELATED DOCUMENTS

00064358

TEXAS DEPARTMENT OF HEALTH DEMOLITION / RENOVATION NOTIFICATION FORM

NOTE: CIRCLE ITEMS THAT ARE AMENDED T.D.H. **NOTIFICATION#** _____

1) Abatement Contractor: ARC Abatement, Inc. TDH License No.: 80-0443
Address: 207 Panther Way City: Hewitt State: TX Zip: 76643
Office Phone Number: 713-896-0668 Job Site Phone Number: N/A
Site Supervisor: See Attached List TDH License Number: See Attached
Site Supervisor: N/A TDH License Number: N/A
Trained On-Site NESHAP Individual: N/A Certification Date: N/A

Demolition Contractor: A-1 Demolition Office Phone Number: 254-826-4074
Address: 922 John Nors Road City: West State: TX Zip: 76691

2) Project Consultant or Operator: Engineering & Fire Investigations TDH License No.: 10-0305
Mailing address: 9700 Richmond Ave., Suite 201
City: Houston State: TX Zip: 77042 Office Phone Number: (713) 975-7031

3) Facility Owner: U.S. Army Industrial Operation-BRAC Technical Support Office
Attention: Brian Gebhart
Mailing address: DAIM-BO-O, 1 Rock Island Arsenal
City: Rock Island State: IL Zip: 61299 Owner Phone Number: 309-782-1387

4) Description or Facility Name: Longhorn Army Ammunition Plant
Physical Address: Hwy 43 @ Spur 449 County: Harrison
City: Karnack Zip: 75671 Facility Phone Number: 903-679-3181
Facility Contact Person: Lynn Muckelrath
Description of Area/Room Number: See Attached List
Prior Use: Ammunition Plant Future Use: To Be Demolished
Age of Building/Facility: 30+ Size: 170,000sf Number of Floors: 2
School (K-12) ☐ YES ☒ NO

5) Type of Work: ☒ Demolition ☐ Renovation (Abatement) ☐ Annual Consolidated
Work will be during: ☒ Day ☐ Evening ☐ Night ☐ Phased Project
Description of work schedule: Mon-Thur. 7am-5:30pm

6) Is this a Public Building? ☐ YES ☒ NO Federal Facility? ☒ YES ☐ NO Industrial Site? ☒ YES ☐ NO
NESHAP-Only Facility? ☒ YES ☐ NO Is Building/Facility Occupied? ☐ YES ☒ NO

7) Notification Type: CHECK ONLY ONE
☒ Original (10 Working Days) ☐ Cancellation Amendment ☐ Emergency/Ordered

If this is an amendment, which amendment number is this? N/A (Enclose copy of original)
If an emergency, who did you talk with at TDH? N/A Emergency# No
Date and Hour of Emergency (HH/MM/DD/YY): N/A
Description of the sudden, unexpected event and explanation of how the event caused unsafe conditions or would cause equipment damage (computers, machinery, etc.): N/A

8) Description of procedures to be followed in the event that unexpected asbestos is found or previously non-friable asbestos material becomes crumbled, pulverized, or reduced to powder: Area will be sealed off and barricaded. The owner, federal, state and local authorities will be notified. All suspect material will be treated as ACM.

9) Was an Asbestos survey performed? ☒ YES ☐ NO Date: 1/30/95 TDH Inspector License No: n/a
Analytical Method: ☒ PLM ☐ TEM ☐ Assumed TDH Laboratory License No: n/a
(For TAHPA (public building) projects: an assumption must be made by a TDH Licensed Inspector)

10) Description of planned demolition or renovation work, type of material, and method(s) to be used: Removal of friable and non-friable asbestos containing materials from schedule buildings and subsequent demolish of building leaving all concrete slabs and foundations in place.

For Office Use Only ☐ TAHPA ☐ NESHAP ☐ T ☐ H ☐ L
POSTMARK / / RCVD / / NO ☐ YES ☐ ?

00064359

11) Description of work practices and engineering controls to be used to prevent emissions of asbestos at the demolition/renovation site: HEPA vacuum, wet methods, containment, criticals, barricades, glove bag Methods, and PPE

12) ALL applicable items in the following table must be completed: IF NO ASBESTOS PRESENT CHECK HERE ☐

Asbestos-Containing Building Material Type	Approximate amount of Asbestos		Check unit of measurement					
	Pipes	Surface Area	Ln Ft	Ln M	SQ Ft	SQ M	Cu Ft	Cu M
RACM to be removed	7,350	2500	X		X			
RACM NOT removed								
Interior Category I non-friable removed		14,860			X			
Exterior Category I non-friable removed								
Category I non-friable NOT removed								
Interior Category II non-friable removed		191,633			X			
Exterior Category II non-friable removed								
Category II non-friable NOT removed								
RACM Off-Facility Component								

13) Waste Transporter Name: ARC Abatement, Inc. TDH License No.: 40-0105
Address: 207 Panther Way City: Hewitt State: TX Zip: 76643
Contact Person: Jerry Fields Phone Number: 713-896-0668

14) Waste Disposal Site Name: BFI McCarty Road Landfill
Address: 11013 Old Beaumont Highway City: Houston State: TX Zip: 77078
Telephone: 713-675-6101 TNRCC Permit Number: 261-A

15) For structurally unsound facilities, attach a copy of demolition order and identify Governmental Official below:
Name: N/A Registration No: N/A
Title: N/A
Date of order (MM/DD/YY) N/A Date order to begin (MM/DD/YY) N/A

16) Scheduled Dates of Asbestos Abatement (MM/DD/YY) Start: 3/19/03 Complete: 7/11/03

17) Scheduled Dates Demolition/Renovation (MM/DD/YY) Start: 5/1/03 Complete: 9/5/03

** Note: If the start date on this notification can not be met, the TDH Regional or Local Program office *Must* be contacted by phone prior to the start date. Failure to do so is a violation in accordance to TAHPA, Section 295.61.**

I hereby certify that all information I have provided is correct, complete, and true to the best of my knowledge. I acknowledge that I am responsible for all aspects of the notification form, including, but not limiting, content and submission dates. The maximum penalty is $10,000 per day per violation.

Owner/Contractor — Jerry Fields "Contractor" — 3/5/03 — 713-896-0668
(Signature of Building Owner/Operator or Delegated Consultant/Contractor) (Printed Name) (Date) (Telephone)
713-896-1772 (Fax Number)

MAIL TO:

Faxes are not accepted

ASBESTOS NOTIFICATION SECTION
TOXIC SUBSTANCES CONTROL DIVISION
TEXAS DEPARTMENT OF HEALTH
PO BOX 143538
AUSTIN, TX 78714-3538
PH: 512-834-6600, 1-800-572-5548

Faxes are not accepted

Form APB#5, dated 07/13/01 Replaces TDH form dated 09/15/97. For assistance in completing form, call 1-800-572-5548.

APPENDIX E
AIR MONITORING CERTIFICATIONS AND LICENSES
&
WORK PROCEDURES

TEXAS
DEPARTMENT OF HEALTH

BE IT KNOWN THAT

ENGINEERING AND FIRE INVESTIGATIONS, INC

is Licensed and authorized to perform as an

Asbestos Consultant Agency

in the State of Texas within the purview of Texas Civil Statutes, Article 4477-3a, as amended, so long as this license is not suspended or revoked and is renewed according to the rules adopted by the Texas Board of Health.

10-0305
License Number

10/24/2003
Issue Date

10/23/2004
Expiration Date

This certificate is void after expiration date.

Todd F. Wingler, P.E.
Chief, Asbestos Programs Branch
Occupational Safety and Health Division

Eduardo J. Sanchez, M.D., M.P.H.
Commissioner of Health

VOID IF ALTERED NON-TRANSFERABLE

75225

00064361

00064362

Texas Department of Health certifies that:

DANIEL POPE

License Number **105185**
is Licensed as an
Individual Asbestos Consultant



From **02/27/2003** To **02/26/2004**

TDH

Eduardo J. Sanchez, M.D., M.P.H.
Commissioner of Health

Control No. 70141

If found return postage guaranteed:Texas Department of Health
1100 West 49th Street 7C790-178 Austin, Texas 78756

It is a violation of Texas Department of Health Rules and a violation of the Texas Penal Code Sec. 37.10 to submit any forged or fraudulent documents in order to obtain a license.

Es una violación de los Reglamentos del Departamento De Salud y del Texas Penal Code Sec. 37.10 al someter cualquer tipo de documentos que esten alterados o falsificados para obtener una licencia.

2003

NOT VALID
WITHOUT STICKER

TDH
TEXAS DEPARTMENT OF HEALTH

00064363

TDH TDH TDH

Texas Department of Health certifies that:

ADAM W SATTERFIELD

is Licensed as

Asbestos Air Monitoring Technician



License Number: 705500

From: 02/27/2004

To: 02/26/2005

Control No: 77257

00064364

TDH TDH TDH

Texas Department of Health certifies that:

JON D BAAK

is Licensed as

Asbestos Air Monitoring Technician



License Number: 70030

From: 11/01/2003

To: 11/31/2004 Control No: 75161

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TDH

Eduardo J. Sanchez, M.D., M.P.H.
Commissioner of Health

00064365

WORK PROCEDURES

FOR

REMOVAL OF ASBESTOS-CONTAINING MATERIALS

AT

LONGHORN ARMY AMMUNITION PLANT

Karnack, Texas

Prepared by:

Engineering and Fire investigations, Inc.
9700 Richmond
Houston, Texas 77042
(713) 975-7031

March, 2003

CERTIFICATION PAGE

DISCLOSURE STATEMENT

THIS DOCUMENT HAS BEEN PREPARED ON BEHALF OF AND EXCLUSIVELY FOR THE USE OF U.S. ARMY INDUSTRIAL OPERATION – BRAC TECHNICAL SUPPORT OFFICE. IF THE DOCUMENT SHOULD BE REPRODUCED IT SHOULD BE REPRODUCED IN WHOLE, AND SUCH REPRODUCTION AND DISTRIBUTION SHALL BE AT U.S. ARMY INDUSTRIAL OPERATION – BRAC TECHNICAL SUPPORT OFFICE. ADDITIONALLY, U.S. ARMY INDUSTRIAL OPERATION – BRAC TECHNICAL SUPPORT OFFICE IS CAUTIONED THAT, SHOULD INTERPRETATIONS BE MADE, OPINIONS FORMED, AND CONCLUSIONS DRAWN AS A RESULT OF EXAMINING THE DOCUMENT, THESE INTERPRETATIONS, OPINIONS, AND CONCLUSIONS WILL BE THOSE MADE, FORMED AND DRAWN SOLELY BY THE PARTY REVIEWING THE DOCUMENT.

TDH Asbestos Consultant Name: Cuong Nguyen

TDH Asbestos Consultant Signature: _____

TDH Asbestos Consultant License No./Expiration: 10-5516 – 10/06/2003

By signing this document, the Asbestos Consultant for the project authorizes and delegates the visual observation requirements of these Work Procedures and the applicable federal, state and local regulations to the following EFI personnel and/or EFI Subcontractor:

END OF CERTIFICATION PAGE

PROJECT DIRECTORY

		Representative
Owner:	U.S. Army Industrial Operation BRAC Technical Support Office	Brian Gebhart
Owner's Representative:	U.S. Army Industrial Operation Hwy 43 @ Spur 449 Karnack, Texas 75671 (903) 679-3181	Lynn Muckelrath
Asbestos Abatement Contractor:	ARC Abatement, Inc. 6630 Roxburgh Drive, Suite 130 Houston, Texas 77041 (713) 896-0668, Fax (713) 896-1772	Michael Luczak
Engineer:	Engineering and Fire Investigations 9700 Richmond Avenue Houston, Texas 77042 (713) 975-7031, Fax (713) 975-7336	Lee A. Burckle, P.E. Cuong Nguyen
Testing Laboratory:	Engineering and Fire Investigations 9700 Richmond Avenue Houston, Texas 77042 (713) 975-7031, Fax (713) 975-7336	Lee A. Burckle, P.E.

END OF PROJECT DIRECTORY

1.0 SUMMARY OF WORK

PART 1 - GENERAL

1.01 DESCRIPTION

A. Project Description

The Longhorn Army Ammunition Plant is located on Hwy 43 @ Spur 449 in Karnack, Texas. The Longhorn Army Ammunition Plant is situated on an approximate 8,000 acres site, which contains of multiple process, warehouse, administrative, and ancillary buildings constructed in the 1950's and 1960's. The majority of the buildings contain interior and exterior transite siding and roofing and composition shingle/roll sheeting roofs. The building structures consist of metal stud and wood joist/roof framing. Typical administrative building interior finishes include carpet and tile/sheeting over concrete slabs, wall partitions constructed of gypsum wallboard with paint texture finishes and/or transite board, and suspended acoustical ceiling tile ceiling system.

B. The Scope of Work (SOW) will include, but not be limited to:

1. Removal and disposal of all Regulated Asbestos-Containing Material (RACM), which is currently RACM or may become RACM during demolition activities of the 41 identified buildings (see attached table in Appendix A). Generally, the RACM identified in the building to be removed is as listed below.
   a. Friable ACM - Thermal System Insulation (Steam - Block/Mudded).
   b. Friable ACM – Thermal System Insulation (Boiler Flue - Block).
   c. Category II, Non Friable – Exterior Corrugated Transite Sidings / Roofing.
   d. Category II, Non Friable - Interior Transite Siding.
2. Removal and disposal of loose and flaking lead-based paint from surfaces of identified buildings scheduled for demolition.
3. Testing of oil-fluids from identified buildings scheduled for demolition to determine if fluids contain PCB.
4. Removal and disposal of identified PCB and PCB contaminated equipment from identified buildings scheduled for demolition.
5. Erection of permanent security fencing and placement of warning barricade around buildings with open pit areas at completion of demolition.

C. Include all work listed in these specifications and incidentals thereto. Require that all phases of the Work be executed by skilled craftsman experienced in their respective trades.

D. Contractor may subcontract any phase or portion of the Work. However, such subcontract shall not relieve Contractor from enforcing the use of all required safety equipment by subcontractor and its employees providing any phase of the Work in contaminated areas. Require and verify that all materials and methods used by subcontractor are consistent with materials and methods for established

and safe asbestos, lead-based paint components, and PCB removal procedures and consistent with the Work Procedures.

1.02 WORK INCLUDED IN THE CONTRACT DOCUMENTS

A. General items include but are not necessarily limited to:

1. Isolation of all HVAC, electrical, fire alarm and security systems servicing the work area.
2. Coordination with Owner for use of building utilities (if feasible), or supply temporary power, water, etc. necessary to execute the Work.
3. Development of special fire protection and security procedures to be compatible with existing building systems and procedures.
4. Preparation of the work area as specified elsewhere.
5. Personal air monitoring for abatement workers and subcontractor's workers as required by regulatory agencies.
6. Removal of existing items that are in the work area to provide access to asbestos-containing materials.
7. Performance of incidental mechanical, electrical and plumbing work necessary for conducting the Work.
8. Removal of friable and Category II non-friable asbestos-containing materials prior to demolition of building structures and disposal of (friable) ACM waste to an approved off-site landfill, (Category II non-friable) to an on-site landfill.
9. Demolition of building structures with Category I non-friable ACM and disposal of ACM waste to an on-site landfill.
10. Removal and disposal of PCB containing transformers.
11. Removal of loose and flaking paint from building structures and characterization of lead waste prior to disposal.
12. Maintain security of Work Area (s) and buildings until Work is completed for each specific property.
13. Clean-up of the work area as specified elsewhere.

B. Mechanical/Plumbing items include but are not limited to:

1. Coordinate with Owner for isolation of any mechanical systems that are to be dismantled, and drain and purge piping systems to be dismantled.
2. Removal and disposal of asbestos-containing pipe/equipment insulation (block/mudded) and pipe/equipment insulation and all associated piping.

C. Electrical items include but are not limited to:

1. Installation of temporary electrical power panels with Ground Fault Circuit Interrupters (GFCI) for Contractor's and Testing Laboratory's equipment. All electrical tie-ins are to be performed by licensed electricians.
2. Installation of temporary lighting.
3. Installation of temporary electrical power as required by Testing Laboratory.
4. Isolate all electrical circuits that are within the work area.

5. Provide generators for source of power should existing utility/power are not available at the site.

1.03 WORK NOT INCLUDED IN THE CONTRACT DOCUMENTS

A. Re-installation of any removed items that are part of the removal work.

1.04 EXISTING CONDITIONS

A. Existing conditions are reflected correctly to the best of Owner's knowledge. Should minor conditions be encountered which are not exactly as indicated, modification to new work shall be made as required at no additional expense to Owner.

B. Results of tests of asbestos-containing materials (which are specifically excluded from these Contract Documents) taken from building surfaces within the scope of this Project are available for review at the office of the Engineer. However, Contractor is cautioned that, should interpretations be made, opinions be formed, and conclusions be drawn as a result of examining the test results, those interpretations, opinions, and conclusions will be those made, formed, and drawn solely by Contractor.

C. Inasmuch as randomly or arbitrarily selected areas were sampled, Engineer and Owner make no representation, warranty, or guaranty that the conditions indicated by the test reports either are representative of those conditions existing throughout the area, or that unforeseen developments may not occur, or that materials other than, or in proportions different from those indicated may not exist.

D. Contractor is advised that the locations of asbestos-containing materials are not clearly known and that the Contractor shall proceed with caution in all phases of the Work. Contractor shall verify all locations of asbestos-containing materials and shall remove similar associated materials that may exist at no extra cost to owner.

1.05 STORAGE

A. Storage space is available at the facility. Supply any additional temporary storage required for storage of equipment and materials for duration of Project. Contractor will be responsible for the security of the equipment and materials utilized for duration of Project.

1.06 BUILDING OCCUPANCY

A. Owner will occupy portions of the facility for the conduct of normal business operations during the abatement operations. Coordinate work with Owner and conduct activities so as to minimize disruption to the building occupants.

B. Predetermine and obtain approval, in advance from Owner, for horizontal transportation of contaminated waste materials, labor and construction materials into and out of building.

1.07 BUILDING SECURITY

A. Maintain personnel on the site at all times any portion of the work areas are open or not properly secured. Secure work areas completely at the end of each working day.

1.08 FIRE PREVENTION

A. Provide Type "A" fire extinguishers for temporary offices and similar spaces where there is minimal danger of electrical or grease-oil-flammable liquid fires. In other locations, provide type "ABC" dry chemical fire extinguishers, or a combination of several extinguishers per National Fire Protection Association (NFPA) recommendations and OSHA regulations.

B. Abatement Contractor's employees shall not enter building areas with cigarette lighters, matches, cigarettes, cigars, pipes or other flame emitting items. Abatement Contractor's employees shall not smoke cigarettes, cigars, pipes or the like within the building areas.

C. Flammable materials shall not be stored in the work area.

1.09 CONTINGENCY PLAN

A. Prepare a contingency plan for emergencies including fire, fire alarms, accident, power failure, or any other emergency event. Incorporate building's emergency procedures as required. Note that nothing in the Work Procedures should impede safe exiting or providing of adequate medical attention in the event of an emergency.

B. Post at the entrance to the work area telephone numbers and locations of emergency services including but not limited to the building security office.

1.10 PROJECT SUPERINTENDENT

A. Maintain a "competent" full-time superintendent as defined by OSHA and EPA, and necessary assistants who shall be in attendance at the building during the progress of the work. The superintendent shall be satisfactory to Owner's Representative and shall not be changed without prior approval by the Owner's Representative.

1.11 SEGREGATION OF WORK AREAS

A. Segregate the work areas from the surrounding occupied or unoccupied areas.
   1. Demarcate the work areas with asbestos and lead warning barrier tape (maintain a minimum clear distance of 15 feet from the work location and the demarcated perimeter) and post asbestos warning signage as required.

1.12 OBSERVATIONS

A. Engineer will observe the status and progress of the Work for completeness and general compliance with the requirements of the Work Procedures. At a minimum, the observations will be conducted at the following times during the Project:

1. Following pre-cleaning of work areas.
2. Following complete preparation of work areas and prior to proceeding with actual removal of asbestos-containing materials.
3. During removal of asbestos-containing materials.
4. At designated times during the cleaning phases.
5. At designated time during the demolition of building structures.
6. Following Demobilization of all equipment and materials.
7. As appropriate during the work outlined elsewhere in the Work Procedures.

1.13 SIGN-IN/OUT LOG

A. Maintain a Sign-In/Out Log in the immediate vicinity of the Change Room of the personnel decontamination enclosure. Maintain log from the time the first activity is performed involving the application of plastic sheeting until acceptance of the final air test results by Engineer. Require all persons entering the work areas, including the Contractor's workers, Engineer, Owner or agents of the Owner, government officials to register each time upon entering and leaving work areas. Indicate name, social security number, time, companies or agencies represented and reason for entering work area.

1.14 UTILITIES

A. Contractor may temporarily connect to existing permanent utilities during execution of the Work. Make connections in locations designated by Owner. The cost of utilities consumed will be paid by Owner.

1.15 SALVAGEABLE MATERIALS

A. Consider all materials and items demolished or removed in the execution of the Work unsalvageable unless specifically noted otherwise in the pre-job walkthrough.

1.16 CLEAN-UP

A. Dismantle and dispose of all temporary barriers erected to isolate the work areas at completion of Work.

B. Leave all areas visibly clean at completion of Work.

2.0 SUBMITTALS

2.01 DESCRIPTION

A. Make submittals required by the Work Procedures in a timely manner and at approximately times in the execution of the Work to allow fur sufficient and prompt review by Engineer. Revise and resubmit as necessary to establish compliance with the specified requirements.

2.02 WORK INCLUDED

A. Submit complete, bound sets of the submittals required herein. Submit separate sets entitled "Project Submittals".

B. Update submittals to Owner to account for all new equipment and employees used on the Project.

C. Project Submittals

1. Submit one complete set of "Project Submittals" to Engineer for review, of the completion of Work. Bind project submittals in a three-ring binder or cover with metal fasteners.

2.03 PROJECT SUBMITTALS

A. Notice of impending commencement of asbestos removal work, and any amendments if required, in writing via regular mail to:

Asbestos Notification and Information Section
P. O. Box 143538
Austin, Texas 78714-3538

Or overnight to:

Asbestos Notification and Information Section
8407 Wall Street
Suite N320
Austin, Texas 78754

and to comply with the applicable notice period set forth in 40 CFR 61.146. Include one copy of notifications in submittal package. Any required notification fees shall be paid by the Contractor.

B. Insurance certificate listing all coverages as required by Owner, listing Owner, and Testing Laboratory as additional insureds'.

C. Personnel Submittals (Asbestos).

1. General certificates from Contractor.
   a. Certification that each and every worker to be utilized on the Project by Contractor or subcontractor is actively involved in medial surveillance, respirator, and asbestos material hazard training programs.
   b. Certification that each and every employee to be utilized on the Project by Contractor or sub-contractor has had instruction on the hazards of asbestos exposure, protective dress, use of showers, entry to and exit from work areas on all aspects of work procedures and protective measures regarding asbestos removal, in an EPA approved course, as required by state and federal laws and regulations.
2. A copy of physician's written opinion per OSHA and TDH regulations for each person to be utilized on the Project.
3. Individually signed and notarized respiratory protection training certificate forms by each and every worker to be utilized on the Project by contractor or subcontractor, documenting that each is actively involved in a company employee Respirator Protection Program and has had appropriate training in respiratory protection.
4. A copy of Texas Department of Health license for each worker to be utilized on the Project or NESHAP accredited Training Certificates.
5. Individually signed and notarized Certificate of Worker's Release Form for each and every worker to be utilized on the project by Contractor or subcontractor.

D. Personnel Submittals (Lead)

1. "Worker Training Form" (SF-1) verifying workers to be utilized on the Project have received the proper training as specified by OSHA and all other pertinent regulatory agencies.
2. "Worker Training Certification Form" (SF-2) certifying that each and every employee has received instruction regarding the hazards of asbestos and lead-based paint exposure, protective dress, use of showers, entry and exit from a Work Area, and in all aspects of work procedures and protective measures regarding asbestos and lead-based paint removal. Employees utilized in asbestos abatement activities shall have successfully completed a course at least as stringent as that required under AHERA regulations for Asbestos Abatement Worker certification, Texas Department of Health regulations, and any other applicable and more stringent City, State, or Federal regulations. Employees utilized in lead abatement activities shall have successfully completed a Lead Abatement Worker training course as described by the Texas Department of Health regulations, and any other applicable more stringent City, State, or Federal regulations. Employees utilized shall have successfully completed all the required refresher training courses.

3. Copy of Blood Lead Determination for each and every worker to be utilized for lead-based paint abatement on the Project by the Contractor or Subcontractor and that each employee is involved in a Medical Surveillance Program in conformance with OSHA 29 CFR 1926.62.

E. Properly completed copies of the Uniform Hazardous Waste Manifest, Texas Natural Resource Conservation Commission form TNRCC-0311 (Current Edition) from the landfill, documenting the disposal of the asbestos containing/contaminated waste material (Off-Site Landfill Facility).

F. Copies of the chain of custody documenting the acceptance, transport, and delivery, by the waste transporter, of lead waste from the Work Site to the specified disposal or recycling facility. Chain of custody documentation should clearly correlate the quantity of material accepted by the transporter with the quantity of materials removed from the Work Site.

G. Copies of the lead waste manifest or Bill of Sale documenting the disposal of lead-based paint waste at the specified landfill or sale of material to a recycling facility. The waste manifest should clearly correlate the quantity of material accepted by the landfill with the quantity of material transported by the waste transporter.

H. A copy of the Sign In/Out Log showing the following: date, name, social security number, entering and leaving time, company or agency represented for asbestos & lead activities.

I. A copy of employee air monitoring results relative to Occupational Health and Safety Administration respiratory protection level compliance for asbestos & lead activities.

J. Physician opinion, training, TDH license and other required forms for each new employee used on the project for asbestos & lead activities..

K. Updated or renewed physicians opinion, training and licensing as necessary for personnel on Project.

2.04 ENGINEER'S REVIEW

A. Partial submittals may be rejected for non-compliance with the Work Procedures.
B. Review by Engineer does not relieve Contractor from responsibility for errors, which may exist in the submitted data.
C. Make revisions when required by Engineer and resubmit for review.

END OF SECTION

3.0 TESTING LABORATORY SERVICES

3.01 DESCRIPTION

A. Contractor will provide a qualified Testing Laboratory to perform routine and special testing of the Work performed under the Work Procedures.

B. Testing Laboratory representative will, in addition to performing routine and special testing necessary to determine general compliance with the Work Procedures, observe and document, on a daily basis, the execution and progress of the Work. Such observation and documentation shall be for the sole benefit of Owner and Contractor and shall not be construed in any way as to include responsibility for Contractor's means, methods, techniques, sequences or procedures involved with the execution of the Work. Nor shall such observation and documentation by Testing Laboratory be construed as to include responsibility for any safety programs or procedures either utilized or not utilized by Contractor during the Work.

3.02 QUALITY ASSURANCE

A. All environmental and final air testing shall be performed in general accordance with the procedures outlined in the National Institute for Occupational Safety and Health (NIOSH) Method No. 7400 and also will follow guidelines issued by Environmental Protection Agency regarding detection limits.

B. Final air samples will be analyzed in general accordance with the sample analysis procedures outlined in NIOSH Method No. 7400, as applicable.

3.03 PAYMENT FOR TESTING

A. Initial Services: Contractor will pay for Daily Environmental Air Testing, and initial Final Air Clearance testing required by the Work Procedures.

B. Retesting: When final air clearance tests indicate non-compliance with the Work Procedures, subsequent retesting will be performed by the same Testing Laboratory, and all associated costs will be paid by Contractor.

3.04 SCHEDULING

A. Testing Laboratory will perform tests in areas and at times during the Work as deemed necessary by the Testing Laboratory and as specified in the Work Procedures.

B. Should advance notice not be give to Engineer, Engineer will make reasonable effort to comply with time of required observations. Do no proceed until such observations by Engineer are made. Any delay in the completion of the Project

caused by lack of advance notice by Contractor to Engineer shall not be sufficient cause for any extension of time or extension of the Project completion deadline.

C. Notify Testing Laboratory of need for final air testing at least 4-hours prior to desired time of testing.

D. Coordinate other scheduling with Testing Laboratory as necessary.

3.05 SCHEDULE OF AIR SAMPLES

A. Before Start of Work (Background Level) per Work Area:

1. Testing Laboratory will collect, at a minimum, the following air samples to establish a base line before the start of work:

BASE LINE SAMPLES				
Sample Location	Number of Samples	Analysis Method	Minimum Volume (Liters)	Rate LPM*
Work Area	2 Minimum	PCM	1250	10-16

* LPM - Liters per Minutes

2. Base Line: An action level expressed in fibers per cubic centimeter, which is equal to the following:
   a. PCM: The greater of the average of the samples collected on mixed cellulose ester filters in the work area prior to abatement activities or 0.01 fibers per cubic centimeter.

B. During The Course of the Work / Final Air Clearance Samples: For Category II – Non Friable ACM.

1. Testing Laboratory will collect the following air samples to determine if the Contractor may remove critical barriers and demobilize from the site:

FINAL AIR CLEARANCE					
Sample Location	Number of Samples	Analysis Method	Minimum Volume (Liters)	Rate LPM *	F/cc
Upwind	1 Minimum Per Work Area	PCM	1250	4-16	$\leq$0.01 or $\leq$ Background
Downwind	1 Minimum Per Work Area	PCM	1250	4-16	$\leq$0.01 or $\leq$ Background

B. Daily During the Course of the Work: For Friable ACM.

1. Testing Laboratory will collect area samples in areas and at times during the work as deemed necessary by the Testing Laboratory, required by the Engineer, or as specified in the Contract Documents. Daily samples will be analyzed using Phase Contrast Microscopy.

C. Final Air Clearance Samples: For Friable ACM.

1. Testing Laboratory will collect the following air samples to determine if the Contractor may remove critical barriers and demobilize from the site:

FINAL AIR CLEARANCE					
Sample Location	Number of Samples	Analysis Method	Minimum Volume (Liters)	Rate LPM *	F/cc
Inside Work Area	1 Minimum Per Work Area Less Than 160 SQ. FT	PCM	1250	10-16	≤0.01
Inside Work Area	3 Minimum Per Work Area Greater Than Or Equal To 160 SQ. FT	PCM	1250	10-16	≤0.01

* Liters per Minutes
F/cc Fibers per cubic centimeter

3.06 RESULTS

A. Testing Laboratory will perform all testing and analysis promptly and issue results expeditiously in order to minimize any possible delay in the progress of the Work.

B. Test results shall be available to Owner and Contractor as follows:

1. Air clearance results: PCM - 4 hours following tests, TEM- 24 hours following receipt at laboratory.
2. Results of other tests deemed necessary by Engineer; as quickly as possible but not earlier than 4 hours following completion of tests.

C. Air tests will be made both inside, outside of work areas and OSHA personnel for the Contractor, as necessary. Contractor is cautioned, however, that should interpretations be made, opinions be formed and conclusions be drawn as a result of examining the test results, these interpretations, opinions and conclusions will be those made, formed and drawn solely by Contractor.

END OF SECTION

4.0 ASBESTOS ABATEMENT

4.01 DESCRIPTION

A. Perform all planning, administration, execution, and cleaning necessary to safely remove and dispose of asbestos-containing materials. Asbestos-containing materials to be removed for each project will be identified in a pre-job walkthrough.

B. Approval of or acceptance by Owner of various construction activities or methods proposed by Contractor does not constitute an assumption of liability either by the Engineer or Owner for inadequacy or adverse consequences of said activities or methods.

4.02 DEFINITIONS

The following definitions pertain to the work of this section.

A. Asbestos Definitions.

1. **Abatement** - procedures to decrease or eliminate fiber release from precast, spray- or trowel-applied asbestos-containing building materials. Includes encapsulation, enclosure and removal.
2. **Abatement Contractor** - the contractor designated in the contract documents as being responsible to the Owner for the control or abatement of asbestos-containing or contaminated materials, and other hazardous materials.
3. **Abatement Contractor's Testing Laboratory** - Testing Laboratory, designated herein as Abatement Contractor's Testing Laboratory, hired by Abatement Contractor to provide employee personal air monitoring services.
4. **ACM** - asbestos-containing material.
5. **Adequately Wet** - a term as defined in 40 CFR 61, Subpart M and EPA 340/1-90-019 that means to sufficiently mix or penetrate with liquid to prevent the release of particulates. If visible emissions are observed coming from asbestos-containing material (ACM), then that material has not been adequately wetted. However, the absence of visible emissions is not sufficient evidence of being adequately wetted.
6. **Airlock** - system for permitting ingress or egress of personnel without permitting air movement between a contaminated area and a uncontaminated area, typically consisting of two curtained doorways at least 3 feet apart.
7. **Air Monitoring** - the process of measuring the fiber content of a specific volume of air during a stated period of time.
8. **Amended Water** - water containing a wetting agent or surfactant with a surface tension of at least 29 dynes per square centimeter when tested in accordance with ASTM D 1331.
9. **Asbestos** - the general name given to a group of fibrous mineral forms including chrysotile, amosite, crocidolite, anthophyllite, tremolite, and actinolite.

10. **Asbestos Regulated Work Area** - An asbestos regulated work area is an area contained and controlled either by an enclosed containment (full containment area or mini-containment area), modified containment, glove bag or outdoor techniques, where asbestos-containing materials (ACM) operations are performed and isolated by physical boundaries to prevent the spread of ACM and control access to authorized persons. A full containment, mini-containment area, modified containment, and glove bag work area is isolated within a containment enclosure in which ACM operations are performed. An outdoor regulated work area is not isolated within a containment enclosure, but is otherwise secured by means of physical barriers, boundary warning tape, and signage, etc., to control access by unauthorized persons.

11. **Asbestos Consultant** - Asbestos Consultant hired by the Government to provide asbestos abatement consulting services as specified herein.

12. **Category I Non friable ACM** - A term as defined in 40 CFR 61, Subpart M and EPA 340/1-90-018 that means asbestos-containing packings, gaskets, resilient floor covering, and asphalt roofing products containing more than 1 percent asbestos as determined using the method specified in 40 CFR 763, Appendix A, Subpart F, Section 1, Polarized Light Microscopy.

13. **Category II Non friable ACM** - A term as defined in 40 CFR 61, Subpart M and EPA 340/1-90-018 that means any material, excluding Category I non friable ACM, containing more than 1 percent asbestos as determined using the methods specified in Appendix A, Subpart F, 40 CFR 763, Section 1, Polarized Light Microscopy, that when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure.

14. **Class I Asbestos Work** - Activities involving the removal of TSI and surfacing ACM and PACM.

15. **Class II Asbestos Work** - Activities involving the removal of ACM that is not TSI or surfacing material. This includes, but is not limited to, the removal of asbestos-containing wallboard, floor tile and sheeting, roofing and siding shingles, and construction mastics.

16. **Class III Asbestos Work** - Repair and maintenance operations, where ACM, including TSI and surfacing ACM and PACM, may be disturbed.

17. Class IV Asbestos Work - Maintenance and custodial activities during which employees handle but do not disturb ACM or PACM and activities to clean up dust, waste and debris resulting from Class I, II and III activities.

18. **Clean Room** - an uncontaminated area or room which is part of the worker decontamination enclosure system, with provisions for storage of workers' street clothes and protective equipment. Also known as the "Change Room".

19. **Contracting Officer's Representative (COR)** - the authorized representative of the Contracting Officer.

20. **Critical Barrier** - Seal applied to openings connecting the abatement area with adjacent spaces that will not be included in the containment. Critical barriers shall not be exposed to the gross removal environment. Examples of openings requiring critical barriers include, but are not limited to: heating, ventilating and air conditioning (HVAC) vents and diffusers; doorways; windows; floor, wall, and ceiling penetrations; and air plenums.

21. **Curtained Doorway** - a device to allow ingress or egress from one room to another while minimizing air movement between the rooms. Two curtained doorways spaced a minimum of 3 feet apart form an airlock.

22. **Decontamination Enclosure System** - a series of connected rooms, with curtained doorways between any two adjacent rooms, for the decontamination of workers or of materials and equipment. A worker decontamination enclosure system typically contains five airlocks (rooms). An equipment decontamination system typically contains three airlocks (rooms).
23. **Encapsulation** - the sealing of asbestos surfaces involving application of a material (encapsulant) that will envelop or coat the fiber matrix and eliminate fiber fallout and protect against contact damage.
24. **Enclosure** - procedures necessary to completely enclose material containing asbestos behind airtight, impermeable, permanent barriers.
25. **Equipment Decontamination Enclosure System (or Load-Out Unit)** - a decontamination enclosure system for materials and equipment, typically consisting of an airlock, a washroom, and a holding area.
26. **Equipment Room** - a contaminated area or room which is part of the worker decontamination enclosure system, with provisions for storage of contaminated clothing and equipment.
27. **Fixed Object (Immoveable object)** - a unit of equipment or furniture in the work area which cannot be removed from the work area.
28. **Friable ACM** - A term as defined in 40 CFR 61, Subpart M and EPA 340/1-90-018 that means any material containing more than 1 percent asbestos as determined using the method specified in 40 CFR 763, Appendix A, Subpart F, Section 1, Polarized Light Microscopy, that when dry, can be crumbled, pulverized, or reduced to powder by hand pressure.
29. **Glove-Bag** - A 6 to 12-mil plastic bag fitted with long-sleeved gloves, a tool pouch and an opening for amended water and sealant application.
30. **Government's Testing Laboratory** - Testing Laboratory employed by the Government to provide area ambient monitoring, monitoring during removal, clearance monitoring and other special testing services.
31. **HEPA Filter** - a High Efficiency Particulate Absolute (HEPA) filter capable of trapping and retaining 99.97 percent of asbestos fibers greater than 0.3 microns in length.
32. **HEPA Vacuum Equipment** - vacuuming equipment equipped with a HEPA-filtration system.
33. **Holding Area** - a chamber between the washroom and uncontaminated area in the equipment decontamination enclosure system. The holding area comprises an airlock.
34. **Moveable Object** - a unit of equipment or furniture in the work area which can be removed from the work area.
35. **Non friable ACM** - A term as defined in 40 CFR 61, Subpart M and EPA 340/1-90-018 that means any material containing more than 1 percent asbestos as determined using the method specified in 40 CFR 763, Appendix A, Subpart F, Section 1, Polarized Light Microscopy, that, when dry, cannot be crumbled, pulverized or reduced to powder by hand pressure.
36. **Plastic Sheeting** - plastic sheet material of specified type and thickness used for protection of walls, floors, etc., and used to seal openings into the work area.
37. **Presumed ACM (PACM)** - Thermal system insulation, surfacing material and resilient flooring material found in buildings constructed no later than 1980.

38. **Procuring Contracting Officer (PCO)** - the authorized representative of the government.
39. **Removal** - the act of removing asbestos-containing or contaminated materials from the structure under properly controlled conditions to a suitable disposal site.
40. **Shower Room** - a room constituting an airlock, between the clean room and the equipment room in the worker decontamination enclosure system, with hot and cold or warm running water suitably arranged for complete showering during decontamination.
41. **Surfacing Material** - Material that is sprayed, troweled-on or otherwise applied to surfaces (such as acoustical plaster on ceilings and fireproofing materials on structural members, or other materials on surfaces for acoustical, fireproofing, and other purposes).
42. **Surfactant** - a chemical wetting agent added to water to improve penetrating ability, thus reducing the quantity of water required to saturate asbestos-containing materials.
43. **Thermal System Insulation (TSI)** - Material applied to pipes, fittings, boilers, breaching, tanks, ducts, or other structural components to prevent heat loss or gain.
44. **Time-Weighted Average (TWA)** - The TWA is an 8-hour time weighted average of airborne concentration of fibers (longer than 5 micrometers) per cubic centimeter of air which represents the employee's 8-hour workday as determined by Appendix A of 29 CFR 1926, Section 1926.1101.
45. **Washroom** - a room between the work area and the holding area in the equipment decontamination enclosure system. The washroom comprises an air lock.
46. **Wet Cleaning** - the process of eliminating asbestos contamination from building surfaces and objects by using cloths, mops, or other cleaning tools which have been dampened with amended water, disposing of these cleaning tools as asbestos-contaminated waste.
47. **Work Area** - area or areas of project which undergo abatement or are contaminated.
48. **Worker Decontamination Enclosure System** - a decontamination enclosure system for workers, typically consisting of a clean room, an airlock, a shower room, an airlock, and an equipment room.

4.03 REFERENCE STANDARDS

A. Acknowledge, by execution of the Contract, awareness and familiarity with the contents and requirements of the following regulations, codes, standards, and guidance documents. Assume responsibility for the performance of the Work in strict compliance with these documents and for every instance of failure to comply with these documents. The current issue of each document shall govern. Where conflict exists between these documents and the Work Procedures, the more stringent requirements shall apply.

1. EPA Regulations for Asbestos (40 CFR 61.140 - 61.157 and 40 CFR 763).
2. OSHA Asbestos Regulations (29 CFR 1910, 29 CFR 1926).

3. EPA Office of Toxic Substances Guidance Document, "Asbestos-Containing Materials in School Buildings", Part I and Part II.
4. U.S. Department of Education, Office of Elementary and Secondary Education (Code of Federal Regulations Title 34, Parts 230 and 231), Federal Register, Vol. 46, No. 11, January 16, 1981.
5. EPA Office of Pesticide and Toxic Substances Guidance Document, "Guidance for Controlling Friable Asbestos-Containing Materials in Buildings", EPA 560/5-85-024, June, 1985.
6. All state, county, and city codes and ordinances as applicable. Make available for review at the site one copy of EPA, OSHA, and applicable state, county and city regulations governing the Work.

4.04 WORKSITE CONDITIONS

A. Worker and Visitor Procedures: Contractor is hereby advised that asbestos has been determined by the U.S. Government to be a CANCER-CAUSING AGENT. Provide workers and visitors with respirators [which, as a minimum, meet the requirements of OSHA 29 CFR 1926.1101(h)(2)(i)] and protective clothing during all phases of the Work and until final air tests are accepted by Engineer.

4.05 PERSONNEL PROTECTION

A. Prior to commencement of work, instruct all workers in the appropriate procedures for personnel protection and asbestos removal. Ensure that workers are knowledgeable in these procedures.

B. Provide respiratory protection at all times, which is in compliance with OSHA requirements. When not in violation of the above, the minimum acceptable respiratory protection used for this project is half-face dual cartridge respirators, unless airborne fiber concentration inside the face mask exceed 0.01 fibers per cubic centimeter. In the event that airborne fiber concentrations inside the mask exceed 0.01 fibers per cubic centimeter, respiratory protection required to achieve 0.01 fibers per cubic centimeter shall be used. Provide additional "piggy-back" cartridges recommended by the product or solvent manufacturer whenever solvents are used.

C. Submit copies of personal air monitoring results to COR at completion of project.

D. Permit no visitors, except for governmental inspectors having jurisdiction, or as authorized by Engineer or Owner, in the work areas after commencement of asbestos disturbance or removal.

E. Provide workers sufficient sets of protective disposable clothing, consisting of full-body coveralls, head covers, gloves, and foot covers, of sizes to properly fit individual workers.

F. Leave reusable equipment, apparel and protection devices (excluding respirators) in the work area until the end of the asbestos abatement work, at which time such items shall be disposed of as contaminated waste or decontaminated for reuse.

G. Provide suitable respirators and protective equipment for use by authorized visitors, Owner, Engineer and Testing Laboratory's representatives. Furnish these in as many sets as required for full-time monitoring by Testing Laboratory.

H. Provide and post in the Clean Room the asbestos removal decontamination and work procedures to be followed by workers.

4.06 MATERIALS

A. **Mastic Remover** - Manufactured by a reputable, established manufacturer of floor mastic (adhesive) remover materials and approved specifically for use in asbestos-contaminated environments. Provide product compatibility for usage in confined areas. Flash Point shall be greater than 140 degrees Fahrenheit as determined by ASTM D 92. Product waste shall not meet the definition of hazardous waste under the EPA hazardous waste regulations 40 CFR 261.

B. **Glove-Bag** - Six-mil or greater thickness, in size sufficient to allow airtight seal around pipe. Separate tool pouch and openings for amended water or sealant and HEPA-vacuum must be present.

C. **Impermeable Containers** - suitable to receive and retain asbestos-containing or contaminated materials until disposal at an approved site and labeled. Containers shall be both air and water tight.

D. **Plastic Sheeting** - thickness as specified, in sizes to minimize the frequency of joints. Use of "spray-on poly" is not permitted without Owner's approval.

E. **Sealant (encapsulant)** - manufactured by reputable, established manufacturer of encapsulant/sealant materials and approved specifically for use in asbestos-contaminated environments. Determine compatibility of the sealant with the materials and conditions.

F. **Surfactant (Wetting Agent)** - mixture of "Dust-Set Amended Water Base: (Matheson Chemical Corporation) or equivalent and water, mixed to manufacturer's specifications.

G. **Tape** - glass fiber or other type capable of sealing joints of adjacent sheets of plastic and for attachment of plastic sheet to finished or unfinished surfaces under both dry and wet conditions.

H. **Warning Labels and Signs** - as required by OSHA 29 CFR 1926.58 and EPA 40 CFR 61.150.

I. **Other Materials** - provide all other materials, such as lumber, nails and hardware, which may be required to construct and dismantle the decontamination system and the barriers that isolate the work area. All lumber to be used shall be fire-retardant.

4.07 TOOLS AND EQUIPMENT

A. Provide suitable tools for asbestos-containing material removal.

1. **Air Purifying Equipment** (for internal recirculation in the work area) - HEPA Filtration Systems or Electronic Precipitators. Verify that no internal air movement system or purification equipment exhausts contaminated air from inside the work area into uncontaminated areas.
2. **Glove-Bag** - suitable for the removal of the pipe insulation.
3. **Scaffolding** - as required to accomplish the specified work and meet all applicable safety regulations.
4. **Transportation** - as required for loading, temporary storage, transit, and unloading of contaminated waste without exposure to persons or property. Use only enclosed or covered trucks to haul waste containers to prevent loss or damage of containers in route to the landfill.
5. **Water Sprayer** - utilize airless or other low pressure sprayer for amended water application.

4.08 PREPARATION

A. Coordinate sequence of work area preparation throughout the building with Owner and other trades to properly segregate work areas from areas that must remain fully or partially operational or in which other construction is being performed.

B. Preparation of Glovebag for Removal of Friable - Thermal System Insulation (Pipe and Equipment Insulation).

1. Coordinate with Owner for HVAC supplying work area to remain off during all abatement activities.
2. Install one layer 6-mil (true thickness) plastic sheeting on floor below work area extending at least 3 feet beyond the glove-bag in each direction.
3. Check pipe along entire length for damaged insulation. If damaged insulation is found, wrap the area with one layer of 6-mil plastic sheeting and seal with duct tape during the removal. If a large portion of the insulation is damaged wrap the entire length in one layer, 6-mil plastic sheeting and seal with duct tape.
4. Place all necessary tools for removal in glove-bag before attaching to pipe.
5. Place at least one layer of duct tape around the pipe at each location where the glove-bag will be attached to ensure an airtight seal. Secure glove-bag to pipe with sufficient duct tape to ensure the bag does not pull loose during removal.
6. Attach the HEPA-vacuum unit to the glove-bag to provide a negative pressure in the bag.

7. In the presence of Engineer, smoke test the glove-bag. If a leak is detected, reseal and retest bag. Turn on the HEPA-vacuum to clear the smoke and further test the seal.
8. Construct a three-stage worker/equipment decontamination unit consisting of an airlock, shower, and a clean room. Construct decontamination unit of appropriate materials (including plastic sheeting) to provide airtight barriers and allow continuous diminished pressure to be maintained in work areas. Provide proper decontamination equipment (water sprayer, towels, etc.) in the airlock to allow workers to properly decontaminate prior to exiting the airlock or removing materials from the work area. Post OSHA decontamination procedures in Change Room for duration of Project.
9. Use decontamination procedures, as described here, for personnel in work area.
    a. Two sets of protective disposable clothing will be work while in work area.
    b. Remove the outer set of protective clothing inside the work area, immediately before entering the airlock.
    c. HEPA-vacuum and remove the inner suit prior to leaving the airlock.
    d. Dispose of all used protective clothing as asbestos-contaminated waste.
10. Notify Engineer for observation of the completion of work area preparation prior to disturbing asbestos-containing material.

C. Preparation of Work Area for Removal of Transite (Interior & Exterior)

1. Remove movable and fixed objects from the work area as necessary to access asbestos-containing materials and dispose of as construction waste.
2. Install barriers of asbestos warning tape along the perimeter of the work area and post warning signs at 15 foot intervals around the perimeter. Maintain a minimum distance of 10 feet between where asbestos-containing materials are being removed and the work area perimeter.
3. Maintain a Sign In/Out Log near the work area to be utilized by every person, each time upon entering and leaving the work area.
4. Use "double-suit" decontamination procedures as follows:
    a. One set of protective disposable clothing will be worn while performing glove-bag removal.
    b. Remove the outer set of protective clothing in the work area and proceed to the centralized decontamination unit to complete the decontamination process.
    c. Inside the decontamination unit airlock, wet clean or HEPA-vacuum respirator and exposed portions of the body. Then HEPA-vacuum and remove the inner suit prior to entering shower.
    d. Maintain respiratory protection throughout the decontamination process. Dispose of all used protective clothing and disposable filter cartridges as asbestos-contaminated waste.
5. Install scaffolding as required to access the asbestos-containing materials.

6. Install one layer of 6-mil plastic sheeting on the floor below the work area extending at least 3 feet beyond the material to be removed in each direction.
7. Establish and maintain a Sign In/Out Log in the immediate vicinity of the work area to be utilized by every person, each time upon entering and leaving the work area.
8. Notify Engineer for observation of the completion of work area preparation prior to disturbing asbestos-containing material. Observation by Engineer must indicate substantial compliance with the preparation requirements to continue with the Work.

D. Preparation of Work Area Enclosure for Removal of Floor Tile.
(RFCI) – Should walls enclosing Work Area not present

1. Remove movable and fixed objects from the work area as necessary to access asbestos-containing materials and clean and relocate to area designated by Owner for future disposal by demolition contractor as construction waste.
2. Install asbestos warning barrier tape and signs to segregate and demarcate work area from occupied or non-occupied areas. Maintain a minimum clear distance of 10 feet from the work location and the demarcated perimeter.
3. Maintain a Sign In/Out Log in the immediate area of the entrance to the work area to be utilized by every person, each time upon entering and leaving the work area.
4. Use decontamination procedures, as described here, for personnel in work area.
   a. Two sets of protective disposable clothing will be work while in work area.
   b. Remove the outer set of protective clothing inside the work area.
   c. HEPA-vacuum and remove the inner suit prior to leaving the work area.
   d. Dispose of all used protective clothing as asbestos-contaminated waste.
5. Place work area under diminished air pressure utilizing HEPA filtration systems which comply with ANSI Z9.2-79, local exhaust ventilation. Ensure that odors from solvents to be used do not permeate to other occupied or public areas of the facility.
6. Notify Asbestos Consultant for observation of the completion of work area preparation prior to disturbing asbestos-containing material.

E. Preparation of Work Area Enclosure for Removal of Floor Tile.
(Walls remaining intact in Work Area)

1. Coordinate with Owner for HVAC inside or supplying work area to remain off during all abatement activities.
2. Install critical barriers and seal all openings and equipment within work area with a minimum of two layers of 6-mil (true thickness) plastic

sheeting. Where fire hazards exist install fire retardant plastic sheeting with the minimum of same thickness as stated above.
Notify Engineer for observation of the critical barriers prior to pre-cleaning work area.

4. Wet clean and HEPA-vacuum all immovable objects, equipment, walls and floor in the work area
5. Install two layers of 4-mil (true thickness) plastic sheeting on walls at a minimum height of 18 inches to serve as splashguard.. Where fire hazards exist install fire retardant plastic sheeting with the minimum of same thickness as stated above.
6. Should the ceiling not be intact, install two layers of 4-mil (true thickness) plastic sheeting to extend the wall sheeting up and over the work area to provide a complete, segregated work area enclosure. Provide at least 18 inches of overlap with wall sheeting. Where fire hazards exist install fire retardant plastic sheeting with the minimum of same thickness as stated above.
7. Construct a three-stage worker/equipment decontamination unit consisting of an airlock, shower, and a clean room. Construct decontamination unit of appropriate materials (including plastic sheeting) to provide airtight barriers and allow continuous diminished pressure to be maintained in work areas. Provide proper decontamination equipment (water sprayer, towels, etc.) in the airlock to allow workers to properly decontaminate prior to exiting the airlock or removing materials from the work area. Post OSHA decontamination procedures in Change Room for duration of Project.
8. Use decontamination procedures, as described here, for personnel in work area.
   a. Two sets of protective disposable clothing will be work while in work area.
   b. Remove the outer set of protective clothing inside the work area, immediately before entering the airlock.
   c. HEPA-vacuum and remove the inner suit prior to leaving the airlock.
   d. Dispose of all used protective clothing as asbestos-contaminated waste.
9. Place each work area under diminished air pressure utilizing HEPA filtration systems, which comply with ANSI Z9.2-79, local exhaust ventilation. Ensure that odors from solvents to be used do not permeate to other occupied or public areas of the facility.
10. Notify Engineer for observation of the completion of work area preparation prior to disturbing asbestos-containing material.

4.09 REMOVAL OF ASBESTOS-CONTAINING MATERIAL

A. Remove and properly dispose of all asbestos-containing materials scheduled for removal in the Work Procedures in accordance with the methods and procedures outlined in the OSHA 29 CFR 1926.1101 and as more stringently specified.

B. Removal of Thermal System Insulation (Pipe & Equipment Insulation)

1. Prepare work area as previously specified in Paragraph 4.08.B.
2. Use two people for glove-bag operation. One shall remove insulation, the other shall operate water sprayer and repair any leaks in bag.
3. At all times, keep insulation thoroughly wetted.
4. Care shall be taken not to puncture bag while cutting insulation.
5. Gently remove insulation from pipe and place it in bottom of bag.
6. After removal of insulation, brush and wet clean pipe or equipment to remove residual material. Continue wet cleaning until surfaces are free of visible material.
7. Spray all tools with water inside bag and place back in pouch.
8. Wet and double seal with plastic sheeting and duct tape, visible ends of remaining pipe insulation.
9. Spray the inside of the bag with amended water and remove the watering wand.
10. Insert the encapsulation wand and encapsulate all abated surfaces of the pipe and remaining pipe insulation. Remove the encapsulation wand and tape the bag opening closed.
11. Using the HEPA-vacuum, collapse the bag and seal off the lower portion containing the asbestos-containing material and gloves of the bag.
12. Remove the bag from the pipe, the tools from the pouch and the HEPA-vacuum from the bag.
13. Consider the glove-bag the first container for the material. Place the glove-bag in an appropriately labeled, 6-mil plastic bag and remove from work area. Dispose of sealed bags properly using appropriate disposal procedures.
14. After removal of the glove-bag, wet clean and HEPA-vacuum all surfaces in the work area to remove residual accumulated material. Continue wet cleaning until surfaces are visibly free of material.
15. Notify Engineer for observation of the completion of cleaning. Surfaces will be considered clean when free from dust, dirt, residue, film, or discoloration resultant from abatement operations or other activities subordinate to these operations.

C. Removal of Thermal System Insulation (Pipe & Equipment Insulation) as an Individual Component

1. Prepare work area as previously specified in Paragraph 4.08.B.
2. Drain and purge all piping to be removed.
3. Cut pipe hangers and piping safely to the ground prior to wrapping with plastic sheeting.
4. Wrap entire pipe or ductwork in 2 layers of 6-mil plastic sheeting, seal ends with duct tape.
5. Cut the pipe or ductwork at sealed ends.
6. Double seal with 6-mil plastic sheeting and duct tape, the exposed ends of cut piping or ductwork. Remove sealed material from the work area and dispose of using appropriate disposal procedures.

7. Notify Engineer for observation of the completion of removal of pipe and pipe insulation.

D. Removal of Transite Panels (Interior & Exterior)

1. Prepare work area as previously specified in Paragraph 4.08.C.
2. Utilize vertical lift equipment as necessary to access transite panels for removal.
3. Spray amended water to areas of transite where bolt/nail attachments are utilized to secure the panels to the building structure.
4. Remove bolt/nail attachments and detach the transite panels in whole pieces from the structure, lower to the ground and wrap in two layers of 6-mil properly labeled plastic sheeting. After removal of the asbestos-containing material, wet clean and HEPA-vacuum all surfaces in the work area to remove residual accumulated material. Continue wet cleaning until surfaces are visibly free of material.
5. Notify Engineer for observation of the completion of cleaning. Surfaces will be considered clean when free from dust, dirt, residue, film, or discoloration resultant from abatement operations or other activities subordinate to these operations.

E. Removal of Floor Tile and Mastic. (RFCI)

1. Prepare work area as previously specified.
2. Utilize a radiant heat source to reduce the adhesion strength of the floor tile with the mastic and floor substrate per manufacturer's recommendation.
3. Allow floor tile and mastic to cool prior to placing the material in a properly labeled sealable plastic bag of 6-mil minimum thickness, and remove from work area.
4. Spray amended water as necessary to keep the floor tile and mastic under a wet-condition to minimize fiber dispersion during the removal process.
5. As necessary, apply mastic remover to dissolve the mastic used to adhere the floor tile to the concrete slab. The mastic remover is to be used per the manufacturer's recommendations.
6. After removal of asbestos-containing material, wet-clean and HEPA-vacuum all surfaces in the work area to remove residual accumulated material. Continue wet-cleaning until surfaces are visibly free of material.
7. Notify Asbestos Consultant for observation of the completion of cleaning.

F. Removal of Floor Tile and Mastic. (Non – RFCI)

1. Prepare work area as previously specified.
2. Spray areas of asbestos-containing material with amended water using spray equipment capable of providing a "mist" application to reduce the release of fibers. Spray the asbestos-containing material repeatedly

during work process to maintain wet condition but do not use excessive amounts of water.

3. As necessary, apply mastic remover to dissolve the mastic used to adhere the floor tile or floor sheeting to the concrete slab. The mastic remover is to be used per the manufacturer's recommendations.
4. Remove floor tile or floor sheeting. As it is removed, place the material in a properly labeled sealable plastic bag of 6-mil minimum thickness, and remove from work area.
5. After removal of asbestos-containing material, wet-clean and HEPA-vacuum all surfaces in the work area to remove residual accumulated material. Continue wet-cleaning until surfaces are visibly free of material.
6. Notify Engineer for observation of the completion of cleaning.

4.10 CLEAN UP AND CLEARANCE TESTING

A. Provide general clean-up of work area concurrent with the removal of all asbestos-containing materials. Do not permit accumulation of debris on workspace floor.

B. Clean-Up Sequence

1. Remove all visible accumulations of asbestos-containing material and debris.
2. Wet clean and HEPA-vacuum all surfaces in the work area.
3. Clean all equipment and materials used in the work area and remove from work area.

C. Final Air Clearance Testing

1. Testing Laboratory will test for the final air clearance levels upon notice from Contractor that work areas are considered by Engineer as visually decontaminated. Final air clearance testing shall be performed using Phase Contrast Microscopy (PCM) analysis.
   a. If the final air clearance samples indicate a fiber level of less than or equal to background levels or 0.01 fibers per cubic centimeter, whichever is greater in the work will be considered completed.
   b. Re-clean and continue to clean at Contractor's expense, areas which do not comply with the specified final clearance level. Contractor to bear cost of all follow-up tests necessitated by the failure of the air tests to meet the specified clearance level.
2. Upon achieving final air clearance, dismantle Decontamination Enclosure Systems and thoroughly wet clean and HEPA-vacuum immediate areas.
3. Dispose of debris from removal operations, used cleaning materials, unsalvageable materials used for sturdy barriers, and any other remaining materials. Consider the materials to be contaminated, and dispose of accordingly.
4. Dispose of debris from removal operations, used cleaning materials, unsalvageable materials used for sturdy barriers, and any other remaining

materials. Consider the materials to be contaminated, and dispose of accordingly.

4.11 DISPOSAL OF ASBESTOS-CONTAMINATED WASTE

A. Perform bag decontamination procedures as follows:

1. As bags is moved out through the air lock, wet-wipe bags to remove all contamination from them before they are moved into an uncontaminated space.
2. Place bagged waste into appropriately labeled second 6-mil (true thickness) bag for transport to landfill.
3. Label asbestos-containing/contaminated waste in accordance with EPA 40 CFR 61.150.
4. Transport bagged waste on-site inside an enclosed dolly. Enclose and secure top of dolly with a minimum of 6-mil opaque plastic sheeting.

B. Transportation to landfill shall be performed in accordance with all federal, state, and local laws and regulations.

1. Place bags in the lockable, fully enclosed, metal waste disposal container, which has been lined with a minimum of one layer of 6-mil plastic sheeting.
2. Transport contaminated waste using a transporter licensed by the Texas Department of Health to transport asbestos waste.
3. Provide Texas Natural Resource Conservation Commission manifests for transportation of all contaminated waste to landfill.

C. Removal sealed and labeled bags of contaminated material and wastes and transport them for disposal to an approved landfill as follows:

1. Notify Engineer prior to removing each waste disposal container from the jobsite.
2. Notify Owner and Engineer not less than 48 hours prior to the proposed time of delivery of contaminated waste to the landfill. Owner and Engineer may elect to observe this operation.
3. Dispose of treated, packaged, labeled, asbestos-containing waste material in accordance with EPA 40CFR 61.150.
4. Allow only sealed plastic bags or impermeable containers to be deposited in landfill.
5. Ensure that there are no visible emissions to the outside air from site where materials and waste are deposited.
6. Submit copies of receipts from authorized representative of landfill operator for each delivery of waste material to Engineer after each delivery and a complete set of copies of receipts for all deliveries.

4.12 INSPECTION/FINAL ACCEPTANCE

A. Provide general clean-up of work area concurrent with the removal of all asbestos-containing materials and demolition waste. Do not permit accumulation of debris on workspace floor.

B. The COR will observe each work area and review the abatement documentation records for completeness.

C. Upon satisfactory review status by the COR, the COR will notify the cognizant HQ, JMC Procuring Contracting Officer (PCO) in writing to that effect.

END OF SECTION

5.0 LEAD ABATEMENT

5.01 DESCRIPTION

A. Perform all planning, administration, execution, and cleaning necessary to safely remove and dispose of loose and flaking lead-based paint. Loose and flaking lead-based paint are to be removed prior to demolition of building structures.

B. Approval of or acceptance by Owner of various construction activities or methods proposed by Contractor does not constitute an assumption of liability either by the Engineer or Owner for inadequacy or adverse consequences of said activities or methods.

5.02 WORK INCLUDED

A. The Work includes, but is not limited to, the following

1. Demolition of items as necessary to access lead materials.
2. Waste characterization of lead-containing materials for proper disposal.
3. Removal and containerization of lead materials identified.
5. Placement of all lead waste generated as a result of work activities in DOT approved drums.
6. Disposal of all lead materials and lead waste.

5.03 DEFINITIONS

A. The following definitions pertain to this section of these Contract Documents.

1. **Abatement** - the elimination of exposure to lead-containing substances that may result in lead toxicity or poisoning by the removal, encapsulation, or enclosure of lead-containing substances, by thorough cleanup procedures, and by post-cleanup treatment of surfaces.
2. **Air Monitoring** - the process of measuring the lead content of a specific volume of air during a stated period of time.
3. **ANSI** - American National Standards Institute.
4. **ASTM** - American Society for Testing and Materials.
5. **Clean Room** - an uncontaminated area of room which is part of the worker decontamination enclosure system, with provisions for storage of workers' street clothes and protective equipment. Also known as the "Change Room."
6. **Cleaning Solution** - TSP detergent and hot water mixed according to the manufacturer's recommendations.
7. **Decontamination Enclosure System** - a series of connected rooms, with curtained doorways between any two adjacent rooms, for the decontamination of workers or of materials and equipment. A worker decontamination enclosure system always contains at least five airlocks (rooms). An equipment decontamination system always contains at least three airlocks (rooms).
8. **Encapsulation** - to resurface or cover surfaces and to seal or caulk seams with durable material, so as to prevent or control chalking, flaking lead-containing substances from being reduced to dust.

9. **Enclosure** - procedures necessary to completely enclose material containing lead-containing substances behind airtight, impermeable, permanent barriers.
10. **EPA** - United States Environmental Protection Agency.
11. **Equipment Decontamination Enclosure System** - a decontamination enclosure system for materials and equipment, typically consisting of an airlock, a washroom, and a holding area.
12. **Equipment Room** - a contaminated area or room which is part of the worker decontamination enclosure system, with provisions for storage of contaminated clothing and equipment.
13. **Fixed Object (Immoveable object)** - a unit of equipment or furniture in the work area which cannot be removed from the work area.
14. **HEPA Filter** - a High Efficiency Particulate Absolute (HEPA) filter capable of trapping and retaining at least 99.97 percent of all monodispersed particles 0.3 microns in diameter or larger.
15. **HEPA Vacuum Equipment** - vacuuming equipment equipped with a HEPA-filtration system.
16. **Holding Area** - a chamber between the washroom and uncontaminated area in the equipment decontamination enclosure system. The holding area comprises an airlock.
17. **Lead Abatement Project** - any work performed in order to abate the presence of a lead-containing substance.
18. **Lead-Containing Substance** - any paint, plaster or other surface coating material containing more than 0.5 percent lead by weight calculated as lead metal in the dried solid, or more than 1.0 milligrams per square centimeter by X-ray fluorescence.
19. **Movable Object** - a unit of equipment or furniture in the work area which can be removed from the work area.
20. **MSHA** - Mine Safety and Health Administration.
21. **NEC** - National Electrical Code.
22. **NIOSH** - National Institute for Occupational Safety and Health.
23. **OSHA** - Occupational Safety and Health Administration.
24. **Plastic Sheeting** - plastic sheet material of specified thickness used for protection of walls, floors, etc., and used to seal openings into the work area.
25. **Removal** - the act of removing lead-containing or contaminated materials from the structure under properly controlled conditions to a suitable disposal site.
26. **Shower Room** - a room constituting an airlock, between the clean room and the equipment room in the worker decontamination enclosure system, with hot and cold or warm running water suitably arranged for complete showering during decontamination.
27. **TCLP** - EPA Toxic Characteristic Leaching Procedure (TCLP) for determining toxicity characteristics of waste materials.
28. **TSP** - Trisodium Phosphate.
29. **Wet Cleaning** - the process of eliminating lead contamination from building surfaces and objects by using cloths, mops, or other cleaning tools which have been dampened with cleaning solution, disposing of these cleaning tools as lead waste.

30. **Washroom** - a room between the work area and the holding area in the equipment decontamination enclosure system. The washroom comprises an air lock.
31. **Work Area** - area or areas of Project which undergo abatement or are contaminated.
32. **Worker Decontamination Enclosure System** - a decontamination enclosure system for workers, typically consisting of a clean room, an airlock, a shower room, an airlock, and an equipment room.

5.04 QUALIFICATIONS FOR PERFORMANCE OF WORK

A. Contractor (or subcontractor) engaged to perform the Work of this Section shall have a record of not less than three years successful experience in lead-based paint removal and related work similar in scope and magnitude to this Project.

B. Maintain on site a Superintendent and one Job Foreman. Superintendent and Job Foreman must be approved by Owner prior to the start of the Work of this Section and shall not be changed without prior approval from Owner. Job Foreman shall remain in the work area at all times work is in progress.

C. Use only trained and experienced lead-based paint removal workers to perform the Work in this Section.

5.05 REFERENCE STANDARDS

A. Acknowledge, by execution of the Contract, awareness and familiarity with the contents and requirements of the following regulations, codes, standards, and guidance documents. Assume responsibility for the performance of the Work in strict compliance with these documents and for every instance of failure to comply with these documents. The current issue of each document shall govern. Where conflict exists between these documents and the Contract Documents, the more stringent requirements shall apply.

1. Environmental Protection Agency (EPA) Regulations: Regulations Identifying Hazardous Waste (40CFR 261); Regulations for Hazardous Waste Generators (40CFR 262); Regulations for Hazardous Waste Transporters (40CFR 263).
2. Occupational Safety and Health Administration (OSHA) Regulations: Respiratory Protection Standard (29CFR 1910.134); General Industry Standards for Lead (29CFR 1910.1025); Hazard Communication Program (29CFR 1926.59); Construction Industry Standards for Lead (29CFR 1926.62)
3. Department of Housing and Urban Development (HUD) Lead-Based Paint Guidelines for Public and Indian Housing (55CFR 14556-14789).
4. U.S. Department of Transportation (DOT) Hazardous Material Regulations (49CFR 171-179).
5. EPA Resource and Recovery Act (RCRA).
6. National Institute of Occupational Safety and Health (NIOSH) Occupational Health Guidelines for Chemical Hazards (NIOSH 81-123).
7. American National Standard Institute (ANSI) Publication on Practices for Respiratory Protection (Z88.2-80).

8. All federal, state, county, and city codes and ordinances as applicable. Make available for review at the site one copy of EPA, OSHA, HUD, and applicable state, county and city regulations governing the Work.

5.06 PRODUCT HANDLING

A. Deliver all materials in the original packages, containers, or bundles bearing the name of the manufacturer and the brand name.

B. Store all materials subject to damage off the ground, away from wet or damp surfaces, and under cover sufficient to prevent damage or contamination.

C. Remove from the premises all damaged or deteriorated materials. Dispose of materials that become contaminated with lead-containing substances in accordance with applicable regulatory standards and these specifications.

5.07 WORKSITE CONDITIONS

A. Worker and Visitor Procedures: Contractor is hereby advised that lead has been determined by the U.S. Government to be a toxic substance. Provide workers and visitors with respirators [which, as a minimum, meet the requirements of OSHA 29CFR 1910.134] and protective clothing during all phases of the Work and until final observation and/or testing is completed.

5.08 PERSONNEL PROTECTION

A. Prior to commencement of work, instruct all workers in the appropriate procedures for personnel protection and lead removal. Ensure that workers are knowledgeable in these procedures.

B. Acknowledge and agree to sole responsibility for enforcing worker protection requirements at least equal to those specified in this Section.

C. Provide workers with personally issued and marked respiratory equipment approved by NIOSH and MSHA for the type of work being performed.

D. Where respirators with disposable filters are used, provide sufficient filters for replacement as necessary.

E. Provide respiratory protection at all times, which is in compliance with OSHA requirements. When not in violation of the above, the minimum acceptable respiratory protection used for this project shall be as follows:

1. Provide a minimum of half-face dual cartridge respirators for workers during pre-cleaning of work area, installation of plastic sheeting, and waste handling and disposal activities outside the work area.
2. Provide a minimum of Powered Air Purifying Respirator (PAPR) equipment for workers during all phases of the Work from the time of first disturbance of the lead materials until final observation or testing is performed.

3. Provide additional "piggy-back" cartridges recommended by the chemical manufacturer whenever chemicals are used, including but not limited to, chemical stripping.

F. Be solely responsible for scheduling necessary air sampling by an independent testing laboratory for compliance monitoring of own respiratory protection with OSHA regulations. Pay for all costs associated with such testing. In addition, submit copies of personal air monitoring results to Engineer daily.

G. Permit no visitors, except for governmental inspectors having jurisdiction, or as authorized by Engineer or Owner, in the work areas after commencement of lead disturbance or removal.

H. Provide workers with sufficient sets of protective disposal clothing, consisting of full-body coveralls, head covers, gloves, and foot covers, of sizes to properly fit individual workers.

I. Leave reusable equipment, apparel and protection devices (excluding respirators) in the contaminated equipment room until the end of the lead abatement work, at which time such items shall be disposed of as contaminated waste or decontaminated for reuse.

J. Provide suitable respirators and protective equipment for use by authorized visitors, Owner, Engineer and Testing Laboratory's representative.

K. Provide and post in an appropriately designated common area the lead removal decontamination and work procedures to be followed by workers.

5.09 MATERIALS

A. **Chemical Stripping Agents** - Shall be commercially available products intended for paint removal such as the "Peel Away Series" manufactured by Dumond Chemicals, or equivalent. Provide incidental products, such as neutralizers, as required by manufacturer's instructions and recommendations.

B. **Impermeable Containers** - Shall be suitable to receive and retain lead-containing or contaminated materials until disposal at an approved site and shall be labeled in accordance with U.S. DOT 49CFR 171-179. Containers shall be both air and water tight. As a minimum, utilize one of the following types of impermeable containers:

1. All lead-containing waste (lead-based paint debris) generated as a result of work activities shall be placed in 6-mil (true thickness), plastic bags. The bagged waste shall then be placed in sealed DOT 17C open top 55 gallon drums lined with 6-mil (true thickness) plastic bags sized to fit within each drum.
2. All loose flaking lead-based paint debris on surfaces of (walls, ceiling and floors) removed shall be stored in sealed DOT 17C open top 55 gallon drums lined with 6-mil (true thickness) plastic bags sized to fit within each drum.
3. All lead-contaminated disposable items used in the course of the work (rags, sorbents, protective clothing, plastic sheeting, etc.) shall be placed

in 6-mil (true thickness), plastic bags. The bagged waste shall then be placed in sealed DOT 17C open top 55 gallon drums lined with 6-mil (true thickness) plastic bags sized to fit within each drum. Contractor shall not place lead-containing waste in the same drum as the items described in this paragraph.

4. All liquids generated as a result of clean-up activities shall be disposed of in DOT 17E closed top drums.

C. **Plastic Sheeting** - thickness shall be six-mil or greater, in sizes to minimize the frequency of joints. Use of "spray-on poly" is not permitted without Owner's approval.

D. **Trisodium Phosphate Cleaning Solution** - Trisodium phosphate cleaning solution, such as Sentinel 805 (Sentinel Chemical Company) or equivalent and water, mixed to manufacturer's specifications.

E. **Tape** - glass fiber or other tape capable of sealing joints of adjacent sheets of plastic and for attachment of plastic sheet to finished or unfinished surfaces under both dry and wet conditions.

F. **Warning labels and signs** - Shall be as required by OSHA regulation 29CFR 1926.62 and U.S. DOT 49CFR 171-179 (for impermeable containers).

G. **Other Materials** - provide all other materials, such as lumber, nails and hardware, which may be required to construct and dismantle the decontamination system and the barriers that isolate the work area(s).

5.10 TOOLS AND EQUIPMENT

A. Provide suitable tools for asbestos-containing material removal.

1. **Air Purifying Equipment** - HEPA Filtration Systems. Verify that no internal air movement system or purification equipment exhausts contaminated air from inside the work area into uncontaminated areas.
2. **Half-Face Respirator Equipment** - negative pressure, half-face air purifying respirators approved by NIOSH and MSHA for lead removal work.
3. **Powered Air Purifying Respirator (PAPR) Equipment** - powered air purifying respirators (PAPRs) approved by NIOSH and MSHA for lead removal work.
4. **Scaffolding** - as required to accomplish the specified work and meet all applicable safety regulations.
5. **Transportation** - as required for loading, temporary storage, transit, and unloading of contaminated waste without exposure to persons or property. Use only enclosed vehicles or dumpsters to haul waste containers to prevent loss or damage of containers in route to the landfill.
6. **Water Sprayer** - utilize airless or other low pressure sprayer for cleaning solution application.

5.11 PREPARATION

A. Coordinate sequence of work area preparation throughout the site with Owner and other trades to properly segregate work areas from areas that must remain fully or partially operational or in which other construction is being performed.

B. Initial Work Area Preparation

1. Segregate the work area from other areas with lead abatement warning/barrier tape and caution signs. The warning/barrier tape and caution signs shall be placed a minimum of 25 feet away from each work area. The signs shall be at least 20" by 14" and include the phrase "Caution Lead Hazard, Keep Out" in bold lettering at least 2 inches high.
2. The following warning signs shall be posted immediately outside each work area.

"WARNING
LEAD WORK AREA
POISON
NO SMOKING OR EATING"

3. Maintain emergency and fire exits from the work areas, or establish alternative exits satisfactory to fire officials. Provide fire extinguishers inside and outside the work area.

C. Preparation of Work Area for Removal of Lead-Based Paint Coated Components

1. No further work area preparation is required as long as the lead coated components are removed intact and in their entirety.

5.12 REMOVAL OF LEAD-CONTAINING MATERIALS

A. Remove and properly dispose of lead-based paint scheduled for removal in the Contract Documents in accordance with the methods and procedures outlined in 40CFR 263, 49CFR 171-179, 55CFR 14556-14789 and as more stringently specified herein.

B. Clean Up and Disposal of Loose and Flaking Lead-Based Paint

1. Prepare work area as previously specified. Maintain diminished air pressure in the immediate vicinity of the stripping operation.
2. Spray areas where lead-based paint materials will be stripped with cleaning solution using spray equipment capable or providing a "mist" application to reduce the release of lead dust.
3. Carefully remove and place all paint chips and associated waste in 6-mil, plastic bags. The bagged waste shall then be placed in sealed DOT 17C open top 55 gallon drums lined with 6-mil plastic bags sized to fit within each drum.
4. Spray the lead-based paint materials repeatedly during the work process to control lead dust.
5. At the end of each work day, perform daily cleanup of the work area. The daily cleanup will include:

a. HEPA vacuum all surfaces in the work area.
b. Using disposable towels, wet clean all surfaces in the work area with TSP cleaning solution. To minimize recontamination, do not recycle TSP cleaning solution or reuse towels.

6. Notify Engineer for observation of the completion of cleaning. Surfaces will be considered clean when free from dust, dirt, and residue.

C. Removal of Lead-Based Paint Coated Components

1. Remove designated lead-based paint coated components and place in a secure area until TCLP tests are performed.
2. If lead-coated items are determined through TCLP testing to be non-hazardous, dispose of as construction waste. If items are determined to be hazardous, double-wrap items in two individually sealed layers of 6-mil (true thickness) plastic sheeting, appropriately labeled, and dispose as hazardous waste.
3. Notify Engineer for observation of the completion of the removal.

5.13 CLEAN UP OF WORK AREA

A. Consider work areas and all other decontaminated and cleaned areas clean when:

1. A visual observation of work area(s) has been performed by the Engineer and that the Engineer determines that the Abatement Contractor has met the specification requirements.
2. As deemed appropriate by the Engineer, wipe samples will be obtained on abated areas or adjacent surfaces during the project for Quality Control (QC) purposes. Sampled areas must have a lead residue level of 40 micrograms per square foot or less for floors and/or 100 micrograms per square foot or less for walls and ceilings to be considered decontaminated. If any wipe samples exceed the above allowable lead level, the Abatement Contractor will reclean these areas at his own expense.

5.14 LEAD RECYCLING/RECLAIMING

A. Lead materials may be sold to a recycler for reuse or a reclaimer for remelt that will accept the materials "as is". Lead materials that may be recycled or reclaimed include sheeting and window frames.

B. Alternatively, lead materials are to be containerized and disposed of as hazardous waste.

5.15 CONTAINERIZATION AND MARKING

A. All lead-containing waste (lead-based paint strippings and debris) generated as a result of work activities shall be placed in 6-mil (true thickness), plastic bags. The bagged waste shall then be placed in sealable DOT 17C open top 55 gallon drums lined with 6-mil (true thickness) plastic bags sized to fit within each drum.

B. All lead sheeting and window frames removed shall be stored in sealable DOT 17C open top 55 gallon drums lined with 6-mil (true thickness) plastic bags sized to fit within each drum.

C. All lead-contaminated disposable items used in the course of the work (rags, sorbents, protective clothing, plastic sheeting, etc.) shall be placed in 6-mil (true thickness), plastic bags. The bagged waste shall then be placed in sealable DOT 17C open top 55 gallon drums lined with 6-mil (true thickness) plastic bags sized to fit within each drum. Contractor shall not place lead-containing waste in the same drum as the items described in this paragraph.

D. All liquids generated as a result of clean-up activities shall be disposed of in DOT 17E closed top drums.

E. All drums shall be permanently marked as to specific contents and dated. In addition, each drum shall be marked with the standard EPA, PCB, M_L label, shown below:

CAUTION

CONTAINS
LEAD

A toxic environmental contaminant requiring
special handling and disposal in accordance with
US Environmental Protection Agency Regulations
40 CFR 761 - For Disposal Information contact
the nearest US EPA Office

In case of accident or spill call toll free the US
Coast Guard National Response Center
800 424-8802

Also Contact:
Tel. No.:

F. All drums shall be marked with the label (properly completed) shown below.

HAZARDOUS WASTE

FEDERAL LAW PROHIBITS IMPROPER DISPOSAL

IF FOUND, CONTACT THE NEAREST POLICE OF PUBLIC SAFETY AUTHORITY, OR THE U.S. ENVIRONMENTAL PROTECTION AGENCY

GENERATOR INFORMATION

NAME _____

ADDRESS _____ PHONE _____

CITY _____ STATE _____ ZIP _____

EPA MANIFEST
ID NO./DOCUMENT NO. _____/_____

ACCUMULATION START DATE _____ EPA WASTE NO. _____

_____

_____

_____

D.O.T. PROPER SHIPPING NAME AND UN OR NA NO. WITH PREFIX

HANDLE WITH CARE!

G. Notify Engineer for observation of the labeling of the drum(s) prior to moving the drum(s) to the storage area.

5.16 TEMPORARY ON-SITE STORAGE

A. All drums shall be sealed, secured and labeled before being moved to a temporary on-site storage location designated by the Owner. Handle drums with utmost care during transportation between removal area and storage area.

5.17 WASTE CHARACTERIZATION AND DISPOSAL

A. Lead waste materials (including strippings, wash water, protective clothing, plastic sheeting, etc.) from stripping and removal operations shall be

containerized separately by type of material and TCLP tested by Engineer to determine hazardous or non-hazardous toxicity characteristics prior to disposal. All non-hazardous waste shall be disposed as construction waste at a construction waste landfill. All hazardous waste shall be disposed at a Texas Natural Resource Conservation Commission registered hazardous waste facility.

B. All hazardous waste generated on this Project shall be disposed of at a registered hazardous waste disposal facility. Disposal facility to be used shall meet all Environmental Protection Agency and Texas Natural Resource Conservation Commission regulatory standards for disposal of hazardous waste.

C. Transportation to disposal facility shall be performed in accordance with all federal, state, and local laws and regulations.

1. Place sealed containers in enclosed truck, trailer or dumpster.
2. Transport hazardous waste using a transporter registered to transport hazardous materials.
3. Provide Uniform Hazardous Waste Manifests (Texas Natural Resource Conservation Commission form TNRCC-0311, current edition) for transportation of all hazardous waste to disposal facility.
4. Submit copies of waste manifests from authorized representative of disposal facility for each delivery of waste material to Engineer after each delivery and a complete set of copies of receipts for all deliveries.

5.18 PROCEDURE FOR DETERMINING COMPLIANCE

A. The Engineer will observe each work area during the lead abatement project to monitor compliance with regulations and specifications.

B. The observations performed shall be a visual observation to monitor whether surfaces requiring abatement have been abated.

C. As deemed appropriate by the Engineer, wipe samples will be obtained on abated areas or adjacent surfaces during the project for Quality Control (QC) purposes. If any wipe samples exceed the above allowable lead level, the contractor will reclean at his own expense these areas.

5.19 INSPECTION/FINAL ACCEPTANCE

A. Provide general clean-up of work area concurrent with the removal of all Lead-based paint materials and demolition waste. Do not permit accumulation of debris on workspace floor.

B. The COR will observe each work area and review the abatement documentation records for completeness.

C. Upon satisfactory review status by the COR, the COR will notify the cognizant HQ, JMC Procuring Contracting Officer (PCO) in writing to that effect.

END OF SECTION

6.0 SITE WORK - DEMOLITION

6.01 SUMMARY

6.01.1 This section specifies the requirements for demolition of facilities and structures.

6.01.2 Demolition may, but not necessarily, require removal and disposal, of the following:

6.01.2.1 Remove all facilities above the floor slab and dispose of legally.

6.01.2.2 Remove all grass, shrubs, vegetation, organic matter, and top soil in work areas, and stockpile topsoil at a location approved by the Owner.

6.01.2.3 Remove and dispose of shrubs and heavy vegetation hindering facilitation of demolition activities.

6.01.2.4 Abandon in place all utilities including, but not limited to: electrical, telephone, water, cable and gas safely and in accordance with the local governing agency. Nothing shall remain active or live on site.

6.01.2.5 Cap or plug each pipe, utility, and conduit left below ground.

6.01.2.6 Remove building structures, and other items not shown but which can be determined by visual inspection. Items indicated to be property of the Owner will be removed prior to start of work.

6.01.2.7 Provide site drainage during and at completion demolition of above ground structures.

6.01.2.8 Restore topsoil and evenly spread as required by Owner.

6.02 DEFINITIONS

6.02.1 Cap / Plug: Plug PVC plastic pipe with PVC cap glued to end of clean primered pipe.

6.02.2 Structures: All man-made facilities above and below ground.

6.03 SUBMITTALS

6.03.1 Submit demolition plan, proposed methods and operations of building demolition to Owner for review and approval prior to starting of work. Include required coordination by agencies for shut off, capping, and continuation of utility services

as required. Indicate site ingress/egress, haul roads, Pollution Prevention Plan (PPP), and provisions for protecting off site property.

6.03.2 Submit a drainage plan for demolition and completion of demolition.

6.03.3 Submit Notice of Intent for Pollution Prevention Plan by certified mail to appropriate governmental agencies at least 48 hours before Work begins.

6.04 QUALITY ASSURANCE

6.04.1 Unless they are modified or exceeded by the requirements of this Specification, conform to applicable parts of the following:

6.04.1.1 ANSI A10.6 "Safety Requirements for Demolition".

6.04.1.2 NFPA 30 Flammable and Combustible Liquids Code.

6.04.1.3 NFPA 241 Standard for Safeguarding Building Construction and Demolition Operations

6.04.2 Comply with applicable OSHA and EPA regulations and codes and local ordinances.

6.04.3 Occupancy: Structure on site may be utilized by contractor during a portion of the construction time for purposes of storage or offices.

6.04.4 Conditions of Structures: The owner assumes no responsibility for actual condition of structures to be demolished. Conditions existing at time of inspection for bidding purposes will be maintained by the Owner insofar as practicable. However, variations within structure and work site may occur prior to start of demolition work.

6.04.5 Salvaged Materials: Unless otherwise indicated, material and debris resulting from demolition operations is the property of the Contractor who shall remove them from the site often enough to prevent unsightly or unsafe accumulation. No sale of surplus materials shall be conducted on the site.

6.04.6 Traffic: Conduct demolition operations and removal of debris to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities. Do not close or obstruct streets, walks, or other occupied or used facilities without permission from authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.

6.04.6.1 Prepare traffic control plan.

6.04.7 Damages: Promptly repair damages caused to adjacent facilities by demolition operations.

6.04.8 Utility Services: Maintain existing utilities to stay in service and protect against damage during demolition operations. Make arrangements and pay the costs for disconnection, capping, and relocating services. Do not start demolition work until utility disconnections have been completed and verified in writing.

6.05 PROTECTION

6.05.1 General: Construct temporary dustproof barricades, walks, passage-ways, etc., that are necessary to protect persons and property from hazard or damage due to construction operations, and as required by applicable regulations. Design and construct such protections to have sufficient strength and of such materials as will accomplish their protective function.

6.05.2 Site: Offsite walks, lawns, other building, and other work on site, whether specifically indicated on the Project Drawings or not.

6.05.3 Streets and Sidewalks: Protect streets, sidewalks, curbs, etc., as necessary to prevent damage to them. Repair any damage caused by these operations. The entire section between expansion joints in which the damage occurs shall be replaced.

6.05.3.1 Patching of sidewalks or curbs shall be permitted.

6.05.3.2 Prevent soil, mud and debris from remaining on offsite property.

6.05.3.3 Clean offsite property daily.

6.05.4 Persons: Provide warning signs, hazard and service lights, etc., as necessary for the protection of persons from injury due to construction operations and as required by applicable regulations.

6.05.5 Remaining Structures - Fencing: Take precautions not to damage existing structures and perimeter fencing which are to remain. Promptly repair damages caused by demolition operations at no cost to Owner or adjacent property owners.

6.06 DEMOLITION SEQUENCE

6.06.1 Strip organic matter, topsoil and stockpile topsoil at location approved by Owner.

6.06.2 Demolish above slab as required.

6.06.3 Establish and maintain site drainage as required.

6.07 DEMOLITION

6.07.1 Pollution Controls: Use water sprinkling, temporary enclosures, and other suitable methods to limit dust and dirt rising and scattering in the air. Comply with governing EPA. OSHA, and local regulations pertaining to environmental protection. Do not create hazardous or objectionable conditions such as flooding and water pollution. Clean adjacent structure and improvements of dust, dirt, and debris caused by demolition operations, as directed by Owner's Representative, or governing authorities. Return adjacent areas to condition existing prior to start of work.

6.07.2 Existing Structures: Demolish building and structures to slab and remove from Work site. Use such methods as required to complete Work within limitations of governing regulations. Proceed with demolition in systematic manner, from top of structure to ground. Demolish concrete and masonry in small sections. Remove structural framing members and lower to ground by hoists, derricks, or other suitable methods. Break up and remove concrete slabs-on-grade, unless otherwise shown to remain. Locate demolition equipment throughout structure and remove materials so as to not impose excessive loads to supporting walls, floors, or framing. Demolish above grade structures to the level of existing grade.

6.08 DISPOSAL OF DEMOLISHED MATERIALS

3.3.1 General: Remove from work site debris, rubbish, and other materials resulting from demolition operations.

3.3.1.1 Burial of removed materials from demolished structures will be permitted at approved landfill location on site.

3.3.1.2 Dispose of legally.

3.3.2 Removal: Safely transport demolished materials and dispose of legally. Transportation and disposal shall be conducted by an authorized, licensed and insured transporter.

END OF SECTION

7.0 MECHANICAL WORK

5.01 DESCRIPTION

A. Coordinate with Owner to establish isolation and removal sequence and procedures to shutdown building HVAC and mechanical/domestic water pipe systems to the affected area.

B. Perform other incidental mechanical work not specified herein but necessary for the successful execution of the Work as set forth in the Work Procedures.

C. Install temporary mechanical work necessary to comply with Work Procedures.

D. Remove temporary mechanical work necessary to comply with Work Procedures at completion of Project and correct any damage to property.

END OF SECTION

8.0 ELECTRICAL WORK

6.01 DESCRIPTION

A.. Installation of temporary lighting and power necessary to perform the Work of the Work Procedures.

B. All materials and equipment required shall be:

1. Approved by Underwriters Laboratories and so labeled.
2. For wire and cable, marked as required by Article 310-10 National Electrical Code.
3. Installed by mechanics skilled in their trades, working under the direct supervision of competent experienced foremen or superintendents.
4. Installed in compliance with all applicable Occupational Safety and Health Administration and city electrical codes.

C. Perform and install items specified at the proper time during progress of construction. Coordinate work operations with other trades as necessary. Refer to Section 1.02.

D. Decontaminate and remove all temporary lighting and other electrical items after removal of asbestos-containing material operations.

END OF SECTION

RESPIRATOR TRAINING CERTIFICATION FORM

I hereby certify that I have been trained in the use of each type of respiratory protection equipment required for use on this project. The training included the following:

1. Explanation of dangers related to misuse.
2. Instruction on putting on, fitting, testing and wearing the respirator.
3. Instruction on inspection, cleaning and maintaining respirator.
4. Instruction on emergency situations.

I further certify that I understand the use, care and inspection of the respirator and have tested and worn the unit.

Name: _____

Signature: _____

Social Security Number: _____

Date: _____

Notary: _____
(Signature)

( )
( )
(Seal)
( )
( )

(Submit one copy for each employee prior to starting work)

CERTIFICATE OF WORKER'S RELEASE FORM

DATE: _____

TO: _____

RE: _____
(Insert Project Name and Address)

1. In consideration of my employment by _____ in conjunction with
(Contractor)
the removal and disposal of asbestos, or other work in asbestos-contaminated work area(s), and in consideration of the sum of ONE AND NO/100 ($1.00) DOLLAR and other good and valuable consideration in hand paid, at and before the sealing and delivery of these presents, the receipt , sufficiency, and adequacy of which are hereby acknowledged, the undersigned does hereby acknowledge, warrant, represent, covenant, and agree as follows:

(a) I acknowledge and understand that I have been or will be employed in connection with the removal of, disposal of, or other work in asbestos-contaminated work areas, and I acknowledge that I have been advised of and I understand the dangers inherent in handling asbestos and breathing asbestos dust, including, but not limited to, THE FACT THAT ASBESTOS CAN CAUSE ASBESTOSIS AND IS A KNOWN CARCINOGEN AND CAN, THEREFORE, CAUSE VARIOUS TYPES OF CANCER.

(b) I acknowledge and understand that ANY CONTACT WITH ASBESTOS, WHETHER IT CAN BE SEEN OR NOT, MAY CAUSE ASBESTOSIS AND VARIOUS FORMS OF CANCER, WHICH MAY NOT SHOW UP FOR MANY YEARS, and I covenant and agree faithfully to take all precautions required of me.

(c) I hereby warrant and represent that I have not been disabled, laid-off, or compensated in damages or otherwise, because of the disease of asbestosis or any other cancer disease.

(d) I represent that I can read the English language, or that I have had someone read this instrument to me, and that I understand the meaning of all the provisions contained herein.

Name: _____

Signature: _____

Social Security Number: _____

Signed in presence of: ____

Notary: _
(Signature)

( )
( )
(Seal)
( )
( )

TABLE 1
SCOPE OF WORK (SOW)
LONGHORN ARMY AMMUNITION PLANT

SECTIONS	LOCATIONS	DESCRIPTION	ASBESTOS-CONTAINING MATERIALS									
			Transite Siding/Roof/ Ceiling/Wall	Tar Shingle Roof	Fire Door	Floor Tile & Mastic	Linoleum	TSI - Steam	TSI - Domestic	PCB	Ceiling Tile	Boiler Flue
N.W. SECTION	501 E	Radio Transmission Building	100 S.F +/-	-	-	-	-	-	-	-	-	-
N.W. SECTION	414	Water Pumping Station	5,200 S.F +/-	-	-	-	-	-	-	3 +/-	-	-
ADMIN. AREA	701	General Purpose Warehouse	2,640 S.F +/-	1,800 S.F +/-	-	-	-	-	-	-	-	-
ADMIN. AREA	703 & 703-A	Admin. General Purpose	21,000 S.F +/-	38,400 S.F +/-	400 S.F +/-	38,000 S.F +/-	900 S.F +/-	2,300 L.F +/-	-	-	-	-
ADMIN. AREA	703-C	Heating Plant - Gas Fired Building	4,700 S.F +/-	-	-	-	-	-	-	-	-	80 S.F +/-
ADMIN. AREA	705	Personnel / Purchasing	5,300 S.F +/-	2,200 S.F +/-	-	3,000 S.F +/-	1,000 S.F +/-	-	-	-	-	-
ADMIN. AREA	707-E	Electronic Main Building	1,500 S.F +/-	2,600 S.F +/-	-	-	-	-	-	-	-	-
ADMIN. AREA	719	Medical Clinic	5,000 S.F +/-	-	-	-	-	-	-	-	8,100 S.F +/-	-
ADMIN. AREA	720-A	Admin. Old Security Building	5,300 S.F +/-	8,500 S.F +/-	-	-	-	-	-	-	-	-
ADMIN. AREA	730	Vehicle Parking	2 S.F +/-	-	-	-	-	-	-	-	-	-
MAGAZINE AREA	722-G	Dunnage Building	1,000 S.F +/-	-	-	-	-	-	-	-	-	-
MAGAZINE AREA	TS-84	Small Building on Slab	1,000 S.F +/-	-	-	-	-	-	-	-	-	-
MAGAZINE AREA	TS-Guard	3 Guard Shacks on Skids	-	-	-	-	-	-	-	-	-	-
MAGAZINE AREA	TS-64	Shack	-	-	-	50 S.F +/-	-	-	-	-	-	-
WAREHOUSE AREA	31-W	Flammable Material Storage	14,240 +/-	-	-	-	-	-	-	-	-	-
WAREHOUSE AREA	33-W	Flammable Material Storage	14,240 +/-	-	-	-	-	-	-	-	-	-
WAREHOUSE AREA	35- W	Flammable Material Storage	14,240 +/-	-	-	-	-	-	-	-	-	-
WAREHOUSE AREA	41-W-2	Clock House	-	-	-	-	-	-	-	-	-	-
WAREHOUSE AREA	41-W-1	Public Toilet	550 S.F +/-	-	-	-	-	-	-	-	-	-
WAREHOUSE AREA	41-W	Quality Assurance Building	6,500 S.F +/-	-	-	2,700 S.F +/-	-	100 L.F +/-	-	-	-	-
WAREHOUSE AREA	42-W	General Purpose Warehouse	18,000 S.F +/-	-	-	-	-		-	-	-	-
WAREHOUSE AREA	44-W	General Purpose Warehouse	18,000 S.F +/-	-	-	-	-	100 L.F +/-	-	-	-	-
WAREHOUSE AREA	46-W	General Purpose Warehouse	22,000 S.F +/-	-	-	-	-	1,000 L.F +/-	-	-	-	-
BATTERY SHOP AREA	18-K	Battery Charging Building	5,100 S.F +/-	-	-	-	-	200 L.F +/-	-	-	-	-
BATTERY SHOP AREA	18-K-1	Restroom	400 S.F +/-	-	-	-	-	-	-	-	-	-
SCRAP YARD	49-W	Loading Dock	2,000 S.F +/-	-	-	-	-	-	-	-	-	-
SCRAP YARD	TS_25	Restroom	100 S.F +/-	-	-	50 S.F +/-	-	-	-	-	-	-
SOUTH TEST AREA	IST-2	Ammunition Quality Buiding	300 S.F +/-	-	-	-	-	100 L.F +/-	-	-	-	-
SOUTH TEST AREA	DST-3	Earth Covered Magazine	-	-	-	-	-	-	-	-	-	-
SOUTH TEST AREA	BST-4	Earth Covered High Explosive Mag.	-	-	-	-	-	-	-	-	-	-
SOUTH TEST AREA	BST-2	Earth Covered High Explosive Mag.	-	-	-	-	-	-	-	-	-	-

0006413

TABLE 1
SCOPE OF WORK (SOW)
LONGHORN ARMY AMMUNITION PLANT

SECTIONS	LOCATIONS	DESCRIPTION	ASBESTOS-CONTAINING MATERIALS									
			Transite Siding/Roof/ Ceiling/Wall	Tar Shingle Roof	Fire Door	Floor Tile & Mastic	Linoleum	TSI - Steam	TSI - Domestic	PCB	Ceiling Tile	Boiler Flue
SIGNAL AREA	TS-62	Shed	100 S.F +/-	-	-	60 S.F +/-	-	-	-	-	-	-
TNT PRODUCTION AREA	707-A	Change House	3,900 S.F +/-	2,900 S.F +/-	-	-	-	-	-	-	-	-
TNT PRODUCTION AREA	704-A	Admin. Building	1,500 S.F +/-	1,800 S.F +/-	-	-	-	-	-	-	-	-
TNT PRODUCTION AREA	707-C	General Purpose Warehouse	2,900 S.F +/-	2,900 S.F +/-	-	-	-	-	-	-	-	-
TNT PRODUCTION AREA	451	Compressed Air Plant Building	10,400 S.F +/-	-	-	-	-	-	-	4 +/-	-	-
TNT PRODUCTION AREA	801F	Large Caliber Rocket Landing	800 S.F +/-	-	-	-	-	-	-	-	-	-
TNT PRODUCTION AREA	601 B	Truck Weigh Station	150 S.F +/-	-	-	-	-	-	-	-	-	-
MISC. BUILDING	25-G	Old Cafeteria	3,000 S.F +/-	-	-	4,950 S.F +/-	-	50 L.F +/-	-	-	-	-
MISC. BUILDING		Pistol Range Shack	100 S. F +/-	-	-	-	-	-	-	-	-	-
MISC. BUILDING	22-G	Sewage Pump Station	200 S. F +/-	-	-	-	-	-	-	-	-	-
MISC. BUILDING	22-A	Admin. Building - 51st. Street	-	-	-	3,000 S.F +/-	1,800 S.F +/-	-	-	-	-	-

00064414

APPENDIX F
LEAD – TCLP TRANSMITTAL OF ANALYTICAL RESULTS

EFI®
Engineering and Fire
Investigations

9700 Richmond
Suite 201
Houston, TX 77042
Tel: 866-464-2127
Fax: 713-975-7336
www.efiinfo.com

May 2, 2003

Mr. Michael Luczak
ARC Abatement, Inc.
6630 Roxburgh Drive, Suite 130
Houston, Texas 77041

Subject: **TRANSMITTAL OF ANALYTICAL RESULTS**
Longhorn Army Ammunition Plant – (TCLP Testing)
Karnack, Texas 77055
EFI PROJECT NO. 98410-13709

Dear Mr. Luczak:

Engineering and Fire Investigations (EFI) has completed sampling and analysis for Toxicity Characteristic Leaching Procedure (TCLP) of demolition debris sample suspect for lead-based paint from a total of 21 buildings. These samples were collected as composite samples (i.e. building materials used in their construction) per building. This work was performed at the verbal request of Mr. Michael Luczak of ARC Abatement, Inc.

The samples were analyzed by our subcontract laboratory (EMSL Analytical in Westmont, New Jersey) using test methods SW846-1311/7420 to determine leachable concentrations of lead by use of Flame Atomic Absorption.

Based on the results TCLP lead concentrations of the 21 buildings tested were below 5mg/l with the exception of Building 720-A. Environmental Protection Agency (EPA) defines that waste materials with concentrations of leachable lead below 5 mg/l as non-hazardous and can be disposed of as construction materials.

We recommend retesting Building 720-A for quality assurance to determine the composite testing protocol to represent the type and percentage of each constituent material utilized during the construction of Building 720-A.

A complete analytical report is presented in Appendix A. In addition, we have included the chain of custody for the samples collected in Appendix B.

We appreciate the opportunity to provide consulting services to ARC Abatement, Inc. in this matter. If there are any questions, please contact us.

Sincerely,
ENGINEERING AND FIRE INVESTIGATIONS

Cuong Nguyen
Project Manager

Lee A. Burckle, P.E.
Branch Manager

Attachments: Appendix A – Laboratory Result Sheets
Appendix B – Chain Of Custody

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APPENDIX A

LABORATORY RESULT SHEETS

EMSL Analytical
3 Cooper St., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

00064418

Attn: Alex Nguyen
EFI
9700 Richmond
Suite 201
Houston, TX 77042
Fax: (713) 975-7336 Phone: 713-724-2709 cell
Project: **98410-13709**

Customer ID: ENGF50
Customer PO:
Received: 04/11/03 11:25 AM

EMSL Order: 200303266
EMSL Project ID:

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
Bldg 704-A	*0001*	4/15/03	<0.4 mg/L
Bldg 707-C	*0002*	4/15/03	<0.4 mg/L
Bldg 451	*0003*	4/15/03	<0.4 mg/L
Bldg 601-B	*0004*	4/15/03	<0.4 mg/L
Bldg 701	*0005*	4/15/03	<0.4 mg/L
Bldg 703 - 703A	*0006*	4/15/03	0.7 mg/L
Bldg 705	*0007*	4/15/03	1.3 mg/L
Bldg 707- E	*0008*	4/15/03	0.5 mg/L
719	*0009*	4/15/03	1.0 mg/L
720-A	*0010*	4/15/03	13.0 mg/L
730	*0011*	4/15/03	0.9 mg/L
Bldg 707- A	*0012*	4/15/03	<0.4 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

Date Printed: 4/15/03 2:53:48 PM

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EMSL Analytical
3 Cooper St., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

00064419

Attn: Alex Nguyen
EFI
9700 Richmond
Suite 201
Houston, TX 77042
Fax: (713) 975-7336 Phone: 713-724-2709 cell
Project: **98410-13709**

Customer ID: ENGF50
Customer PO:
Received: 04/16/03 11:43 AM

EMSL Order: 200303424
EMSL Project ID:

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
TS-84	*0001*	4/17/03	2.1 mg/L
18-K-1	*0002*	4/17/03	1.7 mg/L
22 G	*0003*	4/17/03	<0.4 mg/L
25 G	*0004*	4/17/03	0.6 mg/L
18 K	*0005*	4/17/03	<0.4 mg/L
736 A	*0006*	4/17/03	0.4 mg/L
TS-64	*0007*	4/17/03	<0.4 mg/L
BLDG 722-G	*0008*	4/17/03	<0.4 mg/L
[illegible]UARD	*0009*	4/17/03	2.2 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

Date Printed: 4/21/03 5:18:09 PM

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APPENDIX B

CHAIN OF CUSTODY

EMSL ANALYTICAL
Revised 7/1/99

CHAIN OF CUSTODY

2030266

00064421

EMSL Rep:	Gary	DATE:	Third party billing requires written authorization from third party
Your Company Name:	EFI	EMSL-Bill to:	Alex Nguyen - EFI
Street:	9700 Richmond, St. 210	Street:	9700 Richmond, Suite 210
Box #:		Box #:	
City/State:	Houston, Tx Zip: 77042	City/State:	Houston, Tx Zip: 77042
Phone Results to:		Fax Results to:	
Name:	Alex Nguyen	Name:	Alex Nguyen
Telephone #:	(713) 975-7031	Fax #:	(713) 975-7336
Project Name/Number:	98410-13709	Purchase Order #:	

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water	
Lead Soil +	or SW846-6010	ICP	50 mg/kg (ppm) soil 0.1 mg/l water 10 mg/kg (ppm) soil	
Lead in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
Lead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS -
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
BLDG 719	BLDG 719		07206-9
BLDG 720-A	BLDG 720-A		10
BLDG 730	BLDG 730		11
BLDG 707-A	BLDG 707-A		12

Relinquished By; (Person) [signature]
Date: 4-10-03

Received at EMSL By: [signature]
Date: 4/11/03 1125 H

Note: Please duplicate this form and use additional sheets if necessary.

* Sample bag marked BLDG 720

EMSL ANALYTICAL
Revised 7/1/99

CHAIN OF CUSTODY

2003226

LEAD

00064422

EMSL Rep:	Gary	DATE:	Third party billing requires written authorization from third party
Your Company Name:	EFI	EMSL-Bill to:	Alex Nguyen - EFI
Street:	9700 Richmond, St. 210	Street:	9700 Richmond, Suite 210
Box #:		Box #:	
City/State:	Houston, Tx Zip: 77042	City/State:	Houston, Tx Zip: 77042
Phone Results to:		Fax Results to:	
Name:	Alex Nguyen	Name:	Alex Nguyen
Telephone #:	(713) 975-7031	Fax #:	(713) 975-7336
Project Name/Number:	98410-13709	Purchase Order #:	

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water	
Lead Soil +			50 mg/kg (ppm) soil	
	or SW846-6010	ICP	0.1 mg/l water	
			10 mg/kg (ppm) soil	
Lead in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
Lead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS -
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
BLDG 701	BLDG 701		03226-5
BLDG 703 - 703A	BLDG. 703 - 703A		6
BLDG 705	BLDG 705		7
BLDG 707-E	BLDG 707E		8

Relinquished By; (Person)	Received at EMSL By:
Date: 4-10-03	Date: 4/11/03 1125 hr

Note: Please duplicate this form and use additional sheets if necessary.

2C0303424

EMSL ANALYTICAL CHAIN OF CUSTODY LEAD 00064423

Revised 7/1/99

EMSL Rep:	Gary	DATE:	Third party billing requires written authorization from third party
Your Company Name:	EFI	EMSL-Bill to:	Alex Nguyen - EFI
Street:	9700 Richmond, St. 210	Street:	9700 Richmond, Suite 210
Box #:		Box #:	
City/State:	Houston, Tx Zip: 77042	City/State:	Houston, Tx Zip: 77042
Phone Results to:		Fax Results to:	
Name:	Alex Nguyen	Name:	Alex Nguyen
Telephone #:	(713) 975-7031	Fax #:	(713) 975-7336
Project Name/Number:	98410-13709	Purchase Order #:	

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water	
Lead Soil +	or SW846-6010	ICP	50 mg/kg (ppm) soil 0.1 mg/l water 10 mg/kg (ppm) soil	
Lead in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
ad in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS -
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
TS-84	BLDG. TS-84		03424-1
18-K-1	BLDG 18-K-1		2
22G	BLDG 22G		3
25G	BLDG 25G		4

Relinquished By; (Person)		Received at EMSL By:	LVNguyen
Date:	4-15-03	Date:	4/16/03 1143 HE

Note: Please duplicate this form and use additional sheets if necessary.

EMSL ANALYTICAL
Revised 7/1/99

CHAIN OF CUSTODY

2003424

LEAD 00064424

EMSL Rep:	Gary	DATE:	Third party billing requires written authorization from third party
Your Company Name:	EFI	EMSL-Bill to:	Alex Nguyen - EFI
Street:	9700 Richmond, St. 210	Street:	9700 Richmond, Suite 210
Box #:		Box #:	
City/State:	Houston, Tx Zip: 77042	City/State:	Houston, Tx Zip: 77042
Phone Results to:		Fax Results to:	
Name:	Alex Nguyen	Name:	Alex Nguyen
Telephone #:	(713) 975-7031	Fax #:	(713) 975-7336
Project Name/Number:	98410-13709	Purchase Order #:	

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water	
			50 mg/kg (ppm) soil	
Lead Soil +	or SW846-6010	ICP	0.1 mg/l water	
			10 mg/kg (ppm) soil	
Lead in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
Lead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS -
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in^2	LAB #
TS - GUARD	THREE GUARD SHACKS		03424-9

Relinquished By; (Person)	Received at EMSL By: L Vaughn
Date: 4-15-03	Date: 4/16/3 1123

Note: Please duplicate this form and use additional sheets if necessary.

2L0307427

EMSL ANALYTICAL — CHAIN OF CUSTODY

Revised 7/1/99

LEAD 00064425

EMSL Rep:	Gary	DATE:	Third party billing requires written authorization from third party
Your Company Name:	EFI	EMSL-Bill to:	Alex Nguyen - EFI
Street:	9700 Richmond, St. 210	Street:	9700 Richmond, Suite 210
Box #:		Box #:	
City/State:	Houston, Tx Zip: 77042	City/State:	Houston, Tx Zip: 77042
Phone Results to:		Fax Results to:	
Name:	Alex Nguyen	Name:	Alex Nguyen
Telephone #:	(713) 975-7031	Fax #:	(713) 975-7336
Project Name/Number:	98410-13709	Purchase Order #:	

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water 50 mg/kg (ppm) soil	
Lead Soil +	or SW846-6010	ICP	0.1 mg/l water 10 mg/kg (ppm) soil	
Lead in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
d-in-Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS -
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
18-K	BLDG 18K		03424-5
736A	BLDG 736A		6
TS64	BLDG TS64		7
BLDG 722-G	BLDG 722-G		8

Relinquished By: (Person) [signature]
Date: 4-15-03
Received at EMSL By: L Vaughn
Date: 4/16/03 1143 hrs

Note: Please duplicate this form and use additional sheets if necessary.

May 15, 2003

Mr. Michael Luczak
ARC Abatement, Inc.
6630 Roxburgh Drive, Suite 130
Houston, Texas 77041

Subject: **TRANSMITTAL OF ANALYTICAL RESULTS (No.2)**
Longhorn Army Ammunition Plant – (TCLP Testing)
Karnack, Texas 77055
EFI PROJECT NO. 98410-13709

Dear Mr. Luczak:

Engineering and Fire Investigations (EFI) has completed sampling and analysis for Toxicity Characteristic Leaching Procedure (TCLP) of demolition debris sample suspect for lead-based paint from a total of 12 buildings. These samples were collected as composite samples (i.e. building materials used in their construction) per building. This work was performed at the verbal request of Mr. Michael Luczak of ARC Abatement, Inc.

The samples were analyzed by our subcontract laboratory (EMSL Analytical in Westmont, New Jersey) using test methods SW846-1311/7420 to determine leachable concentrations of lead by use of Flame Atomic Absorption.

Based on the results, 4 buildings (Bldg. TS 39, Bldg. 42-W, Bldg. 44-W, Bldg. 46-W) had TCLP lead concentrations exceeding 5mg/l. Remaining buildings tested were below 5mg/l including the retesting of Building 720-A. Environmental Protection Agency (EPA) defines that waste materials with concentrations of leachable lead below 5 mg/l as non-hazardous and can be disposed of as construction materials.

Building materials collected from 42-W, 44-W and 46-W which have lead concentrations exceeding 5mg/l consists of painted fire hose cabinets and represents less than one percent of the building material used in its construction. We recommend that the painted fire hose cabinets from buildings 42-W, 44-W, and 46W be segregated and disposed of as hazardous waste and retesting of the remaining representative building materials from buildings 42-W, 44-W and 46-W. In addition, Building TS 39 that has lead concentrations exceeding 5mg/l should also be disposed of as hazardous waste.

A complete analytical report is presented in Appendix A. In addition, we have included the chain of custody for the samples collected in Appendix B.

We appreciate the opportunity to provide consulting services to ARC Abatement, Inc. in this matter. If there are any questions, please contact us.

Sincerely,
ENGINEERING AND FIRE INVESTIGATIONS

Cuong Nguyen
Project Manager

Lee A. Burckle, P.E.
Branch Manager

Attachments: Appendix A – Laboratory Result Sheets
Appendix B – Chain Of Custody

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APPENDIX A

LABORATORY RESULT SHEETS

EMSL Analytical
3 Cooper St., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

Attn: Alex Nguyen
EFI
9700 Richmond
Suite 201
Houston, TX 77042
Fax: (713) 975-7336 Phone: 713-724-2709 cell
Project: **98410-13709**

Customer ID: ENGF50
Customer PO:
Received: 04/28/03 11:10 AM

EMSL Order: 200303866
EMSL Project ID:

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
49 W	*0001*	5/1/03	0.8 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

Date Printed: 5/1/03 9:51:21 AM

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EMSL Analytical
3 Cooper St., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

Attn: Alex Nguyen
EFI
9700 Richmond
Suite 201
Houston, TX 77042
Fax: (713) 975-7336 Phone: 713-724-2709 cell
Project: **98410-13709**

Customer ID: ENGF50
Customer PO:
Received: 04/28/03 11:10 AM

EMSL Order: 200303867
EMSL Project ID:

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
41 W-1	*0001*	5/1/03	1.8 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

Date Printed: 5/1/03 9:50:55 AM

PBW/4/30/03

THIS IS THE LAST PAGE OF THE REPORT.

EMSL Analytical
3 Cooper St., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

Attn:	Alex Nguyen EFI 9700 Richmond Suite 201 Houston, TX 77042	Customer ID:	ENGF50
		Customer PO:	
		Received:	04/28/03 11:10 AM
Fax:	(713) 975-7336	Phone: 713-724-2709 cell	
Project:	**98410-13709**	EMSL Order:	200303868
		EMSL Project ID:	

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
TS-39	*0001*	5/1/03	12.0 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

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3 Cooper St., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

Attn:	Alex Nguyen EFI 9700 Richmond Suite 201 Houston, TX 77042	Customer ID:	ENGF50
		Customer PO:	
		Received:	04/28/03 11:10 AM
Fax:	(713) 975-7336 Phone: 713-724-2709 cell	EMSL Order:	200303869
Project:	**98410-13709**	EMSL Project ID:	

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
41 W	*0001*	5/1/03	1.9 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

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EMSL Analytical
3 Cooper St., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

Attn:	Alex Nguyen EFI 9700 Richmond Suite 201 Houston, TX 77042	Customer ID:	ENGF50
		Customer PO:	
		Received:	04/28/03 11:10 AM
Fax:	(713) 975-7336 Phone: 713-724-2709 cell		
Project:	**98410-13709**	EMSL Order:	200303870
		EMSL Project ID:	

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
44 W	*0001*	5/1/03	16.0 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

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EMSL Analytical
3 Cooper St., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

Attn: Alex Nguyen
EFI
9700 Richmond
Suite 201
Houston, TX 77042
Fax: (713) 975-7336 Phone: 713-724-2709 cell
Project: **98410-13709**

Customer ID: ENGF50
Customer PO:
Received: 04/28/03 11:10 AM

EMSL Order: 200303871
EMSL Project ID:

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
42 W	*0001*	5/1/03	16.0 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

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EMSL Analytical
3 Cooper St., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

Attn: Alex Nguyen
EFI
9700 Richmond
Suite 201
Houston, TX 77042
Fax: (713) 975-7336 Phone: 713-724-2709 cell
Project: **98410-13709**

Customer ID: ENGF50
Customer PO:
Received: 04/28/03 11:10 AM

EMSL Order: 200303872
EMSL Project ID:

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
801 F	*0001*	5/1/03	0.4 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

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3 Cooper St., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

Attn:	Alex Nguyen EFI 9700 Richmond Suite 201 Houston, TX 77042	Customer ID:	ENGF50
		Customer PO:	
		Received:	04/28/03 11:10 AM
Fax:	(713) 975-7336 Phone: 713-724-2709 cell	EMSL Order:	200303873
Project:	**98410-13709**	EMSL Project ID:	

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
22 A	*0001*	5/1/03	<0.4 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

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EMSL Analytical

3 Cooper St., Westmont, NJ 08108

Phone: (856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

Attn: Alex Nguyen
EFI
9700 Richmond
Suite 201
Houston, TX 77042

Fax: (713) 975-7336 Phone: 713-724-2709 cell

Project: **98410-13709**

Customer ID: ENGF50
Customer PO:
Received: 04/28/03 11:10 AM

EMSL Order: 200303874
EMSL Project ID:

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
46 W	*0001*	5/1/03	39.0 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

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EMSL Analytical
3 Cooper St., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

Attn:	Alex Nguyen EFI 9700 Richmond Suite 201 Houston, TX 77042	Customer ID:	ENGF50
		Customer PO:	
		Received:	04/28/03 11:10 AM
Fax:	(713) 975-7336 Phone: 713-724-2709 cell	EMSL Order:	200303875
Project:	**98410-13709**	EMSL Project ID:	

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
501 E	*0001*	5/1/03	1.1 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

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EMSL Analytical
3 Cooper St., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

Attn:	Alex Nguyen EFI 9700 Richmond Suite 201 Houston, TX 77042	Customer ID:	ENGF50
		Customer PO:	
		Received:	04/28/03 11:10 AM
Fax:	(713) 975-7336 Phone: 713-724-2709 cell	EMSL Order:	200303876
Project:	**98410-13709**	EMSL Project ID:	

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
720 A	*0001*	5/1/03	0.9 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

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EMSL Analytical
3 Cooper St., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

Attn:	Alex Nguyen EFI 9700 Richmond Suite 201 Houston, TX 77042	Customer ID:	ENGF50
		Customer PO:	
		Received:	04/28/03 11:10 AM
Fax:	(713) 975-7336 Phone: 713-724-2709 cell	EMSL Order:	200303877
Project:	**98410-13709**	EMSL Project ID:	

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
41 W-2	*0001*	5/1/03	1.7 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

Date Printed: 5/1/03 9:51:48 AM

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APPENDIX B

CHAIN OF CUSTODY

EMSL ANALYTICAL
Revised 7/1/99

CHAIN OF CUSTODY

7603866

LEAD
00064441

EMSL Rep:	Gary	DATE:	Third party billing requires written authorization from third party
Your Company Name:	EFI	EMSL-Bill to:	Alex Nguyen - EFI
Street:	9700 Richmond, St. 210	Street:	9700 Richmond, Suite 210
Box #:		Box #:	
City/State:	Houston, Tx Zip: 77042	City/State:	Houston, Tx Zip: 77042
Phone Results to:		Fax Results to:	
Name:	Alex Nguyen	Name:	Alex Nguyen
Telephone #:	(713) 975-7031	Fax #:	(713) 975-7336
Project Name/Number:	98410-13709	Purchase Order #:	

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water	
Lead Soil +	or SW846-6010	ICP	50 mg/kg (ppm) soil 0.1 mg/l water 10 mg/kg (ppm) soil	
Lead in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
Lead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS –
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
49 W	Recycle open side Area Red Exting. GRAY WOOD frame		03866-1

Relinquished By; (Person)		Received at EMSL By:	
Date:	4/23/03	Date:	4/25/03 11:00 a

Note: Please duplicate this form and use additional sheets if necessary.

EMSL ANALYTICAL
Revised 7/1/99

CHAIN OF CUSTODY

2030827 LEAD

00064442

EMSL Rep:	Gary	DATE:	Third party billing requires written authorization from third party
Your Company Name:	EFI	EMSL-Bill to:	Alex Nguyen - EFI
Street:	9700 Richmond, St. 210	Street:	9700 Richmond, Suite 210
Box #:		Box #:	
City/State:	Houston, Tx Zip: 77042	City/State:	Houston, Tx Zip: 77042
Phone Results to:		Fax Results to:	
Name:	Alex Nguyen	Name:	Alex Nguyen
Telephone #:	(713) 975-7031	Fax #:	(713) 975-7336
Project Name/Number:	98410-13709	Purchase Order #:	

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water 50 mg/kg (ppm) soil	
Lead Soil +	or SW846-6010	ICP	0.1 mg/l water 10 mg/kg (ppm) soil	
Lead in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
Lead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS -
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
41W-1	R/R Bldg. Lt. Gray over Green + Beige		03827-1

Relinquished By; (Person)	Received at EMSL By:
Date: 4/23/03	Date: 4/25/03 11:00 AM

Note: Please duplicate this form and use additional sheets if necessary.

EMSL ANALYTICAL
Revised 7/1/99

CHAIN OF CUSTODY

2003827

LEAD 00064443

EMSL Rep: Gary

DATE:

Third party billing requires written authorization from third party

Your Company Name: EFI
Street: 9700 Richmond, St. 210
Box #:
City/State: Houston, Tx Zip: 77042

EMSL-Bill to: Alex Nguyen - EFI
Street: 9700 Richmond, Suite 210
Box #:
City/State: Houston, Tx Zip: 77042

Phone Results to:
Name: Alex Nguyen
Telephone #: (713) 975-7031
Project Name/Number: 98410-13709

Fax Results to:
Name: Alex Nguyen
Fax #: (713) 975-7336
Purchase Order #:

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water 50 mg/kg (ppm) soil	
Lead Soil +	or SW846-6010	ICP	0.1 mg/l water 10 mg/kg (ppm) soil	
Lead in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
ad in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
CLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS –
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
TS-39	PISTOL Shack White wood frame 8'x8'		

Relinquished By; (Person): [signature]
Date: 4/23/03

Received at EMSL By:
Date: 4/28/03 11:00 a

Note: Please duplicate this form and use additional sheets if necessary.

EMSL ANALYTICAL
Revised 7/1/99

CHAIN OF CUSTODY

7L03869 LEAD

00064444

EMSL Rep: Gary

DATE:

Third party billing requires written authorization from third party

Your Company Name:	EFI	EMSL-Bill to:	Alex Nguyen - EFI
Street:	9700 Richmond, St. 210	Street:	9700 Richmond, Suite 210
Box #:		Box #:	
City/State:	Houston, Tx Zip: 77042	City/State:	Houston, Tx Zip: 77042
Phone Results to:		Fax Results to:	
Name:	Alex Nguyen	Name:	Alex Nguyen
Telephone #:	(713) 975-7031	Fax #:	(713) 975-7336
Project Name/Number:	98410-13709	Purchase Order #:	

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water	
Lead Soil +			50 mg/kg (ppm) soil	
	or SW846-6010	ICP	0.1 mg/l water	
			10 mg/kg (ppm) soil	
Lead in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
Lead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS -
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
41 W	Warehouse + LAB white Somerover + Beige @ S. office window	LT. Green	03569-1

Relinquished By; (Person) [signature] Received at EMSL By: [signature]

Date: 4/23/03 Date: 4/24/03 11:45 AM

Note: Please duplicate this form and use additional sheets if necessary.

EMSL ANALYTICAL
Revised 7/1/99

CHAIN OF CUSTODY

2023870

LEAD

00064445

EMSL Rep:	Gary	DATE:	Third party billing requires written authorization from third party
Your Company Name:	EFI	EMSL-Bill to:	Alex Nguyen - EFI
Street:	9700 Richmond, St. 210	Street:	9700 Richmond, Suite 210
Box #:		Box #:	
City/State:	Houston, Tx Zip: 77042	City/State:	Houston, Tx Zip: 77042
Phone Results to:		Fax Results to:	
Name:	Alex Nguyen	Name:	Alex Nguyen
Telephone #:	(713) 975-7031	Fax #:	(713) 975-7336
Project Name/Number:	98410-13709	Purchase Order #:	

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water	
Lead Soil +			50 mg/kg (ppm) soil	
	or SW846-6010	ICP	0.1 mg/l water	
			10 mg/kg (ppm) soil	
Lead in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
Lead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS -
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
44 W	LT. GRAY on WOOD door frames + Red on Extinguish' Boards		023870-1

Relinquished By; (Person) [signature]
Date: 4/23/03

Received at EMSL By: [signature]
Date: 4/24/03 11:45 a

Note: Please duplicate this form and use additional sheets if necessary.

EMSL ANALYTICAL
Revised 7/1/99

CHAIN OF CUSTODY

2003871 LEAD

00064446

EMSL Rep:	Gary	DATE:	Third party billing requires written authorization from third party
Your Company Name:	EFI	EMSL-Bill to:	Alex Nguyen - EFI
Street:	9700 Richmond, St. 210	Street:	9700 Richmond, Suite 210
Box #:		Box #:	
City/State:	Houston, Tx Zip: 77042	City/State:	Houston, Tx Zip: 77042
Phone Results to:		Fax Results to:	
Name:	Alex Nguyen	Name:	Alex Nguyen
Telephone #:	(713) 975-7031	Fax #:	(713) 975-7336
Project Name/Number:	98410-13709	Purchase Order #:	

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water	
Lead Soil +	or SW846-6010	ICP	50 mg/kg (ppm) soil 0.1 mg/l water 10 mg/kg (ppm) soil	
Lead in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
Lead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS -
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
42 W	Warehouse office N. LT. GRAY over lime + Beige Multiple wood on N. End.		03871-1

Relinquished By; (Person) [signature] Received at EMSL By: [signature]

Date: 4/23/03 Date: 4/24/03 11:45

Note: Please duplicate this form and use additional sheets if necessary.

EMSL ANALYTICAL
Revised 7/1/99

CHAIN OF CUSTODY

2103872 LEAD
00064447

EMSL Rep:	Gary	DATE:	Third party billing requires written authorization from third party
Your Company Name:	EFI	EMSL-Bill to:	Alex Nguyen - EFI
Street:	9700 Richmond, St. 210	Street:	9700 Richmond, Suite 210
Box #:		Box #:	
City/State:	Houston, Tx Zip: 77042	City/State:	Houston, Tx Zip: 77042
Phone Results to: Name:	Alex Nguyen	Fax Results to: Name:	Alex Nguyen
Telephone #:	(713) 975-7031	Fax #:	(713) 975-7336
Project Name/Number:	98410-13709	Purchase Order #:	

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water	
			50 mg/kg (ppm) soil	
Lead Soil +	or SW846-6010	ICP	0.1 mg/l water	
			10 mg/kg (ppm) soil	
Lead in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
Lead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS -
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
801 F	Wood Door Frame LT. GRAY + Green 2 story load Rm.		03872-1

Relinquished By; (Person) [signature] Received at EMSL By: [signature]
Date: 4/23/03 Date: 4/25/03

Note: Please duplicate this form and use additional sheets if necessary.

EMSL ANALYTICAL
Revised 7/1/99

CHAIN OF CUSTODY

2030873

LEAD
00064448

EMSL Rep: Gary

DATE:

Third party billing requires written authorization from third party

Your Company Name: EFI
Street: 9700 Richmond, St. 210
Box #:
City/State: Houston, Tx Zip: 77042

EMSL-Bill to: Alex Nguyen - EFI
Street: 9700 Richmond, Suite 210
Box #:
City/State: Houston, Tx Zip: 77042

Phone Results to:
Name: Alex Nguyen
Telephone #: (713) 975-7031
Project Name/Number: 98410-13709

Fax Results to:
Name: Alex Nguyen
Fax #: (713) 975-7336
Purchase Order #:

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water 50 mg/kg (ppm) soil	
Lead Soil +	or SW846-6010	ICP	0.1 mg/l water 10 mg/kg (ppm) soil	
Lead in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
Lead-in-Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS –
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
22A	WOOD LIME, Beige White WINS/DOORS/TRIM/Frame		03873-1

Relinquished By; (Person) [signature]
Date: 4/23/03

Received at EMSL By: [signature]
Date: 4/24/03 11:00 AM

Note: Please duplicate this form and use additional sheets if necessary.

EMSL ANALYTICAL

Revised 7/1/99

CHAIN OF CUSTODY

030374 LEAD

00064449

EMSL Rep: Gary

DATE:

Third party billing requires written authorization from third party

Your Company Name: EFI

Street: 9700 Richmond, St. 210

Box #:

City/State: Houston, Tx Zip: 77042

EMSL-Bill to: Alex Nguyen - EFI

Street: 9700 Richmond, Suite 210

Box #:

City/State: Houston, Tx Zip: 77042

Phone Results to:

Name: Alex Nguyen

Telephone #: (713) 975-7031

Project Name/Number: 98410-13709

Fax Results to:

Name: Alex Nguyen

Fax #: (713) 975-7336

Purchase Order #:

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water 50 mg/kg (ppm) soil	
Lead Soil +	or SW846-6010	ICP	0.1 mg/l water 10 mg/kg (ppm) soil	
Lead in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
Lead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS -
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
H6 W	LT. BRM on WOOD DOOR frames + Red on Extinguish Boards		03874-1

Relinquished By; (Person) [signature]

Date: 4/23/03

Received at EMSL By: [signature]

Date: 4/25/03 11:40 AM

Note: Please duplicate this form and use additional sheets if necessary.

EMSL ANALYTICAL
Revised 7/1/99

CHAIN OF CUSTODY

2003875

LEAD
00064450

EMSL Rep:	Gary	DATE:	Third party billing requires written authorization from third party
Your Company Name:	EFI	EMSL-Bill to:	Alex Nguyen - EFI
Street:	9700 Richmond, St. 210	Street:	9700 Richmond, Suite 210
Box #:		Box #:	
City/State:	Houston, Tx Zip: 77042	City/State:	Houston, Tx Zip: 77042
Phone Results to:		Fax Results to:	
Name:	Alex Nguyen	Name:	Alex Nguyen
Telephone #:	(713) 975-7031	Fax #:	(713) 975-7336
Project Name/Number:	98410-13709	Purchase Order #:	

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water	
Lead Soil +	or SW846-6010	ICP	50 mg/kg (ppm) soil 0.1 mg/l water 10 mg/kg (ppm) soil	
Lead in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
Lead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS -
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
501 E	White + LIME Wood Trim		03875-1

Relinquished By; (Person)	Received at EMSL By:
Date: 4/03/03	Date: 4/4/03 11:00 AM

Note: Please duplicate this form and use additional sheets if necessary.

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EMSL ANALYTICAL — CHAIN OF CUSTODY — LEAD

Revised 7/1/99

00064451

EMSL Rep:	Gary	DATE:	Third party billing requires written authorization from third party
Your Company Name:	EFI	EMSL-Bill to:	Alex Nguyen - EFI
Street:	9700 Richmond, St. 210	Street:	9700 Richmond, Suite 210
Box #:		Box #:	
City/State:	Houston, Tx Zip: 77042	City/State:	Houston, Tx Zip: 77042
Phone Results to:		Fax Results to:	
Name:	Alex Nguyen	Name:	Alex Nguyen
Telephone #:	(713) 975-7031	Fax #:	(713) 975-7336
Project Name/Number:	98410-13709	Purchase Order #:	

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water	
Lead Soil +			50 mg/kg (ppm) soil	
	or SW846-6010	ICP	0.1 mg/l water	
			10 mg/kg (ppm) soil	
Lead in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
Lead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
CLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS –
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
720 A	Beige, White, Yellow Red Wood		03876-1

Relinquished By; (Person) Alan Sellers

Date: 4/23/03

Received at EMSL By: Lindy

Date: 4/28/03 11:00 AM

Note: Please duplicate this form and use additional sheets if necessary.

EMSL ANALYTICAL
Revised 7/1/99

CHAIN OF CUSTODY

2303877

LEAD
00064452

EMSL Rep:	Gary	DATE:	Third party billing requires written authorization from third party
Your Company Name:	EFI	EMSL-Bill to:	Alex Nguyen - EFI
Street:	9700 Richmond, St. 210	Street:	9700 Richmond, Suite 210
Box #:		Box #:	
City/State:	Houston, Tx Zip: 77042	City/State:	Houston, Tx Zip: 77042
Phone Results to:		Fax Results to:	
Name:	Alex Nguyen	Name:	Alex Nguyen
Telephone #:	(713) 975-7031	Fax #:	(713) 975-7336
Project Name/Number:	98410-13709	Purchase Order #:	

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water 50 mg/kg (ppm) soil	
Lead Soil +	or SW846-6010	ICP	0.1 mg/l water 10 mg/kg (ppm) soil	
Lead in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
Lead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS –
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
H1W-2	Sm. Shack Cream over line green window sill, door frame 1/2 2'x4' Frame Exter. CANOPY 4'x4'		03877-1

Relinquished By; (Person)	[signature]	Received at EMSL By:	[signature]
Date:	4/23/03	Date:	4/24/03

Note: Please duplicate this form and use additional sheets if necessary.

EFI®
Engineering and Fire
Investigations

9700 Richmond
Suite 201
Houston, TX 77042
Tel: 866-464-2127
Fax: 713-975-7336
www.efiinfo.com

August 14, 2003

Mr. Michael Luczak
ARC Abatement, Inc.
6630 Roxburgh Drive, Suite 130
Houston, Texas 77041

Subject: **TRANSMITTAL OF ANALYTICAL RESULTS No. 3**
Longhorn Army Ammunition Plant – (TCLP Testing)
Karnack, Texas 77055
EFI PROJECT NO. 98410-13709

Dear Mr. Luczak:

Engineering and Fire Investigations (EFI) has completed sampling and analysis for Toxicity Characteristic Leaching Procedure (TCLP) of demolition debris sample suspect for lead-based paint from a total of 4 buildings. These samples were collected as composite samples (i.e. building materials used in their construction) per building. This work was performed at the verbal request of Mr. Michael Luczak of ARC Abatement, Inc.

The samples were analyzed by our subcontract laboratory (EMSL Analytical in Westmont, New Jersey) using test methods SW846-1311/7420 to determine leachable concentrations of lead by use of Flame Atomic Absorption.

Based on the results TCLP lead concentrations of the 4 buildings tested (Bldgs. 414, 1ST-1, TS-62-1, TS-25,) were below 5mg/l. Environmental Protection Agency (EPA) defines that waste materials with concentrations of leachable lead below 5 mg/l as non-hazardous and can be disposed of as construction materials.

A complete analytical report is presented in Appendix A. In addition, we have included the chain of custody for the samples collected in Appendix B.

We appreciate the opportunity to provide consulting services to ARC Abatement, Inc. in this matter. If there are any questions, please contact us.

Sincerely,
ENGINEERING AND FIRE INVESTIGATIONS

Cuong Nguyen
Project Manager

Lee A. Burckle, P.E.
Branch Manager

Attachments: Appendix A – Laboratory Result Sheets
Appendix B – Chain Of Custody

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APPENDIX A

LABORATORY RESULT SHEETS

EMSL Analytical
3 Cooper St., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

Attn:	Alex Nguyen EFI 9700 Richmond Suite 201 Houston, TX 77042	Customer ID:	ENGF50
		Customer PO:	
		Received:	05/13/03 11:20 AM
Fax:	(713) 975-7336 Phone: (713) 724-2709	EMSL Order:	200304480
Project:	**98410-13709**	EMSL Project ID:	

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
414	*0001*	5/14/03	<0.4 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

Date Printed: 5/14/03 2:16:58 PM

PBLV6.00C1.1

EMSL Analytical
3 Cooper St., Westmont, NJ 08108
e: (856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

Attn:	Alex Nguyen EFI 9700 Richmond Suite 201 Houston, TX 77042	Customer ID:	ENGF50
		Customer PO:	
		Received:	05/13/03 11:20 AM
Fax:	(713) 975-7336 Phone: (713) 724-2709	EMSL Order:	200304481
Project:	**98410-13709**	EMSL Project ID:	

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
1 ST-1	*0001*	5/14/03	1.4 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

Date Printed: 5/14/03 2:17:54 PM

PBLV/QAQC-1

EMSL Analytical
3 Cooper St., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

Attn:	Alex Nguyen EFI 9700 Richmond Suite 201 Houston, TX 77042	Customer ID:	ENGF50
		Customer PO:	
		Received:	05/13/03 11:20 AM
Fax:	(713) 975-7336 Phone: (713) 724-2709	EMSL Order:	200304484
Project:	**98410-13709**	EMSL Project ID:	

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
TS 62-1	*0001*	5/14/03	1.0 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 03653
AIHA: 100194
or other approved signatory

Date Printed: 5/14/03 2:18:54 PM

PRV/COC21

00064458

EMSL Analytical
3 Cooper St., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

Attn: Alex Nguyen
EFI
9700 Richmond
Suite 201
Houston, TX 77042
Fax: (713) 975-7336 Phone: (713) 724-2709
Project: **98410-13709**

Customer ID: ENGF50
Customer PO:
Received: 05/13/03 11:20 AM

EMSL Order: 200304482
EMSL Project ID:

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
TS-25	*0001*	5/14/03	2.0 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

Date Printed: 5/14/03 2:18:25 PM

PBLV/COC1

APPENDIX B

CHAIN OF CUSTODY

00064460

EMSL ANALYTICAL — CHAIN OF CUSTODY — 20030 4480 — LEAD

vised 7/1/99

EMSL Rep:	Gary	**DATE:**	Third party billing requires written authorization from third party
Your Company Name:	EFI	**EMSL-Bill to:**	Alex Nguyen - EFI
Street:	9700 Richmond, St. 210	**Street:**	9700 Richmond, Suite 210
Box #:		**Box #:**	
City/State:	Houston, Tx **Zip:** 77042	**City/State:**	Houston, Tx **Zip:** 77042
Phone Results to:		**Fax Results to:**	
Name:	Alex Nguyen	**Name:**	Alex Nguyen
Telephone #:	(713) 975-7031	**Fax #:**	(713) 975-7336
Project Name/Number:	98410-13709	**Purchase Order #:**	

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water 50 mg/kg (ppm) soil	
Lead Soil +	or SW846-6010	ICP	0.1 mg/l water 10 mg/kg (ppm) soil	
Lead in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
Lead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS -
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
414	White over lime green		64480 -1

Relinquished By; (Person): Adam Sattler — Received at EMSL By:

Date: 4/30/03 — Date: 5/13/03 1120

Note: Please duplicate this form and use additional sheets if necessary.

00064461

EMSL ANALYTICAL
Revised 7/1/99

CHAIN OF CUSTODY

230449R1 LEAD

EMSL Rep:	Gary	DATE:	Third party billing requires written authorization from third party
Your Company Name:	EFI	EMSL-Bill to:	Alex Nguyen - EFI
Street:	9700 Richmond, St. 210	Street:	9700 Richmond, Suite 210
Box #:		Box #:	
City/State:	Houston, Tx Zip: 77042	City/State:	Houston, Tx Zip: 77042
Phone Results to:		Fax Results to:	
Name:	Alex Nguyen	Name:	Alex Nguyen
Telephone #:	(713) 975-7031	Fax #:	(713) 975-7336
Project Name/Number:	98410-13709	Purchase Order #:	

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water 50 mg/kg (ppm) soil	
Lead Soil +	or SW846-6010	ICP	0.1 mg/l water 10 mg/kg (ppm) soil	
Lead in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
Lead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS -
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
1ST-1	white wood door/frame		04481-1

Relinquished By; (Person)	Received at EMSL By:
Date: 4/30/03	Date: 5/13/03 10:00 AM

Note: Please duplicate this form and use additional sheets if necessary.

00064462

EMSL ANALYTICAL
Revised 7/1/99

CHAIN OF CUSTODY

230446R1 LEAD

EMSL Rep:	Gary	DATE:	Third party billing requires written authorization from third party
Your Company Name:	EFI	EMSL-Bill to:	Alex Nguyen - EFI
Street:	9700 Richmond, St. 210	Street:	9700 Richmond, Suite 210
Box #:		Box #:	
City/State:	Houston, Tx Zip: 77042	City/State:	Houston, Tx Zip: 77042
Phone Results to:		Fax Results to:	
Name:	Alex Nguyen	Name:	Alex Nguyen
Telephone #:	(713) 975-7031	Fax #:	(713) 975-7336
Project Name/Number:	98410-13709	Purchase Order #:	

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water	
Lead Soil +	or SW846-6010	ICP	50 mg/kg (ppm) soil 0.1 mg/l water 10 mg/kg (ppm) soil	
Lead in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
Lead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS -
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
1ST-1	White wood door/frame		04481-1

Relinquished By; (Person) [signature] Received at EMSL By: [signature]

Date: 4/30/03 Date: 5/1/03 10:45 AM

Note: Please duplicate this form and use additional sheets if necessary.

00064463

EMSL ANALYTICAL
Revised 7/1/99

CHAIN OF CUSTODY

, 2003 04482 LEAD

EMSL Rep:	Gary	**DATE:**	**Third party billing requires written authorization from third party**
Your Company Name:	EFI	**EMSL-Bill to:**	Alex Nguyen - EFI
Street:	9700 Richmond, St. 210	**Street:**	9700 Richmond, Suite 210
Box #:		**Box #:**	
City/State:	Houston, Tx **Zip:** 77042	**City/State:**	Houston, Tx **Zip:** 77042
Phone Results to:		**Fax Results to:**	
Name:	Alex Nguyen	**Name:**	Alex Nguyen
Telephone #:	(713) 975-7031	**Fax #:**	(713) 975-7336
Project Name/Number:	98410-13709	**Purchase Order #:**	

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water	
			50 mg/kg (ppm) soil	
Lead Soil +	or SW846-6010	ICP	0.1 mg/l water	
			10 mg/kg (ppm) soil	
Lead in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
Lead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS -
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
TS-25	Yellow & white Restrm. @ Recycle		04482-1

Relinquished By; (Person) [signature]	Received at EMSL By: [signature]
Date: 4/30/03	Date: 5/13/03

Note: Please duplicate this form and use additional sheets if necessary.

EFI
Engineering and Fire
Investigations

9700 Richmond
Suite 201
Houston, TX 77042
Tel: 866-464-2127
Fax: 713-975-7336
www.efiinfo.com

August 14, 2003

Mr. Michael Luczak
ARC Abatement, Inc.
6630 Roxburgh Drive, Suite 130
Houston, Texas 77041

Subject: **TRANSMITTAL OF ANALYTICAL RESULTS No. 4**
Longhorn Army Ammunition Plant – (TCLP Testing, Phase II)
Karnack, Texas 77055
EFI PROJECT NO. 98410-13709

Dear Mr. Luczak:

Engineering and Fire Investigations (EFI) has completed sampling and analysis for Toxicity Characteristic Leaching Procedure (TCLP) of demolition debris sample suspect for lead-based paint from a total of 24 buildings. These samples were collected as composite samples (i.e. building materials used in their construction) per building. This work was performed at the verbal request of Mr. Michael Luczak of ARC Abatement, Inc.

The samples were analyzed by our subcontract laboratory (EMSL Analytical in Westmont, New Jersey) using test methods SW846-1311/7420 to determine leachable concentrations of lead by use of Flame Atomic Absorption.

Based on the results TCLP lead concentrations of the 24 buildings tested (Bldgs. 709-A, TS-36, 726, 726-C, 726-D, 718-A, 717, 734, 723, 722-P, 725, 206, 201-A, 201-R, 202, 707-F, 744, 716, 714, 632-A, 630-A, 510-B-2, S36, and TS-10) were below 5mg/l. Environmental Protection Agency (EPA) defines that waste materials with concentrations of leachable lead below 5 mg/l as non-hazardous and can be disposed of as construction materials.

A complete analytical report is presented in Appendix A. In addition, we have included the chain of custody for the samples collected in Appendix B.

We appreciate the opportunity to provide consulting services to ARC Abatement, Inc. in this matter. If there are any questions, please contact us.

Sincerely,
ENGINEERING AND FIRE INVESTIGATIONS

Cuong Nguyen
Project Manager

Lee A. Burckle, P.E.
Branch Manager

Attachments: Appendix A – Laboratory Result Sheets
Appendix B – Chain Of Custody

CN/cn(e:\projects 2003\Longhorn Army Ammunition Plant\TCLP Sampling – Transrpt4.doc

APPENDIX A

LABORATORY RESULT SHEETS

00064466

EMSL Analytical

Cooper St., Westmont, NJ 08108

Phone: (856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

Attn: Alex Nguyen
EFI
9700 Richmond
Suite 201
Houston, TX 77042

Fax: (713) 975-7336 Phone: (713) 724-2709

Project: **98410-13709**

Customer ID: ENGF50
Customer PO:
Received: 05/19/03 11:15 AM

EMSL Order: 200304812
EMSL Project ID:

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
709-A	*0001*	5/21/03	1.0 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

Date Printed: 5/21/03 11:42:40 AM

PE w/ QC

00064467

EMSL Analytical
3 Cooper St., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

Attn:	Alex Nguyen EFI 9700 Richmond Suite 201 Houston, TX 77042	Customer ID:	ENGF50
		Customer PO:	
		Received:	05/19/03 11:15 AM
Fax:	(713) 975-7336 Phone: (713) 724-2709		
Project:	**98410-13709**	EMSL Order:	200304811
		EMSL Project ID:	

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
TS36	*0001*	5/21/03	3.1 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

Date Printed: 5/21/03 11:43:38 AM

PB/V/SVOC1

00064468

EMSL Analytical
3 Cooper St., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

Attn:	Alex Nguyen EFI 9700 Richmond Suite 201 Houston, TX 77042			Customer ID:	ENGF50
				Customer PO:	
				Received:	05/19/03 11:15 AM
Fax:	(713) 975-7336	Phone:	(713) 724-2709	EMSL Order:	200304814
Project:	98410-13709			EMSL Project ID:	

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
726	*0001*	5/21/03	<0.4 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04853
AIHA: 100194
or other approved signatory

Date Printed: 5/21/03 11:40:18 AM

PB w/QC 1

00064469

EMSL Analytical
3 Cooper St., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

Attn:	Alex Nguyen EFI 9700 Richmond Suite 201 Houston, TX 77042	Customer ID:	ENGF50
		Customer PO:	
		Received:	05/19/03 11:15 AM
Fax:	(713) 975-7336 Phone: (713) 724-2709		
Project:	**98410-13709**	EMSL Order:	200304813
		EMSL Project ID:	

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
726 D	*0001*	5/21/03	2.4 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

Date Printed: 5/21/03 11:40:49 AM

PB w/e QC

00064470

EMSL Analytical
3 Cooper St., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

Attn:	Alex Nguyen EFI 9700 Richmond Suite 201 Houston, TX 77042	Customer ID:	ENGF50
		Customer PO:	
		Received:	05/19/03 11:15 AM
Fax:	(713) 975-7336 Phone: (713) 724-2709	EMSL Order:	200304813
Project:	**98410-13709**	EMSL Project ID:	

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
726 D	*0001*	5/21/03	2.4 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

Date Printed: 5/21/03 11:40:49 AM

PB/WetChem

00064471

EMSL Analytical
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Phone: (856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

Attn: Alex Nguyen
EFI
9700 Richmond
Suite 201
Houston, TX 77042
Fax: (713) 975-7336 Phone: (713) 724-2709
Project: **98410-13709**

Customer ID: ENGF50
Customer PO:
Received: 05/19/03 11:15 AM

EMSL Order: 200304815
EMSL Project ID:

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
726 C	*0001*	5/21/03	<0.4 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

Date Printed: 5/21/03 11:39:00 AM

PB/V/SOC1

00064472

EMSL Analytical
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Phone: (856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

Attn: Alex Nguyen
EFI
9700 Richmond
Suite 201
Houston, TX 77042
Fax: (713) 975-7336 Phone: (713) 724-2709
Project: **98410-13709**

Customer ID: ENGF50
Customer PO:
Received: 05/28/03 10:35 AM

EMSL Order: 200305213
EMSL Project ID:

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
718-A	*0001*	5/29/03	<0.4 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04033
AIHA: 100194
or other approved signatory

Date Printed: 5/30/03 8:46:59 AM

PB/M/GC/1

00064473

EMSL Analytical
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Phone: (856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

Attn: Alex Nguyen
EFI
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Suite 201
Houston, TX 77042
Fax: (713) 975-7336 Phone: (713) 724-2709
Project: 98410-13709

Customer ID: ENGF50
Customer PO:
Received: 05/28/03 10:35 AM

EMSL Order: 200305214
EMSL Project ID:

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
717	*0001*	5/29/03	<0.4 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

Date Printed: 5/30/03 8:46:15 AM

PE v/e QC

00064474

EMSL Analytical
2 Cooper St., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

Attn: Alex Nguyen
EFI
9700 Richmond
Suite 201
Houston, TX 77042
Fax: (713) 975-7336 Phone: (713) 724-2709
Project: **98410-13709**

Customer ID: ENGF50
Customer PO:
Received: 05/28/03 10:35 AM

EMSL Order: 200305211
EMSL Project ID:

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
Bldg 734	*0001*	5/29/03	<0.4 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

Date Printed: 5/30/03 8:48:03 AM

PBLAB001

00064475

EMSL Analytical

? Cooper St., Westmont, NJ 08108

Phone: (856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

Attn: Alex Nguyen
EFI
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Suite 201
Houston, TX 77042

Fax: (713) 975-7336 Phone: (713) 724-2709

Project: 98410-13709

Customer ID: ENGF50
Customer PO:
Received: 05/28/03 10:35 AM

EMSL Order: 200305212
EMSL Project ID:

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
Bldg 723	*0001*	5/29/03	<0.4 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

Date Printed: 5/30/03 8:47:34 AM

PBW/0004

EMSL Analytical
3 Cooper St., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

Attn:	Alex Nguyen EFI 9700 Richmond Suite 201 Houston, TX 77042	Customer ID:	ENGF50
		Customer PO:	
		Received:	06/03/03 10:30 AM
Fax:	(713) 975-7336 Phone: (713) 724-2709		
Project:	**98410-13709**	EMSL Order:	200305461
		EMSL Project ID:	

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
722-P	*0001*	6/4/03	0.4 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

Date Printed: 6/5/03 8:53:54 AM

PB/w/eDOC

00064478

EMSL Analytical
3 Cooper St., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

Attn: Alex Nguyen
EFI
9700 Richmond
Suite 201
Houston, TX 77042
Fax: (713) 975-7336 Phone: (713) 724-2709
Project: **98410-13709**

Customer ID: ENGF50
Customer PO:
Received: 06/03/03 10:30 AM

EMSL Order: 200305462
EMSL Project ID:

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
725	*0001*	6/4/03	<0.4 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

Date Printed: 6/5/03 8:53:29 AM

PBW/PQCL

00064479

EMSL Analytical
3 Cooper St., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

Attn: Alex Nguyen
EFI
9700 Richmond
Suite 201
Houston, TX 77042
Fax: (713) 975-7336 Phone: (713) 724-2709
Project: **98410-13709**

Customer ID: ENGF50
Customer PO:
Received: 06/03/03 10:30 AM

EMSL Order: 200305463
EMSL Project ID:

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
206	*0001*	6/4/03	0.5 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

Date Printed: 6/5/03 8:52:53 AM

PBW/6.0CH

00064480

EMSL Analytical
3 Cooper St., Westmont, NJ 08108
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Attn: EFI
9700 Richmond
Suite 201
Houston, TX 77042
Fax: (713) 975-7336 Phone: (713) 975-7031
Project: **98410-13709**

Customer ID: ENGF50
Customer PO:
Received: 06/16/03 9:40 AM

EMSL Order: 200306075
EMSL Project ID:

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
201-A	*0001*	6/17/03	<0.4 mg/L
201-R	*0002*	6/17/03	<0.4 mg/L
202	*0003*	6/17/03	<0.4 mg/L
707F	*0004*	6/17/03	<0.4 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

Date Printed: 6/17/03 3:52:47 PM

PB/w/EDD/IH

00064481

EMSL Analytical
3 Cooper St., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

Attn: Alex Nguyen
EFI
9700 Richmond
Suite 201
Houston, TX 77042
Fax: (713) 975-7336 Phone: (713) 724-2709
Project: 98410-13709

Customer ID: ENGF50
Customer PO:
Received: 06/10/03 12:00 PM

EMSL Order: 200305885
EMSL Project ID:

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
Bldg 201	*0001*	6/11/03	<0.4 mg/L
Bldg 203	*0002*	6/11/03	<0.4 mg/L
Bldg 204	*0003*	6/11/03	<0.4 mg/L
Bldg 713 B	*0004*	6/11/03	<0.4 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

Date Printed: 6/11/03 5:41:36 PM

PLM/EPA/600/R-93/116

00064482

EMSL Analytical
3 Cooper St., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

Attn: Alex Nguyen
EFI
9700 Richmond
Suite 201
Houston, TX 77042
Fax: (713) 975-7336 Phone: (713) 724-2709
Project: **98410-13709**

Customer ID: ENGF50
Customer PO:
Received: 06/03/03 10:30 AM

EMSL Order: 200305460
EMSL Project ID:

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
205	*0001*	6/4/03	<0.4 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

Date Printed: 6/5/03 8:54:18 AM

PBW/LQC1

00064483

EMSL Analytical

3 Cooper St., Westmont, NJ 08108

Phone: (856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

Attn: EFI
9700 Richmond
Suite 201
Houston, TX 77042

Fax: (713) 975-7336 Phone: (713) 975-7031

Project: **98410-13709**

Customer ID: ENGF50
Customer PO:
Received: 07/09/03 11:20 AM

EMSL Order: 200307036
EMSL Project ID:

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
Bldg 744	*0001*	7/10/03	0.7 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

Date Printed: 7/10/03 4:26:00 PM

PBlw/o QC

00064484

EMSL Analytical

3 Cooper St., Westmont, NJ 08108

Phone: (856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

Attn: EFI
9700 Richmond
Suite 201
Houston, TX 77042

Fax: (713) 975-7336 Phone: (713) 975-7031

Project: **98410-13709**

Customer ID: ENGF50
Customer PO:
Received: 07/09/03 11:20 AM

EMSL Order: 200307034
EMSL Project ID:

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
Bldg. 716	*0001*	7/10/03	0.5 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

Date Printed: 7/10/03 4:27:46 PM

PB w/o 00

EMSL Analytical
3 Cooper St., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

Attn: EFI
9700 Richmond
Suite 201
Houston, TX 77042
Fax: (713) 975-7336 Phone: (713) 975-7031
Project: **98410-13709**

Customer ID: ENGF50
Customer PO:
Received: 07/09/03 11:20 AM
EMSL Order: 200307034
EMSL Project ID:

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
Bldg. 716	*0001*	7/10/03	0.5 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

Date Printed: 7/10/03 4:27:46 PM

PB w/o 00064485

EMSL Analytical
3 Cooper St., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

Attn:	EFI 9700 Richmond Suite 201 Houston, TX 77042	Customer ID:	ENGF50
		Customer PO:	
		Received:	07/09/03 11:20 AM
Fax:	(713) 975-7336 Phone: (713) 975-7031	EMSL Order:	200307037
Project:	**98410-13709**	EMSL Project ID:	

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
Bldg 714	*0001*	7/10/03	<0.4 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

Report Printed: 7/10/03 4:26:35 PM

PBW/o QC

00064487

EMSL Analytical

3 Cooper St., Westmont, NJ 08108

Phone: (856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

Attn: EFI
9700 Richmond
Suite 201
Houston, TX 77042

Fax: (713) 975-7336 Phone: (713) 975-7031

Project: **98410-13709**

Customer ID: ENGF50
Customer PO:
Received: 07/09/03 11:20 AM

EMSL Order: 200307035
EMSL Project ID:

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
632-A	*0001*	7/10/03	<0.4 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

Date Printed: 7/10/03 4:27:15 PM

PB w/o QC

EMSL Analytical
3 Cooper St., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

Attn: Alex Nguyen
EFI
9700 Richmond
Suite 201
Houston, TX 77042
Fax: (713) 975-7336 Phone: (713) 724-2709
Project: **98410-13709**

Customer ID: ENGF50
Customer PO:
Received: 07/23/03 10:10 AM

EMSL Order: 200307622
EMSL Project ID:

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
630-A	*0001*	7/24/03	<0.4 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

Date Printed: 7/24/03 2:40:21 PM

00064489

EMSL Analytical
3 Cooper St., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

Attn: Alex Nguyen
EFI
9700 Richmond
Suite 201
Houston, TX 77042
Fax: (713) 975-7336 Phone: (713) 724-2709
Project: **98410-13709**

Customer ID: ENGF50
Customer PO:
Received: 07/23/03 10:10 AM

EMSL Order: 200307623
EMSL Project ID:

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
510-B-2	*0001*	7/24/03	<0.4 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP 04653
AIHA: 100194
or other approved signatory

Date Printed: 7/24/03 2:40:53 PM

Rpt w/o QC

00064490

EMSL Analytical
3 Cooper St., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

Attn: Alex Nguyen
EFI
9700 Richmond
Suite 201
Houston, TX 77042
Fax: (713) 975-7336 Phone: (713) 724-2709
Project: **98410-13709**

Customer ID: ENGF50
Customer PO:
Received: 07/23/03 10:10 AM

EMSL Order: 200307620
EMSL Project ID:

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
S 36	*0001*	7/24/03	<0.4 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

Date Printed: 7/24/03 2:39:18 PM

PBW/COC

EMSL Analytical
3 Cooper St., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

Attn: Alex Nguyen
EFI
9700 Richmond
Suite 201
Houston, TX 77042
Fax: (713) 975-7336 Phone: (713) 724-2709
Project: **98410-13709**

Customer ID: ENGF50
Customer PO:
Received: 07/23/03 10:10 AM

EMSL Order: 200307621
EMSL Project ID:

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
TS-10	*0001*	7/24/03	0.6 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

Date Printed: 7/24/03 2:39:51 PM

APPENDIX B

CHAIN OF CUSTODY

00064493

EMSL ANALYTICAL — CHAIN OF CUSTODY — 2030412 . LEAD

vised 7/1/99

EMSL Rep: GARY PERMULTER DATE:

Third party billing requires written authorization from third party

Your Company Name:	EFI	EMSL-Bill to:	ALEX NGUYEN - EFI
Street:	9700 RICHMOND, ST. 210	Street:	9700 RICHMOND, ST. 210
Box #:		Box #:	
City/State:	HOUSTON / TX Zip: 77042	City/State:	HOUSTON, TX Zip: 77042
Phone Results to:		Fax Results to:	
Name:	ALEX NGUYEN	Name:	ALEX NGUYEN
Telephone #:	(713) 975-7031	Fax #:	(713) 975-7336
Project Name/Number:	98410 - 13709	Purchase Order #:	

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water	
Lead Soil +			50 mg/kg (ppm) soil	
	or SW846-6010	ICP	0.1 mg/l water	
			10 mg/kg (ppm) soil	
d in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
Lead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
09-A	GREEN & GRAY WOOD INTERIOR FRAMING		64812-1

Relinquished By; (Person) [signature] Received at EMSL By: [signature]

Date: 5-15-03 Date: 5/19/03 11:15

Note: Please duplicate this form and use additional sheets if necessary.

00064494

EMSL ANALYTICAL — CHAIN OF CUSTODY — LEAD

Revised 7/1/99

2143049111

EMSL Rep: GARY PERMULTER

DATE:

Third party billing requires written authorization from third party

Your Company Name:	EFI	EMSL-Bill to:	ALEX NGUYEN - EFI
Street:	9700 RICHMOND, ST. 210	Street:	9700 RICHMOND, ST. 210
Box #:		Box #:	
City/State:	HOUSTON / TX Zip: 77042	City/State:	HOUSTON, TX Zip: 77042
Phone Results to:		Fax Results to:	
Name:	ALEX NGUYEN	Name:	ALEX NGUYEN
Telephone #:	(713) 975-7031	Fax #:	(713) 975-7336
Project Name/Number:	9840 - 13709	Purchase Order #:	

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water	
Lead Soil +	or SW846-6010	ICP	50 mg/kg (ppm) soil 0.1 mg/l water 10 mg/kg (ppm) soil	
Lead in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
Lead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
T-536	GRAY INTERIOR WOOD		04911-1

Relinquished By; (Person): David R. Pope — Received at EMSL By:

Date: 5-15-03 — Date: 5/19/03 11:15 AM

Note: Please duplicate this form and use additional sheets if necessary.

00064495

2003048 14

EMSL ANALYTICAL — CHAIN OF CUSTODY — LEAD

Revised 7/1/99

EMSL Rep: GARY PERMENTER

DATE:

Your Company Name:	EFI	EMSL-Bill to:	Third party billing requires written authorization from third party
Street:	9700 RICHMOND, ST. 210	Street:	ALEX NGUYEN - EFI 9700 RICHMOND, ST. 210
Box #:		Box #:	
City/State:	HOUSTON / TX Zip: 77042	City/State:	HOUSTON, TX Zip: 77042
Phone Results to: Name:	ALEX NGUYEN	Fax Results to: Name:	ALEX NGUYEN
Telephone #:	(713) 975-7031	Fax #:	(713) 975-7336
Project Name/Number:	9840 - 13709	Purchase Order #:	

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water	
Lead Soil +			50 mg/kg (ppm) soil	
	or SW846-6010	ICP	0.1 mg/l water	
			10 mg/kg (ppm) soil	
d in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
Lead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
726	GREEN PAINTED WOOD FRAME & BASE BOARD		04814-1

Relinquished By; (Person) David R. Pope

Date: 5-15-03

Received at EMSL By:

Date: 5/15/03 11:15A

Note: Please duplicate this form and use additional sheets if necessary.

00064496

EMSL ANALYTICAL — CHAIN OF CUSTODY — LEAD

Revised 7/1/99

120348/13

EMSL Rep: GARY PERMILLER

DATE:

Third party billing requires written authorization from third party

Your Company Name:	EFI	EMSL-Bill to:	ALEX NGUYEN - EFI
Street:	9700 RICHMOND, ST. 210	Street:	9700 RICHMOND, ST. 210
Box #:		Box #:	
City/State:	HOUSTON / TX Zip: 77042	City/State:	HOUSTON, TX Zip: 77042
Phone Results to:		Fax Results to:	
Name:	ALEX NGUYEN	Name:	ALEX NGUYEN
Telephone #:	(713) 975-7031	Fax #:	(713) 975-7336
Project Name/Number:	9840 - 13709	Purchase Order #:	

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water	
Lead Soil +			50 mg/kg (ppm) soil	
	or SW846-6010	ICP	0.1 mg/l water	
			10 mg/kg (ppm) soil	
Lead in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
Lead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
7260	WHITE, BLUE GRAY PAINTED WOOD		64873-1

Relinquished By; (Person) David R. Lee

Date: 5-15-03

Received at EMSL By: LORI

Date: 5/19/03 11:15A

Note: Please duplicate this form and use additional sheets if necessary.

00064497

EMSL ANALYTICAL — CHAIN OF CUSTODY — 260364815. — LEAD

Revised 7/1/99

EMSL Rep: GARY PERMILLER — DATE:

Third party billing requires written authorization from third party

Your Company Name:	EFI	EMSL-Bill to:	ALEX NGUYEN - EFI
Street:	9700 RICHMOND, ST. 210	Street:	9700 RICHMOND, ST. 210
Box #:		Box #:	
City/State:	HOUSTON / TX Zip: 77042	City/State:	HOUSTON, TX Zip: 77042
Phone Results to:		Fax Results to:	
Name:	ALEX NGUYEN	Name:	ALEX NGUYEN
Telephone #:	(713) 975-7031	Fax #:	(713) 975-7336
Project Name/Number:	9840 - 13709	Purchase Order #:	

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water	
Lead Soil +	or SW846-6010	ICP	50 mg/kg (ppm) soil 0.1 mg/l water 10 mg/kg (ppm) soil	
d in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
Lead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
726 C	BEIGE & GREEN WOOD INTERIOR FRAMING		04115-1

Relinquished By; (Person) Daniel R. Pope	Received at EMSL By:
Date: 5-15-03	Date: 5/19/03 1115A

Note: Please duplicate this form and use additional sheets if necessary.

EMSL ANALYTICAL CHAIN OF CUSTODY 20305213 00064498
Revised 7/1/99 LEAD

EMSL Rep: Gary DATE:

Third party billing requires written authorization from third party

Your Company Name:	EFI	EMSL-Bill to:	Alex Nguyen - EFI
Street:	9700 Richmond, St. 210	Street:	9700 Richmond, Suite 210
Box #:		Box #:	
City/State:	Houston, Tx Zip: 77042	City/State:	Houston, Tx Zip: 77042
Phone Results to:		Fax Results to:	
Name:	Alex Nguyen	Name:	Alex Nguyen
Telephone #:	(713) 975-7031	Fax #:	(713) 975-7336
Project Name/Number:	98410-13709	Purchase Order #:	

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water 50 mg/kg (ppm) soil	
Lead Soil +	or SW846-6010	ICP	0.1 mg/l water 10 mg/kg (ppm) soil	
Lead in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
ad in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS -
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
718-A	WOOD FRAME, INTERIOR		05213-1

Relinquished By; (Person) D. Pope	Received at EMSL By:
Date: 5-19-03	Date: 5/20/03 10:35A

Note: Please duplicate this form and use additional sheets if necessary.

00064499

EMSL ANALYTICAL CHAIN OF CUSTODY 20030521Y LEAD

vised 7/1/99

EMSL Rep:	Gary	DATE:	Third party billing requires written authorization from third party
Your Company Name:	EFI	EMSL-Bill to:	Alex Nguyen - EFI
Street:	9700 Richmond, St. 210	Street:	9700 Richmond, Suite 210
Box #:		Box #:	
City/State:	Houston, Tx Zip: 77042	City/State:	Houston, Tx Zip: 77042
Phone Results to: Name:	Alex Nguyen	Fax Results to: Name:	Alex Nguyen
Telephone #:	(713) 975-7031	Fax #:	(713) 975-7336
Project Name/Number:	98410-13709	Purchase Order #:	

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water 50 mg/kg (ppm) soil	
Lead Soil +	or SW846-6010	ICP	0.1 mg/l water 10 mg/kg (ppm) soil	
Lead in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
Lead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS -
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
717	WOOD TAN PAINT INTERIOR FRAME		05214-1

Relinquished By; (Person) O. Pope	Received at EMSL By: Livingston
Date: 5-19-03	Date: 5/20/03 1035

Note: Please duplicate this form and use additional sheets if necessary.

00064500

EMSL ANALYTICAL — CHAIN OF CUSTODY — 2003052 11 — LEAD

vised 7/1/99

EMSL Rep:	Gary	DATE:	Third party billing requires written authorization from third party
Your Company Name:	EFI	EMSL-Bill to:	Alex Nguyen - EFI
Street:	9700 Richmond, St. 210	Street:	9700 Richmond, Suite 210
Box #:		Box #:	
City/State:	Houston, Tx Zip: 77042	City/State:	Houston, Tx Zip: 77042
Phone Results to:		Fax Results to:	
Name:	Alex Nguyen	Name:	Alex Nguyen
Telephone #:	(713) 975-7031	Fax #:	(713) 975-7336
Project Name/Number:	98410-13709	Purchase Order #:	

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water 50 mg/kg (ppm) soil	
Lead Soil +	or SW846-6010	ICP	0.1 mg/l water 10 mg/kg (ppm) soil	
Lead in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
ead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS -
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
Bldg. 734	Comp. paint wood FRAME & INTERIOR		05211-1

Relinquished By; (Person) D. Pope	Received at EMSL By:
Date: 5-20-03	Date: 5/21/03 1-3PM

Note: Please duplicate this form and use additional sheets if necessary.

00064501

EMSL ANALYTICAL — CHAIN OF CUSTODY — 2123052/2 — LEAD

vised 7/1/99

EMSL Rep:	Gary	DATE:	Third party billing requires written authorization from third party
Your Company Name:	EFI	**EMSL-Bill to:**	Alex Nguyen - EFI
Street:	9700 Richmond, St. 210	**Street:**	9700 Richmond, Suite 210
Box #:		**Box #:**	
City/State:	Houston, Tx **Zip:** 77042	**City/State:**	Houston, Tx **Zip:** 77042
Phone Results to:		**Fax Results to:**	
Name:	Alex Nguyen	**Name:**	Alex Nguyen
Telephone #:	(713) 975-7031	**Fax #:**	(713) 975-7336
Project Name/Number:	98410-13709	**Purchase Order #:**	

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water	
Lead Soil +	or SW846-6010	ICP	50 mg/kg (ppm) soil 0.1 mg/l water 10 mg/kg (ppm) soil	
Lead in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
ead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS -
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Tumaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
Bldg. 723	GRAY PAINT WOOD FRAME & INTERIOR		65212-1

Relinquished By; (Person) D. Pope	Received at EMSL By: Lbridges
Date: 5-20-03	Date: 5/20/03

Note: Please duplicate this form and use additional sheets if necessary.

EMSL ANALYTICAL
Revised 7/1/99

CHAIN OF CUSTODY

260305401

00064502
LEAD

EMSL Rep:	Gary	DATE:	Third party billing requires written authorization from third party
Your Company Name:	EFI	EMSL-Bill to:	Alex Nguyen - EFI
Street:	9700 Richmond, St. 210	Street:	9700 Richmond, Suite 210
Box #:		Box #:	
City/State:	Houston, Tx Zip: 77042	City/State:	Houston, Tx Zip: 77042
Phone Results to:		Fax Results to:	
Name:	Alex Nguyen	Name:	Alex Nguyen
Telephone #:	(713) 975-7031	Fax #:	(713) 975-7336
Project Name/Number:	98410-13709	Purchase Order #:	

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water	
Lead Soil +			50 mg/kg (ppm) soil	
	or SW846-6010	ICP	0.1 mg/l water	
			10 mg/kg (ppm) soil	
Lead in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
Lead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS -
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
722-P	WOOD FRAME GRAY/GREEN INTERIOR WOOD		0526 1-1

Relinquished By; (Person) D. Pope	Received at EMSL By:
Date: 5-27-03	Date: 6/3/03 1030h

Note: Please duplicate this form and use additional sheets if necessary.

EMSL ANALYTICAL — CHAIN OF CUSTODY — 20030542 — 00064503 LEAD

Revised 7/1/99

EMSL Rep:	Gary	DATE:	Third party billing requires written authorization from third party
Your Company Name:	EFI	EMSL-Bill to:	Alex Nguyen - EFI
Street:	9700 Richmond, St. 210	Street:	9700 Richmond, Suite 210
Box #:		Box #:	
City/State:	Houston, Tx Zip: 77042	City/State:	Houston, Tx Zip: 77042
Phone Results to:		Fax Results to:	
Name:	Alex Nguyen	Name:	Alex Nguyen
Telephone #:	(713) 975-7031	Fax #:	(713) 975-7336
Project Name/Number:	98410-13709	Purchase Order #:	

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water	
Lead Soil +			50 mg/kg (ppm) soil	
	or SW846-6010	ICP	0.1 mg/l water	
			10 mg/kg (ppm) soil	
Lead in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
ead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS –
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
725	WOOD FRAME GRAY WOOD INTERIOR		65462.1

Relinquished By: (Person) O. Pope — Received at EMSL By:

Date: 5-27-03 — Date: 6/3/03

Note: Please duplicate this form and use additional sheets if necessary.

EMSL ANALYTICAL CHAIN OF CUSTODY 2003542 00064504
vised 7/1/99 LEAD

EMSL Rep: Gary DATE:

Third party billing requires written authorization from third party

Your Company Name: EFI EMSL-Bill to: Alex Nguyen - EFI

Street: 9700 Richmond, St. 210 Street: 9700 Richmond, Suite 210

Box #: Box #:

City/State: Houston, Tx Zip: 77042 City/State: Houston, Tx Zip: 77042

Phone Results to: Fax Results to:

Name: Alex Nguyen Name: Alex Nguyen

Telephone #: (713) 975-7031 Fax #: (713) 975-7336

Project Name/Number: 98410-13709 Purchase Order #:

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water	
			50 mg/kg (ppm) soil	
Lead Soil +	or SW846-6010	ICP	0.1 mg/l water	
			10 mg/kg (ppm) soil	
Lead in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
ead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS -
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
725	WOOD FRAME GRAY WOOD INTERIOR		65462-1

Relinquished By; (Person) D. Pope Received at EMSL By:

Date: 5-27-03 Date: 6/3/03

Note: Please duplicate this form and use additional sheets if necessary.

EMSL ANALYTICAL
Revised 7/1/99

CHAIN OF CUSTODY

2103954C3

00064505
LEAD

EMSL Rep: Gary

DATE:

Third party billing requires written authorization from third party

Your Company Name: EFI

EMSL-Bill to: Alex Nguyen - EFI

Street: 9700 Richmond, St. 210

Street: 9700 Richmond, Suite 210

Box #:

Box #:

City/State: Houston, Tx Zip: 77042

City/State: Houston, Tx Zip: 77042

Phone Results to:
Name: Alex Nguyen
Telephone #: (713) 975-7031
Project Name/Number: 98410-13709

Fax Results to:
Name: Alex Nguyen
Fax #: (713) 975-7336
Purchase Order #:

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water 50 mg/kg (ppm) soil	
Lead Soil +	or SW846-6010	ICP	0.1 mg/l water 10 mg/kg (ppm) soil	
Lead in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
ead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS -
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*,**, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
206	CMU Block Gray		654C3-1
	wood interior		

Relinquished By: (Person) D. Pope

Received at EMSL By:

Date: 5-28-03

Date: 6/3/03

Note: Please duplicate this form and use additional sheets if necessary.

00064506

EMSL ANALYTICAL — CHAIN OF CUSTODY — 260306075 — LEAD

Revised 7/1/99

EMSL Rep: ~~Gary~~ Joe Pontarelli
DATE: 6/13/03

Third party billing requires written authorization from third party

Your Company Name:	EFI	EMSL-Bill to:	Alex Nguyen - EFI
Street:	9700 Richmond, St. 210	Street:	9700 Richmond, Suite 210
Box #:		Box #:	
City/State:	Houston, Tx Zip: 77042	City/State:	Houston, Tx Zip: 77042
Phone Results to:		Fax Results to:	
Name:	Alex Nguyen	Name:	Alex Nguyen
Telephone #:	(713) 975-7031	Fax #:	(713) 975-7336
Project Name/Number:	98410-13709	Purchase Order #:	

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water	
Lead Soil +			50 mg/kg (ppm) soil	
	or SW846-6010	ICP	0.1 mg/l water	
			10 mg/kg (ppm) soil	
Lead in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
Lead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS -
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
2nd-A	WOOD, CARPET, CEILING TILE, GRID, INSULATION, TAR PAPER, Gypsum		606751
R	CONCRETE, WOOD CEILING		2
2	WOOD DOOR, GYPSUM WALLBOARD, INSULATION		3
7F	GYPSUM WALLBOARD, INSULATION, WOOD STUDS.		4

Relinquished By; (Person) Joseph Pontarelli	Received at EMSL By:
Date: 6/13/03	Date: 6/16/03

Note: Please duplicate this form and use additional sheets if necessary.

EMSL ANALYTICAL
Revised 7/1/99

CHAIN OF CUSTODY

20030588

00064507

EMSL Rep: Gary

DATE:

Third party billing requires written authorization from third party

Your Company Name: EFI
Street: 9700 Richmond, St. 210
Box #:
City/State: Houston, Tx Zip: 77042

EMSL-Bill to: Alex Nguyen - EFI
Street: 9700 Richmond, Suite 210
Box #:
City/State: Houston, Tx Zip: 77042

Phone Results to:
Name: Alex Nguyen
Telephone #: (713) 975-7031
Project Name/Number: 98410-13709

Fax Results to:
Name: Alex Nguyen
Fax #: (713) 975-7336
Purchase Order #:

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water	
Lead Soil +			50 mg/kg (ppm) soil	
	or SW846-6010	ICP	0.1 mg/l water	
			10 mg/kg (ppm) soil	
Lead in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
Lead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead ** ✓	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS -
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
BLDG 201	BLDG 201 DECKING INS. WOOD W/PAINT		65855-1
BLDG 203	BLDG 203 DECKING, Roof Support		2
BLDG 204	BLDG 204 DECKING Roof Support		3
BLDG 713 B	BLDG 713B WALLBOARD W/PAINT, INSUL, DECKING		4

Relinquished By; (Person) Joseph Pontello J
Date: 6/6/03

Received at EMSL By: Lorenzo
Date: 6/10/03 12 pm

Note: Please duplicate this form and use additional sheets if necessary.

EMSL ANALYTICAL
vised 7/1/99

CHAIN OF CUSTODY 2030540-

00064508
LEAD

EMSL Rep: Gary
DATE:

Your Company Name: EFI
Street: 9700 Richmond, St. 210
Box #:
City/State: Houston, Tx Zip: 77042

Third party billing requires written authorization from third party

EMSL-Bill to: Alex Nguyen - EFI
Street: 9700 Richmond, Suite 210
Box #:
City/State: Houston, Tx Zip: 77042

Phone Results to:
Name: Alex Nguyen
Telephone #: (713) 975-7031
Project Name/Number: 98410-13709

Fax Results to:
Name: Alex Nguyen
Fax #: (713) 975-7336
Purchase Order #:

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water 50 mg/kg (ppm) soil	
Lead Soil +	or SW846-6010	ICP	0.1 mg/l water 10 mg/kg (ppm) soil	
Lead in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
ead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS -
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
205	CMU Block with limited GRAY wood interior		05460-1

Relinquished By; (Person) D. Pope
Date: 5-28-03

Received at EMSL By:
Date: 6/3/03 1030

Note: Please duplicate this form and use additional sheets if necessary.

00064509

EMSL ANALYTICAL — CHAIN OF CUSTODY — 030703c — LEAD

Revised 7/1/99

EMSL Rep:	Gary	DATE:	Third party billing requires written authorization from third party
Your Company Name:	EFI	EMSL-Bill to:	Alex Nguyen - EFI
Street:	9700 Richmond, St. 210	Street:	9700 Richmond, Suite 210
Box #:		Box #:	
City/State:	Houston, Tx Zip: 77042	City/State:	Houston, Tx Zip: 77042
Phone Results to:		Fax Results to:	
Name:	Alex Nguyen	Name:	Alex Nguyen
Telephone #:	(713) 975-7031	Fax #:	(713) 975-7336
Project Name/Number:	98410-13709	Purchase Order #:	

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water	
Lead Soil +			50 mg/kg (ppm) soil	
	or SW846-6010	ICP	0.1 mg/l water	
			10 mg/kg (ppm) soil	
Lead in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
Lead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS -
	or SW846-6010	ICP	0.1 mg/l (ppm)	WIN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
Bldg 744	Wood interior And Exterior Gray Green		030703c-1

Relinquished By; (Person) J. Pope	Received at EMSL By: Lindsey
Date: 7/3/03	Date: 7/9/03 1020

Note: Please duplicate this form and use additional sheets if necessary.

00064510

EMSL ANALYTICAL — CHAIN OF CUSTODY — 2003 07634 — LEAD

sed 7/1/99

EMSL Rep:	Gary	DATE:	Third party billing requires written authorization from third party
Your Company Name:	EFI	EMSL-Bill to:	Alex Nguyen - EFI
Street:	9700 Richmond, St. 210	Street:	9700 Richmond, Suite 210
Box #:		Box #:	
City/State:	Houston, Tx Zip: 77042	City/State:	Houston, Tx Zip: 77042
Phone Results to:		Fax Results to:	
Name:	Alex Nguyen	Name:	Alex Nguyen
Telephone #:	(713) 975-7031	Fax #:	(713) 975-7336
Project Name/Number:	98410-13709	Purchase Order #:	

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water	
			50 mg/kg (ppm) soil	
Lead Soil +	or SW846-6010	ICP	0.1 mg/l water	
			10 mg/kg (ppm) soil	
Lead in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
Lead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS -
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
Bldg. 716	WOOD FRAME, METAL SIDING		07634-1

Relinquished By; (Person) D. Pope	Received at EMSL By: L. Edwards
Date: 7/3/03	Date: 7/9/03 1120 AM

Note: Please duplicate this form and use additional sheets if necessary.

EMSL ANALYTICAL CHAIN OF CUSTODY 200307037 00064511 LEAD

ised 7/1/99

EMSL Rep: Gary DATE:

Third party billing requires written authorization from third party

Your Company Name: EFI EMSL-Bill to: Alex Nguyen - EFI

Street: 9700 Richmond, St. 210 Street: 9700 Richmond, Suite 210

Box #: Box #:

City/State: Houston, Tx Zip: 77042 City/State: Houston, Tx Zip: 77042

Phone Results to:

Name: Alex Nguyen

Telephone #: (713) 975-7031

Project Name/Number: 98410-13709

Fax Results to:

Name: Alex Nguyen

Fax #: (713) 975-7336

Purchase Order #:

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water 50 mg/kg (ppm) soil	
Lead Soil +	or SW846-6010	ICP	0.1 mg/l water 10 mg/kg (ppm) soil	
Lead in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
d in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS -
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
Bldg. 714	WOOD FELT PAPER INSIDE		07037-1
	GRAY GREEN EXTERIOR		

Relinquished By; (Person) D. Pope Received at EMSL By:

Date: 7/3/03 Date: 7/5/03

Note: Please duplicate this form and use additional sheets if necessary.

EMSL ANALYTICAL CHAIN OF CUSTODY 207635 00064512

...ised 7/1/99 LEAD

EMSL Rep:	Gary	DATE:	Third party billing requires written authorization from third party
Your Company Name:	EFI	EMSL-Bill to:	Alex Nguyen - EFI
Street:	9700 Richmond, St. 210	Street:	9700 Richmond, Suite 210
Box #:		Box #:	
City/State:	Houston, Tx Zip: 77042	City/State:	Houston, Tx Zip: 77042
Phone Results to:		Fax Results to:	
Name:	Alex Nguyen	Name:	Alex Nguyen
Telephone #:	(713) 975-7031	Fax #:	(713) 975-7336
Project Name/Number:	98410-13709	Purchase Order #:	

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water	
Lead Soil +	or SW846-6010	ICP	50 mg/kg (ppm) soil 0.1 mg/l water 10 mg/kg (ppm) soil	
Lead in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
d in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS -
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
632-A	Concrete Block Tank		67035-1
	wood walkway		

...quished By; (Person) D. Pope	Received at EMSL By: L Wright
Date: 7/3/03	Date: 7/9/03 11:20

Note: Please duplicate this form and use additional sheets if necessary.

00064513

EMSL ANALYTICAL — CHAIN OF CUSTODY — LEAD

2003/07/22

Revised 7/1/99

EMSL Rep:	Gary	DATE:	Third party billing requires written authorization from third party
Your Company Name:	EFI	EMSL-Bill to:	Alex Nguyen - EFI
Street:	9700 Richmond, St. 210	Street:	9700 Richmond, Suite 210
Box #:		Box #:	
City/State:	Houston, Tx Zip: 77042	City/State:	Houston, Tx Zip: 77042
Phone Results to:		Fax Results to:	
Name:	Alex Nguyen	Name:	Alex Nguyen
Telephone #:	(713) 975-7031	Fax #:	(713) 975-7336
Project Name/Number:	98410-13709	Purchase Order #:	

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water 50 mg/kg (ppm) soil	
Lead Soil +	or SW846-6010	ICP	0.1 mg/l water 10 mg/kg (ppm) soil	
in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
Lead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS -
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
630-A	CMU-Block w/ Tin Roof		07622-1
	Wood Door		

Relinquished By; (Person) D. Pope	Received at EMSL By: L. Rhoden
Date:	Date: 7/23/03 1010

Note: Please duplicate this form and use additional sheets if necessary.

00064514

2030623

EMSL ANALYTICAL — CHAIN OF CUSTODY — LEAD

Revised 7/1/99

EMSL Rep: Gary

DATE:

Third party billing requires written authorization from third party

Your Company Name:	EFI	EMSL-Bill to:	Alex Nguyen - EFI
Street:	9700 Richmond, St. 210	Street:	9700 Richmond, Suite 210
Box #:		Box #:	
City/State:	Houston, Tx Zip: 77042	City/State:	Houston, Tx Zip: 77042
Phone Results to:		Fax Results to:	
Name:	Alex Nguyen	Name:	Alex Nguyen
Telephone #:	(713) 975-7031	Fax #:	(713) 975-7336
Project Name/Number:	98410-13709	Purchase Order #:	

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water 50 mg/kg (ppm) soil	
Lead Soil +	or SW846-6010	ICP	0.1 mg/l water 10 mg/kg (ppm) soil	
in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
Lead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS –
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
510-B-2	Wood Fascia, Trim, Siding and Roof		07623-1

Relinquished By; (Person) D. Pope	Received at EMSL By:
Date:	Date: 7/23/13 10:10 A

Note: Please duplicate this form and use additional sheets if necessary.

00064515

EMSL ANALYTICAL — CHAIN OF CUSTODY — 20030720 — LEAD

Revised 7/1/99

EMSL Rep:	Gary	DATE:	Third party billing requires written authorization from third party
Your Company Name:	EFI	EMSL-Bill to:	Alex Nguyen - EFI
Street:	9700 Richmond, St. 210	Street:	9700 Richmond, Suite 210
Box #:		Box #:	
City/State:	Houston, Tx Zip: 77042	City/State:	Houston, Tx Zip: 77042
Phone Results to: Name:	Alex Nguyen	Fax Results to: Name:	Alex Nguyen
Telephone #:	(713) 975-7031	Fax #:	(713) 975-7336
Project Name/Number:	98410-13709	Purchase Order #:	

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water 50 mg/kg (ppm) soil	
Lead Soil +	or SW846-6010	ICP	0.1 mg/l water 10 mg/kg (ppm) soil	
in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
Lead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS -
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
S 36	WOOD FRAME WOOD Siding, TRANSITE ROOF		07020-1

Relinquished By; (Person) D. Pope	Received at EMSL By: L. Ring
Date:	Date: 7/23/03 1010 L

Note: Please duplicate this form and use additional sheets if necessary.

20030721

00064516

EMSL ANALYTICAL — CHAIN OF CUSTODY — LEAD

Revised 7/1/99

EMSL Rep: Gary

DATE:

Third party billing requires written authorization from third party

Your Company Name:	EFI	EMSL-Bill to:	Alex Nguyen - EFI
Street:	9700 Richmond, St. 210	Street:	9700 Richmond, Suite 210
Box #:		Box #:	
City/State:	Houston, Tx Zip: 77042	City/State:	Houston, Tx Zip: 77042
Phone Results to:		Fax Results to:	
Name:	Alex Nguyen	Name:	Alex Nguyen
Telephone #:	(713) 975-7031	Fax #:	(713) 975-7336
Project Name/Number:	98410-13709	Purchase Order #:	

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water 50 mg/kg (ppm) soil	
Lead Soil +	or SW846-6010	ICP	0.1 mg/l water 10 mg/kg (ppm) soil	
in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
Lead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS -
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
TS-10	SMALL WOOD Bldg. TIN ROOF		07621-1

Relinquished By; (Person) D. Pope	Received at EMSL By: L Rodriguez
Date:	Date: 7/23/03 1010

Note: Please duplicate this form and use additional sheets if necessary.

EFI
Engineering and Fire
Investigations

9700 Richmond
Suite 201
Houston, TX 77042
Tel: 866-464-2127
Fax: 713-975-7336
www.efiinfo.com

August 18, 2003

Mr. Michael Luczak
ARC Abatement, Inc.
6630 Roxburgh Drive, Suite 130
Houston, Texas 77041

Subject: **TRANSMITTAL OF ANALYTICAL RESULTS No. 5**
Longhorn Army Ammunition Plant – (TCLP Testing, Phase II)
Karnack, Texas 77055
EFI PROJECT NO. 98410-13709

Dear Mr. Luczak:

Engineering and Fire Investigations (EFI) has completed sampling and analysis for Toxicity Characteristic Leaching Procedure (TCLP) of demolition debris sample suspect for lead-based paint from a total of 5 buildings (a 10% representative of the "811-Buildings"). These samples were collected as composite samples (i.e. building materials used in their construction) per building. This work was performed at the verbal request of Mr. Michael Luczak of ARC Abatement, Inc.

The samples were analyzed by our subcontract laboratory (EMSL Analytical in Westmont, New Jersey) using test methods SW846-1311/7420 to determine leachable concentrations of lead by use of Flame Atomic Absorption.

Based on the results TCLP lead concentrations of the 5 buildings tested (Bldgs. 811-2, 811-20, 811-30, 811-47, & 811-39), which represent 10% of the "811-Building" on site, were below 5mg/l. Environmental Protection Agency (EPA) defines that waste materials with concentrations of leachable lead below 5 mg/l as non-hazardous and can be disposed of as construction materials.

A complete analytical report is presented in Appendix A. In addition, we have included the chain of custody for the samples collected in Appendix B.

We appreciate the opportunity to provide consulting services to ARC Abatement, Inc. in this matter. If there are any questions, please contact us.

Sincerely,
ENGINEERING AND FIRE INVESTIGATIONS

Cuong Nguyen
Project Manager

Lee A. Burckle, P.E.
Branch Manager

Attachments: Appendix A – Laboratory Result Sheets
Appendix B – Chain Of Custody

CN/cn(e:\projects 2003\Longhorn Army Ammunition Plant\TCLP Sampling – Transrpt5.doc

APPENDIX A

LABORATORY RESULT SHEETS

EMSL Analytical
3 Cooper St., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

Attn:	Alex Nguyen EFI 9700 Richmond Suite 201 Houston, TX 77042	Customer ID:	ENGF50
		Customer PO:	
		Received:	07/29/03 10:25 AM
Fax:	(713) 975-7336	Phone: (713) 724-2709	
Project:	**98410-13709**	EMSL Order:	200307882
		EMSL Project ID:	

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
811-2	*0001*	7/30/03	<0.4 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

Date Printed: 7/30/03 3:34:14 PM

PO w/o [illegible]

00064520

EMSL Analytical
3 Cooper St., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

Attn: Alex Nguyen
EFI
9700 Richmond
Suite 201
Houston, TX 77042
Fax: (713) 975-7336 Phone: (713) 724-2709
Project: **98410-13709**

Customer ID: ENGF50
Customer PO:
Received: 07/29/03 10:25 AM

EMSL Order: 200307883
EMSL Project ID:

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
811-20	*0001*	7/30/03	<0.4 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04853
AIHA: 100194
or other approved signatory

Date Printed: 7/30/03 3:35:06 PM

EMSL Analytical
3 Cooper St., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

Attn:	Alex Nguyen EFI 9700 Richmond Suite 201 Houston, TX 77042	Customer ID:	ENGF50
		Customer PO:	
		Received:	07/29/03 10:25 AM
Fax:	(713) 975-7336	Phone: (713) 724-2709	
Project:	98410-13709	EMSL Order:	200307884
		EMSL Project ID:	

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
811-30	*0001*	7/30/03	<0.4 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

Date Printed: 7/30/03 3:35:35 PM

PB w/o Q

EMSL Analytical
3 Cooper St., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

Attn: Alex Nguyen
EFI
9700 Richmond
Suite 201
Houston, TX 77042
Fax: (713) 975-7336 Phone: (713) 724-2709
Project: **98410-13709**

Customer ID: ENGF50
Customer PO:
Received: 07/29/03 10:25 AM

EMSL Order: 200307886
EMSL Project ID:

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
811-47	*0001*	7/30/03	<0.4 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

Date Printed: 7/30/03 3:38:31 PM

EMSL Analytical
3 Cooper St., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

Attn:	Alex Nguyen EFI 9700 Richmond Suite 201 Houston, TX 77042	Customer ID:	ENGF50
		Customer PO:	
		Received:	07/29/03 10:25 AM
Fax:	(713) 975-7336 Phone: (713) 724-2709	EMSL Order:	200307885
Project:	**98410-13709**	EMSL Project ID:	

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
811-39	*0001*	7/30/03	<0.4 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

Date Printed: 7/30/03 3:36:06 PM

APPENDIX B

CHAIN OF CUSTODY

Jan-7582 · 00064525

EMSL ANALYTICAL — CHAIN OF CUSTODY — LEAD

sed 7/1/99

EMSL Rep: Gary

DATE:

Third party billing requires written authorization from third party

Your Company Name: EFI

EMSL-Bill to: Alex Nguyen - EFI

Street: 9700 Richmond, St. 210

Street: 9700 Richmond, Suite 210

Box #:

Box #:

City/State: Houston, Tx Zip: 77042

City/State: Houston, Tx Zip: 77042

Phone Results to:

Name: Alex Nguyen

Telephone #: (713) 975-7031

Project Name/Number: 98410-13709

Fax Results to:

Name: Alex Nguyen

Fax #: (713) 975-7336

Purchase Order #:

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water 50 mg/kg (ppm) soil	
Lead Soil +	or SW846-6010	ICP	0.1 mg/l water 10 mg/kg (ppm) soil	
ad in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
ead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS -
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
811-2	CONCRETE SIDES & FLOOR		07582-1
	WOOD FRONT & REAR		
	SHEETROCK WOOD ROOF		

Relinquished By; (Person) DP.

Received at EMSL By: Livingston

Date: 7-24-03

Date: 7/24/03 10:25

Note: Please duplicate this form and use additional sheets if necessary.

00064526

EMSL ANALYTICAL CHAIN OF CUSTODY 20030583 LEAD

Revised 7/1/99

EMSL Rep:	Gary	DATE:	Third party billing requires written authorization from third party
Your Company Name:	EFI	EMSL-Bill to:	Alex Nguyen - EFI
Street:	9700 Richmond, St. 210	Street:	9700 Richmond, Suite 210
Box #:		Box #:	
City/State:	Houston, Tx Zip: 77042	City/State:	Houston, Tx Zip: 77042
Phone Results to: Name:	Alex Nguyen	Fax Results to: Name:	Alex Nguyen
Telephone #:	(713) 975-7031	Fax #:	(713) 975-7336
Project Name/Number:	98410-13709	Purchase Order #:	

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water	
Lead Soil +			50 mg/kg (ppm) soil	
	or SW846-6010	ICP	0.1 mg/l water	
			10 mg/kg (ppm) soil	
Lead in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
Lead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS –
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
811-20	CONCRETE SIDES & FLOOR		07883-1
	WOOD FRONT & REAR		
	SHEETROCK WOOD ROOF		

Relinquished By; (Person)	Received at EMSL By:
Date: 7-24-03	Date: 7/29/03 1035

Note: Please duplicate this form and use additional sheets if necessary.

00064527

EMSL ANALYTICAL CHAIN OF CUSTODY 20307884 LEAD

sed 7/1/99

EMSL Rep: Gary DATE:

Third party billing requires written authorization from third party

Your Company Name: EFI EMSL-Bill to: Alex Nguyen - EFI

Street: 9700 Richmond, St. 210 Street: 9700 Richmond, Suite 210

Box #: Box #:

City/State: Houston, Tx Zip: 77042 City/State: Houston, Tx Zip: 77042

Phone Results to: Fax Results to:

Name: Alex Nguyen Name: Alex Nguyen

Telephone #: (713) 975-7031 Fax #: (713) 975-7336

Project Name/Number: 98410-13709 Purchase Order #:

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water 50 mg/kg (ppm) soil	
Lead Soil +	or SW846-6010	ICP	0.1 mg/l water 10 mg/kg (ppm) soil	
Lead in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
d in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS –
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
811-30	CONCRETE SIDES & FLOOR		07584-1
	WOOD FRONT & REAR		
	SHEETROCK WOOD ROOF		

Relinquished By; (Person) DP. Received at EMSL By:

Date: Date: 7/29/03

Note: Please duplicate this form and use additional sheets if necessary.

00064528

EMSL ANALYTICAL CHAIN OF CUSTODY 20807882 LEAD

Revised 7/1/99

EMSL Rep: Gary

DATE:

Third party billing requires written authorization from third party

Your Company Name: EFI

EMSL-Bill to: Alex Nguyen - EFI

Street: 9700 Richmond, St. 210

Street: 9700 Richmond, Suite 210

Box #:

Box #:

City/State: Houston, Tx Zip: 77942

City/State: Houston, Tx Zip: 77042

Phone Results to:

Name: Alex Nguyen

Telephone #: (713) 975-7031

Project Name/Number: 98410-13709

Fax Results to:

Name: Alex Nguyen

Fax #: (713) 975-7336

Purchase Order #:

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water 50 mg/kg (ppm) soil	
Lead Soil +	or SW846-6010	ICP	0.1 mg/l water 10 mg/kg (ppm) soil	
Lead in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS -
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
811-47	CONCRETE SIDES & FLOOR		07882-1
	WOOD FRONT & REAR		
	SHEETROCK WOOD ROOF		

Relinquished By; (Person) D.P.

Received at EMSL By:

Date:

Date: 7/14/03

Note: Please duplicate this form and use additional sheets if necessary.

00064529

EMSL ANALYTICAL — CHAIN OF CUSTODY — 2030785 LEAD

Revised 7/1/99

EMSL Rep:	Gary	DATE:	Third party billing requires written authorization from third party
Your Company Name:	EFI	EMSL-Bill to:	Alex Nguyen - EFI
Street:	9700 Richmond, St. 210	Street:	9700 Richmond, Suite 210
Box #:		Box #:	
City/State:	Houston, Tx Zip: 77042	City/State:	Houston, Tx Zip: 77042
Phone Results to: Name:	Alex Nguyen	Fax Results to: Name:	Alex Nguyen
Telephone #:	(713) 975-7031	Fax #:	(713) 975-7336
Project Name/Number:	98410-13709	Purchase Order #:	

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water	
Lead Soil +			50 mg/kg (ppm) soil	
	or SW846-6010	ICP	0.1 mg/l water	
			10 mg/kg (ppm) soil	
Lead in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
Lead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS –
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule,
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
811-39	CONCRETE SIDES & FLOOR		07585-1
	WOOD FRONT & REAR		
	SHEETROCK WOOD ROOF		

Relinquished By; (Person)	Received at EMSL By:
Date:	Date: 7/25/13 10:55 AM

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00064530

EFI®
Engineering and Fire
Investigations

9700 Richmond
Suite 201
Houston, TX 77042
Tel: 866-464-2127
Fax: 713-975-7336
www.efiinfo.com

December 16, 2003

Mr. Michael Luczak
ARC Abatement, Inc.
6630 Roxburgh Drive, Suite 130
Houston, Texas 77041

Subject: **TRANSMITTAL OF ANALYTICAL RESULTS No. 6**
Longhorn Army Ammunition Plant – (TCLP Testing, Phase II)
Karnack, Texas 77055
EFI PROJECT NO. 98410-13709

Dear Mr. Luczak:

Engineering and Fire Investigations (EFI) has completed sampling and analysis for Toxicity Characteristic Leaching Procedure (TCLP) of demolition debris sample suspect for lead-based paint from a total of 35 buildings. These samples were collected as composite samples (i.e. building materials used in their construction) per building. This work was performed at the verbal request of Mr. Michael Luczak of ARC Abatement, Inc.

The samples were analyzed by our subcontract laboratory (EMSL Analytical in Westmont, New Jersey) using test methods SW846-1311/7420 to determine leachable concentrations of lead by use of Flame Atomic Absorption.

Based on the results TCLP lead concentrations of the 35 buildings tested (Bldgs. 413-A, 704-D, 707-G, 707-J, 713, 722E, 722F, 715, 205, 201, 203, 204, 713B, 744-A, 272, 813, 814, 815, 4-Y-2, 3Y, 29Y, 32Y, 48Y, 45Y, 34Y, 38Y, 40Y, TS-87, 18-Y-1, 18Y, 16Y, 16-Y-1, 13-Y-1, 16-Y-2 and Y-Area Walkways) were below 5mg/l. Environmental Protection Agency (EPA) defines that waste materials with concentrations of leachable lead below 5 mg/l as non-hazardous and can be disposed of as construction materials.

A complete analytical report is presented in Appendix A. In addition, we have included the chain of custody for the samples collected in Appendix B.

We appreciate the opportunity to provide consulting services to ARC Abatement, Inc. in this matter. If there are any questions, please contact us.

Sincerely,
ENGINEERING AND FIRE INVESTIGATIONS

Cuong Nguyen
Project Manager

Lee A. Burckle, P.E.
Branch Manager

Attachments: Appendix A – Laboratory Result Sheets
Appendix B – Chain Of Custody

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APPENDIX A

LABORATORY RESULT SHEETS

EMSL Analytical
3 Cooper St., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

00064532

EMSL

Attn: EFI
9700 Richmond
Suite 201
Houston, TX 77042
Fax: (713) 975-7336 Phone: (713) 975-7031
Project: 98410-13709

Customer ID: ENGF50
Customer PO:
Received: 06/23/03 10:50 AM

EMSL Order: 200306372
EMSL Project ID:

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
Bldg 713-A	*0001*	6/24/03	<0.4 mg/L
Bldg 704-D	*0002*	6/24/03	<0.4 mg/L
Bldg 707-G	*0003*	6/24/03	<0.4 mg/L
Bldg 707-J	*0004*	6/24/03	<0.4 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

Date Printed: 6/24/03 1:12:37 PM

EMSL Analytical
3 Cooper St., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-9851 Email: gmiller1@emsl.com

0064533

Attn:	EFI 9700 Richmond Suite 201 Houston, TX 77042		Customer ID:	ENGF50	
			Customer PO:		
			Received:	06/30/03 11:25 AM	
Fax:	(713) 975-7336	Phone: (713) 975-7031	EMSL Order:	200306675	
Project:	98410-13709		EMSL Project ID:		

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
Bldg 713	0001	7/1/03	0.4 mg/L
Bldg 722 E	0002	7/1/03	0.5 mg/L
Bldg 722 F	0003	7/1/03	0.6 mg/L
Bldg 715	0004	7/1/03	<0.4 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

Date Printed: 7/1/03 2:05:23 PM

PB w/ QC

EMSL Analytical
3 Cooper St., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-4851 Email: gmiller1@emsl.com

00064534

EMSL

Attn: Alex Nguyen
EFI
9700 Richmond
Suite 201
Houston, TX 77042
Fax: (713) 975-7336 Phone: (713) 724-2709
Project: 98410-13709

Customer ID: ENGF50
Customer PO:
Received: 06/03/03 10:30 AM

EMSL Order: 200305460
EMSL Project ID:

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
205	0001	6/4/03	<0.4 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

Date Printed: 6/5/03 8:54:18 AM

EMSL Analytical
3 Cooper St., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

00064535

EMSL

Attn: Alex Nguyen
EFI,
9700 Richmond
Suite 201
Houston, TX 77042
Fax: (713) 975-7336 Phone: (713) 724-2709
Project: 98410-13709

Customer ID: ENGF50
Customer PO:
Received: 06/10/03 12:00 PM

EMSL Order: 200305885
EMSL Project ID:

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
Bldg 201	0001	6/11/03	<0.4 mg/L
Bldg 203	0002	6/11/03	<0.4 mg/L
Bldg 204	0003	6/11/03	<0.4 mg/L
Bldg 713 B	0004	6/11/03	<0.4 mg/L

Gerald J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

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EMSL Analytical
3 Cooper St., Westmont, NJ 08108
(856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

00064536

Attn:	Alex Nguyen EFI 9700 Richmond Suite 201 Houston, TX 77042		Customer ID: Customer PO: Received:	ENGF50 08/12/03 1:30 PM	
Fax:	(713) 975-7336	Phone: (713) 724-2709	EMSL Order:	200308677	
Project:	**98410-13709**		EMSL Project ID:		

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
744-A	*0001*	8/13/03	<0.4 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

Date Printed: 8/13/03 1:16:18 PM

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EMSL Analytical
3 Cooper St., Westmont, NJ 08108
(856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

00064537

Attn: Alex Nguyen
EFI
9700 Richmond
Suite 201
Houston, TX 77042
Fax: (713) 975-7336 Phone: (713) 724-2709
Project: 98410-13709

Customer ID: ENGF50
Customer PO:
Received: 08/12/03 1:30 PM

EMSL Order: 200308676
EMSL Project ID:

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
272	*0001*	8/13/03	<0.4 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

Date Printed: 8/13/03 1:15:48 PM

PE w/o PO

EMSL Analytical
3 Cooper St., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

00064538

Attn:	Alex Nguyen EFI 9700 Richmond Suite 201 Houston, TX 77042			Customer ID:	ENGF50
				Customer PO:	
				Received:	08/20/03 10:00 AM
Fax:	(713) 975-7336	Phone:	(713) 724-2709	EMSL Order:	200309073
Project:	98410-13709/ Bldg. 813			EMSL Project ID:	

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
Bldg. 813	*0001*	8/21/03	<0.4 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

Date Printed: 8/21/03 3:18:07 PM

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EMSL Analytical
3 Cooper St., Westmont, NJ 08108
(856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

00064539

Attn:	Alex Nguyen EFI 9700 Richmond Suite 201 Houston, TX 77042			Customer ID:	ENGF50
				Customer PO:	
				Received:	08/20/03 10:00 AM
Fax:	(713) 975-7336	Phone:	(713) 724-2709	EMSL Order:	200309072
Project:	98410-13709/ Bldg 814			EMSL Project ID:	

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
Bldg 814	*0001*	8/21/03	<0.4 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

Date Printed: 8/21/03 3:14:37 PM

PB w/o QC

EMSL Analytical
3 Cooper St., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

00064540

Attn:	Alex Nguyen EFI 9700 Richmond Suite 201 Houston, TX 77042	Customer ID:	ENGF50
		Customer PO:	
		Received:	08/20/03 10:00 AM
Fax:	(713) 975-7336 Phone: (713) 724-2709	EMSL Order:	200309071
Project:	**98410-13709/ Bldg 815**	EMSL Project ID:	

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
Bldg 815	*0001*	8/21/03	<0.4 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

Date Printed: 8/21/03 3:13:56 PM

EMSL Analytical
3 Cooper St., Westmont, NJ 08108
(856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@ernsl.com

00064541

Attn:	Alex Nguyen EFI 9700 Richmond Suite 201 Houston, TX 77042			Customer ID:	ENGF50
				Customer PO:	
				Received:	09/24/03 2:50 PM
Fax:	(713) 975-7336	Phone:	(713) 724-2709	EMSL Order:	200310748
Project:	98410-13709			EMSL Project ID:	

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
4-Y-2	*0001*	9/26/03	<0.4 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

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PB/w/o QC

EMSL Analytical
3 Cooper St., Westmont, NJ 08108
(856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

00064542

Attn:	Alex Nguyen EFI 9700 Richmond Suite 201 Houston, TX 77042		Customer ID:	ENGF50	
			Customer PO:		
			Received:	09/24/03 11:45 AM	
Fax:	(713) 975-7336	Phone: (713) 724-2709	EMSL Order:	200310734	
Project:	**98410-13709/ Bldg 3Y**		EMSL Project ID:		

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
3 Y	*0001*	9/26/03	<0.4 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

Date Printed: 9/26/03 4:03:55 PM

PR w/o QC

EMSL Analytical
3 Cooper St., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

03064543

Attn:	Alex Nguyen EFI 9700 Richmond Suite 201 Houston, TX 77042			Customer ID:	ENGF50
				Customer PO:	
				Received:	10/13/03 10:30 AM
Fax:	(713) 975-7336	Phone:	(713) 724-2709	EMSL Order:	200311655
Project:	**98410-13709**			EMSL Project ID:	

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
29 Y	*0001*	10/15/03	<0.4 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

Date Printed: 10/15/03 9:08:04 AM

PB w/o QC

EMSL Analytical
3 Cooper St., Westmont, NJ 08108
(856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

00064544

Attn:	Alex Nguyen EFI 9700 Richmond Suite 201 Houston, TX 77042			Customer ID:	ENGF50
				Customer PO:	
				Received:	10/13/03 10:30 AM
Fax:	(713) 975-7336	Phone:	(713) 724-2709	EMSL Order:	200311656
Project:	**98410-13709**			EMSL Project ID:	

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
32 Y	*0001*	10/15/03	<0.4 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

Water Blank 10/15/03 9:08:41 AM
PB w/o QC

EMSL Analytical
3 Cooper St., Westmont, NJ 08108
(856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

00064545

Attn:	Alex Nguyen EFI 9700 Richmond Suite 201 Houston, TX 77042		Customer ID:	ENGF50	
			Customer PO:		
			Received:	10/13/03 10:30 AM	
Fax:	(713) 975-7336	Phone: (713) 724-2709	EMSL Order:	200311657	
Project:	98410-13709		EMSL Project ID:		

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
48 Y	*0001*	10/15/03	<0.4 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

Initial Prepped: 10/15/03 9:09:19 AM

PB w/o QC

EMSL Analytical
3 Cooper St., Westmont, NJ 08108
(856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

00064546

Attn:	Alex Nguyen EFI 9700 Richmond Suite 201 Houston, TX 77042		Customer ID:	ENGF50	
			Customer PO:		
			Received:	10/15/03 11:45 AM	
Fax:	(713) 975-7336	Phone: (713) 724-2709	EMSL Order:	200311764	
Project:	98410-13709		EMSL Project ID:		

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
Bldg 45 Y	*0001*	10/17/03	<0.4 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

Date Printed: 10/17/03 2:02:36 PM

PE w/o 10/...

EMSL Analytical
3 Cooper St., Westmont, NJ 08108
(856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

00064547

Attn: Alex Nguyen
EFI
9700 Richmond
Suite 201
Houston, TX 77042
Fax: (713) 975-7336 Phone: (713) 724-2709
Project: 98410-13709

Customer ID: ENGF50
Customer PO:
Received: 10/15/03 11:45 AM

EMSL Order: 200311763
EMSL Project ID:

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
Bldg 34 Y	*0001*	10/17/03	<0.4 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

Date Printed: 10/17/03 2:03:11 PM

PB w/o QC

EMSL Analytical
3 Cooper St., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

00064548

Attn: Alex Nguyen
EFI
9700 Richmond
Suite 201
Houston, TX 77042
Fax: (713) 975-7336 Phone: (713) 724-2709
Project: 98410-13709

Customer ID: ENGF50
Customer PO:
Received: 10/15/03 11:45 AM

EMSL Order: 200311761
EMSL Project ID:

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
Bldg 38 Y	*0001*	10/17/03	<0.4 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

Date Printed: 10/17/03 2:03:58 PM

PB w/o 00

EMSL Analytical
3 Cooper St., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

00064549

Attn:	Alex Nguyen EFI 9700 Richmond Suite 201 Houston, TX 77042			Customer ID: Customer PO: Received:	ENGF50 11/10/03 11:19 AM
Fax:	(713) 975-7336	Phone:	(713) 724-2709	EMSL Order:	200312912
Project:	98410-13709			EMSL Project ID:	

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
40Y	*0001*	11/11/03	<0.4 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

Data Printed: 11/11/03 1:16:49 PM

PB/wlo 00:1

EMSL Analytical
3 Cooper St., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

00064550

Attn: Alex Nguyen
EFI
9700 Richmond
Suite 201
Houston, TX 77042
Fax: (713) 975-7336 Phone: (713) 724-2709
Project: 98410-13709

Customer ID: ENGF50
Customer PO:
Received: 11/10/03 11:19 AM

EMSL Order: 200312909
EMSL Project ID:

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
TS-87	*0001*	11/11/03	<0.4 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

Date Printed: 11/11/03 1:18:57 PM

PB w/o QC

EMSL Analytical
3 Cooper St., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

00064551

Attn:	Alex Nguyen EFI 9700 Richmond Suite 201 Houston, TX 77042	Customer ID:	ENGF50
		Customer PO:	
		Received:	09/22/03 11:25 AM
Fax:	(713) 975-7336 Phone: (713) 724-2709	EMSL Order:	200310581
Project:	98410-13709	EMSL Project ID:	

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
18 Y-1	0001	9/23/03	<0.4 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

Date Printed: 9/23/03 4:50:43 PM

PB w/o QC

EMSL Analytical
3 Cooper St., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

00064552

Attn:	Alex Nguyen EFI 9700 Richmond Suite 201 Houston, TX 77042	Customer ID:	ENGF50
		Customer PO:	
		Received:	09/22/03 11:25 AM
Fax:	(713) 975-7336	Phone: (713) 724-2709	
Project:	98410-13709	EMSL Order:	200310580
		EMSL Project ID:	

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
18 Y	*0001*	9/23/03	<0.4 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

Date Printed: 9/23/03 4:50:13 PM

PB w/o QC

EMSL Analytical
3 Cooper St., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

00064553

Attn:	Alex Nguyen EFI 9700 Richmond Suite 201 Houston, TX 77042		Customer ID:	ENGF50	
			Customer PO:		
			Received:	09/22/03 11:25 AM	
Fax:	(713) 975-7336	Phone: (713) 724-2709	EMSL Order:	200310579	
Project:	98410-13709		EMSL Project ID:		

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
16 Y	*0001*	9/23/03	<0.4 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

Date Printed: 9/23/03 4:49:40 PM

PB w/o QC

EMSL Analytical
3 Cooper St., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

00064554

Attn: Alex Nguyen
EFI
9700 Richmond
Suite 201
Houston, TX 77042
Fax: (713) 975-7336 Phone: (713) 724-2709
Project: 98410-13709

Customer ID: ENGF50
Customer PO:
Received: 11/10/03 11:19 AM

EMSL Order: 200312913
EMSL Project ID:

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
16 Y-1	0001	11/11/03	<0.4 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

Date Printed: 11/11/03 1:19:30 PM

PB/w/o QC

EMSL Analytical
3 Cooper St., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-9551 Email: gmiller1@emsl.com

00064555

Attn:	Alex Nguyen EFI 9700 Richmond Suite 201 Houston, TX 77042	Customer ID:	ENGF50
		Customer PO:	
		Received:	11/20/03 1:54 PM
Fax:	(713) 975-7336 Phone: (713) 724-2709	EMSL Order:	200313449
Project:	**98410-13709**	EMSL Project ID:	

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
13Y-1	*0001*	11/21/03	<0.4 mg/L
Y-Area Walkways	*0002*	11/21/03	<0.4 mg/L
16-Y-2	*0003*	11/21/03	<0.4 mg/L

Gerold J. Miller, Ph.D.
Laboratory Director
NJ-NELAP: 04653
AIHA: 100194
or other approved signatory

Date Printed: 11/24/03 11:56:24 AM

PB w/o QC

APPENDIX B

CHAIN OF CUSTODY

00064557

EMSL ANALYTICAL — CHAIN OF CUSTODY — LEAD

vised 7/1/99

EMSL Rep: Gary

DATE:

Third party billing requires written authorization from third party

Your Company Name: EFI

EMSL-Bill to: Alex Nguyen - EFI

Street: 9700 Richmond, St. 210

Street: 9700 Richmond, Suite 210

Box #:

Box #:

City/State: Houston, Tx Zip: 77042

City/State: Houston, Tx Zip: 77042

Phone Results to:

Name: Alex Nguyen

Telephone #: (713) 975-7031

Project Name/Number: 98410-13709

Fax Results to:

Name: Alex Nguyen

Fax #: (713) 975-7336

Purchase Order #:

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water 50 mg/kg (ppm) soil	
Lead Soil +	or SW846-6010	ICP	0.1 mg/l water 10 mg/kg (ppm) soil	
Lead in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
ead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS -
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
BLDG.413-A: WOOD FRAME, INSULATION, CONCRETE, METAL PANELS ON EXT. WALLS			
BLDG. 704-D: FIBER BOARD WALLS, WATER PROOF SHEET, WOOD FRAME, CEILING TILE, FL. TILE.			
BLDG 707-G: WOOD FRAME, GYPSUM WALLS + CEILING, INSULATION			
BLDG. 707-J: WOOD FRAME, GYPSUM WALLS + CEILING, INSULATION			

Relinquished By; (Person) Joseph Bonterello Jr

Received at EMSL By:

Date: 6/20/03

Date:

Note: Please duplicate this form and use additional sheets if necessary.

00064558

EMSL ANALYTICAL CHAIN OF CUSTODY 2030175 LEAD

Revised 7/1/99

EMSL Rep:	Gary	DATE:	Third party billing requires written authorization from third party
Your Company Name:	EFI	**EMSL-Bill to:**	Alex Nguyen - EFI
Street:	9700 Richmond, St. 210	**Street:**	9700 Richmond, Suite 210
Box #:		**Box #:**	
City/State:	Houston, Tx Zip: 77042	**City/State:**	Houston, Tx Zip: 77042
Phone Results to:		**Fax Results to:**	
Name:	Alex Nguyen	**Name:**	Alex Nguyen
Telephone #:	(713) 975-7031	**Fax #:**	(713) 975-7336
Project Name/Number:	98410-13709	**Purchase Order #:**	

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water	
Lead Soil +	or SW846-6010	ICP	50 mg/kg (ppm) soil 0.1 mg/l water 10 mg/kg (ppm) soil	
Lead in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
Lead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 Hrs. –
	or SW846-6010	ICP	0.1 mg/l (ppm)	M/Sat Work Week
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) 3 hours, 6 hours, Please call ahead to schedule:
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
	Bldg 715		00075-1
	Bldg 722 E		2
	Bldg 722 F		3
	Bldg 715		4

Relinquished By: (Person) S. Ellis Received at EMSL By:

Date: 6/27/03 Date: 6/30/03 1125

Note: Please duplicate this form and use additional sheets if necessary.

00064559

EMSL ANALYTICAL CHAIN OF CUSTODY 203084C LEAD

Revised 7/1/99

EMSL Rep:	Gary	DATE:	Third party billing requires written authorization from third party
Your Company Name:	EFI	EMSL-Bill to:	Alex Nguyen ~ EFI
Street:	9700 Richmond, St. 210	Street:	9700 Richmond, Suite 210
Box #:		Box #:	
City/State:	Houston, Tx Zip: 77042	City/State:	Houston, Tx Zip: 77042
Phone Results to:		Fax Results to:	
Name:	Alex Nguyen	Name:	Alex Nguyen
Telephone #:	(713) 975-7031	Fax #:	(713) 975-7336
Project Name/Number:	98410-13709	Purchase Order #:	

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water	
Lead Soil +	or SW846-6010	ICP	50 mg/kg (ppm) soil 0.1 mg/l water 10 mg/kg (ppm) soil	
Lead in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
Lead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS -
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1 day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
205	CMU Block with limited GMG wood interior		084C0-1

Relinquished By; (Person)	D. Pope	Received at EMSL By:	
Date:	5-28-03	Date:	6/3/03 1030

Note: Please duplicate this form and use additional sheets if necessary.

00064560

EMSL ANALYTICAL CHAIN OF CUSTODY 20030585 LEAD

Revised 7/1/99

EMSL Rep: Gary

DATE:

Third party billing requires written authorization from third party

Your Company Name: EFI

EMSL-Bill to: Alex Nguyen - EFI

Street: 9700 Richmond, St. 210

Box #:

City/State: Houston, Tx Zip: 77042

Street: 9700 Richmond, Suite 210

Box #:

City/State: Houston, Tx Zip: 77042

Phone Results to:
Name: Alex Nguyen
Telephone #: (713) 975-7031
Project Name/Number: 98410-13709

Fax Results to:
Name: Alex Nguyen
Fax #: (713) 975-7336
Purchase Order #:

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater **	SW846-7420	Flame Atomic Absorption	0.4 mg/l water 50 mg/kg (ppm) soil	
Lead Soil +	or SW846-6010	ICP	0.1 mg/l water 10 mg/kg (ppm) soil	
Lead in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
Lead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead ** ✓	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS -
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater **	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil+			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
BLDG 201	BLDG 201 DECKING, INS. WOOD WRAP		65885-1
BLDG 203	BLDG 203 DECKING, Roof Support		2
BLDG 204	BLDG 204 DECKING Roof Support		3
BLDG 713 B	BLDG 713B WINDBURG W/PAINT, INSUL, DECKING		4

Relinquished By; (Person) Joseph Porterfield Jr

Received at EMSL By: Cvelazquez

Date: 6/6/03

Date: 6/10/03 12 pm

Note: Please duplicate this form and use additional sheets if necessary.

00064561

EMSL ANALYTICAL — CHAIN OF CUSTODY — 240868 77 — LEAD

Revised 7/1/99

EMSL Rep: Gary — DATE:

Third party billing requires written authorization from third party

Your Company Name: EFI — EMSL-Bill to: Alex Nguyen - EFI

Street: 9700 Richmond, St. 210 — Street: 9700 Richmond, Suite 210

Box #: — Box #:

City/State: Houston, Tx Zip: 77042 — City/State: Houston, Tx Zip: 77042

Phone Results to:
Name: Alex Nguyen
Telephone #: (713) 975-7031
Project Name/Number: 98410-13709

Fax Results to:
Name: Alex Nguyen
Fax #: (713) 975-7336
Purchase Order #:

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water 50 mg/kg (ppm) soil	
Lead Soil +	or SW846-6010	ICP	0.1 mg/l water 10 mg/kg (ppm) soil	
Lead in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
Lead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	~~or SW846-6010~~	~~ICP~~	~~3.0 ug/wipe~~	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS -
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
744-A			04771

Relinquished By; (Person) DP — Received at EMSL By:

Date: 08-06-03 — Date: 8/11/03 1300

Note: Please duplicate this form and use additional sheets if necessary.

00064562

EMSL ANALYTICAL — CHAIN OF CUSTODY — 2003 0827C — LEAD

sed 7/1/99

EMSL Rep:	Gary	DATE:	Third party billing requires written authorization from third party
Your Company Name:	EFI	EMSL-Bill to:	Alex Nguyen - EFI
Street:	9700 Richmond, St. 210	Street:	9700 Richmond, Suite 210
Box #:		Box #:	
City/State:	Houston, Tx Zip: 77042	City/State:	Houston, Tx Zip: 77042
Phone Results to:		Fax Results to:	
Name:	Alex Nguyen	Name:	Alex Nguyen
Telephone #:	(713) 975-7031	Fax #:	(713) 975-7336
Project Name/Number:	98410-13709	Purchase Order #:	

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water	
Lead Soil +	or SW846-6010	ICP	50 mg/kg (ppm) soil 0.1 mg/l water 10 mg/kg (ppm) soil	
d in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
ad in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS -
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
272			0827C-1

Relinquished By; (Person) DP	Received at EMSL By:
Date: 08-06-03	Date: 8/12/03 1304

Note: Please duplicate this form and use additional sheets if necessary.

00064563

2036973

EMSL ANALYTICAL — CHAIN OF CUSTODY — LEAD

sed 7/1/99

EMSL Rep: Gary

DATE:

Third party billing requires written authorization from third party

Your Company Name: EFI

Street: 9700 Richmond, St. 210

Box #:

City/State: Houston, Tx Zip: 77042

EMSL-Bill to: Alex Nguyen - EFI

Street: 9700 Richmond, Suite 210

Box #:

City/State: Houston, Tx Zip: 77042

Phone Results to:

Name: Alex Nguyen

Telephone #: (713) 975-7031

Project Name/Number: 98410-13709

Fax Results to:

Name: Alex Nguyen

Fax #: (713) 975-7336

Purchase Order #:

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water 50 mg/kg (ppm) soil	
Lead Soil +	or SW846-6010	ICP	0.1 mg/l water 10 mg/kg (ppm) soil	
d in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
ead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS -
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
Bldg. 813	METAL FRAME SHEET METAL ROOF AND SIDDING		09673.1
	WOOD TRIM		

Relinquished By; (Person) [signature] Received at EMSL By: [signature]

Date: 8-14-03 Date: 8/20/3

Note: Please duplicate this form and use additional sheets if necessary.

20030947 L 00064564

EMSL ANALYTICAL CHAIN OF CUSTODY LEAD

Revised 7/1/99

EMSL Rep: Gary DATE:

Third party billing requires written authorization from third party

Your Company Name: EFI EMSL-Bill to: Alex Nguyen - EFI

Street: 9700 Richmond, St. 210 Street: 9700 Richmond, Suite 210

Box #: Box #:

City/State: Houston, Tx Zip: 77042 City/State: Houston, Tx Zip: 77042

Phone Results to:

Name: Alex Nguyen

Telephone #: (713) 975-7031

Project Name/Number: 98410-13709

Fax Results to:

Name: Alex Nguyen

Fax #: (713) 975-7336

Purchase Order #:

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water	
Lead Soil +			50 mg/kg (ppm) soil	
	or SW846-6010	ICP	0.1 mg/l water	
			10 mg/kg (ppm) soil	
Lead in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
Lead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS -
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
Bldg. 814	METAL FRAME, Red Brick		09072-1
	WALL, Tarsosite ROOF		
	WOOD Trim		

Relinquished By; (Person) D. Pope Received at EMSL By: LBlg

Date: 8-14-03 Date: 8/20/03

Note: Please duplicate this form and use additional sheets if necessary.

00064565

EMSL ANALYTICAL — CHAIN OF CUSTODY — 20036971 — LEAD

Revised 7/1/99

EMSL Rep:	Gary	DATE:	Third party billing requires written authorization from third party
Your Company Name:	EFI	EMSL-Bill to:	Alex Nguyen - EFI
Street:	9700 Richmond, St. 210	Street:	9700 Richmond, Suite 210
Box #:		Box #:	
City/State:	Houston, Tx Zip: 77042	City/State:	Houston, Tx Zip: 77042
Phone Results to: Name:	Alex Nguyen	Fax Results to: Name:	Alex Nguyen
Telephone #:	(713) 975-7031	Fax #:	(713) 975-7336
Project Name/Number:	98410-13709	Purchase Order #:	

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water 50 mg/kg (ppm) soil	
Lead Soil +	or SW846-6010	ICP	0.1 mg/l water 10 mg/kg (ppm) soil	
d in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
Lead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS -
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
Bldg. 815	SHEETMETAL SIDING WITH COMP. ROOF WOOD FRAME		09071-1

Relinquished By; (Person) D. Pope	Received at EMSL By: LVRuyn
Date: 8-14-03	Date: 8/20/03 10A

Note: Please duplicate this form and use additional sheets if necessary.

00064566

EMSL ANALYTICAL — CHAIN OF CUSTODY — 2003/1074Y LEAD

Revised 7/1/99

EMSL Rep:	Gary	DATE:	Third party billing requires written authorization from third party
Your Company Name:	EFI	EMSL-Bill to:	Alex Nguyen - EFI
Street:	9700 Richmond, St. 210	Street:	9700 Richmond, Suite 210
Box #:		Box #:	
City/State:	Houston, Tx Zip: 77042	City/State:	Houston, Tx Zip: 77042
Phone Results to:		Fax Results to:	
Name:	Alex Nguyen	Name:	Alex Nguyen
Telephone #:	(713) 975-7031	Fax #:	(713) 975-7336
Project Name/Number:	98410-13709	Purchase Order #:	

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water	
Lead Soil +	or SW846-6010	ICP	50 mg/kg (ppm) soil 0.1 mg/l water 10 mg/kg (ppm) soil	
in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
Lead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS -
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
4-Y-2	CMU Block, WOOD WALLS with TRANSITE SHEETS composition roof FELT		1074Y1

Relinquished By; (Person) DRope	Received at EMSL By: LVNguyen
Date:	Date: 9/24/03

Note: Please duplicate this form and use additional sheets if necessary.

00064567

EMSL ANALYTICAL — CHAIN OF CUSTODY — 2031073Y — LEAD

Revised 7/1/99

EMSL Rep:	Gary	DATE:	Third party billing requires written authorization from third party
Your Company Name:	EFI	EMSL-Bill to:	Alex Nguyen - EFI
Street:	9700 Richmond, St. 210	Street:	9700 Richmond, Suite 210
Box #:		Box #:	
City/State:	Houston, Tx Zip: 77042	City/State:	Houston, Tx Zip: 77042
Phone Results to: Name:	Alex Nguyen	Fax Results to: Name:	Alex Nguyen
Telephone #:	(713) 975-7031	Fax #:	(713) 975-7336
Project Name/Number:	98410-13709	Purchase Order #:	

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water 50 mg/kg (ppm) soil	
Lead Soil +	or SW846-6010	ICP	0.1 mg/l water 10 mg/kg (ppm) soil	
in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
Lead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS -
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
3Y	Bldg. 3Y		
	TRANSITE siding WOOD		
	FRAME TRANSITE ROOF		

Relinquished By; (Person) O. Pope	Received at EMSL By:
Date:	Date: 9/24/03 1175

Note: Please duplicate this form and use additional sheets if necessary.

00064568

2003/1155

EMSL ANALYTICAL — CHAIN OF CUSTODY — LEAD

Revised 7/1/99

EMSL Rep: Gary

DATE:

Third party billing requires written authorization from third party

Your Company Name: EFI

Street: 9700 Richmond, St. 210

Box #:

City/State: Houston, Tx Zip: 77042

EMSL-Bill to: Alex Nguyen - EFI

Street: 9700 Richmond, Suite 210

Box #:

City/State: Houston, Tx Zip: 77042

Phone Results to:

Name: Alex Nguyen

Telephone #: (713) 975-7031

Project Name/Number: 98410-13709

Fax Results to:

Name: Alex Nguyen

Fax #: (713) 975-7336

Purchase Order #:

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water 50 mg/kg (ppm) soil	
Lead Soil +	or SW846-6010	ICP	0.1 mg/l water 10 mg/kg (ppm) soil	
d in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
Lead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS -
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
29Y			1155-1

Relinquished By; (Person) D. Pope

Date: 9-23-03

Received at EMSL By:

Date: 9/23/03 10:20

Note: Please duplicate this form and use additional sheets if necessary.

00064569

EMSL ANALYTICAL — CHAIN OF CUSTODY — LEAD

2/03/1052

Revised 7/1/99

EMSL Rep: Gary

DATE:

Third party billing requires written authorization from third party

Your Company Name: EFI

EMSL-Bill to: Alex Nguyen - EFI

Street: 9700 Richmond, St. 210

Box #:

City/State: Houston, Tx Zip: 77042

Street: 9700 Richmond, Suite 210

Box #:

City/State: Houston, Tx Zip: 77042

Phone Results to:
Name: Alex Nguyen
Telephone #: (713) 975-7031
Project Name/Number: 98410-13709

Fax Results to:
Name: Alex Nguyen
Fax #: (713) 975-7336
Purchase Order #:

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water 50 mg/kg (ppm) soil	
Lead Soil +	or SW846-6010	ICP	0.1 mg/l water 10 mg/kg (ppm) soil	
d in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
Lead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS -
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
32.Y			11052-1

Relinquished By; (Person) D. Pope

Received at EMSL By:

Date: 9-23-03

Date: 10/2/03 10:30

Note: Please duplicate this form and use additional sheets if necessary.

10311C57 00064570

EMSL ANALYTICAL — CHAIN OF CUSTODY — LEAD

Revised 7/1/99

EMSL Rep:	Gary	DATE:	Third party billing requires written authorization from third party
Your Company Name:	EFI	EMSL-Bill to:	Alex Nguyen - EFI
Street:	9700 Richmond, St. 210	Street:	9700 Richmond, Suite 210
Box #:		Box #:	
City/State:	Houston, Tx Zip: 77042	City/State:	Houston, Tx Zip: 77042
Phone Results to:		Fax Results to:	
Name:	Alex Nguyen	Name:	Alex Nguyen
Telephone #:	(713) 975-7031	Fax #:	(713) 975-7336
Project Name/Number:	98410-13709	Purchase Order #:	

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water	
Lead Soil +			50 mg/kg (ppm) soil	
	or SW846-6010	ICP	0.1 mg/l water	
			10 mg/kg (ppm) soil	
Lead in Air**	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
Lead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS -
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
48 Y			10357-1

Relinquished By; (Person) D. Pope	Received at EMSL By: L Vang
Date: 9-23-03	Date: 10/03 10:30

Note: Please duplicate this form and use additional sheets if necessary.

2003117C4 00064571

EMSL ANALYTICAL — CHAIN OF CUSTODY — LEAD

Revised 7/1/99

EMSL Rep: Gary

DATE:

Third party billing requires written authorization from third party

Your Company Name:	EFI	EMSL-Bill to:	Alex Nguyen - EFI
Street:	9700 Richmond, St. 210	Street:	9700 Richmond, Suite 210
Box #:		Box #:	
City/State:	Houston, Tx Zip: 77042	City/State:	Houston, Tx Zip: 77042
Phone Results to:		Fax Results to:	
Name:	Alex Nguyen	Name:	Alex Nguyen
Telephone #:	(713) 975-7031	Fax #:	(713) 975-7336
Project Name/Number:	98410-13709	Purchase Order #:	

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water 50 mg/kg (ppm) soil	
Lead Soil +	or SW846-6010	ICP	0.1 mg/l water 10 mg/kg (ppm) soil	
d in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
Lead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS -
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
Bldg. 45Y	CMU Block		11764
	STEEL FRAME		
	WOOD TRIM		
	TRANSITE ROOF		

Relinquished By; (Person) J. Pope — Received at EMSL By: Lmh

Date: — Date: 10/10/03 1045 hr

Note: Please duplicate this form and use additional sheets if necessary.

00064572

2003117C3

EMSL ANALYTICAL — CHAIN OF CUSTODY — LEAD

Revised 7/1/99

EMSL Rep:	Gary	DATE:	Third party billing requires written authorization from third party
Your Company Name:	EFI	EMSL-Bill to:	Alex Nguyen - EFI
Street:	9700 Richmond, St. 210	Street:	9700 Richmond, Suite 210
Box #:		Box #:	
City/State:	Houston, Tx Zip: 77042	City/State:	Houston, Tx Zip: 77042
Phone Results to:		Fax Results to:	
Name:	Alex Nguyen	Name:	Alex Nguyen
Telephone #:	(713) 975-7031	Fax #:	(713) 975-7336
Project Name/Number:	98410-13709	Purchase Order #:	

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water	
Lead Soil +	or SW846-6010	ICP	50 mg/kg (ppm) soil 0.1 mg/l water 10 mg/kg (ppm) soil	
d in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
ead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS –
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
Bldg. 34 Y	WOOD TRIM		11763.1
	CMU BLOCK & PLASTER		
	& CONCRETE WALLS		

Relinquished By; (Person) A Rope	Received at EMSL By: Lorry
Date:	Date: 1-10-03 1145

Note: Please duplicate this form and use additional sheets if necessary.

00064573

2003117C1

EMSL ANALYTICAL — CHAIN OF CUSTODY — LEAD

Revised 7/1/99

EMSL Rep:	Gary	DATE:	Third party billing requires written authorization from third party
Your Company Name:	EFI	EMSL-Bill to:	Alex Nguyen - EFI
Street:	9700 Richmond, St. 210	Street:	9700 Richmond, Suite 210
Box #:		Box #:	
City/State:	Houston, Tx Zip: 77042	City/State:	Houston, Tx Zip: 77042
Phone Results to:		Fax Results to:	
Name:	Alex Nguyen	Name:	Alex Nguyen
Telephone #:	(713) 975-7031	Fax #:	(713) 975-7336
Project Name/Number:	98410-13709	Purchase Order #:	

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips'	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water	
Lead Soil +	or SW846-6010	ICP	50 mg/kg (ppm) soil 0.1 mg/l water 10 mg/kg (ppm) soil	
Lead in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
Lead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS -
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
Bldg. 38Y	CONCRETE WALLS		117C1-1
	WOOD TRIM		
	WOOD BEAMS		
	TRAVIS TILE ROOF		

Relinquished By; (Person) O. Lope	Received at EMSL By:
Date:	Date: 10/15/03 1145A

Note: Please duplicate this form and use additional sheets if necessary.

00064574

EMSL ANALYTICAL — CHAIN OF CUSTODY — LEAD

2613129N

Revised 7/1/99

EMSL Rep: Gary — DATE:

Third party billing requires written authorization from third party

Your Company Name: EFI — EMSL-Bill to: Alex Nguyen - EFI

Street: 9700 Richmond, St. 210 — Street: 9700 Richmond, Suite 210

Box #: — Box #:

City/State: Houston, Tx Zip: 77042 — City/State: Houston, Tx Zip: 77042

Phone Results to:

Name: Alex Nguyen — Fax Results to: Name: Alex Nguyen

Telephone #: (713) 975-7031 — Fax #: (713) 975-7336

Project Name/Number: 98410-13709 — Purchase Order #:

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water 50 mg/kg (ppm) soil	
Lead Soil +	or SW846-6010	ICP	0.1 mg/l water 10 mg/kg (ppm) soil	
Lead in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
ad in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS -
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

RECEIVED EMSL WESTMONT, N.J. 2003 NOV 10 AM 11:

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
40Y	CMU Block with wood Trim and Built up Roof		03121-1

Relinquished By; (Person) — Received at EMSL By:

Date: 10-29-03 — Date: 11/10/03

Note: Please duplicate this form and use additional sheets if necessary.

00064575

EMSL ANALYTICAL CHAIN OF CUSTODY Jan 12909 LEAD

Revised 7/1/99

EMSL Rep: Gary DATE:

Third party billing requires written authorization from third party

Your Company Name:	EFI	EMSL-Bill to:	Alex Nguyen - EFI
Street:	9700 Richmond, St. 210	Street:	9700 Richmond, Suite 210
Box #:		Box #:	
City/State:	Houston, Tx Zip: 77042	City/State:	Houston, Tx Zip: 77042
Phone Results to:		Fax Results to:	
Name:	Alex Nguyen	Name:	Alex Nguyen
Telephone #:	(713) 975-7031	Fax #:	(713) 975-7336
Project Name/Number:	98410-13709	Purchase Order #:	

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water 50 mg/kg (ppm) soil	
Lead Soil +	or SW846-6010	ICP	0.1 mg/l water 10 mg/kg (ppm) soil	
Lead in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
ad in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS -
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

RECEIVED 2003 NOV 10 AM 8 EMSL WESTMONT, NJ

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
TS-87	CONCRETE FL. CMU Block with WOOD Trim		12909-1

Relinquished By; (Person) Received at EMSL By:

Date: 10-29-03 Date: 11/10/03

Note: Please duplicate this form and use additional sheets if necessary.

00064576

2031581

EMSL ANALYTICAL — CHAIN OF CUSTODY — LEAD

Revised 7/1/99

EMSL Rep: Gary

DATE:

Third party billing requires written authorization from third party

Your Company Name: EFI

EMSL-Bill to: Alex Nguyen - EFI

Street: 9700 Richmond, St. 210

Street: 9700 Richmond, Suite 210

Box #:

Box #:

City/State: Houston, Tx Zip: 77042

City/State: Houston, Tx Zip: 77042

Phone Results to:

Name: Alex Nguyen

Telephone #: (713) 975-7031

Fax Results to:

Name: Alex Nguyen

Fax #: (713) 975-7336

Project Name/Number: 98410-13709

Purchase Order #:

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water 50 mg/kg (ppm) soil	
Lead Soil +	or SW846-6010	ICP	0.1 mg/l water 10 mg/kg (ppm) soil	
in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
Lead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS -
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
18Y-1	Bldg. 18Y-1		10587-1
	CMU Block with		
	TAR & GRAVEL ROOF AND		
	WOOD FRAME		

Relinquished By; (Person) D. Pope

Received at EMSL By: L. Rogers

Date:

Date: 9/12/03 1154

Note: Please duplicate this form and use additional sheets if necessary.

2003/1580

00064577

EMSL ANALYTICAL — CHAIN OF CUSTODY — LEAD

Revised 7/1/99

EMSL Rep: Gary

DATE:

Third party billing requires written authorization from third party

Your Company Name: EFI

EMSL-Bill to: Alex Nguyen - EFI

Street: 9700 Richmond, St. 210

Box #:

City/State: Houston, Tx Zip: 77042

Street: 9700 Richmond, Suite 210

Box #:

City/State: Houston, Tx Zip: 77042

Phone Results to:

Name: Alex Nguyen

Telephone #: (713) 975-7031

Project Name/Number: 98410-13709

Fax Results to:

Name: Alex Nguyen

Fax #: (713) 975-7336

Purchase Order #:

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water 50 mg/kg (ppm) soil	
Lead Soil +	or SW846-6010	ICP	0.1 mg/l water 10 mg/kg (ppm) soil	
in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
Lead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS -
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
18Y	WOOD FRAME TRANSITE SIDING & ROOF		1580-1

Relinquished By; (Person) D. Pope

Received at EMSL By: LBlg

Date:

Date: 7/24/03 1025

Note: Please duplicate this form and use additional sheets if necessary.

2003/0579 00064578

EMSL ANALYTICAL CHAIN OF CUSTODY LEAD

Revised 7/1/99

EMSL Rep: Gary

DATE:

Third party billing requires written authorization from third party

Your Company Name: EFI

EMSL-Bill to: Alex Nguyen - EFI

Street: 9700 Richmond, St. 210

Street: 9700 Richmond, Suite 210

Box #:

Box #:

City/State: Houston, Tx Zip: 77042

City/State: Houston, Tx Zip: 77042

Phone Results to:

Name: Alex Nguyen

Telephone #: (713) 975-7031

Project Name/Number: 98410-13709

Fax Results to:

Name: Alex Nguyen

Fax #: (713) 975-7336

Purchase Order #:

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water 50 mg/kg (ppm) soil	
Lead Soil +	or SW846-6010	ICP	0.1 mg/l water 10 mg/kg (ppm) soil	
in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
Lead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS -
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
164	TRANSITE SIDDING AND ROOF W/ WOOD FRAME		10579.1

Relinquished By; (Person) D Pope

Received at EMSL By: L. Ortega

Date:

Date: 9/22/03 11:25A

Note: Please duplicate this form and use additional sheets if necessary.

00064579

EMSL ANALYTICAL — CHAIN OF CUSTODY — 2003129/3 LEAD

Revised 7/1/99

EMSL Rep:	Gary	DATE:	Third party billing requires written authorization from third party
Your Company Name:	EFI	EMSL-Bill to:	Alex Nguyen - EFI
Street:	9700 Richmond, St. 210	Street:	9700 Richmond, Suite 210
Box #:		Box #:	
City/State:	Houston, Tx Zip: 77042	City/State:	Houston, Tx Zip: 77042
Phone Results to: Name:	Alex Nguyen	Fax Results to: Name:	Alex Nguyen
Telephone #:	(713) 975-7031	Fax #:	(713) 975-7336
Project Name/Number:	98410-13709	Purchase Order #:	

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water 50 mg/kg (ppm) soil	
Lead Soil +	or SW846-6010	ICP	0.1 mg/l water 10 mg/kg (ppm) soil	
ead in Air***	NIOSH 7082	Flame Atomic Absorption	.5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
ead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS -
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN Work Week
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

RECEIVED 2003 NOV 6 EMSL WESTMONT N.J. 11:16

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
16Y-1	CMU Block walls		12913 1
	Transite Roof with		
	some TAR & GRAVEL		
	WOOD TRIM		

Relinquished By; (Person)	Received at EMSL By:
Date: 10-30-03	Date: 11/6/03

Note: Please duplicate this form and use additional sheets if necessary.

2003134119

00064580

EMSL ANALYTICAL — CHAIN OF CUSTODY — LEAD

Revised 7/1/99

EMSL Rep: Gary

DATE:

Third party billing requires written authorization from third party

Your Company Name:	EFI	EMSL-Bill to:	Alex Nguyen - EFI
Street:	9700 Richmond, St. 210	Street:	9700 Richmond, Suite 210
Box #:		Box #:	
City/State:	Houston, Tx Zip: 77042	City/State:	Houston, Tx Zip: 77042
Phone Results to:		Fax Results to:	
Name:	Alex Nguyen	Name:	Alex Nguyen
Telephone #:	(713) 975-7031	Fax #:	(713) 975-7336
Project Name/Number:	98410-13709	Purchase Order #:	

RECEIVED
2003 NOV 20 PM 1:54
EMSL WESTMONT, N.J.

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water 50 mg/kg (ppm) soil	
Lead Soil +	or SW846-6010	ICP	0.1 mg/l water 10 mg/kg (ppm) soil	
Lead in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
ad in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS -
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
13Y-1	Bldg. 13Y-1 CMU Block Wood farm, Transite Roof		

Relinquished By; (Person) [signature]

Date: 11-11-03

Received at EMSL By: [signature]

Date: 11/20

Note: Please duplicate this form and use additional sheets if necessary.

2003134149

00064581

EMSL ANALYTICAL — CHAIN OF CUSTODY — LEAD

Revised 7/1/99

EMSL Rep:	Gary	DATE:	Third party billing requires written authorization from third party
Your Company Name:	EFI	EMSL-Bill to:	Alex Nguyen - EFI
Street:	9700 Richmond, St. 210	Street:	9700 Richmond, Suite 210
Box #:		Box #:	
City/State:	Houston, Tx Zip: 77042	City/State:	Houston, Tx Zip: 77042
Phone Results to:		Fax Results to:	
Name:	Alex Nguyen	Name:	Alex Nguyen
Telephone #:	(713) 975-7031	Fax #:	(713) 975-7336
Project Name/Number:	98410-13709	Purchase Order #:	

RECEIVED EMSL WESTMONT, N.J. 2003 NOV 12 PM 1:54

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water 50 mg/kg (ppm) soil	
Lead Soil +	or SW846-6010	ICP	0.1 mg/l water 10 mg/kg (ppm) soil	
ead in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
ead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS -
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
Y-AREA WALKWAYS	WOOD WITH BUILT UP ROOF		

Relinquished By; (Person)	Received at EMSL By:
Date: 11-12-03	Date:

Note: Please duplicate this form and use additional sheets if necessary.

2003134419

00064582

LEAD

EMSL ANALYTICAL — CHAIN OF CUSTODY

Revised 7/1/99

EMSL Rep: Gary

DATE:

Third party billing requires written authorization from third party

Your Company Name: EFI

EMSL-Bill to: Alex Nguyen - EFI

Street: 9700 Richmond, St. 210

Box #:

City/State: Houston, Tx Zip: 77042

Street: 9700 Richmond, Suite 210

Box #:

City/State: Houston, Tx Zip: 77042

Phone Results to:
Name: Alex Nguyen
Telephone #: (713) 975-7031
Project Name/Number: 98410-13709

Fax Results to:
Name: Alex Nguyen
Fax #: (713) 975-7336
Purchase Order #:

RECEIVED
2003 NOV 20 PM 1:54
EMSL WESTMONT, N.J.

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water 50 mg/kg (ppm) soil	
Lead Soil +	or SW846-6010	ICP	0.1 mg/l water 10 mg/kg (ppm) soil	
Lead in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
Lead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS -
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
16-Y-2	CMU BLOCK WALLS WITH TOARSITE ROOF WOOD TRIM		

Relinquished By; (Person)

Received at EMSL By:

Date: 11-13-03

Date:

Note: Please duplicate this form and use additional sheets if necessary.

EFI®
Engineering and Fire
Investigations

9700 Richmond
Suite 201
Houston, TX 77042
Tel: 866-464-2127
Fax: 713-975-7336
www.efiglobal.com

May 11, 2004

Mr. Michael Luczak
ARC Abatement, Inc.
6630 Roxburgh Drive, Suite 130
Houston, Texas 77041

Subject: **TRANSMITTAL OF ANALYTICAL RESULTS No. 7**
Longhorn Army Ammunition Plant – (TCLP Testing – "T" Area")
Karnack, Texas 77055
EFI PROJECT NO. 98410-13709

Dear Mr. Luczak:

Engineering and Fire Investigations (EFI) has completed sampling and analysis for Toxicity Characteristic Leaching Procedure (TCLP) of demolition debris sample suspect for lead-based paint from a total of 6 buildings representative of each type and construction (same paint scheme) from the "T-Area". These samples were collected as composite samples (i.e. building materials used in their construction) per building group. This work was performed at the verbal request of Mr. Michael Luczak of ARC Abatement, Inc.

The samples were analyzed by our subcontract laboratory (EMSL Analytical in Westmont, New Jersey) using test methods SW846-1311/7420 to determine leachable concentrations of lead by use of Flame Atomic Absorption.

Based on the results TCLP lead concentrations of the 6 buildings tested (Bldgs. 31T, 20T-1, 35T, 20T, 39T, and 39T-1) were below 5mg/l. Environmental Protection Agency (EPA) defines that waste materials with concentrations of leachable lead below 5 mg/l as non-hazardous and can be disposed of as construction materials.

A complete analytical report is presented in Appendix A. In addition, we have included the chain of custody for the samples collected in Appendix B.

We appreciate the opportunity to provide consulting services to ARC Abatement, Inc. in this matter. If there are any questions, please contact us.

Sincerely,
ENGINEERING AND FIRE INVESTIGATIONS

Cuong Nguyen
Project Manager

Lee A. Burckle, P.E.
Branch Manager

Attachments: Appendix A – Laboratory Result Sheets
Appendix B – Chain Of Custody

CN/cn(e:\projects 2003\Longhorn Army Ammunition Plant\TCLP Sampling – Transrpt7.doc

APPENDIX A

LABORATORY RESULT SHEETS

EMSL Analytical
3 Cooper St., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-9551 Email: skauffman@emsl.com

Attn:	Alex Nguyen EFI 9700 Richmond Suite 201 Houston, TX 77042		Customer ID:	ENGF50	
			Customer PO:		
			Received:	05/07/04 10:14 AM	
Fax:	(713) 975-7336	Phone: (713) 724-2709	EMSL Order:	200405215	
Project:	98410-13709		EMSL Proj:		

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
31T	0001	5/10/04	<0.4 mg/L

William Chamberlin
Laboratory Director
or other approved signatory

The test results contained within this report meet the requirements of NELAC unless otherwise noted. This report relates only to those items tested.
ACCREDITATIONS: NJ-NELAP: 04083, AIHA Environmental Lead Laboratory Approval Program: 100194

Date Printed: 5/10/04 12:35:14 PM

EMSL Analytical
3 Copper St., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-8551 Email: skauffman@emsl.com

Attn: Alex Nguyen
EFI
9700 Richmond
Suite 201
Houston, TX 77042
Fax: (713) 975-7336 Phone: (713) 724-2709
Project: 98410-13709

Customer ID: ENGF50
Customer PO:
Received: 05/07/04 10:14 AM

EMSL Order: 200405213
EMSL Proj:

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
20T-1	0001	5/10/04	<0.4 mg/L

William Chamberlin
Laboratory Director
or other approved signatory

The test results contained within this report meet the requirements of NELAC unless otherwise noted. This report relates only to these items tested.
ACCREDITATIONS: NJ-NELAP: 04653, AIHA Environmental Lead Laboratory Approval Program: 100194

Date Printed: 5/10/04 12:34:33 PM

00064587

EMSL Analytical
3 Cooper St., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-9551 Email: skauffman@emsl.com

Attn:	Alex Nguyen EFI 9700 Richmond Suite 201 Houston, TX 77042	Customer ID:	ENGF50
		Customer PO:	
		Received:	05/07/04 10:14 AM
Fax:	(713) 975-7336 Phone: (713) 724-2709		
Project:	99410-13709	EMSL Order:	200405210
		EMSL Proj:	

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
35T	0001	5/10/04	<0.4 mg/L

William Chamberlin
Laboratory Director
or other approved signatory

The test results contained within this report meet the requirements of NELAC unless otherwise noted. This report relates only to those items tested.
ACCREDITATIONS: NJ-NELAP; 04653, AIHA Environmental Lead Laboratory Approval Program: 100194

Date Printed: 5/10/04 12:34:01 PM

00064588

EMSL Analytical
3 Cooper St., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-9551 Email: akauffman@emsl.com

EMSL

Attn: Alex Nguyen
EFI
9700 Richmond
Suite 201
Houston, TX 77042
Fax: (713) 975-7336 Phone: (713) 724-2709
Project: 98410-13709

Customer ID: ENGF50
Customer PO:
Received: 05/07/04 10:14 AM

EMSL Order: 200405209
EMSL Proj:

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
20T	0001	5/10/04	<0.4 mg/L

William Chamberlin
Laboratory Director
or other approved signatory

The test results contained within this report meet the requirements of NELAC unless otherwise noted. This report relates only to those items tested.
ACCREDITATIONS: NJ-NELAP: 04853, AIHA Environmental Lead Laboratory Approval Program: 100194

Date Printed: 5/10/04 12:33:15 PM

00064589

EMSL Analytical
3 Cooper St, Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-8651 Email: skauffman@emsl.com

EMSL

Attn: Alex Nguyen
EFI
9700 Richmond
Suite 201
Houston, TX 77042
Fax: (713) 975-7336 Phone: (713) 724-2709
Project: 98410-13709

Customer ID: ENGF50
Customer PO:
Received: 05/07/04 10:14 AM

EMSL Order: 200405208
EMSL Proj:

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
39T	0001	5/10/04	<0.4 mg/L

William Chamberlin
Laboratory Director
or other approved signatory

The test results contained within this report meet the requirements of NELAC unless otherwise noted. This report relates only to those items tested.
ACCREDITATIONS: NJ-NELAP: 04853, AIHA Environmental Lead Laboratory Approval Program: 100154

Date Printed: 5/10/04 12:32:39 PM

00064590

EMSL Analytical
3 Cooper St., Westmont, NJ 08108
Phone: (856) 858-4800 Fax: (856) 858-9551 Email: skauffman@emsl.com

Attn: Alex Nguyen
EFI
9700 Richmond
Suite 201
Houston, TX 77042
Fax: (713) 975-7336 Phone: (713) 724-2709
Project: 98410-13709

Customer ID: ENGF50
Customer PO:
Received: 05/07/04 10:14 AM

EMSL Order: 200405207
EMSL Proj:

Toxicity Characteristic Leaching Procedure (SW846, 1311/7420)

Client Sample Description	*Lab ID*	*Analyzed*	*Lead Concentration*
39T-1	0001	5/10/04	<0.4 mg/L

William Chamberlin
Laboratory Director
or other approved signatory

The test results contained within this report meet the requirements of NELAC unless otherwise noted. This report relates only to those items tested.
ACCREDITATIONS: NJ-NELAP: 04852. AIHA Environmental Lead Laboratory Approval Program: 100194

Date Printed: 5/10/04 12:32:05 PM

APPENDIX B

CHAIN OF CUSTODY

00064592

EMSL ANALYTICAL CHAIN OF CUSTODY 200465215 LEAD

Revised 7/1/99

EMSL Rep: Gary

DATE:

Third party billing requires written authorization from third party

Your Company Name: EFI

EMSL-Bill to: Alex Nguyen - EFI

Street: 9700 Richmond, St. 210

Street: 9700 Richmond, Suite 210

Box #:

Box #:

City/State: Houston, Tx Zip: 77042

City/State: Houston, Tx Zip: 77042

Phone Results to:

Name: Alex Nguyen

Fax Results to:

Name: Alex Nguyen

Telephone #: (713) 975-7031

Fax #: (713) 975-7336

Project Name/Number: 98410-13709

Purchase Order #:

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	72 HR - 1 WEEK
Lead Wastewater	SW845-7420	Flame Atomic Absorption	0.4 mg/l water	
Lead Soil +			50 mg/kg (ppm) soil	
	or SW846-6010	ICP	0.1 mg/l water	
			10 mg/kg (ppm) soil	
Lead in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	24 HR - 1 WEEK
	or NIOSH 7300	ICP	3.0 ug/filter	
Lead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS -
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

RECEIVED EMSL HOUST. TX. MAY 10 4

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule,
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
317			05215-1

Relinquished By: (Person) Don Comeaux

Received at EMSL By: LMay

Date: 5/4/04

Date: 5/7/04

Note: Please duplicate this form and use additional sheets if necessary.

EMSL ANALYTICAL CHAIN OF CUSTODY

2004052 13 00064593

LEAD

Revised 7/1/99

EMSL Rep:	Gary	DATE:	Third party billing requires written authorization from third party
Your Company Name:	EFI	EMSL-Bill to:	Alex Nguyen - EFI
Street:	9700 Richmond, St. 210	Street:	9700 Richmond, Suite 210
Box #:		Box #:	
City/State:	Houston, Tx Zip: 77042	City/State:	Houston, Tx Zip: 77042
Phone Results to: Name:	Alex Nguyen	Fax Results to: Name:	Alex Nguyen
Telephone #:	(713) 975-7031	Fax #:	(713) 975-7336
Project Name/Number:	98410-13709	Purchase Order #:	

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% **	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water	
Lead Soil +			50 mg/kg (ppm) soil	
	or SW846-6010	ICP	0.1 mg/l water	
			10 mg/kg (ppm) soil	
Lead in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
Lead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	
	or SW846-6010	ICP	0.1 mg/l (ppm)	
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
* 20-T-1			05213-1
20-T-1 per Alex Nguyen 5/7 3:45			

Relinquished By: (Person) Alex Nguyen Received at EMSL By: [illegible]

Date: 5/4/04 Date: 5/7/04

Note: Please duplicate this form and use additional sheets if necessary.

* Sample 50 in bag 20-T-1

RECEIVED EMSL HOUSTON, TX 2004 MAY -7 AM 10:14

00064594

YTICAL CHAIN OF CUSTODY 20040521 LEAD

	Garv	DATE:	Third party billing requires written authorization from third party
ny		EMSL-Bill to:	Alex Nguyen - EFI
	EFI		
	9700 Richmond, St. 210	Street:	9700 Richmond, Suite 210
		Box #:	
e:	Houston, Tx Zip: 77042	City/State:	Houston, Tx Zip: 77042
Results to:	Alex Nguyen	Fax Results to: Name:	Alex Nguyen
hone #:	(713) 975-7031	Fax #:	(713) 975-7336
ect ne/Number:	98410-13709	Purchase Order #:	

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water 50 mg/kg (ppm) soil	
Lead Soil +	or SW846-6010	ICP	0.1 mg/l water 10 mg/kg (ppm) soil	
Lead in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
Lead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS -
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	24 HR W/IN WORK WEEK
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	1
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	10
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	4

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TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
351			852/d.1

Relinquished By: (Person) Don Lorenzo — Received at EMSL By: [illegible]
Date: 5/4/04 — Date: 5/7/04

Note: Please duplicate this form and use additional sheets if necessary.

00064595

EMSL ANALYTICAL — CHAIN OF CUSTODY

Revised 7/1/99

2007052049 LEAD

EMSL Rep: Gary

DATE:

Third party billing requires written authorization from third party

Your Company Name:	EFI	EMSL-Bill to:	Alex Nguyen - EFI
Street:	9700 Richmond, St. 210	Street:	9700 Richmond, Suite 210
Box #:		Box #:	
City/State:	Houston, Tx Zip: 77042	City/State:	Houston, Tx Zip: 77042
Phone Results to:		Fax Results to:	
Name:	Alex Nguyen	Name:	Alex Nguyen
Telephone #:	(713) 975-7031	Fax #:	(713) 975-7336
Project Name/Number:	98410-13709	Purchase Order #:	

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips'	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water	
Lead Soil +			50 mg/kg (ppm) soil	
	or SW846-6010	ICP	0.1 mg/l water	
			10 mg/kg (ppm) soil	
Lead in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
Lead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS -
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

RECEIVED
2004 MAY -4 AM 10:14
WESTMONT, NJ.
EMSL

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
201			05249

Relinquished By: (Person) Don Corneau — Received at EMSL By:

Date: 5/4/04 — Date: 5/7/04

Note: Please duplicate this form and use additional sheets if necessary.

EMSL ANALYTICAL CHAIN OF CUSTODY

Revised 7/1/99

2006526Y

00064596

LEAD

EMSL Rep: Gary

DATE:

Third party billing requires written authorization from third party

Your Company Name: EFI

EMSL-Bill to: Alex Nguyen - EFI

Street: 9700 Richmond, St. 210

Box #:

City/State: Houston, Tx Zip: 77042

Street: 9700 Richmond, Suite 210

Box #:

City/State: Houston, Tx Zip: 77042

Phone Results to:

Name: Alex Nguyen

Telephone #: (713) 975-7031

Project Name/Number: 98410-13709

Fax Results to:

Name: Alex Nguyen

Fax #: (713) 975-7336

Purchase Order #:

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips`	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water 50 mg/kg (ppm) soil	
Lead Soil +	or SW846-6010	ICP	0.1 mg/l water 10 mg/kg (ppm) soil	
Lead in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
Lead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HR TAT
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

RECEIVED EMSL WESTMONT, NJ 2004 MAY -7 AM 10:

TAT (Turnaround) - 3 hours, 6 hours. Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
397			05768-1

Relinquished By: (Person) Alex Nguyen

Date: 5/4/04

Received at EMSL By:

Date: 5/7/04

Note: Please duplicate this form and use additional sheets if necessary.

00064597

EMSL ANALYTICAL — CHAIN OF CUSTODY — 26040527 — LEAD

Revised 7/1/99

EMSL Rep: Gary

DATE:

Third party billing requires written authorization from third party

Your Company Name:	EEI	EMSL-Bill to:	Alex Nguyen - EEI
Street:	9700 Richmond, St. 210	Street:	9700 Richmond, Suite 210
Box #:		Box #:	
City/State:	Houston, Tx Zip: 77042	City/State:	Houston, Tx Zip: 77042
Phone Results to:		Fax Results to:	
Name:	Alex Nguyen	Name:	Alex Nguyen
Telephone #:	(713) 975-7031	Fax #:	(713) 975-7336
Project Name/Number:	98410-13709	Purchase Order #:	

MATRIX	METHOD	INSTRUMENT	mdls	TAT
Lead Chips*	SW846-7420 or AOAC 5.009 (974.02)	Flame Atomic Absorption	0.01% ++	
Lead Wastewater	SW846-7420	Flame Atomic Absorption	0.4 mg/l water	
Lead Soil +	or SW846-6010	ICP	50 mg/kg (ppm) soil 0.1 mg/l water 10 mg/kg (ppm) soil	
Lead in Air***	NIOSH 7082	Flame Atomic Absorption	5 ug/filter	
	or NIOSH 7300	ICP	3.0 ug/filter	
Lead in Wipe	SW846-7420	Flame Atomic Absorption	10 ug/wipe	
	or SW846-6010	ICP	3.0 ug/wipe	
TCLP Lead **	SW846-1311/7420	Flame Atomic Absorption	0.4 mg/l (ppm)	30 HRS -
	or SW846-6010	ICP	0.1 mg/l (ppm)	W/IN WORK WEEK
Lead in Air ****	NIOSH 7105	Graphite Furnace Atomic Absorption	0.03 ug/filter	
Lead Wastewater	SW846-7421	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm) water	
Lead Soil +			0.3 mg/kg (ppm) soil	
Lead in Drinking Water (check state Certification Requirements)	EPA 239.2	Graphite Furnace Atomic Absorption	0.003 mg/l (ppm)	
Total Dust	NIOSH 0500-0600	Gravimetric Reduction	0.0001g	

RECEIVED 2004 MAY 7 EMSL WESTMONT, N.J. AM 10 11 4

TAT (Turnaround) - 3 hours, 6 hours, Please call ahead to schedule.
12 hours (must arrive by 11:00 a.m),
24 hours (1day), 48 hours (2 days), 72 hours, 96 hours (3 days), 120 hours(4 days), 144 + hours (6-10 days)
*, **, ***, ****, +, ++ Please Refer to Price Quote

SAMPLE #	LOCATION	Air volume, L Area, in²	LAB #
39T-1			65207 1

Relinquished By: (Person) [signature] Date: 5/4/04

Received at EMSL By: [signature] Date: 5/7/04

Note: Please duplicate this form and use additional sheets if necessary.

APPENDIX G
BUILDING 451 – TNT PRODUCTION AREA
PCBs - TRANSMITTAL OF ANALYTICAL RESULTS

EFI®
Engineering and Fire
Investigations

9700 Richmond
Suite 201
Houston, TX 77042
Tel: 866-464-2127
Fax: 713-975-7336
www.efiglobal.com

April 3, 2003

Mr. Michael Luczak
ARC Abatement, Inc.
6630 Roxburgh Drive, Suite 130
Houston, Texas 77041

Subject: **TRANSMITTAL OF ANALYTICAL RESULTS**
Longhorn Army Ammunition Plant – (PCB Testing)
Karnack, Texas 77055
EFI PROJECT NO. 98410-13709

Dear Mr. Luczak:

Engineering and Fire Investigations (EFI) has completed sampling and analysis of dielectric fluid oil sample suspect for Polychlorinated Biphenyls (PCBs). The fluid sample was collected from a 6-gallons transform reservoir located in the TNT Production Area (Building 451) at the Longhorn Army Ammunition Plant located in Karnack, Texas. This work was performed at the verbal request of Mr. Michael Luczak of ARC Abatement, Inc.

The samples were analyzed by our subcontract laboratory (E-Lab) in Houston, Texas) using test methods SW8082 to determine concentrations of PCBs as Aroclors or as individual PCB congeners in extracts from solid and aqueous matrices by use of gas chromatography.

Based on the results the dielectric fluid collected from a 6-gallons transform reservoir located in the TNT Production Area (Building 451) is not considered to be PCB as defined by the Environmental Protection Agency (EPA).

A complete analytical report is presented in Appendix A. In addition, we have included the chain of custody for the samples collected in Appendix B.

We appreciate the opportunity to provide consulting services to ARC Abatement, Inc. in this matter. If there are any questions, please contact us.

Sincerely,

ENGINEERING AND FIRE INVESTIGATIONS

Cuong Nguyen
Project Manager

Lee A. Burckle, P.E.
Branch Manager

Attachments: Appendix A – Laboratory Result Sheets
Appendix B – Chain Of Custody

CN/cn(e:\projects 2003\Longhorn Army Ammunition Plant\PCB Sampling – Transrpt.doc

APPENDIX A

LABORATORY RESULT SHEETS

00064601

e-Lab, Inc.
10450 Stancliff Road, Suite 210 • Houston, Texas 77099 • Ph: 281.530.5656 • Fax: 281.530.5887

March 26, 2003

Wellington Joe
Engineering and Fire Investigations (EFI)
9700 Richmond
Suite 201
Houston, TX 77042

Tel: (713) 975-7031
Fax: (713) 975-7336

Re: LAA Plant/Bldg 451 Work Order : **0303152**

Dear Wellington Joe,

e-Lab, Inc. received 1 sample on 3/24/2003 5:30:00 PM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by e-Lab, Inc. and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by e-Lab Inc. The total number of pages in this report is 7.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Hector Coronado
Project Manager

Lab, Inc.

Date: *March 26, 2003*

CLIENT: Engineering and Fire Investigations (EFI)
Project: LAA Plant/Bldg 451
Work Order: **0303152**

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
0303152-01	LAAP-01/Bldg. 451	Oil		3/20/2003 12:00	3/24/2003 17:30	☐

e-Lab, Inc.

Date: *March 26, 2003*

CLIENT: Engineering and Fire Investigations (EFI)
Project: LAA Plant/Bldg 451
Work Order: 0303152

Case Narrative

Analytical comment for QC samples labeled "PLCSO1-030325 & PLCSDO1-030325 for the PCB analysis: The recovery for Aroclor 1016 was marginally high for both the PLCSO and the PLCSDO. The samples were ND, so the data was accepted.

Lab, Inc. **Date:** *March 26, 2003*

CLIENT: Engineering and Fire Investigations (EFI) **Client Sample ID:** LAAP-01/Bldg. 451
Work Order: 0303152 **Collection Date:** 3/20/2003 12:00:00 PM
Project: LAA Plant/Bldg 451
Lab ID: 0303152-01 **Matrix:** OIL

Analyses	Result	Report Limit	Qual	Units	Dilution Factor	Date Analyzed
PCBS IN OIL		**SW8082**			Prep Date: **3/25/2003**	Analyst: **JLJ**
Aroclor 1016	ND	500		µg/Kg	1	3/25/2003 11:06:00 AM
Aroclor 1221	ND	500		µg/Kg	1	3/25/2003 11:06:00 AM
Aroclor 1232	ND	500		µg/Kg	1	3/25/2003 11:06:00 AM
Aroclor 1242	ND	500		µg/Kg	1	3/25/2003 11:06:00 AM
Aroclor 1248	ND	500		µg/Kg	1	3/25/2003 11:06:00 AM
Aroclor 1254	ND	500		µg/Kg	1	3/25/2003 11:06:00 AM
Aroclor 1260	ND	500		µg/Kg	1	3/25/2003 11:06:00 AM
Surr: Decachlorobiphenyl	118	30-150		%REC	1	3/25/2003 11:06:00 AM
Surr: Tetrachloro-m-xylene	120	30-150		%REC	1	3/25/2003 11:06:00 AM

ualifiers:
ND - Not Detected at the Reporting Limit
J - Analyte detected below quantitation limits
B - Analyte detected in the associated Method Blank
* - Value exceeds Maximum Contaminant Level
S - Spike Recovery outside accepted recovery limits
P - Dual Column results percent difference > 40%
E - Value above quantitation range
H - Analyzed outside of Hold Time

METHOD 8082

POLYCHLORINATED BIPHENYLS (PCBs) BY GAS CHROMATOGRAPHY

1.0 SCOPE AND APPLICATION

1.1 Method 8082 is used to determine the concentrations of polychlorinated biphenyls (PCBs) as Aroclors or as individual PCB congeners in extracts from solid and aqueous matrices. Open-tubular, capillary columns are employed with electron capture detectors (ECD) or electrolytic conductivity detectors (ELCD). When compared to packed columns, these fused-silica, open-tubular columns offer improved resolution, better selectivity, increased sensitivity, and faster analysis. The target compounds listed below may be determined by either a single- or dual-column analysis system. The PCB congeners listed below have been tested by this method, and the method may be appropriate for additional congeners.

Compound	CAS Registry No.	IUPAC #
Aroclor 1016	12674-11-2	-
Aroclor 1221	11104-28-2	-
Aroclor 1232	11141-16-5	-
Aroclor 1242	53469-21-9	-
Aroclor 1248	12672-29-6	-
Aroclor 1254	11097-69-1	-
Aroclor 1260	11096-82-5	-
2-Chlorobiphenyl	2051-60-7	1
2,3-Dichlorobiphenyl	16605-91-7	5
2,2',5-Trichlorobiphenyl	37680-65-2	18
2,4',5-Trichlorobiphenyl	16606-02-3	31
2,2',3,5'-Tetrachlorobiphenyl	41464-39-5	44
2,2',5,5'-Tetrachlorobiphenyl	35693-99-3	52
2,3',4,4'-Tetrachlorobiphenyl	32598-10-0	66
2,2',3,4,5'-Pentachlorobiphenyl	38380-02-8	87
2,2',4,5,5'-Pentachlorobiphenyl	37680-73-2	101
2,3,3',4',6-Pentachlorobiphenyl	38380-03-9	110
2,2',3,4,4',5'-Hexachlorobiphenyl	35065-28-2	138
2,2',3,4,5,5'-Hexachlorobiphenyl	52712-04-6	141
2,2',3,5,5',6-Hexachlorobiphenyl	52663-63-5	151
2,2',4,4',5,5'-Hexachlorobiphenyl	35065-27-1	153
2,2',3,3',4,4',5-Heptachlorobiphenyl	35065-30-6	170
2,2',3,4,4',5,5'-Heptachlorobiphenyl	35065-29-3	180
2,2',3,4,4',5',6-Heptachlorobiphenyl	52663-69-1	183
2,2',3,4',5,5',6-Heptachlorobiphenyl	52663-68-0	187
2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl	40186-72-9	206

e-Lab, Inc.

CLIENT: Engineering and Fire Investigations (EFI)

Order: 0303152

Project: LAA Plant/Bldg 451

Date: Mar-26-2003 00064606

QC BATCH REPORT

Batch ID: **5186** InstrumentID: **ECD_3**

MBLK Sample ID: **PBLKO1-030325** Test Code: **SW8082** Units: **µg/Kg** Analysis Date **03/25/03 9:22**

Client ID: Run ID: **ECD_3_030324A** SeqNo: **302693** Prep Date: **3/25/2003**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aroclor 1016	ND	500								
Aroclor 1221	ND	500								
Aroclor 1232	ND	500								
Aroclor 1242	ND	500								
Aroclor 1248	ND	500								
Aroclor 1254	ND	500								
Aroclor 1260	ND	500								
Surr: Decachlorobiphenyl	235	0	200	0	117	30-150	0			
Surr: Tetrachloro-m-xylene	250.2	0	200	0	125	30-150	0			

LCS Sample ID: **PLCSO1-030325** Test Code: **SW8082** Units: **µg/Kg** Analysis Date **03/25/03 9:57**

Client ID: Run ID: **ECD_3_030324A** SeqNo: **302694** Prep Date: **3/25/2003**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aroclor 1016	6889	500	5000	0	138	50-130	0			S
Aroclor 1260	5886	500	5000	0	118	50-130	0			
Surr: Decachlorobiphenyl	255	0	200	0	128	30-150	0			
Surr: Tetrachloro-m-xylene	292.5	0	200	0	146	30-150	0			

LCSD Sample ID: **PLCSDO1-030325** Test Code: **SW8082** Units: **µg/Kg** Analysis Date **03/25/03 10:32**

Client ID: Run ID: **ECD_3_030324A** SeqNo: **302695** Prep Date: **3/25/2003**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aroclor 1016	6720	500	5000	0	134	50-130	6889	2.48	30	S
Aroclor 1260	6140	500	5000	0	123	50-130	5886	4.22	30	
Surr: Decachlorobiphenyl	233.6	0	200	0	117	30-150	255	8.8	30	
Surr: Tetrachloro-m-xylene	272.9	0	200	0	136	30-150	292.5	6.94	30	

The following samples were analyzed in this batch: 0303152-01A

N - Not Detected at the Reporting Limit

J - Analyte detected below quantitation limits

O - Referenced analyte value is > 4 times amount spiked

S - Spike Recovery outside accepted recovery limits

R - RPD outside accepted recovery limits

P - Dual Column results percent difference > 40%

B - Analyte detected in assoc. Method Blank

U - Analyzed for but not detected

E - Value above quantitation range

APPENDIX B

CHAIN OF CUSTODY

e-Lab, Inc.
10450 Stancliff Rd. Suite 210
Houston, Texas 77099
Tel. 281.530.5656
Fax. 281.530.5887

QUALITY • INTEGRITY • SERVICE

Chain of Custody Form

Page ___ of ___

e-Lab Work Order No. 030352

CUSTOMER INFORMATION		PROJECT INFORMATION		PARAMETER/METHOD REQUEST FOR ANALYSIS	
Purchase Order:	N/A	Project Name:	LAA Plant / Bldg 451	A	PCB's on oil
Work Order:		Project Number:	98410-13709	B	
Company Name:	EFI	Bill To Company:		C	
Send Report To:	Wellington Joe	Invoice Attn.:		D	
Address:	9700 Richmond Ave. Suite 201	Address:		E	
				F	
City/State/Zip:	Hou, TX 77042	City/State/Zip:		G	
Phone:	713 975 7031	Phone:		H	
Fax:	713 975 7336	Fax:		I	
E-mail:	wellinston_joe@efiinfo.com	E-mail:		J	

No.	Sample Description	Date	Time	Matrix	No. of Bottles	A	B	C	D	E	F	G	H	I	J	HOLD
1	LAAP-01 / Bldg. 451	3/20/03	12h00	transformer oil	1	X										
2																
3																
4																
5																
6																
7																
8																
9																
10																

Sampler(s): Please Print & Sign — Wellington Joe

Shipment Method:

Airbill No.:

Required TAT: 3-4 days

Results Due Date: 3/28/03

Relinquished By:	Date: 3/24/03	Time: 5:30 P	Received By:	Date:	Time:	Notes:
Relinquished By:	Date:	Time:	Received By:	Date:	Time:	
Relinquished By:	Date:	Time:	Received By (Laboratory):	Date: 3/24/03	Time: 5:30p	

QC Package : (Check Box Below)
☐ Standard QC ☐ Standard QC + Raw Data ☐ Level IV - SW846 Methods ☐ Level IV - CLP SOW

IMPORTANT NOTE: Any changes must be made in writing once samples and COC Form have been submitted to e-Lab, Inc.

Copyright 1999 by e-Lab, Inc.
COC Form.xls

0006450

e-Lab, Inc.

00064609

Sample Receipt Checklist

Client Name EFI

Date/Time Received: 3/24/2003 5:30:00 PM

Work Order Number 0303152

Received by: SLT

Checklist completed by RICHARD SANCHEZ 3-24-03 (Signature / Date)

Reviewed by [illegible] 3/25/03 (Initials / Date)

Matrix: transformer oil

Carrier name: Client

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
Samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☐	No ☑	
Temperature(s)/Thermometer(s):	Ambient	NA	
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑

Adjusted? _____ Checked by _____

Login Notes:

Any No and/or NA (not applicable) response must be detailed in the comments section below.

Client contacted _____ Date contacted: _____ Person contacted _____

Contacted by: _____ Regarding: _____

Comments: _____

Corrective Action _____

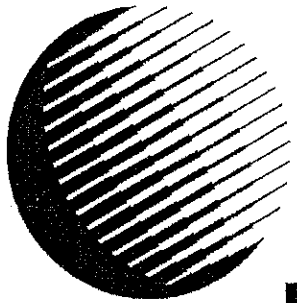
Site-Specific
Health & Safety Plan for

Building Review and Condition Assessment for Explosive Materials Longhorn Army Ammunition Plant - Karnack, Texas

Prepared for:

(ARC Abatement, Inc.)

Prepared by:



EFI

Engineering and Fire Investigations, Inc.
9700 Richmond Avenue, Suite 201
Houston, Texas 77042

(September, 2003)

Client Name: ARC Abatement, Inc.

EFI Project # :98410-00810

00064610

EFI

HEALTH AND SAFETY PLAN
REVIEW AND APPROVAL

CLIENT: ARC Abatement, Inc.

SITE NAME: Longhorn Army Ammunition Plant

PROJECT NAME: Karnack

PROJECT NUMBER: 98410-00810

START DATE: September 22, 2003

END DATE: December 15, 2003

PLAN EXPIRATION DATE: November 31, 2003
(Last day of expected fieldwork or no longer than 6 months).

Cuong Nguyen Project Manager	Signature:_____	Date:_____
Daniel A. Penaloza II, CIH EFI Office Health and Safety Coordinator	Signature:_____	Date:_____
Lee A. Burckle, P.E. Principal - in - Charge	Signature:_____	Date:_____
Rick A. Anderson, P.E. Peer Reviewer	Signature:_____	Date:_____

This Health and Safety Plan has been written for the use of EFI and its employees. It may also be used as a guidance document by properly trained and experienced EFI subcontractors and clients.

Our work can be hazardous, and it is imperative that we never forget that! It is the intent of this document to address our risks. The health and safety guidelines in this Plan were prepared specifically for this site, its conditions, purposes, dates and personnel and must be amended if conditions change. This Plan must not be used on any other site without prior research by trained health and safety specialists.

EFI claims no responsibility for its use by others for purposes unrelated to this project. This Plan will provide useful information to subcontractors and will assist them in developing their own HASP. Subcontractors should sign this plan (See Attachment 4) as an acknowledgement of hazard information and notice that they must ensure that the risks posed by work on this site are addressed. EFI is readily available to assist subcontractors in identifying and addressing their employees' risks.

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ATTACHMENT 4	ACKNOWLEDGEMENT & AGREEMENT FORM
ATTACHMENT 5	HAZARD CLASSIFICATION
ATTACHMENT 6	MATERIAL SAFETY DATA SHEETS

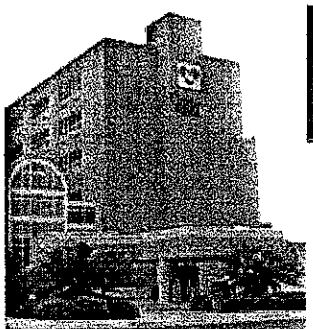
1.0 LOCAL EMERGENCY CONTACT NAMES, PHONE NUMBERS, AND DIRECTIONS TO THE HOSPITAL

The location of the nearest telephone is: Thomas Pilgrim – Site Office (903-679-9139)

DIRECTIONS AND MAP TO THE HOSPITAL – SEE BELOW

	NAME	TELEPHONE NO.
Hospital	Marshall Regional Medical Center	903-927-6000
Ambulance		911
Police/Sheriff	Harrison Country Sheriff	911 or 903-923-4000 (non-emergency)
Fire	Marshll Fire Department	903-935-4588

00064615



MARSHALL REGIONAL MEDICAL CENTER

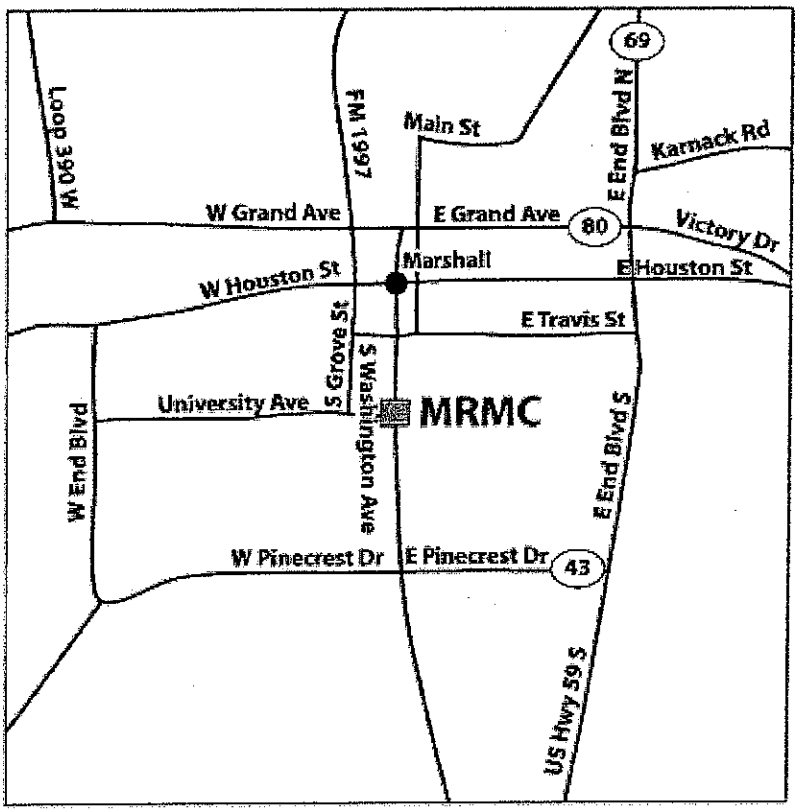
Creating A Healthier Communit

811 S. Washington • Marshall, Texas 7567
Ph: (903) 927-6000 • Fax: (903) 927-6101 •

Map Locator

Click here for an interactive driving map. »

Click here to print this map. »



Top

©2003 MRMC
Great M7 Design

2.0 OBJECTIVES AND GOALS OF THIS HASP

The purpose of this HASP is to:

- **Document a proactive, scientific exposure assessment, which identifies and helps us understand our risks.**
- **Document proactive precautions we are going to take to avoid the risks.**

Our goal is to:

- **Complete our work on this site without any incidents at all; no injuries, no illnesses, no impacts to the environment or to property and equipment. NONE! We have zero tolerance for incidents of any type. We expect all subcontractors and other project participants to share this goal.**

3.0 SCOPE OF WORK

The purpose of this project is to:

- Assess ordnance explosive residue and Ammonium Percholorate residue.
- Explosively classify selected facilities for disposal.

This HASP was prepared for the use of EFI personnel while performing the following tasks:

Task 1: Visual observations of the identified buildings for the presence of ordnance and explosive residue, and Ammonium Percholrate residue.
Task 2: Testing (wipe samples) of surfaces in buildings to identify ordnance and explosive residue and Ammonium Percholorate residue.
Task 3: Collection of QA/QC field test samples.

4.0 EMERGENCY RESPONSE

- In the event of an injury or illness, notification of the family of the individual involved shall be made as promptly as possible following the office's emergency action plan.
- You must have an eyewash bottle with you on site in case you get something in your eyes.)

The Project Manager (PM) must be familiar with the directions to the hospital given in **Section 1.**

Injury or Illness

If an injury or illness occurs, take the following action:

- Determine if emergency response (fire/ambulance) staff are necessary. If so, dial **911** *(or 903-935-4588 for non-emergency)* on cell phone or closest available phone. *(closest phone other than personal cellular phones are located in the job office trailer at 903-679-9139)* Provide the location of the injured person and other details as requested. If it makes sense to take an individual to the hospital, follow the directions in **Section 1.**

- Get First Aid for the person immediately. Utilize first aid kit in vehicle or ARC Abatement job trailer.

- Notify the PM immediately. The PM is responsible for preparing and submitting the Incident/Near Miss Investigation Report EFI's Director of Human Resources within 24 hours of the incident, as well as notifying the employee's supervisor and Principal-in-Charge. Use the Incident/Near Miss Investigation Report and Root Cause Analysis Flowchart in **Attachment 2.** Mr. Beagan can be contacted at 281-358-4441. ***(Note: All incidents must be reported to the Project Manager within 24 hours, but the actual investigation need not be completed within 24 hours.)***

- The PM will assume responsibility during a medical emergency until more qualified emergency response personnel arrive at the site.

First Aid Procedures for Minor Cuts, Scratches, Bruises, etc.

- Each occupational illness or injury shall be reported immediately by employees to the PM. The PM will complete the Incident/Near Miss Investigation Report in **Attachment 2** and report the incident to the Human Resources Director.

Medical Cases Not Requiring Ambulance Service

- Medical cases normally not requiring ambulance services are injuries such as minor lacerations, minor sprains, etc.
- The PM will ensure prompt transportation of the injured person to a physician or hospital following the directions in **Section 1**.
- A representative of EFI/sub-contractor should always drive the injured employee to the medical facility and remain at the facility until the employee is ready to return.
- If the driver of the vehicle is not familiar with directions to the hospital, a second person shall accompany the driver and the injured employee to the hospital
- If it is necessary for the PM to accompany the injured employee, provisions must be made to have another employee, properly trained and certified in first aid, to act as the temporary PM. If the injured employee is able to return to the jobsite the same day, he/she should bring with him/her a statement from the doctor containing such information as:
  - Date
  - Employee's name
  - Diagnosis
  - Date he/she is able to return to work, regular or light duty
  - Date he/she is to return to doctor for follow-up appointment, if necessary
  - Signature and address of doctor

  If the injured employee is unable to return to the jobsite the same day, the employee who transported him should bring this information back to the jobsite and report it to the Project Manager.

Emergency Cases Requiring Ambulance Services

- Medical cases requiring ambulance services would be such cases as severe head injuries, amputations, heart attacks, etc.

- Should ambulance service be necessary, the following procedures should be taken immediately.
  - Contact necessary ambulance service and company emergency services by dialing **911** and notify the PM for the site.
  - Administer first aid until ambulance service arrives.
  - While the injured employee is being transported, the PM should contact the medical facility to be utilized.
  - One designated representative should accompany the injured employee to the medical facility and remain at the facility until final diagnosis and other relevant information is obtained.

Death of an Individual or Hospitalization of Three or More Employees

The procedure as outlined in "First Aid and Medical Cases", above, should be followed. If the injured person dies, then EFI Human Resources Department, local officials and coroner must be notified ***immediately***. EFI Human Resources will notify the **local OSHA office within 8 hours of the incident or fatality** in the event of fatality or hospitalization of three or more employees.

5.0 CONTRACTOR EMERGENCY ACTION PLAN

The PM will ensure that the Subcontractor/Contractor is capable of efficient evacuation/emergency response in the event of an emergency. Subcontractor/Contractor's employees will be trained by their employer in site-specific evacuation/emergency procedures, including alarm systems and evacuation plans and routes.

The Subcontractor/Contractor shall instruct its employees that in the event of an emergency such as a fire, release, or accident involving injuries, they are required to dial **911** *(*903-679-9139 for Marshall Fire Department*)*. The reporting employee is to state the problem clearly and fully and remain on the line until dismissed by the operator.

EFI staff and Subcontractor/Contractors working in an area where an emergency exists shall evacuate to a safe location, preferably upwind, away from the area and take attendance. The gathering location will be:

Front Gate (Security Office) of the Longhorn Army Ammunition Plant.

(If the emergency causes the route to a gate surrounding the site to be closed EFI staff and Subcontractor/Contractors shall move to an open area upwind of the hazard area, and remain there until instructed by emergency response personnel (i.e., police, fire, ambulance, paramedics, etc.) to do otherwise.)

Subcontractor/Contractor has the responsibility to account for its own employees and to provide such information immediately to emergency response personnel upon request.

EFI staff and Subcontractor/Contractor may not reenter the emergency site without specific approval from emergency response personnel.

In the event of fire ignition in close proximity to EFI staff and Subcontractor/Contractor's employees, those persons shall evacuate the area and notify emergency personnel unless the fire is readily extinguished with portable dry chemical equipment on-hand. **When in doubt, emergency response personnel shall be notified.**

6.0 BACKGROUND INFORMATION ON THE PROJECT SITE

The Longhorn Army Ammunition Plant is located in Karnack, Texas. The plant began operation in 1942 with the primary mission of producing 2,4,6 Trinitrotoluene flake and continued until August 1945 when the plant went in standby status. The plant reopened in 1952 and continued operating until 1997 when it became inactive and excess to the Army's needs. In 1998 the Army contracted with Earth Tech to liquidate all personal property and specific installed property. In 1999 the Army contracted with Project Development Corp. to demolish specific structurally unsafe buildings. Currently, the Army is requesting that additional buildings (~210) be demolished. Prior to their demolition, a survey is required to identify ordnance and explosive residue and Ammonium Perchlorate residue.

7.0 CLIENT SAFETY PROCEDURES

The contractor is responsible for meeting all applicable federal, state, and local safety and environmental regulations, including, but not limited to Occupational Safety and Health Act (OSHA) and Environmental Protection Agency (EPA) regulations. Decontamination, transportation, and disposal of contaminated materials shall be performed IAW applicable federal, state and local laws and regulation. No ozone-depleting chemical (as defined by Public Law 102-484, Section 326) shall be used during the execution of the project.

8.0 SITE PLAN

A site Plan(s) is(are) included in **Attachment 1.**

9.0 GOVERNMENT CONTACT NAMES AND PHONE NUMBERS

AGENCY	NAME	TELEPHONE NO.
BRAC Technical Support Office	Mr. Brian Gebhart	309-782-1387
Utility Locators		

Questions about this project posed by neighbors, the press, or other interested parties should be directed to:

Name: Mr. Michael Luczak Company: ARC Abatement , Inc. Phone: 713-542-4073 (cell) or 713-896-0668 (office)
The site phone number is 903-679-9139

PROJECT JOB TITLE	NAME	TELEPHONE NO.	GENERAL PROJECT RESPONSIBILITIES	CPR/First Aid
Project Manager	Cuong Nguyen	713-724-2709	Overall financial and logistics. Follow-up all incidents upon notice. Implementing this HASP. Has authority to stop work. Perform surface and QA/QC sampling. Take charge of all incidents. Review subcontractor's HASP	2001
Project Staff	Don Corneau Adam Satterfield	832-563-8427 281-546-3888	Conduct work in accordance with this HASP. Report all incidents and near misses immediately to Project Manager.	
Subcontractor- Project Manager	N/A			
Subcontractor-	N/A			
EFI Principal-in-Charge	Lee A. Burckle	713-569-4618	Provide immediate support at notice of all incidents. Respond with corporate resources to all incidents as appropriate. Assist in HASP review. Assist in incident investigation.	
Client Contact	Michael Luczak	713-542-4073	Provide all known analytical data performed by others and notice of hazards. Provide access to site and available emergency response capabilities.	
EFI Human Resources Director	Robert Beagan	(281) 312-3103	Assist with incident review.	

10.0 CONTAMINANTS IDENTIFIED ONSITE

Listed below are the known contaminants that are expected to be encountered at the site.

Substance	Explosive	Pyrotechnic	Other
acetone			x
alcohol			x
aluminum (as pyro powder)		x	
ammonium perchlorate	x	x	
antimony sulfide		x	
arsenic			x
asphaltum		x	
barium		x	
barium chromate		x	
barium nitrite		x	
benzathrone (dye)			x
black powder	x		
boron		x	
chromic oxide (polishing compound)			x
chromium			x
cobalt (gamma radiation)			x
copper powder (colorant)			x
diesel			x
diglycidyl ether (resin manufacture)			x
fluorinated polymers (insulation/lubricants)			x
hexane			x
lead			x
lead oxide (tetra red)	x		
magnesium	x	x	
magnesium powder	x	x	
MEK			x
mercury	x		
methylene chloride			x

Substance	Explosive	Pyrotechnic	Other
molybedenum trioxide		x	
organic peroxides	x		
oxamide		x	
PBX	x		
perchlorates	x		
Phthalates (plasticizing compounds)			x
polyester resins			x
polyvinyl chloride			x
potassium chlorate	x	x	
potassium perchlorate	x	x	
RDX	x	x	
Red Phosphorus		x	
silicon		x	
silver	x		
sodium nitrate	x	x	
strontium nitrate		x	
styrene monomer (mfg of plastics and resins)			x
tetrafluoroethylene (mfg of polymers)			x
tetranitrocarbazole	x		
Thallium (insecticides)			x
toluene			x
trichloroethylene			x
triethylenetetramine (resins and epoxy)			x
tungsten		x	
zinc		x	
zirconium		x	

11.0 POTENTIAL CONCERNS

- ***The level for respirator use indicated below is that concentration at which a respirator must be put on. It does not require the job to stop. The respirator is a tool to be used while determining why the exposure has reached that concentration. Take action to reduce the concentration by engineering controls such as water mist, spray foam, plastic cover, etc.***
- ***The level for work stoppage indicated below is that concentration at which work on the job must stop. Determine why exposures have reached that concentration and how they can be reduced. Site evacuation is not necessary at this level. It does not mean that stopping operations should reduce the likelihood that the concentration will continue to rise. Implement engineering controls to reduce the concentration, then resume work.***

POTENTIAL AIRBORNE CHEMICALS ONSITE IN THIS PROJECT
REVIEW THIS TABLE AND CONTACT PROJECT MANAGER WITH QUESTIONS

CHEMICAL (OR CLASS)	OSHA PEL ACGIH TLV	OTHER PERTINENT LIMITS	WARNING PROPERTIES	ROUTES OF EXPOSURE OR IRRITATION	ACUTE HEALTH EFFECTS	CHRONIC HEALTH EFFECTS/ TARGET ORGANS
1,1,1-Trichloroethane (methyl chloroform)	PEL - TWA 350 ppm; TLV - 350 ppm; STEL - 450ppm	NIOSH Ceiling 350 ppm	Colorless liquid with a mild, chloroform-like odor	Inhalation, skin absorption, ingestion, and/or eye contact	Irritation to eyes, skin; headache, lassitude (weakness, exhaustion), central nervous system depressant/depression, poor equilibrium; dermatitis	Cardiac arrhythmias; liver damage **Target Organs** Eyes, skin, central nervous system, cardiovascular system, liver
1,1,2-Trichloroethane	PEL - TWA 10 ppm (45 mg/m^3) [skin] TLV 10ppm	NIOSH considers this compound a carcinogen; REL - TWA 10 ppm (45 mg/m^3) [skin]	Colorless liquid with a sweet, chloroform-like odor	Inhalation, skin absorption, ingestion, and/or eye contact	Irritation to eyes, nose; central nervous system depressant/depression; dermatitis	Liver, kidney damage; Potential occupational liver carcinogen **Target Organs** Eyes, respiratory system, central nervous system, liver, kidneys
Toluene	PEL 200 ppm TLV 50 ppm	NIOSH REL = 100ppm TWA; 150ppm STEL ILDH = 500 ppm	Sweet, pungent, benzene-like odor	Inhalation, dermal, ingestion, eyes	Skin (dermatitis) eye, respiratory tract irritant, headache, dizziness, weakness, and fatigue.	CNS, liver, kidneys, skin.
Acetone	PEL 1000 ppm TLV 500 ppm	NIOSH REL =250ppm TLV STEL = 750ppm IDLH = 2500ppm	Fragrant, mint-like odor	Inhalation, dermal, ingestion, eyes	Irritation to eyes, nose, throat; headache, dizziness, dermatitis .	Central nervous system depressant/depression; liver and kidney damage.
Benzene	PEL 1 TLV 0.5 ppm (skin)	PEL-STEL= 5 ppm NIOSH REL=0.1ppm IDLH=500 ppm	Characteristic benzene odor	Inhalation, Dermal, ingestion, eyes	Skin (dermatitis), eye, respiratory tract irritant, headache, dizziness, nausea.	Carcinogen, CNS, eye damage, bone marrow, blood, skin, leukemia.

POTENTIAL AIRBORNE CHEMICALS ONSITE IN THIS PROJECT REVIEW THIS TABLE AND CONTACT PROJECT MANAGER WITH QUESTIONS						
CHEMICAL (OR CLASS)	**OSHA PEL ACGIH TLV**	**OTHER PERTINENT LIMITS**	**WARNING PROPERTIES**	**ROUTES OF EXPOSURE OR IRRITATION**	**ACUTE HEALTH EFFECTS**	**CHRONIC HEALTH EFFECTS/ TARGET ORGANS**
2-Butanone (methyl ethyl ketone)	PEL 200 ppm TLV 200 ppm	NIOSH REL 200 ppm; REL STEL 300 ppm; TLV STEL 300 ppm	Colorless liquid with a moderately sharp, fragrant, mint- or acetone-like odor.	Inhalation, dermal, ingestion, eyes	Irritation to eyes, skin, nose; headache; dizziness; vomiting; dermatitis	Eyes, skin, respiratory system, central nervous system
Arsenic	PEL 0.01 mg/m3 TLV 0.01 mg/m3	NIOSH REL ceiling = 0.002 mg/m3 IDLH = 5 mg/m3	Odorless, gray-silver, solid	Inhalation, dermal absorption, ingestion, eyes	Dermatitis, gastrointestinal disturbances, respiratory irritation, hyperpigmentation of skin.	Skin, respiratory system, including ulceration of nasal septum,, CNS, kidneys, eyes. Potential occupational carcinogen
Lead	PEL 0.05 mg/m^3 TLV 0.05 mg/m^3	IDLH 100 mg/m^3	A heavy, flexible, soft, gray solid	Inhalation, dermal, ingestion, eyes	Weakness, lassitude (weakness, exhaustion); abdominal pain; gingival lead line; tremor; irritation eyes; hypertension	Insomnia; facial pallor; anorexia, weight loss, malnutrition; constipation, colic; anemia; paralysis wrist, ankles; encephalopathy; kidney disease; Potential for damage to eyes, gastrointestinal tract, central nervous system, kidneys, blood, gingival tissue
Thallium	PEL 0.10 mg/m3 TLV 0.1 mg/m3	NIOSH REL 0.1mg/m3 IDLH = 15 mg/m3	Appearance and odor vary depending upon the soluble compound(s).	Inhalation, dermal, ingestion, eyes	Irritation to eyes, skin; fatigue, weakness, somnolence (sleepiness, unnatural drowsiness), lightheadedness; numbness, tingle limbs; nausea.	Potential occupational carcinogen. **Target Organs** Eyes, skin, cardiovascular system, central nervous system.

POTENTIAL AIRBORNE CHEMICALS ONSITE IN THIS PROJECT REVIEW THIS TABLE AND CONTACT PROJECT MANAGER WITH QUESTIONS						
CHEMICAL (OR CLASS)	**OSHA PEL ACGIH TLV**	**OTHER PERTINENT LIMITS**	**WARNING PROPERTIES**	**ROUTES OF EXPOSURE OR IRRITATION**	**ACUTE HEALTH EFFECTS**	**CHRONIC HEALTH EFFECTS/ TARGET ORGANS**
Methylene chloride	PEL 25 ppm TLV 50 ppm	NIOSH considers methylene chloride to be a carcinogen.	Colorless liquid with a chloroform-like odor.	Inhalation, dermal, ingestion, eyes	Irritation to eyes, skin; fatigue, weakness, somnolence (sleepiness, unnatural drowsiness), lightheadedness; numbness, tingle limbs; nausea.	Potential occupational carcinogen. **Target Organs** Eyes, skin, cardiovascular system, central nervous system.
Styrene	PEL 100 ppm TLV 20 ppm	PEL Ceiling 200 ppm TLV STEL 40 ppm NIOSH REL 50 ppm	Colorless to yellow, oily liquid with a sweet, floral odor.	Inhalation, dermal, ingestion, eyes	Irritation to eyes, nose, respiratory system; headache, fatigue, dizziness, confusion, malaise (vague feeling of discomfort), drowsiness, weakness, unsteady gait; narcosis.	Defatting dermatitis; possible liver injury; reproductive effects.
Mercury	PEL Ceiling Limit: 0.1 mg/m^3 TLV 0.01 - 0.1 mg/m^3 depending on the form.	NIOSH REL = 0.05 mg/m^3 IDLH=10 mg/m^3	Silver-white, heavy, odorless liquid.	Inhalation, skin absorption, ingestion, skin and/or eye contact	Irritation to eyes, skin; cough, chest pain, dyspnea (breathing difficulty), headache, fatigue, weakness;	Bronchitis pneumonitis; tremor, insomnia, irritability, indecision, stomatitis, salivation; gastrointestinal disturbance, anorexia, weight loss; proteinuria **Target Organs** Eyes, skin, respiratory system, central nervous system, kidneys

For a detailed listing of known or assumed chemicals identified at the site, see Appendix 7 for Material Safety Data Sheets associated with the know or assumed contaminants listed in Section 10 (above).

Explanation - Abbreviations

PEL = Permissible Exposure Limit;
TLV = Threshold Limit Value set by the ACGIH (American Conference of Governmental Industrial Hygienists);
AIHA WEEL = Workplace Environmental Exposure Limits set by the AIHA (American Industrial Hygiene Association);
SKIN = Skin absorption;
STEL = Short Term Exposure Limit;
NIOSH = National Institute for Occupation Safety and Health;
REL = Recommended exposure limit set by NIOSH;
IDLH = Immediately Dangerous to Life or Health;
C = Ceiling limit;
CNS = Central Nervous System;
CVS = cardiovascular system

12.0 HAZARD ASSESSMENTS AND PRECAUTIONS

EFI has identified that approximately 200 buildings (individual work areas) will be reviewed as part of the overall residue testing and building condition assessment work activities. Work on this project will be conducted during the hours of 7:00 am to 5:30 pm (Monday through Thursday). As part of EFI's residue testing and building assessment activities, EFI has included the following work activities that may be conducted on a day-to-day basis and subject to the provision of the Health and Safety Plan.

Field verification and building condition assessment activities,
Entry of building and documentation of functional spaces,
Condition assessment of identified functional spaces,
Photographing interior and exterior building areas (general construction, administration, laboratory, warehouse, service, utility, etc.),
Select demolition of wall and ceiling cavity finishes to observe for reside within various voids, interior cavities, and chases,
Wipe sampling of select interior/exterior surface areas (walls, ceilings, floors, equipment, drains, electrical, mechanical, etc.), and
Contaminant classification on visually reviewed and residue test sites.

Personal Safety Concerns and Precautions: In addition to the precautions set forth in other sections of the Health and Safety Plan, field workers shall be cognizant of game animals, rodents, insects, bugs, snakes, etc. in all areas (concealed or otherwise).

Jewelry safety: Jewelry can be dangerous. Large ear rings, long necklaces, loose-fitting bracelets, rings, watches, etc. can become entangled in machinery and cause removal of limbs, as well as be conductive of electricity. Use caution and avoid unnecessary hazards!

12.1 Planned Field Activity:

_____ Drilling Soil Borings and Well Installations
_____ Soil Gas Survey
_____ Ground-Water Sampling
__X__ Other – Residue Testing and Building Classification Summary

Subcontractors Used:
1. _____
2. _____
3. _____
4. _____

12.2 Site Monitoring Procedures

No entry into the work area will be allowed without express authorization by the Field Safety Coordinator. Authorization into the work area will be contingent upon individual acknowledgment that he/she has read and understands and will comply with the requirements of this Health and Safety Plan.

In addition, each discipline (subcontract work) shall be responsible to provide their personnel with adequate and proper supervision, safety information, instruction and equipment.

In order to assess the potential contaminants suspected for each building facility, the following work activities shall be conducted prior to exterior visual assessment and/or interior assessment and residue testing activities:

Review applicable historical document records prepared for each individual building/area,
Identify suspect substances (descriptions) noted on the historical document review records,
Isolate appropriate MSDS from the MSDS included in Attachment No. 7 to this document for quick reference in case of adverse health affects,

As there are several suspect chemical contaminants and associated chemical contaminant categories (alkalis, caustics, hydrocarbons, dyes, explosives, pyrotechnics, etc.) that may have been used, stored, produced at any of the building area facilities, it is imperative that specific hazard identification, emergency overview, first aid measures, handling, exposure controls, personal protections, physical and chemical properties, etc. be reviewed prior to any type of field work that may be required and discussed as part of daily safety meetings.

Removal of asbestos-containing materials shall be conducted by licensed asbestos abatement contractors and monitored by a licensed asbestos consultant/project manager.

12.3 Personnel Monitoring Procedures

No single combination of protective equipment and clothing is capable of protecting against all hazards. This PPE should be used in conjunction with other protective methods and its effectiveness evaluated periodically.

The use of PPE can itself create significant worker hazards, such as heat stress, physical and psychological stress, and impaired vision, mobility and communication. For any given situation, equipment and clothing should be selected that provide an adequate level of protection.

Exposure monitoring criteria is identified in the MSDS sheets located in Attachment No. 7. For a detailed description of PPE and health hazards associated with coming in contact with various chemical constituents (as identified in Section 10.0 of this document), review the MSDS prior to entering each work area (building).

12.4 Clothing and Protective Equipment Required

1. Hard hats are to be worn as required by OSHA standards or site/workplan requirements;
2. Steel toed leather or rubber boots as necessary based on site requirements;
3. Safety glasses or chemical goggles (Note: contact lenses are not to be worn);
4. Normal work clothes shall be worn during building assessment review and residue testing activities. Disposable clothing, such as Tyveks®, shall be worn if the potential for contact with contaminated material increases. The Field Safety Coordinator shall closely observe all individuals to monitor and prevent heat stress. Tyveks® will be discarded at the end of each work day, and should they become torn during the work day and can not easily be field repaired, they will be replaced immediately.
5. Half-face air purifying respirators with appropriate cartridges shall be worn as described in Personnel Monitoring Procedures and during all explosive residue sampling procedures.

12.5 Dec[illegible]amination Procedures

Decontamination procedures should be tailored to the specific hazards of the site and will vary in complexity and number of steps, depending on the level of hazard and the employee's exposure to the hazard. Decontamination procedures and PPE decontamination methods will vary depending upon the specific substance, since one procedure or method will not work for all substances. Evaluation of decontamination methods and procedure should be performed, as necessary,to assure that employees are not exposed to hazards by re-using PPE.

Use these as necessary or modify to suit site conditions and/or workplan requirements.

1. Personnel: If any skin contact occurs, flush affected area with water for 15 minutes. Wash affected area with soap and water. Seek medical attention if needed. See MSDS for specific decontamination procedures prior to entering building facility work areas.

2. Equipment: Other equipment which comes into contact with contaminated materials shall also be washed with soap and water and rinsed.

12.6 Work Precautions

1. No smoking, eating, drinking or chewing of gum or tobacco products while on the site. A designated smoking and break area may be established offsite.

2. Hard hats with face shields or goggles are required at all times within the site. Face shields or goggles will be worn whenever the potential for chemical splash or flying debris is present. Use of impervious gloves (neoprene, natural rubber, poly vinyl chloride, butyl rubber) and foot coverings are recommended.

3. Use of tools and equipment with the potential to produce sparks is strictly prohibited. Select demolition of interior wall spaces and cavities shall be conducted with non-sparking tools such as a "dead-blow" hammer.

4. Decontamination of equipment, clothing and personnel shall be in accordance with the previous section entitled "Decontamination and Disposal".

5. Hot work which involves the use of open flame and/or spark-producing equipment shall not be initiated without prior authorization from the Field Safety Coordinator.

6. Personnel must wash all exposed skin areas with soap and water before departing the site or going on break.

7. Prior to the start of work, any EFI employees or subcontractor personnel shall be briefed on the contents of this plan by the Field Safety Coordinator.

12.7 Hazard Classification

For a complete listing of general protection of explosives, toxicity hazards, hazard classes and class division, see the assessment and classification sheets in Attachment No. 6.

13.0 WASTE CHARACTERISTICS

A. Waste Generation (Type(s)/Quantities Expected):

Anticipated (YES/NO): Y

Types: Liquid ___ Solid ___ Sludge ___ Other (Paper towels, respirator cartridges, wipes, etc.)

Quantity (Expected Volume): 1 cubic yard

B. Characteristics (Expected):

Corrosive ___ Flammable/Ignitable X Radioactive ___ Toxic ___

Reactive ___ Unknown ___

Other (specify)

C. Packaging requirements for waste material (N/A):

D. Disposal and/or Treatment Methods Proposed:

Treat disposable items as normal refuse based on available information and dispose with regular trash onsite, if possible.

ATTACHMENT 1

SITE PLAN(s)

ATTACHMENT 2

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Incident Investigation/ Near-Miss Investigation Report

INCIDENT TYPE				Date of Incident:
☐ Fatality	☐ Industrial Non-Recordable	☐ Spill/Leak	☐ General Liability	
☐ Lost Workday	☐ Non-Industrial	☐ Product Integrity	☐ Criminal Activity	
☐ LW Restricted Duty	☐ Off-the-Job Injury	☐ Equipment	☐ Notice of Violation	
☐ OSHA Medical or Illness w/o LW	☐ MVA	☐ Business Interruption	☐ Near Miss	
☐ First Aid	☐ Fire	(TO BE COMPLETED BY HR)		

This report must be completed by the employee's supervisor or Project Manager immediately upon learning of the incident. The completed report must be reviewed and signed by the Principal-In-Charge and e-mailed or faxed to the Director of Human Resources, within 24 hours of the incident, even if employee is not available to review and sign. Employee or employee's doctor must submit a copy of the doctor's report to Human Resources within 24 hours of the initial exam and any subsequent exams.

EMPLOYER

Company Name:					
Work Location Address where incident occurred:			Project Name:		

EMPLOYEE

Name:	Employee #:	Birthdate:
Employment Status: ☐ Full-Time ☐ Part-Time ☐ Hourly-As-Needed	How long in present job?	

INJURY OR ILLNESS INFO

Where did incident / near miss occur? (number, street, city, state, zip):	
nty:	On Employer's premises? ☐ Yes ☐ No

Specific activity the employee was engaged in when the incident / near miss occurred:

All equipment, materials, or chemicals the employee was using when the incident / near miss occurred (e.g., the machine employee struck against or which struck employee; the vapor inhaled or material swallowed; what the employee was lifting, pulling, etc.):

Describe the specific injury or illness (e.g., cut, strain, fracture, skin rash, etc.):

Body part(s) affected (e.g., back, left wrist, right eye, etc.):

Name and address of Health Care Provider (e.g., physician or clinic):	Phone No.:
If hospitalized, name and address of hospital:	Phone No.:

Date of injury or onset of illness(MM/DD/YYYY) / /	Time of event or exposure: ☐ AM ☐ PM
Time employee began work: ☐ AM ☐ PM	Did employee lose at least one full shift's work? ☐ No ☐ Yes, 1st date absent (MM/DD/YYYY) / /

Has employee returned to work? ☐ Regular work ☐ Restricted work ☐ No, still off work ☐ Yes, date returned (MM/DD/YYYY) / /

Did employee die? ☐ No ☐ Yes, date (MM/DD/YYYY) / /

Date employer notified of incident / near miss: (MM/DD/YYYY) / /

To whom reported:

er workers injured/made ill in this event? ☐ Yes ☐ No

Description of Incident / Near Miss: (Describe fully the incident / near miss events. Tell what happened and how it happened.)

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Motor Vehicle Accident (MVA)				Professional Driver? ☐ Yes ☐ No	
Total Years Driving:	Company Vehicle? ☐ Yes ☐ No		Operation Type:		Accident Situation:
Truck Transportation:	Years with Carrier:		Vehicle Type:		Equipment #:
Accident Location (street, city, state):					
Hazardous Material? ☐ Yes ☐ No	Recordable? ☐ Yes ☐ No	No. of Vehicles Towed		No. of Injuries:	No. of Fatalities:

Spill/Leak/Product Quality									
Product Name		Quantity		Product 2 Name		Quantity		Product 3 Name		Quantity	
Agency Notifications									
Cost of Incident	$								

Third Party Incidents					
Name of Owner		Address		Telephone	
Description of Damage:					
Witness Name		Address		Telephone	
Witness Name		Address		Telephone	

#	**Root Cause and Contributing Factors: Conclusion (Describe in Detail Why Incident / Near Miss Occurred)**
1	
2	
3	
4	
5	

Root Cause(s) Analysis (RCA):

1. Lack of skill or knowledge
2. Lack of or inadequate operational procedures or work standards
3. Inadequate communication of expectations regarding procedures or work standards
4. Inadequate tools or equipment
5. Correct way takes more time and/or requires more effort
6. Short-cutting standard procedures is positively reinforced or tolerated
7. Person thinks there is no personal benefit to always doing the job according to standards
8. Uncontrollable

#	RCA #	Solution(s): How to Prevent Incident / Near Miss From Reoccurring	Person Responsible	Due Date	Closure Date

Investigation Team Members

Name	Job Title	Date

Results of Solution Verification and Validation

Reviewed By

Name	Job Title	Date
	First Line Supervisor	
	Other (name)	

Acknowledgment Signatures for Injuries/Illnesses		
Title	**Signature**	**Date**
Director of HR:		
VP, Environmental Services Group:		
District/Branch Manager:		
Project Manager:		
Site Supervisor:		
President, EFI:		

ATTACHMENT 3
DAILY PRODUCTION HEALTH AND SAFETY BRIEFING LOG

Date:	
Start Time:	
Issues Discussed:	
1.	
2.	
3.	
4.	
5.	
Attendees	
Print Name and Company	**Signature**
Meeting Conducted by:	
Name (Site Health and Safety Coordinator)	**Signature**

DISCUSSION IDEAS FOR THE DAILY PRODUCTION H&S MEETING

Emergency response plan, emergency vehicle (full of fuel) and muster point

Route to medical aid (hospital or other facility)

Work hours, is night work planned?

Hand signals around heavy equipment

Traffic control

Pertinent Legislation and Regulations

Above and below ground utilities (energized or de-energized)

Material Data Sheets (MSDS)

To who, what, why, and when to report an incident

Fire extinguisher and first aid kit locations

Personal protective equipment (PPE) and training

Safety equipment and training

Emergency telephone and telephone numbers (may not be 911)

Eye wash stations and washroom locations

Weather restrictions

Site security. Site hazards. Is special waste present.

Traffic and people movements

Working around machinery (both static and mobile)

Sources of ignition, static electricity etc.

Stings, bites, large animals and other naturally related injuries

Working at isolated sites

Decontamination procedures (both personnel and equipment)

Falls, trips, sprains and lifting injuries (how to prevent)

Right to refuse unsafe work

Adjacent property issues (residence, business, school, day care center)

ATTACHMENT 4
HEALTH AND SAFETY PLAN ACKNOWLEDGMENT AND AGREEMENT FORM
(All EFI and subcontractor personnel must sign.)

"Zero Tolerance for Incident of ANY Kind. Work Together to Ensure A SAFE and High Quality Project

This Health and Safety Plan has been developed for the purpose of informing EFI employees of the hazards they are likely to encounter on the project site, and the precautions they should take to avoid those hazards. Sub-contractors and other contractors at the site must develop their own Health and Safety Plan to address the hazards faced by their own employees. EFI has provided a copy of this Plan to contractors in the interest of full disclosure of hazards of which we may be aware, and to satisfy EFI's responsibilities under the Occupational Safety and Health Administration (OSHA) Hazard Communication standard. Similarly, contractors are required to inform EFI of any hazards of which they are aware or that the contractor's work on site might possibly pose to EFI employees, including (but not limited to) the Material Safety Data Sheets for chemicals the contractor may bring on-site. This plan should NOT be understood by contractors to provide information on all of the hazards to which a contractor's employees may be exposed as a result of their work.

All parties conducting site activities are required to coordinate their activities and practices with the Project Manager. Your signature below confirms that you have read and understand the hazards discussed in this Plan, and understand that sub-contractors and contractors must develop their own Health and Safety Plan for their employees. You also understand you could be prohibited by the Project Manager or other EFI personnel from working on this project for not complying with any aspect of this Health and Safety Plan.

Name	Title	Signature	Company	Date

Client Name: ARC Abatement, Inc.

EFI Project # :98410-00810

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ATTACHMENT 5

HAZARD CLASSIFICATION

1.0 Protection of Explosives

Explosives are energetic materials that can react violently. Explosives should be protected from abnormal stimuli or environments, including

- Friction forces;
- Excessive pressures and temperatures;
- Impact, shock, and pinching;
- Deformation;
- Electrical sparks, abrasive or welding sparks, and open flame;
- Contamination; and
- Contact with incompatible materials.

2.0 Toxicity Hazards

Explosives materials, explosives components (additives or adhesives), and materials such as organic solvents used in explosives processing can be toxic when inhaled, ingested or absorbed through the skin. Skin contact with explosives materials, or with solvents and adhesives used in conjunction with explosives operations, can result in a skin rash. This is the most frequently reported effect from working with these materials. The following general precautions should be used to prevent overexposure to these materials during explosives processing and handling:

a. Know the health hazard and controls before beginning operations.

b. Evaluate the operation during startup to assure that occupational exposure limits are not exceeded; routine operations should be monitored periodically.

c. Handle in a well ventilated area; local exhaust ventilation is preferred.

d. Avoid skin contact; use appropriate protective clothing.

e. Practice good personal cleanliness; wash before eating, smoking, or using toilet facilities; end-of-shift showers may be required for some operators.

The hazard of contents classification of any explosives occupancy shall be determined using the guidelines given in NFPA 101 and the following requirements:

a. High-hazard explosives contents are those which, because of form, character, or volume, are likely to burn with extreme rapidity or from which poisonous fumes or explosions can be expected in the event of a fire. The expectation of poisonous fumes or explosions is a relative matter to be determined on a case-by-case basis. Operating buildings containing propellant, pyrotechnic, or explosive powders shall be classified as high-hazard occupancies unless a reduced hazard classification can be justified.

4.0 Clothing and Personal Equipment

Clothing

Each operation shall be analyzed to determine when personnel working with explosives and toxic materials must wear approved coveralls or laboratory coats to prevent contact with these materials and to prevent contaminating personal apparel. Flame-retardant coveralls may be desired for certain explosives operations where the possibility of flash fire exists. These coveralls shall not have cuffs and should not have metallic fasteners. Written procedures shall include protective clothing and equipment requirements.

Cotton (or other antistatic material) outer and undergarments, including socks, should be worn where generation of static electricity would create a hazard.

Footwear

Personnel working in a building or area where electrostatic-sensitive explosive powders or materials are handled shall wear conductive, nonsparking footwear. Exception: personnel working on electrical or electronic equipment shall not wear conductive footwear unless protected by insulated mats, ground fault circuit interrupters (GFCI), etc. Personnel working in other areas where explosives contamination may be present shall wear nonsparking footwear or bootie shoe coverings.

Respirators

Appropriate, approved respiratory protection shall be used when exhaust ventilation is not available, or does not adequately control airborne particulate, gases, or vapors liberated during explosives operations. The employee must have current approval to wear respiratory protection (medical exam, respirator fitting, and training).

Eye Protection

Suitable eye protection devices must be worn by all personnel when working or visiting in eye hazard areas, particularly when electroexplosive devices are handled. The type of explosive operation shall be evaluated for eye hazard risks. Contact lenses shall not be considered as an appropriate eye protection.

Gloves

Skin contact with some explosives, and with some materials used in conjunction with explosives, can result in dermatitis or absorption across the skin barrier. Each type of operation using these materials must be evaluated for the potential skin contact hazard and the need for the proper type of glove.

5.0 Quantity-Distance Criteria for Explosives Activities

Quantity-distance criteria must account for the types and severity of hazards presented by each explosive material, the construction and orientation of facilities to which the criteria are applied, and the degree of protection desired for facilities and personnel adjacent to the explosives operations. The hazard classification system recommended by the United Nations Organization (UNO) defines types and severities of hazards for explosives. The guidelines presented below specify minimum degrees of protection for various categories of facilities. These guidelines also describe how

the quantity-distance tables are to be applied to facilities of various construction and orientation with respect to adjacent facilities.

5.1 Hazard Classes and Class Division

Explosives shall be classified on the basis of their reactions to specific initiating influences. The hazard classification system recommended by the UNO shall be used for DOE explosives classification. The UNO system consists of nine classes for dangerous goods, with explosives included in Class 1. The explosives hazard class is further subdivided into "divisions," which are based on the character and predominance of the associated hazards and on the potential for causing personnel casualties or property damage. Table VI-1 lists the six divisions of Class I.

Divisions of Class 1.

Hazard class and division designators	Hazards
1.1	Mass detonating
1.2	Non-mass explosion, fragment producing
1.3	Mass fire, minor blast or fragment
1.4	Moderate fire, no blast or fragment
1.5	Explosive substance, very insensitive (with a mass explosion hazard)
1.6	Explosive article, extremely insensitive

When required to properly describe the hazard, a numerical figure in parenthesis shall be placed to the left of the division designators 1.1 through 1.3 [e.g., (18) 1.1, (08) 1.2, and (06) 1.3]; this number indicates the minimum separation distance (in hundreds of feet) for specified levels of protection from explosive items for inhabited buildings, public traffic routes, and personnel in the open. A minimum distance number shall be used for all items in Class 1, Division 2, as shown in the applicable tables. Figure VI-1 illustrates the use of the UNO hazards classification system. Also, this figure lists the storage compatibility group opposite each hazard class. The listed compatibility group is typical for the expected compatibility to hazard class relationships. Note however, that the two classification systems apply to different concerns.

- Compatibility groupings define which explosives may be safely stored together without increasing the risk of initiation.
- Hazard classifications indicate the initiation effects of the various explosives.

Classification tests (described by TB 700-2, "Explosives Hazard Classification Procedures") and/or additional tests (as desired), including United Nations ST/SG/AC.10/1 and ST/SG/AC/10/11, shall be used in the assignment of energetic materials to the appropriate compatibility group and hazard division. These tests may be supplemented by other tests to characterize material hazards more fully if material properties or anticipated material environment are expected to significantly influence the explosives classification.

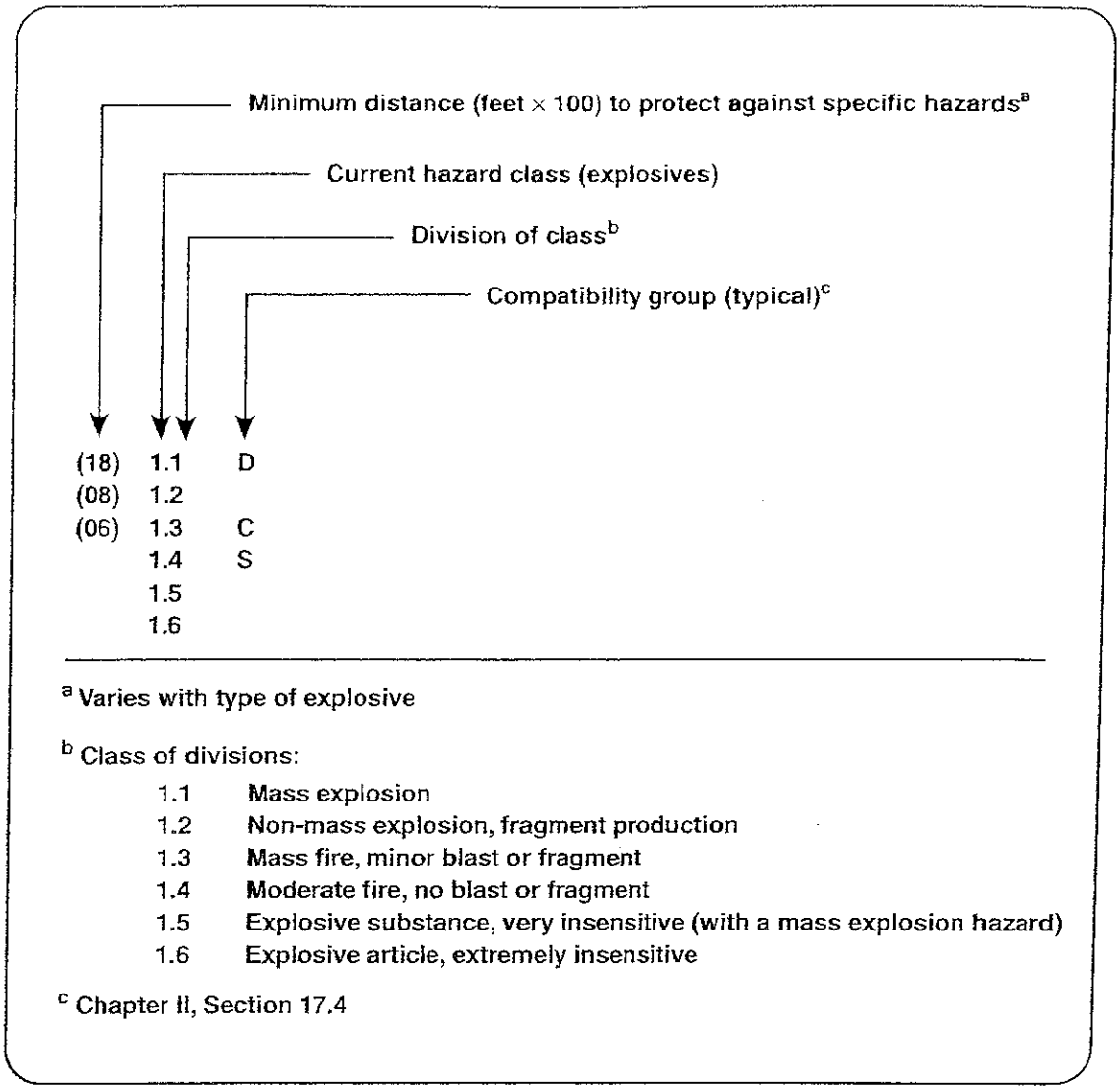


Figure VI-1. Application of Hazard Classification System.

Though DOT Hazard classifications require the use of the Bureau of Explosives' (BOE) Impact Apparatus to determine impact sensitivity, other impact apparatus may be used, providing:

a. Test results for at least two reference explosives are compared to results for the reference explosives on the BOE Impact Apparatus; and

b. A minimum of ten trials each is run for the reference explosives and the explosives being classified.

5.2 Establishing Quantity of Explosives and Distances

General

The principles and tables presented in DoD 6055.9-STD, "DoD Ammunition and Explosives Safety Standards," shall be used to determine the following:

a. The total quantities of explosives in adjacent magazines, operating buildings, or other explosives facilities that must be applied to quantity distance tables.

b. When the levels of protection required by Section 4 of this chapter for different types of facilities differ from the requirements of DoD 6055.9-STD, Section 4 shall take precedence.

c. The minimum separation distances required for the facilities are based on the desired level of protection and total quantities of explosives.

d. The total quantity of explosives is determined by defining and examining the maximum credible event (MCE). If an explosives event occurs, the maximum credible explosives event is the largest credible amount of explosives that could be involved in the event (not necessarily the total quantity of explosives present).

Use of Metric System

Throughout DoD 6055.9-STD, the net explosive weight (NEW) is used to calculate distance by means of a formula of the type D=KW1/3, when D is the distance in feet, K is a factor depending upon the risk assumed or permitted, and W is the NEW in pounds. When metric units are used, the symbol Q denotes net explosive quantity (NEQ) expressed in kilograms. In the formula $D=KQ^{1/3}$, the distance D is expressed in meters. Thus, the respective units of K are $ft/lb^{1/3}$ and $m/kg^{1/3}$ in the two systems. The value of K in English units is approximately 2.5 times its value in metric units [e.g., if $D(m)=6Q^{1/3}$, then $D(ft)=15W^{1/3}$].

Quantity-distance separation for protection of underground service installations.

Quantity of explosives (maximum pounds)	Distance	
	Meters	Feet
100	26	80
200	26	80
500	26	80
1,000	26	80
2,000	26	80
5,000	26	80
10,000	26	80
20,000	28	85
50,000	36	110
100,000	46	140
250,000	62	190

Note: If the potential donor building is designed to contain the effects of an explosion, the formula D=3.0 W1/3 can be used to determine separation distances for less than 20,000 pounds.

6.0 Level of Protection Criteria

6.1 Hazard Classes

The level of protection required for any specific explosives activity shall be based on the hazard class (accident potential) for the explosives activity involved. These four hazard classes are defined for explosives activities as follows:

a. **Class I.** Class I consists of those explosives activities that involve a high accident potential; any personnel exposure is unacceptable for Class I activities, and they thus require remote operations. In general, Class I

would include activities where energies that may interface with the explosives are approaching the upper safety limits, or the loss of control of the interfacing energy is likely to exceed the safety limits for the explosives involved. This category includes those research and development activities where the safety implications have not been fully characterized. Examples of Class I activities are screening, blending, pressing, extrusion, drilling of holes, dry machining, machining explosives and metal in combination, some environmental testing, new explosives development and processes, explosives disposal, and destructive testing.

b. **Class II.** Class II consists of those explosives activities that involve a moderate accident potential because of the explosives type, the condition of the explosives, or the nature of the operations involved. This category consists of activities where the accident potential is greater than for Class III, but the exposure of personnel performing contact operations is acceptable. Class II includes activities where the energies that do or may interface with the explosives are normally well within the safety boundaries for the explosives involved, but where the loss of control of these energies might approach the safety limits of the explosives. Examples of Class II activities are weighing, some wet machining, assembly and disassembly, some environmental testing, and some packaging operations.

c. **Class III.** Class III consists of those explosives activities that represent a low accident potential. Class III includes explosives activities during storage and operations incidental to storage or removal from storage.

d. **Class IV.** Class IV consists of those explosives activities with IHE or IHE subassemblies. Although mass detonating, this explosive type is so insensitive that a negligible probability exists for accidental initiation or transition from burning to detonation. IHE explosions will be limited to pressure ruptures of containers heated in a fire. Most processing and storage activities with IHE and IHE subassemblies are Class IV. However, the following examples of explosives activities with IHE and IHE subassemblies will remain Class I:

- Pressing;
- Some machining (see Chapter II, paragraph 12.4.2.c);
- Dry blending;
- Dry milling; and
- Dry screening.

6.2 Required Level of Protection

Each bay (i.e., storage, handling, or processing building) housing an explosives activity shall have levels of protection that are based on the hazard class determined for the activity. The levels of protection may be accomplished by equipment design, structural design, operation separation, or provision of operational shields. The levels of protection required for each hazard class are as follows and shall be required for all new facilities or redesign of any existing facilities where changes in activities will result in a change to a more hazardous class.

Explosives Bay

a. **Class IV.** Bays for Class IV (negligible probability of accidental initiation) activities shall provide protection from fire hazards effects. This protection may be achieved by Hazard Class/Division 1.3 aboveground-magazine distance separation or by a design that contains the effects of an accident. Because accidental detonation is not considered credible, Class IV bays shall be sited and designed as acceptors rather than donors for the effects of blast overpressure, structural collapse, and missiles (hazardous fragments).

b. **Class III.** Bays for Class III (low accident potential) activities shall provide protection from explosion propagation from bay to bay within buildings and between buildings that are located at intraline or magazine distance. If intermediate storage of explosives is within an operating building containing Class II or Class I operations, the intermediate storage or staging bay will require Class II level of protection. Examples of Class II activities are weighing, some wet machining, assembly and disassembly, some environmental testing, and some packaging operations. Minimum separation distances may be reduced when explosives bays are designed to adequately contain the effects of an accident (blast pressures and missiles).

c. **Class II.** Bays for Class II (moderate accident potential) activities shall, in addition to complying with the requirements for Class III bays, provide protection to prevent fatalities and severe injury to personnel in all occupied areas other than the bay of occurrence. (For the purpose of this Class II Category, access ramps and plant roads are not considered occupied areas.) Prevention of fatalities and severe injuries is satisfied where personnel in occupied areas other than the bay of occurrence will not be exposed to the following:

- Overpressures greater than 100 kPa (15 psig) maximal effective pressure.
- Structural collapse resulting from overpressure or debris impact—structural collapse is the failure of a structural component as a direct result of loss of structural integrity of the facility being subjected to various loadings (judged in accordance with the ability of the structure to remain intact so that explosion propagation, fatalities, or severe injuries will not occur).
- Missiles (hazardous fragments) generated in acceptor-occupied areas—hazardous fragments that can cause fatalities and severe injuries are defined as those having greater than 58 ft-lb impact energy. These values are taken from Chapter I of TM 5-1300. The threshold pressure for eardrum rupture is 34 kPa; one-half of the threshold pressure for lung damage is 100 kPa.

d. **Class I.** Bays for Class I (high accident potential) activities shall, in addition to complying with the requirements for Class II bays, provide protection to prevent serious injuries to all personnel, including personnel performing the activity, personnel in other occupied areas, and all transient personnel. This protection may be achieved by controlling blast and debris through suppression, containment, or establishment of an exclusion area with positive access control. Prevention of serious injuries is satisfied where personnel will not be exposed to:

- Overpressures greater than 34 kPa (5 psi) maximal effective pressure, and should not exceed 16 kPa (2.3 psi) peak positive incident pressure[1] ;
- Structural collapse of the building from overpressure or debris impact—structural collapse is the failure of a structural component as a direct result of loss of structural integrity of the facility being subjected to various loadings (judged in accordance with the ability of the structure to remain intact so that explosion propagation and serious injury to personnel will not occur.);
- Missiles (hazardous fragments)—hazardous fragments that can cause serious injuries are defined as those having greater than 11 ft-lb impact energy; and
- Thermal fluxes greater than 0.3 cal/cm sq/sec.[2]

Bays for Joint Explosives-Plutonium Activities

Bays for joint explosives-plutonium activities shall comply with the requirements of 4.2.1 of this chapter for the class of explosives activity involved and DOE DNA TP 20-7. In addition, because of the plutonium contamination potential, they shall comply with the following.

a. **Bays for Uncased Explosives—Plutonium Activities.** Where it is necessary to store, handle, or process uncased explosives components in the same bay with plutonium, the enclosing structure and its associated ventilation, electrical, fire protection, and utility system shall be designed to assure that, in the event all the explosives present should detonate, radiation exposures shall comply with DOE O 420.1," from the standpoint of hypothesized accidental releases. The quantity of plutonium allowed in such a bay will be governed by the safety analysis report. Activities may be performed in Class IV bays if IHE, IHE subassemblies, or IHE weapons are present; however, the quantity of plutonium allowed will be governed by criticality considerations.

b. **Bays for Cased Explosives—Plutonium Activities.** Where it is necessary to handle or process cased high-explosive components that contain plutonium, the enclosing structure shall be designed as a Class II explosives bay. Storage shall conform to Class III requirements. The limit of plutonium shall be 25 kg per bay. The plutonium limits for magazines are specified in DOE DNA TP 20-7. Activities may be performed in Class IV bays if only IHE, IHE subassemblies, or IHE weapons are present; however, the quantity of plutonium allowed will be governed by criticality considerations.

ATTACHMENT 6

MATERIAL SAFETY DATA SHEETS

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Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format)
For Cornell University Convenience Only

ACETONE

Section 1 - Product and Company Identification	Section 9 - Physical & Chemical Properties
Section 2 - Compositon/Information on Ingredients	Section 10 - Stability & Reactivity Data
Section 3 - Hazards Identification Including Emergency Overview	Section 11 - Toxicological Information
Section 4 - First Aid Measures	Section 12 - Ecological Information
Section 5 - Fire Fighting Measures	Section 13 - Disposal Considerations
Section 6 - Accidental Release Measures	Section 14 - MSDS Transport Information
Section 7 - Handling and Storage	Section 15 - Regulatory Information
Section 8 - Exposure Controls & Personal Protection	Section 16 - Other Information

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Cornell University does not in any way warrant or imply the applicability, viability or use of this information to any person or for use in any situation.

Section 1 - Product and Company Identification
ACETONE

Product Identification: ACETONE
Date of MSDS: 12/03/1990 **Technical Review Date:** 03/04/1993
FSC: 6810 **NIIN:** **LIIN:** 00N040268
Submitter: N EN
Status Code: C
MFN: 01
Article: N
Kit Part: N

00064651

Manufacturer's Information

Manufacturer's Name: SYSTEMS SCIENTIFIC LABORATORIES INC
Manufacturer's Address1: 1295 BOULAVARD WAY
Manufacturer's Address2: WALNUT CREEK, CA 94595
Manufacturer's Country: US
General Information Telephone: 415-937-6748
Emergency Telephone: 415-937-6748
Emergency Telephone: 415-937-6748
MSDS Preparer's Name: JAMES P. GILLEENY
Proprietary: N
Reviewed: N
Published: Y
CAGE: 3R697
Special Project Code: N

Contractor Information

Contractor's Name: SYSTEMS SCIENTIFIC LABORATORIES INC
Contractor's Address1: 1295 BOULAVARD WAY
Contractor's Address2: WALNUT CREEK, CA 94595
Contractor's Telephone: 415-937-6748
Contractor's CAGE: 3R697

Section 2 - Compositon/Information on Ingredients
ACETONE

Ingredient Name: ACETONE (SARA III)
Ingredient CAS Number: 67-64-1 **Ingredient CAS Code:** M
RTECS Number: AL3150000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: N/K
% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: 1000PPM **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: 750PPM/1000STEL;9293 **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity: 5000 LBS
DOT Reporting Quantity: 5000 LBS
Ozone Depleting Chemical: N

Section 3 - Hazards Identification, Including Emergency Overview
ACETONE

Health Hazards Acute & Chronic: CAUSES EYE IRRITATION. AVOID REPEATED SKIN CONTACT. AMMONIA IS A RESPIRATORY AND EYE IRRITANT. AMMONIUM FLUORIDE IS HIGHLY TOXIC & CAUSES IRRITATION TO EYES, SKIN AND RESPIRATORY TRACT.

Signs & Symptoms of Overexposure:
SEE HEALTH HAZARDS.

Medical Conditions Aggravated by Exposure:
NONE SPECIFIED BY MANUFACTURER.

LD50 LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.

Route of Entry Indicators:
Inhalation: YES
Skin: NO
Ingestion: YES

Carcenogenicity Indicators
NTP: NO
IARC: NO
OSHA: NO

Carcinogenicity Explanation: NOT RELEVANT.

Section 4 - First Aid Measures
ACETONE

First Aid:
EYE:FLUSH WITH WATER FOR AT LEAST 15 MINUTES. CALL MD. INHAL:MOVE TO FRESH AIR. SUPPORT BREATHING (GIVE O*2/ARTF RESP) (FP N). INGEST:CALL MD IMMEDIATELY (FP N). SKIN:FLUSH WITH COPIOUS AMOUNTS OF WAT ER FOR AT LEAST 15 MINUTES. CALL MD (FPN).

Section 5 - Fire Fighting Measures
ACETONE

Fire Fighting Procedures:
WEAR NIOSH/MSHA APPROVED SCBA & FULL PROTECTIVE EQUIPMENT (FP N).
Unusual Fire or Explosion Hazard:
NONE SPECIFIED BY MANUFACTURER.
Extinguishing Media:
CO*2, DRY CHEMICAL, ALCOHOL FOAM.
Flash Point: Flash Point Text: 0F,-18C

Autoignition Temperature:
Autoignition Temperature Text: N/A
Lower Limit(s): 12.8%

Upper Limit(s): 2.6%

Section 6 - Accidental Release Measures
ACETONE

Spill Release Procedures:
COLLECT IN SUITABLE CONTAINER.

Section 7 - Handling and Storage
ACETONE

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
ACETONE

Repiratory Protection:
NIOSH/MSHA APPROVED DUST MASK.
Ventilation:
LOCAL AND MECHANICAL (GENERAL) EXHAUST ACCEPTABLE.
Protective Gloves:
RUBBER GLOVES.
Eye Protection: CHEMICAL WORKERS GOGGLES (FP N).
Other Protective Equipment: NONE SPECIFIED BY MANUFACTURER.
Work Hygenic Practices: NONE SPECIFIED BY MANUFACTURER.
Supplemental Health & Safety Information: NONE SPECIFIED BY MANUFACTURER.

Section 9 - Physical & Chemical Properties
ACETONE

HCC:
NRC/State License Number:
Net Property Weight for Ammo:
Boiling Point: Boiling Point Text: 133F,56C
Melting/Freezing Point: Melting/Freezing Text: N/K
Decomposition Point: Decomposition Text: N/K
Vapor Pressure: 186 **Vapor Density:** 2
Percent Volatile Organic Content:
Specific Gravity: 0.79
Volatile Organic Content Pounds per Gallon:
pH: N/K
Volatile Organic Content Grams per Liter:
Viscosity: N/P
Evaporation Weight and Reference: 14.5 (BUTYL ACETATE=1)
Solubility in Water: COMPLETE
Appearance and Odor: COLORLESS LIQUID
Percent Volatiles by Volume: 100
Corrosion Rate: N/K

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Section 10 - Stability & Reactivity Data
ACETONE

Stability Indicator: YES
Materials to Avoid:
CONTACT WITH ACID FORMS HYDROGEN FLUORIDE. CONTACT WITH CAUSTIC LIBERATES AMMONIA.
Stability Condition to Avoid:
NONE SPECIFIED BY MANUFACTURER.
Hazardous Decomposition Products:
ON HEATING, LIBERATES AMMONIA AND HYDROGEN FLUORIDE.
Hazardous Polymerization Indicator: NO
Conditions to Avoid Polymerization:
NOT RELEVANT.

Section 11 - Toxicological Information
ACETONE

Toxicological Information:
N/P

Section 12 - Ecological Information
ACETONE

Ecological Information:
N/P

Section 13 - Disposal Considerations
ACETONE

Waste Disposal Methods:
DISPOSE OF BY MEANS AS TO COMPLY WITH ALL LOCAL, STATE AND FEDERAL REGULATIONS. CONTACT AN APPROVED AND LICENSED DISPOSAL AGENCY.

Section 14 - MSDS Transport Information
ACETONE

Transport Information:
N/P

Section 15 - Regulatory Information
ACETONE

SARA Title III Information:
N/P
Federal Regulatory Information:
N/P
State Regulatory Information:
N/P

Section 16 - Other Information

00064655

ACETONE

Other Information:
N/P

HAZCOM Label Information

Product Identification: ACETONE
CAGE: 3R697
Assigned Individual: N
Company Name: SYSTEMS SCIENTIFIC LABORATORIES INC
Company PO Box:
Company Street Address1: 1295 BOULAVARD WAY
Company Street Address2: WALNUT CREEK, CA 94595 US
Health Emergency Telephone: 415-937-6748
Label Required Indicator: Y
Date Label Reviewed: 03/04/1993
Status Code: C
Manufacturer's Label Number:
Date of Label: 03/04/1993
Year Procured: N/K
Organization Code: G
Chronic Hazard Indicator: N
Eye Protection Indicator: YES
Skin Protection Indicator: YES
Respiratory Protection Indicator: YES
Signal Word: DANGER
Health Hazard: None
Contact Hazard: Slight
Fire Hazard: Severe
Reactivity Hazard: None

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Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format)
For Cornell University Convenience Only

ALCOHOL A. C. S., ETHYL ALCOHOL, 200 PROOF

Section 1 - Product and Company Identification	Section 9 - Physical & Chemical Properties
Section 2 - Compositon/Information on Ingredients	Section 10 - Stability & Reactivity Data
Section 3 - Hazards Identification Including Emergency Overview	Section 11 - Toxicological Information
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Cornell University does not in any way warrant or imply the applicability, viability or use of this information to any person or for use in any situation.

Section 1 - Product and Company Identification
ALCOHOL A. C. S., ETHYL ALCOHOL, 200 PROOF

Product Identification: ALCOHOL A. C. S., ETHYL ALCOHOL, 200 PROOF
Date of MSDS: 11/01/1998 **Technical Review Date:** 04/10/2000
FSC: 6810 **NIIN:** 00-127-4532
Submitter: D DG
Status Code: A
MFN: 01
Article: N
Kit Part: N

00064657

Manufacturer's Information

Manufacturer's Name: AAPER ALCOHOL AND CHEMICAL CO.
Post Office Box: 339
Manufacturer's Address1: 1101 ISAAC SHELBY DRIVE
Manufacturer's Address2: SHELBYVILLE, KY 40066-0339
Manufacturer's Country: US
General Information Telephone: 502-633-0650
Emergency Telephone: 502-633-0650
Other Number for MSDS Information: 100-A1
Emergency Telephone: 502-633-0650
MSDS Preparer's Name: NOT PROVIDED
Chemtec Telephone: (800)424-9300
Proprietary: N
Reviewed: Y
Published: Y
CAGE: 61305

Item Description

Item Name: ETHYL ALCOHOL,ABSOLUTE,ACS
Item Manager: S9G
Specification Number: O-E-760
Type/Grade/Class: TY I, GR A
Unit of Issue: GL
Unit of Issue Quantity: 0
Type of Container: CAN

Contractor Information

Contractor's Name: AAPER ALCOHOL AND CHEMICAL CO.
Post Office Box: 339
Contractor's Address1: 1101 ISAAC SHELBY DRIVE
Contractor's Address2: SHELBYVILLE, KY 40066-0339
Contractor's Telephone: 502-633-0650
Contract Number: SP0450-00-M-D897
Contractor's CAGE: 61305

Section 2 - Compositon/Information on Ingredients
ALCOHOL A. C. S., ETHYL ALCOHOL, 200 PROOF

Ingredient Name: ETHYL ALCOHOL
Ingredient CAS Number: 64-17-5 **Ingredient CAS Code:** T
RTECS Number: KQ6300000 **RTECS Code:** T
=WT: 100. **=WT Code:** M
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:

% High WT: **% High WT Code:**
% Low Volume: **% Low Volume Code:**
% High Volume: **% High Volume Code:**
% Text:
% Enviromental Weight:
Other REC Limits: N/P
OSHA PEL: 1900 MG/M3;1000 PPM **OSHA PEL Code:** T
OSHA STEL: N/P **OSHA STEL Code:**
ACGIH TLV: 1880 MG/M3;1000 PPM **ACGIH TLV Code:** T
ACGIH STEL: NOT ESTABLISHED **ACGIH STEL Code:** T
EPA Reporting Quantity:
DOT Reporting Quantity:
Ozone Depleting Chemical: N

Section 3 - Hazards Identification, Including Emergency Overview
ALCOHOL A. C. S., ETHYL ALCOHOL, 200 PROOF

Health Hazards Acute & Chronic: INHALATION: EXPOSURE TO OVER 1000 PPM MAY CAUSE HEADACHE, DROWSINESS & LASSITUDE, LOSS OF APPETITE & INABILITY TO CONCENTRATE. IRRITATION OF THE THROAT. INGESTION: CAN CAUSE DEPRESSION OF CENTRAL NERV OUS SYSTEM, NAUSEA, VOMITING, DIARRHEA. EYE CONTACT: LIQUID OR VAPOR MAY CAUSE IRRITATION. SKIN CONTACT: MAY CAUSE IRRITATION & DEFATTING OF SKIN ON PROLONGED CONTACT.

Signs & Symptoms of Overexposure:
SEE HEALTH EFFECTS ACUTE & CHRONIC

Medical Conditions Aggravated by Exposure:
NOT PROVIDED

LD50 LC50 Mixture: NOT PROVIDED

Route of Entry Indicators:
Inhalation: YES
Skin: YES
Ingestion: YES

Carcenogenicity Indicators
NTP: N/P
IARC: N/P
OSHA: N/P

Carcinogenicity Explanation: NO DATA PROVIDED ON MSDS. ETHYL ALCOHOL IS NOT A KNOWN CARCINOGEN

Section 4 - First Aid Measures
ALCOHOL A. C. S., ETHYL ALCOHOL, 200 PROOF

First Aid:
INGESTION: IF CONSCIOUS & ABLE TO SWALLOW, GIVE WATER OR MILK TO DILUTE.

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NEVER GIVE ANYTHING BY MOUTH IF UNCONSCIOUS OR HAVING CONVULSIONS. CALL PHYSICIAN OR CHEMTREC (POISON CONTROL) IMMEDIATELY. IND UCE VOMITING ONLY IF ADVISED BY PHYSICIAN OR POISON CONTROL. INHALATION: IMMEDIATELY REMOVE VICTIM TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION, PREFERABLY MOUTH-TO-MOUTH. GET MEDICAL A TTENTION IMMEDIATELY. EYES/SKIN: IMMEDIATELY FLUSH WITH PLENTY COOL WATER FOR AT LEAST 15 MINUTES. REMOVE & WASH CONTAMINATED CLOTHING BEFORE REUSE. GET MEDICAL ATTENTION IMMEDIATELY.

Section 5 - Fire Fighting Measures
ALCOHOL A. C. S., ETHYL ALCOHOL, 200 PROOF

Fire Fighting Procedures:
WEAR SELF CONTAINED BREATHING APPARATUS IN POSITIVE PRESSURE MODE WITH FULL FACEPIECE & PROTECTIVE CLOTHING. IF SPILL OR LEAK HAS NOT OCCURRED, USE WATER SPRAY TO DISPERSE VAPORS & TO PROTECT PERSONS ATTEMPTING TO STOP LEAK.
Unusual Fire or Explosion Hazard:
WEAR SELF CONTAINED BREATHING APPARATUS IN POSITIVE PRESSURE MODE WITH FULL FACEPIECE & PROTECTIVE CLOTHING IF THERE IS POSSIBILITY OF EXPOSURE TO SMOKE, FUMES OR HAZARDOUS DECOMPOSITION PRODUCTS.
Extinguishing Media:
DRY CHEMICAL, ALCOHOL FOAM, CARBON DIOXIDE. WATER MAY BE INEFFECTIVE BUT SHOULD BE USED TO KEEP FIRE EXPOSED CONTAINERS COOL.
Flash Point: =13.3C, 56.F **Flash Point Text:**

Autoignition Temperature: =362.8C, 685.F
Autoignition Temperature Text:
Lower Limit(s): 3.3%
Upper Limit(s): 19%

Section 6 - Accidental Release Measures
ALCOHOL A. C. S., ETHYL ALCOHOL, 200 PROOF

Spill Release Procedures:
WEAR APPROPRIATE PPE. CONTAIN SPILLED MATERIAL. TRANSFER TO SECURE CONTAINERS. WHERE NEEDED, COLLECT WITH ABSORBENTS. IN EVENT OF UNCONTROLLED RELEASE, DETERMINE IF RELEASE IS REPORTABLE UNDER APPLICA BLE LAWS & REGULATIONS.

Section 7 - Handling and Storage
ALCOHOL A. C. S., ETHYL ALCOHOL, 200 PROOF

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
ALCOHOL A. C. S., ETHYL ALCOHOL, 200 PROOF

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Repiratory Protection:
HANDLE IN PRESENCE OF ADEQUATE VENTILATION. WHERE EXPOSURE EXCEEDS ACCEPTABLE CRITERIA, USE NIOSH/MSHA APPROVED RESPIRATORY PROTECTION EQUIPMENT. RESPIRATORS SHOULD BE SELECTED BASED ON FORM & CONCENT RATION OF AIR CONTAMINANT & IAW OSHA (29CFR1910.134)
Ventilation:
NONE SPECIFIED ON MSDS. LOCAL OR GOOD GENERAL MECHANICAL RECOMMENDED AS NEED TO MAINTAIN GOOD VENTILATION
Protective Gloves:
IMPERVIOUS
Eye Protection: SAFETY GLASSES MEETING ANSI STANDARD Z87.1WHERE NO CONTACT EXPECTED
Other Protective Equipment: CHEMICAL SAFETY GOGGLES MEETING ANSI Z87.1 IF SPLASHING IN EYES IS ANTICIPATED
Work Hygenic Practices: NOT PROVIDED
Supplemental Health & Safety Information: NOT APPLICABLE

Section 9 - Physical & Chemical Properties
ALCOHOL A. C. S., ETHYL ALCOHOL, 200 PROOF

HCC: F2
NRC/State License Number:
Net Property Weight for Ammo:
Boiling Point: =78.3C, 173.F **Boiling Point Text:**
Melting/Freezing Point: =-113.7C, -173.F **Melting/Freezing Text:**
Decomposition Point: Decomposition Text: N/P
Vapor Pressure: 44.6 MM HG @ 68F **Vapor Density:** 1.59
Percent Volatile Organic Content:
Specific Gravity: .7940
Volatile Organic Content Pounds per Gallon:
pH: N/P
Volatile Organic Content Grams per Liter:
Viscosity: N/P
Evaporation Weight and Reference: N/P
Solubility in Water: COMPLETE
Appearance and Odor: CLEAR LIQUID, COLORLESS
Percent Volatiles by Volume: N/P
Corrosion Rate: N/P

Section 10 - Stability & Reactivity Data
ALCOHOL A. C. S., ETHYL ALCOHOL, 200 PROOF

Stability Indicator: YES
Materials to Avoid:
CONTACT WITH ACETYL CHLORIDE & A WIDE RANGE OF OXIDIZING AGENTS MAY REACT VIOLENTLY
Stability Condition to Avoid:
NOT PROVIDED
Hazardous Decomposition Products:
NOT PROVIDED
Hazardous Polymerization Indicator: NO

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Conditions to Avoid Polymerization:
NOT APPLICABLE

Section 11 - Toxicological Information
ALCOHOL A. C. S., ETHYL ALCOHOL, 200 PROOF

Toxicological Information:
NOT PROVIDED

Section 12 - Ecological Information
ALCOHOL A. C. S., ETHYL ALCOHOL, 200 PROOF

Ecological Information:
NOT PROVIDED

Section 13 - Disposal Considerations
ALCOHOL A. C. S., ETHYL ALCOHOL, 200 PROOF

Waste Disposal Methods:
ALL RECOVERED MATERIAL SHOULD BE PACKAGED, LABELED, TRANSPORTED & DISPOSED OF, OR RECLAIMED IN ACCORDANCE WITH APPLICABLE LAWS & REGULATIONS & IN COINFORMANCE WITH GOOD ENGINEERING PRACTICES.

Section 14 - MSDS Transport Information
ALCOHOL A. C. S., ETHYL ALCOHOL, 200 PROOF

Transport Information:
DOT CLASS: 3, SHIPPING NAME: ETHYL ALCOHOL, PG II, UN 1170

Section 15 - Regulatory Information
ALCOHOL A. C. S., ETHYL ALCOHOL, 200 PROOF

SARA Title III Information:
NOT APPLICABLE
Federal Regulatory Information:
COVERED BY ATF REGULATIONS, TITLE 27 CFR. LISTED ON TSCA.
State Regulatory Information:
NOT PROVIDED

Section 16 - Other Information
ALCOHOL A. C. S., ETHYL ALCOHOL, 200 PROOF

Other Information:
NOT APPLICABLE

HMIS Transportation Information

Product Identification: ALCOHOL A. C. S., ETHYL ALCOHOL, 200 PROOF
Transporation ID Number: 152361
Responsible Party CAGE: 61305
Date MSDS Prepared: 11/01/1998
Date MSDS Reviewed: 04/10/2000
MFN: 04/10/2000
Submitter: D DG

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Status Code: A

Container Information
Unit of Issue: GL
Container Quantity: 0
Type of Container: CAN
Net Unit Weight: 6.61 LB

Article without MSDS: N
Technical Entry NOS Shipping Number:
Radioactivity:
Form:
Net Explosive Weight:
Coast Guard Ammunition Code:
Magnetism:
AF MMAC Code:
DOD Exemption Number: N/A
Limited Quantity Indicator: N
Multiple Kit Number: 0
Kit Indicator: N
Kit Part Indicator: N
Review Indicator: N
Additional Data:

Department of Transportation Information

DOT Proper Shipping Name: ETHANOL OR ETHYL ALCOHOL OR ETHANOL SOLUTIONS OR ETHYL ALCOHOL SOLUTIONS
DOT PSN Code: FTN
Symbols:
DOT PSN Modifier:
Hazard Class: 3
UN ID Number: UN1170
DOT Packaging Group: II
Label: FLAMMABLE LIQUID
Special Provision(s): 24,T1
Packaging Exception: 150
Non Bulk Packaging: 202
Bulk Packaging: 242
Maximimum Quanity in Passenger Area: 5 L
Maximimum Quanity in Cargo Area: 60 L
Stow in Vessel Requirements: A
Requirements Water/Sp/Other:

IMO Detail Information

IMO Proper Shipping Name: ETHYL ALCOHOL
IMO PSN Code: GPL
IMO PSN Modifier:
IMDG Page Number: 3219
UN Number: 1170
UN Hazard Class: 3.2
IMO Packaging Group: II

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Subsidiary Risk Label: -
EMS Number: 3-06
Medical First Aid Guide Number: 305

IATA Detail Information

IATA Proper Shipping Name: ETHYL ALCOHOL
IATA PSN Code: LAI
IATA PSN Modifier:
IATA UN Id Number: 1170
IATA UN Class: 3
Subsidiary Risk Class:
UN Packaging Group: II
IATA Label: FLAMMABLE LIQUID
Packaging Note for Passengers: 305
Maximum Quantity for Passengers: 5L
Packaging Note for Cargo: 307
Maximum Quantity for Cargo: 60L
Exceptions: A3, A58

AFI Detail Information

AFI Proper Shipping Name: ETHANOL OR ETHANOL SOLUTIONS OR ETHYL ALCOHOL OR EHTYL ALCOHOL SOLUTIONS
AFI Symbols:
AFI PSN Code: KXQ
AFI PSN Modifier:
AFI UN Id Number: UN1170
AFI Hazard Class: 3
AFI Packing Group: II
AFI Label:
Special Provisions: P5
Back Pack Reference: A7.3

HAZCOM Label Information

Product Identification: ALCOHOL A. C. S., ETHYL ALCOHOL, 200 PROOF
CAGE: 61305
Assigned Individual: N
Company Name: AAPER ALCOHOL AND CHEMICAL CO.
Company PO Box: 339
Company Street Address1: 1101 ISAAC SHELBY DRIVE
Company Street Address2: SHELBYVILLE, KY 40066-0339 US
Health Emergency Telephone: 502-633-0650
Label Required Indicator: Y
Date Label Reviewed: 04/10/2000
Status Code: A
Manufacturer's Label Number:
Date of Label:
Year Procured: N/K
Organization Code: F
Chronic Hazard Indicator: N/P
Eye Protection Indicator: YES
Skin Protection Indicator: YES
Respiratory Protection Indicator: YES
Signal Word: DANGER
Health Hazard: Slight

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Contact Hazard: Slight
Fire Hazard: Severe
Reactivity Hazard: None

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Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format)
For Cornell University Convenience Only

ALUMINUM POWDER, MILA-512

Section 1 - Product and Company Identification	Section 9 - Physical & Chemical Properties
Section 2 - Compositon/Information on Ingredients	Section 10 - Stability & Reactivity Data
Section 3 - Hazards Identification Including Emergency Overview	Section 11 - Toxicological Information
Section 4 - First Aid Measures	Section 12 - Ecological Information
Section 5 - Fire Fighting Measures	Section 13 - Disposal Considerations
Section 6 - Accidental Release Measures	Section 14 - MSDS Transport Information
Section 7 - Handling and Storage	Section 15 - Regulatory Information
Section 8 - Exposure Controls & Personal Protection	Section 16 - Other Information

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Cornell University does not in any way warrant or imply the applicability, viability or use of this information to any person or for use in any situation.

Section 1 - Product and Company Identification
ALUMINUM POWDER, MILA-512

Product Identification: ALUMINUM POWDER, MILA-512
Date of MSDS: 10/13/1992 **Technical Review Date:** 11/17/1999
FSC: 6810 **NIIN:** 00-628-3382
Submitter: N TN
Status Code: A
MFN: 01
Article: N
Kit Part: N

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Manufacturer's Information

Manufacturer's Name: AMPAL INC
Post Office Box: 2270
Manufacturer's Address1: ROUTE 202
Manufacturer's Address2: FLEMINGTON, NJ 08822
Manufacturer's Country: US
General Information Telephone: 908-782-5454
Emergency Telephone: 800-424-9300
Emergency Telephone: 800-424-9300
Chemtec Telephone: (800)424-9300
Proprietary: N
Reviewed: Y
Published: Y
CAGE: 0BPJ5

Item Description

Item Name: ALUMINUM,TECHNICAL
Item Manager: B14
Specification Number: NK
Type/Grade/Class: NK
Unit of Issue: LB
Unit of Issue Quantity: Z
Type of Container:

Contractor Information

Contractor's Name: AMPAL INC
Post Office Box: 2270
Contractor's Address1: ROUTE 202
Contractor's Address2: FLEMINGTON, NJ 08822
Contractor's Telephone: 908-782-5454
Contractor's CAGE: 0BPJ5

Section 2 - Compositon/Information on Ingredients
ALUMINUM POWDER, MILA-512

Ingredient Name: ALUMINIUM
Ingredient CAS Number: 7429-90-5 **Ingredient CAS Code:** T
RTECS Number: BD0330000 **RTECS Code:** T
=WT: =WT Code:
=Volume: =Volume Code:
>WT: 99. **>WT Code:** M
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:

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% Text:
% Enviromental Weight:
Other REC Limits: OSHA PEL:5 MG/M3 (M)
OSHA PEL: 15 MG/M3 **OSHA PEL Code:** T
OSHA STEL: N/P **OSHA STEL Code:**
ACGIH TLV: 10 MG/M3 **ACGIH TLV Code:** T
ACGIH STEL: NOT ESTABLISHED **ACGIH STEL Code:** T
EPA Reporting Quantity:
DOT Reporting Quantity:
Ozone Depleting Chemical: N

Section 3 - Hazards Identification, Including Emergency Overview
ALUMINUM POWDER, MILA-512

Health Hazards Acute & Chronic: ALUMINUM, METALLIC, POWDER IS AN EYE AND MUCOUS MEMBRANE IRRITANT. TARGET ORGANS: EYES, SKIN, LUNGS, MUCOUS MEMBRANES.

Signs & Symptoms of Overexposure:

Medical Conditions Aggravated by Exposure:

LD50 LC50 Mixture: N/P

Route of Entry Indicators:
Inhalation: YES
Skin: YES
Ingestion: YES

Carcenogenicity Indicators
NTP: NO
IARC: NO
OSHA: NO

Carcinogenicity Explanation: NOT LISTED.

Section 4 - First Aid Measures
ALUMINUM POWDER, MILA-512

First Aid:
EYES: IMMEDIATELY WASH WITH LARGE AMOUNTS OF WATER FOR AT LEAST 15 MINUTES, OCCASIONALLY LIFTING LOWER AND UPPER LIDS. GET MEDICAL ATTENTION IMMEDIATELY. SKIN: FLUSH CONTAMINATED SKIN WITH WATER. GET MEDICAL ATTENTION IF IRRITATION OCCURS.INHALATION: IF A PERSON BREATHES IN LARGE AMOUNTS OF THIS CHEMICAL, MOVE EXPOSED PERSON TO FRESH AIR AT ONCE. IF BREATHING HAS STOPPED PERFORM ARTIFICIAL RESPIRA TION. KEEP AFFECTED PERSON WARM AND AT REST. GET MEDICAL ATTENTION AS SOON AS POSSIBLE. INGESTION: CALL MD IMMEDIATELY (FP N).

Section 5 - Fire Fighting Measures
ALUMINUM POWDER, MILA-512

Fire Fighting Procedures:
USE NIOSH APPROVED SCBA AND FULL PROTECTIVE EQUIPMENT (FP N).
Unusual Fire or Explosion Hazard:
HMIS RATING: HEALTH - 0; FLAMMABILITY - 4; REACTIVITY - 1.
Extinguishing Media:
DRY SAND, DRY INERT GRANULAR MATERIAL OR POWDER, OR APPROVED DRY POWDER EXTINGUISHING AGENT.
Flash Point: Flash Point Text: NOT APPLICABLE

Autoignition Temperature: >590.C, 1094.F
Autoignition Temperature Text: SUPDAT
Lower Limit(s): 0.040 OZ/FT3
Upper Limit(s): N/A

Section 6 - Accidental Release Measures
ALUMINUM POWDER, MILA-512

Spill Release Procedures:
NEVER EMPLOY WATER, HAVE SAND PAILS AVAILABLE. SWEEP SPILL GENTLY TO AVOID DUST CLOUD FORMATION, USE NON-SPARKING, NON-STATIC GENERATING IMPLEMENTS.

Section 7 - Handling and Storage
ALUMINUM POWDER, MILA-512

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
ALUMINUM POWDER, MILA-512

Repiratory Protection:
WEAR NIOSH APROVED DUST MASK.
Ventilation:
SUFFICIENT VENTILATION, IN BOTH VOLUME AND PATTERN, SHOULD BE PROVIDED TO KEEP AIR CONTAMINATION BELOW CURRENT APPLICABLE OSHA PELS.
Protective Gloves:
IMPERVIOUS GLOVES (FP N).
Eye Protection: ANSI APPROVED CHEMICAL WORKERS GOGGLES (FP N).
Other Protective Equipment: ANSI APPROVED EYE WASH & DELUGE SHOWER (FP N).
Work Hygenic Practices: CONTACT LENSES SHOULD NOT BE WORN WHEN WORKING WITH THIS CHEMICAL.
Supplemental Health & Safety Information: PHYSICAL DATA: MOLECULAR WEIGHT: 26.99. FIRE & EXPLO DATA: AUTOIGNITION TEMP: CLOUD - 1202F(650C); LAYER - 1094F (590C). - - MATLS TO AVOID: MAGNESIUM PLUS POTASSIUM CHLORATE, SODIUM CARBONATE,

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SULFATE S, DIBORANE.

Section 9 - Physical & Chemical Properties
ALUMINUM POWDER, MILA-512

HCC:
NRC/State License Number:
Net Property Weight for Ammo:
Boiling Point: =2630.C, 4766.F **Boiling Point Text:**
Melting/Freezing Point: =660.C, ######F **Melting/Freezing Text:**
Decomposition Point: Decomposition Text: N/P
Vapor Pressure: 1 MM HG @ 68F (20C) **Vapor Density:** N/A
Percent Volatile Organic Content:
Specific Gravity: 2.7 (H*2O=1)
Volatile Organic Content Pounds per Gallon:
pH: N/P
Volatile Organic Content Grams per Liter:
Viscosity: N/P
Evaporation Weight and Reference: NOT APPLICABLE
Solubility in Water: INSOLUBLE
Appearance and Odor: SILVERY-WHITE POWDER.
Percent Volatiles by Volume: N/A
Corrosion Rate: N/P

Section 10 - Stability & Reactivity Data
ALUMINUM POWDER, MILA-512

Stability Indicator: YES
Materials to Avoid:
ACIDS, STRONG ALKALIES, STRONG BASES, STRONG OXIDIZERS, SILVER CHLORIDE, IODATES, CHLORINATED HYDROCARBONS, OXIDES, NITRITES, NITRATES, CARBONDISULFIDE, CHLORIDES, SODIUM PEROXIDE PLUS CARBON DIOXIDE, SULFUR DICHLORIDE, PAL
Stability Condition to Avoid:
N/P
Hazardous Decomposition Products:
ALUMINUM REACTS WITH WATER, ACIDS AND ALKALIES TO FORM COMBUSTIBLE HYDROGEN GAS.
Hazardous Polymerization Indicator: NO
Conditions to Avoid Polymerization:
HAZARDOUS POLYMERIZATION CANNOT OCCUR.

Section 11 - Toxicological Information
ALUMINUM POWDER, MILA-512

None Listed

Section 12 - Ecological Information
ALUMINUM POWDER, MILA-512

None Listed

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Section 13 - Disposal Considerations
ALUMINUM POWDER, MILA-512

Waste Disposal Methods:
DISPOSE OF I/A/W LOCAL, STATE AND FEDERAL REGULATIONS.

Section 14 - MSDS Transport Information
ALUMINUM POWDER, MILA-512

None Listed

Section 15 - Regulatory Information
ALUMINUM POWDER, MILA-512

SARA Title III Information:
THIS PRODUCT CONTAINS THE FOLLOWING TOXIC CHEMICALS SUBJECT TO THE REPORTING REQUIREMENTS OF SECTION 313 OF THE EMERGENCY PLANNING AND COMMUNITY RIGHT-TO-KNOW ACT OF 1986 AND OF 40 CFR 372: ALUMINUM - CAS # 7429-90-5 - >99% BY WT.
Federal Regulatory Information:
N/P
State Regulatory Information:

Section 16 - Other Information
ALUMINUM POWDER, MILA-512

Other Information:
EMERGENCY CONTACT: CHEMTREC: (800) 424-9300 - TO BE USED "ONLY IN THE EVENT OF CHEMICAL EMERGENCIES INVOLVING A SPILL, LEAK, FIRE, EXPOSURE OR ACCIDENT INVOLVING CHEMICALS".

HAZCOM Label Information

Product Identification: ALUMINUM POWDER, MILA-512
CAGE: 0BPJ5
Assigned Individual: N
Company Name: AMPAL INC
Company PO Box: 2270
Company Street Address1: ROUTE 202
Company Street Address2: FLEMINGTON, NJ 08822 US
Health Emergency Telephone: 800-424-9300
Label Required Indicator: Y
Date Label Reviewed: 07/26/1999
Status Code: A
Manufacturer's Label Number:
Date of Label:
Year Procured: N/K
Organization Code: F
Chronic Hazard Indicator: N
Eye Protection Indicator: YES
Skin Protection Indicator: YES
Respiratory Protection Indicator: YES
Signal Word: DANGER

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Health Hazard: None
Contact Hazard: Slight
Fire Hazard: Severe
Reactivity Hazard: None

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Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format)
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AMMONIUM PERCHLORATE

Section 1 - Product and Company Identification	Section 9 - Physical & Chemical Properties
Section 2 - Compositon/Information on Ingredients	Section 10 - Stability & Reactivity Data
Section 3 - Hazards Identification Including Emergency Overview	Section 11 - Toxicological Information
Section 4 - First Aid Measures	Section 12 - Ecological Information
Section 5 - Fire Fighting Measures	Section 13 - Disposal Considerations
Section 6 - Accidental Release Measures	Section 14 - MSDS Transport Information
Section 7 - Handling and Storage	Section 15 - Regulatory Information
Section 8 - Exposure Controls & Personal Protection	Section 16 - Other Information

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Section 1 - Product and Company Identification
AMMONIUM PERCHLORATE

Product Identification: AMMONIUM PERCHLORATE
Date of MSDS: 03/02/1996 **Technical Review Date:** 06/26/1998
FSC: 6810 **NIIN:** **LIIN:** 00N088119
Submitter: N EN
Status Code: C
MFN: 01
Article: N
Kit Part: N

Manufacturer's Information

Manufacturer's Name: HUMMEL CROTON INC
Post Office Box: 250
Manufacturer's Address1: 10 HARMICH RD
Manufacturer's Address2: SOUTH PLAINFIELD, NJ 07080
Manufacturer's Country: US
General Information Telephone: 908-754-1800
Emergency Telephone: 800-424-9300 (CHEMTREC)
Emergency Telephone: 800-424-9300 (CHEMTREC)
MSDS Preparer's Name: MIKE DUGAN
Proprietary: N
Reviewed: N
Published: Y
CAGE: HO946
Special Project Code: N

Contractor Information

Contractor's Name: HUMMEL CROTON INC
Contractor's Address1: 10 HARMICH ROAD
Contractor's Address2: SOUTH PLAINFIELD, NJ 07080
Contractor's Telephone: 908-754-1800
Contractor's CAGE: 60728

Contractor Information

Contractor's Name: HUMMEL CROTON INC
Post Office Box: 250
Contractor's Address1: 10 HARMICH RD
Contractor's Address2: SOUTH PLAINFIELD, NJ 07080-0250
Contractor's Telephone: 908-754-1800
Contractor's CAGE: HO946

Section 2 - Compositon/Information on Ingredients
AMMONIUM PERCHLORATE

Ingredient Name: AMMONIUM PERCHLORATE
Ingredient CAS Number: 7790-98-9 **Ingredient CAS Code:** M
RTECS Number: SC7520000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: 100

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% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: N/K (FP N) **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: N/K (FP N) **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity:
DOT Reporting Quantity:
Ozone Depleting Chemical: N

Section 3 - Hazards Identification, Including Emergency Overview
AMMONIUM PERCHLORATE

Health Hazards Acute & Chronic: ACUTE: INHAL: MAY IRRITATE RESP TRACT. SYMPS MAY INCLUDE COUGHING, SHORTNESS OF BREATH, SORE THROAT & RUNNY NOSE. IF SUFFICIENT AMTS ARE INHALED & ABSORBED, SYMPS MAY RESEMBLE THOSE IN ACUTE INGEST. S KIN: MAY CAUSE IRRIT W/SYMPS OF REDNESS, SWELL, ITCH & PAIN. EYES: MAY CAUSE IRRIT W/SYMPS OF REDNESS, (EFTS OF OVEREXP)

Signs & Symptoms of Overexposure:
HLTH HAZ: SWELL, ITCH, TEARING & PAIN. INGEST: MAY CAUSE GASTROENTERITIS (INFLAMM OF LINING MEMB OF STOM & INTESTINES) W/ABDOM PAIN, NAUS, VOMIT & DIARR. SYSTEMIC EFTS MAY FOLLOW & MAY INCLUDE RINGING OF EARS, DIZZ, ELEVATED BLOOD PRESS, BLURRED VISION & TREMORS. CHRONIC: NONE SPECIFIED BY MANUFACTURER.

Medical Conditions Aggravated by Exposure:
PERSONS WITH PREEXISTING EYE OR SKIN CONDITIONS OR IMPAIRED PULMONARY FUNCTION MAY BE MORE SUSCEPTIBLE TO THE EFFECTS OF THIS PRODUCT.

LD50 LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.

Route of Entry Indicators:
Inhalation: YES
Skin: YES
Ingestion: YES

Carcenogenicity Indicators
NTP: NO
IARC: NO
OSHA: NO

Carcinogenicity Explanation: NOT RELEVANT.

Section 4 - First Aid Measures
AMMONIUM PERCHLORATE

First Aid:
EYES: IMMEDIATELY FLUSH WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES. CALL MD. SKIN: FLUSH WITH WATER. WASH CLOTHING BEFORE REUSE. CALL MD IF

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IRRITATION OCCURS. INHALATION: REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN. CALL MD. INGESTION: CALL MD IMMEDIATELY.

Section 5 - Fire Fighting Measures
AMMONIUM PERCHLORATE

Fire Fighting Procedures:
WEAR NIOSH APPROVED SCBA AND FULL PROTECTIVE EQUIPMENT (FP N). USE WATER SPRAY TO COOL FIRE-EXPOSED CONTAINERS. STRONG OXIDIZER.
Unusual Fire or Explosion Hazard:
MAY EXPLODE WHEN HEATED. CONTACT WITH OTHER MATERIAL MAY CAUSE FIRE. EMITS TOXIC FUMES UNDER FIRE CONDITIONS.
Extinguishing Media:
USE WATER SPRAY.
Flash Point: Flash Point Text: N/A

Autoignition Temperature:
Autoignition Temperature Text: N/A
Lower Limit(s): N/K
Upper Limit(s): N/K

Section 6 - Accidental Release Measures
AMMONIUM PERCHLORATE

Spill Release Procedures:
UTILIZE RECOMMENDED PROTECTIVE CLOTHING AND EQUIPMENT. CLEAN SPILLS IN A MANNER THAT DOES NOT DISPERSE DUST INTO THE AIR. SPILL AREA CAN BE WASHED WITH WATER. COLLECT WASH WATER FOR APPROVED DISPOSAL. KEEP FROM ENTERING WATER OR GROUND WATER.

Section 7 - Handling and Storage
AMMONIUM PERCHLORATE

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
AMMONIUM PERCHLORATE

Repiratory Protection:
WORK AMBIENT CONCENTRATION SHOULD BE MONITORED AND IF THE RECOMMENDED EXPOSURE LIMIT IS EXCEEDED, A NIOSH APPROVED DUST RESPIRATOR MUST BE WORN.
Ventilation:
USE LOCAL VENTILATION IF DUSTING IS A PROBLEM, TO MAINTAIN AIR LEVELS BELOW THE RECOMMENDED EXPOSURE LIMITS.
Protective Gloves:
PVC GLOVES RECOMMENDED.

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Eye Protection: ANSI APPRVD CHEM WORKERS GOGGLES (FP N).
Other Protective Equipment: ANSI APPRVD EMER EYEWASH & DELUGE SHOWER (FP N). WEAR IMPERVIOUS BOOTS, APRON/COVERALLS. EDUCATE & TRAIN EMPLOYEES.
Work Hygenic Practices: WASH THOROUGHLY AFTER HANDLING. WASH HANDS AND FACE BEFORE EATING, DRINKING OR USING TOBACCO PRODUCTS.
Supplemental Health & Safety Information: WASTE DISP METH: DISP, WHETHER MATL CONTAINING PROD/DERIVED FROM PROD SHOULD BE CLASSIFIED AS HAZ WASTE (40 CFR 261.20-24).

Section 9 - Physical & Chemical Properties
AMMONIUM PERCHLORATE

HCC:
NRC/State License Number:
Net Property Weight for Ammo:
Boiling Point: Boiling Point Text: N/A
Melting/Freezing Point: Melting/Freezing Text: N/K
Decomposition Point: Decomposition Text: N/K
Vapor Pressure: N/A **Vapor Density:** N/K
Percent Volatile Organic Content:
Specific Gravity: 1.95
Volatile Organic Content Pounds per Gallon:
pH: NEUT
Volatile Organic Content Grams per Liter:
Viscosity: N/P
Evaporation Weight and Reference: N/K
Solubility in Water: FREELY SOLUBLE
Appearance and Odor: WHITE SOLID CRYSTALS, ODORLESS
Percent Volatiles by Volume: N/K
Corrosion Rate: N/K

Section 10 - Stability & Reactivity Data
AMMONIUM PERCHLORATE

Stability Indicator: YES
Materials to Avoid:
STRONG REDUCING AGENTS, STRONG ACIDS.
Stability Condition to Avoid:
EXCESSIVE TEMPERATURES. EXCESSIVE HEAT.
Hazardous Decomposition Products:
AMMONIA.
Hazardous Polymerization Indicator: NO
Conditions to Avoid Polymerization:
NOT RELEVANT.

Section 11 - Toxicological Information
AMMONIUM PERCHLORATE

Toxicological Information:
N/P

Section 12 - Ecological Information

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AMMONIUM PERCHLORATE

Ecological Information:
N/P

Section 13 - Disposal Considerations
AMMONIUM PERCHLORATE

Waste Disposal Methods:
WASTE DISP SHOULD BE I/A/W FED, STATE & LOC ENVIRON REGS. IF DISCARDED IN ITS PURCHASED FORM, THIS PROD WOULD NOT BE HAZ WASTE EITHER BY LISTING/BY CHARACT. HOWEVER, UNDER RCRA, IT IS THE RESPONSIBILI TY OF PROD USER TO DETERMINE AT TIME OF(SUP DAT)

Section 14 - MSDS Transport Information
AMMONIUM PERCHLORATE

Transport Information:
N/P

Section 15 - Regulatory Information
AMMONIUM PERCHLORATE

SARA Title III Information:
N/P
Federal Regulatory Information:
N/P
State Regulatory Information:
N/P

Section 16 - Other Information
AMMONIUM PERCHLORATE

Other Information:
N/P

HAZCOM Label Information
Product Identification: AMMONIUM PERCHLORATE
CAGE: HO946
Assigned Individual: Y
Company Name: HUMMEL CROTON INC
Company PO Box: 250
Company Street Address1: 10 HARMICH RD
Company Street Address2: SOUTH PLAINFIELD, NJ 07080-0250 US
Health Emergency Telephone: 800-424-9300 (CHEMTREC)
Label Required Indicator: Y
Date Label Reviewed: 06/26/1998
Status Code: C
Manufacturer's Label Number:
Date of Label: 06/26/1998
Year Procured: N/K
Organization Code: M
Chronic Hazard Indicator: N

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Eye Protection Indicator: YES
Skin Protection Indicator: YES
Respiratory Protection Indicator: YES
Signal Word: WARNING
Health Hazard: Moderate
Contact Hazard: Moderate
Fire Hazard: None
Reactivity Hazard: None

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Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format)
For Cornell University Convenience Only

ANTIMONY SULFIDE

Section 1 - Product and Company Identification	Section 9 - Physical & Chemical Properties
Section 2 - Compositon/Information on Ingredients	Section 10 - Stability & Reactivity Data
Section 3 - Hazards Identification Including Emergency Overview	Section 11 - Toxicological Information
Section 4 - First Aid Measures	Section 12 - Ecological Information
Section 5 - Fire Fighting Measures	Section 13 - Disposal Considerations
Section 6 - Accidental Release Measures	Section 14 - MSDS Transport Information
Section 7 - Handling and Storage	Section 15 - Regulatory Information
Section 8 - Exposure Controls & Personal Protection	Section 16 - Other Information

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Cornell University does not in any way warrant or imply the applicability, viability or use of this information to any person or for use in any situation.

Section 1 - Product and Company Identification
ANTIMONY SULFIDE

Product Identification: ANTIMONY SULFIDE
Date of MSDS: 12/10/1989 **Technical Review Date:** 02/28/1992
FSC: 6810 **NIIN:** **LIIN:** 00N027052
Submitter: N EN
Status Code: C
MFN: 01
Article: N
Kit Part: N

Manufacturer's Information

Manufacturer's Name: BARIUM AND CHEMICALS
Post Office Box: 218
Manufacturer's Address1: COUNTY RD 44
Manufacturer's Address2: STEUBENVILLE, OH 43952
Manufacturer's Country: US
General Information Telephone: 614-282-9776
Emergency Telephone: 614-282-9776
Emergency Telephone: 614-282-9776
MSDS Preparer's Name: N/P
Proprietary: N
Reviewed: N
Published: Y
CAGE: 20865
Special Project Code: N

Contractor Information

Contractor's Name: BARIUM AND CHEMICALS INC
Post Office Box: 218
Contractor's Address1: COUNTY RD 44
Contractor's Address2: STEUBENVILLE, OH 43952
Contractor's Telephone: 740-282-9776
Contractor's CAGE: 20865

Section 2 - Compositon/Information on Ingredients
ANTIMONY SULFIDE

Ingredient Name: ANTIMONY TRISULFIDE; (ANTIMONY SULFIDE)
Ingredient CAS Number: 1345-04-6 **Ingredient CAS Code:** M
RTECS Number: CC9450000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: 100
% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: 0.5 MG/M3 (SB) **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: 0.5 MG/M3 (SB) **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity:
DOT Reporting Quantity:

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Ozone Depleting Chemical: N

Section 3 - Hazards Identification, Including Emergency Overview
ANTIMONY SULFIDE

Health Hazards Acute & Chronic: INHAL: IRRIT TO RESP & GI TRACTS. SKIN: MAY CAUSE DERM. EYE: MAY CAUSE CONJUNCT. INGEST: MAY CAUSE VIOLENT IRRIT OF NOSE, THROAT, STOMACH & INTESTINES. MAY CAUSE SHALLOW RESP, WEIGHT LOSS, ACUTE CONGE STION OF HEART, LIVER & KIDNEYS. MAY CAUSE SORES IN MOUTH, THROAT, HDCH, INDIGESTION, & DIZZ. (EFTS OF OVEREXP)

Signs & Symptoms of Overexposure:
HLTH HAZ: CHRONIC: DEGENERATIVE CHANGES OF LIVER AND KIDNEYS MAY OCCUR.

Medical Conditions Aggravated by Exposure:
CHRONIC HEART DISEASE.

LD50 LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.

Route of Entry Indicators:
Inhalation: YES
Skin: NO
Ingestion: YES

Carcenogenicity Indicators
NTP: NO
IARC: NO
OSHA: NO

Carcinogenicity Explanation: NOT RELEVANT.

Section 4 - First Aid Measures
ANTIMONY SULFIDE

First Aid:
INGESTION: REMOVE INGESTED ANTIMONY COMPOUNDS BY GASTRIC LAVAGED OR EMESIS. (NOT IF PERSON IS UNCONSCIOUS). SKIN: WASH WITH SOAP AND WATER. EYES: WASH WITH LARGE AMOUNTS OF WATER FOR AT LEAST 15 MINUT ES. GET MEDICAL ATTENTION. INHALATION: REMOVE FROM EXPOSURE. SUPPORT BREATHING (GIVE ARTIFICIAL RESPIRATION/OXYGEN) (FP N).

Section 5 - Fire Fighting Measures
ANTIMONY SULFIDE

Fire Fighting Procedures:
WEAR NIOSH/MSHA APPRVD SCBA & FULL PROT EQUIP (FP N). MOVE CNTNR FROM FIRE AREA IF POSS. COOL CNTNRS EXPOS TO FLAME W/H*2O. AVOID BRTHG FUMES FROM BURNING MATL.
Unusual Fire or Explosion Hazard:
BURNS IN AIR AND EMITS A BLUE FLAME. REACTS WITH STEAM OR WATER TO

PRODUCE TOXIC FUMES.
Extinguishing Media:
SAND, WATER SPRAY OR FOAM. FOR LARGER FIRES USE WATER SPRAY, FOG, OR ALCOHOL FOAM.
Flash Point: Flash Point Text: N/K

Autoignition Temperature:
Autoignition Temperature Text: N/A
Lower Limit(s): N/K
Upper Limit(s): N/K

Section 6 - Accidental Release Measures
ANTIMONY SULFIDE

Spill Release Procedures:
PICK UP WITH CLEAN SHOVEL INTO CLEAN DRY CONTAINER. COVER. LARGER SPILLS-WET DOWN WITH WATER AND DIKE FOR LATER DISPOSAL. NO SMOKING. ISOLATE HAZARD AREA. USE TOXIC DUST PROTECTIVE RESPIRATOR.

Section 7 - Handling and Storage
ANTIMONY SULFIDE

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
ANTIMONY SULFIDE

Repiratory Protection:
NIOSH/MSHA APPROVED TOXIC DUST RESPIRATOR.
Ventilation:
LOCAL EXHAUST IN HANDLING AREAS. PROCESS ENCLOSURE VENTILATION TO MEET PUBLISHED EXPOSURE LIMITS.
Protective Gloves:
IMPERVIOUS GLOVES (FP N).
Eye Protection: CHEMICAL WORKERS GOGGLES (FP N).
Other Protective Equipment: IMPERVIOUS CLOTHING.
Work Hygenic Practices: REMOVE CLOTHING AND WASH THOROUGHLY. NO SMOKING IN WORK AREAS AND WASH BEFORE SMOKING OR EATING.
Supplemental Health & Safety Information: NONE SPECIFIED BY MANUFACTURER.

Section 9 - Physical & Chemical Properties
ANTIMONY SULFIDE

HCC: N1
NRC/State License Number:
Net Property Weight for Ammo:
Boiling Point: Boiling Point Text: 2102F,1150C
Melting/Freezing Point: Melting/Freezing Text: 1022F,550C

Decomposition Point: Decomposition Text: N/K
Vapor Pressure: NEGLIGIBLE **Vapor Density:** N/A
Percent Volatile Organic Content:
Specific Gravity: 4.64
Volatile Organic Content Pounds per Gallon:
pH: N/K
Volatile Organic Content Grams per Liter:
Viscosity: N/P
Evaporation Weight and Reference: NOT APPLICABLE
Solubility in Water: INSOLUBLE
Appearance and Odor: BLACK ODORLESS POWDER
Percent Volatiles by Volume: N/K
Corrosion Rate: N/K

Section 10 - Stability & Reactivity Data
ANTIMONY SULFIDE

Stability Indicator: YES
Materials to Avoid:
CADMIUM CHLORATE AND CHLORIC ACID: INCANDESCENT REACTION.
Stability Condition to Avoid:
THERMAL OF ACID DECOMPOSITION EMITS HIGHLY TOXIC FUMES OF OXIDES OF SULFUR AND ANTIMONY.
Hazardous Decomposition Products:
HYDROCHLORIC ACID: VIGOROUS REACTION. POTASSIUM CHLORATE: EXPLOSIVE REACTION.
Hazardous Polymerization Indicator: NO
Conditions to Avoid Polymerization:
NOT RELEVANT.

Section 11 - Toxicological Information
ANTIMONY SULFIDE

Toxicological Information:
N/P

Section 12 - Ecological Information
ANTIMONY SULFIDE

Ecological Information:
N/P

Section 13 - Disposal Considerations
ANTIMONY SULFIDE

Waste Disposal Methods:
DISPOSE OF IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS IN LANDFILL OR DUMP.

Section 14 - MSDS Transport Information
ANTIMONY SULFIDE

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Transport Information:
N/P

Section 15 - Regulatory Information
ANTIMONY SULFIDE

SARA Title III Information:
N/P
Federal Regulatory Information:
N/P
State Regulatory Information:
N/P

Section 16 - Other Information
ANTIMONY SULFIDE

Other Information:
N/P

HMIS Transportation Information

Product Identification: ANTIMONY SULFIDE
Transporation ID Number: 31623
Responsible Party CAGE: 20865
Date MSDS Prepared: 12/10/1989
Date MSDS Reviewed: 07/30/1992
MFN: 07/30/1992
Submitter: N TN
Status Code: C

Container Information
- **Unit of Issue:** NK
- **Container Quantity:** NK
- **Type of Container:**
- **Net Unit Weight:**

Article without MSDS: N
Technical Entry NOS Shipping Number:
Radioactivity:
Form:
Net Explosive Weight:
Coast Guard Ammunition Code:
Magnetism: N/P
AF MMAC Code:
DOD Exemption Number:
Limited Quantity Indicator:
Multiple Kit Number: 0
Kit Indicator: N
Kit Part Indicator: N
Review Indicator: Y
Additional Data:

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Department of Transportation Information

DOT Proper Shipping Name: ANTIMONY COMPOUNDS, INORGANIC, SOLID, N.O.S.
DOT PSN Code: BFZ
Symbols:
DOT PSN Modifier:
Hazard Class: 6.1
UN ID Number: UN1549
DOT Packaging Group: III
Label: KEEP AWAY FROM FOOD
Special Provision(s): 35
Packaging Exception: 153
Non Bulk Packaging: 213
Bulk Packaging: 240
Maximimum Quanity in Passenger Area: 100 KG
Maximimum Quanity in Cargo Area: 200 KG
Stow in Vessel Requirements: A
Requirements Water/Sp/Other:

IMO Detail Information

IMO Proper Shipping Name: NOT REGULATED FOR THIS MODE OF TRANSPORTATION
IMO PSN Code: ZZZ
IMO PSN Modifier:
IMDG Page Number: N/R
UN Number: N/R
UN Hazard Class: N/R
IMO Packaging Group: N/R
Subsidiary Risk Label: N/R
EMS Number: N/R
Medical First Aid Guide Number: N/R

IATA Detail Information

IATA Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION
IATA PSN Code: ZZZ
IATA PSN Modifier:
IATA UN Id Number: N/R
IATA UN Class: N/R
Subsidiary Risk Class: N/R
UN Packaging Group: N/R
IATA Label: N/R
Packaging Note for Passengers: N/R
Maximum Quantity for Passengers: N/R
Packaging Note for Cargo: N/R
Maximum Quantity for Cargo: N/R
Exceptions: N/R

AFI Detail Information

AFI Proper Shipping Name: ANTIMONY COMPOUNDS, INORGANIC, SOLID, N.O.S.
AFI Symbols:
AFI PSN Code: CGI
AFI PSN Modifier:
AFI UN Id Number: UN1549
AFI Hazard Class: 6.1
AFI Packing Group: III
AFI Label:

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Special Provisions: P5
Back Pack Reference: A10.6

HAZCOM Label Information

Product Identification: ANTIMONY SULFIDE
CAGE: 20865
Assigned Individual: N
Company Name: BARIUM AND CHEMICALS INC
Company PO Box: 218
Company Street Address1: COUNTY RD 44
Company Street Address2: STEUBENVILLE, OH 43952 US
Health Emergency Telephone: 614-282-9776
Label Required Indicator: Y
Date Label Reviewed: 02/28/1992
Status Code: C
Manufacturer's Label Number:
Date of Label: 02/28/1992
Year Procured: N/K
Organization Code: G
Chronic Hazard Indicator: Y
Eye Protection Indicator: YES
Skin Protection Indicator: YES
Respiratory Protection Indicator: YES
Signal Word: WARNING
Health Hazard: Moderate
Contact Hazard: Slight
Fire Hazard: None
Reactivity Hazard: None

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Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format)
For Cornell University Convenience Only

ARSENIC METAL-MBE CHARGES, ARSENIC CHUNK & GRANULE

Section 1 - Product and Company Identification	Section 9 - Physical & Chemical Properties
Section 2 - Compositon/Information on Ingredients	Section 10 - Stability & Reactivity Data
Section 3 - Hazards Identification Including Emergency Overview	Section 11 - Toxicological Information
Section 4 - First Aid Measures	Section 12 - Ecological Information
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Section 1 - Product and Company Identification
ARSENIC METAL-MBE CHARGES, ARSENIC CHUNK & GRANULE

Product Identification: ARSENIC METAL-MBE CHARGES, ARSENIC CHUNK & GRANULE
Date of MSDS: 08/01/1997 **Technical Review Date:** 09/01/1999
FSC: 6810 **NIIN: LIIN:** 00N092040
Submitter: N NF
Status Code: A
MFN: 01
Article: N
Kit Part: N

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Manufacturer's Information

Manufacturer's Name: UNITED MINERAL & CHEMICAL CORP
Manufacturer's Address1: 1100 VALLEYBROOK AVE
Manufacturer's Address2: LYNDHURST, NJ 07071
Manufacturer's Country: US
General Information Telephone: 201-507-3300
Emergency Telephone: (800)424-9300
Emergency Telephone: (800)424-9300
Chemtec Telephone: (800)424-9300
Proprietary: N
Reviewed: Y
Published: Y
CAGE: 87730

Contractor Information

Contractor's Name: UNITED MINERAL & CHEMICAL CORP
Contractor's Address1: 1100 VALLEYBROOK AVE
Contractor's Address2: LYNDHURST, NJ 07071
Contractor's Telephone: 201-507-3300
Contractor's CAGE: 87730

Section 2 - Compositon/Information on Ingredients
ARSENIC METAL-MBE CHARGES, ARSENIC CHUNK & GRANULE

Ingredient Name: ARSENIC; (ARSENIC METAL)
Ingredient CAS Number: 7440-38-2 **Ingredient CAS Code:** T
RTECS Number: CG0525000 **RTECS Code:** T
=WT: 100. **=WT Code:** M
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text:
% Enviromental Weight:
Other REC Limits: N/P
OSHA PEL: N/P **OSHA PEL Code:**
OSHA STEL: N/P **OSHA STEL Code:**
ACGIH TLV: 0.01 MG/M3 **ACGIH TLV Code:** T
ACGIH STEL: NOT ESTABLISHED **ACGIH STEL Code:** T
EPA Reporting Quantity: 1 LB
DOT Reporting Quantity: 1 LB
Ozone Depleting Chemical: N

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Section 3 - Hazards Identification, Including Emergency Overview
ARSENIC METAL-MBE CHARGES, ARSENIC CHUNK & GRANULE

Health Hazards Acute & Chronic: ARSENIC METAL IS NOT AS READILY AVAIL IN THE BODY AS ARSENIC IN THE FORM OF DUST OR VAP OR WHEN PROCESSED INTO ARSENIC CMPDS (ARSENICALS). INORGANIC ARSENICALS ARE MORE TOXIC THAN ORGANIC ARSENICALS. ACUTE EFTS: ARSENIC IS POISON BY SUBCUTANEOUS, INTRAMUSCULAR & INTRAPERITONEAL ROUTES. ACUTE ARSENIC POISONING FROM INGEST RSLTS IN MARKED IRRIT OF STOMACH & INTESTINES W/NAUS, VOMIT & DIARR. IN SEV C ASES STOOLS & VOMIT ARE BLOODY & PATIENT MAY GO INTO COLLAPSE & SHOCK W/WEAK, RAPID PULSE, COLD SWEATS, COMA & DEATH. INHAL MAY CAUSE ULCERATION OF NASAL SEPTUM, RESP IRRIT. SKIN/EYE CNTCT MAY CAUSE DERM, SKIN & EYE (EFTS OF OVEREXP)

Signs & Symptoms of Overexposure:
HLTH HAZS: IRRIT. CHRONIC EFTS: ARSENIC IS CONFIRMED HUMAN CARCIN PRODUCING LIVER TUMORS & AN EXPERIMENTAL TERATOGEN (MAY CAUSE DMG TO DEVELOPING FETUS). CHRONIC ARSENIC POISONING MAY INCL ANY/ALL OF FOLLOWING: DIGEST SYS DISTURBS, LOSS OFAPPETITE, CRAMPS, NAUS, CONSTIP, DIARR; LIVER DMG WHICH MAY RSLT IN JAUN; DISTURBS OF BLOOD, KIDNEYS & NERVOUS SYS; SKIN ABNORMS INCL ITCHING, PIGMENTATION & POS S CANCEROUS CHGS. TARGET ORGANS FOR INORGANIC CMPDS AS AS): LIVER, KIDNEYS, SKIN, LUNGS, LYMPHATIC SYS. TLV: 0.01 MG/M3 TWA ARSENIC, ELEMENTAL & INORGANIC CMPDS (EXCEPT ARSINE), AS AS. OSHA PEL: (SUPD AT)

Medical Conditions Aggravated by Exposure:
KNOWN EFFECTS ON OTHER ILLNESSES: GASTROINTESTINAL. NERVOUS SYSTEM. SKIN. LIVER & KIDNEY PROBLEMS. AFTER EXPOSURE HAVE URINE TEST.

LD50 LC50 Mixture: LD50: (ORAL, RAT) 763 MG/M3

Route of Entry Indicators:
Inhalation: YES
Skin: YES
Ingestion: YES

Carcenogenicity Indicators
NTP: YES
IARC: YES
OSHA: YES

Carcinogenicity Explanation: ARSENIC: IARC MONOGRAPHS, SUPPLEMENT, VOL 7, PG 100, 1987: GROUP 1. NTP 8TH ANNUAL REPORT ON CARCINOGENS, 1998: KNOWN TO BE CARCINOGEN. OSHA REGULATED: CFR 29 1910.1018.

Section 4 - First Aid Measures
ARSENIC METAL-MBE CHARGES, ARSENIC CHUNK & GRANULE

First Aid:
SKIN: FLUSH WITH SOAP AND WATER. AVOID RUBBING INTO SKIN. CONTACT MD IMMEDIATELY. EYES: FLUSH WITH WATER FOR AT LEAST 15 MINUTES. CONTACT

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PHYSICIAN IMMEDIATELY. INHALATION: REMOVE TO FRESH AIR. PROVID E OXYGEN IF NECESSARY. CONTACT PHYSICIAN IMMEDIATELY. INGESTION: TREATMENT WITH BAS (DIMERCAPTOL) IS OF QUESTIONABLE EFFECTIVENESS IN TRIVALENT ARSENIC COMPOUNDS. INDUCE VOMITING AND DO GASTRIC LAVAGE. GET PERSONNEL TO HOSPITAL IMMEDIATELY. A PHYSICIAN CAN INITIATE AN EXCHANGE TRANSFUSION AND DIALYSIS. ALSO ABSORPTION AND REMOVAL WITH ANIMAL BONE COAL OR FE (OH)*2 SHOULD BE DONE.

Section 5 - Fire Fighting Measures
ARSENIC METAL-MBE CHARGES, ARSENIC CHUNK & GRANULE

Fire Fighting Procedures:
USE NIOSH APPRVD SCBA & FULL PROT EQUIP (FP N). RESTRICT PERS NOT WEARING PROT EQUIP FROM AREA. TRY TO SNUFF FIRE W/SAND, DRY MEDIA, FOAM OR CO*2. IF NO OTHER OPTIONS AVAILABLE, USE WATER & ALWAYS WEA R NIOSH APPRVD SCBA OR NIOSH TOXIC VAPOR RESP. POISONOUS GASES ARE PRODUCED IN FIRE, INCLUDING ARSENIC OXIDES.
Unusual Fire or Explosion Hazard:
ARSENIC, WHEN HEATED OR IN CONTACT W/ACID OR ACID FUMES, CAN PRODUCE HIGHLY TOXIC FUMES. ARSENIC REACTS VIGOROUSLY W/OXIDIZING MATLS. ARSENIC IS FLAMMABLE IN FORM OF DUST WHEN EXPOSED TO HEAT OR FLAME OR BY CHEMICAL RXN W/POWERFUL OXIDIZERS. SLIGHT EXPLOSION HAZ EXISTS IN FORM OF DUST WHEN EXPOSED TO (ECOLOGICAL INFO)
Extinguishing Media:
FOAM, CARBON DIOXIDE, DRY CHEMICAL.
Flash Point: Flash Point Text: NONE

Autoignition Temperature:
Autoignition Temperature Text: N/K
Lower Limit(s): N/A
Upper Limit(s): N/A

Section 6 - Accidental Release Measures
ARSENIC METAL-MBE CHARGES, ARSENIC CHUNK & GRANULE

Spill Release Procedures:
RESTRICT PERSONS NOT WEARING PROTECTIVE EQUIPMENT FROM AREA UNTIL CLEANUP IS COMPLETE. WEARING NIOSH APPROVED RESPIRATOR, GLOVES, GOGGLES, LAB COAT, GATHER UP CHUNKS, RODS OR GRANULES WITH VACUUM OR U TENSILS RESERVED FOR POISONOUS SOLIDS. AVOID RAISING DUST. VENTILATE THE AREA AFTER CLEANUP IS COMPLETE.

Section 7 - Handling and Storage
ARSENIC METAL-MBE CHARGES, ARSENIC CHUNK & GRANULE

Handling and Storage Precautions:

Other Precautions:

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Section 8 - Exposure Controls & Personal Protection
ARSENIC METAL-MBE CHARGES, ARSENIC CHUNK & GRANULE

Repiratory Protection:
NIOSH APPROVED, AIR PURIFYING, TOXIC VAPOR RESPIRATOR TO PARTICULATE AND FUME AIR LEVEL. FOR INORGANIC ARSENIC APPLICATIONS, SEE 29 CFR 1910.1018 FOR PROPER RESPIRATOR SELECTION.
Ventilation:
LOC EXHST/MECH (GEN) SCRUBBER OR TRAP IF POSS TO MAINTAIN EXPOS TO LESS THAN PERMISSIBLE LIMITS FOR ELEMENTAL ARSENIC & ANY CMPDS BEING GENERATED.
Protective Gloves:
NEOPRENE OR PLASTIC.
Eye Protection: ANSI APPROVED CHEMICAL WORKERS GOGGLES (FP N).
Other Protective Equipment: ANSI APPROVED EYE WASH AND DELUGE SHOWER (FP N). LAB COAT.
Work Hygenic Practices: N/P
Supplemental Health & Safety Information: EFTS OF OVEREXP: 0.01 MG/M3 AS AS & INORGANIC CMPDS; 0.5 AS AS ORGANIC CMPDS. ACGIH TLV: 0.01 MG/M3 TWA ARSENIC, ELEMENTAL & INORGANIC CMPDS (EXCEPT ARSINE), AS AS. ALSO SEE TOXICOLOGICAL INFO. WASTE DISP METH: HAZ DEPENDING ON LEVEL OF TOX CHARACT OF ARSENIC. SEE 40 CFR 261.24 FOR DETERMINATION. (OTHER INFO)

Section 9 - Physical & Chemical Properties
ARSENIC METAL-MBE CHARGES, ARSENIC CHUNK & GRANULE

HCC:
NRC/State License Number:
Net Property Weight for Ammo:
Boiling Point: =612.C, 1133.6F **Boiling Point Text:** SUBLIMES
Melting/Freezing Point: =814.C, ######F **Melting/Freezing Text:** @ 36 ATM. FP:N/A
Decomposition Point: Decomposition Text: N/P
Vapor Pressure: 1 MMHG @ 372C **Vapor Density:** N/A
Percent Volatile Organic Content:
Specific Gravity: 5.727
Volatile Organic Content Pounds per Gallon:
pH: NONE-0% IN H*2O
Volatile Organic Content Grams per Liter:
Viscosity: N/P
Evaporation Weight and Reference: N/A
Solubility in Water: INSOLUBLE
Appearance and Odor: SILVER GRAY CRYSTALLINE CHUNKS, RODS OR GRANULES; NO ODOR AS (ECOLOGICAL INFO)
Percent Volatiles by Volume: N/A (BY WT)
Corrosion Rate: N/P

Section 10 - Stability & Reactivity Data
ARSENIC METAL-MBE CHARGES, ARSENIC CHUNK & GRANULE

Stability Indicator: YES
Materials to Avoid:

INCOMPATIBLE W/BROMINE AZIDE, DIRUBIDIUM ACETYLIDE, HALOGENS, PALLADIUM ZINC, PLATINUM, NCL*3, AGNO*3, CRO*3, NA*2O*2, HEXAFLUOROISOPROPYLIDENEAMINO LITHIUM. CAN REACT W/ACIDS OR ACID FUMES & POWERFUL OXIDIZERS SUCH AS BROM

Stability Condition to Avoid:
AVOID OPEN CONTAINERS AND CONTACT WITH INCOMPATIBLE MATERIALS.

Hazardous Decomposition Products:
ARSENIC FUMES, ARSINE, OTHER ARSENIC COMPOUNDS.

Hazardous Polymerization Indicator: NO

Conditions to Avoid Polymerization:
N/P

Section 11 - Toxicological Information
ARSENIC METAL-MBE CHARGES, ARSENIC CHUNK & GRANULE

Toxicological Information:
LD50: TDLO 605 ?G/KG. ORAL-MAN TDLO 7857 MG/KG/55Y SKIN. DERMAL IRRITATION-RABBIT: UNKNOWN; SUBCUTANEOUS IMPLANT RABBIT LTLO 75 MG/KG. EYE IRRITATION-RABBIT: UNKNOWN.

Section 12 - Ecological Information
ARSENIC METAL-MBE CHARGES, ARSENIC CHUNK & GRANULE

Ecological Information:
N/P. EXPLO HAZ: FLAME. IN EVENT OF A FIRE OR SPILL CONTACT THE STATE DEPARTMENT OF THE ENVIRONMENT & YOUR REGIONAL OFFICE OF THE FEDERAL EPA. PHYSICAL DATA - APPEAR/ODOR: METAL AS COMPOUND, ASH*3, HAS GARLIC ODOR. ODOR THRESHOLD: N/A. MATLS TO AVOID: CHLORATES, IODATES, PEROXIDES, LITHIUM, NACL*3, KMNO*3, RB*2C*2, AGNO*4, NOCL, IF*5, CRO*3, CLF*3, CLO, BRF*3, BRF*5, BRN*3, RBC*3BCH, CSC*3BCH.

Section 13 - Disposal Considerations
ARSENIC METAL-MBE CHARGES, ARSENIC CHUNK & GRANULE

Waste Disposal Methods:
SOLID WASTES SHOULD BE VITRIFIED, PLACED IN LABELED CNTNR & BURIED IN EPA SUPERVISED FACILITY. ETCHING SOLNS & CUTTING WASTES SHOULD BE PRECIPITATED, CEMENTED/VITRIFIED & PLACED IN METAL/PLASTIC LABEL ED CNTNRS & BURIED IN EPA SUPERVISED FACILITY. PASS GAS THRU POTASSIUM PERMANGANATE, PRECIPITATE & T REAT AS ABOVE. WASTE MAY BE CONSIDERED (SUPDAT)

Section 14 - MSDS Transport Information
ARSENIC METAL-MBE CHARGES, ARSENIC CHUNK & GRANULE

Transport Information:
DOT REGULATED: YES. RQ: (NA - PIECES ARE LARGER THAN 100 MICROMETERS IN DIAMETER). IF REGULATED, PROPER SHIPPING NAME: ARSENIC. HAZARD CLASS: (6.1). IDENTIFICATION NO: (UN1558). PACKING GROUP: (III). LABEL REQUIRED: (POISON). INLAND B/L: ARSENIC, 6.1, UN1558, PACKING GROUP II, POISON. EMERGENCY RESPONSE GUIDE NO: (152).

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Section 15 - Regulatory Information
ARSENIC METAL-MBE CHARGES, ARSENIC CHUNK & GRANULE

SARA Title III Information:
SARA TITLE III, SECT 313: LISTED.
Federal Regulatory Information:
TSCA: WE CERTIFY THAT ALL COMPONENTS OF THIS PRODUCT ARE REGISTERED UNDER THE REGULATIONS OF THE TOXIC SUBSTANCES CONTROL ACT. HMIS: HEALTH (4); FLAMMABILITY (0); REACTIVITY (1).
State Regulatory Information:

Section 16 - Other Information
ARSENIC METAL-MBE CHARGES, ARSENIC CHUNK & GRANULE

Other Information:
WASTE DISP METH: HAZARDOUS DEPENDING ON LEVEL OF TOXICITY CHARACTERISTIC OF ARSENIC. SEE 40 CFR 261.24 FOR DETERMINATION. RCRA HAZARDOUS WASTE: YES RCRA @: D004; IF TESTED POSITIVE AS CHARACT OF TOXIC ITY FOR ARSENIC. CERCLA: YES. RQ (1 LB RQ IS APPLICABLE ONLY IF DIAMETER OF PIECES OF SOLID METAL RELEASED IS LESS THAN 100 MICROMETERS OR 0.004 INCH. THIS PROD FORM IS LARGER THAN 100 MICROMETERS & H AS NO RQ IN ITS CURRENT FORM. IF AS HAZ WASTE CHARACT OF ARSENIC, THEN RQ=1LB. FOLLOW ALL LOCAL, STATE AND FEDERAL INFO & REGULATIONS.

HAZCOM Label Information

Product Identification: ARSENIC METAL-MBE CHARGES, ARSENIC CHUNK & GRANULE
CAGE: 87730
Assigned Individual: N
Company Name: UNITED MINERAL & CHEMICAL CORP
Company PO Box:
Company Street Address1: 1100 VALLEYBROOK AVE
Company Street Address2: LYNDHURST, NJ 07071 US
Health Emergency Telephone: (800)424-9300
Label Required Indicator: Y
Date Label Reviewed: 09/01/1999
Status Code: A
Manufacturer's Label Number:
Date of Label:
Year Procured: N/K
Organization Code: F
Chronic Hazard Indicator: Y
Eye Protection Indicator: YES
Skin Protection Indicator: YES
Respiratory Protection Indicator: YES
Signal Word: DANGER
Health Hazard: Severe
Contact Hazard: Severe
Fire Hazard: None
Reactivity Hazard: Slight

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Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format)
For Cornell University Convenience Only

2765 ASPHALTUM

Section 1 - Product and Company Identification	Section 9 - Physical & Chemical Properties
Section 2 - Compositon/Information on Ingredients	Section 10 - Stability & Reactivity Data
Section 3 - Hazards Identification Including Emergency Overview	Section 11 - Toxicological Information
Section 4 - First Aid Measures	Section 12 - Ecological Information
Section 5 - Fire Fighting Measures	Section 13 - Disposal Considerations
Section 6 - Accidental Release Measures	Section 14 - MSDS Transport Information
Section 7 - Handling and Storage	Section 15 - Regulatory Information
Section 8 - Exposure Controls & Personal Protection	Section 16 - Other Information

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Section 1 - Product and Company Identification
2765 ASPHALTUM

Product Identification: 2765 ASPHALTUM
Date of MSDS: 01/01/1987 **Technical Review Date:** 02/24/1994
FSC: 8010 **NIIN:** **LIIN:** 00F033053
Submitter: F BT
Status Code: C
MFN: 01
Article: N
Kit Part: N

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Manufacturer's Information

Manufacturer's Name: MARTIN F WEBER CO
Post Office Box: N/K
Manufacturer's Address1: 2727 SOUTHAMPTON RD
Manufacturer's Address2: PHILADELPHIA, PA 19154-1293
Manufacturer's Country: US
General Information Telephone: 215-677-5600
Emergency Telephone: 215-677-5600
Emergency Telephone: 215-677-5600
MSDS Preparer's Name: N/P
Proprietary: N
Reviewed: Y
Published: Y
CAGE: MART5
Special Project Code: N

Preparer Information

Preparer's Name: MARTIN F WEBER CO
Preparer's Address1: 2727 SOUTHAMPTON RD
Preparer's Address2: PHILADELPHIA, PA 19154-1293
Preparer's CAGE: MART5
Assigned Individual: N

Contractor Information

Contractor's Name: MARTIN F WEBER CO
Contractor's Address1: 2727 SOUTHAMPTON RD
Contractor's Address2: PHILADELPHIA, PA 19154-1293
Contractor's Telephone: 215-677-5600
Contractor's CAGE: MART5

Section 2 - Compositon/Information on Ingredients
2765 ASPHALTUM

Ingredient Name: NON-HAZARDOUS FOR INGREDIENTS
Ingredient CAS Number: Ingredient CAS Code: X
RTECS Number: RTECS Code: X
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: N/K
% Enviromental Weight:

Other REC Limits: N/K
OSHA PEL: N/K **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: N/K **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity:
DOT Reporting Quantity:
Ozone Depleting Chemical:

Section 3 - Hazards Identification, Including Emergency Overview
2765 ASPHALTUM

Health Hazards Acute & Chronic: N/K

Signs & Symptoms of Overexposure:
N/K

Medical Conditions Aggravated by Exposure:
N/K

LD50 LC50 Mixture: N/K

Route of Entry Indicators:
Inhalation: NO
Skin: NO
Ingestion: NO

Carcenogenicity Indicators
NTP: NO
IARC: NO
OSHA: NO

Carcinogenicity Explanation: NONE

Section 4 - First Aid Measures
2765 ASPHALTUM

First Aid:
N/K

Section 5 - Fire Fighting Measures
2765 ASPHALTUM

Fire Fighting Procedures:
N/K
Unusual Fire or Explosion Hazard:
N/K
Extinguishing Media:
N/K
Flash Point: Flash Point Text: N/K

Autoignition Temperature:
Autoignition Temperature Text: N/A
Lower Limit(s): N/K
Upper Limit(s): N/K

Section 6 - Accidental Release Measures
2765 ASPHALTUM

Spill Release Procedures:
CLEAN UP W/CLOTH OR PAPER TOWELS.

Section 7 - Handling and Storage
2765 ASPHALTUM

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
2765 ASPHALTUM

Repiratory Protection:
N/K
Ventilation:
N/K
Protective Gloves:
N/K
Eye Protection: N/K
Other Protective Equipment: N/K
Work Hygenic Practices: N/K
Supplemental Health & Safety Information: N/K

Section 9 - Physical & Chemical Properties
2765 ASPHALTUM

HCC:
NRC/State License Number:
Net Property Weight for Ammo:
Boiling Point: Boiling Point Text: N/K
Melting/Freezing Point: Melting/Freezing Text: N/K
Decomposition Point: Decomposition Text: N/K
Vapor Pressure: N/K **Vapor Density:** N/K
Percent Volatile Organic Content:
Specific Gravity: N/K
Volatile Organic Content Pounds per Gallon:
pH: N/K
Volatile Organic Content Grams per Liter:
Viscosity: N/P
Evaporation Weight and Reference: N/K
Solubility in Water: N/K

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Appearance and Odor: N/K
Percent Volatiles by Volume: N/K
Corrosion Rate: N/K

Section 10 - Stability & Reactivity Data
2765 ASPHALTUM

Stability Indicator: YES
Materials to Avoid:
N/K
Stability Condition to Avoid:
N/K
Hazardous Decomposition Products:
N/K
Hazardous Polymerization Indicator: NO
Conditions to Avoid Polymerization:
N/K

Section 11 - Toxicological Information
2765 ASPHALTUM

Toxicological Information:
N/P

Section 12 - Ecological Information
2765 ASPHALTUM

Ecological Information:
N/P

Section 13 - Disposal Considerations
2765 ASPHALTUM

Waste Disposal Methods:
DISPOSE AS NORMAL HOUSEHOLD TRASH

Section 14 - MSDS Transport Information
2765 ASPHALTUM

Transport Information:
N/P

Section 15 - Regulatory Information
2765 ASPHALTUM

SARA Title III Information:
N/P
Federal Regulatory Information:
N/P
State Regulatory Information:
N/P

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Section 16 - Other Information
2765 ASPHALTUM

Other Information:
N/P

HAZCOM Label Information

Product Identification: 2765 ASPHALTUM
CAGE: MART5
Assigned Individual: N
Company Name: MARTIN F WEBER CO
Company PO Box:
Company Street Address1: 2727 SOUTHAMPTON RD
Company Street Address2: PHILADELPHIA, PA 19154-1293 US
Health Emergency Telephone: 215-677-5600
Label Required Indicator: Y
Date Label Reviewed: 02/24/1994
Status Code: C
Manufacturer's Label Number: N/R
Date of Label: 02/24/1994
Year Procured: N/K
Organization Code: F
Chronic Hazard Indicator: N
Eye Protection Indicator: N/P
Skin Protection Indicator: N/P
Respiratory Protection Indicator: N/P
Signal Word: NONE
Health Hazard: None
Contact Hazard: None
Fire Hazard: None
Reactivity Hazard: None

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Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format)
For Cornell University Convenience Only

BARIUM, 95692

Section 1 - Product and Company Identification	Section 9 - Physical & Chemical Properties
Section 2 - Compositon/Information on Ingredients	Section 10 - Stability & Reactivity Data
Section 3 - Hazards Identification Including Emergency Overview	Section 11 - Toxicological Information
Section 4 - First Aid Measures	Section 12 - Ecological Information
Section 5 - Fire Fighting Measures	Section 13 - Disposal Considerations
Section 6 - Accidental Release Measures	Section 14 - MSDS Transport Information
Section 7 - Handling and Storage	Section 15 - Regulatory Information
Section 8 - Exposure Controls & Personal Protection	Section 16 - Other Information

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Section 1 - Product and Company Identification
BARIUM, 95692

Product Identification: BARIUM, 95692
Date of MSDS: 04/04/1997 **Technical Review Date:** 05/29/1998
FSC: 6810 **NIIN:** **LIIN:** 00N087285
Submitter: N EN
Status Code: C
MFN: 01
Article: N
Kit Part: N

00064701

Manufacturer's Information

Manufacturer's Name: QCD ANALYSTS
Post Office Box: 699
Manufacturer's Address1:
Manufacturer's Address2: SPRING LAKE, NJ 07762
Manufacturer's Country: US
General Information Telephone: 723-919-1909
Emergency Telephone: 888-723-5478
Emergency Telephone: 888-723-5478
MSDS Preparer's Name: N/P
Proprietary: N
Reviewed: N
Published: Y
CAGE: JO626
Special Project Code: N

Contractor Information

Contractor's Name: QCD ANALYSTS
Post Office Box: 699
Contractor's Address1:
Contractor's Address2: SPRING LAKE, NJ 07762
Contractor's Telephone: 888-QCD-LIST
Contractor's CAGE: 09KS0

Contractor Information

Contractor's Name: QCD ANALYSTS
Post Office Box: 699
Contractor's Address1: UNKNOWN
Contractor's Address2: SPRING LAKE, NJ 07762
Contractor's Telephone: 800-723-5478
Contractor's CAGE: JO626

Section 2 - Compositon/Information on Ingredients
BARIUM, 95692

Ingredient Name: BARIUM NITRATE
Ingredient CAS Number: 10022-31-8 **Ingredient CAS Code:** M
RTECS Number: CQ9625000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:

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% Text: 0.01-1
% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: 5 MG/M3 (BA) **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: 2 MG/M3 (BA) **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity:
DOT Reporting Quantity:
Ozone Depleting Chemical: N

Ingredient Name: NITRIC ACID (SARA 302/313) (CERCLA)
Ingredient CAS Number: 7697-37-2 **Ingredient CAS Code:** M
RTECS Number: QU5775000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: 2
% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: 2 PPM **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: 2 PPM;4 STEL **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity: 1000 LBS
DOT Reporting Quantity: 1000 LBS
Ozone Depleting Chemical: N

Ingredient Name: WATER
Ingredient CAS Number: 7732-18-5 **Ingredient CAS Code:** M
RTECS Number: ZC0110000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: 98
% Enviromental Weight:
Other REC Limits: N/K

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OSHA PEL: N/K (FP N) **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: N/K (FP N) **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity:
DOT Reporting Quantity:
Ozone Depleting Chemical: N

Section 3 - Hazards Identification, Including Emergency Overview
BARIUM, 95692

Health Hazards Acute & Chronic: SKIN ABSORPTION, IRRITATION OF MUCOUS MEMBRANES. SKIN/EYE IRRITATION OR INFLAMMATION. BARIUM NITRATE & NITRIC ACID:POISON.

Signs & Symptoms of Overexposure:
SEE HEALTH HAZARDS.

Medical Conditions Aggravated by Exposure:
NONE.

LD50 LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.

Route of Entry Indicators:
Inhalation: YES
Skin: YES
Ingestion: YES

Carcenogenicity Indicators
NTP: NO
IARC: NO
OSHA: NO

Carcinogenicity Explanation: NOT RELEVANT

Section 4 - First Aid Measures
BARIUM, 95692

First Aid:
SEEK MEDICAL ASSISTANCE FOR FURTHER ASSISTANCE. EYES:FLUSH W/WATER FOR AT LEAST 15 MINUTES. SKIN:FLUSH W/WATER FOR 15 MINUTES. WASH CONTAMINATED CLOTHING BEFORE RE-USE. INHAL:REMOVE TO FRESH AIR. INGE ST:DO NOT INDUCE VOMITING. GIVE WATER OR MILK.

Section 5 - Fire Fighting Measures
BARIUM, 95692

Fire Fighting Procedures:
USE NIOSH APPROVED SCBA & FULL PROTECTIVE EQUIPMENT (FP N).
Unusual Fire or Explosion Hazard:

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NONE.
Extinguishing Media:
WATER OR CO*2.
Flash Point: Flash Point Text: NOT APPLICABLE

Autoignition Temperature:
Autoignition Temperature Text: N/A
Lower Limit(s): N/A
Upper Limit(s): N/A

Section 6 - Accidental Release Measures
BARIUM, 95692

Spill Release Procedures:
TAKE UP W/INERT, ABSORBENT MATERIAL. CONTAINERIZE FOR DISPOSAL. FLUSH SPILL AREA W/WATER.

Section 7 - Handling and Storage
BARIUM, 95692

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
BARIUM, 95692

Repiratory Protection:
NIOSH APPROVED RESPIRATOR, WHEN NEEDED.
Ventilation:
NONE REQUIRED. LOCAL EXHAUST, WHEN NEEDED.
Protective Gloves:
NEOPRENE GLOVES.
Eye Protection: ANSI APPROVED CHEM WORKERS GOGGS(SUPDAT)
Other Protective Equipment: EYE WASH FOUNTAIN & DELUGE SHOWER WHICH MEET ANSI DESIGN CRITERIA (FP N). LAB COAT.
Work Hygenic Practices: USUAL.
Supplemental Health & Safety Information: EYE PROT:& FULL LENGTH FACESHIELD (FP N).

Section 9 - Physical & Chemical Properties
BARIUM, 95692

HCC:
NRC/State License Number:
Net Property Weight for Ammo:
Boiling Point: Boiling Point Text: 212F,100C
Melting/Freezing Point: Melting/Freezing Text: N/A
Decomposition Point: Decomposition Text: N/K
Vapor Pressure: N/A **Vapor Density:** N/A
Percent Volatile Organic Content:

Specific Gravity: 1 (H*2O=1)
Volatile Organic Content Pounds per Gallon:
pH: N/K
Volatile Organic Content Grams per Liter:
Viscosity: N/P
Evaporation Weight and Reference: N/K
Solubility in Water: SOLUBLE
Appearance and Odor: CLEAR, COLORLESS SOLUTION; NO ODOR.
Percent Volatiles by Volume: N/K
Corrosion Rate: N/K

Section 10 - Stability & Reactivity Data
BARIUM, 95692

Stability Indicator: YES
Materials to Avoid:
STRONG BASES OR STRONG REDUCING AGENTS.
Stability Condition to Avoid:
EXCESSIVE HEAT OR EXTREME COLD.
Hazardous Decomposition Products:
NO*X.
Hazardous Polymerization Indicator: NO
Conditions to Avoid Polymerization:
NOT RELEVANT

Section 11 - Toxicological Information
BARIUM, 95692

Toxicological Information:
N/P

Section 12 - Ecological Information
BARIUM, 95692

Ecological Information:
N/P

Section 13 - Disposal Considerations
BARIUM, 95692

Waste Disposal Methods:
CORROSIVE WASTE I/A/W ALL FEDERAL, STATE & LOCAL ENVIRONMENTAL REGULATIONS.

Section 14 - MSDS Transport Information
BARIUM, 95692

Transport Information:
N/P

Section 15 - Regulatory Information
BARIUM, 95692

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SARA Title III Information:
N/P
Federal Regulatory Information:
N/P
State Regulatory Information:
N/P

Section 16 - Other Information
BARIUM, 95692

Other Information:
N/P

HAZCOM Label Information

Product Identification: BARIUM, 95692
CAGE: JO626
Assigned Individual: Y
Company Name: QCD ANALYSTS
Company PO Box: 699
Company Street Address1: UNKNOWN
Company Street Address2: SPRING LAKE, NJ 07762 US
Health Emergency Telephone: 888-723-5478
Label Required Indicator: Y
Date Label Reviewed: 06/24/1998
Status Code: C
Manufacturer's Label Number:
Date of Label: 06/24/1998
Year Procured: N/K
Organization Code: M
Chronic Hazard Indicator: N
Eye Protection Indicator: YES
Skin Protection Indicator: YES
Respiratory Protection Indicator: YES
Signal Word: WARNING
Health Hazard: Moderate
Contact Hazard: Moderate
Fire Hazard: None
Reactivity Hazard: None

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Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format)
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BARIUM CHROMATE

Section 1 - Product and Company Identification	Section 9 - Physical & Chemical Properties
Section 2 - Compositon/Information on Ingredients	Section 10 - Stability & Reactivity Data
Section 3 - Hazards Identification Including Emergency Overview	Section 11 - Toxicological Information
Section 4 - First Aid Measures	Section 12 - Ecological Information
Section 5 - Fire Fighting Measures	Section 13 - Disposal Considerations
Section 6 - Accidental Release Measures	Section 14 - MSDS Transport Information
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Section 1 - Product and Company Identification
BARIUM CHROMATE

Product Identification: BARIUM CHROMATE
Date of MSDS: 08/15/1990 **Technical Review Date:** 08/11/1995
FSC: 6850 **NIIN:** **LIIN:** 00N012831
Submitter: N EN
Status Code: C
MFN: 01
Article: N
Kit Part: N

Manufacturer's Information

Manufacturer's Name: BARIUM & CHEMICALS INC
Manufacturer's Address1: BOX 218 COUNTY ROAD 44
Manufacturer's Address2: STEUBENVILLE, OH 43952
Manufacturer's Country: US
General Information Telephone: 614-282-9776
Emergency Telephone: 614-282-7197;614-282-9776
Emergency Telephone: 614-282-7197;614-282-9776
MSDS Preparer's Name: N/P
Proprietary: N
Reviewed: N
Published: Y
CAGE: DO062
Special Project Code: N

Contractor Information

Contractor's Name: BARIUM & CHEMICAL
Post Office Box: 218
Contractor's Address1: COUNTY RD 44
Contractor's Address2: STEUBENVILLE, NK 00000
Contractor's Telephone: 614-282-9776
Contractor's CAGE: DO062

Contractor Information

Contractor's Name: BARIUM AND CHEMICALS INC
Post Office Box: 218
Contractor's Address1: COUNTY RD 44
Contractor's Address2: STEUBENVILLE, OH 43952
Contractor's Telephone: 740-282-9776
Contractor's CAGE: 20865

Section 2 - Compositon/Information on Ingredients
BARIUM CHROMATE

Ingredient Name: BARIUM CHROMATE (VI) CONTAINING 54.2% ELEMENTAL BARIUM & 39.5% ELEMENTAL CHROMIUM. PEL/TLV AS CHROMATES: 0.1 (ING 2)
Ingredient CAS Number: 10294-40-3 **Ingredient CAS Code:** M
RTECS Number: CQ8760000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:

% Text: N/K
% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: 0.5 MG/M3 (BA) **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: 0.5 MG/M3 (BA) **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity:
DOT Reporting Quantity:
Ozone Depleting Chemical: N

Ingredient Name: ING 1: MG/M3 PEL; 0.05 MG/M3 TLV; 0.001 MG/M3 C.
Ingredient CAS Number: Ingredient CAS Code: X
RTECS Number: 9999999ZZ **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: N/K
% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: NOT APPLICABLE **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: NOT APPLICABLE **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity:
DOT Reporting Quantity:
Ozone Depleting Chemical:

Section 3 - Hazards Identification, Including Emergency Overview
BARIUM CHROMATE

Health Hazards Acute & Chronic: WORKERS MAY EXPERIENCE AN INCREASED INCIDENCE OF LUNG CANCER. POISONING MAY AFFECT THE BLOOD, CNS, LIVER AND KIDNEYS. BARIUM COMPOUNDS ARE SKIN, EYE AND MUCOUS MEMBRANE IRRITANTS.

Signs & Symptoms of Overexposure:
VOMITING, VIOLENT DIARRHEA, ABDOMINAL PAIN, DIFFICULTY IN BREATHING, SLOW PULSE AND IRREGULAR HEARTBEAT. MAY CAUSE BLEEDING AND ULCERATION OF NASAL SEPTUM. SORE THROAT, COUGHING AND POSSIBLE LIVER DAM AGE. SKIN RASHES, LARGE DOSES MAY CAUSECARDIAC AND RESPIRATORY FAILURE AND HEMORRHAGES IN THE GI TRACT AND KIDNEYS.

Medical Conditions Aggravated by Exposure:

NONE SPECIFIED BY MANUFACTURER.

LD50 LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.

Route of Entry Indicators:
Inhalation: YES
Skin: NO
Ingestion: NO

Carcenogenicity Indicators
NTP: YES
IARC: YES
OSHA: NO

Carcinogenicity Explanation: BARIUM CHROMATE (VI):IARC MONOGRAPHS, SUPPLEMENT, VOL 49, PG 49, 1990: GROUP 1. NTP 7TH ANNUAL REPORT ON (SUPP DATA)

Section 4 - First Aid Measures
BARIUM CHROMATE

First Aid:
INHAL: REMOVE FROM EXPOSURE AREA. SKIN: REMOVE CONTAMINATED CLOTHING AND SHOES. WASH AFFECTED AREA WITH SOAP AND WATER. EYES: FLUSH WITH LARGE AMOUNTS OF WATER FOR AT LEAST 15 MIN. GET MEDICAL ATTENTI ON. INGEST: MEDICAL PERSONNEL SHOULD REMOVE CHROMATES BY GASTRIC LAVAGE.

Section 5 - Fire Fighting Measures
BARIUM CHROMATE

Fire Fighting Procedures:
IN STORAGE AREA - USE UNMANNED HOSE HOLDER AND WITHDRAW FROM AREA UNTIL FIRE IS OUT. WEAR NIOSH/MSHA APPROVED SCBA AND FULL PROTECTIVE EQUIPMENT (FP N).
Unusual Fire or Explosion Hazard:
NOT APPLICABLE
Extinguishing Media:
DRY CHEMICAL, CARBON DIOXIDE OR WATER SPRAY. FOR LARGE FIRES - FOG.
Flash Point: Flash Point Text: NOT APPLICABLE

Autoignition Temperature:
Autoignition Temperature Text: N/A
Lower Limit(s): NON-FLAMM
Upper Limit(s): NON-FLAMM

Section 6 - Accidental Release Measures
BARIUM CHROMATE

Spill Release Procedures:
KEEP COMBUSTIBLES AWAY FROM SPILLED MATERIAL. SHOVEL MATERIAL INTO CLEAN DRY CONTAINER AND COVER. MOVE CONTAINERS FROM SPILL AREA.

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Section 7 - Handling and Storage
BARIUM CHROMATE

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
BARIUM CHROMATE

Repiratory Protection:
NIOSH/MSHA APPROVED HIGH EFFICIENCY PARTICULATE RESPIRATOR WITH FULL FACE PIECE.
Ventilation:
LOCAL EXHAUST: SUFFICIENT TO ELIMINATE DUSTS.
Protective Gloves:
IMPERVIOUS GLOVES (FP N).
Eye Protection: ANSI APPRVD CHEM WORKER GOGGLES (FP N).
Other Protective Equipment: IMPERVIOUS CLOTHING AND EQUIPMENT TO PREVENT ANY POSSIBILITY OF SKIN CONTACT WITH SUBSTANCE.
Work Hygenic Practices: WASH CLOTHING BEFORE REUSE. WORKERS SHOULD TAKE HOT SHOWERS AFTER WORK IS FINISHED.
Supplemental Health & Safety Information: CARCIN: CARCINOGENS, 1992: KNOWN TO BE CARCINOGENIC.

Section 9 - Physical & Chemical Properties
BARIUM CHROMATE

HCC: T2
NRC/State License Number:
Net Property Weight for Ammo:
Boiling Point: Boiling Point Text: DECOMPOSES
Melting/Freezing Point: Melting/Freezing Text: DECOMPOSES
Decomposition Point: Decomposition Text: N/K
Vapor Pressure: NEGLIGIBLE **Vapor Density:** N/A
Percent Volatile Organic Content:
Specific Gravity: 4.5 (H*2O=1)
Volatile Organic Content Pounds per Gallon:
pH: N/K
Volatile Organic Content Grams per Liter:
Viscosity: N/P
Evaporation Weight and Reference: NOT APPLICABLE
Solubility in Water: INSOLUBLE
Appearance and Odor: YELLOW POWDER - NO ODOR.
Percent Volatiles by Volume: N/K
Corrosion Rate: N/K

Section 10 - Stability & Reactivity Data
BARIUM CHROMATE

Stability Indicator: YES
Materials to Avoid:
REDUCING AGENTS MAY REACT VIGOROUSLY.
Stability Condition to Avoid:
NONE SPECIFIED BY MANUFACTURER.
Hazardous Decomposition Products:
NONE SPECIFIED BY MANUFACTURER.
Hazardous Polymerization Indicator: NO
Conditions to Avoid Polymerization:
NOT RELEVANT

Section 11 - Toxicological Information
BARIUM CHROMATE

Toxicological Information:
N/P

Section 12 - Ecological Information
BARIUM CHROMATE

Ecological Information:
N/P

Section 13 - Disposal Considerations
BARIUM CHROMATE

Waste Disposal Methods:
CONTAMINATED RESIDUE AND SWEEPINGS ARE CONSIDERED A TOXIC WASTE. MUST BE DISPOSED OF IN A LICENSED TOXIC WASTE DUMP. DISPOSAL MUST BE IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS (FP N).

Section 14 - MSDS Transport Information
BARIUM CHROMATE

Transport Information:
N/P

Section 15 - Regulatory Information
BARIUM CHROMATE

SARA Title III Information:
N/P
Federal Regulatory Information:
N/P
State Regulatory Information:
N/P

Section 16 - Other Information
BARIUM CHROMATE

Other Information:
N/P

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HAZCOM Label Information

Product Identification: BARIUM CHROMATE
CAGE: DO062
Assigned Individual: Y
Company Name: BARIUM & CHEMICAL
Company PO Box: 218
Company Street Address1: COUNTY RD 44
Company Street Address2: STEUBENVILLE, NK 00000 NK
Health Emergency Telephone: 614-282-7197;614-282-9776
Label Required Indicator: Y
Date Label Reviewed: 08/19/1993
Status Code: C
Manufacturer's Label Number:
Date of Label: 08/19/1993
Year Procured: N/K
Organization Code: G
Chronic Hazard Indicator: Y
Eye Protection Indicator: YES
Skin Protection Indicator: YES
Respiratory Protection Indicator: YES
Signal Word: DANGER
Health Hazard: Severe
Contact Hazard: Slight
Fire Hazard: None
Reactivity Hazard: None

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Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format)
For Cornell University Convenience Only

BARIUM NITRATE, CAT #3788

Section 1 - Product and Company Identification	Section 9 - Physical & Chemical Properties
Section 2 - Compositon/Information on Ingredients	Section 10 - Stability & Reactivity Data
Section 3 - Hazards Identification Including Emergency Overview	Section 11 - Toxicological Information
Section 4 - First Aid Measures	Section 12 - Ecological Information
Section 5 - Fire Fighting Measures	Section 13 - Disposal Considerations
Section 6 - Accidental Release Measures	Section 14 - MSDS Transport Information
Section 7 - Handling and Storage	Section 15 - Regulatory Information
Section 8 - Exposure Controls & Personal Protection	Section 16 - Other Information

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Section 1 - Product and Company Identification
BARIUM NITRATE, CAT #3788

Product Identification: BARIUM NITRATE, CAT #3788
Date of MSDS: 01/01/1987 **Technical Review Date:** 06/02/1986
FSC: 6810 **NIIN:** 00-247-0604
Submitter: D DG
Status Code: C
MFN: 01
Article: N
Kit Part: N

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Manufacturer's Information

Manufacturer's Name: MALLINCKRODT INC.,SCIENCE PRODUCTS DIVISION
Post Office Box: M
Manufacturer's Address1: PARIS BYPASS
Manufacturer's Address2: PARIS, KY 40361
Manufacturer's Country: US
General Information Telephone: 314-982-5000
Emergency Telephone: 314-982-5000
Emergency Telephone: 314-982-5000
MSDS Preparer's Name: N/P
Proprietary: N
Reviewed: Y
Published: Y
CAGE: 62910
Special Project Code: N

Item Description

Item Name: BARIUM NITRATE,ACS
Item Manager:
Specification Number: O-C-565C
Type/Grade/Class: NONE
Unit of Issue: BT **Quantitative Expression:** 00000000100GM
Unit of Issue Quantity: 0
Type of Container: BOTTLE

Contractor Information

Contractor's Name: MALLINCKRODT SPECIALTY CHEMICALS CO
Contractor's Address1: 222 RED SCHOOL LANE
Contractor's Address2: PHILLIPSBURG, NJ 08865
Contractor's Telephone: 908-859-2151
Contractor's CAGE: 62910

Section 2 - Compositon/Information on Ingredients
BARIUM NITRATE, CAT #3788

Ingredient Name: BARIUM NITRATE
Ingredient CAS Number: 10022-31-8 **Ingredient CAS Code:** M
RTECS Number: CQ9625000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:

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% Text: >99
% Enviromental Weight:
Other REC Limits: N/P
OSHA PEL: 0.5 MG/M3 (BA) **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: 0.5 MG/M3 (BA); 8990 **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity:
DOT Reporting Quantity:
Ozone Depleting Chemical: N

Section 3 - Hazards Identification, Including Emergency Overview
BARIUM NITRATE, CAT #3788

Health Hazards Acute & Chronic: N/P

Signs & Symptoms of Overexposure:
INH:MAY IRRIT RESP TRACT;ING:TOXIC!MAY CAUSE VOMIT,DIARR,WKNESS;EYES/SKIN:MAY CAUSE IRRIT/PAIN RDNSS

Medical Conditions Aggravated by Exposure:
N/P

LD50 LC50 Mixture: N/P

Route of Entry Indicators:
Inhalation: N/P
Skin: N/P
Ingestion: N/P

Carcenogenicity Indicators
NTP: N/P
IARC: N/P
OSHA: N/P

Carcinogenicity Explanation: N/P

Section 4 - First Aid Measures
BARIUM NITRATE, CAT #3788

First Aid:
INHAL:RMV TO FRESH AIR.GIVE CPR/OXYGEN IF BREATHING IS DIFFICULT.GET MD;INGEST:IMMED INDUCE VOMIT BY GIVING 2 GL OF WATER.NOTHING BY MOUTH IF UNCONSCIOUS.GET MD IMMED;SKIN/EYES:FLUSH IMMED W/LG QTY H* 2O FOR 15 MIN.RMV CONTMNTD CLOTHES.GET MED ATTN.

Section 5 - Fire Fighting Measures
BARIUM NITRATE, CAT #3788

Fire Fighting Procedures:

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WEAR SELF-CNTD BRTHG,APP H*20 SPRAY TO COOL CONTR.
Unusual Fire or Explosion Hazard:
CONTACT W/OXIDIZABLE SUBSTANCES MAY CAUSE EXTREMELY VIOLENT CUMBUSTION.
Extinguishing Media:
FOAM,DRY CHEM,CO*2.DO NOT USE H*2O ON MOLTEN MATL.
Flash Point: Flash Point Text: NONE

Autoignition Temperature:
Autoignition Temperature Text: N/A
Lower Limit(s): N/R
Upper Limit(s): N/R

Section 6 - Accidental Release Measures
BARIUM NITRATE, CAT #3788

Spill Release Procedures:
VENTILATE AREA OF SPILL.CLEAN UP PERSONS NEED PROTCTV CLOTHG/RESP PROTCTION FM DUST.PICK UP SPILL & PLACE IN A SUITABLE CONTAINER FOR RECLAMATION OR DISPOSAL IN A METHOD THAT DOES NOT GENERATE DUST;VA CCUMING OR WET SWEEPG MAY BE USED TO AVOID DUST.

Section 7 - Handling and Storage
BARIUM NITRATE, CAT #3788

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
BARIUM NITRATE, CAT #3788

Repiratory Protection:
SUPPLIED AIR RESPIR/SCBA; ESCAPE: GAS MASK
Ventilation:
LOCAL EXHAUST TO MAINTN BELOW TLV.
Protective Gloves:
IMPERVIOUS
Eye Protection: GOGGLES/FACE SHIELD
Other Protective Equipment: FULL PROTECTIVE CLOTHING,SAFETY SHOWER,EYE WASH STATION
Work Hygenic Practices: N/P
Supplemental Health & Safety Information: MSDS FROM MFR DATED,30 JULY 85,CONFORMS TO OSHA HAZ COMM STD; TOXICITY DATA:-LD50 ORL RAT:355MG/CUM,IRRIT SKIN RAB:500MG/24H MILD,IRRIT EYE RAB:100MG/24H SEVERE

Section 9 - Physical & Chemical Properties
BARIUM NITRATE, CAT #3788

HCC: D1

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NRC/State License Number:
Net Property Weight for Ammo:
Boiling Point: Boiling Point Text: SEE SUPPL
Melting/Freezing Point: Melting/Freezing Text: N/A
Decomposition Point: Decomposition Text: N/A
Vapor Pressure: N/R **Vapor Density:** N/R
Percent Volatile Organic Content:
Specific Gravity: 3.24
Volatile Organic Content Pounds per Gallon:
pH: N/P
Volatile Organic Content Grams per Liter:
Viscosity: N/P
Evaporation Weight and Reference: N/R
Solubility in Water: COMPLETE
Appearance and Odor: WHITE CRYSTALS.ODORLESS
Percent Volatiles by Volume: N/R
Corrosion Rate: N/P

Section 10 - Stability & Reactivity Data
BARIUM NITRATE, CAT #3788

Stability Indicator: YES
Materials to Avoid:
FLAMMABLE MATL,MG,BA,ZN PEROXIDES;AL/MG ALLOYS
Stability Condition to Avoid:
N/K
Hazardous Decomposition Products:
MAY FORM OXIDES OF NITROGEN & BARIUM
Hazardous Polymerization Indicator: NO
Conditions to Avoid Polymerization:
N/K

Section 11 - Toxicological Information
BARIUM NITRATE, CAT #3788

Toxicological Information:
N/P

Section 12 - Ecological Information
BARIUM NITRATE, CAT #3788

Ecological Information:
N/P

Section 13 - Disposal Considerations
BARIUM NITRATE, CAT #3788

Waste Disposal Methods:
WHATEVER CANNOT BE SAVED FOR RECLAMATION MAY BE DISPOSD AS HAZ WASTE IN A RCRA APPRVD WASTE DISPOSAL FACILITY.COMPLY WITH LOCAL,ST.& FED REGS.

Section 14 - MSDS Transport Information

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BARIUM NITRATE, CAT #3788

Transport Information:
N/P

Section 15 - Regulatory Information
BARIUM NITRATE, CAT #3788

SARA Title III Information:
N/P
Federal Regulatory Information:
N/P
State Regulatory Information:
N/P

Section 16 - Other Information
BARIUM NITRATE, CAT #3788

Other Information:
N/P

HMIS Transportation Information

Product Identification: BARIUM NITRATE, CAT #3788
Transporation ID Number: 60624
Responsible Party CAGE: 62910
Date MSDS Prepared: 01/01/1987
Date MSDS Reviewed: 11/28/1995
MFN: 11/28/1995
Submitter: D DG
Status Code: C

Container Information
- **Unit of Issue:** BT
- **Container Quantity:** 0
- **Type of Container:** BOTTLE
- **Net Unit Weight:** 4 OZ

Article without MSDS: N
Technical Entry NOS Shipping Number:
Radioactivity:
Form:
Net Explosive Weight:
Coast Guard Ammunition Code:
Magnetism: N/P
AF MMAC Code:
DOD Exemption Number:
Limited Quantity Indicator:
Multiple Kit Number: 0
Kit Indicator: N
Kit Part Indicator: N
Review Indicator: Y
Additional Data:

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Department of Transportation Information

DOT Proper Shipping Name: BARIUM NITRATE
DOT PSN Code: BPS
Symbols:
DOT PSN Modifier:
Hazard Class: 5.1
UN ID Number: UN1446
DOT Packaging Group: II
Label: OXIDIZER, POISON
Special Provision(s):
Packaging Exception: NONE
Non Bulk Packaging: 212
Bulk Packaging: 242
Maximimum Quanity in Passenger Area: 5 KG
Maximimum Quanity in Cargo Area: 25 KG
Stow in Vessel Requirements: A
Requirements Water/Sp/Other:

IMO Detail Information

IMO Proper Shipping Name: BARIUM NITRATE
IMO PSN Code: BVB
IMO PSN Modifier:
IMDG Page Number: 5128
UN Number: 1446
UN Hazard Class: 5.1
IMO Packaging Group: II
Subsidiary Risk Label: TOXIC
EMS Number: 5.1-05
Medical First Aid Guide Number: 120

IATA Detail Information

IATA Proper Shipping Name: BARIUM NITRATE
IATA PSN Code: CXO
IATA PSN Modifier:
IATA UN Id Number: 1446
IATA UN Class: 5.1
Subsidiary Risk Class: 6.1
UN Packaging Group: II
IATA Label: OXIDIZER & TOXIC
Packaging Note for Passengers: 508
Maximum Quantity for Passengers: 5KG
Packaging Note for Cargo: 511
Maximum Quantity for Cargo: 25KG
Exceptions:

AFI Detail Information

AFI Proper Shipping Name: BARIUM NITRATE
AFI Symbols:
AFI PSN Code: CXO
AFI PSN Modifier:
AFI UN Id Number: UN1446
AFI Hazard Class: 5.1

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AFI Packing Group: II
AFI Label: 6.1
Special Provisions: P5
Back Pack Reference: A9.8

HAZCOM Label Information

Product Identification: BARIUM NITRATE, CAT #3788
CAGE: 62910
Assigned Individual: N
Company Name: MALLINCKRODT SPECIALTY CHEMICALS CO
Company PO Box:
Company Street Address1: 222 RED SCHOOL LANE
Company Street Address2: PHILLIPSBURG, NJ 08865 US
Health Emergency Telephone: 314-982-5000
Label Required Indicator: Y
Date Label Reviewed: 12/16/1998
Status Code: C
Manufacturer's Label Number:
Date of Label: 12/16/1998
Year Procured: N/K
Organization Code: F
Chronic Hazard Indicator: N/P
Eye Protection Indicator: N/P
Skin Protection Indicator: N/P
Respiratory Protection Indicator: N/P
Signal Word: N/P
Health Hazard:
Contact Hazard:
Fire Hazard:
Reactivity Hazard:

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Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format)
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BLACK POWDER

Section 1 - Product and Company Identification	Section 9 - Physical & Chemical Properties
Section 2 - Compositon/Information on Ingredients	Section 10 - Stability & Reactivity Data
Section 3 - Hazards Identification Including Emergency Overview	Section 11 - Toxicological Information
Section 4 - First Aid Measures	Section 12 - Ecological Information
Section 5 - Fire Fighting Measures	Section 13 - Disposal Considerations
Section 6 - Accidental Release Measures	Section 14 - MSDS Transport Information
Section 7 - Handling and Storage	Section 15 - Regulatory Information
Section 8 - Exposure Controls & Personal Protection	Section 16 - Other Information

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Section 1 - Product and Company Identification
BLACK POWDER

Product Identification: BLACK POWDER
Date of MSDS: 09/01/1988 **Technical Review Date:** 12/29/1992
FSC: 1376 **NIIN:** **LIIN:** 00N037788
Submitter: N EN
Status Code: C
MFN: 01
Article: N
Kit Part: N

Manufacturer's Information

Manufacturer's Name: GOEX INC
Manufacturer's Address1: 1002 SPRINGBROOK AVE
Manufacturer's Address2: MOOSIC, PA 18507
Manufacturer's Country: US
General Information Telephone: 717-457-6724
Emergency Telephone: 717-457-6724;800-424-9300(CHEMTREC)
Emergency Telephone: 717-457-6724;800-424-9300(CHEMTREC)
MSDS Preparer's Name: N/P
Proprietary: N
Reviewed: N
Published: Y
CAGE: 51580
Special Project Code: N

Contractor Information

Contractor's Name: GOEX INC
Contractor's Address1: 1002 SPRINGBROOK AVE
Contractor's Address2: MOOSIC, PA 18507
Contractor's Telephone: 717-457-6724
Contractor's CAGE: 51580

Section 2 - Compositon/Information on Ingredients
BLACK POWDER

Ingredient Name: CHARCOAL
Ingredient CAS Number: 16291-96-6 **Ingredient CAS Code:** M
RTECS Number: FL7243500 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: 8-18
% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: NOT APPLICABLE **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: NOT APPLICABLE **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity:
DOT Reporting Quantity:
Ozone Depleting Chemical: N

Ingredient Name: POTASSIUM NITRATE
Ingredient CAS Number: 7757-79-1 **Ingredient CAS Code:** M
RTECS Number: TT3700000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: 70-76
% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: NOT APPLICABLE **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: NOT APPLICABLE **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity:
DOT Reporting Quantity:
Ozone Depleting Chemical: N

Ingredient Name: SULFUR; (SULPHUR)
Ingredient CAS Number: 7704-34-9 **Ingredient CAS Code:** M
RTECS Number: WS4250000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: 9-20
% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: NOT APPLICABLE **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: NOT APPLICABLE **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity:
DOT Reporting Quantity:
Ozone Depleting Chemical: N

Section 3 - Hazards Identification, Including Emergency Overview
BLACK POWDER

Health Hazards Acute & Chronic: NOT APPLICABLE

Signs & Symptoms of Overexposure:
NOT APPLICABLE

Medical Conditions Aggravated by Exposure:
NOT APPLICABLE

LD50 LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.

Route of Entry Indicators:
Inhalation: YES
Skin: NO
Ingestion: NO

Carcenogenicity Indicators
NTP: NO
IARC: NO
OSHA: NO

Carcinogenicity Explanation: NOT RELEVANT

Section 4 - First Aid Measures
BLACK POWDER

First Aid:
INGEST:CALL MD IMMEDIATELY (FP N). INHAL:REMOVE TO FRESH AIR. SUPPORT BREATHING (GIVE O*2/ARTF RESP) (FP N). EYES:IMMEDIATELY FLUSH W/POTABLE WATER FOR A MINIMUM OF 15 MINUTES, SEEK ASSISTANCE FROM MD (FP N). SKIN:FLUSH W/COPIOUS AMOUNTS OF WATER. CALL MD (FP N).

Section 5 - Fire Fighting Measures
BLACK POWDER

Fire Fighting Procedures:
DO NOT FIGHT FIRES. EVACUATE AREA.
Unusual Fire or Explosion Hazard:
DO NOT FIGHT FIRES. BLACK POWDER MAY DEFLAGRATE OR EXPLODE IN A FIRE WHILE CONFINED. EVACUATE AREA.
Extinguishing Media:
WATER.
Flash Point: Flash Point Text: NOT APPLICABLE

Autoignition Temperature:
Autoignition Temperature Text: N/A
Lower Limit(s): N/K
Upper Limit(s): N/K

Section 6 - Accidental Release Measures

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BLACK POWDER

Spill Release Procedures:
CAREFULLY PICK UP SPILLS W/NONSPARKING & NONSTATIC PRODUCING TOOLS. SUPERVISION ONLY BY A PERSON KNOWLEDGEABLE IN EXPLOSIVES.

Section 7 - Handling and Storage
BLACK POWDER

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
BLACK POWDER

Repiratory Protection:
USE NIOSH/MSHA APPROVED RESPIRATOR APPROPRIATE FOR EXPOSURE OF CONCERN (FP N).
Ventilation:
NOT REQUIRED IN OPEN, UNCONFINED AREAS.
Protective Gloves:
IMPERVIOUS GLOVES (FP N).
Eye Protection: CHEMICAL WORKERS GOGGLES (FP N).
Other Protective Equipment: METAL FREE & NONSTATIC PRODUCING CLOTHES.
Work Hygenic Practices: WASH HANDS/SHOWER.
Supplemental Health & Safety Information: SPEC GRAV:1.7-1.82 (H*2O=1).

Section 9 - Physical & Chemical Properties
BLACK POWDER

HCC:
NRC/State License Number:
Net Property Weight for Ammo:
Boiling Point: Boiling Point Text: N/A
Melting/Freezing Point: Melting/Freezing Text: N/K
Decomposition Point: Decomposition Text: N/K
Vapor Pressure: N/A **Vapor Density:** N/A
Percent Volatile Organic Content:
Specific Gravity: SUPP DATA
Volatile Organic Content Pounds per Gallon:
pH: 6-8
Volatile Organic Content Grams per Liter:
Viscosity: N/P
Evaporation Weight and Reference: NOT APPLICABLE
Solubility in Water: HIGH
Appearance and Odor: BLACK; NO ODOR.
Percent Volatiles by Volume: N/A
Corrosion Rate: N/K

Section 10 - Stability & Reactivity Data

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BLACK POWDER

Stability Indicator: YES
Materials to Avoid:
NOT APPLICABLE
Stability Condition to Avoid:
KEEP AWAY FROM HEAT, SPARKS & OPEN FLAME. AVOID IMPACT, FRICTION & STATIC ELECTRICITY.
Hazardous Decomposition Products:
NONE SPECIFIED BY MANUFACTURER.
Hazardous Polymerization Indicator: NO
Conditions to Avoid Polymerization:
NOT RELEVANT

Section 11 - Toxicological Information
BLACK POWDER

Toxicological Information:
N/P

Section 12 - Ecological Information
BLACK POWDER

Ecological Information:
N/P

Section 13 - Disposal Considerations
BLACK POWDER

Waste Disposal Methods:
DE-SENSITIZE BY DILUTING IN WATER. OPEN TRAIN BURNING OF SMALL UNCONFINED QUANTITIES. ALL PROCEDURES MUST BE IN COMPLIANCE W/ALL LOCAL, STATE & FEDERAL REGULATIONS.

Section 14 - MSDS Transport Information
BLACK POWDER

Transport Information:
N/P

Section 15 - Regulatory Information
BLACK POWDER

SARA Title III Information:
N/P
Federal Regulatory Information:
N/P
State Regulatory Information:
N/P

Section 16 - Other Information
BLACK POWDER

Other Information:
N/P

HAZCOM Label Information

Product Identification: BLACK POWDER
CAGE: 51580
Assigned Individual: N
Company Name: GOEX INC
Company PO Box:
Company Street Address1: 1002 SPRINGBROOK AVE
Company Street Address2: MOOSIC, PA 18507 US
Health Emergency Telephone: 717-457-6724;800-424-9300(CHEMTREC)
Label Required Indicator: Y
Date Label Reviewed: 12/29/1992
Status Code: C
Manufacturer's Label Number:
Date of Label: 12/29/1992
Year Procured: N/K
Organization Code: G
Chronic Hazard Indicator: N
Eye Protection Indicator: YES
Skin Protection Indicator: YES
Respiratory Protection Indicator: YES
Signal Word: DANGER
Health Hazard: None
Contact Hazard: None
Fire Hazard: None
Reactivity Hazard: Severe

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Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format)
For Cornell University Convenience Only

BORON, 90595

Section 1 - Product and Company Identification	Section 9 - Physical & Chemical Properties
Section 2 - Compositon/Information on Ingredients	Section 10 - Stability & Reactivity Data
Section 3 - Hazards Identification Including Emergency Overview	Section 11 - Toxicological Information
Section 4 - First Aid Measures	Section 12 - Ecological Information
Section 5 - Fire Fighting Measures	Section 13 - Disposal Considerations
Section 6 - Accidental Release Measures	Section 14 - MSDS Transport Information
Section 7 - Handling and Storage	Section 15 - Regulatory Information
Section 8 - Exposure Controls & Personal Protection	Section 16 - Other Information

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Section 1 - Product and Company Identification
BORON, 90595

Product Identification: BORON, 90595
Date of MSDS: 04/04/1997 **Technical Review Date:** 03/04/1998
FSC: 6810 **NIIN:** **LIIN:** 00N083465
Submitter: N EN
Status Code: C
MFN: 01
Article: N
Kit Part: N

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Manufacturer's Information

Manufacturer's Name: QCD ANALYSTS
Post Office Box: 699
Manufacturer's Address1:
Manufacturer's Address2: SPRING LAKE, NJ 07762
Manufacturer's Country: US
General Information Telephone: 800-723-5478
Emergency Telephone: 723-919-1909
Emergency Telephone: 723-919-1909
MSDS Preparer's Name: N/P
Proprietary: N
Reviewed: N
Published: Y
CAGE: JO626
Special Project Code: N

Contractor Information

Contractor's Name: QCD ANALYSTS
Post Office Box: 699
Contractor's Address1: UNKNOWN
Contractor's Address2: SPRING LAKE, NJ 07762
Contractor's Telephone: 800-723-5478
Contractor's CAGE: JO626

Section 2 - Compositon/Information on Ingredients
BORON, 90595

Ingredient Name: BORIC ACID; (ORTHOBORIC ACID)
Ingredient CAS Number: 10043-35-3 **Ingredient CAS Code:** M
RTECS Number: ED4550000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: >0.01
% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: 10 MG BORATES/M3 **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: 5 MG BORATES/M3 **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity:
DOT Reporting Quantity:

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Ozone Depleting Chemical: N

Section 3 - Hazards Identification, Including Emergency Overview
BORON, 90595

Health Hazards Acute & Chronic: ACUTE: SKIN/EYE IRRITATION OR INFLAMMATION. CHRONIC: NONE SPECIFIED BY MANUFACTURER.

Signs & Symptoms of Overexposure:
SEE HEALTH HAZARDS.

Medical Conditions Aggravated by Exposure:
NONE.

LD50 LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.

Route of Entry Indicators:
Inhalation: NO
Skin: YES
Ingestion: NO

Carcenogenicity Indicators
NTP: NO
IARC: NO
OSHA: NO

Carcinogenicity Explanation: NOT RELEVANT.

Section 4 - First Aid Measures
BORON, 90595

First Aid:
EYE CONTACT: FLUSH WITH WATER FOR AT LEAST 15 MINUTES. SKIN CONTACT: FLUSH WITH WATER FOR 15 MINUTES. WASH CONTAMINATED CLOTHING BEFORE RE-USE. INHALATION: REMOVE TO FRESH AIR. INGESTION: DO NOT INDUC E VOMITING. GIVE WATER OR MILK.

Section 5 - Fire Fighting Measures
BORON, 90595

Fire Fighting Procedures:
USE NIOSH APPROVED SCBA & FULL PROTECTIVE EQUIPMENT (FP N).
Unusual Fire or Explosion Hazard:
NONE.
Extinguishing Media:
WATER OR CO*2.
Flash Point: Flash Point Text: N/A

Autoignition Temperature:
Autoignition Temperature Text: N/A

Lower Limit(s): N/A
Upper Limit(s): N/A

Section 6 - Accidental Release Measures
BORON, 90595

Spill Release Procedures:
TAKE UP WITH INERT, ABSORBENT MATERIAL. CONTAINERIZE FOR DISPOSAL FLUSH SPILL AREA WITH WATER.

Section 7 - Handling and Storage
BORON, 90595

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
BORON, 90595

Repiratory Protection:
NIOSH APPROVED, WHEN NEEDED.
Ventilation:
NONE REQUIRED. LOCAL EXHAUST, WHEN NEEDED.
Protective Gloves:
NEOPRENE GLOVES.
Eye Protection: ANSI APPROVED CHEM WORKERS GOGGS (FP N).
Other Protective Equipment: EYE WASH FOUNTAIN & DELUGE SHOWER WHICH MEET ANSI DESIGN CRITERIA (FP N). LAB COAT.
Work Hygenic Practices: USUAL.
Supplemental Health & Safety Information: NONE SPECIFIED BY MANUFACTURER.

Section 9 - Physical & Chemical Properties
BORON, 90595

HCC:
NRC/State License Number:
Net Property Weight for Ammo:
Boiling Point: Boiling Point Text: 212F,100C
Melting/Freezing Point: Melting/Freezing Text: N/A
Decomposition Point: Decomposition Text: N/K
Vapor Pressure: N/A **Vapor Density:** N/A
Percent Volatile Organic Content:
Specific Gravity: 1 (H*2O = 1)
Volatile Organic Content Pounds per Gallon:
pH: N/K
Volatile Organic Content Grams per Liter:
Viscosity: N/P
Evaporation Weight and Reference: H*2O = 1
Solubility in Water: SOLUBLE

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Appearance and Odor: CLEAR, COLORLESS SOLUTION. NO ODOR.
Percent Volatiles by Volume: N/K
Corrosion Rate: N/K

Section 10 - Stability & Reactivity Data
BORON, 90595

Stability Indicator: YES
Materials to Avoid:
STRONG BASES OR STRONG REDUCING AGENTS.
Stability Condition to Avoid:
EXCESSIVE HEAT OR EXTREME COLD.
Hazardous Decomposition Products:
NO HAZARDOUS DECOMP.
Hazardous Polymerization Indicator: NO
Conditions to Avoid Polymerization:
NOT RELEVANT.

Section 11 - Toxicological Information
BORON, 90595

Toxicological Information:
N/P

Section 12 - Ecological Information
BORON, 90595

Ecological Information:
N/P

Section 13 - Disposal Considerations
BORON, 90595

Waste Disposal Methods:
CORROSIVE WASTE IN ACCORDANCE WITH ALL FEDERAL, STATE AND LOCAL ENVIRONMENTAL REGULATIONS.

Section 14 - MSDS Transport Information
BORON, 90595

Transport Information:
N/P

Section 15 - Regulatory Information
BORON, 90595

SARA Title III Information:
N/P
Federal Regulatory Information:
N/P
State Regulatory Information:
N/P

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Section 16 - Other Information
BORON, 90595

Other Information:
N/P

HAZCOM Label Information

Product Identification: BORON, 90595
CAGE: JO626
Assigned Individual: Y
Company Name: QCD ANALYSTS
Company PO Box: 699
Company Street Address1: UNKNOWN
Company Street Address2: SPRING LAKE, NJ 07762 US
Health Emergency Telephone: 723-919-1909
Label Required Indicator: Y
Date Label Reviewed: 03/05/1998
Status Code: C
Manufacturer's Label Number:
Date of Label: 03/05/1998
Year Procured: N/K
Organization Code: G
Chronic Hazard Indicator: N
Eye Protection Indicator: YES
Skin Protection Indicator: YES
Respiratory Protection Indicator: YES
Signal Word: CAUTION
Health Hazard: Slight
Contact Hazard: Slight
Fire Hazard: None
Reactivity Hazard: None

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Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format)
For Cornell University Convenience Only

CHROMIC OXIDE

Section 1 - Product and Company Identification	Section 9 - Physical & Chemical Properties
Section 2 - Compositon/Information on Ingredients	Section 10 - Stability & Reactivity Data
Section 3 - Hazards Identification Including Emergency Overview	Section 11 - Toxicological Information
Section 4 - First Aid Measures	Section 12 - Ecological Information
Section 5 - Fire Fighting Measures	Section 13 - Disposal Considerations
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Section 1 - Product and Company Identification
CHROMIC OXIDE

Product Identification: CHROMIC OXIDE
Date of MSDS: 01/01/1985 **Technical Review Date:** 08/15/1979
FSC: 6850 **NIIN:** 00-290-6624
Submitter: D DG
Status Code: C
MFN: 01
Article: N
Kit Part: N

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Manufacturer's Information

Manufacturer's Name: M&T CHEMICALS
Post Office Box: 1104
Manufacturer's Address1:
Manufacturer's Address2: RAHWAY, NJ 07065-1104
Manufacturer's Country: US
General Information Telephone:
Emergency Telephone: N/P
Emergency Telephone: N/P
MSDS Preparer's Name: N/P
Proprietary: N
Reviewed: Y
Published: Y
CAGE: LO197
Special Project Code: N

Item Description

Item Name:
Item Manager:
Specification Number: NK
Type/Grade/Class: NK
Unit of Issue:
Unit of Issue Quantity:
Type of Container:

Contractor Information

Contractor's Name: M AND T CHEMICALS INC SUB OF AMERICAN CAN CO
Post Office Box: 1104
Contractor's Address1: UNKNOWN
Contractor's Address2: RAHWAY, NJ 07065-1104
Contractor's Telephone: UNKNOWN
Contractor's CAGE: 76323

Contractor Information

Contractor's Name: M&T CHEMICALS
Post Office Box: 1104
Contractor's Address1: UNKNOWN
Contractor's Address2: RAHWAY, NJ 07065-1104
Contractor's Telephone: UNKNOWN
Contractor's CAGE: LO197

Section 2 - Compositon/Information on Ingredients
CHROMIC OXIDE

Ingredient Name: CHROMIUM (III) OXIDE
Ingredient CAS Number: 1308-38-9 **Ingredient CAS Code:** M
RTECS Number: GB6475000 **RTECS Code:** M

=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: N/P
% Enviromental Weight:
Other REC Limits: N/P
OSHA PEL: 0.5 MG/M3 (CR) **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: 0.5 MG/M3 (CR); 8990 **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity:
DOT Reporting Quantity:
Ozone Depleting Chemical: N

Section 3 - Hazards Identification, Including Emergency Overview
CHROMIC OXIDE

Health Hazards Acute & Chronic: N/P

Signs & Symptoms of Overexposure:
STRONG IRRITATION OF SKIN & MUCOUS MEMBRANES.DERMATITIS,CHROME ULCER,CHROME HOLE,CONJUNCTIVITIS.

Medical Conditions Aggravated by Exposure:
N/P

LD50 LC50 Mixture: N/P

Route of Entry Indicators:
Inhalation: N/P
Skin: N/P
Ingestion: N/P

Carcenogenicity Indicators
NTP: N/P
IARC: N/P
OSHA: N/P

Carcinogenicity Explanation: N/P

Section 4 - First Aid Measures
CHROMIC OXIDE

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First Aid:
REMOVE CONTAMINATED CLOTHING & SHOES.IRRIGATE EYES W/RUNNING WATER FOR 15 MINUTES & CALL FOR MEDICAL TREATMENT OF OPHTHALMOLOGIST.TREAT SKIN BURNS ORALLY DOSING ANTI-HISTAMINE AGENT,FOLLOWED BY THE LO CAL TREATMENTS W/CORTISONE

Section 5 - Fire Fighting Measures
CHROMIC OXIDE

Fire Fighting Procedures:
WEAR SELF-CONTAINED BREATHING APPARATUS
Unusual Fire or Explosion Hazard:
MAY IGNITE COMBUSTIBLES(WOOD,PAPER,OIL,ETC).REACTION WITH FUELS MAY BE VIOLENT
Extinguishing Media:
SMALL FIRES:DRY CHEMICAL OR CO*2,LG FIRES:WATE SPRAY OR FOG
Flash Point: Flash Point Text: N.A.

Autoignition Temperature:
Autoignition Temperature Text: N/A
Lower Limit(s):
Upper Limit(s):

Section 6 - Accidental Release Measures
CHROMIC OXIDE

Spill Release Procedures:
STOP LEAK IF WITHOUT RISK. DO NOT TOUCH SPILLED MATERIAL.KEEP COMBUSTIBLES(WOOD,PAPER,OIL,ETC)AWAY FROM SPILLED MATERIAL COVER W/WEAK REDUCING AGENTS SUCH AS HYPO,BISULFITES,OR FERROUS SALTS.BISULFITE S OR FERROUS SALTS NEED ADD PROMOTER 3M-H*2SO*4

Section 7 - Handling and Storage
CHROMIC OXIDE

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
CHROMIC OXIDE

Repiratory Protection:
SELF-CONTAINED BREATHING APPARATUS
Ventilation:
AS REQUIRED TO CONTROL DUST IN AIR
Protective Gloves:
RUBBER
Eye Protection: SAFETY GOGGLES
Other Protective Equipment: MASK,OVERALLS,RUBBER APRONS,RUBBER SHOES

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Work Hygenic Practices: N/P
Supplemental Health & Safety Information: N/P

Section 9 - Physical & Chemical Properties
CHROMIC OXIDE

HCC: D1
NRC/State License Number:
Net Property Weight for Ammo:
Boiling Point: Boiling Point Text: N/A
Melting/Freezing Point: Melting/Freezing Text: N/A
Decomposition Point: Decomposition Text: N/A
Vapor Pressure: N/P **Vapor Density:** N/P
Percent Volatile Organic Content:
Specific Gravity: 5.04
Volatile Organic Content Pounds per Gallon:
pH: N/P
Volatile Organic Content Grams per Liter:
Viscosity: N/P
Evaporation Weight and Reference: N/P
Solubility in Water: NEGLIGIBLE
Appearance and Odor: BRIGHT GREEN,CRYSTALLINE POWDER
Percent Volatiles by Volume: N/P
Corrosion Rate: N/P

Section 10 - Stability & Reactivity Data
CHROMIC OXIDE

Stability Indicator: YES
Materials to Avoid:
COMBUSTIBLE MATERIALS & EASILY OXIDITABLE MATLS,WOODEN FLOOR
Stability Condition to Avoid:
N/P
Hazardous Decomposition Products:
N/P
Hazardous Polymerization Indicator: NO
Conditions to Avoid Polymerization:
N/P

Section 11 - Toxicological Information
CHROMIC OXIDE

Toxicological Information:
N/P

Section 12 - Ecological Information
CHROMIC OXIDE

Ecological Information:
N/P

Section 13 - Disposal Considerations

CHROMIC OXIDE

Waste Disposal Methods:
AFTER SPILL IS HANDLED AS ABOVE,TRANSFER INTO A LARGE CONTAINER OF WATER & NEUTRALIZE W/SODA ASH OR DILUTE HCL.DRAIN INTO AN APPROVED DISPOSAL AREA

Section 14 - MSDS Transport Information
CHROMIC OXIDE

Transport Information:
N/P

Section 15 - Regulatory Information
CHROMIC OXIDE

SARA Title III Information:
N/P
Federal Regulatory Information:
N/P
State Regulatory Information:
N/P

Section 16 - Other Information
CHROMIC OXIDE

Other Information:
N/P

HMIS Transportation Information

Product Identification: CHROMIC OXIDE
Transporation ID Number: 67750
Responsible Party CAGE: LO197
Date MSDS Prepared: 01/01/1985
Date MSDS Reviewed: 08/15/1979
MFN: 08/15/1979
Submitter: D DG
Status Code: C

Container Information
- **Unit of Issue:**
- **Container Quantity:**
- **Type of Container:**
- **Net Unit Weight:**

Article without MSDS: N
Technical Entry NOS Shipping Number:
Radioactivity:
Form:
Net Explosive Weight:
Coast Guard Ammunition Code:
Magnetism: N/P

AF MMAC Code:
DOD Exemption Number:
Limited Quantity Indicator:
Multiple Kit Number: 0
Kit Indicator: N
Kit Part Indicator: N
Review Indicator: Y
Additional Data:

Department of Transportation Information

DOT Proper Shipping Name: OXIDIZING SOLID, N.O.S.
DOT PSN Code: LDP
Symbols: G
DOT PSN Modifier:
Hazard Class: 5.1
UN ID Number: UN1479
DOT Packaging Group: II
Label: OXIDIZER
Special Provision(s):
Packaging Exception: 152
Non Bulk Packaging: 212
Bulk Packaging: 240
Maximimum Quanity in Passenger Area: 5 KG
Maximimum Quanity in Cargo Area: 25 KG
Stow in Vessel Requirements: B
Requirements Water/Sp/Other: 56,58,69,106

IMO Detail Information

IMO Proper Shipping Name: OXIDIZING SOLID, N.O.S. o
IMO PSN Code: LBH
IMO PSN Modifier:
IMDG Page Number: 5163
UN Number: 1479
UN Hazard Class: 5.1
IMO Packaging Group: I/II/III
Subsidiary Risk Label: -
EMS Number: 5.1-11
Medical First Aid Guide Number: 760

IATA Detail Information

IATA Proper Shipping Name: OXIDIZING SOLID, N.O.S. *
IATA PSN Code: SVU
IATA PSN Modifier:
IATA UN Id Number: 1479
IATA UN Class: 5.1
Subsidiary Risk Class:
UN Packaging Group: II
IATA Label: OXIDIZER
Packaging Note for Passengers: 508
Maximum Quantity for Passengers: 5KG
Packaging Note for Cargo: 511
Maximum Quantity for Cargo: 25KG

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Exceptions:

AFI Detail Information

AFI Proper Shipping Name: OXIDIZING SOLID, N.O.S.
AFI Symbols: *
AFI PSN Code: SVU
AFI PSN Modifier:
AFI UN Id Number: UN1479
AFI Hazard Class: 5.1
AFI Packing Group: II
AFI Label:
Special Provisions: P5
Back Pack Reference: A9.8

HAZCOM Label Information

Product Identification: CHROMIC OXIDE
CAGE: LO197
Assigned Individual: Y
Company Name: M&T CHEMICALS
Company PO Box: 1104
Company Street Address1: UNKNOWN
Company Street Address2: RAHWAY, NJ 07065-1104 US
Health Emergency Telephone:
Label Required Indicator: Y
Date Label Reviewed: 12/16/1998
Status Code: C
Manufacturer's Label Number:
Date of Label: 12/16/1998
Year Procured: N/K
Organization Code: F
Chronic Hazard Indicator: N/P
Eye Protection Indicator: N/P
Skin Protection Indicator: N/P
Respiratory Protection Indicator: N/P
Signal Word: N/P
Health Hazard:
Contact Hazard:
Fire Hazard:
Reactivity Hazard:

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Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format)
For Cornell University Convenience Only

CHROMIUM

Section 1 - Product and Company Identification	Section 9 - Physical & Chemical Properties
Section 2 - Compositon/Information on Ingredients	Section 10 - Stability & Reactivity Data
Section 3 - Hazards Identification Including Emergency Overview	Section 11 - Toxicological Information
Section 4 - First Aid Measures	Section 12 - Ecological Information
Section 5 - Fire Fighting Measures	Section 13 - Disposal Considerations
Section 6 - Accidental Release Measures	Section 14 - MSDS Transport Information
Section 7 - Handling and Storage	Section 15 - Regulatory Information
Section 8 - Exposure Controls & Personal Protection	Section 16 - Other Information

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Section 1 - Product and Company Identification
CHROMIUM

Product Identification: CHROMIUM
Date of MSDS: 11/01/1993 **Technical Review Date:** 11/10/1995
FSC: 6810 **NIIN:** **LIIN:** 00N066370
Submitter: N EN
Status Code: C
MFN: 01
Article: N
Kit Part: N

Manufacturer's Information

Manufacturer's Name: HIGH-PURITY STANDARDS
Post Office Box: 30188
Manufacturer's Address1:
Manufacturer's Address2: CHARLESTON, SC 29417
Manufacturer's Country: US
General Information Telephone: 803-556-3411
Emergency Telephone: 803-556-3411
Emergency Telephone: 803-556-3411
MSDS Preparer's Name: N/P
Proprietary: N
Reviewed: N
Published: Y
CAGE: 0YZE5
Special Project Code: N

Contractor Information

Contractor's Name: HIGH-PURITY STANDARDS INC
Post Office Box: 30180
Contractor's Address1: 2040 SAVAGE RD
Contractor's Address2: CHARLESTON, SC 29417
Contractor's Telephone: 803-556-3411
Contractor's CAGE: 0YZE5

Section 2 - Compositon/Information on Ingredients
CHROMIUM

Ingredient Name: CHROMIUM (III) CHLORIDE (1:3); (CHROMIUM) (SARA 302/313) (IN 10% INGREDIENT 2)
Ingredient CAS Number: 10025-73-7 **Ingredient CAS Code:** M
RTECS Number: GB5425000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: 1
% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: 0.1 MG (CRO3)/M3 **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: 0.05 MG(CR)/M3 **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity:

DOT Reporting Quantity:
Ozone Depleting Chemical: N

Ingredient Name: NITRIC ACID; (HNO*3) (SARA 302/313) (CERCLA)
Ingredient CAS Number: 7697-37-2 **Ingredient CAS Code:** M
RTECS Number: QU5775000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: 10
% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: 2 PPM **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: 2 PPM/4 STEL **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity: 1000 LBS
DOT Reporting Quantity: 1000 LBS
Ozone Depleting Chemical: N

Section 3 - Hazards Identification, Including Emergency Overview
CHROMIUM

Health Hazards Acute & Chronic: LIQUID MAY CAUSE BURNS TO SKIN AND EYES.

Signs & Symptoms of Overexposure:
SEE HEALTH HAZARDS.

Medical Conditions Aggravated by Exposure:
NONE IDENTIFIED.

LD50 LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.

Route of Entry Indicators:
Inhalation: YES
Skin: YES
Ingestion: YES

Carcenogenicity Indicators
NTP: NO
IARC: NO
OSHA: NO

Carcinogenicity Explanation: NOT RELEVANT

Section 4 - First Aid Measures
CHROMIUM

First Aid:
INHAL:REMOVE TO FRESH AIR. SUPPORT BREATHING (GIVE O*2/ARTF RESP) (FP N). CALL A PHYSICIAN. INGESTION:DO NOT INDUCE VOMITING, IF CONSCIOUS GIVE WATER, MILK. EYES:FLUSH WITH PLENTY OF WATER FOR AT LEAS T 15 MINUTES. SKIN:FLUSH WITH PLENTY OFWATER.

Section 5 - Fire Fighting Measures
CHROMIUM

Fire Fighting Procedures:
WEAR NIOSH/MSHA APPROVED SCBA & FULL PROTECTIVE EQUIPMENT (FP N).
Unusual Fire or Explosion Hazard:
NOT APPLICABLE. TOXIC GASES PRODUCED:NO, NO*2 GAS.
Extinguishing Media:
MEDIA SUITABLE FOR SURROUNDING FIRE (FP N).
Flash Point: Flash Point Text: NOT APPLICABLE

Autoignition Temperature:
Autoignition Temperature Text: N/A
Lower Limit(s): N/A
Upper Limit(s): N/A

Section 6 - Accidental Release Measures
CHROMIUM

Spill Release Procedures:
REMOVE SOURCE OF IGNITION IF HYDROGEN IS A HAZARD. PROVIDE OPTIMUM VENTILATION. FLUSH TO HOLDING AREA FOR NEUTRALIZATION.

Section 7 - Handling and Storage
CHROMIUM

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
CHROMIUM

Repiratory Protection:
NIOSH/MSHA APPROVED RESPIRATOR.
Ventilation:
LOCAL EXHAUST. VENT HOOD.
Protective Gloves:
IMPERVIOUS GLOVES (FP N). PROPER GLOVES.

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Eye Protection: ANSI APPROVED CHEM WORKERS GOGGS(SUPDAT)
Other Protective Equipment: ANSI APPROVED EMERGENCY EYE WASH AND DELUGE SHOWER (FP N). LAB COAT/APRON; VENT HOOD.
Work Hygenic Practices: NONE SPECIFIED BY MANUFACTURER.
Supplemental Health & Safety Information: EYE PROT:AND FULL LENGTH FACE SHIELD (FP N).

Section 9 - Physical & Chemical Properties
CHROMIUM

HCC:
NRC/State License Number:
Net Property Weight for Ammo:
Boiling Point: Boiling Point Text: 212F,100C
Melting/Freezing Point: Melting/Freezing Text: N/A
Decomposition Point: Decomposition Text: N/K
Vapor Pressure: N/A **Vapor Density:** N/A
Percent Volatile Organic Content:
Specific Gravity: 1 (H*2O=1)
Volatile Organic Content Pounds per Gallon:
pH: N/K
Volatile Organic Content Grams per Liter:
Viscosity: N/P
Evaporation Weight and Reference: N/K
Solubility in Water: COMPLETE
Appearance and Odor: DARK BLUE, ODORLESS SOLUTION.
Percent Volatiles by Volume: N/K
Corrosion Rate: N/K

Section 10 - Stability & Reactivity Data
CHROMIUM

Stability Indicator: YES
Materials to Avoid:
STRONG REDUCING AGENTS.
Stability Condition to Avoid:
METALS, HYDROXIDES, CARBONATES, CYANIDES.
Hazardous Decomposition Products:
NO, NO*2.
Hazardous Polymerization Indicator: NO
Conditions to Avoid Polymerization:
NOT RELEVANT

Section 11 - Toxicological Information
CHROMIUM

Toxicological Information:
N/P

Section 12 - Ecological Information
CHROMIUM

Ecological Information:
N/P

Section 13 - Disposal Considerations
CHROMIUM

Waste Disposal Methods:
FOLLOW FEDERAL, STATE AND LOCAL REGULATIONS FOR ACID WASTE.

Section 14 - MSDS Transport Information
CHROMIUM

Transport Information:
N/P

Section 15 - Regulatory Information
CHROMIUM

SARA Title III Information:
N/P
Federal Regulatory Information:
N/P
State Regulatory Information:
N/P

Section 16 - Other Information
CHROMIUM

Other Information:
N/P

HAZCOM Label Information

Product Identification: CHROMIUM
CAGE: 0YZE5
Assigned Individual: N
Company Name: HIGH-PURITY STANDARDS INC
Company PO Box: 30180
Company Street Address1: 2040 SAVAGE RD
Company Street Address2: CHARLESTON, SC 29417 US
Health Emergency Telephone: 803-556-3411
Label Required Indicator: Y
Date Label Reviewed: 11/10/1995
Status Code: C
Manufacturer's Label Number:
Date of Label: 11/10/1995
Year Procured: N/K
Organization Code: G
Chronic Hazard Indicator: N
Eye Protection Indicator: YES
Skin Protection Indicator: YES
Respiratory Protection Indicator: YES
Signal Word: CAUTION
Health Hazard: Slight

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Contact Hazard: Slight
Fire Hazard: None
Reactivity Hazard: None

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Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format)
For Cornell University Convenience Only

COBALT, 92792

Section 1 - Product and Company Identification	Section 9 - Physical & Chemical Properties
Section 2 - Compositon/Information on Ingredients	Section 10 - Stability & Reactivity Data
Section 3 - Hazards Identification Including Emergency Overview	Section 11 - Toxicological Information
Section 4 - First Aid Measures	Section 12 - Ecological Information
Section 5 - Fire Fighting Measures	Section 13 - Disposal Considerations
Section 6 - Accidental Release Measures	Section 14 - MSDS Transport Information
Section 7 - Handling and Storage	Section 15 - Regulatory Information
Section 8 - Exposure Controls & Personal Protection	Section 16 - Other Information

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Section 1 - Product and Company Identification
COBALT, 92792

Product Identification: COBALT, 92792
Date of MSDS: 04/04/1997 **Technical Review Date:** 06/02/1998
FSC: 6665 **NIIN:** **LIIN:** 00N086450
Submitter: N EN
Status Code: C
MFN: 01
Article: N
Kit Part: N

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Manufacturer's Information

Manufacturer's Name: QCD ANALYSTS
Post Office Box: 699
Manufacturer's Address1:
Manufacturer's Address2: SPRING LAKE, NJ 07762
Manufacturer's Country: US
General Information Telephone: 888-723-5478
Emergency Telephone: 723-919-1909
Emergency Telephone: 723-919-1909
MSDS Preparer's Name: N/P
Proprietary: N
Reviewed: N
Published: Y
CAGE: JO626
Special Project Code: N

Contractor Information

Contractor's Name: QCD ANALYSTS
Post Office Box: 699
Contractor's Address1:
Contractor's Address2: SPRING LAKE, NJ 07762
Contractor's Telephone: 888-QCD-LIST
Contractor's CAGE: 09KS0

Contractor Information

Contractor's Name: QCD ANALYSTS
Post Office Box: 699
Contractor's Address1: UNKNOWN
Contractor's Address2: SPRING LAKE, NJ 07762
Contractor's Telephone: 800-723-5478
Contractor's CAGE: JO626

Section 2 - Compositon/Information on Ingredients COBALT, 92792

Ingredient Name: COBALT (SARA 313)
Ingredient CAS Number: 7440-48-4 **Ingredient CAS Code:** M
RTECS Number: GF8750000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:

% Text: 0.01-1
% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: 0.1 MG/M3 **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: 0.02 MG/M3 **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity:
DOT Reporting Quantity:
Ozone Depleting Chemical:

Ingredient Name: NITRIC ACID (SARA 302/313) (CERCLA)
Ingredient CAS Number: 7697-37-2 **Ingredient CAS Code:** M
RTECS Number: QU5775000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: 2
% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: 2 PPM **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: 2 PPM;4 STEL **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity: 1000 LBS
DOT Reporting Quantity: 1000 LBS
Ozone Depleting Chemical: N

Ingredient Name: WATER
Ingredient CAS Number: 7732-18-5 **Ingredient CAS Code:** M
RTECS Number: ZC0110000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: 98
% Enviromental Weight:
Other REC Limits: N/K

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OSHA PEL: N/K (FP N) **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: N/K (FP N) **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity:
DOT Reporting Quantity:
Ozone Depleting Chemical: N

Section 3 - Hazards Identification, Including Emergency Overview
COBALT, 92792

Health Hazards Acute & Chronic: SKIN ABSORPTION, IRRITATION OF MUCOUS MEMBRANES. SKIN OR EYE IRRITATION OR INFLAMMATION. NITRIC ACID:POISON.

Signs & Symptoms of Overexposure:
SEE HEALTH HAZARDS.

Medical Conditions Aggravated by Exposure:
NONE.

LD50 LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.

Route of Entry Indicators:
Inhalation: YES
Skin: YES
Ingestion: YES

Carcenogenicity Indicators
NTP: NO
IARC: YES
OSHA: NO

Carcinogenicity Explanation: COBALT:IARC MONOGRAPHS, VOL 52, PG 363, 1991:GROUP 2B. ANIMAL:PULMONARY FIBROSIS (BLOOD EFFECTS).

Section 4 - First Aid Measures
COBALT, 92792

First Aid:
SEE MEDICAL ASSISTANCE FOR FURTHER ASSISTANCE. EYES:FLUSH W/WATER FOR AT LEAST 15 MINUTES. SKIN:FLUSH W/WATER FOR 15 MINUTES. WASH CONTAMINATED CLOTHING BEFORE RE-USE. INHAL:REMOVE TO FRESH AIR. INGES T:DO NOT INDUCE VOMITING. GIVE WATER ORMILK.

Section 5 - Fire Fighting Measures
COBALT, 92792

Fire Fighting Procedures:
USE NIOSH APPROVED SCBA & FULL PROTECTIVE EQUIPMENT (FP N).
Unusual Fire or Explosion Hazard:

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NONE.
Extinguishing Media:
WATER OR CO*2.
Flash Point: Flash Point Text: NOT APPLICABLE

Autoignition Temperature:
Autoignition Temperature Text: N/A
Lower Limit(s): N/A
Upper Limit(s): N/A

Section 6 - Accidental Release Measures
COBALT, 92792

Spill Release Procedures:
TAKE UP W/INERT, ABSORBENT MATERIAL. CONTAINERIZE FOR DISPOSAL. FLUSH SPILL AREA W/WATER.

Section 7 - Handling and Storage
COBALT, 92792

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
COBALT, 92792

Repiratory Protection:
NIOSH APPROVED RESPIRATOR, WHEN NEEDED.
Ventilation:
NONE REQUIRED. LOCAL EXHAUST, WHEN NEEDED.
Protective Gloves:
NEOPRENE GLOVES.
Eye Protection: ANSI APPROVED CHEM WORKERS GOGGS(SUPDAT)
Other Protective Equipment: EYE WASH FOUNTAIN & DELUGE SHOWER WHICH MEET ANSI DESIGN CRITERIA (FP N). LAB COAT.
Work Hygenic Practices: USUAL.
Supplemental Health & Safety Information: EYE PROT:& FULL LENGTH FACESHIELD (FP N).

Section 9 - Physical & Chemical Properties
COBALT, 92792

HCC:
NRC/State License Number:
Net Property Weight for Ammo:
Boiling Point: Boiling Point Text: 212F,100C
Melting/Freezing Point: Melting/Freezing Text: N/A
Decomposition Point: Decomposition Text: N/K
Vapor Pressure: N/A **Vapor Density:** N/A
Percent Volatile Organic Content:

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Specific Gravity: 1 (H*2O=1)
Volatile Organic Content Pounds per Gallon:
pH: N/K
Volatile Organic Content Grams per Liter:
Viscosity: N/P
Evaporation Weight and Reference: H*2O=1
Solubility in Water: SOLUBLE
Appearance and Odor: CLEAR, PINK SOLUTION; NO ODOR.
Percent Volatiles by Volume: N/K
Corrosion Rate: N/K

Section 10 - Stability & Reactivity Data
COBALT, 92792

Stability Indicator: YES
Materials to Avoid:
STRONG BASES OR STRONG REDUCING AGENTS.
Stability Condition to Avoid:
EXCESSIVE HEAT OR EXTREME COLD.
Hazardous Decomposition Products:
NO*X.
Hazardous Polymerization Indicator: NO
Conditions to Avoid Polymerization:
NOT RELEVANT

Section 11 - Toxicological Information
COBALT, 92792

Toxicological Information:
N/P

Section 12 - Ecological Information
COBALT, 92792

Ecological Information:
N/P

Section 13 - Disposal Considerations
COBALT, 92792

Waste Disposal Methods:
CORROSIVE WASTE I/A/W ALL FEDERAL, STATE & LOCAL ENVIRONMENTAL REGULATIONS.

Section 14 - MSDS Transport Information
COBALT, 92792

Transport Information:
N/P

Section 15 - Regulatory Information
COBALT, 92792

SARA Title III Information:
N/P
Federal Regulatory Information:
N/P
State Regulatory Information:
N/P

Section 16 - Other Information
COBALT, 92792

Other Information:
N/P

HAZCOM Label Information

Product Identification: COBALT, 92792
CAGE: JO626
Assigned Individual: Y
Company Name: QCD ANALYSTS
Company PO Box: 699
Company Street Address1: UNKNOWN
Company Street Address2: SPRING LAKE, NJ 07762 US
Health Emergency Telephone: 723-919-1909
Label Required Indicator: Y
Date Label Reviewed: 06/02/1998
Status Code: C
Manufacturer's Label Number:
Date of Label: 06/02/1998
Year Procured: N/K
Organization Code: M
Chronic Hazard Indicator: Y
Eye Protection Indicator: YES
Skin Protection Indicator: YES
Respiratory Protection Indicator: YES
Signal Word: WARNING
Health Hazard: Moderate
Contact Hazard: Moderate
Fire Hazard: Slight
Reactivity Hazard: None

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Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format)
For Cornell University Convenience Only

COPPER POWDER, 13990

Section 1 - Product and Company Identification	Section 9 - Physical & Chemical Properties
Section 2 - Compositon/Information on Ingredients	Section 10 - Stability & Reactivity Data
Section 3 - Hazards Identification Including Emergency Overview	Section 11 - Toxicological Information
Section 4 - First Aid Measures	Section 12 - Ecological Information
Section 5 - Fire Fighting Measures	Section 13 - Disposal Considerations
Section 6 - Accidental Release Measures	Section 14 - MSDS Transport Information
Section 7 - Handling and Storage	Section 15 - Regulatory Information
Section 8 - Exposure Controls & Personal Protection	Section 16 - Other Information

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Section 1 - Product and Company Identification
COPPER POWDER, 13990

Product Identification: COPPER POWDER, 13990
Date of MSDS: 12/28/1987 **Technical Review Date:** 12/21/1995
FSC: 6810 **NIIN:** **LIIN:** 00N066654
Submitter: N EN
Status Code: C
MFN: 01
Article: N
Kit Part: N

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Manufacturer's Information

Manufacturer's Name: JOHNSON MATTHEY
Manufacturer's Address1: 30 BOND ST
Manufacturer's Address2: WARD HILL, MA 01835-0747
Manufacturer's Country: US
General Information Telephone: 508-521-6300
Emergency Telephone: 800-424-9300(CHEMTREC)
Emergency Telephone: 800-424-9300(CHEMTREC)
MSDS Preparer's Name: N/P
Proprietary: N
Reviewed: N
Published: Y
CAGE: 0JVJ1
Special Project Code: N

Contractor Information

Contractor's Name: JOHNSON MATTHEY CATALOG CO INC ALFA AESAR
Contractor's Address1: 30 BOND ST
Contractor's Address2: WARD HILL, MA 01835-0747
Contractor's Telephone: 978-521-6300
Contractor's CAGE: 0JVJ1

Section 2 - Compositon/Information on Ingredients
COPPER POWDER, 13990

Ingredient Name: COPPER (SARA 313) (CERCLA)
Ingredient CAS Number: 7440-50-8 **Ingredient CAS Code:** M
RTECS Number: GL5325000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: 100
% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: 0.1MG/M3 FUME;1 DUST **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: 0.2 MG/M3 FUME **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity: 5000 LBS
DOT Reporting Quantity: 5000 LBS
Ozone Depleting Chemical: N

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Section 3 - Hazards Identification, Including Emergency Overview
COPPER POWDER, 13990

Health Hazards Acute & Chronic: ACUTE:INGEST:LG DOSES MAY CAUSE NAUS, VOMIT, ABDOM PAIN, METALLIC TASTE & DIARR. ACUTE POIS IS CHARACT BY HEMALYSIS, JAUNDICE, ANEMIA, HYPOTENSION & CONVLS. SKIN CONT:MAY CAUSE IRRIT. EYE CONT:DUST/PW DR MAY CAUSE IRRIT. INHAL:DUST/FUMES MAY CAUSE IRRIT, METALLIC TASTE, METAL-FUME FEVER, DISCOLORATION (EFTS OF OVEREXP)

Signs & Symptoms of Overexposure:
HLTH HAZ:OF SKIN & HAIR. CHRONIC:INGEST:RENAL DMG. SKIN:PRLNG CONT MAY PRDCE SENSIT, DERM. CHRONIC SKIN CONT W/COPPER SOLNS WILL CAUSE ERYTHEMA & OTHER SKIN RXNS IN SOME INDIVIDUALS. EYE CONT:NONE KNO WN. INHAL:ATROPHIC CHANGES & IRRIT OF MUC MEMBS, RENAL DAMAGE.

Medical Conditions Aggravated by Exposure:
PRE-EXISTING SKIN DISORDERS, IMPAIRED LIVER, KIDNEY OR PULMONARY FUNCTION.

LD50 LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.

Route of Entry Indicators:
- **Inhalation:** YES
- **Skin:** YES
- **Ingestion:** YES

Carcenogenicity Indicators
- **NTP:** NO
- **IARC:** NO
- **OSHA:** NO

Carcinogenicity Explanation: NOT RELEVANT

Section 4 - First Aid Measures
COPPER POWDER, 13990

First Aid:
INGEST:ONE SHOULD OBTAIN MEDICAL ATTENTION. SKIN:REMOVE CONTAMINATED CLOTHING, FLOOD SKIN W/LARGE AMOUNTS OF WATER. EYE:IMMEDIATELY FLUSH, INCLUDING UNDER EYELIDS, W/LARGE AMOUNTS OF WATER FOR AT LEAS T 15 MINUTES. CALL MD. INHAL:ONE SHOULDOBTAIN MEDICAL ATTENTION.

Section 5 - Fire Fighting Measures
COPPER POWDER, 13990

Fire Fighting Procedures:
USE NIOSH/MSHA APPROVED SCBA & FULL PROTECTIVE EQUIPMENT (FP N). NO SPECIAL FIREFIGHTING PROCS NEEDED. IF W/OUT RISK REMOVE MATERIAL FROM FIRE AREA.
Unusual Fire or Explosion Hazard:

NONE SPECIFIED BY MANUFACTURER.
Extinguishing Media:
MAY BE FLAMM IN FINELY DIVIDED FORM. DO NOT USE WATER/HALOGENATED EXTINGS. USE DRY CHEM EXTING AGENTS, DRY SAND/(SUPDAT)
Flash Point: Flash Point Text: NOT APPLICABLE

Autoignition Temperature:
Autoignition Temperature Text: N/A
Lower Limit(s): N/A
Upper Limit(s): N/A

Section 6 - Accidental Release Measures
COPPER POWDER, 13990

Spill Release Procedures:
WEARING FULL PROTECTIVE EQUIPMENT, COVER SPILL W/DRY SAND OR VERMICULITE. MIX WELL & CAREFULLY TRANSFER TO A CONTAINER.

Section 7 - Handling and Storage
COPPER POWDER, 13990

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
COPPER POWDER, 13990

Repiratory Protection:
NIOSH/MSHA APPROVED HIGH EFFICIENCY PARTICLE RESPIRATOR.
Ventilation:
LABORATORY FUME HOOD.
Protective Gloves:
RUBBER GLOVES.
Eye Protection: ANSI APPROVED CHEM WORKERS GOGGS (FP N).
Other Protective Equipment: EYE WASH FOUNTAIN & DELUGE SHOWER WHICH MEET ANSI DESIGN CRITERIA (FP N). LAB COAT & APRON, FLAME & CHEMICAL (SUPDAT)
Work Hygenic Practices: WASH THOROUGHLY AFTER USE.
Supplemental Health & Safety Information: EXTING MEDIA:DRY GROUND DOLOMITE. MATLS TO AVOID:(CL+OF*2), ETHYLENE OXIDE, H*2O*2, HYDRAZINE MONONITRATE, HYDRAZOIC ACID, H*2S, PB(NA)*2, K*2O*2, NAN*3, NA*2O*2. OTHER PROT EQUIP:RESISTANT COVERALLS & HYGIENIC FACILITIES FOR WASHING.

Section 9 - Physical & Chemical Properties
COPPER POWDER, 13990

HCC:
NRC/State License Number:
Net Property Weight for Ammo:
Boiling Point: Boiling Point Text: 4703F,2595C

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Melting/Freezing Point: Melting/Freezing Text: 1981F,1083C
Decomposition Point: Decomposition Text: N/K
Vapor Pressure: 1 @ 1628C **Vapor Density:** N/A
Percent Volatile Organic Content:
Specific Gravity: 8.94 (H*2O=1)
Volatile Organic Content Pounds per Gallon:
pH: N/K
Volatile Organic Content Grams per Liter:
Viscosity: N/P
Evaporation Weight and Reference: 0 (BUTYL ACETATE=1)
Solubility in Water: INSOLUBLE
Appearance and Odor: REDDISH METALLIC POWDER; ODORLESS.
Percent Volatiles by Volume: 0
Corrosion Rate: N/K

Section 10 - Stability & Reactivity Data
COPPER POWDER, 13990

Stability Indicator: YES
Materials to Avoid:
STRONG ACIDS, STRONG OXIDIZER, HALOGENS, ACID CHLORIDES, CHLORATES, BROMATES, IODATES, C*2H*2, NH*4NO*3, CLF*3, (SUPDAT)
Stability Condition to Avoid:
INCOMPATIBLE W/PROLONGED HEATING IN AIR.
Hazardous Decomposition Products:
TOXIC FUMES.
Hazardous Polymerization Indicator: NO
Conditions to Avoid Polymerization:
NOT RELEVANT

Section 11 - Toxicological Information
COPPER POWDER, 13990

Toxicological Information:
N/P

Section 12 - Ecological Information
COPPER POWDER, 13990

Ecological Information:
N/P

Section 13 - Disposal Considerations
COPPER POWDER, 13990

Waste Disposal Methods:
CONSULT STATE, LOCAL OR FEDERAL EPA REGULATIONS FOR PROPER DISPOSAL. RCRA CODE:D001. TSCA REGISTERED:YES.

Section 14 - MSDS Transport Information
COPPER POWDER, 13990

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Transport Information:
N/P

Section 15 - Regulatory Information
COPPER POWDER, 13990

SARA Title III Information:
N/P
Federal Regulatory Information:
N/P
State Regulatory Information:
N/P

Section 16 - Other Information
COPPER POWDER, 13990

Other Information:
N/P

HAZCOM Label Information

Product Identification: COPPER POWDER, 13990
CAGE: 0JVJ1
Assigned Individual: N
Company Name: JOHNSON MATTHEY CATALOG CO INC ALFA AESAR
Company PO Box:
Company Street Address1: 30 BOND ST
Company Street Address2: WARD HILL, MA 01835-0747 US
Health Emergency Telephone: 800-424-9300(CHEMTREC)
Label Required Indicator: Y
Date Label Reviewed: 12/21/1995
Status Code: C
Manufacturer's Label Number:
Date of Label: 12/21/1995
Year Procured: N/K
Organization Code: G
Chronic Hazard Indicator: Y
Eye Protection Indicator: YES
Skin Protection Indicator: YES
Respiratory Protection Indicator: YES
Signal Word: CAUTION
Health Hazard: Slight
Contact Hazard: Slight
Fire Hazard: None
Reactivity Hazard: None

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Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format)
For Cornell University Convenience Only

DIESEL OIL/FUEL/DIESEL FUEL NO. 2

Section 1 - Product and Company Identification	Section 9 - Physical & Chemical Properties
Section 2 - Compositon/Information on Ingredients	Section 10 - Stability & Reactivity Data
Section 3 - Hazards Identification Including Emergency Overview	Section 11 - Toxicological Information
Section 4 - First Aid Measures	Section 12 - Ecological Information
Section 5 - Fire Fighting Measures	Section 13 - Disposal Considerations
Section 6 - Accidental Release Measures	Section 14 - MSDS Transport Information
Section 7 - Handling and Storage	Section 15 - Regulatory Information
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Section 1 - Product and Company Identification
DIESEL OIL/FUEL/DIESEL FUEL NO. 2

Product Identification: DIESEL OIL/FUEL/DIESEL FUEL NO. 2
Date of MSDS: 06/27/1989 **Technical Review Date:** 11/27/1992
FSC: 9140 **NIIN:** 00-286-5294
Submitter: D DG
Status Code: C
MFN: 01
Article: N
Kit Part: N

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Manufacturer's Information

Manufacturer's Name: ULTRAMAR INC.
Post Office Box: 93102
Manufacturer's Address1:
Manufacturer's Address2: LONG BEACH, CA 90809-3102
Manufacturer's Country: US
General Information Telephone: 213-491-8795 OR 213-435-5832
Emergency Telephone: 213-491-8795 OR 213-435-5832
Emergency Telephone: 213-491-8795 OR 213-435-5832
MSDS Preparer's Name: N/P
Proprietary: N
Reviewed: Y
Published: Y
CAGE: LO173
Special Project Code: N

Item Description

Item Name: DIESEL FUEL
Item Manager:
Specification Number: VV-F-800
Type/Grade/Class: GRADE DF-2
Unit of Issue: GL
Unit of Issue Quantity: X
Type of Container: BULK

Contractor Information

Contractor's Name: TESORO PETROLEUM CORP
Contractor's Address1: 100 OCEANGATE ST, SUITE 515
Contractor's Address2: LONG BEACH, CA 90802-4319
Contractor's Telephone: 213-436-5660
Contractor's CAGE: 0NFN0

Contractor Information

Contractor's Name: ULTRAMAR INC.
Post Office Box: 93102
Contractor's Address1: UNKNOWN
Contractor's Address2: LONG BEACH, CA 90809-3102
Contractor's Telephone: 213-491-8795 OR 213-435-5832
Contractor's CAGE: LO173

Section 2 - Compositon/Information on Ingredients
DIESEL OIL/FUEL/DIESEL FUEL NO. 2

Ingredient Name: DIESEL FUEL N0. 2; PETROLEUM MID-DISTILLATE
Ingredient CAS Number: 68476-34-6 **Ingredient CAS Code:** M
RTECS Number: RTECS Code: X
=WT: =WT Code:

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=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: >99
% Enviromental Weight:
Other REC Limits: 400 PPM
OSHA PEL: 5 MG/M3 OIL MIST **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: 5 MG/M3 OIL MIST **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity:
DOT Reporting Quantity:
Ozone Depleting Chemical: N

Section 3 - Hazards Identification, Including Emergency Overview
DIESEL OIL/FUEL/DIESEL FUEL NO. 2

Health Hazards Acute & Chronic: EYES:IRRITATION. SKIN:SKIN IRRITANT. INHALATION:LUNG IRRITATION, CNS EFFECTS. INGESTION:PRACTICALLY NON-TOXIC TO INTERNAL ORGANS. HOWEVER, IF ASPIRATED INTO LUNGS IT MAY CAUSE CHEMICAL PNEUMONITIS WHI CH CAN BE FATAL. CHRONIC:MIDDLE DISTILLATE HAS CAUSED SKIN CANCER WHEN REPEATEDLY APPLIED TO MICE OVER LIFETIME,KIDNEY.

Signs & Symptoms of Overexposure:
SKIN:IRRITAION, DRYING EFFECT. INHALATION: HEADACHE, DIZZINESS, LOSS OF APPETITE, WEAKNESS AND LOSS OF COORDINATION.

Medical Conditions Aggravated by Exposure:
NONE SPECIFIED BY MANUFACTURER.

LD50 LC50 Mixture: LD50,ORAL RAT= >5 ML/KG

Route of Entry Indicators:
Inhalation: YES
Skin: YES
Ingestion: YES

Carcenogenicity Indicators
NTP: NO
IARC: NO
OSHA: NO

Carcinogenicity Explanation: WHOLE DIESEL ENGINE EXHAUST IS LISTED AS A PROBABLE CARCINOGEN BY IARC AND NIOSH.

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Section 4 - First Aid Measures
DIESEL OIL/FUEL/DIESEL FUEL NO. 2

First Aid:
EYES:FLUSH WITH FRESH WATER FOR 15 MINUTES. SKIN: REMOVE CONTAMINATED CLOTHING. WASH SKIN THOROUGHLY WITH SOAP AND WATER. SEE A DOCTOR IF SYMPTOMS DEVELOP. INHALATION: REMOVE TO FRESH AIR. INGESTION: GIVE WATER OR MILK TO DRINK AND GET IMMEDIATE MEDICAL ATTENTION. DO NOT MAKE PERSON VOMIT UNLESS DIRECTED TO DO SO BY MEDICAL PERSONNEL.

Section 5 - Fire Fighting Measures
DIESEL OIL/FUEL/DIESEL FUEL NO. 2

Fire Fighting Procedures:
WEAR FIRE FIGHTING PROTECTIVE EQUIPMENT AND A FULL FACED SELF CONTAINED BREATHING APPARATUS. EVACUATE AREA. COOL FIRE EXPOSED CONTAINERS WITH WATER SPRAY.
Unusual Fire or Explosion Hazard:
COMBUSTION OR HEAT OF FIRE MAY PRODUCE HAZARDOUS DECOMPOSITION PRODUCTS AND VAPORS. LIQUID EVAPORATES AND FORMS VAPORS WHICH CAN CATCH FIRE WITH VIOLENT BURNING
Extinguishing Media:
USE WATER FOG, CARBON DIOXIDE, FOAM, OR DRY CHEMICAL.
Flash Point: Flash Point Text: >125F,>52C

Autoignition Temperature:
Autoignition Temperature Text: N/K
Lower Limit(s): 0.6
Upper Limit(s): 7.5%

Section 6 - Accidental Release Measures
DIESEL OIL/FUEL/DIESEL FUEL NO. 2

Spill Release Procedures:
THIS MATERIAL IS CONSIDERED TO BE A WATER POLLUTANT AND RELEASES OF THIS PRODUCT SHOULD BE PREVENTED. ELIMINATE ALL OPEN FLAMES. STOP SOURCE OF THE LEAK. CONTAIN LIQUID. CLEAN UP SPILL USING APPROPRIA TE TECHNIQUES SUCH AS ABSORBENT MATERIALS.

Section 7 - Handling and Storage
DIESEL OIL/FUEL/DIESEL FUEL NO. 2

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
DIESEL OIL/FUEL/DIESEL FUEL NO. 2

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Repiratory Protection:
NONE NORMALLY REQUIRED. USE NIOSH APPROVED SELF-CONTAINED BREATHING APPARATUS IF TLV IS EXCEEDED OR WHEN SPRAYING OR USING IN CONFINED SPACES.
Ventilation:
USE THIS MATERIAL ONLY IN WELL VENTILATED AREAS.
Protective Gloves:
PVC
Eye Protection: GOGGLES
Other Protective Equipment: WEAR PROTECTIVE CLOTHINGS.
Work Hygenic Practices: WASH HANDS THOROUGHLY AFTER HANDLING THIS PRODUCT.
Supplemental Health & Safety Information: NONE

Section 9 - Physical & Chemical Properties
DIESEL OIL/FUEL/DIESEL FUEL NO. 2

HCC: F4
NRC/State License Number:
Net Property Weight for Ammo:
Boiling Point: Boiling Point Text: 350F,177C
Melting/Freezing Point: Melting/Freezing Text: N/A
Decomposition Point: Decomposition Text: UNKNOWN
Vapor Pressure: 1 **Vapor Density:** >1
Percent Volatile Organic Content:
Specific Gravity: 0.87-0.90
Volatile Organic Content Pounds per Gallon:
pH: N/A
Volatile Organic Content Grams per Liter:
Viscosity: 1.9 CST
Evaporation Weight and Reference: N/K
Solubility in Water: INSOLUBLE
Appearance and Odor: COLORLESS TO YELLOW BROWN LIQUID, MILD PETROLEUM ODOR
Percent Volatiles by Volume: NIL
Corrosion Rate: UNKNOWN

Section 10 - Stability & Reactivity Data
DIESEL OIL/FUEL/DIESEL FUEL NO. 2

Stability Indicator: YES
Materials to Avoid:
STRONG OXIDIZING AGENTS
Stability Condition to Avoid:
HIGH HEAT, OPEN FLAMES AND OTHER SOURCES OF IGNITION
Hazardous Decomposition Products:
TOXIC CARBON MONOXIDE AND CARBON DIOXIDE, SULFUR DIOXIDE AND HYDROGEN SULFIDE.
Hazardous Polymerization Indicator: NO
Conditions to Avoid Polymerization:
NOT APPLICABLE

Section 11 - Toxicological Information
DIESEL OIL/FUEL/DIESEL FUEL NO. 2

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Toxicological Information:
N/P

Section 12 - Ecological Information
DIESEL OIL/FUEL/DIESEL FUEL NO. 2

Ecological Information:
N/P

Section 13 - Disposal Considerations
DIESEL OIL/FUEL/DIESEL FUEL NO. 2

Waste Disposal Methods:
PLACE CONTAMINATED MATERIALS IN DISPOSABLE CONTAINERS AND DISPOSE OF IN A MANNER CONSISTENT WITH APPLICABLE REGULATIONS. CANTACT LOCAL ENVIRONMENTAL OR HEALTH AUTHORITIES FOR APPROVED DISPOSAL OF THIS MATERIAL.

Section 14 - MSDS Transport Information
DIESEL OIL/FUEL/DIESEL FUEL NO. 2

Transport Information:
N/P

Section 15 - Regulatory Information
DIESEL OIL/FUEL/DIESEL FUEL NO. 2

SARA Title III Information:
N/P
Federal Regulatory Information:
N/P
State Regulatory Information:
N/P

Section 16 - Other Information
DIESEL OIL/FUEL/DIESEL FUEL NO. 2

Other Information:
N/P

HMIS Transportation Information

Product Identification: DIESEL OIL/FUEL/DIESEL FUEL NO. 2
Transporation ID Number: 66800
Responsible Party CAGE: LO173
Date MSDS Prepared: 06/27/1989
Date MSDS Reviewed: 11/27/1992
MFN: 11/27/1992
Submitter: D DG
Status Code: C

Container Information
Unit of Issue: GL
Container Quantity: X

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Type of Container: BULK
Net Unit Weight:

Article without MSDS: N
Technical Entry NOS Shipping Number: PETROLEUM, MID DISTILLATE.
Radioactivity:
Form:
Net Explosive Weight:
Coast Guard Ammunition Code:
Magnetism: N/P
AF MMAC Code:
DOD Exemption Number:
Limited Quantity Indicator:
Multiple Kit Number: 0
Kit Indicator: N
Kit Part Indicator: N
Review Indicator: Y
Additional Data:
NONE

Department of Transportation Information

DOT Proper Shipping Name: GAS OIL OR DIESEL FUEL OR HEATING OIL, LIGHT
DOT PSN Code: GTF
Symbols:
DOT PSN Modifier:
Hazard Class: 3
UN ID Number: UN1202
DOT Packaging Group: III
Label: FLAMMABLE LIQUID
Special Provision(s): B1,T7,T30
Packaging Exception: 150
Non Bulk Packaging: 203
Bulk Packaging: 242
Maximimum Quanity in Passenger Area: 60 L
Maximimum Quanity in Cargo Area: 220 L
Stow in Vessel Requirements: A
Requirements Water/Sp/Other:

IMO Detail Information

IMO Proper Shipping Name: GAS OIL
IMO PSN Code: HRR
IMO PSN Modifier:
IMDG Page Number: 3375
UN Number: 1202
UN Hazard Class: 3.3
IMO Packaging Group: III
Subsidiary Risk Label: -
EMS Number: 3-07
Medical First Aid Guide Number: 311

IATA Detail Information

IATA Proper Shipping Name: GAS OIL
IATA PSN Code: MTX

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IATA PSN Modifier:
IATA UN Id Number: 1202
IATA UN Class: 3
Subsidiary Risk Class:
UN Packaging Group: III
IATA Label: FLAMMABLE LIQUID
Packaging Note for Passengers: 309
Maximum Quantity for Passengers: 60L
Packaging Note for Cargo: 310
Maximum Quantity for Cargo: 220L
Exceptions: A3

AFI Detail Information

AFI Proper Shipping Name: GAS OIL OR DIESEL FUEL OR HEATING OIL, LIGHT
AFI Symbols:
AFI PSN Code: MTX
AFI PSN Modifier:
AFI UN Id Number: UN1202
AFI Hazard Class: 3
AFI Packing Group: III
AFI Label:
Special Provisions: P5
Back Pack Reference: A7.3

HAZCOM Label Information

Product Identification: DIESEL OIL/FUEL/DIESEL FUEL NO. 2
CAGE: LO173
Assigned Individual: Y
Company Name: ULTRAMAR INC.
Company PO Box: 93102
Company Street Address1: UNKNOWN
Company Street Address2: LONG BEACH, CA 90809-3102 US
Health Emergency Telephone: 213-491-8795 OR 213-435-5832
Label Required Indicator: Y
Date Label Reviewed: 11/27/1992
Status Code: C
Manufacturer's Label Number: NONE
Date of Label: 11/27/1992
Year Procured: 1992
Organization Code: F
Chronic Hazard Indicator: Y
Eye Protection Indicator: YES
Skin Protection Indicator: YES
Respiratory Protection Indicator: YES
Signal Word: WARNING
Health Hazard: Slight
Contact Hazard: Slight
Fire Hazard: Moderate
Reactivity Hazard: None

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CORNELL

Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format)
For Cornell University Convenience Only

DIGLYCIDYL ETHER OF BISPHENOL A, LIQUID FORM

Section 1 - Product and Company Identification	Section 9 - Physical & Chemical Properties
Section 2 - Compositon/Information on Ingredients	Section 10 - Stability & Reactivity Data
Section 3 - Hazards Identification Including Emergency Overview	Section 11 - Toxicological Information
Section 4 - First Aid Measures	Section 12 - Ecological Information
Section 5 - Fire Fighting Measures	Section 13 - Disposal Considerations
Section 6 - Accidental Release Measures	Section 14 - MSDS Transport Information
Section 7 - Handling and Storage	Section 15 - Regulatory Information
Section 8 - Exposure Controls & Personal Protection	Section 16 - Other Information

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Cornell University does not in any way warrant or imply the applicability, viability or use of this information to any person or for use in any situation.

Section 1 - Product and Company Identification
DIGLYCIDYL ETHER OF BISPHENOL A, LIQUID FORM

Product Identification: DIGLYCIDYL ETHER OF BISPHENOL A, LIQUID FORM
Date of MSDS: 02/27/1986 **Technical Review Date:** 07/07/1995
FSC: 6810 **NIIN: LIIN:** 00F040881
Submitter: F BT
Status Code: C
MFN: 01
Article: N
Kit Part: N

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Manufacturer's Information

Manufacturer's Name: NATIONAL STARCH & CHEMICAL CORP PERMABOND INTL
Post Office Box: 6500
Manufacturer's Address1: 10 FINDERNE AVE
Manufacturer's Address2: BRIDGEWATER, NJ 08807-5000
Manufacturer's Country: US
General Information Telephone: 908-685-5000
Emergency Telephone: 908-685-5000
Emergency Telephone: 908-685-5000
MSDS Preparer's Name: N/P
Proprietary: N
Reviewed: Y
Published: Y
CAGE: 85091
Special Project Code: N

Preparer Information

Preparer's Name: NATIONAL STARCH AND CHEMICAL CORP
Post Office Box: 6500
Preparer's Address1: 10 FINDERNE AVE
Preparer's Address2: BRIDGEWATER, NJ 08807
Preparer's CAGE: 85091
Assigned Individual: N

Contractor Information

Contractor's Name: NATIONAL STARCH AND CHEMICAL CORP
Post Office Box: 6500
Contractor's Address1: 10 FINDERNE AVE
Contractor's Address2: BRIDGEWATER, NJ 08807
Contractor's Telephone: 908-685-5379; FAX:908685-5306
Contractor's CAGE: 85091

Section 2 - Compositon/Information on Ingredients
DIGLYCIDYL ETHER OF BISPHENOL A, LIQUID FORM

Ingredient Name: REACTION PRODUCTS OF EPICHLOROHYDRIN & BISPHENOL A *95-2*
Ingredient CAS Number: 25085-99-8 **Ingredient CAS Code:** M
RTECS Number: RTECS Code: X
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:

% Text: 100
% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: N/K **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: N/K **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity:
DOT Reporting Quantity:
Ozone Depleting Chemical: N

Section 3 - Hazards Identification, Including Emergency Overview
DIGLYCIDYL ETHER OF BISPHENOL A, LIQUID FORM

Health Hazards Acute & Chronic: INHALATION: IRRITANT. LIQUID FORM IS IRRITATING TO EYES, SKIN & MUCOUS MEMBRANES. SKIN: SENSITIZER, MAY CAUSE DERMATITIS. EYES: MINOR TRANSIENT IRRITATION & CORNEAL INJURY. MAY CAUSE CONJUNCTIVITIS. I NGESTION: LOCAL IRRITATION/INFLAMMATION. DEATH MAY RESULT FROM DEPRESSION OF THE RESPIRATORY CENTER.

Signs & Symptoms of Overexposure:
IRRITATION, ERYTHEMA & EDEMA, CRUSTING & SCALING SKIN, RASH, ITCHING, INFLAMMATION

Medical Conditions Aggravated by Exposure:
PERSONS W/HISTORY OF SKIN DISEASE, ALLERGIES/ASTHMA.

LD50 LC50 Mixture: ORAL LD50(RAT): >2000 MG/KG

Route of Entry Indicators:
Inhalation: YES
Skin: NO
Ingestion: YES

Carcenogenicity Indicators
NTP: NO
IARC: NO
OSHA: NO

Carcinogenicity Explanation: NONE

Section 4 - First Aid Measures
DIGLYCIDYL ETHER OF BISPHENOL A, LIQUID FORM

First Aid:
INHALATION: REMOVE TO FRESH AIR. GIVE CPR IF NECESSARY. KEEP WARM/AT REST. SKIN: WASH W/SOAP/MILD DETERGENT & PLENTY OF WATER FOR 15-20 MINS. EYES: WASH W/PLENTY OF WATER FOR 15-20 MINS. INGESTION: TREAT SYMPTOMATICALLY & SUPPORTIVELY. OBTAIN MEDICAL ATTENTION IN ALL CASES.

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Section 5 - Fire Fighting Measures
DIGLYCIDYL ETHER OF BISPHENOL A, LIQUID FORM

Fire Fighting Procedures:
MOVE CONTAINERS FROM FIRE AREA. USE AGENTS SUITABLE FOR TYPE OF SURROUNDING FIRE. DIKE FIRE CONTROL WATER FOR LATER DISPOSAL. AVOID BREATHING VAPORS/KEEP UPWIND
Unusual Fire or Explosion Hazard:
SLIGHT FIRE HAZARD WHEN EXPOSED TO HEAT/FLAME.
Extinguishing Media:
DRY CHEMICAL, CO2, WATER SPRAY/FOAM. LARGE: WATER SPRAY, FOG/ALCOHOL FOAM.
Flash Point: Flash Point Text: >200F

Autoignition Temperature:
Autoignition Temperature Text: N/A
Lower Limit(s): N/K
Upper Limit(s): N/K

Section 6 - Accidental Release Measures
DIGLYCIDYL ETHER OF BISPHENOL A, LIQUID FORM

Spill Release Procedures:
STOP LEAK SAFELY. SMALL: TAKE UP W/SAND/OTHER ABSORBENT & PLACE INTO CLEAN, DRY CONTAINERS FOR LATER DISPOSAL. KEEP PEOPLE AWAY. ISOLATE AREA & DENY ENTRY.

Section 7 - Handling and Storage
DIGLYCIDYL ETHER OF BISPHENOL A, LIQUID FORM

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
DIGLYCIDYL ETHER OF BISPHENOL A, LIQUID FORM

Repiratory Protection:
USE A CHEMICAL CARTRIDGE RESPIRATOR W/AN ORGANIC VAPOR CARTRIDGE W/A FULL FACEPIECE/GAS MASK W/ORGANIC VAPOR CANISTER W/A FULL FACEPIECE/TYPE C SUPPLIED AIR RESPIRATOR W/A FULL FACEPIECE OPERATED IN P RESSURE DEMAND/POSSITIVE PRESSURE MODE.
Ventilation:
LOCAL EXHAUST/GENERAL DILUTION VENTILATION SYSTEM
Protective Gloves:
REQUIRED
Eye Protection: SPLASH PROOF/DUST RESISTANT GOGGLES
Other Protective Equipment: FACESHIELD, EYE WASH FOUNTAIN, IMPERVIOUS CLOTHING
Work Hygenic Practices: REMOVE/LAUNDER CONTAMINATED CLOTHING & SHOES

BEFORE REUSE.
Supplemental Health & Safety Information: N/K

Section 9 - Physical & Chemical Properties
DIGLYCIDYL ETHER OF BISPHENOL A, LIQUID FORM

HCC:
NRC/State License Number:
Net Property Weight for Ammo:
Boiling Point: Boiling Point Text: N/K
Melting/Freezing Point: Melting/Freezing Text: N/K
Decomposition Point: Decomposition Text: N/K
Vapor Pressure: <0.01 **Vapor Density:** >1
Percent Volatile Organic Content:
Specific Gravity: 1.15
Volatile Organic Content Pounds per Gallon:
pH: N/K
Volatile Organic Content Grams per Liter:
Viscosity: N/P
Evaporation Weight and Reference: (BU AC=1): <1
Solubility in Water: INSOLUBLE
Appearance and Odor: STRAW COLORED LIQUID W/A MILD AROMATIC ODOR
Percent Volatiles by Volume: N/K
Corrosion Rate: N/K

Section 10 - Stability & Reactivity Data
DIGLYCIDYL ETHER OF BISPHENOL A, LIQUID FORM

Stability Indicator: YES
Materials to Avoid:
AMINE COMPOUNDS, STRONG ACIDS, BASES, MERCAPTANS
Stability Condition to Avoid:
N/K
Hazardous Decomposition Products:
TOXIC OXIDES OF CARBON
Hazardous Polymerization Indicator: NO
Conditions to Avoid Polymerization:
N/K

Section 11 - Toxicological Information
DIGLYCIDYL ETHER OF BISPHENOL A, LIQUID FORM

Toxicological Information:
N/P

Section 12 - Ecological Information
DIGLYCIDYL ETHER OF BISPHENOL A, LIQUID FORM

Ecological Information:
N/P

Section 13 - Disposal Considerations

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DIGLYCIDYL ETHER OF BISPHENOL A, LIQUID FORM

Waste Disposal Methods:
DISPOSE OF IN ACCORDANCE W/LOCAL, STATE & FEDERAL REGULATIONS.

Section 14 - MSDS Transport Information
DIGLYCIDYL ETHER OF BISPHENOL A, LIQUID FORM

Transport Information:
N/P

Section 15 - Regulatory Information
DIGLYCIDYL ETHER OF BISPHENOL A, LIQUID FORM

SARA Title III Information:
N/P
Federal Regulatory Information:
N/P
State Regulatory Information:
N/P

Section 16 - Other Information
DIGLYCIDYL ETHER OF BISPHENOL A, LIQUID FORM

Other Information:
N/P

HAZCOM Label Information

Product Identification: DIGLYCIDYL ETHER OF BISPHENOL A, LIQUID FORM
CAGE: 85091
Assigned Individual: N
Company Name: NATIONAL STARCH AND CHEMICAL CORP
Company PO Box: 6500
Company Street Address1: 10 FINDERNE AVE
Company Street Address2: BRIDGEWATER, NJ 08807 US
Health Emergency Telephone: 908-685-5000
Label Required Indicator: Y
Date Label Reviewed: 12/16/1998
Status Code: C
Manufacturer's Label Number:
Date of Label: 12/16/1998
Year Procured: N/K
Organization Code: G
Chronic Hazard Indicator: N/P
Eye Protection Indicator: N/P
Skin Protection Indicator: N/P
Respiratory Protection Indicator: N/P
Signal Word: N/P
Health Hazard:
Contact Hazard:
Fire Hazard:
Reactivity Hazard:

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METACHEM RESINS CORP -- MERECO XLN-589HTC ACTIVATOR

MSDS Safety Information

FSC: 6850
MSDS Date: 10/27/1994
MSDS Num: BZWCY
LIIN: 00F049541
Product ID: MERECO XLN-589HTC ACTIVATOR
MFN: 02
Responsible Party
Cage: 18604
Name: METACHEM RESINS CORP
Address: 1505 MAIN ST
City: WEST WARWICK RI 02893-2992
Emergency Phone Number: 800-556-7164
Review Ind: Y
Published: Y

Preparer Co. when other than Responsible Party Co.

Cage: 18604
Name: METACHEM RESINS CORP MERECO PRODUCTS DIV
Address: 1505 MAIN ST
City: WEST WARWICK RI 02893-2992

Contractor Summary

Cage: 18599
Name: METACHEM RESINS CORP
Address: UNKNOWN
Box: UNKNOW
City: UNKNOWN NK 00000
Phone: UNKNOWN
Cage: 18604
Name: METACHEM RESINS CORP MERECO PRODUCTS DIV
Address: 1505 MAIN ST
City: WEST WARWICK RI 02893-2992
Phone: UNKNOWN

Ingredients

Name: MINERAL OR CERAMIC POWDERS

Name: LIQUID EPOXY CURING AGENTS

Health Hazards Data

Route Of Entry Inds - Inhalation: YES
Skin: YES
Ingestion: YES
Carcinogenicity Inds - NTP: NO
IARC: NO
OSHA: NO
Effects of Exposure: SKIN: CAUSES BURNS. EYES: SEVERE MEMBRANE IRRITATION.
INHALATION: HOT VAPORS MAY IRRITATE RESPIRATORY TRACT IRRITATION.
DEPIGMENTATION MAY RESULT FROM PROLONGED/REPEATED CONTACT.
Explanation Of Carcinogenicity: NONE
Signs And Symptions Of Overexposure: BURNS, IRRITATION, COUGHING, DIZZINESS.
First Aid: INHALATION: REMOVE TO FRESH AIR. CONTINOUS OXYGEN INHALER FOR

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LABORED BREATHING. INGESTION: IF CONSCIOUS, IMMEDIATELY GIVE SEVERAL GLASSES OF WATER. DON'T INDUCE VOMITING. SKIN: WASH W/PLENTY OF WATER FOR 15 MINS. EYES: IMMEDIATELY FLUSH W/WATER FOR 15 MINS. FLUSH ONLY. DON'T WIPE/RUB. PRODUCT CONTAINS AN ABRASIVE. OBTAIN MEDICAL ATTENTION IN ALL CASES.

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Handling and Disposal

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Spill Release Procedures: REMOVE SOURCES OF IGNITION. AVOID DIRECT CONTACT. RECOVER UNCONTAMINATED MATERIAL FOR USE. ABSORB RESIDUE ON COMBUSTIBLE MATERIAL. PUT IN CLOSABLE CONTAINER FOR DISPOSAL. FLUSH CONTAMINATED AREA W/WAT ER. PREVENT RUNOFF TO SEWER/WATERWAY.

Waste Disposal Methods: DISPOSE OF IAW/FEDERAL, STATE & LOCAL REGULATIONS. CORROSIVE SOLID, UN1759.

Handling And Storage Precautions: STORE IN COOL WELL VENTILATED AREA. STORE ONLY IN STEEL, FLUORINATED POLYMER/POLYPROPYLENE. DON'T TRANSFER TO UNLABELED CONTAINER.

Other Precautions: GROUND FIXED EQUIPMENT. DON'T CUT, DRILL/WELD ON EMPTY CONTAINER. BOND & GROUND TRANSFER CONTAINERS & EQUIPMENT. DON'T LEAVE CONTAINERS OPEN. AVOID BREATHING VAPOR, MIST/SPRAY. KEEP AWAY FROM SOURCES OF IGNITION. COMBUSTIBLE.

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Fire and Explosion Hazard Information

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Flash Point Method: TOC

Flash Point Text: 190F

Extinguishing Media: CO2, WATER SPRAY, DRY CHEMICAL

Fire Fighting Procedures: USE SCBA. WATER MAY CAUSE FROTHING. KEEP FIRE EXPOSED CONTAINERS COOL W/WATER SPRAY.

Unusual Fire/Explosion Hazard: DECOMPOSITION & COMBUSTION PRODUCTS MAY BE TOXIC. VERY HOT PRODUCT FORMS FLAMMABLE VAPORS WHICH MAY FORM EXPLOSIVE MIXTURE W/AIR.

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Control Measures

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Respiratory Protection: USE NIOSH APPROVED RESPIRATOR FOR ORGANIC & AMMONIA VAPORS. USE RESPIRATORY PROTECTION AGAINST DUST IF DRILLING, FILING, GRINDING/SANDING CURED PRODUCT.

Ventilation: LOCAL EXHAUST/MECHANICAL (GENERAL) MAY BE ADEQUATE.

Protective Gloves: BUTYL RUBBER

Eye Protection: SPLASH PROOF GOGGLES

Other Protective Equipment: BARRIER CREAM RECOMMENDED, APRON, EYE WASH, FIRE EXTINGUISHER.

Work Hygienic Practices: REMOVE/LAUNDER CONTAMINATED CLOTHING BEFORE REUSE. WASH THOROUGHLY BEFORE EATING, DRINKING/SMOKING.

Supplemental Safety and Health: MAINTAIN GOOD HOUSEKEEPING. STORE AWAY FROM FOODSTUFFS & ANIMAL FEED. WASH THOROUGHLY AFTER HANDLING.

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Physical/Chemical Properties

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B.P. Text: 390F

Vapor Pres: <1

Vapor Density: >1

Spec Gravity: >1

Solubility in Water: NEGLIGIBLE

Appearance and Odor: SOFT GRAYISH-WHITE PASTE W/MILD AMMONIA LIKE ODOR

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Reactivity Data

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Stability Indicator: YES

Stability Condition To Avoid: AIR

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Materials To Avoid: OXIDIZERS, EPOXY RESINS, ACIDS, ALUMINUM.
Hazardous Decomposition Products: CO2, CO, AMMONIA, NITROGEN OXIDE, TRACES OF PHENOL.
Hazardous Polymerization Indicator: NO
Conditions To Avoid Polymerization: NONE

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Toxicological Information

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Ecological Information

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MSDS Transport Information

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Regulatory Information

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Other Information

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HAZCOM Label

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Product ID: MERECO XLN-589HTC ACTIVATOR
Cage: 18604
Company Name: METACHEM RESINS CORP MERECO PRODUCTS DIV
Street: 1505 MAIN ST
City: WEST WARWICK RI
Zipcode: 02893-2992
Health Emergency Phone: 800-556-7164
Label Required IND: Y
Date Of Label Review: 12/16/1998
Status Code: C
Label Date: 12/16/1998
Origination Code: G
Hazard And Precautions: SKIN: CAUSES BURNS. EYES: SEVERE MEMBRANE IRRITATION. INHALATION: HOT VAPORS MAY IRRITATE RESPIRATORY TRACT IRRITATION. DEPIGMENTATION MAY RESULT FROM PROLONGED/REPEATED CONTACT. BURNS, IRRITATION, COUGHING, DIZZINESS.

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Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format)
For Cornell University Convenience Only

HEXANE

Section 1 - Product and Company Identification	Section 9 - Physical & Chemical Properties
Section 2 - Compositon/Information on Ingredients	Section 10 - Stability & Reactivity Data
Section 3 - Hazards Identification Including Emergency Overview	Section 11 - Toxicological Information
Section 4 - First Aid Measures	Section 12 - Ecological Information
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Section 1 - Product and Company Identification
HEXANE

Product Identification: HEXANE
Date of MSDS: 07/01/1994 **Technical Review Date:** 06/10/1996
FSC: 6810 **NIIN: LIIN:** 00N070962
Submitter: N EN
Status Code: C
MFN: 01
Article: N
Kit Part: N

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Manufacturer's Information

Manufacturer's Name: ABSOLUTE STANDARDS INC
Manufacturer's Address1: 44 ROSSOTTO DR
Manufacturer's Address2: HAMDEN, CT 06518
Manufacturer's Country: US
General Information Telephone: 203-281-2917
Emergency Telephone: 800-368-1131
Emergency Telephone: 800-368-1131
MSDS Preparer's Name: JACK CRISCIO
Proprietary: N
Reviewed: N
Published: Y
CAGE: 0TZV1
Special Project Code: N

Contractor Information

Contractor's Name: ABSOLUTE STANDARDS INC
Contractor's Address1: 44 ROSSOTTO DR
Contractor's Address2: HAMDEN, CT 06514-5000
Contractor's Telephone: 203-281-2917/800-368-1131
Contractor's CAGE: 0TZV1

Section 2 - Compositon/Information on Ingredients
HEXANE

Ingredient Name: HEXANE (N-HEXANE) (CERCLA)
Ingredient CAS Number: 110-54-3 **Ingredient CAS Code:** M
RTECS Number: MN9275000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: >97
% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: 500 PPM **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: 50 PPM **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity: 1 LB
DOT Reporting Quantity: 1 LB
Ozone Depleting Chemical: N

Section 3 - Hazards Identification, Including Emergency Overview
HEXANE

Health Hazards Acute & Chronic: ACUTE:INHALATION AND INGESTION ARE HARMFUL AND MAY BE FATAL. INHALATION AND INGESTION MAY CAUSE HEADACHE, NAUSEA, VOMITING, DIZZINESS, IRRITATION OF RESPIRATORY TRACT, GASTROINTESTINAL IRRITATION AND UNCONSCIOUSNESS. CONTACT W/SKIN AND EYES MAY CAUSE IRRITATION. PROLONGED SKIN MAY RESULT IN DERMATITIS (EFTS OF OVEREXP)

Signs & Symptoms of Overexposure:
HLTH HAZ:CHRONIC:MAY INCLUDE CENTRAL NERVOUS SYSTEM DEPRESSION.

Medical Conditions Aggravated by Exposure:
NONE IDENTIFIED.

LD50 LC50 Mixture: LD50:(ORAL,RAT) 28.7 KG/MG

Route of Entry Indicators:
Inhalation: YES
Skin: YES
Ingestion: YES

Carcenogenicity Indicators
NTP: NO
IARC: NO
OSHA: NO

Carcinogenicity Explanation: NOT APPLICABLE

Section 4 - First Aid Measures
HEXANE

First Aid:
CALL A PHYSICIAN. INGEST:DO NOT INDUCE VOMITING. INHAL:REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN. EYES:IMMED FLUSH W/PLENTY OF WATER FO R AT LEAST 15 MINS. SKIN:IMMED FLUSH W/PLENTY OF WATER FOR AT LEAST 15 MINS WHILE REMOVING CONTAMD CLTHG & SHOES. WASH CLOTHING BEFORE REUSE.

Section 5 - Fire Fighting Measures
HEXANE

Fire Fighting Procedures:
USE NIOSH/MSHA APPROVED SCBA & FULL PROTECTIVE EQUIPMENT (FP N).
Unusual Fire or Explosion Hazard:
VAP MAY FORM ALONG SURFS TO DIST IGNIT SOURCES & FLASH BACK. CONT W/STRONG OXIDIZERS MAY CAUSE FIRE. TOX GASES PRDCED MAY INCL:CARBON MONOXIDE, CARBON DIOXIDE.
Extinguishing Media:
USE ALCOHOL FOAM, DRY CHEMICAL OR CARBON DIOXIDE. (WATER MAY BE

INEFFECTIVE).
Flash Point: Flash Point Text: -9F,-23C

Autoignition Temperature:
Autoignition Temperature Text: N/A
Lower Limit(s): 1.2%
Upper Limit(s): 77.7%

Section 6 - Accidental Release Measures
HEXANE

Spill Release Procedures:
WEAR NIOSH/MSHA SCBA & FULL PROT CLTHG. SHUT OFF IGNIT SOURCES:NO FLAMES, SMKNG/FLAMES IN AREA. STOP LEAK IF YOU CAN DO SO W/OUT HARM. USE WATER SPRAY TO REDUCE VAPS. TAKE UP W/SAND OR OTHER NON-COMBU ST MATL & PLACE INTO CNTNR FOR LATER (SUPDAT)

Section 7 - Handling and Storage
HEXANE

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
HEXANE

Repiratory Protection:
RESPIRATORY PROTECTION REQUIRED IF AIRBORNE CONCENTRATION EXCEEDS TLV. AT CONCENTRATIONS ABOVE 200 PPM, A NIOSH/MSHA APPROVED SELF-CONTAINED BREATHING APPARATUS IS ADVISED.
Ventilation:
MECHANICAL (GENERAL).
Protective Gloves:
IMPERVIOUS GLOVES (FP N).
Eye Protection: ANSI APPRVD CHEM WORKERS GOGGLES (FP N).
Other Protective Equipment: ANSI APPRVD EMERGENCY EYE WASH & DELUGE SHOWER (FP N).
Work Hygenic Practices: GOOD LABORATORY PRACTICES.
Supplemental Health & Safety Information: SPILL RELEASE PROC:DISPOSAL. FLUSH AREA WITH WATER.

Section 9 - Physical & Chemical Properties
HEXANE

HCC:
NRC/State License Number:
Net Property Weight for Ammo:
Boiling Point: Boiling Point Text: 156F,69C
Melting/Freezing Point: Melting/Freezing Text: -121F,-85C

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Decomposition Point: Decomposition Text: N/K
Vapor Pressure: 100 **Vapor Density:** 3
Percent Volatile Organic Content:
Specific Gravity: 0.66 (H*2O=1)
Volatile Organic Content Pounds per Gallon:
pH: N/K
Volatile Organic Content Grams per Liter:
Viscosity: N/P
Evaporation Weight and Reference: 27.5 (BUTYL ACETATE =1)
Solubility in Water: NEGLIGIBLE (<1%)
Appearance and Odor: CLEAR, COLORLESS LIQUID WITH MILD ODOR.
Percent Volatiles by Volume: N/K
Corrosion Rate: N/K

Section 10 - Stability & Reactivity Data
HEXANE

Stability Indicator: YES
Materials to Avoid:
STRONG OXIDIZING AGENTS, STRONG ACIDS.
Stability Condition to Avoid:
HEAT, FLAME, OTHER IGNITION SOURCES.
Hazardous Decomposition Products:
CARBON MONOXIDE, CARBON DIOXIDE.
Hazardous Polymerization Indicator: NO
Conditions to Avoid Polymerization:
NOT APPLICABLE

Section 11 - Toxicological Information
HEXANE

Toxicological Information:
N/P

Section 12 - Ecological Information
HEXANE

Ecological Information:
N/P

Section 13 - Disposal Considerations
HEXANE

Waste Disposal Methods:
DISPOSE IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL ENVIRONMENTAL REGULATIONS. EPA HAZARDOUS WASTE NUMBER:D001 (IGNITABLE WASTE).

Section 14 - MSDS Transport Information
HEXANE

Transport Information:

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N/P

Section 15 - Regulatory Information
HEXANE

SARA Title III Information:
N/P
Federal Regulatory Information:
N/P
State Regulatory Information:
N/P

Section 16 - Other Information
HEXANE

Other Information:
N/P

HAZCOM Label Information

Product Identification: HEXANE
CAGE: 0TZV1
Assigned Individual: N
Company Name: ABSOLUTE STANDARDS INC
Company PO Box:
Company Street Address1: 44 ROSSOTTO DR
Company Street Address2: HAMDEN, CT 06514-5000 US
Health Emergency Telephone: 800-368-1131
Label Required Indicator: Y
Date Label Reviewed: 06/10/1996
Status Code: C
Manufacturer's Label Number:
Date of Label: 06/10/1996
Year Procured: N/K
Organization Code: G
Chronic Hazard Indicator: Y
Eye Protection Indicator: YES
Skin Protection Indicator: YES
Respiratory Protection Indicator: YES
Signal Word: DANGER
Health Hazard: Moderate
Contact Hazard: Slight
Fire Hazard: Severe
Reactivity Hazard: None

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Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format)
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PURE LEAD

Section 1 - Product and Company Identification	Section 9 - Physical & Chemical Properties
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Section 1 - Product and Company Identification
PURE LEAD

Product Identification: PURE LEAD
Date of MSDS: 09/01/1986 **Technical Review Date:** 07/05/1994
FSC: 3439 **NIIN:** **LIIN:** 00N050881
Submitter: N EN
Status Code: C
MFN: 01
Article: N
Kit Part: N

Manufacturer's Information

Manufacturer's Name: MC CANFIELD SONS
Manufacturer's Address1: 1000 BRIGHTON STREET
Manufacturer's Address2: UNION, NJ 07083
Manufacturer's Country: US
General Information Telephone: 201-688-5050
Emergency Telephone: 201-688-5050
Emergency Telephone: 201-688-5050
MSDS Preparer's Name: N/P
Proprietary: N
Reviewed: N
Published: Y
CAGE: IO796
Special Project Code: N

Contractor Information

Contractor's Name: CANFIELD M C SONS
Post Office Box: 3100
Contractor's Address1: 1000 BRIGHTON ST
Contractor's Address2: UNION, NJ 07083-6805
Contractor's Telephone: UNKNOWN
Contractor's CAGE: 57191

Contractor Information

Contractor's Name: MC CANFIELD SONS
Contractor's Address1: 1000 BRIGHTON STREET
Contractor's Address2: UNION, NJ 07083
Contractor's Telephone: 201-688-5050
Contractor's CAGE: IO796

Section 2 - Compositon/Information on Ingredients
PURE LEAD

Ingredient Name: LEAD (SARA III)
Ingredient CAS Number: 7439-92-1 **Ingredient CAS Code:** M
RTECS Number: OF7525000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: 99.9
% Enviromental Weight:

Other REC Limits: N/K
OSHA PEL: O/K 1910.1025 **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: 0.15 MG/M3,DUST **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity: 1 LB
DOT Reporting Quantity: 1 LB
Ozone Depleting Chemical: N

Section 3 - Hazards Identification, Including Emergency Overview
PURE LEAD

Health Hazards Acute & Chronic: CHRONIC OVEREXPOSURE TO HIGH LEVELS OF AIRBORNE/INGESTED LEAD MAY RESULT IN LEAD INTOXICATION W/SYMPTOMS OF ANEMIA, INSOMNIA, WEAKNESS, CONSTIPATION, NAUSEA & ABDOMINAL PAIN. PROLONGED OVEREXPOSURE MA Y RESULT IN KIDNEY & NERVOUS SYSTEM DAMAGE. LEAD APPEARS ON THE NAVY LISTING OF OCCUPATIONAL CHEMICAL (EFTS OF OVEREXP)

Signs & Symptoms of Overexposure:
HEALTH HAZ:REPRODUCTIVE HAZARDS. SEEK CONSULTATION FROM APPROPRIATE HEALTH PROFESSIONALS CONCERNING LATEST HAZARD LIST INFORMATION AND SAFE HANDLING & EXPOSURE INFORMATION (FP N).

Medical Conditions Aggravated by Exposure:
NONE SPECIFIED BY MANUFACTURER.

LD50 LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.

Route of Entry Indicators:
Inhalation: YES
Skin: YES
Ingestion: YES

Carcenogenicity Indicators
NTP: NO
IARC: NO
OSHA: NO

Carcinogenicity Explanation: NOT RELEVANT.

Section 4 - First Aid Measures
PURE LEAD

First Aid:
INDIVIDUAL SHOULD BE REMOVED FROM EXPOS & PHYS CONSULTED. FOR HOT METAL BURNS, EXPOS AREA SHOULD BE COOLED W/WATER & MED ATTN SOUGHT. INGEST:CALL MD IMMED (FP N). INHAL:REMOVE TO FRESH AIR. SUPPORT BR THG (GIVE O*2/ARTF RESP) (FP N). EYES:IMMED FLUSH W/POTABLE WATER FOR MIN OF 15 MINUTES, SEEK ASSISTANCE FROM MD (FP N). SKIN:FLUSH W/COPIOUS AMTS OF

WATER. CALL MD (FP N).

Section 5 - Fire Fighting Measures
PURE LEAD

Fire Fighting Procedures:
WHEN HEATED TO POINT OF VAPORIZATION, TOXIC FUMES ARE EMITTED. USE NIOSH/MSHA APPROVED SCBA & FULL PROTECTIVE EQUIPMENT (FP N).
Unusual Fire or Explosion Hazard:
FIRE AND EXPLOSION HAZARDS MOD IN FORM OF DUST WHEN EXPOS TO HEAT/FLAME. WHEN HEATED, LEAD EMITS HIGHLY TOXIC FUMES; CAN REACT VIGOROUSLY W/OXIDIZING MATLS.
Extinguishing Media:
NOT APPLICABLE. MEDIA SUITABLE FOR SURROUNDING FIRE (FP N).
Flash Point: Flash Point Text: N/A

Autoignition Temperature:
Autoignition Temperature Text: N/A
Lower Limit(s): N/K
Upper Limit(s): N/K

Section 6 - Accidental Release Measures
PURE LEAD

Spill Release Procedures:
AVOID INHAL OF DUST/FUMES IN CONCENTRATIONS EXCEEDING OSHA LIMITS. VACUUMING RECOMMENDED. USE APPRVD RESPIRATORY PROT IF POSSIBILITY OF DUST/FUMES EXPOSURE EXISTS.

Section 7 - Handling and Storage
PURE LEAD

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
PURE LEAD

Repiratory Protection:
NIOSH/MSHA APPROVED DUST/FUME RESPIRATOR SHOULD BE WORN WHERE APPLICABLE LIMITS MAY BE EXCEEDED.
Ventilation:
LOC EXHAUST:ADEQ VENT SHOULD BE USED WHEN MATERIAL IS IN MOLTEN/DUSTY STATE. MECHANICAL:SAME AS LOC EXHAUST.
Protective Gloves:
IMPERVIOUS GLOVES (FP N).
Eye Protection: ANSI APPRVD CHEM WORKERS GOGGLES (FP N).
Other Protective Equipment: WORK CLOTHES SHOULD BE WORN & LAUNDERED I/A/W OSHA LEAD STANDARD 1910.1025.

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Work Hygenic Practices: NONE SPECIFIED BY MANUFACTURER.
Supplemental Health & Safety Information: NONE SPECIFIED BY MANUFACTURER.

Section 9 - Physical & Chemical Properties
PURE LEAD

HCC:
NRC/State License Number:
Net Property Weight for Ammo:
Boiling Point: Boiling Point Text: 2437F,1336C
Melting/Freezing Point: Melting/Freezing Text: N/K
Decomposition Point: Decomposition Text: N/K
Vapor Pressure: 1 @ 973 **Vapor Density:** 11.288 @20
Percent Volatile Organic Content:
Specific Gravity: 11.3
Volatile Organic Content Pounds per Gallon:
pH: N/K
Volatile Organic Content Grams per Liter:
Viscosity: N/P
Evaporation Weight and Reference: NOT APPLICABLE
Solubility in Water: NOT SOLUBLE
Appearance and Odor: BLUISH-GREY SOFT METAL
Percent Volatiles by Volume: N/A
Corrosion Rate: N/K

Section 10 - Stability & Reactivity Data
PURE LEAD

Stability Indicator: YES
Materials to Avoid:
OXIDIZING MATERIALS.
Stability Condition to Avoid:
CONTACT W/HYDROGEN PEROXIDE MAY CAUSE A VIOLENT REACTION. LEAD CAN REACT VIOLENTLY W/OXIDIZING MATERIALS.
Hazardous Decomposition Products:
AT TEMPERATURES ABOVE MELTING POINT, LEAD OXIDE FUMES MAY BE EVOLVED.
Hazardous Polymerization Indicator: NO
Conditions to Avoid Polymerization:
NOT RELEVANT.

Section 11 - Toxicological Information
PURE LEAD

Toxicological Information:
N/P

Section 12 - Ecological Information
PURE LEAD

Ecological Information:
N/P

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Section 13 - Disposal Considerations
PURE LEAD

Waste Disposal Methods:
SCRAP OR WASTE SHOULD BE RECYCLED OR DISPOSED OF IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS.

Section 14 - MSDS Transport Information
PURE LEAD

Transport Information:
N/P

Section 15 - Regulatory Information
PURE LEAD

SARA Title III Information:
N/P
Federal Regulatory Information:
N/P
State Regulatory Information:
N/P

Section 16 - Other Information
PURE LEAD

Other Information:
N/P

HAZCOM Label Information

Product Identification: PURE LEAD
CAGE: IO796
Assigned Individual: Y
Company Name: MC CANFIELD SONS
Company PO Box:
Company Street Address1: 1000 BRIGHTON STREET
Company Street Address2: UNION, NJ 07083 US
Health Emergency Telephone: 201-688-5050
Label Required Indicator: Y
Date Label Reviewed: 07/05/1994
Status Code: C
Manufacturer's Label Number:
Date of Label: 07/05/1994
Year Procured: N/K
Organization Code: G
Chronic Hazard Indicator: Y
Eye Protection Indicator: YES
Skin Protection Indicator: YES
Respiratory Protection Indicator: YES
Signal Word: NONE
Health Hazard: None
Contact Hazard: None
Fire Hazard: None

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Reactivity Hazard: None

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Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format)
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LEAD OXIDE, RED

Section 1 - Product and Company Identification	Section 9 - Physical & Chemical Properties
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Section 1 - Product and Company Identification
LEAD OXIDE, RED

Product Identification: LEAD OXIDE, RED
Date of MSDS: 05/01/1989 **Technical Review Date:** 05/25/1993
FSC: 6810 **NIIN:** 00-241-1120
Submitter: D DG
Status Code: C
MFN: 01
Article: N
Kit Part: N

Manufacturer's Information

Manufacturer's Name: J.T. BAKER INC.
Manufacturer's Address1: 222 RED SCHOOL LANE
Manufacturer's Address2: PHILLIPSBURG, NJ 08865
Manufacturer's Country: US
General Information Telephone: 201-859-2151
Emergency Telephone: 201-859-2151, CHEMTREC 800-424-9300
Emergency Telephone: 201-859-2151, CHEMTREC 800-424-9300
MSDS Preparer's Name: N/P
Proprietary: N
Reviewed: Y
Published: Y
CAGE: HO785
Special Project Code: N

Item Description

Item Name: LEAD OXIDE,RED,ANALYZED REAGENT
Item Manager:
Specification Number: MIL-L-51336
Type/Grade/Class: NONE
Unit of Issue: LB
Unit of Issue Quantity: 1
Type of Container: BOTTLE

Contractor Information

Contractor's Name: J.T. BAKER INC.
Contractor's Address1: 222 RED SCHOOL LANE
Contractor's Address2: PHILLIPSBURG, NJ 08865
Contractor's Telephone: 202-483-7616
Contractor's CAGE: HO785

Contractor Information

Contractor's Name: MALLINCKRODT BAKER, INC. (FORMERLY J.T. BAKER INC)
Contractor's Address1: 222 RED SCHOOL LANE
Contractor's Address2: PHILLIPSBURG, NJ 08865-2219
Contractor's Telephone: 800-582-2537
Contractor's CAGE: 70829

Section 2 - Compositon/Information on Ingredients
LEAD OXIDE, RED

Ingredient Name: LEAD(II,III)OXIDE (RED LEAD OXIDE)
Ingredient CAS Number: 1314-41-6 **Ingredient CAS Code:** M
RTECS Number: OG5425000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:

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>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: 98-100
% Enviromental Weight:
Other REC Limits: NONE SPECIFIED
OSHA PEL: 50 UG/M3 **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: 0.15 MG/M3 **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity:
DOT Reporting Quantity:
Ozone Depleting Chemical: N

Section 3 - Hazards Identification, Including Emergency Overview
LEAD OXIDE, RED

Health Hazards Acute & Chronic: ACUTE-INHALATION:IRRITATION OF BRONCHIA & LUNGS. INGESTION-ABDOMINAL PAIN & SPASM, NAUSEA, VOMITING, HEADACHE, CONVULSIONS, AND MAY BE FATAL. SKIN-IRRITATION. EYE:IRRITATION. CHRONIC: ANEMIA, KIDNEY D AMAGE, BLURRED VISION, CNS ABNORMALITIES.

Signs & Symptoms of Overexposure:
INHAL-METALLIC TASTE, CHEST & ABDOMINAL PAIN, & INCREASED BLOOD LEVELS MAY FOLLOW. INGEST- LEAD POISONING, MUSCLE WEAKNESS, "LEAD LINE" ON THE GUMS, DEFINITE APPETITE LOSS, INSOMNIA, DIZZINESS, HIGH L EAD LEVELS IN BLOOD & URINE WITH SHOCK,COMA & DEATH IN EXTREME CASES. SKIN-REDNESS.

Medical Conditions Aggravated by Exposure:
PERSONS WITH PRE-EXISTING CNS DISORDERS, OR PRE-EXPOSED TO LEAD MAY BECOME MORE SUSCEPTIBLE TO THE EFFECTS OF THIS SUBSTANCE.

LD50 LC50 Mixture: ORAL LD50 (RAT) IS 630 MG/KG

Route of Entry Indicators:
- **Inhalation:** YES
- **Skin:** YES
- **Ingestion:** YES

Carcenogenicity Indicators
- **NTP:** NO
- **IARC:** NO
- **OSHA:** NO

Carcinogenicity Explanation: LEAD/INORG LEAD COMPOUNDS ARE ANTICIPATED TO BE CARCINOGENS BY NTP, POSSIBLY CARCINOGEN BY IARC (2B & I)INADEQUATE EVID.

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Section 4 - First Aid Measures
LEAD OXIDE, RED

First Aid:
INHALATION-REMOVE TO FRESH AIR. GET MEDICAL ATTENTION FOR BREATHING PROBLEMS. INGESTION-INDUCE VOMITING IMMEDIATELY BY GIVING 2 GLASSES OF WATER & STICKING FINGER DOWN THROAT. CALL A PHYSICIAN IMMEDIA TELY. SKIN-WASH AREA WITH SOAP & WATER.GET MEDICAL ADVICE IF IRRITATION DEVELOPS. EYE-WASH WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES. CONSULT A PHYSICIAN.

Section 5 - Fire Fighting Measures
LEAD OXIDE, RED

Fire Fighting Procedures:
WEAR FIRE FIGHTING PROTECTIVE EQUIPMENT AND A FULL FACED SELF CONTAINED BREATHING APPARATUS. EVACUATE AREA. COOL FIRE EXPOSED CONTAINERS WITH WATER SPRAY.
Unusual Fire or Explosion Hazard:
COMBUSTION OR HEAT OF FIRE MAY PRODUCE HAZARDOUS DECOMPOSITION PRODUCTS AND VAPORS.
Extinguishing Media:
FOR SURROUNDING FIRES: USE WATER FOG, CARBON DIOXIDE, FOAM, OR DRY CHEMICAL.
Flash Point: Flash Point Text: N/R

Autoignition Temperature:
Autoignition Temperature Text: N/R
Lower Limit(s): N/R
Upper Limit(s): N/R

Section 6 - Accidental Release Measures
LEAD OXIDE, RED

Spill Release Procedures:
WEAR PROTECTIVE CLOTHING & RESPIRATORY EQUIPMENT SUITABLE FOR TOXIC DUSTS. SWEEP, OR SCOOP UP SPILLED MATERIAL. VACUUMING OR WET SWEEPING MAY BE USED TO AVOID DUST DISPERSAL. PACKAGE FOR RECLAMATION O R RECOVERY.

Section 7 - Handling and Storage
LEAD OXIDE, RED

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
LEAD OXIDE, RED

Repiratory Protection:
IF THE PEL IS EXCEEDED, A NIOSH-APPROVED HALF-MASK AIR-PURIFYING RESPIRATOR EQUIPPED WITH A HIGH-EFFICIENCY FILTER, OR ANY HALF-MASK SUPPLIED AIR RESPIRATOR MAY BE WORN UP TO CONCENTRATIONS OF 50 UG P ER CUBIC METER (8-HR TWA).
Ventilation:
A SYSTEM OF LOCAL &/OR GENERAL EXHAUST IS RECOMMENDED TO KEEP EXPOSURE BELOW THE PEL.
Protective Gloves:
IMPERVIOUS GLOVES.
Eye Protection: CHEMICAL SAFETY GOGGLES
Other Protective Equipment: WEAR IMPERVIOUS PROTECTIVE CLOTHING (BOOTS, LAB COAT, APRON OR COVERALLS). EYE WASH STATION.
Work Hygenic Practices: EATING, DRINKING & SMOKING SHOULD NOT BE ALLOWED IN AREAS WHERE SOLID/LIQUIDS CONTAINING SOLUBLE LEAD IS STORED/HANDLED.
Supplemental Health & Safety Information: PER MFR NOT REGULATED BY DOT.

Section 9 - Physical & Chemical Properties
LEAD OXIDE, RED

HCC: N1
NRC/State License Number: N/R
Net Property Weight for Ammo: N/R
Boiling Point: Boiling Point Text: N/R
Melting/Freezing Point: Melting/Freezing Text: N/K
Decomposition Point: Decomposition Text: UNKNOWN
Vapor Pressure: N/R **Vapor Density:** N/R
Percent Volatile Organic Content:
Specific Gravity: 9.10
Volatile Organic Content Pounds per Gallon:
pH: N/R
Volatile Organic Content Grams per Liter:
Viscosity: N/R
Evaporation Weight and Reference: N/R
Solubility in Water: <0.1%
Appearance and Odor: RED POWDER, ODORLESS.
Percent Volatiles by Volume: 0
Corrosion Rate: UNKNOWN

Section 10 - Stability & Reactivity Data
LEAD OXIDE, RED

Stability Indicator: YES
Materials to Avoid:
STRONG REDUCING AGENTS
Stability Condition to Avoid:
HIGH HEAT
Hazardous Decomposition Products:
LEAD FUMES
Hazardous Polymerization Indicator: NO

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Conditions to Avoid Polymerization:
NOT APPLICABLE

Section 11 - Toxicological Information
LEAD OXIDE, RED

Toxicological Information:
N/P

Section 12 - Ecological Information
LEAD OXIDE, RED

Ecological Information:
N/P

Section 13 - Disposal Considerations
LEAD OXIDE, RED

Waste Disposal Methods:
PACKAGE UNRECLAIMABLE MATERIAL FOR DISPOSAL IN A RCRA-APPROVED WASTE FACILITY. ENSURE COMPLIANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS.

Section 14 - MSDS Transport Information
LEAD OXIDE, RED

Transport Information:
N/P

Section 15 - Regulatory Information
LEAD OXIDE, RED

SARA Title III Information:
N/P
Federal Regulatory Information:
N/P
State Regulatory Information:
N/P

Section 16 - Other Information
LEAD OXIDE, RED

Other Information:
N/P

HMIS Transportation Information

Product Identification: LEAD OXIDE, RED
Transporation ID Number: 59544
Responsible Party CAGE: HO785
Date MSDS Prepared: 05/01/1989
Date MSDS Reviewed: 05/25/1993
MFN: 05/25/1993
Submitter: D DG
Status Code: C

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Container Information
Unit of Issue: LB
Container Quantity: 1
Type of Container: BOTTLE
Net Unit Weight: 1.0 LBS

Article without MSDS: N
Technical Entry NOS Shipping Number: LEAD OXIDE, RED.
Radioactivity:
Form:
Net Explosive Weight:
Coast Guard Ammunition Code:
Magnetism: N/P
AF MMAC Code:
DOD Exemption Number:
Limited Quantity Indicator:
Multiple Kit Number: 0
Kit Indicator: N
Kit Part Indicator: N
Review Indicator: Y
Additional Data:
LEAD TETRAOXIDE (RED LEAD OXIDE) IS NOT REGULATED.

Department of Transportation Information
DOT Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION
DOT PSN Code: ZZZ
Symbols: N/R
DOT PSN Modifier:
Hazard Class: N/R
UN ID Number: N/R
DOT Packaging Group: N/R
Label: N/R
Special Provision(s): N/R
Packaging Exception: N/R
Non Bulk Packaging: N/R
Bulk Packaging: N/R
Maximimum Quanity in Passenger Area: N/R
Maximimum Quanity in Cargo Area: N/R
Stow in Vessel Requirements: N/R
Requirements Water/Sp/Other: N/R

IMO Detail Information
IMO Proper Shipping Name: NOT REGULATED FOR THIS MODE OF TRANSPORTATION
IMO PSN Code: ZZZ
IMO PSN Modifier:
IMDG Page Number: N/R
UN Number: N/R
UN Hazard Class: N/R
IMO Packaging Group: N/R
Subsidiary Risk Label: N/R
EMS Number: N/R
Medical First Aid Guide Number: N/R

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Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format)
For Cornell University Convenience Only

MAGNESIUM

Section 1 - Product and Company Identification	Section 9 - Physical & Chemical Properties
Section 2 - Compositon/Information on Ingredients	Section 10 - Stability & Reactivity Data
Section 3 - Hazards Identification Including Emergency Overview	Section 11 - Toxicological Information
Section 4 - First Aid Measures	Section 12 - Ecological Information
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Section 1 - Product and Company Identification
MAGNESIUM

Product Identification: MAGNESIUM
Date of MSDS: 11/25/1985 **Technical Review Date:** 02/09/1993
FSC: 6810 **NIIN:** **LIIN:** 00N038810
Submitter: N EN
Status Code: C
MFN: 01
Article: N
Kit Part: N

00064802

Manufacturer's Information

Manufacturer's Name: BELMONT METALS INC
Manufacturer's Address1: 330 BELMONT AVE
Manufacturer's Address2: BROOKLYN, NY 11207
Manufacturer's Country: US
General Information Telephone: 718-342-4900
Emergency Telephone: 718-342-4900
Emergency Telephone: 718-342-4900
MSDS Preparer's Name: BRUCE N. REED
Proprietary: N
Reviewed: N
Published: Y
CAGE: 70774
Special Project Code: N

Contractor Information

Contractor's Name: BELMONT METALS INC
Contractor's Address1: 330 BELMONT AVE
Contractor's Address2: BROOKLYN, NY 11207
Contractor's Telephone: 718-342-4900
Contractor's CAGE: 70774

Section 2 - Compositon/Information on Ingredients
MAGNESIUM

Ingredient Name: MAGNESIUM
Ingredient CAS Number: 7439-95-4 **Ingredient CAS Code:** M
RTECS Number: OM2100000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: 99.8
% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: N/K (FP N) **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: N/K (FP N) **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity:
DOT Reporting Quantity:
Ozone Depleting Chemical: N

Section 3 - Hazards Identification, Including Emergency Overview
MAGNESIUM

Health Hazards Acute & Chronic: ACUTE: INHAL: DUST MAY CAUSE IRRITATION TO UPPER RESPIRATORY TRACT. INGEST: INGEST IS UNLIKELY DUE TO PHYSICAL ST. IF DUSTS ARE PRDCD, AMTS INGESTED INCIDENTAL TO INDUST HNDLG ARE NOT LIKELY TO CAUSE INJURY; HOWEVER, INGEST OF LGR AMTS COULD CAUSE SERIOUS INJURY, EVEN DEATH, BECAUSE ACUTE ORAL TOX (EFTS OF OVEREXP)

Signs & Symptoms of Overexposure:
HLTH HAZ: OF MAGNESIUM IS CONSIDERED MODERATE. EYE: MECH INJURY ONLY. SKIN: MECH INJURY ONLY. MOLTEN MATERIAL MAY BURN SKIN. SIGNS & SYMPS: REPEATED EXPOSURES ARE NOT ANTICIPATED TO CAUSE ANY SIGNIFIC ANT ADVERSE EFFECT.

Medical Conditions Aggravated by Exposure:
NO.

LD50 LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.

Route of Entry Indicators:
- **Inhalation:** YES
- **Skin:** NO
- **Ingestion:** NO

Carcenogenicity Indicators
- **NTP:** NO
- **IARC:** NO
- **OSHA:** NO

Carcinogenicity Explanation: NOT RELEVANT

Section 4 - First Aid Measures
MAGNESIUM

First Aid:
INHAL: REMOVE TO FRESH AIR IF EFFECTS OCCUR. CONSULT A PHYSICIAN. INGEST: INDUCE VOMITING IF LARGE AMOUNTS ARE INGESTED. CONSULT MEDICAL PERSONNEL. EYE: IRRIGATE IMMEDIATELY W/WATER FOR AT LEAST 15 MI NUTES. SKIN: WASH OFF IN FLOWING WATER OR SHOWER.

Section 5 - Fire Fighting Measures
MAGNESIUM

Fire Fighting Procedures:
WEAR NIOSH/MSHA APPROVED SCBA AND FULL PROTECTIVE EQUIPMENT (FP N).
Unusual Fire or Explosion Hazard:
WHEN HEATED IN AIR TO A TEMP NEAR ITS MELT PT, MAGNESIUM IGNITES & BURNS W/A WHITE FLAME. USE OF WATER ON MOLTEN MAGNESIUM WILL PRDCE HYDROGEN GAS & (SUPP DATA)

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Extinguishing Media:
SMOTHER BURNING MAGNESIUM BY COVERING W/AN EXTINGUISHING POWDER APPROVED FOR USE ON MAGNESIUM FIRES SUCH AS G1, MET-L-X.
Flash Point: Flash Point Text: NONE

Autoignition Temperature:
Autoignition Temperature Text: N/A
Lower Limit(s): N/A
Upper Limit(s): N/A

Section 6 - Accidental Release Measures
MAGNESIUM

Spill Release Procedures:
CLEAN OFF AND USE.

Section 7 - Handling and Storage
MAGNESIUM

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
MAGNESIUM

Repiratory Protection:
USE NIOSH/MSHA APPROVED RESPIRATOR APPROPRIATE FOR EXPOSURE OF CONCERN (FP N).
Ventilation:
GOOD GEN VENT SHOULD BE SUFFICIENT FOR MOST CNDTNS. LOC EXHAUST VENT MAY BE NEC FOR SOME OPERATIONS.
Protective Gloves:
IMPERVIOUS GLOVES (FP N).
Eye Protection: CHEMICAL WORKERS GOGGLES (FP N).
Other Protective Equipment: NOT APPLICABLE
Work Hygenic Practices: NONE SPECIFIED BY MANUFACTURER.
Supplemental Health & Safety Information: EXPLO HAZ: MAY CAUSE AN EXPLOSION.

Section 9 - Physical & Chemical Properties
MAGNESIUM

HCC:
NRC/State License Number:
Net Property Weight for Ammo:
Boiling Point: Boiling Point Text: 2030F,1110C
Melting/Freezing Point: Melting/Freezing Text: 1202F,650C
Decomposition Point: Decomposition Text: N/K
Vapor Pressure: N/A **Vapor Density:** N/A
Percent Volatile Organic Content:

Specific Gravity: 1.74
Volatile Organic Content Pounds per Gallon:
pH: N/K
Volatile Organic Content Grams per Liter:
Viscosity: N/P
Evaporation Weight and Reference: NOT APPLICABLE
Solubility in Water: NOT APPLICABLE
Appearance and Odor: SILVER SOLID, NO ODOR.
Percent Volatiles by Volume: N/A
Corrosion Rate: N/K

Section 10 - Stability & Reactivity Data
MAGNESIUM

Stability Indicator: YES
Materials to Avoid:
ACID, WATER, REACTS W/ACID TO FORM HYDROGEN GAS.
Stability Condition to Avoid:
NONE SPECIFIED BY MANUFACTURER.
Hazardous Decomposition Products:
NONE UNDER NORMAL USE OR STORAGE.
Hazardous Polymerization Indicator: NO
Conditions to Avoid Polymerization:
NOT RELEVANT

Section 11 - Toxicological Information
MAGNESIUM

Toxicological Information:
N/P

Section 12 - Ecological Information
MAGNESIUM

Ecological Information:
N/P

Section 13 - Disposal Considerations
MAGNESIUM

Waste Disposal Methods:
MATERIAL CAN BE RECYCLED THROUGH SECONDARY SCRAP RECLAIMERS. DISPOSE OF IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS (FP N).

Section 14 - MSDS Transport Information
MAGNESIUM

Transport Information:
N/P

Section 15 - Regulatory Information
MAGNESIUM

SARA Title III Information:
N/P
Federal Regulatory Information:
N/P
State Regulatory Information:
N/P

Section 16 - Other Information
MAGNESIUM

Other Information:
N/P

HAZCOM Label Information

Product Identification: MAGNESIUM
CAGE: 70774
Assigned Individual: N
Company Name: BELMONT METALS INC
Company PO Box:
Company Street Address1: 330 BELMONT AVE
Company Street Address2: BROOKLYN, NY 11207 NK
Health Emergency Telephone: 718-342-4900
Label Required Indicator: Y
Date Label Reviewed: 01/28/1993
Status Code: C
Manufacturer's Label Number:
Date of Label: 01/28/1993
Year Procured: N/K
Organization Code: G
Chronic Hazard Indicator: N
Eye Protection Indicator: YES
Skin Protection Indicator: YES
Respiratory Protection Indicator: YES
Signal Word: CAUTION
Health Hazard: Slight
Contact Hazard: Slight
Fire Hazard: None
Reactivity Hazard: None

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Material Safety Data Sheets

Division of Facilities Services

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MAGNESIUM POWDER

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Section 2 - Compositon/Information on Ingredients	Section 10 - Stability & Reactivity Data
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Section 1 - Product and Company Identification
MAGNESIUM POWDER

Product Identification: MAGNESIUM POWDER
Date of MSDS: 06/14/1993 **Technical Review Date:** 06/03/1994
FSC: 6810 **NIIN:** 00-935-5878
Submitter: D DG
Status Code: C
MFN: 02
Article: N
Kit Part: N

00064808

Manufacturer's Information

Manufacturer's Name: READE MFG CO INC
Manufacturer's Address1: RIDGEWAY BLVD
Manufacturer's Address2: LAKEHURST, NJ 08733
Manufacturer's Country: US
General Information Telephone: 800-424-9300
Emergency Telephone: 800-424-9300
Emergency Telephone: 800-424-9300
MSDS Preparer's Name: N/P
Proprietary: N
Reviewed: Y
Published: Y
CAGE: 81454
Special Project Code: N

Item Description

Item Name: MAGNESIUM,TECHNICAL
Item Manager: S9G
Specification Number: MIL-P-14067
Type/Grade/Class: TYPE I
Unit of Issue: DR **Quantitative Expression:** 00000000125LB
Unit of Issue Quantity: 1
Type of Container: DRUM

Contractor Information

Contractor's Name: READE MFG CO INC
Contractor's Address1: RIDGEWAY BLVD
Contractor's Address2: LAKEHURST, NJ 08733
Contractor's Telephone: UNKNOWN
Contractor's CAGE: 81454

Section 2 - Compositon/Information on Ingredients
MAGNESIUM POWDER

Ingredient Name: MAGNESIUM
Ingredient CAS Number: 7439-95-4 **Ingredient CAS Code:** M
RTECS Number: OM2100000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: 99.8

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% Enviromental Weight:
Other REC Limits: NONE RECOMMENDED
OSHA PEL: NOT ESTABLISHED **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: NOT ESTABLISHED **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity:
DOT Reporting Quantity:
Ozone Depleting Chemical: N

Section 3 - Hazards Identification, Including Emergency Overview
MAGNESIUM POWDER

Health Hazards Acute & Chronic: INHALATION-MAY IRRITATE MUCOUS MEMBRANES OR UPPER RESPIRATORY TRACT. EYES-MECHANICAL INJURY OR PARTICLES MAY EMBED IN EYE. SKIN-EMBEDDING OF PARTICLES IN SKIN. INGESTION-INGESTION IS UNLIKELY; HOWEVER , INGESTION OF LARGE AMOUNTS OF MAGNESIUM POWDER COULD CAUSE INJURY.

Signs & Symptoms of Overexposure:
EXPOSURE TO MAGNESIUM OXIDE FUME SUBSEQUENT TO BURNING, WELDING OR MOLTEN METAL WORK CAN RESULT IN METAL FUME FEVER. METAL FUME FEVER'S TEMPORARY SYMPTOMS INCLUDE FEVER, CHILLS, NAUSEA, VOMITING AND M USCLE PAIN.

Medical Conditions Aggravated by Exposure:
NONE SPECIFIED BY MANUFACTURER.

LD50 LC50 Mixture: TLV: 10 MG/M3

Route of Entry Indicators:
Inhalation: YES
Skin: YES
Ingestion: NO

Carcenogenicity Indicators
NTP: NO
IARC: NO
OSHA: NO

Carcinogenicity Explanation: NOT CARCINOGENIC.

Section 4 - First Aid Measures
MAGNESIUM POWDER

First Aid:
INHALATION-REMOVE TO FRESH AIR IF INHALATION OCCURS. EYES-FLUSH EYES WITH WATER THOROUGHLY. CONSULT A PHYSICIAN. SKIN-WASH WITH SOAP & WATER THOROUGHLY TO REMOVE PARTICLES. INGESTION-IF LARGE AMOUNTS OF MAGNESIUM POWDER ARE INGESTED, INDUCE VOMITING AND CONSULT A PHYSICIAN.

Section 5 - Fire Fighting Measures
MAGNESIUM POWDER

Fire Fighting Procedures:
WEAR FIRE FIGHTING GLASSES WHEN FIGHTING FIRES. APPLY EXTINGUISHING AGENTS SLOWKY. USE SELF-CONTAINED BREATHING APPARATUS OR APPROACH FROM UP WIND. NO WATER.
Unusual Fire or Explosion Hazard:
MAGNESIUM POWDER BURNS VIGOROUSLY ONCE IT IS IGNITED. MAGNESIUM POWDER CAN EXPLODE IF SUSPENDED IN AIR. DO NOT USE WATER, IT WILL ACT AS AN ACCELERANT.
Extinguishing Media:
SMOTHER BURNING MAGNESIUM POWDER BY GENTLY COVERING WITH DRY GENTS ONLY SUCH AS MELTING FLUX, DRY SAND, DRY TALC, ETC.E
Flash Point: Flash Point Text: NOT APPLICABLE

Autoignition Temperature:
Autoignition Temperature Text: N/R
Lower Limit(s): N/R
Upper Limit(s): N/R

Section 6 - Accidental Release Measures
MAGNESIUM POWDER

Spill Release Procedures:
MAGNESIUM POWDER IF SPILLED SHOULD BE PROMPTLY SWEPT UP USING NATURAL FIBER BRUSHES OR BROOMS AND NON-SPARKING DUST PAN. THE POWDER SWEEPING MUST BE KEPT SEPERATE FROM OTHER TRASH AND REFUSE. IF THE P OWDER IS DRY PLACE IN A COVERED STEEL DRUM.

Section 7 - Handling and Storage
MAGNESIUM POWDER

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
MAGNESIUM POWDER

Repiratory Protection:
USE AN APPROVED DUST MASK OR RESPIRATOR.
Ventilation:
EITHER EXTREME CARE IN HANDLING OR A VENTILATION SYSTEM (EXPLOSION PROOF) IS NEEDED TO PREVENT ANY AIRBORNE CONC.
Protective Gloves:
GLOVES RECOMMENDED.
Eye Protection: SAFETY GLASSES OR GOGGLES RECOMMENDED.
Other Protective Equipment: FLAME RESISTANT CLOTHING WITHOUT CUFFS OR POCKETS

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IS RECOMMENDED. AVOID WEARING FABRICS THAT CAUSE STATIC SPARKS.
Work Hygenic Practices: ACCUMULATION OF MAGNESIUM POWDERS OR DUST MUST BE PREVENTED. THOROUGH CLEANUP INCLUDING RAFTERS MUST BE DONE FREQUENTLY.
Supplemental Health & Safety Information: WORK ARES MUST BE KEPT CLEAN AT ALL TIMES.

Section 9 - Physical & Chemical Properties
MAGNESIUM POWDER

HCC: R2
NRC/State License Number: N/R
Net Property Weight for Ammo: N/R
Boiling Point: Boiling Point Text: 2025F,1107C
Melting/Freezing Point: Melting/Freezing Text: 1202F,650C
Decomposition Point: Decomposition Text: N/R
Vapor Pressure: N/R **Vapor Density:** N/R
Percent Volatile Organic Content:
Specific Gravity: 1.74
Volatile Organic Content Pounds per Gallon:
pH: N/R
Volatile Organic Content Grams per Liter:
Viscosity: N/R
Evaporation Weight and Reference: N/K
Solubility in Water: NONE
Appearance and Odor: SILVER GREY SOLID METALLIC POWDER, NO ODOR.
Percent Volatiles by Volume: N/R
Corrosion Rate: N/R

Section 10 - Stability & Reactivity Data
MAGNESIUM POWDER

Stability Indicator: YES
Materials to Avoid:
ACIDS, WATER.
Stability Condition to Avoid:
NO MOISTURE. KEEP AWAY FROM OPEN FLAME, SPARKS, MODERATE HEAT AND SOURCES OF IGNITION.
Hazardous Decomposition Products:
REACTS WITH ACI OR WATER TO PRODUCE HYDROGEN GAS, WHICH IS FLAMMABLE & EXPLOSIVE.
Hazardous Polymerization Indicator: NO
Conditions to Avoid Polymerization:
NONE

Section 11 - Toxicological Information
MAGNESIUM POWDER

Toxicological Information:
N/P

Section 12 - Ecological Information
MAGNESIUM POWDER

Ecological Information:
N/P

Section 13 - Disposal Considerations
MAGNESIUM POWDER

Waste Disposal Methods:
WASTE MAGNESIUM POWDER SHOULD BE DISPOSED OF UNDER RELEVENT FEDERA, STATE AND LOCAL REGULATIONS. MAGNESIUM IS A RECYCLABLE MATERIAL AND REUSE OR RECYCLING ARE PREFERABLE TO OTHER METHODS OF DISPOSAL.

Section 14 - MSDS Transport Information
MAGNESIUM POWDER

Transport Information:
N/P

Section 15 - Regulatory Information
MAGNESIUM POWDER

SARA Title III Information:
N/P
Federal Regulatory Information:
N/P
State Regulatory Information:
N/P

Section 16 - Other Information
MAGNESIUM POWDER

Other Information:
N/P

HMIS Transportation Information

Product Identification: MAGNESIUM POWDER
Transporation ID Number: 93322
Responsible Party CAGE: 81454
Date MSDS Prepared: 06/14/1993
Date MSDS Reviewed: 06/03/1994
MFN: 06/03/1994
Submitter: D DG
Status Code: C

Container Information
- **Unit of Issue:** DR
- **Container Quantity:** 1
- **Type of Container:** DRUM
- **Net Unit Weight:** 150 LBS

Article without MSDS: N
Technical Entry NOS Shipping Number:
Radioactivity: N/R

Form:
Net Explosive Weight: N/R
Coast Guard Ammunition Code: N/R
Magnetism: N/P
AF MMAC Code: NR
DOD Exemption Number: N/R
Limited Quantity Indicator:
Multiple Kit Number: 0
Kit Indicator: N
Kit Part Indicator: N
Review Indicator: Y
Additional Data:

Department of Transportation Information

DOT Proper Shipping Name: WATER-REACTIVE SOLID, SELF-HEATING, N.O.S.
DOT PSN Code: NQG
Symbols: G
DOT PSN Modifier:
Hazard Class: 4.3
UN ID Number: UN3135
DOT Packaging Group: II
Label: DANGEROUS WHEN WET, SPONTANEOUSLY COMB
Special Provision(s): B101,B106
Packaging Exception:
Non Bulk Packaging: 212
Bulk Packaging: 242
Maximimum Quanity in Passenger Area: 15 KG
Maximimum Quanity in Cargo Area: 50 KG
Stow in Vessel Requirements: E
Requirements Water/Sp/Other:

IMO Detail Information

IMO Proper Shipping Name: SYNTHETIC FABRICS,
IMO PSN Code: ODA
IMO PSN Modifier: OILY o
IMDG Page Number: SEE4233
UN Number: 1373
UN Hazard Class: 4.2
IMO Packaging Group: III
Subsidiary Risk Label: -
EMS Number: 4.2-05
Medical First Aid Guide Number: NON

IATA Detail Information

IATA Proper Shipping Name: WATER-REACTIVE SOLID, N.O.S. *
IATA PSN Code: ZNE
IATA PSN Modifier:
IATA UN Id Number: 2813
IATA UN Class: 4.3
Subsidiary Risk Class:
UN Packaging Group: II
IATA Label: DANGEROUS WHEN WET

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Packaging Note for Passengers: 415
Maximum Quantity for Passengers: 15 KG
Packaging Note for Cargo: 417
Maximum Quantity for Cargo: 50 KG
Exceptions:

AFI Detail Information

AFI Proper Shipping Name: WATER-REACTIVE SOLID, N.O.S.
AFI Symbols: *
AFI PSN Code: ZNE
AFI PSN Modifier:
AFI UN Id Number: UN2813
AFI Hazard Class: 4.3
AFI Packing Group: II
AFI Label:
Special Provisions: P5
Back Pack Reference: A8.4

HAZCOM Label Information

Product Identification: MAGNESIUM POWDER
CAGE: 81454
Assigned Individual: N
Company Name: READE MFG CO INC
Company PO Box:
Company Street Address1: RIDGEWAY BLVD
Company Street Address2: LAKEHURST, NJ 08733 US
Health Emergency Telephone: 800-424-9300
Label Required Indicator: Y
Date Label Reviewed: 06/03/1994
Status Code: C
Manufacturer's Label Number: N/R
Date of Label: 06/03/1994
Year Procured: N/K
Organization Code: F
Chronic Hazard Indicator: Y
Eye Protection Indicator: YES
Skin Protection Indicator: YES
Respiratory Protection Indicator: YES
Signal Word: WARNING
Health Hazard: Moderate
Contact Hazard: Slight
Fire Hazard: Moderate
Reactivity Hazard: None

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CORNELL

Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format)
For Cornell University Convenience Only

MEK

Section 1 - Product and Company Identification	Section 9 - Physical & Chemical Properties
Section 2 - Compositon/Information on Ingredients	Section 10 - Stability & Reactivity Data
Section 3 - Hazards Identification Including Emergency Overview	Section 11 - Toxicological Information
Section 4 - First Aid Measures	Section 12 - Ecological Information
Section 5 - Fire Fighting Measures	Section 13 - Disposal Considerations
Section 6 - Accidental Release Measures	Section 14 - MSDS Transport Information
Section 7 - Handling and Storage	Section 15 - Regulatory Information
Section 8 - Exposure Controls & Personal Protection	Section 16 - Other Information

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Section 1 - Product and Company Identification
MEK

Product Identification: MEK
Date of MSDS: 07/05/1994 **Technical Review Date:** 02/02/1995
FSC: 6810 **NIIN: LIIN:** 00N056895
Submitter: N EN
Status Code: C
MFN: 01
Article: N
Kit Part: N

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Manufacturer's Information

Manufacturer's Name: PARKS CORP
Post Office Box: 5
Manufacturer's Address1:
Manufacturer's Address2: SOMERSET, MA 02726
Manufacturer's Country: US
General Information Telephone: 617-679-5938
Emergency Telephone: 617-679-5938
Emergency Telephone: 617-679-5938
MSDS Preparer's Name: N/P
Proprietary: N
Reviewed: N
Published: Y
CAGE: GO179
Special Project Code: N

Contractor Information

Contractor's Name: PARKS CORP
Post Office Box: 5
Contractor's Address1: MAIN ST
Contractor's Address2: SOMERSET, MA 02726
Contractor's Telephone: 508-679-5938
Contractor's CAGE: GO179

Contractor Information

Contractor's Name: PARKS CORPORATION
Post Office Box: 5
Contractor's Address1: UNKNOWN
Contractor's Address2: SOMERSET, MA 02726
Contractor's Telephone: 508-679-5938
Contractor's CAGE: 6L244

Section 2 - Compositon/Information on Ingredients
MEK

Ingredient Name: 2-BUTANONE; (METHYL ETHYL KETONE) (MEK) (SARA 313) (CERCLA)
Ingredient CAS Number: 78-93-3 **Ingredient CAS Code:** M
RTECS Number: EL6475000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:

% Text: 100
% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: 200 PPM **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: 200 PPM;300 STEL **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity: 5000 LBS
DOT Reporting Quantity: 5000 LBS
Ozone Depleting Chemical: N

Section 3 - Hazards Identification, Including Emergency Overview
MEK

Health Hazards Acute & Chronic: CAUSES EYE BURNS. VAPORS IRRITATING TO EYES, NOSE, THROAT & CAN RESULT IN HEADACHE, DIZZINESS, NAUSEA, WEAKNESS & LOSS OF CONSCIOUSNESS.

Signs & Symptoms of Overexposure:
SEE HEALTH HAZARDS.

Medical Conditions Aggravated by Exposure:
NONE SPECIFIED BY MANUFACTURER.

LD50 LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.

Route of Entry Indicators:
Inhalation: YES
Skin: NO
Ingestion: NO

Carcenogenicity Indicators
NTP: NO
IARC: NO
OSHA: NO

Carcinogenicity Explanation: NOT RELEVANT

Section 4 - First Aid Measures
MEK

First Aid:
INGEST:CALL MD IMMEDIATELY (FP N). SKIN:FLUSH W/COPIOUS AMOUNTS OF WATER. CALL MD (FP N). INHAL:REMOVE TO FRESH AIR, IF BREATHING IRREGULAR OR STOPPED, START RESUSCITATION, ADMINISTER OXYGEN. EYES:FLU SH W/WATER FOR AT LEAST 15 MINUTES. CALL MD.

Section 5 - Fire Fighting Measures
MEK

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Fire Fighting Procedures:
USE NIOSH/MSHA APPROVED SCBA & FULL PROTECTIVE EQUIPMENT (FP N). KEEP UPWIND, COOL EXPOSED CONTAINERS W/WATER.
Unusual Fire or Explosion Hazard:
FLAMMABLE.
Extinguishing Media:
FOAM, CO*2, DRY CHEMICAL, WATER FOG.
Flash Point: Flash Point Text: 20.0F,-6.7C

Autoignition Temperature:
Autoignition Temperature Text: N/A
Lower Limit(s): 1.8%
Upper Limit(s): 10%

Section 6 - Accidental Release Measures
MEK

Spill Release Procedures:
REMOVE IGNITION SOURCES. KEEP PEOPLE AWAY. VENTILATE ENCLOSED SPACES. OPEN WINDOWS & DOORS. AVOID BREATHING VAPOR. ADD ABSORBENT TO SPILL AREA. RECOVER FREE LIQUID.

Section 7 - Handling and Storage
MEK

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
MEK

Repiratory Protection:
NIOSH/MSHA APPROVED ORGANIC CANISTER OR AIR-SUPPLIED MASK.
Ventilation:
USE W/ADEQUATE VENTILATION. NO SMOKING OR FLAME.
Protective Gloves:
SYNTHETIC RUBBER GLOVES.
Eye Protection: ANSI APPROVED CHEM WORKERS GOGGS (FP N).
Other Protective Equipment: ANSI APPROVED EMERGENCY EYE WASH (FP N).
Work Hygenic Practices: NONE SPECIFIED BY MANUFACTURER.
Supplemental Health & Safety Information: NONE SPECIFIED BY MANUFACTURER.

Section 9 - Physical & Chemical Properties
MEK

HCC: F3
NRC/State License Number:
Net Property Weight for Ammo:
Boiling Point: Boiling Point Text: 175F,79C

Melting/Freezing Point: Melting/Freezing Text: N/K
Decomposition Point: Decomposition Text: N/K
Vapor Pressure: 71 **Vapor Density:** 2.48
Percent Volatile Organic Content:
Specific Gravity: 0.81 (H*2O=1)
Volatile Organic Content Pounds per Gallon:
pH: N/K
Volatile Organic Content Grams per Liter:
Viscosity: N/P
Evaporation Weight and Reference: 5.8 (BUTYL ACETATE=1)
Solubility in Water: MODERATE
Appearance and Odor: CLEAR, COLORLESS LIQUID; PLEASANT ODOR.
Percent Volatiles by Volume: 100
Corrosion Rate: N/K

Section 10 - Stability & Reactivity Data
MEK

Stability Indicator: YES
Materials to Avoid:
STRONG OXIDANTS, WILL DISSOLVE SOME PLASTICS & RUBBER.
Stability Condition to Avoid:
NONE SPECIFIED BY MANUFACTURER.
Hazardous Decomposition Products:
CARBON MONOXIDE, IF NOT BURNED COMPLETELY.
Hazardous Polymerization Indicator: NO
Conditions to Avoid Polymerization:
NOT RELEVANT

Section 11 - Toxicological Information
MEK

Toxicological Information:
N/P

Section 12 - Ecological Information
MEK

Ecological Information:
N/P

Section 13 - Disposal Considerations
MEK

Waste Disposal Methods:
DISPOSAL MUST BE I/A/W FEDERAL, STATE & LOCAL REGULATIONS (FP N). ABSORB ON SOLIDS & INCINERATE. RUN-OFF TO WATERWAY CREATED FIRE HAZARD; NOTIFY FIRE AGENCIES.

Section 14 - MSDS Transport Information
MEK

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Transport Information:
N/P

Section 15 - Regulatory Information
MEK

SARA Title III Information:
N/P
Federal Regulatory Information:
N/P
State Regulatory Information:
N/P

Section 16 - Other Information
MEK

Other Information:
N/P

HAZCOM Label Information

Product Identification: MEK
CAGE: GO179
Assigned Individual: Y
Company Name: PARKS CORP
Company PO Box: 5
Company Street Address1: MAIN ST
Company Street Address2: SOMERSET, MA 02726 US
Health Emergency Telephone: 617-679-5938
Label Required Indicator: Y
Date Label Reviewed: 02/02/1995
Status Code: C
Manufacturer's Label Number:
Date of Label: 02/02/1995
Year Procured: N/K
Organization Code: G
Chronic Hazard Indicator: N
Eye Protection Indicator: YES
Skin Protection Indicator: YES
Respiratory Protection Indicator: YES
Signal Word: DANGER
Health Hazard: Moderate
Contact Hazard: Severe
Fire Hazard: Severe
Reactivity Hazard: None

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CORNELL

Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format)
For Cornell University Convenience Only

MERCURY, MERCURY

Section 1 - Product and Company Identification	Section 9 - Physical & Chemical Properties
Section 2 - Compositon/Information on Ingredients	Section 10 - Stability & Reactivity Data
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Section 4 - First Aid Measures	Section 12 - Ecological Information
Section 5 - Fire Fighting Measures	Section 13 - Disposal Considerations
Section 6 - Accidental Release Measures	Section 14 - MSDS Transport Information
Section 7 - Handling and Storage	Section 15 - Regulatory Information
Section 8 - Exposure Controls & Personal Protection	Section 16 - Other Information

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Section 1 - Product and Company Identification
MERCURY, MERCURY

Product Identification: MERCURY, MERCURY
Date of MSDS: 11/05/1992 **Technical Review Date:** 03/31/1999
FSC: 6810 **NIIN:** 00-281-7453
Submitter: D DG
Status Code: C
MFN: 01
Article: N
Kit Part: N

Manufacturer's Information

Manufacturer's Name: MERIAM INSTRUMENTS CO., THE
Manufacturer's Address1: 10920 MADISON AVE.
Manufacturer's Address2: CLEVELAND, OH 44102-2526
Manufacturer's Country: US
General Information Telephone: 216-281-1100
Emergency Telephone: 216-281-1100
Emergency Telephone: 216-281-1100
MSDS Preparer's Name: DOD-HMIS (DGSC-SSH)GASTON
Proprietary: N
Reviewed: Y
Published: Y
CAGE: 39739
Special Project Code: N

Item Description

Item Name: MERCURY,ACS
Item Manager: S9G
Specification Number: NK
Type/Grade/Class: NK
Unit of Issue: BT **Quantitative Expression:** 00000000500GM
Unit of Issue Quantity: G
Type of Container:

Preparer Information

Preparer's Name: MERIAM INSTRUMENT CO, DIV OF THE SCOTT & FETZER CO
Preparer's Address1: 10920 MADISON AVE
Preparer's Address2: CLEVELAND, OH 44102-2526
Preparer's CAGE: 39739
Assigned Individual: N

Contractor Information

Contractor's Name: MERIAM INSTRUMENT CO, DIV OF THE SCOTT & FETZER CO
Contractor's Address1: 10920 MADISON AVE
Contractor's Address2: CLEVELAND, OH 44102-2526
Contractor's Telephone: 216-281-1100
Contractor's CAGE: 39739

Section 2 - Compositon/Information on Ingredients
MERCURY, MERCURY

Ingredient Name: MERCURY (SARA III)
Ingredient CAS Number: 7439-97-6 **Ingredient CAS Code:** M
RTECS Number: OV4550000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:

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>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: 100.0
% Enviromental Weight:
Other REC Limits: NONE SPECIFIED
OSHA PEL: S, C, 0.1 MG/M3 **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: S, 0.05 MG/M3; 9192 **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity: 1 LB
DOT Reporting Quantity: 1 LB
Ozone Depleting Chemical: N

Section 3 - Hazards Identification, Including Emergency Overview
MERCURY, MERCURY

Health Hazards Acute & Chronic: ACUTE: SKIN:IRRITATION. ABSORBED THROUGH SKIN CAUSING ANURIA. EYE:IRRITATION, CORNEAL INJURY OR BURNS. INGESTION: IMMEDIATE NECROSIS IN MOUTH, THROAT, ESOPHAGUS & STOMACH. DEATH MAY OCCUR. INHALATION: DYSPNEA, COUGH, FEVER, NAUSEA & VOMITING, DIARRHEA, STOMATITIS, SALIVATION & METALLIC TASTE. CHRONIC: CNS DISTURBANCES.

Signs & Symptoms of Overexposure:
TREMORS, CONVULSIONS & OTHER CNS DISTURBANCES, PNEUMONITIS, CHEST PAINS, DYSPNEA, COUGHING, STOMATITIS, GINGIVITIS AND LOOSENING OF TEETH, SALIVATION, LOSS OF MEMORY, METALLIC TASTE, DIZZINESS, CLUMSI NESS, SLURRED SPEECH, DIARRHEA, PAIN & NUMBNESS IN EXTREMITIES, NEPHRITIS, ANXIETY, HEADACHE, WEIGHT LOSS, AND INSOMNIA.

Medical Conditions Aggravated by Exposure:
PERSONS WITH A HISTORY OF ALCOHOLISM, CHRONIC KIDNEY DISEASE OR KNOWN ALLERGY TO MERCURY MAY BE AT INCREASED RISK FROM EXPOSURE.

LD50 LC50 Mixture: LD50 (ORAL RAT) IS UNKNOWN

Route of Entry Indicators:
- **Inhalation:** YES
- **Skin:** YES
- **Ingestion:** YES

Carcenogenicity Indicators
- **NTP:** NO
- **IARC:** NO
- **OSHA:** NO

Carcinogenicity Explanation: THIS PRODUCT IS NOT LISTED BY NTP, IARC, OR OSHA

Section 4 - First Aid Measures
MERCURY, MERCURY

First Aid:
INHALATION: REMOVE TO FRESH AIR. IF NOT BREATHING GIVE CPR/OXYGEN. GET MEDICAL ATTENTION. EYE: IMMEDIATELY FLUSH EYES WITH PLENTY OF WATER FOR 15 MINUTES HOLDING EYELIDS OPEN. GET MEDICAL ATTENTION. S KIN: REMOVE CONTAMINATED CLOTHING. WASHSKIN WITH PLENTY OF SOAP & WATER. INGESTION: GET IMMEDIATE MEDICAL ATTENTION. A 5% SOLUTION OF SODIUM FORMALDEHYDE SULFOXYLATE MAY BE USED TO INDUCE VOMITING.

Section 5 - Fire Fighting Measures
MERCURY, MERCURY

Fire Fighting Procedures:
FIRE FIGHTERS SHOULD USE NIOSH APPROVED SCBA & FULL PROTECTIVE EQUIPMENT WHEN FIGHTING CHEMICAL FIRE. USE WATER SPRAY TO COOL NEARBY CONTAINERS EXPOSED TO FIRE.
Unusual Fire or Explosion Hazard:
MERCURY VAPORS ARE HAZARDOUS. AVOID BREATHING CORROSIVE AND POISONOUS VAPORS. KEEP UPWIND.
Extinguishing Media:
USE WATER FOG, CARBON DIOXIDE, FOAM, OR DRY CHEMICAL.
Flash Point: Flash Point Text: NONE

Autoignition Temperature:
Autoignition Temperature Text: N/R
Lower Limit(s): N/R
Upper Limit(s): N/R

Section 6 - Accidental Release Measures
MERCURY, MERCURY

Spill Release Procedures:
SMALL SPILL: PICK UP WITH VACUUM EQUIPMENT SPECIFICALLY DESIGNED FOR MERCURY PICK UP OR USE MERCURY SPILL KIT. LARGE SPILL: EVACUATE AND VENTILATE AREA. IF POSSIBLE, STOP LEAK. DIKE TO RETAIN. VACUUM UP FREE LIQUID. DO NOT TOUCH SPILLED MATERIAL.

Section 7 - Handling and Storage
MERCURY, MERCURY

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
MERCURY, MERCURY

Repiratory Protection:
IF VENTILATION DOES NOT MAINTAIN INHALATION EXPOSURES BELOW PEL(TLV), USE NIOSH/MSHA APPROVED RESPIRATORS AS PER CURRENT 29 CFR 1910.134, INSTRUCTIONS/WARNINGS AND NIOSH-RESPIRATOR DECISION LOGIC-PUBL ICATION NUMBER 87.108.
Ventilation:
PROVIDE SUFFICIENT GENERAL/LOCAL EXHAUST VENTILATION IN PATTERN/VOLUME TO CONTROL INHALATION EXPOSURES BELOW OSHA'S PEL.
Protective Gloves:
RUBBER
Eye Protection: CHEMICAL SAFETY GOGGLES
Other Protective Equipment: SEPARATE WORK AND STREET CLOTHING. STORE WORK CLOTHING IN SPECIAL LOCKERS. SHOWER BEFORE CHANGING TO STREET CLOTHES.
Work Hygenic Practices: USE GOOD CHEMICAL HYGIENE PRACTICE. AVOID UNNECESSARY CONTACT. WASH THOROUGHLY BEFORE EATING OR DRINKING.
Supplemental Health & Safety Information: DO NOT GET ON SKIN, IN EYES OR ON CLOTHING. DO NOT BREATHE VAPORS. **MSDS WRITTEN BY HMIS IN RESPOSNSE TO A REQUEST FROM RECEIVING FOR A STATION RETURN. NO RECORD OF THIS SUPPLIER WAS FOUND.

Section 9 - Physical & Chemical Properties
MERCURY, MERCURY

HCC: T6
NRC/State License Number: NONE
Net Property Weight for Ammo: NONE
Boiling Point: =356.7C, 674.F **Boiling Point Text:**
Melting/Freezing Point: =-38.9C, -38.F **Melting/Freezing Text:**
Decomposition Point: Decomposition Text: UNKNOWN
Vapor Pressure: 0.002 **Vapor Density:** 7.0
Percent Volatile Organic Content:
Specific Gravity: 13.5939
Volatile Organic Content Pounds per Gallon:
pH: N/P
Volatile Organic Content Grams per Liter:
Viscosity: N/K
Evaporation Weight and Reference: N/R
Solubility in Water: INSOLUBLE
Appearance and Odor: COLORLESS,SILVERY LIQUID WITH METALLIC LUSTER
Percent Volatiles by Volume: N/R
Corrosion Rate: UNKNOWN

Section 10 - Stability & Reactivity Data
MERCURY, MERCURY

Stability Indicator: YES
Materials to Avoid:
AMMONIA,METALS,O2,OXIDANTS,ACETYLINICS,BORON, DIIDOPHOSPHIDE
Stability Condition to Avoid:
EXCESSIVE HEAT

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Hazardous Decomposition Products:
THERMAL DECOMPOSITION PRODUCTS INCLUDE TOXIC MERCURY VAPORS AND OXYGEN.
Hazardous Polymerization Indicator: NO
Conditions to Avoid Polymerization:
NOT APPLICABLE

Section 11 - Toxicological Information
MERCURY, MERCURY

Toxicological Information:
N/P

Section 12 - Ecological Information
MERCURY, MERCURY

Ecological Information:
N/P

Section 13 - Disposal Considerations
MERCURY, MERCURY

Waste Disposal Methods:
DISPOSE OF I/A/W ALL FEDERAL, STATE AND LOCAL ENVIRONMENTAL REGULATIONS. DO NOT INCINERATE - RETURN TO RECLAMATION CENTER.

Section 14 - MSDS Transport Information
MERCURY, MERCURY

Transport Information:
N/P

Section 15 - Regulatory Information
MERCURY, MERCURY

SARA Title III Information:
N/P
Federal Regulatory Information:
N/P
State Regulatory Information:
N/P

Section 16 - Other Information
MERCURY, MERCURY

Other Information:
N/P

HMIS Transportation Information

Product Identification: MERCURY, MERCURY
Transporation ID Number: 65988
Responsible Party CAGE: 39739
Date MSDS Prepared: 11/05/1992

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Date MSDS Reviewed: 11/05/1992
MFN: 11/05/1992
Submitter: D DG
Status Code: C

Container Information
Unit of Issue: BT
Container Quantity: G
Type of Container:
Net Unit Weight: 500 GRAMS

Article without MSDS: N
Technical Entry NOS Shipping Number:
Radioactivity:
Form:
Net Explosive Weight:
Coast Guard Ammunition Code:
Magnetism: N/P
AF MMAC Code:
DOD Exemption Number:
Limited Quantity Indicator:
Multiple Kit Number: 0
Kit Indicator: N
Kit Part Indicator: N
Review Indicator: Y
Additional Data:
RQ = 1 POUND OR 454 GRAMS.

Department of Transportation Information
DOT Proper Shipping Name: MERCURY
DOT PSN Code: IWD
Symbols: A,W
DOT PSN Modifier:
Hazard Class: 8
UN ID Number: UN2809
DOT Packaging Group: III
Label: CORROSIVE
Special Provision(s):
Packaging Exception: 164
Non Bulk Packaging: 164
Bulk Packaging: 240
Maximimum Quanity in Passenger Area: 35 KG
Maximimum Quanity in Cargo Area: 35 KG
Stow in Vessel Requirements: B
Requirements Water/Sp/Other: 40,97

IMO Detail Information
IMO Proper Shipping Name: MERCURY
IMO PSN Code: JKJ
IMO PSN Modifier: ,METAL
IMDG Page Number: 8191
UN Number: 2809

UN Hazard Class: 8
IMO Packaging Group: III
Subsidiary Risk Label: -
EMS Number: 8-12
Medical First Aid Guide Number: NON

IATA Detail Information

IATA Proper Shipping Name: MERCURY
IATA PSN Code: PYF
IATA PSN Modifier:
IATA UN Id Number: 2809
IATA UN Class: 8
Subsidiary Risk Class:
UN Packaging Group: III
IATA Label: CORROSIVE
Packaging Note for Passengers: 803
Maximum Quantity for Passengers: 35KG
Packaging Note for Cargo: 803
Maximum Quantity for Cargo: 35KG
Exceptions:

AFI Detail Information

AFI Proper Shipping Name: MERCURY
AFI Symbols:
AFI PSN Code: PYF
AFI PSN Modifier:
AFI UN Id Number: UN2809
AFI Hazard Class: 8
AFI Packing Group: I
AFI Label:
Special Provisions: P5
Back Pack Reference: A12.10

HAZCOM Label Information

Product Identification: MERCURY, MERCURY
CAGE: 39739
Assigned Individual: N
Company Name: MERIAM INSTRUMENT CO, DIV OF THE SCOTT & FETZER CO
Company PO Box:
Company Street Address1: 10920 MADISON AVE
Company Street Address2: CLEVELAND, OH 44102-2526 US
Health Emergency Telephone: 216-281-1100
Label Required Indicator: Y
Date Label Reviewed: 11/05/1992
Status Code: C
Manufacturer's Label Number: N/K
Date of Label: 11/05/1992
Year Procured: N/K
Organization Code: F
Chronic Hazard Indicator: Y
Eye Protection Indicator: YES
Skin Protection Indicator: YES
Respiratory Protection Indicator: YES
Signal Word: DANGER

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Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format)
For Cornell University Convenience Only

METHYLENE CHLORIDE

Section 1 - Product and Company Identification	Section 9 - Physical & Chemical Properties
Section 2 - Compositon/Information on Ingredients	Section 10 - Stability & Reactivity Data
Section 3 - Hazards Identification Including Emergency Overview	Section 11 - Toxicological Information
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Section 1 - Product and Company Identification
METHYLENE CHLORIDE

Product Identification: METHYLENE CHLORIDE
Date of MSDS: 06/28/1988 **Technical Review Date:** 04/16/1998
FSC: 6810 **NIIN:** 00-616-9188
Submitter: D DG
Status Code: C
MFN: 01
Article: N
Kit Part: N

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Manufacturer's Information

Manufacturer's Name: BAKER J T CHEMICAL CO
Manufacturer's Address1: 222 RED SCHOOL LANE
Manufacturer's Address2: PHILLIPSBURG, NJ 08865-2219
Manufacturer's Country: US
General Information Telephone: 201 859 2151
Emergency Telephone: 201 859 2151
Emergency Telephone: 201 859 2151
MSDS Preparer's Name: N/P
Proprietary: N
Reviewed: Y
Published: Y
CAGE: LO457
Special Project Code: N

Item Description

Item Name: DICHLOROMETHANE,TECHNICAL
Item Manager: S9G
Specification Number: MIL-D-6998
Type/Grade/Class: NONE
Unit of Issue: DR **Quantitative Expression:** 00000000055GL
Unit of Issue Quantity: 1
Type of Container: DRUM

Contractor Information

Contractor's Name: BAKER J T CHEMICAL CO
Contractor's Address1: 222 RED SCHOOL LANE
Contractor's Address2: PHILLIPSBURG, NJ 08865-2219
Contractor's Telephone: 201 859 2151
Contractor's CAGE: LO457

Contractor Information

Contractor's Name: MALLINCKRODT BAKER, INC. (FORMERLY J.T. BAKER INC)
Contractor's Address1: 222 RED SCHOOL LANE
Contractor's Address2: PHILLIPSBURG, NJ 08865-2219
Contractor's Telephone: 800-582-2537
Contractor's CAGE: 70829

Section 2 - Compositon/Information on Ingredients
METHYLENE CHLORIDE

Ingredient Name: METHYLENE CHLORIDE (SARA III)
Ingredient CAS Number: 75-09-2 **Ingredient CAS Code:** M
RTECS Number: PA8050000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:

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>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: >98
% Enviromental Weight:
Other REC Limits: N/R
OSHA PEL: 500 PPM/C,1000; Z2 **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: 50 PPM, A2; 9192 **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity: 1000 LBS
DOT Reporting Quantity: 1000 LBS
Ozone Depleting Chemical: N

Section 3 - Hazards Identification, Including Emergency Overview
METHYLENE CHLORIDE

Health Hazards Acute & Chronic: INHALATION & INGESTION ARE HARMFUL & MAY BE FATAL. OVEREXPOSURE TO THIS PRODUCT CAN PRODUCE ELEVATED CARHOXYHEMOGLOBIN LEVELS IN THE BLOOD. CONTACT WITH SKIN ORT IN TEMPORARY CORNEAL DAMAGE. CHRONIC E FF:KIDNEY,LIVER,LUNG,BLOOD

Signs & Symptoms of Overexposure:
INHALE:HEADACHE,NAUSEA,VOMITING,NARCOSIS, WEAKNESS,FATIQUE,DIZZINESS,IRRITATION OF RESPIRATORY TRACT,NUMBNESS OF EXTRENITIES,CENTRAL NERVOUS SYSTEM DEPRESSION,PURVOUS SYSTEM DEPRESSION, GASTROINTESTIN AL IRRITATION, & UNCONSCIOUS

Medical Conditions Aggravated by Exposure:
NESS.

LD50 LC50 Mixture: LD50 ORAL RAT=2136 MG/KG

Route of Entry Indicators:
Inhalation: YES
Skin: YES
Ingestion: YES

Carcenogenicity Indicators
NTP: NO
IARC: YES
OSHA: NO

Carcinogenicity Explanation: METHYLENE CHLORIDE IS LISTED AS POSSIBLE CARCINOGENIC TO HUMAN BY IARC.

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Section 4 - First Aid Measures
METHYLENE CHLORIDE

First Aid:
INHALE:REMOVE TO FRESH AIR, IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN; IN CASE OF CONTACT, FLUSH EYES OR SKIN WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES W HING BEFORE REUSE; INGEST: DO NOT INDUCE VOMITING, SEE A PHYSICIAN.

Section 5 - Fire Fighting Measures
METHYLENE CHLORIDE

Fire Fighting Procedures:
FIREFIGHTERS SHOULD WEAR PROPER PROTECTIVE EQUIPMENT AND SELF-CONTAINED BREATHING APPARATUS WITH FULL FACEPIECE OPERATED IN POSITIVE PRESSURE MODE.
Unusual Fire or Explosion Hazard:
USE WATER TO KEEP FIRE-EXPOSED CONTAINERS COOL. MOVE CONTAINERS FROM FIRE AREA IF IT CAN BE DONE WITHOUT RISK.
Extinguishing Media:
USE EXTINGUISHING MEDIA APPROPRIATE FOR SURROUNDING FIRE.
Flash Point: Flash Point Text: NONE

Autoignition Temperature:
Autoignition Temperature Text: N/K
Lower Limit(s): N/R
Upper Limit(s): N/R

Section 6 - Accidental Release Measures
METHYLENE CHLORIDE

Spill Release Procedures:
ELIMINATE IGNITION SOURCES. VENTILATE AREA. USE NON-SPARKING TOOLS.STOP LEAK.ABS0RB IN INERT ABSORBENT & PLACE INTO APPROPIATE DISPOSAL CONTAINER & SEAL. FLUSH AREA WITH WATER.

Section 7 - Handling and Storage
METHYLENE CHLORIDE

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
METHYLENE CHLORIDE

Repiratory Protection:
USE SELF-CONTAINED BREATHING APPARATUS IF AIRBORNE CONCENTRATION EXCEEDS TLV.
Ventilation:

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SUFFICIENT MECHANICAL (GENERAL) AND/OR LOCAL EXHAUST VENTILATION TO MAINTAIN EXPOSURE BELOW TLV.
Protective Gloves:
POLYVINYL
Eye Protection: SAFETY GOGGLES & FACE SHIELD.
Other Protective Equipment: FULL WORK CLOTHING TO PREVENT REPEATED OR PROLONGED SKIN CONTACT. EYE WASH STATION AND SAFETY SHOWER.
Work Hygenic Practices: AVOID CONTACT WITH EYES & SKIN.DO NOT BREATHE VAPORS.WASH THOROUGHLY AFTER HANDLING.LAUNDER CONTAMINATED CLOTHING.
Supplemental Health & Safety Information: N/P

Section 9 - Physical & Chemical Properties
METHYLENE CHLORIDE

HCC: T4
NRC/State License Number: N/R
Net Property Weight for Ammo: N/R
Boiling Point: Boiling Point Text: 104F/40C
Melting/Freezing Point: Melting/Freezing Text: -139F/-95C
Decomposition Point: Decomposition Text: N/K
Vapor Pressure: 350 **Vapor Density:** 2.9
Percent Volatile Organic Content:
Specific Gravity: 1.32
Volatile Organic Content Pounds per Gallon:
pH: N/K
Volatile Organic Content Grams per Liter:
Viscosity: N/K
Evaporation Weight and Reference: 27.5 (BU AC =1)
Solubility in Water: MODERATE(1-10 %)
Appearance and Odor: CLEAR,COLORLESS LIQUID. PENETRATING ETHER-LIKE ODOR.
Percent Volatiles by Volume: 100
Corrosion Rate: N/K

Section 10 - Stability & Reactivity Data
METHYLENE CHLORIDE

Stability Indicator: YES
Materials to Avoid:
ALKALI METALS,STRONG OXIDIZING AGENTS,STRONG BASES, OXIDES OF NITROGEN,ZINC,ALUMINUM,WATER,MAGNESIUM,AMINES,RUBBER,ETC.
Stability Condition to Avoid:
HEAT, FLAME, OTHER SOURCES OF IGNITION, MOISTURE, LIGHT.
Hazardous Decomposition Products:
HYDROGEN CHLORIDE,PHOSGENE,CHLORINE,CARBON MONOXIDE, CARBON DIOXIDE.
Hazardous Polymerization Indicator: NO
Conditions to Avoid Polymerization:
N/R

Section 11 - Toxicological Information
METHYLENE CHLORIDE

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Toxicological Information:
N/P

Section 12 - Ecological Information
METHYLENE CHLORIDE

Ecological Information:
N/P

Section 13 - Disposal Considerations
METHYLENE CHLORIDE

Waste Disposal Methods:
DISPOSAL.DISPOSE OF IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL ENVIRONMENTAL REGULATIONS.

Section 14 - MSDS Transport Information
METHYLENE CHLORIDE

Transport Information:
N/P

Section 15 - Regulatory Information
METHYLENE CHLORIDE

SARA Title III Information:
N/P
Federal Regulatory Information:
N/P
State Regulatory Information:
N/P

Section 16 - Other Information
METHYLENE CHLORIDE

Other Information:
N/P

HMIS Transportation Information

Product Identification: METHYLENE CHLORIDE
Transporation ID Number: 79908
Responsible Party CAGE: LO457
Date MSDS Prepared: 06/28/1988
Date MSDS Reviewed: 04/16/1998
MFN: 04/16/1998
Submitter: D DG
Status Code: C

Container Information
Unit of Issue: DR
Container Quantity: 1
Type of Container: DRUM
Net Unit Weight: 605 LBS.

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Article without MSDS: N
Technical Entry NOS Shipping Number:
Radioactivity: N/R
Form:
Net Explosive Weight: N/R
Coast Guard Ammunition Code: N/R
Magnetism: N/P
AF MMAC Code: NR
DOD Exemption Number: N/R
Limited Quantity Indicator:
Multiple Kit Number: 0
Kit Indicator: N
Kit Part Indicator: N
Review Indicator: Y
Additional Data:
CARGO AIR ONLY.RQ FOR METHYLENE CHLORIDE IS 1000 LBS.

Department of Transportation Information

DOT Proper Shipping Name: DICHLOROMETHANE
DOT PSN Code: EUP
Symbols:
DOT PSN Modifier:
Hazard Class: 6.1
UN ID Number: UN1593
DOT Packaging Group: III
Label: KEEP AWAY FROM FOOD
Special Provision(s): N36,T13
Packaging Exception: 153
Non Bulk Packaging: 203
Bulk Packaging: 241
Maximimum Quanity in Passenger Area: 60 L
Maximimum Quanity in Cargo Area: 220 L
Stow in Vessel Requirements: A
Requirements Water/Sp/Other:

IMO Detail Information

IMO Proper Shipping Name: DICHLOROMETHANE
IMO PSN Code: FLF
IMO PSN Modifier:
IMDG Page Number: 6127
UN Number: 1593
UN Hazard Class: 6.1
IMO Packaging Group: III
Subsidiary Risk Label: -
EMS Number: 6.1-02
Medical First Aid Guide Number: 340

IATA Detail Information

IATA Proper Shipping Name: DICHLOROMETHANE
IATA PSN Code: IYW
IATA PSN Modifier:
IATA UN Id Number: 1593
IATA UN Class: 6.1

Subsidiary Risk Class:
UN Packaging Group: III
IATA Label: TOXIC
Packaging Note for Passengers: 605
Maximum Quantity for Passengers: 60L
Packaging Note for Cargo: 612
Maximum Quantity for Cargo: 220L
Exceptions:

AFI Detail Information

AFI Proper Shipping Name: DICHLOROMETHANE
AFI Symbols:
AFI PSN Code: IYW
AFI PSN Modifier:
AFI UN Id Number: UN1593
AFI Hazard Class: 6.1
AFI Packing Group: III
AFI Label:
Special Provisions: P5, N36
Back Pack Reference: A10.5

HAZCOM Label Information

Product Identification: METHYLENE CHLORIDE
CAGE: LO457
Assigned Individual: Y
Company Name: BAKER J T CHEMICAL CO
Company PO Box:
Company Street Address1: 222 RED SCHOOL LANE
Company Street Address2: PHILLIPSBURG, NJ 08865-2219 US
Health Emergency Telephone: 201-859-2151
Label Required Indicator: Y
Date Label Reviewed: 04/16/1998
Status Code: C
Manufacturer's Label Number: UNKNOWN
Date of Label: 04/16/1998
Year Procured: N/K
Organization Code: F
Chronic Hazard Indicator: Y
Eye Protection Indicator: YES
Skin Protection Indicator: YES
Respiratory Protection Indicator: YES
Signal Word: WARNING
Health Hazard: Moderate
Contact Hazard: Slight
Fire Hazard: Slight
Reactivity Hazard: Slight

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Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format)
For Cornell University Convenience Only

MOLYBDENUM TRIOXIDE, M0753

Section 1 - Product and Company Identification	Section 9 - Physical & Chemical Properties
Section 2 - Compositon/Information on Ingredients	Section 10 - Stability & Reactivity Data
Section 3 - Hazards Identification Including Emergency Overview	Section 11 - Toxicological Information
Section 4 - First Aid Measures	Section 12 - Ecological Information
Section 5 - Fire Fighting Measures	Section 13 - Disposal Considerations
Section 6 - Accidental Release Measures	Section 14 - MSDS Transport Information
Section 7 - Handling and Storage	Section 15 - Regulatory Information
Section 8 - Exposure Controls & Personal Protection	Section 16 - Other Information

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Cornell University does not in any way warrant or imply the applicability, viability or use of this information to any person or for use in any situation.

Section 1 - Product and Company Identification
MOLYBDENUM TRIOXIDE, M0753

Product Identification: MOLYBDENUM TRIOXIDE, M0753
Date of MSDS: 10/31/1989 **Technical Review Date:** 04/21/1995
FSC: 6810 **NIIN:** **LIIN:** 00N021653
Submitter: N EN
Status Code: C
MFN: 01
Article: N
Kit Part: N

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Manufacturer's Information

Manufacturer's Name: SIGMA CHEMICAL CO
Post Office Box: 14508
Manufacturer's Address1:
Manufacturer's Address2: ST LOUIS, MO 63178
Manufacturer's Country: US
General Information Telephone: 314-771-5765
Emergency Telephone: 800-325-8070
Emergency Telephone: 800-325-8070
MSDS Preparer's Name: N/P
Proprietary: N
Reviewed: N
Published: Y
CAGE: 21076
Special Project Code: N

Contractor Information

Contractor's Name: SIGMA CHEMICAL COMPANY
Contractor's Address1: 3050 SPRUCE ST
Contractor's Address2: ST LOUIS, MO 63178
Contractor's Telephone: 314-771-5765
Contractor's CAGE: 21076

Section 2 - Compositon/Information on Ingredients
MOLYBDENUM TRIOXIDE, M0753

Ingredient Name: MOLYBDENUM TRIOXIDE (SARA III)
Ingredient CAS Number: 1313-27-5 **Ingredient CAS Code:** M
RTECS Number: QA4725000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: N/K
% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: 5 MG MO/M3 **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: 5 MG MO/M3; 9192 **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity:
DOT Reporting Quantity:
Ozone Depleting Chemical: N

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Section 3 - Hazards Identification, Including Emergency Overview
MOLYBDENUM TRIOXIDE, M0753

Health Hazards Acute & Chronic: HARMFUL IF SWALLOWED, INHALED, OR ABSORBED THROUGH SKIN. CAUSES EYE AND SKIN IRRITATION. MATERIAL IS IRRITATING TO MUCOUS MEMBRANES AND UPPER RESPIRATORY TRACT.

Signs & Symptoms of Overexposure:
SEE HEALTH HAZARDS.

Medical Conditions Aggravated by Exposure:
NONE SPECIFIED BY MANUFACTURER.

LD50 LC50 Mixture: LD50:(ORAL,RAT) 125 MG/KG

Route of Entry Indicators:
Inhalation: YES
Skin: YES
Ingestion: YES

Carcenogenicity Indicators
NTP: NO
IARC: NO
OSHA: NO

Carcinogenicity Explanation: NOT RELEVANT.

Section 4 - First Aid Measures
MOLYBDENUM TRIOXIDE, M0753

First Aid:
EYES OR SKIN: FLUSH EYES OR SKIN WITH COPIOUS AMOUNTS OF WATER FOR AT LEAST 15 MIN WHILE REMOVING CONTAMINATED CLOTHING AND SHOES. INHAL: REMOVE TO FRESH AIR. IF NOT BREATHING GIVE ARTIFICIAL RESPIRAT ION. IF BREATHING IS DIFFICULT, GIVE OXYGEN. IN CASE OF EXPOSURE, OBTAIN MEDICAL ATTENTION IMMEDIATELY. WASH CONTAMINATED CLOTING BEFORE REUSE.

Section 5 - Fire Fighting Measures
MOLYBDENUM TRIOXIDE, M0753

Fire Fighting Procedures:
WEAR NIOSH/MSHA APPROVED SCBA AND FULL PROTECTIVE EQUIPMENT (FP N). PROTECTIVE CLOTHING TO PREVENT CONTACT WITH SKIN AND EYES.
Unusual Fire or Explosion Hazard:
EMITS TOXIC FUMES UNDER FIRE CONDITIONS.
Extinguishing Media:
NONCOMBUSTIBLE. USE EXTINGUISHING MEDIA APPROPRIATE TO SURROUNDING FIRE CONDITIONS.
Flash Point: Flash Point Text: N/K

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Autoignition Temperature:
Autoignition Temperature Text: N/A
Lower Limit(s): N/K
Upper Limit(s): N/K

Section 6 - Accidental Release Measures
MOLYBDENUM TRIOXIDE, M0753

Spill Release Procedures:
EVACUATE AREA. WEAR SCBA, RUBBER BOOTS AND HEAVY RUBBER GLOVES. SWEEP UP, PLACE IN A BAG AND HOLD FOR WASTE DISPOSAL. AVOID RAISING DUST.

Section 7 - Handling and Storage
MOLYBDENUM TRIOXIDE, M0753

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
MOLYBDENUM TRIOXIDE, M0753

Repiratory Protection:
WEAR APPROPRIATE NIOSH/MSHA APPROVED RESPIRATOR.
Ventilation:
USE ONLY IN A CHEMICAL FUME HOOD.
Protective Gloves:
CHEMICAL-RESISTANT GLOVES.
Eye Protection: CHEMICAL WORKERS GOGGLES (FP N).
Other Protective Equipment: NONE SPECIFIED BY MANUFACTURER.
Work Hygenic Practices: WASH THOROUGHLY AFTER HANDLING.
Supplemental Health & Safety Information: NONE SPECIFIED BY MANUFACTURER.

Section 9 - Physical & Chemical Properties
MOLYBDENUM TRIOXIDE, M0753

HCC: T2
NRC/State License Number:
Net Property Weight for Ammo:
Boiling Point: Boiling Point Text: N/K
Melting/Freezing Point: Melting/Freezing Text: 1463F,795C
Decomposition Point: Decomposition Text: N/K
Vapor Pressure: N/K **Vapor Density:** N/K
Percent Volatile Organic Content:
Specific Gravity: 4.692
Volatile Organic Content Pounds per Gallon:
pH: N/K
Volatile Organic Content Grams per Liter:
Viscosity: N/P
Evaporation Weight and Reference: N/K

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Solubility in Water: N/K
Appearance and Odor: BLUE-GREY GRANULAR POWDER
Percent Volatiles by Volume: N/K
Corrosion Rate: N/K

Section 10 - Stability & Reactivity Data
MOLYBDENUM TRIOXIDE, M0753

Stability Indicator: YES
Materials to Avoid:
STRONG ACIDS
Stability Condition to Avoid:
NONE SPECIFIED BY MANUFACTURER.
Hazardous Decomposition Products:
NATURE OF DECOMPOSITION PRODUCTS NOT KNOWN.
Hazardous Polymerization Indicator: NO
Conditions to Avoid Polymerization:
NOT RELEVANT.

Section 11 - Toxicological Information
MOLYBDENUM TRIOXIDE, M0753

Toxicological Information:
N/P

Section 12 - Ecological Information
MOLYBDENUM TRIOXIDE, M0753

Ecological Information:
N/P

Section 13 - Disposal Considerations
MOLYBDENUM TRIOXIDE, M0753

Waste Disposal Methods:
BURY IN A LANDFILL SITE APPROVED FOR THE DISPOSAL OF CHEMICAL AND HAZARDOUS WASTES. OBSERVE ALL FEDERAL, STATE, AND LOCAAL LAWS.

Section 14 - MSDS Transport Information
MOLYBDENUM TRIOXIDE, M0753

Transport Information:
N/P

Section 15 - Regulatory Information
MOLYBDENUM TRIOXIDE, M0753

SARA Title III Information:
N/P
Federal Regulatory Information:
N/P
State Regulatory Information:

N/P

Section 16 - Other Information
MOLYBDENUM TRIOXIDE, M0753

Other Information:
N/P

HMIS Transportation Information

Product Identification: MOLYBDENUM TRIOXIDE, M0753
Transporation ID Number: 26293
Responsible Party CAGE: 21076
Date MSDS Prepared: 10/31/1989
Date MSDS Reviewed: 09/01/1998
MFN: 09/01/1998
Submitter: N TN
Status Code: D

Container Information
- **Unit of Issue:** NK
- **Container Quantity:** NK
- **Type of Container:**
- **Net Unit Weight:**

Article without MSDS: N
Technical Entry NOS Shipping Number:
Radioactivity:
Form:
Net Explosive Weight:
Coast Guard Ammunition Code:
Magnetism: N/P
AF MMAC Code:
DOD Exemption Number:
Limited Quantity Indicator:
Multiple Kit Number: 0
Kit Indicator: N
Kit Part Indicator: N
Review Indicator: Y
Additional Data:
* * THIS ITEM DELETED BECAUSE OF ERRONEOUS DATA * *

Department of Transportation Information

DOT Proper Shipping Name: POISONOUS SOLIDS, N.O.S.
DOT PSN Code: LVK
Symbols:
DOT PSN Modifier:
Hazard Class: 6.1
UN ID Number: UN2811
DOT Packaging Group: I
Label: POISON
Special Provision(s):
Packaging Exception: NONE

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Non Bulk Packaging: 211
Bulk Packaging: 242
Maximimum Quanity in Passenger Area: 5 KG
Maximimum Quanity in Cargo Area: 50 KG
Stow in Vessel Requirements: B
Requirements Water/Sp/Other:

IMO Detail Information

IMO Proper Shipping Name: POISONOUS SOLIDS, N.O.S.
IMO PSN Code: LYT
IMO PSN Modifier:
IMDG Page Number: 6236
UN Number: 2811
UN Hazard Class: 6.1
IMO Packaging Group: I/II/III
Subsidiary Risk Label: -
EMS Number: 6.1-04
Medical First Aid Guide Number: **

IATA Detail Information

IATA Proper Shipping Name: POISONOUS SOLID, N.O.S.
IATA PSN Code: UJU
IATA PSN Modifier: *
IATA UN Id Number: 2811
IATA UN Class: 6.1
Subsidiary Risk Class:
UN Packaging Group: I
IATA Label: POISON
Packaging Note for Passengers: 606
Maximum Quantity for Passengers: 5KG
Packaging Note for Cargo: 607
Maximum Quantity for Cargo: 50KG
Exceptions: A3

AFI Detail Information

AFI Proper Shipping Name: POISONOUS SOLIDS, N.O.S.
AFI Symbols:
AFI PSN Code: UJU
AFI PSN Modifier:
AFI UN Id Number: UN2811
AFI Hazard Class: 6.1
AFI Packing Group: I
AFI Label: POISON
Special Provisions: N/A
Back Pack Reference: A10.6

HAZCOM Label Information

Product Identification: MOLYBDENUM TRIOXIDE, M0753
CAGE: 21076
Assigned Individual: N
Company Name: SIGMA CHEMICAL COMPANY
Company PO Box:
Company Street Address1: 3050 SPRUCE ST
Company Street Address2: ST LOUIS, MO 63178 US
Health Emergency Telephone: 800-325-8070

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Label Required Indicator: Y
Date Label Reviewed: 11/25/1991
Status Code: C
Manufacturer's Label Number:
Date of Label: 11/25/1991
Year Procured: N/K
Organization Code: G
Chronic Hazard Indicator: N
Eye Protection Indicator: YES
Skin Protection Indicator: YES
Respiratory Protection Indicator: YES
Signal Word: WARNING
Health Hazard: Moderate
Contact Hazard: Slight
Fire Hazard: None
Reactivity Hazard: None

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Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format)
For Cornell University Convenience Only

ORGANIC PEROXIDE

Section 1 - Product and Company Identification	Section 9 - Physical & Chemical Properties
Section 2 - Compositon/Information on Ingredients	Section 10 - Stability & Reactivity Data
Section 3 - Hazards Identification Including Emergency Overview	Section 11 - Toxicological Information
Section 4 - First Aid Measures	Section 12 - Ecological Information
Section 5 - Fire Fighting Measures	Section 13 - Disposal Considerations
Section 6 - Accidental Release Measures	Section 14 - MSDS Transport Information
Section 7 - Handling and Storage	Section 15 - Regulatory Information
Section 8 - Exposure Controls & Personal Protection	Section 16 - Other Information

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Section 1 - Product and Company Identification
ORGANIC PEROXIDE

Product Identification: ORGANIC PEROXIDE
Date of MSDS: 01/01/1985 **Technical Review Date:** 04/22/1982
FSC: 6810 **NIIN:** 00-290-7104
Submitter: D DG
Status Code: C
MFN: 01
Article: N
Kit Part: N

Manufacturer's Information

Manufacturer's Name: CHEM COMMODITIES AGY, INC
Manufacturer's Address1: 27447 PACIFIC STREET
Manufacturer's Address2: HIGHLAND, CA 92346-2640
Manufacturer's Country: US
General Information Telephone: 714-864-2310
Emergency Telephone: 714-864-2310
Emergency Telephone: 714-864-2310
MSDS Preparer's Name: N/P
Proprietary: N
Reviewed: Y
Published: Y
CAGE: JO769
Special Project Code: N

Item Description

Item Name:
Item Manager: S9G
Specification Number: MIL-M-81351
Type/Grade/Class: NK
Unit of Issue: LB
Unit of Issue Quantity: G
Type of Container:

Contractor Information

Contractor's Name: CHEM COMMODITIES AGY, INC
Post Office Box: 1650
Contractor's Address1: 27447 PACIFIC STREET
Contractor's Address2: HIGHLAND, CA 92346-2640
Contractor's Telephone: 714-864-2310
Contractor's CAGE: JO769

Contractor Information

Contractor's Name: CHEMICAL COMMODITIES AGENCY, INC.
Contractor's Address1: 27447 PACIFIC STREET
Contractor's Address2: HIGHLAND, CA 92346-2640
Contractor's Telephone: 909-864-2310
Contractor's CAGE: 60777

Section 2 - Compositon/Information on Ingredients
ORGANIC PEROXIDE

Ingredient Name: DIMETHYLPHTHALATE (SARA III)
Ingredient CAS Number: 131-11-3 **Ingredient CAS Code:** M
RTECS Number: TI1575000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:

>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: 40.0
% Enviromental Weight:
Other REC Limits: N/P
OSHA PEL: 5 MG/M3 **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: 5 MG/M3; 9192 **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity: 5000 LBS
DOT Reporting Quantity: 5000 LBS
Ozone Depleting Chemical: N

Ingredient Name: METHYL ETHYL KETONE PEROXIDE (MEKP) (SARA III)
Ingredient CAS Number: 1338-23-4 **Ingredient CAS Code:** M
RTECS Number: EL9450000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: 60.0
% Enviromental Weight:
Other REC Limits: NONE RECOMMENDED
OSHA PEL: C 0.7 PPM **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: C 0.2; 9394 **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity: 10 LBS
DOT Reporting Quantity: 10 LBS
Ozone Depleting Chemical: N

Section 3 - Hazards Identification, Including Emergency Overview
ORGANIC PEROXIDE

Health Hazards Acute & Chronic: N/P

Signs & Symptoms of Overexposure:
CNTCT W/SKIN/EYES/CLOTHING SHOULD BE AVOIDED. AVOID PROLONGED BRTHNG OF

PEROXIDE.

Medical Conditions Aggravated by Exposure:
N/P

LD50 LC50 Mixture: N/P

Route of Entry Indicators:
Inhalation: N/P
Skin: N/P
Ingestion: N/P

Carcenogenicity Indicators
NTP: N/P
IARC: N/P
OSHA: N/P

Carcinogenicity Explanation: N/P

Section 4 - First Aid Measures
ORGANIC PEROXIDE

First Aid:
IN CASE OF CNTCT W/SKIN, WASH W/SOAP & WATER. FOR EYES, IMMED WASH W/PLENTY WATER, EVERY SECOND IS IMPORTANT! CONSULT MD. INGEST: CONSULT MD & LOCAL POISON CONTROL CENTER. CONTAM CLOTHING SHOULD BE CL EANED.

Section 5 - Fire Fighting Measures
ORGANIC PEROXIDE

Fire Fighting Procedures:
SEE SUPP DATA
Unusual Fire or Explosion Hazard:
PEROXIDE MUST BE KEPT AWAY FROM ALL SOURCES OF HEAT/IGNITION: STEAM PIPES, FLAMES, SPARKS, RADIATORS
Extinguishing Media:
SM FIRES: DRY CHEM, FOAM, CO*2
Flash Point: Flash Point Text: 225F OC

Autoignition Temperature:
Autoignition Temperature Text: N/A
Lower Limit(s):
Upper Limit(s):

Section 6 - Accidental Release Measures
ORGANIC PEROXIDE

Spill Release Procedures:
USE NON COMBUST MATL LIKE VERMICULITE, PERLITE, ABSORBENT EARTH TO SOAK SPILLED MATL. USE NON SPARKING SHOVEL, COLLECT SATURATED VERMICULITE &

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DEPOSIT IN SM PIPES ON NEWSPAPER LOCATED IN OPEN SAFE PLA CE.

Section 7 - Handling and Storage
ORGANIC PEROXIDE

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
ORGANIC PEROXIDE

Repiratory Protection:
PROLONGED INH OF PEROXIDE SHOULD BE AVOIDED
Ventilation:
LOCAL RECOMMENDED
Protective Gloves:
GLOVES OR CREAM
Eye Protection: WELL FITTING GOGGLES
Other Protective Equipment: EYE WASH STATION,APRON ETC
Work Hygenic Practices: N/P
Supplemental Health & Safety Information: TYPE I OF MIL SPEC. SPECIAL FIRE FIGHTING PROC: LG FIRES, EVACUATE AREA & APPLY H*2O FROM FAR DISTANCE. IF FIRE NEARBY, SPRAY H*2O ON PEROXIDE CNTNRS TO PREVENT OVERHEATING.

Section 9 - Physical & Chemical Properties
ORGANIC PEROXIDE

HCC: D1
NRC/State License Number:
Net Property Weight for Ammo:
Boiling Point: Boiling Point Text: N/A
Melting/Freezing Point: Melting/Freezing Text: N/A
Decomposition Point: Decomposition Text: N/A
Vapor Pressure: N/P **Vapor Density:** N/P
Percent Volatile Organic Content:
Specific Gravity: 1.168
Volatile Organic Content Pounds per Gallon:
pH: N/P
Volatile Organic Content Grams per Liter:
Viscosity: N/P
Evaporation Weight and Reference: N/A
Solubility in Water: NEGLIGIBLE
Appearance and Odor: CLEAR, COLORLESS LIQ
Percent Volatiles by Volume: N/P
Corrosion Rate: N/P

Section 10 - Stability & Reactivity Data
ORGANIC PEROXIDE

Stability Indicator: NO

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Materials to Avoid:
NEVER MIX ACCELERATORS LIKE COBALT OCTOATE
Stability Condition to Avoid:
ALL HEAT SOURCES/DIRECT SUNLIGHT. DO NOT USE ACETONE DILUENT
Hazardous Decomposition Products:
DECOMP VIOLENTLY, DISPERSE THOROUGH ACCEL W/RESIN
Hazardous Polymerization Indicator: YES
Conditions to Avoid Polymerization:
COMBUST MATLS,STRONG OXIDIZERS,REDUCING AGENTS,ACCELERATORS.

Section 11 - Toxicological Information
ORGANIC PEROXIDE

Toxicological Information:
N/P

Section 12 - Ecological Information
ORGANIC PEROXIDE

Ecological Information:
N/P

Section 13 - Disposal Considerations
ORGANIC PEROXIDE

Waste Disposal Methods:
MATERIAL MAY BE SHOCK SENSITIVE.DISPOSAL SHOULD BE DONE BY PROFESSIONAL DISPOSAL FIRM

Section 14 - MSDS Transport Information
ORGANIC PEROXIDE

Transport Information:
N/P

Section 15 - Regulatory Information
ORGANIC PEROXIDE

SARA Title III Information:
N/P
Federal Regulatory Information:
N/P
State Regulatory Information:
N/P

Section 16 - Other Information
ORGANIC PEROXIDE

Other Information:
N/P

HMIS Transportation Information

Product Identification: ORGANIC PEROXIDE

Transporation ID Number: 67809
Responsible Party CAGE: JO769
Date MSDS Prepared: 01/01/1985
Date MSDS Reviewed: 12/05/1995
MFN: 12/05/1995
Submitter: D DG
Status Code: C

Container Information
Unit of Issue: LB
Container Quantity: G
Type of Container:
Net Unit Weight:

Article without MSDS: N
Technical Entry NOS Shipping Number:
Radioactivity:
Form:
Net Explosive Weight:
Coast Guard Ammunition Code:
Magnetism: N/P
AF MMAC Code:
DOD Exemption Number:
Limited Quantity Indicator:
Multiple Kit Number: 0
Kit Indicator: N
Kit Part Indicator: N
Review Indicator: Y
Additional Data:
NSN CANCELLED.

Department of Transportation Information
DOT Proper Shipping Name: ORGANIC PEROXIDE TYPE D, LIQUID
DOT PSN Code: KZD
Symbols: G
DOT PSN Modifier:
Hazard Class: 5.2
UN ID Number: UN3105
DOT Packaging Group: II
Label: ORGANIC PEROXIDE
Special Provision(s):
Packaging Exception: 152
Non Bulk Packaging: 225
Bulk Packaging: NONE
Maximimum Quanity in Passenger Area: 5 L
Maximimum Quanity in Cargo Area: 10 L
Stow in Vessel Requirements: D
Requirements Water/Sp/Other: 12,40

IMO Detail Information
IMO Proper Shipping Name: ORGANIC PEROXIDE TYPE D, LIQUID
IMO PSN Code: LAO

IMO PSN Modifier:
IMDG Page Number: 5225
UN Number: 3105
UN Hazard Class: 5.2
IMO Packaging Group: II
Subsidiary Risk Label: *
EMS Number: 5.2-01
Medical First Aid Guide Number: 735

IATA Detail Information

IATA Proper Shipping Name: ORGANIC PEROXIDE TYPE D, LIQUID * +
IATA PSN Code: SNJ
IATA PSN Modifier:
IATA UN Id Number: 3105
IATA UN Class: 5.2
Subsidiary Risk Class:
UN Packaging Group: II
IATA Label: ORGANIC PEROXIDE
Packaging Note for Passengers: 500
Maximum Quantity for Passengers: 5L
Packaging Note for Cargo: 502
Maximum Quantity for Cargo: 10L
Exceptions: A20

AFI Detail Information

AFI Proper Shipping Name: ORGANIC PEROXIDE TYPE D, LIQUID
AFI Symbols: *
AFI PSN Code: SNJ
AFI PSN Modifier: (SPECIFIC TECHNICAL NAME REQUIRED, SEE PARAGRAPH A9.4)
AFI UN Id Number: UN3105
AFI Hazard Class: 5.2
AFI Packing Group: II
AFI Label:
Special Provisions: P5
Back Pack Reference: TABLE A9.1

HAZCOM Label Information

Product Identification: ORGANIC PEROXIDE
CAGE: JO769
Assigned Individual: Y
Company Name: CHEM COMMODITIES AGY, INC
Company PO Box: 1650
Company Street Address1: 27447 PACIFIC STREET
Company Street Address2: HIGHLAND, CA 92346-2640 US
Health Emergency Telephone: 714-864-2310
Label Required Indicator: Y
Date Label Reviewed: 12/16/1998
Status Code: C
Manufacturer's Label Number:
Date of Label: 12/16/1998
Year Procured: N/K
Organization Code: F
Chronic Hazard Indicator: N/P
Eye Protection Indicator: N/P

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CORNELL

Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format)
For Cornell University Convenience Only

OXAMIDE 98% 0-932-8

Section 1 - Product and Company Identification	Section 9 - Physical & Chemical Properties
Section 2 - Compositon/Information on Ingredients	Section 10 - Stability & Reactivity Data
Section 3 - Hazards Identification Including Emergency Overview	Section 11 - Toxicological Information
Section 4 - First Aid Measures	Section 12 - Ecological Information
Section 5 - Fire Fighting Measures	Section 13 - Disposal Considerations
Section 6 - Accidental Release Measures	Section 14 - MSDS Transport Information
Section 7 - Handling and Storage	Section 15 - Regulatory Information
Section 8 - Exposure Controls & Personal Protection	Section 16 - Other Information

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Cornell University does not in any way warrant or imply the applicability, viability or use of this information to any person or for use in any situation.

Section 1 - Product and Company Identification
OXAMIDE 98% 0-932-8

Product Identification: OXAMIDE 98% 0-932-8
Date of MSDS: 12/19/1988 **Technical Review Date:** 04/02/1991
FSC: 6810 **NIIN: LIIN:** 00N014538
Submitter: N EN
Status Code: C
MFN: 01
Article: N
Kit Part: N

Manufacturer's Information

Manufacturer's Name: ALDRICH CHEMICAL COMPANY
Post Office Box: 355
Manufacturer's Address1:
Manufacturer's Address2: MILWAUKEE, WI 53201
Manufacturer's Country: US
General Information Telephone: 414-273-3850
Emergency Telephone: N/P
Emergency Telephone: N/P
MSDS Preparer's Name: N/P
Proprietary: N
Reviewed: N
Published: Y
CAGE: 60928
Special Project Code: N

Contractor Information

Contractor's Name: ALDRICH CHEMICAL CO INC
Post Office Box: 355
Contractor's Address1: 1001 WEST ST PAUL AVE
Contractor's Address2: MILWAUKEE, WI 53233
Contractor's Telephone: 414-273-3850
Contractor's CAGE: 60928

Section 2 - Compositon/Information on Ingredients
OXAMIDE 98% 0-932-8

Ingredient Name: OXAMIDE (98%)
Ingredient CAS Number: 471-46-5 **Ingredient CAS Code:** M
RTECS Number: RO4900000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: 98
% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: NOT APPLICABLE **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: NOT APPLICABLE **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity:
DOT Reporting Quantity:

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Ozone Depleting Chemical: N

Section 3 - Hazards Identification, Including Emergency Overview
OXAMIDE 98% 0-932-8

Health Hazards Acute & Chronic: ACUTE: HARMFUL IF SWALLOWED, INHALED, OR ABSORBED THROUGH SKIN. CAUSES EYE AND SKIN IRRITATION. MATERIAL IS IRRITATING TO MUCOUS MEMBRANES AND UPPER RESPIRATORY TRACT.

Signs & Symptoms of Overexposure:
NONE SPECIFIED BY MANUFACTURER.

Medical Conditions Aggravated by Exposure:
NONE SPECIFIED BY MANUFACTURER.

LD50 LC50 Mixture: SEE SUPP DATA

Route of Entry Indicators:
Inhalation: YES
Skin: YES
Ingestion: YES

Carcenogenicity Indicators
NTP: NO
IARC: NO
OSHA: NO

Carcinogenicity Explanation: NONE.

Section 4 - First Aid Measures
OXAMIDE 98% 0-932-8

First Aid:
IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES WITH COPIOUS AMOUNTS OF WATER FOR AT LEAST 15 MINUTES. IN CASE OF CONTACT, IMMEDIATELY WASH SKIN WITH SOAP AND COPIOUS AMOUNTS OF WATER. IF INHALED, REMOVE T O FRESH AIR. IF NOT BREATHING GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN. CALL MD. WASH CONTAMINATED CLOTHING BEFORE REUSE. INGEST: CALL MD IMMEDIATELY (FP N).

Section 5 - Fire Fighting Measures
OXAMIDE 98% 0-932-8

Fire Fighting Procedures:
WEAR NIOSH/MSHA APPROVED SCBA AND PROTECTIVE CLOTHING TO PREVENT CONTACT WITH EYES AND SKIN.
Unusual Fire or Explosion Hazard:
EMITS TOXIC FUMES UNDER FIRE CONDITIONS.
Extinguishing Media:
WATER SPRAY. CO*2, DRY CHEMICAL POWDER, ALCOHOL OR POLYMER FOAM.

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Flash Point: Flash Point Text: NONE.

Autoignition Temperature:
Autoignition Temperature Text: N/A
Lower Limit(s): N/K
Upper Limit(s): N/K

Section 6 - Accidental Release Measures
OXAMIDE 98% 0-932-8

Spill Release Procedures:
WEAR NIOSH/MSHA APPROVED SCBA, RUBBER BOOTS AND HEAVY RUBBER GLOVES. SWEEP UP, PLACE IN A BAG AND HOLD FOR WASTE DISPOSAL. AVOID RAISING DUST. VENTILATE AREA AND WASH SPILL SITE AFTER MATERIAL PICKUP IS COMPLETE.

Section 7 - Handling and Storage
OXAMIDE 98% 0-932-8

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
OXAMIDE 98% 0-932-8

Repiratory Protection:
NIOSH/MSHA APPROVED RESPIRATOR.
Ventilation:
USE ONLY IN A CHEMICAL FUME HOOD.
Protective Gloves:
RUBBER GLOVES.
Eye Protection: CHEMICAL WORKERS GOGGLES.(SEE SUPP DATA)
Other Protective Equipment: SAFETY SHOWER AND EYE BATH.
Work Hygenic Practices: WASH THOROUGHLY AFTER HANDLING.
Supplemental Health & Safety Information: LD50-LC50 MIX: LD50:(ORL,RAT) 447 MG/KG, (ORL,MUS) 235 MG/KG. EYE PROT: MAY ADD FULL LENGTH FACE SHIELD TO GOGGLES (FP N).

Section 9 - Physical & Chemical Properties
OXAMIDE 98% 0-932-8

HCC: N1
NRC/State License Number:
Net Property Weight for Ammo:
Boiling Point: Boiling Point Text: N/K
Melting/Freezing Point: Melting/Freezing Text: >572F,>300C
Decomposition Point: Decomposition Text: N/K
Vapor Pressure: N/K **Vapor Density:** N/K
Percent Volatile Organic Content:
Specific Gravity: N/K

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Volatile Organic Content Pounds per Gallon:
pH: N/K
Volatile Organic Content Grams per Liter:
Viscosity: N/P
Evaporation Weight and Reference: N/K
Solubility in Water: N/K
Appearance and Odor: NONE SPECIFIED BY MANUFACTURER.
Percent Volatiles by Volume: N/K
Corrosion Rate: N/K

Section 10 - Stability & Reactivity Data
OXAMIDE 98% 0-932-8

Stability Indicator: N/P
Materials to Avoid:
STRONG OXIDIZING AGENTS & STRONG BASES.
Stability Condition to Avoid:
NONE SPECIFIED BY MANUFACTURER.
Hazardous Decomposition Products:
TOXIC FUMES OF: CO, CO*2 & NO*X.
Hazardous Polymerization Indicator: N/P
Conditions to Avoid Polymerization:
NONE SPECIFIED BY MANUFACTURER.

Section 11 - Toxicological Information
OXAMIDE 98% 0-932-8

Toxicological Information:
N/P

Section 12 - Ecological Information
OXAMIDE 98% 0-932-8

Ecological Information:
N/P

Section 13 - Disposal Considerations
OXAMIDE 98% 0-932-8

Waste Disposal Methods:
DISSOLVE OR MIX THE MATERIAL WITH A COMBUSTIBLE SOLVENT AND BURN IN A CHEMICAL INCINERATOR EQUIPPED WITH AN AFTERBURNER AND SCRUBBER. OBSERVE ALL FEDERAL, STATE & LOCAL LAWS.

Section 14 - MSDS Transport Information
OXAMIDE 98% 0-932-8

Transport Information:
N/P

Section 15 - Regulatory Information
OXAMIDE 98% 0-932-8

SARA Title III Information:
N/P
Federal Regulatory Information:
N/P
State Regulatory Information:
N/P

Section 16 - Other Information
OXAMIDE 98% 0-932-8

Other Information:
N/P

HMIS Transportation Information

Product Identification: OXAMIDE 98% 0-932-8
Transporation ID Number: 19766
Responsible Party CAGE: 60928
Date MSDS Prepared: 12/19/1988
Date MSDS Reviewed: 09/30/1991
MFN: 09/30/1991
Submitter: N TN
Status Code: C

Container Information
Unit of Issue: NK
Container Quantity: NK
Type of Container:
Net Unit Weight:

Article without MSDS: N
Technical Entry NOS Shipping Number:
Radioactivity:
Form:
Net Explosive Weight:
Coast Guard Ammunition Code:
Magnetism: N/P
AF MMAC Code:
DOD Exemption Number:
Limited Quantity Indicator:
Multiple Kit Number: 0
Kit Indicator: N
Kit Part Indicator: N
Review Indicator: Y
Additional Data:

Department of Transportation Information

DOT Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION
DOT PSN Code: ZZZ
Symbols: N/R
DOT PSN Modifier:

Hazard Class: N/R
UN ID Number: N/R
DOT Packaging Group: N/R
Label: N/R
Special Provision(s): N/R
Packaging Exception: N/R
Non Bulk Packaging: N/R
Bulk Packaging: N/R
Maximimum Quanity in Passenger Area: N/R
Maximimum Quanity in Cargo Area: N/R
Stow in Vessel Requirements: N/R
Requirements Water/Sp/Other: N/R

IMO Detail Information

IMO Proper Shipping Name: NOT REGULATED FOR THIS MODE OF TRANSPORTATION
IMO PSN Code: ZZZ
IMO PSN Modifier:
IMDG Page Number: N/R
UN Number: N/R
UN Hazard Class: N/R
IMO Packaging Group: N/R
Subsidiary Risk Label: N/R
EMS Number: N/R
Medical First Aid Guide Number: N/R

IATA Detail Information

IATA Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION
IATA PSN Code: ZZZ
IATA PSN Modifier:
IATA UN Id Number: N/R
IATA UN Class: N/R
Subsidiary Risk Class: N/R
UN Packaging Group: N/R
IATA Label: N/R
Packaging Note for Passengers: N/R
Maximum Quantity for Passengers: N/R
Packaging Note for Cargo: N/R
Maximum Quantity for Cargo: N/R
Exceptions: N/R

AFI Detail Information

AFI Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION
AFI Symbols:
AFI PSN Code: ZZZ
AFI PSN Modifier:
AFI UN Id Number: N/R
AFI Hazard Class: N/R
AFI Packing Group: N/R
AFI Label: N/R
Special Provisions: N/A
Back Pack Reference: N/A

HAZCOM Label Information

Product Identification: OXAMIDE 98% 0-932-8
CAGE: 60928

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Assigned Individual: N
Company Name: ALDRICH CHEMICAL CO INC
Company PO Box: 355
Company Street Address1: 1001 WEST ST PAUL AVE
Company Street Address2: MILWAUKEE, WI 53233 US
Health Emergency Telephone:
Label Required Indicator: Y
Date Label Reviewed: 06/10/1991
Status Code: C
Manufacturer's Label Number:
Date of Label: 06/10/1991
Year Procured: N/K
Organization Code: G
Chronic Hazard Indicator: N
Eye Protection Indicator: YES
Skin Protection Indicator: YES
Respiratory Protection Indicator: YES
Signal Word: WARNING
Health Hazard: Moderate
Contact Hazard: Moderate
Fire Hazard: None
Reactivity Hazard: None

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Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format)
For Cornell University Convenience Only

SERMABOND PBX POWDER

Section 1 - Product and Company Identification	Section 9 - Physical & Chemical Properties
Section 2 - Compositon/Information on Ingredients	Section 10 - Stability & Reactivity Data
Section 3 - Hazards Identification Including Emergency Overview	Section 11 - Toxicological Information
Section 4 - First Aid Measures	Section 12 - Ecological Information
Section 5 - Fire Fighting Measures	Section 13 - Disposal Considerations
Section 6 - Accidental Release Measures	Section 14 - MSDS Transport Information
Section 7 - Handling and Storage	Section 15 - Regulatory Information
Section 8 - Exposure Controls & Personal Protection	Section 16 - Other Information

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Section 1 - Product and Company Identification
SERMABOND PBX POWDER

Product Identification: SERMABOND PBX POWDER
Date of MSDS: 01/01/1987 **Technical Review Date:** 03/03/1988
FSC: 8040 **NIIN:** 01-204-5428
Submitter: D DG
Status Code: C
MFN: 01
Article: N
Kit Part: Y

Manufacturer's Information

Manufacturer's Name: SERMATECH INTERNATIONAL INC.
Manufacturer's Address1: 155 S LIMERICK RD
Manufacturer's Address2: LIMERICK, PA 19468-1603
Manufacturer's Country: US
General Information Telephone: 215-948-5100
Emergency Telephone: 215-948-5100
Emergency Telephone: 215-948-5100
MSDS Preparer's Name: N/P
Proprietary: N
Reviewed: Y
Published: Y
CAGE: 58913
Special Project Code: N

Item Description

Item Name:
Item Manager:
Specification Number: N/R
Type/Grade/Class: N/R
Unit of Issue:
Unit of Issue Quantity:
Type of Container: STD COML PKG

Contractor Information

Contractor's Name: SERMATECH INTERNATIONAL INC SUB OF TELEFEX INC
Contractor's Address1: 155 S LIMERICK RD
Contractor's Address2: LIMERICK, PA 19468-1603
Contractor's Telephone: 610-948-5100
Contractor's CAGE: 58913

Section 2 - Compositon/Information on Ingredients
SERMABOND PBX POWDER

Ingredient Name: ALPHA-ALUMINA (ALUMINUM OXIDE) (EPA LISTS ONLY FIBROUS FORMS) (SARA III)
Ingredient CAS Number: 1344-28-1 **Ingredient CAS Code:** M
RTECS Number: BD1200000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:

% Text: 15-25
% Enviromental Weight:
Other REC Limits: N/P
OSHA PEL: 15 MG/M3 TDUST **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: 10 MG/M3 TDUST; 9293 **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity:
DOT Reporting Quantity:
Ozone Depleting Chemical: N

Ingredient Name: CHROMIUM (III) OXIDE
Ingredient CAS Number: 1308-38-9 **Ingredient CAS Code:** M
RTECS Number: GB6475000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: <5
% Enviromental Weight:
Other REC Limits: N/P
OSHA PEL: 0.5 MG/M3 (CR) **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: 0.5 MG/M3 (CR); 8990 **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity:
DOT Reporting Quantity:
Ozone Depleting Chemical: N

Ingredient Name: NON-HAZARDOUS INGREDIENTS ARE BEING WITH HELD AS A TRADE SECRET
Ingredient CAS Number: Ingredient CAS Code: X
RTECS Number: 9999999ZZ **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: N/P
% Enviromental Weight:

Other REC Limits: N/P
OSHA PEL: N/P **OSHA PEL Code:**
OSHA STEL: OSHA STEL Code:
ACGIH TLV: N/P **ACGIH TLV Code:**
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity:
DOT Reporting Quantity:
Ozone Depleting Chemical:

Ingredient Name: SILICA, CRYSTALLINE - QUARTZ
Ingredient CAS Number: 14808-60-7 **Ingredient CAS Code:** M
RTECS Number: VV7330000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: 70-80
% Enviromental Weight:
Other REC Limits: N/P
OSHA PEL: SEE TABLE Z3 **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: 0.1 MG/M3 RDUST;9293 **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity:
DOT Reporting Quantity:
Ozone Depleting Chemical: N

Section 3 - Hazards Identification, Including Emergency Overview
SERMABOND PBX POWDER

Health Hazards Acute & Chronic: N/P

Signs & Symptoms of Overexposure:
N/P

Medical Conditions Aggravated by Exposure:
N/P

LD50 LC50 Mixture: N/P

Route of Entry Indicators:
Inhalation: N/P
Skin: N/P
Ingestion: N/P

Carcenogenicity Indicators
NTP: N/P
IARC: N/P
OSHA: N/P

Carcinogenicity Explanation: N/P

Section 4 - First Aid Measures
SERMABOND PBX POWDER

First Aid:
N/P

Section 5 - Fire Fighting Measures
SERMABOND PBX POWDER

Fire Fighting Procedures:
NONE
Unusual Fire or Explosion Hazard:
NONE
Extinguishing Media:
N/R-MATERIAL WILL NOT BURN OR SUPPORT COMBUSTION.
Flash Point: Flash Point Text: NONE

Autoignition Temperature:
Autoignition Temperature Text: N/R
Lower Limit(s): NONE
Upper Limit(s): NONE

Section 6 - Accidental Release Measures
SERMABOND PBX POWDER

Spill Release Procedures:
N/P

Section 7 - Handling and Storage
SERMABOND PBX POWDER

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
SERMABOND PBX POWDER

Repiratory Protection:
N/P
Ventilation:
N/P
Protective Gloves:

N/P
Eye Protection: N/P
Other Protective Equipment: N/P
Work Hygenic Practices: N/P
Supplemental Health & Safety Information: PAGE 2 OF MSDS WAS MISSING UPON RECEIPT.

Section 9 - Physical & Chemical Properties
SERMABOND PBX POWDER

HCC: N1
NRC/State License Number: N/R
Net Property Weight for Ammo: N/R
Boiling Point: Boiling Point Text: N/R
Melting/Freezing Point: Melting/Freezing Text: N/K
Decomposition Point: Decomposition Text: N/K
Vapor Pressure: N/R **Vapor Density:** N/R
Percent Volatile Organic Content:
Specific Gravity: 2.70
Volatile Organic Content Pounds per Gallon:
pH: N/K
Volatile Organic Content Grams per Liter:
Viscosity: N/P
Evaporation Weight and Reference: N/R
Solubility in Water: NEGLIGIBLE
Appearance and Odor: PALE GREEN POWDER, NO ODOR
Percent Volatiles by Volume: 0
Corrosion Rate: N/K

Section 10 - Stability & Reactivity Data
SERMABOND PBX POWDER

Stability Indicator: YES
Materials to Avoid:
N/P
Stability Condition to Avoid:
N/P
Hazardous Decomposition Products:
N/P
Hazardous Polymerization Indicator: N/P
Conditions to Avoid Polymerization:
N/P

Section 11 - Toxicological Information
SERMABOND PBX POWDER

Toxicological Information:
N/P

Section 12 - Ecological Information
SERMABOND PBX POWDER

Ecological Information:

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N/P

Section 13 - Disposal Considerations
SERMABOND PBX POWDER

Waste Disposal Methods:
N/P

Section 14 - MSDS Transport Information
SERMABOND PBX POWDER

Transport Information:
N/P

Section 15 - Regulatory Information
SERMABOND PBX POWDER

SARA Title III Information:
N/P
Federal Regulatory Information:
N/P
State Regulatory Information:
N/P

Section 16 - Other Information
SERMABOND PBX POWDER

Other Information:
N/P

HMIS Transportation Information

Product Identification: SERMABOND PBX POWDER
Transporation ID Number: 114931
Responsible Party CAGE: 58913
Date MSDS Prepared: 01/01/1987
Date MSDS Reviewed: 03/03/1988
MFN: 03/03/1988
Submitter: D DG
Status Code: C

Container Information
- **Unit of Issue:**
- **Container Quantity:**
- **Type of Container:** STD COML PKG
- **Net Unit Weight:** 1 LBS

Article without MSDS: N
Technical Entry NOS Shipping Number:
Radioactivity:
Form:
Net Explosive Weight:
Coast Guard Ammunition Code:
Magnetism: N/P

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AF MMAC Code:
DOD Exemption Number:
Limited Quantity Indicator:
Multiple Kit Number: 0
Kit Indicator: N
Kit Part Indicator: Y
Review Indicator: Y
Additional Data:

Department of Transportation Information

DOT Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION
DOT PSN Code: ZZZ
Symbols: N/R
DOT PSN Modifier:
Hazard Class: N/R
UN ID Number: N/R
DOT Packaging Group: N/R
Label: N/R
Special Provision(s): N/R
Packaging Exception: N/R
Non Bulk Packaging: N/R
Bulk Packaging: N/R
Maximimum Quanity in Passenger Area: N/R
Maximimum Quanity in Cargo Area: N/R
Stow in Vessel Requirements: N/R
Requirements Water/Sp/Other: N/R

IMO Detail Information

IMO Proper Shipping Name: NOT REGULATED FOR THIS MODE OF TRANSPORTATION
IMO PSN Code: ZZZ
IMO PSN Modifier:
IMDG Page Number: N/R
UN Number: N/R
UN Hazard Class: N/R
IMO Packaging Group: N/R
Subsidiary Risk Label: N/R
EMS Number: N/R
Medical First Aid Guide Number: N/R

IATA Detail Information

IATA Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION
IATA PSN Code: ZZZ
IATA PSN Modifier:
IATA UN Id Number: N/R
IATA UN Class: N/R
Subsidiary Risk Class: N/R
UN Packaging Group: N/R
IATA Label: N/R
Packaging Note for Passengers: N/R
Maximum Quantity for Passengers: N/R
Packaging Note for Cargo: N/R
Maximum Quantity for Cargo: N/R

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Exceptions: N/R

AFI Detail Information

AFI Proper Shipping Name: NOT REGULATED BY THIS MODE OF TRANSPORTATION
AFI Symbols:
AFI PSN Code: ZZZ
AFI PSN Modifier:
AFI UN Id Number: N/R
AFI Hazard Class: N/R
AFI Packing Group: N/R
AFI Label: N/R
Special Provisions: N/A
Back Pack Reference: N/A

HAZCOM Label Information

Product Identification: SERMABOND PBX POWDER
CAGE: 58913
Assigned Individual: N
Company Name: SERMATECH INTERNATIONAL INC SUB OF TELEFEX INC
Company PO Box:
Company Street Address1: 155 S LIMERICK RD
Company Street Address2: LIMERICK, PA 19468-1603 US
Health Emergency Telephone: 215-948-5100
Label Required Indicator: Y
Date Label Reviewed: 12/16/1998
Status Code: C
Manufacturer's Label Number:
Date of Label: 12/16/1998
Year Procured: N/K
Organization Code: G
Chronic Hazard Indicator: N/P
Eye Protection Indicator: N/P
Skin Protection Indicator: N/P
Respiratory Protection Indicator: N/P
Signal Word: N/P
Health Hazard:
Contact Hazard:
Fire Hazard:
Reactivity Hazard:

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CORNELL

Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format)
For Cornell University Convenience Only

ETHERS AND PHTHALATES MIXTURE, US-110

Section 1 - Product and Company Identification	Section 9 - Physical & Chemical Properties
Section 2 - Compositon/Information on Ingredients	Section 10 - Stability & Reactivity Data
Section 3 - Hazards Identification Including Emergency Overview	Section 11 - Toxicological Information
Section 4 - First Aid Measures	Section 12 - Ecological Information
Section 5 - Fire Fighting Measures	Section 13 - Disposal Considerations
Section 6 - Accidental Release Measures	Section 14 - MSDS Transport Information
Section 7 - Handling and Storage	Section 15 - Regulatory Information
Section 8 - Exposure Controls & Personal Protection	Section 16 - Other Information

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Section 1 - Product and Company Identification
ETHERS AND PHTHALATES MIXTURE, US-110

Product Identification: ETHERS AND PHTHALATES MIXTURE, US-110
Date of MSDS: 04/21/1992 **Technical Review Date:** 09/08/1995
FSC: 6850 **NIIN:** **LIIN:** 00N044825
Submitter: N EN
Status Code: C
MFN: 01
Article: N
Kit Part: N

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Manufacturer's Information

Manufacturer's Name: ULTRA SCIENTIFIC
Manufacturer's Address1: 250 SMITH ST
Manufacturer's Address2: NO KINGSTOWN, RI 02852
Manufacturer's Country: US
General Information Telephone: 401-294-9400
Emergency Telephone: 401-294-9400
Emergency Telephone: 401-294-9400
MSDS Preparer's Name: N/P
Proprietary: N
Reviewed: N
Published: Y
CAGE: 0MU35
Special Project Code: N

Contractor Information

Contractor's Name: ULTRA SCIENTIFIC
Contractor's Address1: 250 SMITH STREET
Contractor's Address2: NORTH KINGSTOWN, RI 02852-5000
Contractor's Telephone: 401-294-9400
Contractor's CAGE: 0MU35

Section 2 - Compositon/Information on Ingredients
ETHERS AND PHTHALATES MIXTURE, US-110

Ingredient Name: 4-BROMOPHENYL PHENYL ETHER (SARA III)
Ingredient CAS Number: 101-55-3 **Ingredient CAS Code:** M
RTECS Number: RTECS Code: X
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: 0.151
% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: N/K (FP N) **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: N/K (FP N) **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity: 100 LBS
DOT Reporting Quantity: 100 LBS
Ozone Depleting Chemical: N

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Ingredient Name: 4-CHLOROPHENYL PHENYL ETHER (SARA III)
Ingredient CAS Number: 7005-72-3 **Ingredient CAS Code:** M
RTECS Number: RTECS Code: X
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: 0.151
% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: N/K (FP N) **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: N/K (FP N) **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity: 5000 LBS
DOT Reporting Quantity: 5000 LBS
Ozone Depleting Chemical: N

Ingredient Name: ETHER, BIS(2-CHLORO-1-METHYLETHYL); (BIS(2-CHLORO-1-METHYLETHYL) ETHER). LD50:(ORAL,RAT) 240 MG/KG.
Ingredient CAS Number: 108-60-1 **Ingredient CAS Code:** M
RTECS Number: KN1750000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: 0.151
% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: N/K (FP N) **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: N/K (FP N) **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity: 1000 LBS
DOT Reporting Quantity: 1000 LBS
Ozone Depleting Chemical: N

Ingredient Name: ETHER, BIS(2-CHLOROETHYL); (BIS(2-CHLOROETHYL) ETHER) (SARA III). LD50:(ORAL,RAT) 75 MG/KG.

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Ingredient CAS Number: 111-44-4 **Ingredient CAS Code:** M
RTECS Number: KN0875000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: 0.151
% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: 5 PPM;10 PPM STEL, S **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: 5 PPM;10 PPM STEL, S **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity: 10 LBS
DOT Reporting Quantity: 10 LBS
Ozone Depleting Chemical: N

Ingredient Name: METHANE, BIS(2-CHLOROETHOXY)-; (BIS(2-CHLOROETHOXY) METHANE) (SARA III)
Ingredient CAS Number: 111-91-1 **Ingredient CAS Code:** M
RTECS Number: PA3675000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: 0.151
% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: N/K (FP N) **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: N/K (FP N) **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity: 1000 LBS
DOT Reporting Quantity: 1000 LBS
Ozone Depleting Chemical: N

Ingredient Name: METHANE, DICHLORO-; (METHYLENE CHLORIDE) (SARA III). LD50: (ORAL,RAT) 2136 MG/KG.
Ingredient CAS Number: 75-09-2 **Ingredient CAS Code:** M

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RTECS Number: PA8050000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: 98.34
% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: 500 PPM;1000 PPM, C **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: 50 PPM **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity: 1000 LBS
DOT Reporting Quantity: 1000 LBS
Ozone Depleting Chemical: N

Ingredient Name: PHTHALIC ACID, BENZYL BUTYL ESTER; (BUTYL BENZYL PHTHALATE) (SARA III). LD50:(ORAL,RAT) 3160 MG/KG.
Ingredient CAS Number: 85-68-7 **Ingredient CAS Code:** M
RTECS Number: TH9990000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: 0.151
% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: N/K (FP N) **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: N/K (FP N) **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity: 100 LBS
DOT Reporting Quantity: 100 LBS
Ozone Depleting Chemical: N

Ingredient Name: PHTHALIC ACID, BIS(2-ETHYLHEXYL) ESTER; (BIS(2-ETHYLHEXYL) PHTHALATE) (SARA III). LD50:(ORAL,RAT) 31,000 MG/KG.
Ingredient CAS Number: 117-81-7 **Ingredient CAS Code:** M
RTECS Number: TI0350000 **RTECS Code:** M

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=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: 0.151
% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: 5 MG/M3;10 STEL **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: 5 MG/M3 **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity: 100 LBS
DOT Reporting Quantity: 100 LBS
Ozone Depleting Chemical: N

Ingredient Name: PHTHALIC ACID, DIBUTYL ESTER; (DIBUTYL PHTHALATE) (DI-N-BUTYL PHTHALATE) (SARA III). LD50:(ORAL,RAT) 3050 MG/KG.
Ingredient CAS Number: 84-74-2 **Ingredient CAS Code:** M
RTECS Number: TI0875000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: 0.151
% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: 5 MG/M3 **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: 5 MG/M3 **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity: 10 LBS
DOT Reporting Quantity: 10 LBS
Ozone Depleting Chemical: N

Ingredient Name: PHTHALIC ACID, DIETHYL ESTER; (DIETHYL PHTHALATE) (SARA III). LD50:(ORAL,RAT) 31,000 MG/KG.
Ingredient CAS Number: 84-66-2 **Ingredient CAS Code:** M
RTECS Number: TI1050000 **RTECS Code:** M
=WT: =WT Code:

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=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: 0.151
% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: 5 MG/M3 **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: 5 MG/M3 **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity: 1000 LBS
DOT Reporting Quantity: 1000 LBS
Ozone Depleting Chemical: N

Ingredient Name: PHTHALIC ACID, DIMETHYL ESTER; (DIMETHYLPHTHALATE) (DIMETHYL PHTHALATE) (SARA III). LD50:(ORAL,RAT) 3375 MG/KG.
Ingredient CAS Number: 131-11-3 **Ingredient CAS Code:** M
RTECS Number: TI1575000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: 0.151
% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: 5 MG/M3 **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: 5 MG/M3 **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity: 5000 LBS
DOT Reporting Quantity: 5000 LBS
Ozone Depleting Chemical: N

Ingredient Name: PHTHALIC ACID, DIOCTYL ESTER; (N-DIOCTYLPHTHALATE) (DI-N-OCTYL PHTHALATE) (SARA III)
Ingredient CAS Number: 117-84-0 **Ingredient CAS Code:** M
RTECS Number: TI1925000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:

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>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: 0.151
% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: N/K (FP N) **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: N/K (FP N) **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity: 5000 LBS
DOT Reporting Quantity: 5000 LBS
Ozone Depleting Chemical: N

Section 3 - Hazards Identification, Including Emergency Overview
ETHERS AND PHTHALATES MIXTURE, US-110

Health Hazards Acute & Chronic: CONTAINS CARCINOGEN(S) OR SUSPECT AGENT(S). TOXIC; IRRITANT. ALL CHEMICALS SHOULD BE CONSIDERED HAZARDOUS - DIRECT PHYSICAL CONTACT SHOULD BE AVOIDED. CHLOROCARBON MATERIALS PRODUCED SENSITIZATION OF MYOCARDIUM TO EPINEPHRINE IN LABORATORYANIMALS & COULD HAVE SIMILAR EFFECT IN HUMANS. ADRENOMIMETICS (EFTS OF OVEREXP)

Signs & Symptoms of Overexposure:
HLTH HAZ: (E.G., EPINEPHRINE) MAY BE CONTRAINDICATED EXCEPT FOR LIFE-SUSTAINING USES IN HUMANS ACUTELY OR CHRONICALLY EXPOSED TO CHLOROCARBONS (FP N).

Medical Conditions Aggravated by Exposure:
NONE SPECIFIED BY MANUFACTURER.

LD50 LC50 Mixture: SEE INGREDIENTS.

Route of Entry Indicators:
Inhalation: YES
Skin: YES
Ingestion: NO

Carcenogenicity Indicators
NTP: YES
IARC: YES
OSHA: NO

Carcinogenicity Explanation: METHYLENE CHLORIDE:IARC MONOGRAPHS, SUPP, VOL 7, PG 194, 1987:GRP 2B. NTP 6TH ANNUAL RPT ON CARCINS, 1991:ANTIC (SUPDAT)

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Section 4 - First Aid Measures
ETHERS AND PHTHALATES MIXTURE, US-110

First Aid:
INGEST:CALL MD IMMEDIATELY (FP N). EYE:FLUSH W/COPIOUS AMOUNTS OF WATER FOR AT LEAST 15 MINUTES. SKIN:FLUSH W/COPIOUS AMOUNTS OF WATER. INHAL:REMOVE TO FRESH AIR - GIVE OXYGEN, IF NECESSARY. CONTACT M D.

Section 5 - Fire Fighting Measures
ETHERS AND PHTHALATES MIXTURE, US-110

Fire Fighting Procedures:
USE NIOSH/MSHA APPROVED PRESSURE DEMAND SCBA & FULL PROTECTIVE EQUIPMENT (FP N).
Unusual Fire or Explosion Hazard:
THERMAL DECOMPOSITION PRODUCTS INCLUDE HCL & PHOSGENE (FP N).
Extinguishing Media:
CARBON DIOXIDE, DRY CHEMICAL POWDER OR WATER SPRAY.
Flash Point: Flash Point Text: NOT APPLICABLE

Autoignition Temperature:
Autoignition Temperature Text: N/A
Lower Limit(s): N/K
Upper Limit(s): N/K

Section 6 - Accidental Release Measures
ETHERS AND PHTHALATES MIXTURE, US-110

Spill Release Procedures:
DUE TO THE SMALL QUANTITY INVOLVED, SPILLS OR LEAKS SHOULD NOT POSE A SIGNIFICANT PROBLEM. A LEAKING BOTTLE MAY BE PLACED IN A PLASTIC BAG & NORMAL DISPOSAL PROCEDURES FOLLOWED. LIQUID SAMPLES MAY BE ABSORBED ON VERMICULITE OR SAND.

Section 7 - Handling and Storage
ETHERS AND PHTHALATES MIXTURE, US-110

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
ETHERS AND PHTHALATES MIXTURE, US-110

Repiratory Protection:
NIOSH/MSHA APPROVED RESPIRATOR APPROPRIATE FOR EXPOSURE OF CONCERN (FP N).
Ventilation:
NONE SPECIFIED BY MANUFACTURER.

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Protective Gloves:
IMPERVIOUS GLOVES (FP N).
Eye Protection: ANSI APPVD CHEM GOGGS, FACE SHIELD(FP N)
Other Protective Equipment: USE APPROP NIOSH/MSHA APPRVD SAFETY EQUIP. WEAR CHEM RESIST CLTHG SUCH AS LAB COAT &/OR RUBBER APRON TO PREVENT (SUPDAT)
Work Hygenic Practices: NONE SPECIFIED BY MANUFACTURER.
Supplemental Health & Safety Information: EXPLAN OF CARCIN:TO BE CARCIN. PHTHALIC ACID, BIS(2-ETHYL HEXYL) ESTER IARC MONOGRAPHS, SUPP, VOL 7, PG 56, 1987:GRP 2B. NTP 6TH ANNUAL RPT ON CARCINS, 1991:ANTIC TO BE CARCINOGEN. OTHER PROT EQUIP:CO NT W/EYES, SKIN & CLTHG.

Section 9 - Physical & Chemical Properties
ETHERS AND PHTHALATES MIXTURE, US-110

HCC: T6
NRC/State License Number:
Net Property Weight for Ammo:
Boiling Point: Boiling Point Text: N/K
Melting/Freezing Point: Melting/Freezing Text: N/K
Decomposition Point: Decomposition Text: N/K
Vapor Pressure: N/K **Vapor Density:** N/K
Percent Volatile Organic Content:
Specific Gravity: N/K
Volatile Organic Content Pounds per Gallon:
pH: N/K
Volatile Organic Content Grams per Liter:
Viscosity: N/P
Evaporation Weight and Reference: N/K
Solubility in Water: N/K
Appearance and Odor: LIQUID.
Percent Volatiles by Volume: N/K
Corrosion Rate: N/K

Section 10 - Stability & Reactivity Data
ETHERS AND PHTHALATES MIXTURE, US-110

Stability Indicator: YES
Materials to Avoid:
STRONG OXIDIZERS.
Stability Condition to Avoid:
NONE SPECIFIED BY MANUFACTURER.
Hazardous Decomposition Products:
HCL, PHOSGENE (FP N).
Hazardous Polymerization Indicator: NO
Conditions to Avoid Polymerization:
NOT RELEVANT

Section 11 - Toxicological Information
ETHERS AND PHTHALATES MIXTURE, US-110

Toxicological Information:
N/P

Section 12 - Ecological Information
ETHERS AND PHTHALATES MIXTURE, US-110

Ecological Information:
N/P

Section 13 - Disposal Considerations
ETHERS AND PHTHALATES MIXTURE, US-110

Waste Disposal Methods:
BURN IN A CHEMICAL INCINERATOR EQUIPPED W/AFTERBURNER & SCRUBBER.
OBSERVE ALL FEDERAL, STATE & LOCAL LAWS CONCERNING DISPOSAL.

Section 14 - MSDS Transport Information
ETHERS AND PHTHALATES MIXTURE, US-110

Transport Information:
N/P

Section 15 - Regulatory Information
ETHERS AND PHTHALATES MIXTURE, US-110

SARA Title III Information:
N/P
Federal Regulatory Information:
N/P
State Regulatory Information:
N/P

Section 16 - Other Information
ETHERS AND PHTHALATES MIXTURE, US-110

Other Information:
N/P

HAZCOM Label Information

Product Identification: ETHERS AND PHTHALATES MIXTURE, US-110
CAGE: 0MU35
Assigned Individual: N
Company Name: ULTRA SCIENTIFIC
Company PO Box:
Company Street Address1: 250 SMITH STREET
Company Street Address2: NORTH KINGSTOWN, RI 02852-5000 US
Health Emergency Telephone: 401-294-9400
Label Required Indicator: Y
Date Label Reviewed: 10/21/1993
Status Code: C
Manufacturer's Label Number:
Date of Label: 10/21/1993
Year Procured: N/K
Organization Code: G
Chronic Hazard Indicator: Y

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CORNELL

Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format)
For Cornell University Convenience Only

POLYSTER RESIN/GEL COAT, RESIN UN 1866

Section 1 - Product and Company Identification	Section 9 - Physical & Chemical Properties
Section 2 - Compositon/Information on Ingredients	Section 10 - Stability & Reactivity Data
Section 3 - Hazards Identification Including Emergency Overview	Section 11 - Toxicological Information
Section 4 - First Aid Measures	Section 12 - Ecological Information
Section 5 - Fire Fighting Measures	Section 13 - Disposal Considerations
Section 6 - Accidental Release Measures	Section 14 - MSDS Transport Information
Section 7 - Handling and Storage	Section 15 - Regulatory Information
Section 8 - Exposure Controls & Personal Protection	Section 16 - Other Information

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Cornell University does not in any way warrant or imply the applicability, viability or use of this information to any person or for use in any situation.

Section 1 - Product and Company Identification
POLYSTER RESIN/GEL COAT, RESIN UN 1866

Product Identification: POLYSTER RESIN/GEL COAT, RESIN UN 1866
Date of MSDS: 04/19/1991 **Technical Review Date:** 03/24/1993
FSC: 8010 **NIIN:** **LIIN:** 00N040575
Submitter: N EN
Status Code: C
MFN: 01
Article: N
Kit Part: N

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Manufacturer's Information

Manufacturer's Name: POLYGARD INC
Post Office Box: 15477
Manufacturer's Address1: 5010 N COOLIDGE AVE
Manufacturer's Address2: TAMPA, FL 33684
Manufacturer's Country: US
General Information Telephone: 813-877-7591
Emergency Telephone: 800-424-9300 (CHEMTREC)
Emergency Telephone: 800-424-9300 (CHEMTREC)
MSDS Preparer's Name: N/P
Proprietary: N
Reviewed: N
Published: Y
CAGE: 0GYZ7
Special Project Code: N

Contractor Information

Contractor's Name: POLYGARD, INC.
Post Office Box: 15477
Contractor's Address1: 6010 N COOLIDGE AVE
Contractor's Address2: TAMPA, FL 33614
Contractor's Telephone: 813-877-7591
Contractor's CAGE: 0GYZ7

Section 2 - Compositon/Information on Ingredients
POLYSTER RESIN/GEL COAT, RESIN UN 1866

Ingredient Name: EXPLO HAZ:FIRE. VAPOR EXPLOS HAZARD INDOORS, OUTDOORS OR IN SEWERS. RUNOFF TO SEWER MAY CREATE FIRE/EXPLOS HAZARD.
Ingredient CAS Number: Ingredient CAS Code: X
RTECS Number: 9999999ZZ **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: N/K
% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: NOT APPLICABLE **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: NOT APPLICABLE **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity:

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DOT Reporting Quantity:
Ozone Depleting Chemical:

Ingredient Name: FIRST AID PROC:DO NOT FORCE LENS; IF UNABLE TO INSERT, DO NOT USE. SKIN:DO NOT USE EMETICS. COVER SKIN W/DRY (ING 4)
Ingredient CAS Number: Ingredient CAS Code: X
RTECS Number: 9999999ZZ **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: N/K
% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: NOT APPLICABLE **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: NOT APPLICABLE **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity:
DOT Reporting Quantity:
Ozone Depleting Chemical:

Ingredient Name: ING 3:STERILE DRESSINGS AFTER DECONTAMINATION. NOTES TO MD:PROD MAY CAUSE ACIDOSIS; HYPERVENTILATION MAY BE (ING 5)
Ingredient CAS Number: Ingredient CAS Code: X
RTECS Number: 9999999ZZ **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: N/K
% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: NOT APPLICABLE **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: NOT APPLICABLE **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity:
DOT Reporting Quantity:

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Ozone Depleting Chemical:

Ingredient Name: ING 4:BENEFICIAL. AVOID EPINEPHRINE & RELATED COMPOUNDS.
Ingredient CAS Number: **Ingredient CAS Code:** X
RTECS Number: 9999999ZZ **RTECS Code:** M
=WT: **=WT Code:**
=Volume: **=Volume Code:**
>WT: **>WT Code:**
>Volume: **>Volume Code:**
<WT: **<WT Code:**
<Volume: **<Volume Code:**
% Low WT: **% Low WT Code:**
% High WT: **% High WT Code:**
% Low Volume: **% Low Volume Code:**
% High Volume: **% High Volume Code:**
% Text: N/K
% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: NOT APPLICABLE **OSHA PEL Code:** M
OSHA STEL: **OSHA STEL Code:**
ACGIH TLV: NOT APPLICABLE **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity:
DOT Reporting Quantity:
Ozone Depleting Chemical:

Ingredient Name: STYRENE, MONOMER (SARA III). VP:5
Ingredient CAS Number: 100-42-5 **Ingredient CAS Code:** M
RTECS Number: WL3675000 **RTECS Code:** M
=WT: **=WT Code:**
=Volume: **=Volume Code:**
>WT: **>WT Code:**
>Volume: **>Volume Code:**
<WT: **<WT Code:**
<Volume: **<Volume Code:**
% Low WT: **% Low WT Code:**
% High WT: **% High WT Code:**
% Low Volume: **% Low Volume Code:**
% High Volume: **% High Volume Code:**
% Text: 40
% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: 50 PPM; 100 STEL **OSHA PEL Code:** M
OSHA STEL: **OSHA STEL Code:**
ACGIH TLV: 50 PPM; 100 STEL, S **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity: 1000 LBS
DOT Reporting Quantity: 1000 LBS
Ozone Depleting Chemical: N

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Section 3 - Hazards Identification, Including Emergency Overview
POLYSTER RESIN/GEL COAT, RESIN UN 1866

Health Hazards Acute & Chronic: STYRENE AT HIGH PPM OR IN A STRONG CONCENTRATION IS IRRITATING TO ALL PARTS OF THE RESPIRATORY TRACT & EYES. STYRENE VAPOR GENERATION OF POLYESTER RESINS WILL RARELY EXCEED 200 PPM. RESPIRATORY AGGRAV ATION & DERMATITIS MAY OCCUR.

Signs & Symptoms of Overexposure:
SEE HEALTH HAZARDS.

Medical Conditions Aggravated by Exposure:
NONE SPECIFIED BY MANUFACTURER.

LD50 LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.

Route of Entry Indicators:
Inhalation: YES
Skin: YES
Ingestion: YES

Carcenogenicity Indicators
NTP: NO
IARC: YES
OSHA: NO

Carcinogenicity Explanation: STYRENE: GROUP 2B (IARC SUPP7, P345, 1987).

Section 4 - First Aid Measures
POLYSTER RESIN/GEL COAT, RESIN UN 1866

First Aid:
INHAL:REMOVE VICTIM FROM EXPOSURE TO WELL-VENTILATED AREA. MAKE COMFORTABLY WARM BUT NOT HOT. ASSIST IN VENTILATIONS (ARTF RESP) IF NEEDED. ADMIN OXYGEN BY NONREBREATHING MASK. MONITOR FOR PULM EDEMA & TREAT AS NEC. ANTICIPATE SEIZURES & TREAT AS NEC. EYES:FLUSH IMMED W/AVAIL WATER FOR AT LEAST 15 MINS. IN ADULTS, IF LID & GLOBE ARE INTACT & W/OUT EDEMA, EYE IRRIGATION LENS MAY BE USED. (ING 3)

Section 5 - Fire Fighting Measures
POLYSTER RESIN/GEL COAT, RESIN UN 1866

Fire Fighting Procedures:
WEAR NIOSH/MSHA APPRVD SCBA & FULL PROT EQUIP (FP N). MOVE CONTR FROM FIRE AREA IF YOU CAN W/OUT RISK. COOL CONTRS THAT ARE EXPOSED TO FLAMES W/WATER (SUP DAT)
Unusual Fire or Explosion Hazard:
HIGHLY FLAMM/COMBUST MATL; MAY BE IGNITED BY HEAT, SPARKS OR FLAMES. VAPS MAY TRAVEL TO A SOURCE OF IGNIT & FLASH BACK. CONTR MAY EXPLODE IN HEAT OF (ING 2)
Extinguishing Media:

SMALL:DRY CHEM, CARBON DIOXIDE, HALON, WATER SPRAY OR STD FOAM.
LGE:WATER SPRAY, FOG OR STD FOAM.
Flash Point: Flash Point Text: 80.0F,26.7C

Autoignition Temperature:
Autoignition Temperature Text: N/A
Lower Limit(s): 1
Upper Limit(s): N/K

Section 6 - Accidental Release Measures
POLYSTER RESIN/GEL COAT, RESIN UN 1866

Spill Release Procedures:
REMOVE SATURATED CLOTHING PROMPLTY & WASH AFFECTED AREAS W/SOAP & WATER. REMOVE ALL SOURCES OF IGNITION. VENTILATE AREA. USE PROTECTIVE MEASURES.

Section 7 - Handling and Storage
POLYSTER RESIN/GEL COAT, RESIN UN 1866

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
POLYSTER RESIN/GEL COAT, RESIN UN 1866

Repiratory Protection:
UP TO 100 PPM:NONE. ABOVE 100 PPM:WEAR NIOSH/MSHA APPROVED RESPIRATORS WHEN HANDLING & APPLYING THE PRODUCT, THE USE OF A NIOSH/MSHA APPROVED SCBA MAY ALSO BE USED.
Ventilation:
LOCAL AND MECHANCIAL EXHAUST. USE OF EXPLOSION PROOF MOTORS IS HIGHLY RECOMMENDED.
Protective Gloves:
NEOPRENE OR NON-SOLUBLE PLASTIC.
Eye Protection: ANSI APRV CHEM WORK GOGG (FP N).
Other Protective Equipment: SAFETY SHOWERS & EYE WASH STATIONS SHOULD BE AVAILABLE.
Work Hygenic Practices: STANDARD GOOD HOUSEKEEPING & HEALTH PRACTICES.
Supplemental Health & Safety Information: FIRE FIGHT PROC:FROM SIDE UNTIL WELL AFTER FIRE IS OUT. STAY AWAY FROM ENDS OF TANKS. FOR MASSIVE FIRE IN CARGO AREA, USE UNMANNED HOSE HOLDER OR MONITOR NOZZ; IF THIS IS IMPOSS, WITHDRAW FROM AREA & LET FIRE BURN. WITHDRAW IMMED IN CASE OF RISING SOUND FROM VENTING SFTY DEVICE OR ANY DISCOLORATION OF TANK DUE TO FIRE.

Section 9 - Physical & Chemical Properties
POLYSTER RESIN/GEL COAT, RESIN UN 1866

HCC:

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NRC/State License Number:
Net Property Weight for Ammo:
Boiling Point: Boiling Point Text: 290F,143C
Melting/Freezing Point: Melting/Freezing Text: N/K
Decomposition Point: Decomposition Text: N/K
Vapor Pressure: SEE INGRED **Vapor Density:** HVR/AIR
Percent Volatile Organic Content:
Specific Gravity: 1.08-1.44(FP N)
Volatile Organic Content Pounds per Gallon:
pH: N/K
Volatile Organic Content Grams per Liter:
Viscosity: N/P
Evaporation Weight and Reference: SLOWER THAN BUTYL ACETATE
Solubility in Water: N/K
Appearance and Odor: LIQUID; STYRENE ODOR.
Percent Volatiles by Volume: <50
Corrosion Rate: N/K

Section 10 - Stability & Reactivity Data
POLYSTER RESIN/GEL COAT, RESIN UN 1866

Stability Indicator: YES
Materials to Avoid:
STRONG ACIDS, PEROXIDES & OTHER OXIDIZING AGENTS.
Stability Condition to Avoid:
NONE SPECIFIED BY MANUFACTURER.
Hazardous Decomposition Products:
CARBON MONOXIDE & DIOXIDE, LOW MOLECULAR WEIGHT HYDROCARBONS & ORGANIC ACID.
Hazardous Polymerization Indicator: YES
Conditions to Avoid Polymerization:
NONE SPECIFIED BY MANUFACTURER.

Section 11 - Toxicological Information
POLYSTER RESIN/GEL COAT, RESIN UN 1866

Toxicological Information:
N/P

Section 12 - Ecological Information
POLYSTER RESIN/GEL COAT, RESIN UN 1866

Ecological Information:
N/P

Section 13 - Disposal Considerations
POLYSTER RESIN/GEL COAT, RESIN UN 1866

Waste Disposal Methods:
ABSORB W/INERT MATERIALS SUCH AS VERMICULITE OR SAND IN A CLOSED CONTAINER FOR DISPOSAL AS A SOLID WASTE. WASH AREA WELL W/TRISODIUM PHOSPHATE & WATER. DISPOSAL MUST CONFORM TO LOCAL, STATE & FEDERAL

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REGULATIONS.

Section 14 - MSDS Transport Information
POLYSTER RESIN/GEL COAT, RESIN UN 1866

Transport Information:
N/P

Section 15 - Regulatory Information
POLYSTER RESIN/GEL COAT, RESIN UN 1866

SARA Title III Information:
N/P
Federal Regulatory Information:
N/P
State Regulatory Information:
N/P

Section 16 - Other Information
POLYSTER RESIN/GEL COAT, RESIN UN 1866

Other Information:
N/P

HAZCOM Label Information

Product Identification: POLYSTER RESIN/GEL COAT, RESIN UN 1866
CAGE: 0GYZ7
Assigned Individual: N
Company Name: POLYGARD, INC.
Company PO Box: 15477
Company Street Address1: 6010 N COOLIDGE AVE
Company Street Address2: TAMPA, FL 33614 US
Health Emergency Telephone: 800-424-9300 (CHEMTREC)
Label Required Indicator: Y
Date Label Reviewed: 03/19/1993
Status Code: C
Manufacturer's Label Number:
Date of Label: 03/19/1993
Year Procured: N/K
Organization Code: G
Chronic Hazard Indicator: Y
Eye Protection Indicator: YES
Skin Protection Indicator: YES
Respiratory Protection Indicator: YES
Signal Word: DANGER
Health Hazard: Slight
Contact Hazard: Slight
Fire Hazard: Severe
Reactivity Hazard: None

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Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format)
For Cornell University Convenience Only

SN CMPD 7048, POLYVINYL CHLORIDE COMPOUND-(SUPDAT)

Section 1 - Product and Company Identification	Section 9 - Physical & Chemical Properties
Section 2 - Compositon/Information on Ingredients	Section 10 - Stability & Reactivity Data
Section 3 - Hazards Identification Including Emergency Overview	Section 11 - Toxicological Information
Section 4 - First Aid Measures	Section 12 - Ecological Information
Section 5 - Fire Fighting Measures	Section 13 - Disposal Considerations
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Section 1 - Product and Company Identification
SN CMPD 7048, POLYVINYL CHLORIDE COMPOUND-(SUPDAT)

Product Identification: SN CMPD 7048, POLYVINYL CHLORIDE COMPOUND-(SUPDAT)
Date of MSDS: 11/10/1986 **Technical Review Date:** 07/30/1997
FSC: 6850 **NIIN:** **LIIN:** 00N077866
Submitter: N EN
Status Code: C
MFN: 01
Article: N
Kit Part: N

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Manufacturer's Information

Manufacturer's Name: GEORGIA GULF CORP
Post Office Box: 629
Manufacturer's Address1:
Manufacturer's Address2: PLAGUEMINE, LA 70765-0629
Manufacturer's Country: US
General Information Telephone: 601-892-5612
Emergency Telephone: 800-424-9300 (CHEMTREC)
Emergency Telephone: 800-424-9300 (CHEMTREC)
MSDS Preparer's Name: N/P
Proprietary: N
Reviewed: N
Published: Y
CAGE: 49960
Special Project Code: N

Contractor Information

Contractor's Name: GEORGIA GULF CORP
Post Office Box: 629
Contractor's Address1:
Contractor's Address2: PLAQUEMINE, LA 70765-0629
Contractor's Telephone: 225-685-2500
Contractor's CAGE: GEXRG

Contractor Information

Contractor's Name: GEORGIA GULF CORPORATION
Post Office Box: 105197
Contractor's Address1: 400 PERIMETER CENTER TER SUITE 595
Contractor's Address2: ATLANTA, GA 30348
Contractor's Telephone: 504-685-2500/770-395-4500 GOOD#
Contractor's CAGE: 49960

Section 2 - Compositon/Information on Ingredients
SN CMPD 7048, POLYVINYL CHLORIDE COMPOUND-(SUPDAT)

Ingredient Name: ETHYLENE, CHLORO-, POLYMER; (VINYL CHLORIDE)
Ingredient CAS Number: 9002-86-2 **Ingredient CAS Code:** M
RTECS Number: KV0350000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:

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% Text: <0.0002
% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: N/K (FP N) **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: N/K (FP N) **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity:
DOT Reporting Quantity:
Ozone Depleting Chemical: N

Section 3 - Hazards Identification, Including Emergency Overview
SN CMPD 7048, POLYVINYL CHLORIDE COMPOUND-(SUPDAT)

Health Hazards Acute & Chronic: ACUTE:THE PHYSICAL STATE OF PVC CMPD SHOULD PRVT ANY SIGNIFICANT ORAL, OCULAR/DERM EXPOS. IT IS EXPECTED TO BE NON IRRITATING CHEMICALLY. MATL IS EXPECTED TO BE PRACTICALLY NON-TOXIC BY ORAL INGEST. A BNORMAL HEATING MAY LEAD TO DECOMP W/RELEASE OF HCL THEREBY CAUSING IRRIT OF EYES, SKIN AND/OR RESP (EFTS OF OVEREXP)

Signs & Symptoms of Overexposure:
HLTH HAZ:TRACT. CMPDS CONTAINS ORGANOTIN STABILIZER. SOME INDIVIDUALS HAVE BEEN SHOWN TO DEVELOP SENSIT TO TIN CMPDS. IRRIT OF SKIN, EYE/RESP TRACT MAY OCCUR FROM EXPOS TO HCL/ORGANOTIN. MATL CNTNS VI NYL CHLORIDE WHICH IS CANCER SUSPECT AGENT. PVC MEETS RTECS CRITERIA AS EQUIVOCAL TUMORIGENIC AGENT-TUMORS OF (SUPDAT)

Medical Conditions Aggravated by Exposure:
NONE SPECIFIED BY MANUFACTURER.

LD50 LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.

Route of Entry Indicators:
Inhalation: YES
Skin: NO
Ingestion: NO

Carcenogenicity Indicators
NTP: NO
IARC: NO
OSHA: NO

Carcinogenicity Explanation: NOT RELEVANT.

Section 4 - First Aid Measures
SN CMPD 7048, POLYVINYL CHLORIDE COMPOUND-(SUPDAT)

First Aid:
INGEST:PRACTICALLY INERT. CALL MD IMMEDIATELY (FP N). SKIN:FLUSH W/COPIOUS AMOUNTS OF WATER. CALL MD (FP N). INHAL:REMOVE VICTIM TO FRESH AIR. GET

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MEDICAL ATTENTION IF NECESSARY. EYE:IRRIGATE WITH COO L WATER FOR AT LEAST 15 MINUTES. SEEK MEDICAL ATTENTION, IF NEEDED.

Section 5 - Fire Fighting Measures
SN CMPD 7048, POLYVINYL CHLORIDE COMPOUND-(SUPDAT)

Fire Fighting Procedures:
USE NIOSH APPROVED SCBA & FULL PROTECTIVE EQUIPMENT (FP N). FLASH POINT METHOD:ASTM D1229.
Unusual Fire or Explosion Hazard:
PVC CMPD WILL NOT CONTINUE TO BURN AFTER IGNITION WITHOUT AN EXTERNAL FIRE SOURCE. BURNING OR TEMPERATURES AT OR ABOVE 45F LIBERATES HCL GAS.
Extinguishing Media:
WATER, CARBON DIOXIDE, OR FOAM.
Flash Point: Flash Point Text: 735F,391C

Autoignition Temperature:
Autoignition Temperature Text: N/A
Lower Limit(s): N/A
Upper Limit(s): N/A

Section 6 - Accidental Release Measures
SN CMPD 7048, POLYVINYL CHLORIDE COMPOUND-(SUPDAT)

Spill Release Procedures:
VACUUM, SWEEP, OR SHOVEL UP IMMEDIATELY.

Section 7 - Handling and Storage
SN CMPD 7048, POLYVINYL CHLORIDE COMPOUND-(SUPDAT)

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
SN CMPD 7048, POLYVINYL CHLORIDE COMPOUND-(SUPDAT)

Repiratory Protection:
NONE UNDER NORMAL PROCESSING CONDITIONS. NIOSH APPROVED RESPIRATOR APPROPRIATE FOR EXPOSURE OF CONCERN (FP N).
Ventilation:
LOCAL EXHAUST:RECOMMENDED FOR PROCESSING EQUIPMENT WHEN COMPOUND IS HEATED.
Protective Gloves:
IMPERVIOUS GLOVES (FP N).
Eye Protection: ANSI APPRVD CHEM WORKERS GOGGLES (FP N).
Other Protective Equipment: ANSI APPRVD EYE WASH & DELUGE SHOWER (FP N).
Work Hygenic Practices: NONE SPECIFIED BY MANUFACTURER.
Supplemental Health & Safety Information: MFR TRADE NAME/PART NO:RIGID 7048. SPEC GRAV:1.2-1.4 (WATER =1). MATLS TO AVOID:TWO MATLS ARE NOT COMPAT & WILL

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REACT IN VIOLENT DECOMP WHEN MIXED UNDER CNDTNS OF HEAT & PRESS. EFTS OF OVEREXP:LUNGS, THORAX/RESP SYS; TUMORS OF SKIN(RAT-ORAL). MATL MAY CNTN TRACE AMTS OF VINYL CHLORIDE WHICH IS CANCER SUSPECT AGENT.

Section 9 - Physical & Chemical Properties
SN CMPD 7048, POLYVINYL CHLORIDE COMPOUND-(SUPDAT)

HCC:
NRC/State License Number:
Net Property Weight for Ammo:
Boiling Point: Boiling Point Text: N/A
Melting/Freezing Point: Melting/Freezing Text: N/A
Decomposition Point: Decomposition Text: N/K
Vapor Pressure: <0.1 **Vapor Density:** NONE
Percent Volatile Organic Content:
Specific Gravity: SUPDAT
Volatile Organic Content Pounds per Gallon:
pH: N/A
Volatile Organic Content Grams per Liter:
Viscosity: N/P
Evaporation Weight and Reference: NONE
Solubility in Water: NONE
Appearance and Odor: 4/32 INCH CUBES, VARIOUS COLORS.
Percent Volatiles by Volume: 0
Corrosion Rate: N/K

Section 10 - Stability & Reactivity Data
SN CMPD 7048, POLYVINYL CHLORIDE COMPOUND-(SUPDAT)

Stability Indicator: YES
Materials to Avoid:
POLYVINYL CHLORIDE CMPDS SHOULD NOT COME INTO CONT W/ACETAL/ACETAL COPOLYMERS IN ELEVATED TEMP PROCESSING EQUIP.(SUPDAT)
Stability Condition to Avoid:
OVERHEATING. TEMPERATURES ABOVE 400F.
Hazardous Decomposition Products:
SLOW RELEASE OF HCL WHEN HEATED ABOVE 450F.
Hazardous Polymerization Indicator: NO
Conditions to Avoid Polymerization:
NOT RELEVANT.

Section 11 - Toxicological Information
SN CMPD 7048, POLYVINYL CHLORIDE COMPOUND-(SUPDAT)

Toxicological Information:
N/P

Section 12 - Ecological Information
SN CMPD 7048, POLYVINYL CHLORIDE COMPOUND-(SUPDAT)

Ecological Information:
N/P

Section 13 - Disposal Considerations
SN CMPD 7048, POLYVINYL CHLORIDE COMPOUND-(SUPDAT)

Waste Disposal Methods:
DISPOSAL MUST BE I/A/W FEDERAL, STATE & LOCAL REGULATIONS (FP N). APPROVED LANDFILL OR HIGH TEMPERATURE INCINERATION UNDER CONTROLLED CONDITIONS DUE TO FORMATION OF HCL.

Section 14 - MSDS Transport Information
SN CMPD 7048, POLYVINYL CHLORIDE COMPOUND-(SUPDAT)

Transport Information:
N/P

Section 15 - Regulatory Information
SN CMPD 7048, POLYVINYL CHLORIDE COMPOUND-(SUPDAT)

SARA Title III Information:
N/P
Federal Regulatory Information:
N/P
State Regulatory Information:
N/P

Section 16 - Other Information
SN CMPD 7048, POLYVINYL CHLORIDE COMPOUND-(SUPDAT)

Other Information:
N/P

HAZCOM Label Information

Product Identification: SN CMPD 7048, POLYVINYL CHLORIDE COMPOUND-(SUPDAT)
CAGE: 49960
Assigned Individual: N
Company Name: GEORGIA GULF CORPORATION
Company PO Box: 105197
Company Street Address1: 400 PERIMETER CENTER TER SUITE 595
Company Street Address2: ATLANTA, GA 30348 US
Health Emergency Telephone: 800-424-9300 (CHEMTREC)
Label Required Indicator: Y
Date Label Reviewed: 07/31/1997
Status Code: C
Manufacturer's Label Number:
Date of Label: 07/31/1997
Year Procured: N/K
Organization Code: M
Chronic Hazard Indicator: Y
Eye Protection Indicator: YES
Skin Protection Indicator: YES
Respiratory Protection Indicator: YES
Signal Word: WARNING
Health Hazard: Moderate

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Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format)
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POTASSIUM CHLORATE

Section 1 - Product and Company Identification	Section 9 - Physical & Chemical Properties
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Section 3 - Hazards Identification Including Emergency Overview	Section 11 - Toxicological Information
Section 4 - First Aid Measures	Section 12 - Ecological Information
Section 5 - Fire Fighting Measures	Section 13 - Disposal Considerations
Section 6 - Accidental Release Measures	Section 14 - MSDS Transport Information
Section 7 - Handling and Storage	Section 15 - Regulatory Information
Section 8 - Exposure Controls & Personal Protection	Section 16 - Other Information

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Section 1 - Product and Company Identification
POTASSIUM CHLORATE

Product Identification: POTASSIUM CHLORATE
Date of MSDS: 12/23/1994 **Technical Review Date:** 07/27/1998
FSC: 6810 **NIIN:** 00-824-9089
Submitter: D DG
Status Code: C
MFN: 01
Article: N
Kit Part: N

00064896

Manufacturer's Information

Manufacturer's Name: WARD'S NATURAL SCIENCE
Post Office Box: 92912
Manufacturer's Address1:
Manufacturer's Address2: ROCHESTER, NY 14692-9012
Manufacturer's Country: US
General Information Telephone: 716-359-2502
Emergency Telephone: 800-424-9300(CHEMTREC)
Emergency Telephone: 800-424-9300(CHEMTREC)
MSDS Preparer's Name: MICHAEL RASZEJA
Proprietary: N
Reviewed: Y
Published: Y
CAGE: EO227
Special Project Code: N

Item Description

Item Name: POTASSIUM CHLORATE,ACS
Item Manager:
Specification Number: O-C-265
Type/Grade/Class: NK
Unit of Issue:
Unit of Issue Quantity:
Type of Container: BOTTLE

Preparer Information

Preparer's Name: WARD'S NATURAL SCIENCE ESTABLISHMENT INC.
Post Office Box: 92912
Preparer's Address1: UNKNOWN
Preparer's Address2: ROCHESTER, NY 14692-9012
Preparer's CAGE: EO227
Assigned Individual: Y

Contractor Information

Contractor's Name: WARD'S NATURAL SCIENCE ESTABLISHMENT INC.
Post Office Box: 92912
Contractor's Address1: UNKNOWN
Contractor's Address2: ROCHESTER, NY 14692-9012
Contractor's Telephone: 716-359-2502
Contractor's CAGE: EO227

Contractor Information

Contractor's Name: WARDS NATURAL SCIENCE ESTABLISHMENT INC
Post Office Box: 92912
Contractor's Address1: 5100 W HENRIETTA RD

Contractor's Address2: ROCHESTER, NY 14692-9012
Contractor's Telephone: (716) 359-2502
Contractor's CAGE: 63759

Section 2 - Compositon/Information on Ingredients
POTASSIUM CHLORATE

Ingredient Name: POTASSIUM CHLORATE
Ingredient CAS Number: 3811-04-9 **Ingredient CAS Code:** M
RTECS Number: FO0350000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: 99.7
% Enviromental Weight:
Other REC Limits: NONE RECOMMENDED
OSHA PEL: NOT ESTABLISHED **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: NOT ESTABLISHED **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity:
DOT Reporting Quantity:
Ozone Depleting Chemical: N

Section 3 - Hazards Identification, Including Emergency Overview
POTASSIUM CHLORATE

Health Hazards Acute & Chronic: REPEATED OR PROLONGED EXPOSURE TO HIGH DUST CONCENTRATIONS MAY CAUSE RUPTURING OF RED BLOOD CELLS. PROLONGED EXPOSURE OF EYES & SKIN TO DUST MAY CAUSE IRRITATION TO MUCOUS MEMBRANES, SKIN & EYES. INGE STION OF RELATIVELY LARGE QUANTITIES MAY BE FATAL, MAY CAUSE NAUSEA, VOMITING, DIARRHEA, ABDOMINAL PAIN, CONFUSION.

Signs & Symptoms of Overexposure:
METHERROGLOBIN FORMATION & RUPTURING OF RED BLOOD CELLS. EYE/SKIN IRRITATION, BURNING. MUCOUS MEMBRANE IRRITATION. DEATH, NAUSEA, VOMITING, DIARRHEA, ABDOMINAL PAIN, CONFUSION, CONVULSIONS.

Medical Conditions Aggravated by Exposure:
NONE SPECIFIED BY MANUFACTURER.

LD50 LC50 Mixture: ORAL LD50 (RATS): > 5000 MG/KG.

Route of Entry Indicators:
Inhalation: YES
Skin: YES
Ingestion: YES

Carcenogenicity Indicators
NTP: NO
IARC: NO
OSHA: NO

Carcinogenicity Explanation: THIS COMPOUND CONTAINS NO INGREDIENTS AT CONCENTRATIONS OF 0.1% OR GREATER THAT ARE CARCINOGENS OR SUSPECT CARCINOGENS.

Section 4 - First Aid Measures
POTASSIUM CHLORATE

First Aid:
EYES: IMMEDIATELY FLUSH WITH WATER FOR AT LEAST 15 MINUTES. FLUSH UNDER LIDS BY LIFTING THEM OR ROLLING EYES. SEE DOCTOR ASAP. SKIN: FLUSH WITH WATER. REMOVE CLOTHING AND CONTINUE FLUSHING. INHALATION : REMOVE TO FRESH AIR AND RESTORE BREATHING. GET MEDICAL HELP. INGESTION: IF CONSCIOUS, GIVE 1-2 GLASSES OF WATER. CALL PHYSICIAN IMMEDIATELY. NEVER GIVE ANYTHING BY MOUTH IF UNCONSCIOUS.

Section 5 - Fire Fighting Measures
POTASSIUM CHLORATE

Fire Fighting Procedures:
IN FIRE CONDITIONS WEAR NIOSH-APPROVED SELF- CONTAINED BREATHING APPARATUS & FULL PROTECTIVE CLOTHING. DO NOT USE FIRE BLANKET OR SMOTHERING TYPE EXTINGUISHER.
Unusual Fire or Explosion Hazard:
POWERFUL OXIDIZING MATERIAL. FORMS EXPLOSIVE MIXTURES WITH COMBUSTIBLE, ORGANIC OR OTHER EASILY OXIDIZABLE MATERIALS. THESE MIXTURES ARE EASILY IGNITED.
Extinguishing Media:
FLOOD W/WATER.
Flash Point: Flash Point Text: NON-FLAMMABLE

Autoignition Temperature:
Autoignition Temperature Text: N/K
Lower Limit(s): NOT GIVEN
Upper Limit(s): NOT GIVEN

Section 6 - Accidental Release Measures
POTASSIUM CHLORATE

Spill Release Procedures:
FLUSH TO SEWER WITH COPIOUS AMOUNTS OF WATER, IF ALLOWABLE. FLULSH SPILL

AREA WITH SOAP AND WATER.

Section 7 - Handling and Storage
POTASSIUM CHLORATE

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
POTASSIUM CHLORATE

Repiratory Protection:
NONE SHOULD BE NEEDED IN NORMAL LABORATORY HANDLING. IF DUSTY CONDITIONS PREVAIL WORK IN FUME HOOD OR WEAR A NIOSH- APPROVED RESPIRATOR OR DUST MASK.
Ventilation:
LOCAL EXHAUST AND MECHANICAL (GENERAL) VENTILATION AS REQUIRED TO MAINTAIN EXPOSURE LEVELS.
Protective Gloves:
RUBBER, VINYL, ETC GLOVES.
Eye Protection: CHEMICAL SAFETY GLASSES.
Other Protective Equipment: SMOCK, APRON, EYE WASH STATION, GOGGLES, VENTILATION HOOD, PROPER GLOVES, FIRE EXTINGUISHER.
Work Hygenic Practices: WASH HANDS THOROUGHLY WITH SOAP AND WATER BEFORE EATING, DRINKING, SMOKING OR USING TOILET FACILITIES.
Supplemental Health & Safety Information: DO NOT USE WATER TO CLEAN UP SPILLS ON POROUS OR WOOD FLOORS, SURFACES WILL BECOME IMPREGNATED AND EXTREMELY HAZARDOUS. FOR LABORATORY USE ONLY. NOT FOR DRUG, FOOD, OR HOUSEHOLD USE. KEEP OUT OF REACH OF CHILDREN.

Section 9 - Physical & Chemical Properties
POTASSIUM CHLORATE

HCC: D1
NRC/State License Number: N/R
Net Property Weight for Ammo: N/R
Boiling Point: Boiling Point Text: DECOMP@400C
Melting/Freezing Point: Melting/Freezing Text: 694F,368C
Decomposition Point: Decomposition Text: 752F,400C
Vapor Pressure: NEGLIGIBLE **Vapor Density:** 4.24
Percent Volatile Organic Content:
Specific Gravity: 2.337
Volatile Organic Content Pounds per Gallon:
pH: N/K
Volatile Organic Content Grams per Liter:
Viscosity: N/P
Evaporation Weight and Reference: NON-VOLATILE.
Solubility in Water: MODERATE
Appearance and Odor: COLORLESS, WHITE GRANULES OR POWDER, NO ODOR.
Percent Volatiles by Volume: NIL

Corrosion Rate: UNKNOWN

Section 10 - Stability & Reactivity Data
POTASSIUM CHLORATE

Stability Indicator: YES
Materials to Avoid:
STRONG ACIDS, OXIDIZABLE MATERIALS, ORGANIC SUBSTANCES, FINELY DIVIDED METALS, SULFUR, PHOSPHOROUS, AMMONIA COMPOUNDS
Stability Condition to Avoid:
EXTREME HEAT.
Hazardous Decomposition Products:
OXYGEN, CHLORINE, CHLORINE DIOXIDE.
Hazardous Polymerization Indicator: NO
Conditions to Avoid Polymerization:
NONE. WILL NOT OCCUR.

Section 11 - Toxicological Information
POTASSIUM CHLORATE

Toxicological Information:
N/P

Section 12 - Ecological Information
POTASSIUM CHLORATE

Ecological Information:
N/P

Section 13 - Disposal Considerations
POTASSIUM CHLORATE

Waste Disposal Methods:
PREVENT WASTE FROM CONTAMINATING SURROUNDING ENVIRONMENT. DISCARD ANY PRODUCT, RESIDUE, DISPOSAL CONTAINER OR LINER IN ACCORDANCE WITH ALL FEDERAL, STATE AND LOCAL REGULATIONS.

Section 14 - MSDS Transport Information
POTASSIUM CHLORATE

Transport Information:
N/P

Section 15 - Regulatory Information
POTASSIUM CHLORATE

SARA Title III Information:
N/P
Federal Regulatory Information:
N/P
State Regulatory Information:
N/P

Section 16 - Other Information
POTASSIUM CHLORATE

Other Information:
N/P

HMIS Transportation Information

Product Identification: POTASSIUM CHLORATE
Transporation ID Number: 87310
Responsible Party CAGE: EO227
Date MSDS Prepared: 12/23/1994
Date MSDS Reviewed: 07/27/1998
MFN: 07/27/1998
Submitter: D DG
Status Code: C

Container Information
Unit of Issue:
Container Quantity:
Type of Container: BOTTLE
Net Unit Weight: 2.5 KG MAX

Article without MSDS: N
Technical Entry NOS Shipping Number:
Radioactivity:
Form:
Net Explosive Weight:
Coast Guard Ammunition Code:
Magnetism: N/P
AF MMAC Code:
DOD Exemption Number:
Limited Quantity Indicator:
Multiple Kit Number: 0
Kit Indicator: N
Kit Part Indicator: N
Review Indicator: Y
Additional Data:
PER MSDS:DOT:POTASSIUM CHLORATE, 5.1, UN1485.

Department of Transportation Information

DOT Proper Shipping Name: POTASSIUM CHLORATE
DOT PSN Code: LXY
Symbols:
DOT PSN Modifier:
Hazard Class: 5.1
UN ID Number: UN1485
DOT Packaging Group: II
Label: OXIDIZER
Special Provision(s): A9,N34
Packaging Exception: 152
Non Bulk Packaging: 212

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Bulk Packaging: 242
Maximimum Quanity in Passenger Area: 5 KG
Maximimum Quanity in Cargo Area: 25 KG
Stow in Vessel Requirements: A
Requirements Water/Sp/Other: 56,58,106

IMO Detail Information

IMO Proper Shipping Name: POTASSIUM CHLORATE
IMO PSN Code: MBR
IMO PSN Modifier:
IMDG Page Number: 5169
UN Number: 1485
UN Hazard Class: 5.1
IMO Packaging Group: II
Subsidiary Risk Label: -
EMS Number: 5.1-06
Medical First Aid Guide Number: 745

IATA Detail Information

IATA Proper Shipping Name: POTASSIUM CHLORATE
IATA PSN Code: UMW
IATA PSN Modifier:
IATA UN Id Number: 1485
IATA UN Class: 5.1
Subsidiary Risk Class:
UN Packaging Group: II
IATA Label: OXIDIZER
Packaging Note for Passengers: 509
Maximum Quantity for Passengers: 5KG
Packaging Note for Cargo: 512
Maximum Quantity for Cargo: 25KG
Exceptions:

AFI Detail Information

AFI Proper Shipping Name: POTASSIUM CHLORATE
AFI Symbols:
AFI PSN Code: UMW
AFI PSN Modifier:
AFI UN Id Number: UN1485
AFI Hazard Class: 5.1
AFI Packing Group: II
AFI Label:
Special Provisions: P5, A9, N34
Back Pack Reference: A9.8

HAZCOM Label Information

Product Identification: POTASSIUM CHLORATE
CAGE: EO227
Assigned Individual: Y
Company Name: WARD'S NATURAL SCIENCE ESTABLISHMENT INC.
Company PO Box: 92912
Company Street Address1: UNKNOWN
Company Street Address2: ROCHESTER, NY 14692-9012 US
Health Emergency Telephone: 800-424-9300(CHEMTREC)
Label Required Indicator: Y

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Date Label Reviewed: 07/27/1998
Status Code: C
Manufacturer's Label Number: NONE
Date of Label: 07/27/1998
Year Procured: N/K
Organization Code: F
Chronic Hazard Indicator: N
Eye Protection Indicator: YES
Skin Protection Indicator: YES
Respiratory Protection Indicator: N/P
Signal Word: WARNING
Health Hazard: Moderate
Contact Hazard: Moderate
Fire Hazard: Slight
Reactivity Hazard: Moderate

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CORNELL

Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format)
For Cornell University Convenience Only

POTASSIUM PERCHLORATE

Section 1 - Product and Company Identification	Section 9 - Physical & Chemical Properties
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Section 1 - Product and Company Identification
POTASSIUM PERCHLORATE

Product Identification: POTASSIUM PERCHLORATE
Date of MSDS: 11/01/1994 **Technical Review Date:** 09/14/1995
FSC: 6810 **NIIN:** **LIIN:** 00N063164
Submitter: N EN
Status Code: C
MFN: 01
Article: N
Kit Part: N

00064905

Manufacturer's Information

Manufacturer's Name: MALLINCKRODT
Post Office Box: 800
Manufacturer's Address1:
Manufacturer's Address2: PARIS, KY 40362
Manufacturer's Country: US
General Information Telephone: 314-539-1600
Emergency Telephone: 314-539-1600
Emergency Telephone: 314-539-1600
MSDS Preparer's Name: N/P
Proprietary: N
Reviewed: N
Published: Y
CAGE: ZA916
Special Project Code: N

Contractor Information

Contractor's Name: MALLINCKRODT MEDICAL, INC
Post Office Box: M
Contractor's Address1: 2703 WAGNER PLACE
Contractor's Address2: MARYLAND HEIGHTS, MO 63043
Contractor's Telephone: 314-770-7800
Contractor's CAGE: ZA916

Contractor Information

Contractor's Name: MALLINCKRODT SPECIALTY CHEMICALS CO
Contractor's Address1: 222 RED SCHOOL LANE
Contractor's Address2: PHILLIPSBURG, NJ 08865
Contractor's Telephone: 908-859-2151
Contractor's CAGE: 62910

Section 2 - Compositon/Information on Ingredients
POTASSIUM PERCHLORATE

Ingredient Name: ING 3:WASTE MAY BE TRANSFERRED TO CLSD, PREF METAL CNTNR & SENT TO APPRVD WASTE DISP FACILITY. RELS TO AIR, LAND/(ING 5)
Ingredient CAS Number: Ingredient CAS Code: X
RTECS Number: 9999999ZZ **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:

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% Text: N/K
% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: NOT APPLICABLE **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: NOT APPLICABLE **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity:
DOT Reporting Quantity:
Ozone Depleting Chemical:

Ingredient Name: ING 4:WATER OF THESE HAZ SUBSTANCES WHICH EXCEED RQ MUST BE REPORTED TO THE NRC (800-424-8802); LISTED AT 40 CFR 302.4.
Ingredient CAS Number: Ingredient CAS Code: X
RTECS Number: 9999999ZZ **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: N/K
% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: NOT APPLICABLE **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: NOT APPLICABLE **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity:
DOT Reporting Quantity:
Ozone Depleting Chemical:

Ingredient Name: ING 7:PLEASE REFER TO ACGIH DOCUMENT, "INDUS VENT, A MANUAL OF RECOMMENDED PRACTICES", MOST RECENT EDITION, FOR DETAILS.
Ingredient CAS Number: Ingredient CAS Code: X
RTECS Number: 9999999ZZ **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: N/K

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% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: NOT APPLICABLE **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: NOT APPLICABLE **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity:
DOT Reporting Quantity:
Ozone Depleting Chemical:

Ingredient Name: OTHER PREC:& CLOTHING. AVOID BREATHING DUST.
Ingredient CAS Number: Ingredient CAS Code: X
RTECS Number: 9999999ZZ **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: N/K
% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: NOT APPLICABLE **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: NOT APPLICABLE **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity:
DOT Reporting Quantity:
Ozone Depleting Chemical:

Ingredient Name: PERCHLORIC ACID, POTASSIUM SALT; (POTASSIUM PERCHLORATE) (CONTAINING ING 2)
Ingredient CAS Number: 7778-74-7 **Ingredient CAS Code:** M
RTECS Number: SC9700000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: N/K
% Enviromental Weight:
Other REC Limits: N/K

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OSHA PEL: 15 MG/M3 (MFR) **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: 10 MG/M3 (MFR) **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity:
DOT Reporting Quantity:
Ozone Depleting Chemical: N

Ingredient Name: SILICA, CRYSTALLINE - FUSED; (CRYSTALLINE SILICA)
Ingredient CAS Number: 60676-86-0 **Ingredient CAS Code:** M
RTECS Number: VV7328000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: <1
% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: N/K (FP N) **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: 0.1 MG/M3 RDUST **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity:
DOT Reporting Quantity:
Ozone Depleting Chemical: N

Ingredient Name: SUPDAT:SODIUM THIOSULFATE. MOISTEN & ACIDIFY, IF NEC, TO PROMOTE REDUCTION RXN. NEUT SLURRY W/SODA ASH. NEUT (ING 4)
Ingredient CAS Number: Ingredient CAS Code: X
RTECS Number: 9999999ZZ **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: N/K
% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: NOT APPLICABLE **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:

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ACGIH TLV: NOT APPLICABLE **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity:
DOT Reporting Quantity:
Ozone Depleting Chemical:

Ingredient Name: VENT:BECAUSE IT CAN CONTROL EMISSIONS OF CONTAM AT ITS SOURCE, PREVENTING DISPERSION OF IT INTO GEN WORK AREA. (ING 8)
Ingredient CAS Number: Ingredient CAS Code: X
RTECS Number: 9999999ZZ **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: N/K
% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: NOT APPLICABLE **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: NOT APPLICABLE **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity:
DOT Reporting Quantity:
Ozone Depleting Chemical:

Section 3 - Hazards Identification, Including Emergency Overview
POTASSIUM PERCHLORATE

Health Hazards Acute & Chronic: ACUTE:INHAL:IRRITANT, ESPECIALLY AS FINE DUST. CAN CAUSE COUGHING, SNEEZING, BREATHING DIFFICULTY. INGEST:IRRITANT TO MUCOUS MEMBRANE; CAUSES GASTRO-INTESTINAL UPSET & LARGER DOSES CAN CAUSE NAUSEA, V OMITING, FEVER, RASHES. CAN REDUCE OXYGEN TO BODY ORGANS & HIGH EXPOSURES MAY CAUSE LIPS & SKIN TO TURN(EFTS OF OVEREXP)

Signs & Symptoms of Overexposure:
HLTH HAZ:BLUE. SKIN CONTACT:IRRITANT. MAY CAUSE BURNS/SORENESS, ESP ON MOIST SKIN. EYE CONTACT:IRRITANT. MAY CAUSE REDDENING, TEARING. CHRONIC:CHRONIC EXPOSURE MAY AFFECT RED BLOOD CELLS WHICH CAN HAV E EFFECT ON LIVER, KIDNEY & OTHER ORGANS.

Medical Conditions Aggravated by Exposure:
PERSONS W/PRE-EXISTING SKIN DISORDERS OR IMPAIRED RESPIRATORY FUNCTION MAY BE MORE SUSCEPTIBLE TO THE EFFECTS OF THE SUBSTANCE.

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LD50 LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.

Route of Entry Indicators:
Inhalation: YES
Skin: YES
Ingestion: YES

Carcenogenicity Indicators
NTP: NO
IARC: NO
OSHA: NO

Carcinogenicity Explanation: NOT RELEVANT

Section 4 - First Aid Measures
POTASSIUM PERCHLORATE

First Aid:
INHAL:REMOVE TO FRESH AIR. IF NOT BRTHG, GIVE ARTF RESP. IF BRTHG IS DFCLT, GIVE OXYG. CALL MD. INGEST:INDUCE VOMIT IMMED AS DIRECTED BY MED PERS. NEVER GIVE ANYTHING BY MOUTH TO UNCON PERS. SKIN:IMME D FLUSH W/PLENTY OF WATER FOR AT LST 15MINS WHILE REMOVING CONTAM CLTHG & SHOES. WASH CLTHG BEFORE REUSE. CALL MD IMMED. EYE:WASH W/PLENTY OF WATER FOR AT LST 15 MINS, LIFTING EYELIDS OCCAS. (SUPDAT)

Section 5 - Fire Fighting Measures
POTASSIUM PERCHLORATE

Fire Fighting Procedures:
USE NIOSH/MSHA APPROVED SCBA & FULL PROTECTIVE EQUIPMENT (FP N).
Unusual Fire or Explosion Hazard:
NOT COMBUST, BUT SUBSTANCE IS STRONG OXIDIZER & ITS HEAT OF RXN W/REDUCING AGENTS/COMBUSTS MAY CAUSE IGNIT. CONT W/OXIDIZABLE SUBSTANCES MAY CAUSE (SUPP DATA)
Extinguishing Media:
FLOOD W/LARGE AMOUNTS OF WATER.
Flash Point: Flash Point Text: N/K

Autoignition Temperature:
Autoignition Temperature Text: N/A
Lower Limit(s): N/K
Upper Limit(s): N/K

Section 6 - Accidental Release Measures
POTASSIUM PERCHLORATE

Spill Release Procedures:
CLEAN-UP PERS SHOULD WEAR PROT CLTHG & NIOSH/MSHA APPRVD RESP EQUIP SUITABLE FOR FLAMM & FIRE-PROMOTING MATLS. SCOOP UP LG SPILLS FOR RECOVERY/DISP IN RCRA WASTE DISP FACILITY. AVOID DUSTING. SPILLS C AN BE

DIKED & COVERED W/FERROUS SULFATE, (SUPDAT)

Section 7 - Handling and Storage
POTASSIUM PERCHLORATE

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
POTASSIUM PERCHLORATE

Repiratory Protection:
IF THE TLV IS EXCEEDED, A NIOSH/MSHA APPROVED DUST/MIST RESPIRATOR MAY BE WORN UP TO TEN TIMES THE TLV. CONSULT RESPIRATOR SUPPLIER FOR DETAILS.
Ventilation:
SYS OF LOC &/OR GEN EXHST IS REC TO KEEP EMPLOYEE EXPOS BELOW AIRBORNE EXPOS LIMS. LOC EXHST VENT IS GENRLY PREF (ING 7)
Protective Gloves:
IMPERVIOUS GLOVES (FP N).
Eye Protection: ANSI APPROVED CHEM WORKERS GOGGS (FP N).
Other Protective Equipment: WEAR CLEAN BODY-COVERING CLTHG. MAINTAIN ANSI APPRVD EYE WASH FOUNTAINS & QUICK-DRENCH FACILITIES IN WORK AREA (FP N).
Work Hygenic Practices: WASH THOROUGHLY AFTER HANDLING. CONTACT LENSES SHOULD NOT BE WORN WHEN WORKING W/THIS MATERIAL.
Supplemental Health & Safety Information: EXPLO HAZ:EXTREMELY VIOLENT COMBUST. LIBERATES TOX GASES WHEN INVOLVED IN FIRE. STRONG OXIDANTS MAY EXPLODE WHEN SHOCKED/IF EXPOS TO HEAT, FLAME/FRICTION. ALSO MAY ACT AS INITIATION SOURCE FOR DUST/VA P EXPLOS. CNTNRS MAY EXPLODE WHEN INVOLVED IN FIRE. FIRST AID PROC:GET MED ATTN IMMED. SPILL PROC:SODIUM SULFATE/(ING 3)

Section 9 - Physical & Chemical Properties
POTASSIUM PERCHLORATE

HCC:
NRC/State License Number:
Net Property Weight for Ammo:
Boiling Point: Boiling Point Text: N/A
Melting/Freezing Point: Melting/Freezing Text: 752F,400C
Decomposition Point: Decomposition Text: 752F,400C
Vapor Pressure: N/K **Vapor Density:** N/K
Percent Volatile Organic Content:
Specific Gravity: 2.52
Volatile Organic Content Pounds per Gallon:
pH: N/K
Volatile Organic Content Grams per Liter:
Viscosity: N/P
Evaporation Weight and Reference: N/K
Solubility in Water: 1.5 G IN 100 G.
Appearance and Odor: WHITE POWDER; ODORLESS.
Percent Volatiles by Volume: N/K

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Corrosion Rate: N/K

Section 10 - Stability & Reactivity Data
POTASSIUM PERCHLORATE

Stability Indicator: YES
Materials to Avoid:
ALUMINUM, MAGNESIUM, CHARCOAL, FLUORINE, SULFUR, MANY COMBUSTIBLE SUBSTANCES & REDUCING AGENTS.
Stability Condition to Avoid:
STABLE UNDER ORDINARY CONDITIONS OF USE & STORAGE.
Hazardous Decomposition Products:
CHLORINE & OXIDES OF POTASSIUM.
Hazardous Polymerization Indicator: NO
Conditions to Avoid Polymerization:
NOT RELEVANT

Section 11 - Toxicological Information
POTASSIUM PERCHLORATE

Toxicological Information:
N/P

Section 12 - Ecological Information
POTASSIUM PERCHLORATE

Ecological Information:
N/P

Section 13 - Disposal Considerations
POTASSIUM PERCHLORATE

Waste Disposal Methods:
ENSURE COMPLIANCE W/LOCAL, STATE & FEDERAL REGULATIONS.

Section 14 - MSDS Transport Information
POTASSIUM PERCHLORATE

Transport Information:
N/P

Section 15 - Regulatory Information
POTASSIUM PERCHLORATE

SARA Title III Information:
N/P
Federal Regulatory Information:
N/P
State Regulatory Information:
N/P

Section 16 - Other Information

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POTASSIUM PERCHLORATE

Other Information:
N/P

HMIS Transportation Information

Product Identification: POTASSIUM PERCHLORATE
Transporation ID Number: 42748
Responsible Party CAGE: ZA916
Date MSDS Prepared: 11/01/1994
Date MSDS Reviewed: 09/01/1995
MFN: 09/01/1995
Submitter: N TN
Status Code: C

Container Information
Unit of Issue: NK
Container Quantity: NK
Type of Container:
Net Unit Weight:

Article without MSDS: N
Technical Entry NOS Shipping Number:
Radioactivity:
Form:
Net Explosive Weight:
Coast Guard Ammunition Code:
Magnetism: N/P
AF MMAC Code:
DOD Exemption Number:
Limited Quantity Indicator:
Multiple Kit Number: 0
Kit Indicator: N
Kit Part Indicator: N
Review Indicator: Y
Additional Data:

Department of Transportation Information

DOT Proper Shipping Name: SEE ADDITIONAL DATA FIELD IN HMIS FOR FURTHER INFORMATION
DOT PSN Code: XXX
Symbols: N/R
DOT PSN Modifier:
Hazard Class: N/A
UN ID Number:
DOT Packaging Group:
Label:
Special Provision(s):
Packaging Exception:
Non Bulk Packaging:
Bulk Packaging:

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Maximimum Quanity in Passenger Area:
Maximimum Quanity in Cargo Area:
Stow in Vessel Requirements:
Requirements Water/Sp/Other:

IMO Detail Information

IMO Proper Shipping Name: SEE ADDITIONAL DATA FIELD IN HMIS FOR FURTHER INFORMATION
IMO PSN Code: XXX
IMO PSN Modifier:
IMDG Page Number: N/A
UN Number:
UN Hazard Class: N/A
IMO Packaging Group:
Subsidiary Risk Label:
EMS Number: N/A
Medical First Aid Guide Number: N/A

IATA Detail Information

IATA Proper Shipping Name: SEE ADDITIONAL DATA FIELD IN HMIS FOR FURTHER INFORMATION
IATA PSN Code: XXX
IATA PSN Modifier:
IATA UN Id Number:
IATA UN Class:
Subsidiary Risk Class:
UN Packaging Group:
IATA Label:
Packaging Note for Passengers:
Maximum Quantity for Passengers:
Packaging Note for Cargo:
Maximum Quantity for Cargo:
Exceptions:

AFI Detail Information

AFI Proper Shipping Name: SEE ADDITIONAL DATA FIELD IN HMIS FOR FURTHER INFORMATION
AFI Symbols:
AFI PSN Code: XXX
AFI PSN Modifier:
AFI UN Id Number: N/A
AFI Hazard Class: N/A
AFI Packing Group: N/A
AFI Label:
Special Provisions: N/A
Back Pack Reference: N/A

HAZCOM Label Information

Product Identification: POTASSIUM PERCHLORATE
CAGE: ZA916
Assigned Individual: N
Company Name: MALLINCKRODT MEDICAL, INC
Company PO Box: M
Company Street Address1: 2703 WAGNER PLACE
Company Street Address2: MARYLAND HEIGHTS, MO 63043 US

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Health Emergency Telephone: 314-539-1600
Label Required Indicator: Y
Date Label Reviewed: 09/14/1995
Status Code: C
Manufacturer's Label Number:
Date of Label: 09/14/1995
Year Procured: N/K
Organization Code: G
Chronic Hazard Indicator: Y
Eye Protection Indicator: YES
Skin Protection Indicator: YES
Respiratory Protection Indicator: YES
Signal Word: WARNING
Health Hazard: Moderate
Contact Hazard: Moderate
Fire Hazard: None
Reactivity Hazard: None

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Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format)
For Cornell University Convenience Only

RDX CYCLONITE HEXOGEN

Section 1 - Product and Company Identification	Section 9 - Physical & Chemical Properties
Section 2 - Compositon/Information on Ingredients	Section 10 - Stability & Reactivity Data
Section 3 - Hazards Identification Including Emergency Overview	Section 11 - Toxicological Information
Section 4 - First Aid Measures	Section 12 - Ecological Information
Section 5 - Fire Fighting Measures	Section 13 - Disposal Considerations
Section 6 - Accidental Release Measures	Section 14 - MSDS Transport Information
Section 7 - Handling and Storage	Section 15 - Regulatory Information
Section 8 - Exposure Controls & Personal Protection	Section 16 - Other Information

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Section 1 - Product and Company Identification
RDX CYCLONITE HEXOGEN

Product Identification: RDX CYCLONITE HEXOGEN
Date of MSDS: 10/01/1986 **Technical Review Date:** 02/21/1996
FSC: 1377 **NIIN:** **LIIN:** 00N069396
Submitter: N EN
Status Code: C
MFN: 01
Article: N
Kit Part: N

Manufacturer's Information

Manufacturer's Name: DYNO INDUSTRIER AS
Manufacturer's Address1: DEFENCE PRODUCTS SECTOR
Manufacturer's Address2: SAETRE, NORWAY, NK 00000
Manufacturer's Country: NK
General Information Telephone: 427-322-8110
Emergency Telephone: 427-322-8110
Emergency Telephone: 427-322-8110
MSDS Preparer's Name: N/P
Proprietary: N
Reviewed: N
Published: Y
CAGE: N0380
Special Project Code: N

Contractor Information

Contractor's Name: DYNO INDUSTRIER AS
Contractor's Address1: DEFENCE PRODUCTS SECTOR
Contractor's Address2: SAETRE, NORWAY, NK 00000
Contractor's Telephone: 427-322-8110
Contractor's CAGE: N0380

Section 2 - Compositon/Information on Ingredients
RDX CYCLONITE HEXOGEN

Ingredient Name: 1,3,5,7-TETRAZOCINE, OCTAHYDRO-1,3,5,7-TETRANITRO-; (CYCLOTETRAMETHYLENE-TETRANITRAMINE) (HMX)
Ingredient CAS Number: 2691-41-0 **Ingredient CAS Code:** M
RTECS Number: XF7450000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: 0-50
% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: N/K (FP N) **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: N/K (FP N) **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity:
DOT Reporting Quantity:
Ozone Depleting Chemical: N

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Ingredient Name: S-TRIAZINE, HEXAHYDRO-1,3,5-TRINITRO-; (CYCLOTRIMETHYLENE-TRINITRAMINE) (RDX). LD50:(ORAL,RAT) 100 MG/KG
Ingredient CAS Number: 121-82-4 **Ingredient CAS Code:** M
RTECS Number: XY9450000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: 50-100
% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: N/K (FP N) **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: N/K (FP N) **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity:
DOT Reporting Quantity:
Ozone Depleting Chemical: N

Section 3 - Hazards Identification, Including Emergency Overview
RDX CYCLONITE HEXOGEN

Health Hazards Acute & Chronic: EXPOSURE TO RDX BY SWALLOWING OR INHALATION, MAY GIVE ACUTE OR CHRONIC SYMPTOMS LIKE HEADACHE, NAUSEA AND SLEEP DISTURBANCES. CONVULSIONS OF EPILEPTIC TYPE HAVE BEEN DESCRIBED FOLLOWING EXPOSURE. ACUT E:INHALATION:SLIGHT IRRITATION. UPTAKE OF RDX IS POSSIBLE. SKIN:SLIGHT IRRITATION. ALLERGIC DERMATITIS (EFTS OF OVEREXP)

Signs & Symptoms of Overexposure:
HLTH HAZ:HAS BEEN DESCRIBED. UPTAKE THROUGH SKIN IS POSSIBLE. EYES:IRRITATING.

Medical Conditions Aggravated by Exposure:
NONE SPECIFIED BY MANUFACTURER.

LD50 LC50 Mixture: SEE INGREDIENT 1

Route of Entry Indicators:
Inhalation: YES
Skin: YES
Ingestion: YES

Carcenogenicity Indicators

NTP: NO
IARC: NO
OSHA: NO

Carcinogenicity Explanation: NOT RELEVANT.

Section 4 - First Aid Measures
RDX CYCLONITE HEXOGEN

First Aid:
INHAL:BRING PATIENT TO FRESH AIR. IF RECOVERY IS NOT RAPID, SEEK MED ATTN. INGEST:GIVE WATER/MILK. INDUCE VOMIT. SKIN:WASH W/WATER & SOAP. EYES:FLUSH W/WATER FOR @ LEAST 15 MINS. OBTAIN MED AID IF IRR IT PERSISTS. EXPOS TO RDX, PROBABLY BY INHAL OF DUST, HAS CAUSED EPILEPTIFORM CONVL IN FEW INDIVIDUALS. THESE CONVL HAVE BEEN OF BENIGN NATURE, W/COMPLETE RESTITUTION OF AFFECTED INDIVIDUALS. (SUPDAT)

Section 5 - Fire Fighting Measures
RDX CYCLONITE HEXOGEN

Fire Fighting Procedures:
USE NIOSH/MSHA APPROVED SCBA & FULL PROTECTIVE EQUIPMENT (FP N).
Unusual Fire or Explosion Hazard:
NONE SPECIFIED BY MANUFACTURER.
Extinguishing Media:
DO NOT ATTEMPT TO EXTINGUISH THE FIRE, AS AN EXPLOSION MAY OCCUR.
Flash Point: Flash Point Text: N/K

Autoignition Temperature:
Autoignition Temperature Text: N/A
Lower Limit(s): N/K
Upper Limit(s): N/K

Section 6 - Accidental Release Measures
RDX CYCLONITE HEXOGEN

Spill Release Procedures:
RDX MAY BE DESTRUCTED BY BURNING. NATIONAL REGULATIONS FOR HANDLING EXPLOSIVES MUST BE FOLLOWED. MOISTEN W/WATER BEFORE HNDLG. SPILL OF PROD MUST BE REMOVED WITH AN ALUMINUM OR WOODEN SPADE, AND STORE D IN SPECIAL CNTNRS.

Section 7 - Handling and Storage
RDX CYCLONITE HEXOGEN

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection

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RDX CYCLONITE HEXOGEN

Repiratory Protection:
NIOSH/MSHA APPROVED DUST MASK.
Ventilation:
NONE SPECIFIED BY MANUFACTURER.
Protective Gloves:
IMPERVIOUS GLOVES (FP N).
Eye Protection: ANSI APPRVD CHEM WORKERS GOGGLES (FP N).
Other Protective Equipment: ANSI APPRVD EMERGENCY EYE WASH & DELUGE SHOWER (FP N).
Work Hygenic Practices: PERSONAL HYGIENE MOST IMPORTANT.
Supplemental Health & Safety Information: FIRST AID PROC:SYMPTOMATIC TREATMENT.

Section 9 - Physical & Chemical Properties
RDX CYCLONITE HEXOGEN

HCC:
NRC/State License Number:
Net Property Weight for Ammo:
Boiling Point: Boiling Point Text: N/K
Melting/Freezing Point: Melting/Freezing Text: 374F,190C
Decomposition Point: Decomposition Text: N/K
Vapor Pressure: N/K **Vapor Density:** N/K
Percent Volatile Organic Content:
Specific Gravity: 1.80-1.85
Volatile Organic Content Pounds per Gallon:
pH: N/K
Volatile Organic Content Grams per Liter:
Viscosity: N/P
Evaporation Weight and Reference: NOT KNOWN
Solubility in Water: NOT KNOWN
Appearance and Odor: WHITE SOLID CRYSTALLINE.
Percent Volatiles by Volume: N/K
Corrosion Rate: N/K

Section 10 - Stability & Reactivity Data
RDX CYCLONITE HEXOGEN

Stability Indicator: YES
Materials to Avoid:
NONE SPECIFIED BY MANUFACTURER.
Stability Condition to Avoid:
EXTREME RISK OF EXPLOSION BY SHOCK, FRICTION, FIRE OR OTHER SOURCES OF IGNITION.
Hazardous Decomposition Products:
NONE SPECIFIED BY MANUFACTURER.
Hazardous Polymerization Indicator: NO
Conditions to Avoid Polymerization:
NOT RELEVANT.

Section 11 - Toxicological Information

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RDX CYCLONITE HEXOGEN

Toxicological Information:
N/P

Section 12 - Ecological Information
RDX CYCLONITE HEXOGEN

Ecological Information:
N/P

Section 13 - Disposal Considerations
RDX CYCLONITE HEXOGEN

Waste Disposal Methods:
DESTRUCTION BY BURNING. DISPOSAL MUST BE I/A/W FEDERAL, STATE & LOCAL REGULATIONS (FP N).

Section 14 - MSDS Transport Information
RDX CYCLONITE HEXOGEN

Transport Information:
N/P

Section 15 - Regulatory Information
RDX CYCLONITE HEXOGEN

SARA Title III Information:
N/P
Federal Regulatory Information:
N/P
State Regulatory Information:
N/P

Section 16 - Other Information
RDX CYCLONITE HEXOGEN

Other Information:
N/P

HAZCOM Label Information

Product Identification: RDX CYCLONITE HEXOGEN
CAGE: N0380
Assigned Individual: N
Company Name: DYNO INDUSTRIER AS
Company PO Box:
Company Street Address1: DEFENCE PRODUCTS SECTOR
Company Street Address2: SAETRE, NORWAY, NK 00000 NK
Health Emergency Telephone: 427-322-8110
Label Required Indicator: Y
Date Label Reviewed: 02/21/1996
Status Code: C
Manufacturer's Label Number:

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Date of Label: 02/21/1996
Year Procured: N/K
Organization Code: G
Chronic Hazard Indicator: N
Eye Protection Indicator: YES
Skin Protection Indicator: YES
Respiratory Protection Indicator: YES
Signal Word: DANGER
Health Hazard: Moderate
Contact Hazard: Slight
Fire Hazard: Moderate
Reactivity Hazard: Severe

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Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format)
For Cornell University Convenience Only

RED PHOSPHORUS HB 250

Section 1 - Product and Company Identification	Section 9 - Physical & Chemical Properties
Section 2 - Compositon/Information on Ingredients	Section 10 - Stability & Reactivity Data
Section 3 - Hazards Identification Including Emergency Overview	Section 11 - Toxicological Information
Section 4 - First Aid Measures	Section 12 - Ecological Information
Section 5 - Fire Fighting Measures	Section 13 - Disposal Considerations
Section 6 - Accidental Release Measures	Section 14 - MSDS Transport Information
Section 7 - Handling and Storage	Section 15 - Regulatory Information
Section 8 - Exposure Controls & Personal Protection	Section 16 - Other Information

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Section 1 - Product and Company Identification
RED PHOSPHORUS HB 250

Product Identification: RED PHOSPHORUS HB 250
Date of MSDS: 10/10/1991 **Technical Review Date:** 03/24/1998
FSC: 6850 **NIIN:** **LIIN:** 00N084312
Submitter: N EN
Status Code: C
MFN: 01
Article: N
Kit Part: N

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Manufacturer's Information

Manufacturer's Name: HOECHST CELANESE CORP
Post Office Box: 1026
Manufacturer's Address1:
Manufacturer's Address2: CHARLOTTE, NC 28201-1026
Manufacturer's Country: US
General Information Telephone: 800-235-2637
Emergency Telephone: 804-484-5000;800-424-9300(CHEMTREC)
Emergency Telephone: 804-484-5000;800-424-9300(CHEMTREC)
MSDS Preparer's Name: N/P
Proprietary: N
Reviewed: N
Published: Y
CAGE: 0RIR4
Special Project Code: N

Contractor Information

Contractor's Name: CRESCENT CHEMICAL CO., INC.
Contractor's Address1: 1324 MOTOR PARKWAY
Contractor's Address2: HAUPPAUGE, NY 11788
Contractor's Telephone: (516) 348-0333
Contractor's CAGE: 0R1R4

Contractor Information

Contractor's Name: HOECHST CELANESE CORP
Post Office Box: 1026
Contractor's Address1: UNKNOWN
Contractor's Address2: CHARLOTTE, NC 28201-1026
Contractor's Telephone: 800-253-2637
Contractor's CAGE: 0RIR4

Section 2 - Compositon/Information on Ingredients
RED PHOSPHORUS HB 250

Ingredient Name: PHOSPHOROUS (YELLOW); (RED PHOSPHORUS) (SARA 302/313) (CERCLA)
Ingredient CAS Number: 7723-14-0 **Ingredient CAS Code:** M
RTECS Number: TH3500000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:

% Text: >99
% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: 0.1 MG/M3 **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: 0.02 PPM **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity: 1 LB
DOT Reporting Quantity: 1 LB
Ozone Depleting Chemical: N

Section 3 - Hazards Identification, Including Emergency Overview
RED PHOSPHORUS HB 250

Health Hazards Acute & Chronic: MAY CAUSE IRRITATION TO SKIN, EYES AND MUCOUS MEMBRANES.

Signs & Symptoms of Overexposure:
SEE HEALTH HAZARDS.

Medical Conditions Aggravated by Exposure:
NONE SPECIFIED BY MANUFACTURER.

LD50 LC50 Mixture: LD50: (ORAL, RAT) >15,000 MG/KG

Route of Entry Indicators:
Inhalation: YES
Skin: YES
Ingestion: YES

Carcenogenicity Indicators
NTP: NO
IARC: NO
OSHA: NO

Carcinogenicity Explanation: NOT RELEVANT

Section 4 - First Aid Measures
RED PHOSPHORUS HB 250

First Aid:
INHAL: REMOVE VICTIM TO FRESH AIR. GET IMMED MED HELP. EYES: FLUSH THOROUGHLY W/WATER FOR AT LEAST 15 MINUTES. GET IMMED MED HELP. SKIN: IMMED REMOVE CONTAM CLTHG & WASH AFFECTED AREA THOROUGHLY W/SOA P & WATER. GET MED HELP. INGEST: DO NOTINDUCE VOMIT. GET IMMED MED HELP. ADDNL MEASURES: ADMIN ARTF RESP IF BREATHING HAS STOPPED. CONTACT LENSES SHOULD NOT BE WORN WHEN WORKING W/THIS CHEMICAL.

Section 5 - Fire Fighting Measures
RED PHOSPHORUS HB 250

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Fire Fighting Procedures:
USE NIOSH APPROVED SCBA AND FULL PROTECTIVE EQUIPMENT (FP N). FIGHT FIRE FROM A SAFE DISTANCE DUE TO EXPLOSION HAZARD.
Unusual Fire or Explosion Hazard:
EMITS TOXIC AND CORROSIVE FUMES UNDER FIRE CONDITIONS. FINE POWDER MAY PRESENT DUST EXPLOSION HAZARD.
Extinguishing Media:
WATER SPRAY, MOIST SAND. DO NOT USE CARBON DIOXIDE OR OTHER PRESSURIZED EXTINGUISHERS.
Flash Point: Flash Point Text: N/K

Autoignition Temperature:
Autoignition Temperature Text: N/A
Lower Limit(s): N/K
Upper Limit(s): N/K

Section 6 - Accidental Release Measures
RED PHOSPHORUS HB 250

Spill Release Procedures:
REMOVE ALL SPARKING DEVICES OR IGNITION SOURCES. CAREFULLY COLLECT INTO SUITABLE CONTAINER.

Section 7 - Handling and Storage
RED PHOSPHORUS HB 250

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
RED PHOSPHORUS HB 250

Repiratory Protection:
NIOSH APPROVED DUST RESPIRATOR RECOMMENDED.
Ventilation:
NONE SPECIFIED BY MANUFACTURER.
Protective Gloves:
IMPERVIOUS GLOVES (FP N).
Eye Protection: ANSI APPRVD CHEM WORKERS GOGGLES (FP N).
Other Protective Equipment: ANSI APPROVED EYE WASH & DELUGE SHOWER (FP N).
CLOTHING SUITABLE TO AVOID SKIN CONTACT.
Work Hygenic Practices: NONE SPECIFIED BY MANUFACTURER.
Supplemental Health & Safety Information: PH: 6-9 @ 100G/L WATER. MATL TO AVOID: OXIDIZING AGENTS, ACCORDING TO NFPA 49.

Section 9 - Physical & Chemical Properties
RED PHOSPHORUS HB 250

HCC:
NRC/State License Number:
Net Property Weight for Ammo:
Boiling Point: Boiling Point Text: N/K
Melting/Freezing Point: Melting/Freezing Text: 1094F,590C
Decomposition Point: Decomposition Text: N/K
Vapor Pressure: <0.1 @ 20C **Vapor Density:** N/K
Percent Volatile Organic Content:
Specific Gravity: 2.2
Volatile Organic Content Pounds per Gallon:
pH: SUPDAT
Volatile Organic Content Grams per Liter:
Viscosity: N/P
Evaporation Weight and Reference: N/K
Solubility in Water: INSOLUBLE
Appearance and Odor: DARK RED-BROWN-VIOLET POWDER; CHARACTERISTIC ODOR.
Percent Volatiles by Volume: N/K
Corrosion Rate: N/K

Section 10 - Stability & Reactivity Data
RED PHOSPHORUS HB 250

Stability Indicator: YES
Materials to Avoid:
AVOID CONTACT W/OXIDIZING AGENTS. AVOID EXPOS TO STITIC CHARGES, SPARKS & IMPACT. FORMS EXPLOSIVE MIXTURES WITH (SUPDAT)
Stability Condition to Avoid:
NONE SPECIFIED BY MANUFACTURER.
Hazardous Decomposition Products:
CONTACT WITH MOIST AIR RESULTS IN FORMATION OF HIGHLY TOXIC PHOSPHINE, YELLOW PHOSPHORUS AND OXIDES OF PHOSPHORUS.
Hazardous Polymerization Indicator: NO
Conditions to Avoid Polymerization:
NOT RELEVANT

Section 11 - Toxicological Information
RED PHOSPHORUS HB 250

Toxicological Information:
N/P

Section 12 - Ecological Information
RED PHOSPHORUS HB 250

Ecological Information:
N/P

Section 13 - Disposal Considerations
RED PHOSPHORUS HB 250

Waste Disposal Methods:
DISPOSE OF OR INCINERATE IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL

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REGULATIONS. LISTED AS A HAZARDOUS SUBSTANCE, AS DEFINED IN THE COMPRHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION AND LIABILITY ACT OF 1980.

Section 14 - MSDS Transport Information
RED PHOSPHORUS HB 250

Transport Information:
N/P

Section 15 - Regulatory Information
RED PHOSPHORUS HB 250

SARA Title III Information:
N/P
Federal Regulatory Information:
N/P
State Regulatory Information:
N/P

Section 16 - Other Information
RED PHOSPHORUS HB 250

Other Information:
N/P

HAZCOM Label Information

Product Identification: RED PHOSPHORUS HB 250
CAGE: 0RIR4
Assigned Individual: N
Company Name: HOECHST CELANESE CORP
Company PO Box: 1026
Company Street Address1: UNKNOWN
Company Street Address2: CHARLOTTE, NC 28201-1026 US
Health Emergency Telephone: 804-484-5000;800-424-9300(CHEMTREC)
Label Required Indicator: Y
Date Label Reviewed: 03/25/1998
Status Code: C
Manufacturer's Label Number:
Date of Label: 03/25/1998
Year Procured: N/K
Organization Code: G
Chronic Hazard Indicator: N
Eye Protection Indicator: YES
Skin Protection Indicator: YES
Respiratory Protection Indicator: YES
Signal Word: CAUTION
Health Hazard: Slight
Contact Hazard: Slight
Fire Hazard: None
Reactivity Hazard: None

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Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format)
For Cornell University Convenience Only

SILICON/SILICON OXIDE/SILICON DIOXIDE

Section 1 - Product and Company Identification	Section 9 - Physical & Chemical Properties
Section 2 - Compositon/Information on Ingredients	Section 10 - Stability & Reactivity Data
Section 3 - Hazards Identification Including Emergency Overview	Section 11 - Toxicological Information
Section 4 - First Aid Measures	Section 12 - Ecological Information
Section 5 - Fire Fighting Measures	Section 13 - Disposal Considerations
Section 6 - Accidental Release Measures	Section 14 - MSDS Transport Information
Section 7 - Handling and Storage	Section 15 - Regulatory Information
Section 8 - Exposure Controls & Personal Protection	Section 16 - Other Information

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Section 1 - Product and Company Identification
SILICON/SILICON OXIDE/SILICON DIOXIDE

Product Identification: SILICON/SILICON OXIDE/SILICON DIOXIDE
Date of MSDS: 08/28/1990 **Technical Review Date:** 06/20/1994
FSC: 6850 **NIIN:** **LIIN:** 00F034382
Submitter: F BT
Status Code: C
MFN: 01
Article: N
Kit Part: N

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Manufacturer's Information

Manufacturer's Name: CERAC INC
Post Office Box: 1178
Manufacturer's Address1: 407 N 13TH ST
Manufacturer's Address2: MILWAUKEE, WI 53201
Manufacturer's Country: US
General Information Telephone: 414-289-9800
Emergency Telephone: 414-289-9800
Emergency Telephone: 414-289-9800
MSDS Preparer's Name: N/P
Proprietary: N
Reviewed: Y
Published: Y
CAGE: FO994
Special Project Code: N

Preparer Information

Preparer's Name: CERAC INC
Post Office Box: 1178
Preparer's Address1: 407 NO 13TH ST
Preparer's Address2: MILWAUKEE, WI 53201
Preparer's CAGE: FO994
Assigned Individual: Y

Contractor Information

Contractor's Name: CERAC INC
Post Office Box: 1178
Contractor's Address1: 407 NO 13TH ST
Contractor's Address2: MILWAUKEE, WI 53201
Contractor's Telephone: (414) 289-9800
Contractor's CAGE: FO994

Contractor Information

Contractor's Name: CERAC, INCORPORATED
Post Office Box: 1178
Contractor's Address1: 407-N,13TH STREET
Contractor's Address2: MILWAUKEE, WI 53201
Contractor's Telephone: 414-289-9800
Contractor's CAGE: 67027

Section 2 - Compositon/Information on Ingredients
SILICON/SILICON OXIDE/SILICON DIOXIDE

Ingredient Name: SILICON DIOXIDE, CELITE 322
Ingredient CAS Number: 7631-86-9 **Ingredient CAS Code:** M
RTECS Number: VV3100000 **RTECS Code:** M
=WT: =WT Code:

=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: 100
% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: 80 MG/CUM **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: 0.2 MG/CUM **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity:
DOT Reporting Quantity:
Ozone Depleting Chemical: N

Section 3 - Hazards Identification, Including Emergency Overview
SILICON/SILICON OXIDE/SILICON DIOXIDE

Health Hazards Acute & Chronic: INHALATION:PROLONGED CAN CAUSE FIBROSIS OF THE LUNG (SILICOSIS). MODERATELY TOXIC AS A DUST. SKIN: IRRITATION & INFLAMMATION. EYES: IRRITATION, INFLAMMATION & RISK OF SERIOUS INJURY.

Signs & Symptoms of Overexposure:
IRRITATION, WATERING, INFLAMMATION

Medical Conditions Aggravated by Exposure:
RESPIRATORY DISORDERS.

LD50 LC50 Mixture: ORAL LD50 (RAT): 3160 MG/KG

Route of Entry Indicators:
Inhalation: YES
Skin: NO
Ingestion: YES

Carcenogenicity Indicators
NTP: NO
IARC: NO
OSHA: NO

Carcinogenicity Explanation: NONE

Section 4 - First Aid Measures
SILICON/SILICON OXIDE/SILICON DIOXIDE

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First Aid:
INHALATION: REMOVE TO FRESH AIR/ADMINISTER OXYGEN IF BREATHING IS DIFFICULT. INGESTION: ADMINISTER 1 TO 2 GLASSES OF WATER/MILK TO INDUCE VOMITING. SKIN: BRUSH MATERIAL OFF SKIN/WASH AFFECTED AREA W/S OAP/WATER. EYES: FLUSH EYES W/LUKEWARM WATER FOR 15 MINS. OBTAIN MEDICAL ATTENTION IN ALL CASES.

Section 5 - Fire Fighting Measures
SILICON/SILICON OXIDE/SILICON DIOXIDE

Fire Fighting Procedures:
WEAR A SELF-CONTAINED BREATHING APPARTUS/FULL PROTECTIVE CLOTHING TO PREVENT CONTACT W/SKIN/EYES.
Unusual Fire or Explosion Hazard:
MATERIAL MAY GENERATE TOXIC FUMES IF INVOLVED IN AFIRE.
Extinguishing Media:
DRY CHEMICAL, CO2.
Flash Point: Flash Point Text: N/K

Autoignition Temperature:
Autoignition Temperature Text: N/A
Lower Limit(s): N/K
Upper Limit(s): N/K

Section 6 - Accidental Release Measures
SILICON/SILICON OXIDE/SILICON DIOXIDE

Spill Release Procedures:
WEAR SCBA & FULL PROTECTIVE CLOTHING. ISOLATE AREA WHERE OCCURED. INSURE PROPER VENTILATION IS AVAILABLE. VACUUM UP USING A HIGH EFFICIENCY UNIT. PLACE IN CONTAINER FOR PROPER DISPOSAL. TAKE CARE NOT TO RAISE DUST.

Section 7 - Handling and Storage
SILICON/SILICON OXIDE/SILICON DIOXIDE

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
SILICON/SILICON OXIDE/SILICON DIOXIDE

Repiratory Protection:
WEAR NIOSH-APPROVED DUST/MIST/FUME CARTRIDGE RESPIRATOR.
Ventilation:
LOCAL EXHAUST
Protective Gloves:
NEOPRENE
Eye Protection: SAFETY GLASSES
Other Protective Equipment: WEAR PROTECTIVE CLOTHING TO PREVENT

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CONTAMINATION OF SKIN/CLOTHES.
Work Hygenic Practices: WASH HANDS THOROUGHLY AFTER HANDLING.
Supplemental Health & Safety Information: N/K

Section 9 - Physical & Chemical Properties
SILICON/SILICON OXIDE/SILICON DIOXIDE

HCC:
NRC/State License Number:
Net Property Weight for Ammo:
Boiling Point: Boiling Point Text: 4694F
Melting/Freezing Point: Melting/Freezing Text: 1575-1725
Decomposition Point: Decomposition Text: N/K
Vapor Pressure: N/K **Vapor Density:** N/K
Percent Volatile Organic Content:
Specific Gravity: N/K
Volatile Organic Content Pounds per Gallon:
pH: N/K
Volatile Organic Content Grams per Liter:
Viscosity: N/P
Evaporation Weight and Reference: N/K
Solubility in Water: INSOLUBLE
Appearance and Odor: CLEAR, WHITE POWDER /CRYSTALS.
Percent Volatiles by Volume: N/K
Corrosion Rate: N/K

Section 10 - Stability & Reactivity Data
SILICON/SILICON OXIDE/SILICON DIOXIDE

Stability Indicator: NO
Materials to Avoid:
CHLORINE TRIFUORIDE, MANGANIC FLOURIDE, OXYGEN, FLOURIDE
Stability Condition to Avoid:
HEAT
Hazardous Decomposition Products:
SILICON, SILICON TETRAFLOURIDE
Hazardous Polymerization Indicator: NO
Conditions to Avoid Polymerization:
HEAT, INCOMPATIBLE

Section 11 - Toxicological Information
SILICON/SILICON OXIDE/SILICON DIOXIDE

Toxicological Information:
N/P

Section 12 - Ecological Information
SILICON/SILICON OXIDE/SILICON DIOXIDE

Ecological Information:
N/P

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Section 13 - Disposal Considerations
SILICON/SILICON OXIDE/SILICON DIOXIDE

Waste Disposal Methods:
DISPOSE OF IAW/APPLICABLE FEDERAL, STATE & LOCAL REGULATIONS.

Section 14 - MSDS Transport Information
SILICON/SILICON OXIDE/SILICON DIOXIDE

Transport Information:
N/P

Section 15 - Regulatory Information
SILICON/SILICON OXIDE/SILICON DIOXIDE

SARA Title III Information:
N/P
Federal Regulatory Information:
N/P
State Regulatory Information:
N/P

Section 16 - Other Information
SILICON/SILICON OXIDE/SILICON DIOXIDE

Other Information:
N/P

HAZCOM Label Information

Product Identification: SILICON/SILICON OXIDE/SILICON DIOXIDE
CAGE: FO994
Assigned Individual: Y
Company Name: CERAC INC
Company PO Box: 1178
Company Street Address1: 407 NO 13TH ST
Company Street Address2: MILWAUKEE, WI 53201 NK
Health Emergency Telephone: 414-289-9800
Label Required Indicator: Y
Date Label Reviewed: 06/20/1994
Status Code: C
Manufacturer's Label Number: N/R
Date of Label: 06/20/1994
Year Procured: N/K
Organization Code: F
Chronic Hazard Indicator: Y
Eye Protection Indicator: YES
Skin Protection Indicator: YES
Respiratory Protection Indicator: YES
Signal Word: DANGER
Health Hazard: Moderate
Contact Hazard: Severe
Fire Hazard: None
Reactivity Hazard: None

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Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format)
For Cornell University Convenience Only

SILVER METAL AND SOLUBLE SILVER COMPOUNDS (SILVER NITRATE)

Section 1 - Product and Company Identification	Section 9 - Physical & Chemical Properties
Section 2 - Compositon/Information on Ingredients	Section 10 - Stability & Reactivity Data
Section 3 - Hazards Identification Including Emergency Overview	Section 11 - Toxicological Information
Section 4 - First Aid Measures	Section 12 - Ecological Information
Section 5 - Fire Fighting Measures	Section 13 - Disposal Considerations
Section 6 - Accidental Release Measures	Section 14 - MSDS Transport Information
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Section 1 - Product and Company Identification
SILVER METAL AND SOLUBLE SILVER COMPOUNDS (SILVER NITRATE)

Product Identification: SILVER METAL AND SOLUBLE SILVER COMPOUNDS (SILVER NITRATE)
Date of MSDS: 09/01/1978 **Technical Review Date:** 07/17/1999
FSC: 6665 **NIIN:** 00-859-2214
Submitter: D DG
Status Code: C
MFN: 04
Article: N
Kit Part: Y

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Manufacturer's Information

Manufacturer's Name: ENVIRONMENTAL TECHNOLOGIES GROUP INC
Post Office Box: 9840
Manufacturer's Address1: 1400 TAYLOR AVE
Manufacturer's Address2: BALTIMORE, MD 21284-9840
Manufacturer's Country: US
General Information Telephone: 301-321-5200
Emergency Telephone: 301-321-5200
Emergency Telephone: 301-321-5200
MSDS Preparer's Name: UNKNOWN
Proprietary: N
Reviewed: Y
Published: Y
CAGE: 23667
Special Project Code: N

Item Description

Item Name: REFILL KIT,CHEMICAL AGENT DETECTOR
Item Manager: S9G
Specification Number: NK
Type/Grade/Class: NK
Unit of Issue: EA
Unit of Issue Quantity: 1
Type of Container: UNKNOWN

Preparer Information

Preparer's Name: ENVIRONMENTAL TECHNOLOGIES GROUP INC
Post Office Box: 9840
Preparer's Address1: 1400 TAYLOR AVE
Preparer's Address2: BALTIMORE, MD 21284-9840
Preparer's CAGE: 23667
Assigned Individual: N

Contractor Information

Contractor's Name: ENVIRONMENTAL TECHNOLOGIES GROUP INC
Post Office Box: 9840
Contractor's Address1: 1400 TAYLOR AVE
Contractor's Address2: BALTIMORE, MD 21284-9840
Contractor's Telephone: 301-321-5200
Contractor's CAGE: 23667

Section 2 - Compositon/Information on Ingredients
SILVER METAL AND SOLUBLE SILVER COMPOUNDS (SILVER NITRATE)

Ingredient Name: SILVER NITRATE (SARA 313) (CERCLA)
Ingredient CAS Number: 7761-88-8 **Ingredient CAS Code:** M
RTECS Number: VW4725000 **RTECS Code:** M

=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: 100
% Enviromental Weight:
Other REC Limits: NONE RECOMMENDED
OSHA PEL: 0.01 MG(AG)/M3 **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: 0.01 MG(AG)/M3; 9495 **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity: 1 LB
DOT Reporting Quantity: 1 LB
Ozone Depleting Chemical: N

Section 3 - Hazards Identification, Including Emergency Overview
SILVER METAL AND SOLUBLE SILVER COMPOUNDS (SILVER NITRATE)

Health Hazards Acute & Chronic: ACUTE: MAY CAUSE IRRITATION, ULCERS AND DISCOLORATION OF SKIN. IF INGESTED, MAY CAUSE ABDOMINAL PAIN AND GASTROENTERITIS. CHRONIC: PROLONGED OR REPEATED EXPSOURE MAY CAUSE ARGYRIA (DISCOLORATION/PIGME NTATION).

Signs & Symptoms of Overexposure:
IRRITATION, ULCERS, DISCOLORATION OF SKIN; ABDOMINAL PAIN, GASTROENTERITIS.

Medical Conditions Aggravated by Exposure:
NONE SPECIFIED BY MANUFACTURER.

LD50 LC50 Mixture: UNKNOWN

Route of Entry Indicators:
Inhalation: YES
Skin: YES
Ingestion: YES

Carcenogenicity Indicators
NTP: NO
IARC: NO
OSHA: NO

Carcinogenicity Explanation: NO INGREDIENT OF A CONCENTRATION OF 0.1% OR GREATER IS LISTED AS A CARCINOGEN OR SUSPECTED CARCINOGEN.

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Section 4 - First Aid Measures
SILVER METAL AND SOLUBLE SILVER COMPOUNDS (SILVER NITRATE)

First Aid:
EYES-FLUSH WITH LOTS OF WATER FOR 15 MINUTES, LIFT LIDS. GET MEDICAL ATTENTION IMMEDIATELY. SKIN-REMOVE CONTAMINATED CLOTHES. FLUSH WITH WATER. GET MEDICAL ATTENTION IF SYMPTOMS DEVELOP. INHALED-REMOV E TO FRESH AIR. IF BREATHING STOPPED, GIVE ARTIFICIAL RESPIRATION. GET MEDICAL ATTENTION. INGESTED-DO NOT INDUCE VOMITING! IF CONSCIOUS, GIVE LOTS OF WATER. GET IMMEIDATE MEDICAL ATTENTION.

Section 5 - Fire Fighting Measures
SILVER METAL AND SOLUBLE SILVER COMPOUNDS (SILVER NITRATE)

Fire Fighting Procedures:
WEAR SELF-CONTAINED BREATHING APPARATUS AND FULL PROTECTIVE GEAR. COOL FIRE EXPOSED CONTAINERS WITH WATER.
Unusual Fire or Explosion Hazard:
SILVER NITRATE IS A STRONG OXIDING MATERIAL CAPABLE OF INCREASING THE FLAMMABILITY OF COMBUSTIBLE, ORGANIC OR OTHER READILY OXIDIZABLE MATERIALS.
Extinguishing Media:
USE MEDIA APPROPRIATE FOR SURROUNDING FIRE.
Flash Point: Flash Point Text: NOT APPLICABLE

Autoignition Temperature:
Autoignition Temperature Text: N/R
Lower Limit(s): N/R
Upper Limit(s): N/R

Section 6 - Accidental Release Measures
SILVER METAL AND SOLUBLE SILVER COMPOUNDS (SILVER NITRATE)

Spill Release Procedures:
ISOLATE & DENY ENTRY. WEAR PROPER PROTECTIVE CLOTHING/EQUIPMENT. VENTILATE AREA OF SPILL OR LEAK. ABSORB ON INERT MATERIAL AND PLACE IN A CONTAINER FOR LATER DISPOSAL.

Section 7 - Handling and Storage
SILVER METAL AND SOLUBLE SILVER COMPOUNDS (SILVER NITRATE)

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
SILVER METAL AND SOLUBLE SILVER COMPOUNDS (SILVER NITRATE)

Repiratory Protection:

IF ENGINEERING CONTROLS FAIL OR NON-ROUTINE USE OR AN EMERGENCY OCCURS; WEAR AN MSHA/NIOSH APPROVED RESPIRATOR OR AN AIR-SUPPLIED RESPIRATOR OR SCBA, AS REQUIRED. USE IN ACCORDANCE WITH 29 CFR 1910.13 4 AND MANUFACTURER'S RECOMMENDATIONS.

Ventilation:
USE ADEQUATE MECHANICAL VENTILATION OR LOCAL EXHAUST TO MAINTAIN EXPOSURE BELOW TLV(S).

Protective Gloves:
NEOPRENE.

Eye Protection: SAFETY GLASSES/CHEMICAL SPLASH GOGGLES.

Other Protective Equipment: EYE WASH STATION & SAFETY SHOWER. RUBBER BOOTS, APRON.

Work Hygenic Practices: WASH HANDS AFTER HANDLING AND BEFORE EATING, DRINKING, OR SMOKING. LAUNDER CONTAMINATED CLOTHES BEFORE REUSE.

Supplemental Health & Safety Information: KEY1=D1. MSDS IF PART D OF 4 PART KIT. HCC IS BASED ON PNI B. NOTE: DISPOSAL DATA- EPA/RCRA WASTE NUMBER D011 MAY APPLY TO UNUSED/UNCONTAMINATED PRODUCT (PER DEMIL INTRUCTIONS).

Section 9 - Physical & Chemical Properties
SILVER METAL AND SOLUBLE SILVER COMPOUNDS (SILVER NITRATE)

HCC: D1
NRC/State License Number: N/R
Net Property Weight for Ammo: N/R
Boiling Point: Boiling Point Text: 772F,411C
Melting/Freezing Point: Melting/Freezing Text: 408F,209C
Decomposition Point: Decomposition Text: 772F,411C
Vapor Pressure: NEGLIGIBLE **Vapor Density:** N/R
Percent Volatile Organic Content:
Specific Gravity: 4.4
Volatile Organic Content Pounds per Gallon:
pH: N/K
Volatile Organic Content Grams per Liter:
Viscosity: UNKNOWN
Evaporation Weight and Reference: NOT APPLICABLE
Solubility in Water: APPRECIABLE
Appearance and Odor: COLORLESS TO GREY SOLID; ODORLESS.
Percent Volatiles by Volume: N/K
Corrosion Rate: UNKNOWN

Section 10 - Stability & Reactivity Data
SILVER METAL AND SOLUBLE SILVER COMPOUNDS (SILVER NITRATE)

Stability Indicator: YES
Materials to Avoid:
ACETYLENE, AMMONIA, STRONG HYDROGEN PEROXIDE; MAY ATTACK SOME FORMS OF PLASTICS, RUBBER, COATINGS.
Stability Condition to Avoid:
HEAT; CONTACT WITH INCOMPATIBLE MATERIALS.
Hazardous Decomposition Products:
TOXIC GASES AND VAPORS (EG OXIDES OF NITROGEN) MAY BE RELEASED WHEN

DECOMPOSED.
Hazardous Polymerization Indicator: NO
Conditions to Avoid Polymerization:
WILL NOT OCCUR.

Section 11 - Toxicological Information
SILVER METAL AND SOLUBLE SILVER COMPOUNDS (SILVER NITRATE)

Toxicological Information:
N/P

Section 12 - Ecological Information
SILVER METAL AND SOLUBLE SILVER COMPOUNDS (SILVER NITRATE)

Ecological Information:
N/P

Section 13 - Disposal Considerations
SILVER METAL AND SOLUBLE SILVER COMPOUNDS (SILVER NITRATE)

Waste Disposal Methods:
SILVER METAL AND SOLUBLE SILVER COMPOUNDS MAY BE DISPOSED OF IN SEALED CONTAINERS IN A SECURED SANITARY LANDFILL. DEMILITARIZATION WILL BE PER DRMS-H 4160.3 VOL 1 CHAPTER XVIII-3, SEPTEMBER 1990.

Section 14 - MSDS Transport Information
SILVER METAL AND SOLUBLE SILVER COMPOUNDS (SILVER NITRATE)

Transport Information:
N/P

Section 15 - Regulatory Information
SILVER METAL AND SOLUBLE SILVER COMPOUNDS (SILVER NITRATE)

SARA Title III Information:
N/P
Federal Regulatory Information:
N/P
State Regulatory Information:
N/P

Section 16 - Other Information
SILVER METAL AND SOLUBLE SILVER COMPOUNDS (SILVER NITRATE)

Other Information:
N/P

HMIS Transportation Information

Product Identification: SILVER METAL AND SOLUBLE SILVER COMPOUNDS (SILVER NITRATE)
Transporation ID Number: 89172
Responsible Party CAGE: 23667
Date MSDS Prepared: 09/01/1978

Date MSDS Reviewed: 11/01/1995
MFN: 11/01/1995
Submitter: D DG
Status Code: C

Container Information
Unit of Issue: EA
Container Quantity: 1
Type of Container: UNKNOWN
Net Unit Weight: UNKNOWN

Article without MSDS: N
Technical Entry NOS Shipping Number:
Radioactivity: N/R
Form:
Net Explosive Weight: N/R
Coast Guard Ammunition Code: N/R
Magnetism: N/P
AF MMAC Code:
DOD Exemption Number: N/R
Limited Quantity Indicator:
Multiple Kit Number: 0
Kit Indicator: N
Kit Part Indicator: Y
Review Indicator: Y
Additional Data:

Department of Transportation Information
DOT Proper Shipping Name: SILVER NITRATE
DOT PSN Code: NBI
Symbols:
DOT PSN Modifier:
Hazard Class: 5.1
UN ID Number: UN1493
DOT Packaging Group: II
Label: OXIDIZER
Special Provision(s):
Packaging Exception: 152
Non Bulk Packaging: 212
Bulk Packaging: 242
Maximimum Quanity in Passenger Area: 5 KG
Maximimum Quanity in Cargo Area: 25 KG
Stow in Vessel Requirements: A
Requirements Water/Sp/Other:

IMO Detail Information
IMO Proper Shipping Name: SILVER NITRATE
IMO PSN Code: NMD
IMO PSN Modifier:
IMDG Page Number: 5177
UN Number: 1493

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UN Hazard Class: 5.1
IMO Packaging Group: II
Subsidiary Risk Label: -
EMS Number: 5.1-06
Medical First Aid Guide Number: 235

IATA Detail Information

IATA Proper Shipping Name: SILVER NITRATE
IATA PSN Code: WHU
IATA PSN Modifier:
IATA UN Id Number: 1493
IATA UN Class: 5.1
Subsidiary Risk Class:
UN Packaging Group: II
IATA Label: OXIDIZER
Packaging Note for Passengers: 508
Maximum Quantity for Passengers: 5KG
Packaging Note for Cargo: 511
Maximum Quantity for Cargo: 25KG
Exceptions:

AFI Detail Information

AFI Proper Shipping Name: SILVER NITRATE
AFI Symbols:
AFI PSN Code: WHU
AFI PSN Modifier:
AFI UN Id Number: UN1493
AFI Hazard Class: 5.1
AFI Packing Group: II
AFI Label:
Special Provisions: P5
Back Pack Reference: A9.8

HAZCOM Label Information

Product Identification: SILVER METAL AND SOLUBLE SILVER COMPOUNDS (SILVER NITRATE)
CAGE: 23667
Assigned Individual: N
Company Name: ENVIRONMENTAL TECHNOLOGIES GROUP INC
Company PO Box: 9840
Company Street Address1: 1400 TAYLOR AVE
Company Street Address2: BALTIMORE, MD 21284-9840 US
Health Emergency Telephone: 301-321-5200
Label Required Indicator: Y
Date Label Reviewed: 12/16/1998
Status Code: C
Manufacturer's Label Number:
Date of Label: 12/16/1998
Year Procured: N/K
Organization Code: G
Chronic Hazard Indicator: N/P
Eye Protection Indicator: N/P
Skin Protection Indicator: N/P
Respiratory Protection Indicator: N/P

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Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format)
For Cornell University Convenience Only

SODIUM NITRATE

Section 1 - Product and Company Identification	Section 9 - Physical & Chemical Properties
Section 2 - Compositon/Information on Ingredients	Section 10 - Stability & Reactivity Data
Section 3 - Hazards Identification Including Emergency Overview	Section 11 - Toxicological Information
Section 4 - First Aid Measures	Section 12 - Ecological Information
Section 5 - Fire Fighting Measures	Section 13 - Disposal Considerations
Section 6 - Accidental Release Measures	Section 14 - MSDS Transport Information
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Section 1 - Product and Company Identification
SODIUM NITRATE

Product Identification: SODIUM NITRATE
Date of MSDS: 05/04/1989 **Technical Review Date:** 11/12/1992
FSC: 6810 **NIIN:** 00-143-6000
Submitter: D DG
Status Code: C
MFN: 01
Article: N
Kit Part: N

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Manufacturer's Information

Manufacturer's Name: CHILEAN NITRATE SALES CORP.
Post Office Box: N/K
Manufacturer's Address1: 109 E MAIN STREET,SUITE 500
Manufacturer's Address2: NORFOLK, VA 23510
Manufacturer's Country: US
General Information Telephone: 804-622-9600
Emergency Telephone: 804-640-7270
Emergency Telephone: 804-640-7270
MSDS Preparer's Name: M. HALL & H. CONRAD
Proprietary: N
Reviewed: Y
Published: Y
CAGE: 0EPP6
Special Project Code: N

Item Description

Item Name: SODIUM NITRATE,ACS
Item Manager: S9M
Specification Number: O-C-265
Type/Grade/Class: NK
Unit of Issue: BT
Unit of Issue Quantity: 1
Type of Container: BOTTLE

Contractor Information

Contractor's Name: CHILEAN NITRATE CORP
Contractor's Address1: 150 BOUSH STREET, SUITE 701
Contractor's Address2: NORFOLK, VA 23510
Contractor's Telephone: 757-640-7270
Contractor's CAGE: 0EPP6

Section 2 - Compositon/Information on Ingredients
SODIUM NITRATE

Ingredient Name: SODIUM NITRATE
Ingredient CAS Number: 7631-99-4 **Ingredient CAS Code:** M
RTECS Number: WC5600000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:

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% Text: 100
% Enviromental Weight:
Other REC Limits: N/R
OSHA PEL: NOT ESTABLISHED **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: NOT ESTABLISHED **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity:
DOT Reporting Quantity:
Ozone Depleting Chemical: N

Section 3 - Hazards Identification, Including Emergency Overview
SODIUM NITRATE

Health Hazards Acute & Chronic: ACUTE:IRRITATION OF SKIN AND/OR MUCOUS MEMBRANES. INGESTION OF LARGE AMOUNTS CAUSES VIOLENT GASTROENTERITIS. CHRONIC:ANEMIA, METHEMOGLOBINEMIA, NEPHRITIS. CHRONIC:NONE EX[PECTED AT INDUSTRIAL USE LEV ELS.

Signs & Symptoms of Overexposure:
DIZZINESS, ABDOMINAL CRAMPS, VOMITING, HEADACHE, MENTAL IMPAIRMENT, CYANOSIS

Medical Conditions Aggravated by Exposure:
NO INFORMATION GIVEN ON MSDS BY SUPPLIER.

LD50 LC50 Mixture: ORAL RAT LD50 IS 4,300 MG/KG

Route of Entry Indicators:
Inhalation: YES
Skin: YES
Ingestion: YES

Carcenogenicity Indicators
NTP: NO
IARC: NO
OSHA: NO

Carcinogenicity Explanation: A CONSTANT INTAKE OF NITRATE CVONTAINING FOOD OR WATER MAY LEAD TO FORMATION OF CARCINOGENIC N-NITROSO COMPOUNDS.

Section 4 - First Aid Measures
SODIUM NITRATE

First Aid:
SKIN:FLUSH THOROUGHLY WITH WATER. EYES:FLUSH WITH WATER FOR 15 MINUTES. CALL A PHYSICIAN. INHALATION:REMOVE TO FRESH AIR,CALL A PHYSICIAN. INGESTION:DRINK WATER AND INDUCE VOMITING BY STICKING FINGER DOWN THROAT,CONSULT A PHYSICIAN IMMEDIATELY.

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Section 5 - Fire Fighting Measures
SODIUM NITRATE

Fire Fighting Procedures:
REMOVE CONTAINERS FROM FIRE AREA IF W/O RISK. COOL CONTAINERS EXPOSED TO FLAME W/WATER. USE NIOSH/MSHA APPROVED SCBA WHERE THIS MATERIAL IS INVOLVED WITH FIRE.
Unusual Fire or Explosion Hazard:
OXIDIZER! KEEP AWAY FROM REDUCING AGENTS. WILL EXPLODE IF HEAT TO 1000C IN THE PRESENCE OF REDUCING AGENTS OR MIXED W/CYANIDES. YIELDS TOXIC GASES WHEN HEATED.
Extinguishing Media:
SMALL FIRES:DRY CHEMICAL,CO2,WATER SPRAY OR FOAM. LARGE FIRES:WATER SPRAY FOG OR FOAM.
Flash Point: Flash Point Text: "NOT APPLICABLE"

Autoignition Temperature:
Autoignition Temperature Text: N/R
Lower Limit(s): "N/A"
Upper Limit(s): "N/A"

Section 6 - Accidental Release Measures
SODIUM NITRATE

Spill Release Procedures:
WEAR IMPERVIOUS GLOVES, BOOTS, WEAR GOGGLES, COVERALLS. WEAR NIOSH/MSHA APPROVED RESPIRATOR. SWEEP OR SHOVEL UP SPILLED MATERIAL.

Section 7 - Handling and Storage
SODIUM NITRATE

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
SODIUM NITRATE

Repiratory Protection:
USE NIOSH/MSHA APPROVED RESPIRATOR
Ventilation:
MECHANICAL (GENERAL).
Protective Gloves:
IMPERVIOUS, BUTYL OR RUBBER.
Eye Protection: GOGGLES.
Other Protective Equipment: COVERALLS AND IMPERVIOUS BOOTS
Work Hygenic Practices: FOLLOW RECOMMENDATIONS IN SECTION ON SPILL PRECAUTIONS AND STORAGE. WASH SKIN AND CLOTHING AFTER CONTACT.
Supplemental Health & Safety Information: MSDS RECEIVED FROM NAVY (FOCAL POINT N).

NAVY IDENTIFIED NSN.

Section 9 - Physical & Chemical Properties
SODIUM NITRATE

HCC: D1
NRC/State License Number: NONE
Net Property Weight for Ammo: NONE
Boiling Point: Boiling Point Text: "N/A"
Melting/Freezing Point: Melting/Freezing Text: 583F,306C
Decomposition Point: Decomposition Text: UNKNOWN
Vapor Pressure: "N/A" **Vapor Density:** "N/A"
Percent Volatile Organic Content:
Specific Gravity: POWDER
Volatile Organic Content Pounds per Gallon:
pH: N/K
Volatile Organic Content Grams per Liter:
Viscosity: N/P
Evaporation Weight and Reference: NO INFORMATION AVAILABLE
Solubility in Water: COMPLETE
Appearance and Odor: WHITE PRILLS
Percent Volatiles by Volume: NONE
Corrosion Rate: N/K

Section 10 - Stability & Reactivity Data
SODIUM NITRATE

Stability Indicator: YES
Materials to Avoid:
REDUCING AGENTS,FLAMMABLES AND COMBUSTIBLE MATERIALS.
Stability Condition to Avoid:
NO INFORMATION GIVEN ON MSDS BY SUPPLIER
Hazardous Decomposition Products:
OXIDES OF NITROGEN.
Hazardous Polymerization Indicator: NO
Conditions to Avoid Polymerization:
WILL NOT OCCUR.

Section 11 - Toxicological Information
SODIUM NITRATE

Toxicological Information:
N/P

Section 12 - Ecological Information
SODIUM NITRATE

Ecological Information:
N/P

Section 13 - Disposal Considerations
SODIUM NITRATE

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Waste Disposal Methods:
SANITARY LANDFILL IN ACCORDANCE WITH LOCAL,STATE AND FEDERAL REGULATIONS.

Section 14 - MSDS Transport Information
SODIUM NITRATE

Transport Information:
N/P

Section 15 - Regulatory Information
SODIUM NITRATE

SARA Title III Information:
N/P
Federal Regulatory Information:
N/P
State Regulatory Information:
N/P

Section 16 - Other Information
SODIUM NITRATE

Other Information:
N/P

HMIS Transportation Information

Product Identification: SODIUM NITRATE
Transporation ID Number: 50397
Responsible Party CAGE: 0EPP6
Date MSDS Prepared: 05/04/1989
Date MSDS Reviewed: 11/12/1992
MFN: 11/12/1992
Submitter: D DG
Status Code: C

Container Information
- **Unit of Issue:** BT
- **Container Quantity:** 1
- **Type of Container:** BOTTLE
- **Net Unit Weight:** 4.000 OZ

Article without MSDS: N
Technical Entry NOS Shipping Number:
Radioactivity:
Form:
Net Explosive Weight:
Coast Guard Ammunition Code:
Magnetism: N/P
AF MMAC Code:
DOD Exemption Number:

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Limited Quantity Indicator:
Multiple Kit Number: 0
Kit Indicator: N
Kit Part Indicator: N
Review Indicator: Y
Additional Data:

Department of Transportation Information

DOT Proper Shipping Name: SODIUM NITRATE
DOT PSN Code: NHW
Symbols:
DOT PSN Modifier:
Hazard Class: 5.1
UN ID Number: UN1498
DOT Packaging Group: III
Label: OXIDIZER
Special Provision(s): A1,A29
Packaging Exception: 152
Non Bulk Packaging: 213
Bulk Packaging: 240
Maximimum Quanity in Passenger Area: 25 KG
Maximimum Quanity in Cargo Area: 100 KG
Stow in Vessel Requirements: A
Requirements Water/Sp/Other:

IMO Detail Information

IMO Proper Shipping Name: SODIUM NITRATE
IMO PSN Code: NUP
IMO PSN Modifier:
IMDG Page Number: 5180
UN Number: 1498
UN Hazard Class: 5.1
IMO Packaging Group: III
Subsidiary Risk Label: -
EMS Number: 5.1-06
Medical First Aid Guide Number: 235

IATA Detail Information

IATA Proper Shipping Name: SODIUM NITRATE
IATA PSN Code: WUC
IATA PSN Modifier:
IATA UN Id Number: 1498
IATA UN Class: 5.1
Subsidiary Risk Class:
UN Packaging Group: III
IATA Label: OXIDIZER
Packaging Note for Passengers: 516
Maximum Quantity for Passengers: 25KG
Packaging Note for Cargo: 518
Maximum Quantity for Cargo: 100KG
Exceptions:

AFI Detail Information

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AFI Proper Shipping Name: SODIUM NITRATE
AFI Symbols:
AFI PSN Code: WUC
AFI PSN Modifier:
AFI UN Id Number: UN1498
AFI Hazard Class: 5.1
AFI Packing Group: III
AFI Label:
Special Provisions: P5, A1, A29
Back Pack Reference: A9.8

HAZCOM Label Information

Product Identification: SODIUM NITRATE
CAGE: 0EPP6
Assigned Individual: N
Company Name: CHILEAN NITRATE CORP
Company PO Box:
Company Street Address1: 150 BOUSH STREET, SUITE 701
Company Street Address2: NORFOLK, VA 23510 US
Health Emergency Telephone: 804-622-9600
Label Required Indicator: Y
Date Label Reviewed: 11/12/1992
Status Code: C
Manufacturer's Label Number: NONE
Date of Label: 11/12/1992
Year Procured: 1992
Organization Code: F
Chronic Hazard Indicator: N/P
Eye Protection Indicator: YES
Skin Protection Indicator: YES
Respiratory Protection Indicator: N/P
Signal Word: WARNING
Health Hazard: Slight
Contact Hazard: None
Fire Hazard: None
Reactivity Hazard: Moderate

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Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format)
For Cornell University Convenience Only

STRONTIUM NITRATE

Section 1 - Product and Company Identification	Section 9 - Physical & Chemical Properties
Section 2 - Compositon/Information on Ingredients	Section 10 - Stability & Reactivity Data
Section 3 - Hazards Identification Including Emergency Overview	Section 11 - Toxicological Information
Section 4 - First Aid Measures	Section 12 - Ecological Information
Section 5 - Fire Fighting Measures	Section 13 - Disposal Considerations
Section 6 - Accidental Release Measures	Section 14 - MSDS Transport Information
Section 7 - Handling and Storage	Section 15 - Regulatory Information
Section 8 - Exposure Controls & Personal Protection	Section 16 - Other Information

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Cornell University does not in any way warrant or imply the applicability, viability or use of this information to any person or for use in any situation.

Section 1 - Product and Company Identification
STRONTIUM NITRATE

Product Identification: STRONTIUM NITRATE
Date of MSDS: 12/01/1985 **Technical Review Date:** 12/05/1995
FSC: 6810 **NIIN: LIIN:** 00N066909
Submitter: N EN
Status Code: C
MFN: 01
Article: N
Kit Part: N

Manufacturer's Information

Manufacturer's Name: GENIUM PUBLISHING CORP
Manufacturer's Address1: 1145 CATALYN ST
Manufacturer's Address2: SCHENECTADY, NY 12303
Manufacturer's Country: US
General Information Telephone: 518-377-8854
Emergency Telephone: 518-377-8854
Emergency Telephone: 518-377-8854
MSDS Preparer's Name: N/P
Proprietary: N
Reviewed: N
Published: Y
CAGE: 5Z768
Special Project Code: N

Contractor Information

Contractor's Name: GENIUM PUBLISHING CORPORATION
Contractor's Address1: 1145 CATALYN ST
Contractor's Address2: SCHENECTADY, NY 12303-1836
Contractor's Telephone: 518-377-8854
Contractor's CAGE: 5Z768

Section 2 - Compositon/Information on Ingredients
STRONTIUM NITRATE

Ingredient Name: STRONTIUM NITRATE; (STRONTIUM NITRATE, SR(NO*3)*2). LD50: (ORAL, RAT) 2750 MG/KG.
Ingredient CAS Number: 10042-76-9 **Ingredient CAS Code:** M
RTECS Number: WK9800000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: 99
% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: N/K (FP N) **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: N/K (FP N) **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity:
DOT Reporting Quantity:
Ozone Depleting Chemical: N

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Section 3 - Hazards Identification, Including Emergency Overview
STRONTIUM NITRATE

Health Hazards Acute & Chronic: SKIN CONTACT CAN CAUSE IRRITATION. CHEMICAL BURNS CAN OCCUR ON EYE CONTACT. INHALATION OF DUST AND MIST OF STRONTIUM NITRATE CAN CAUSE IRRITATION OF THE MUCOUS MEMBRANES OF THE NOSE, THROAT, AND RESPI RATORY TRACT. INHALATION OF STRONTIUM NITRATE BY LABORTORY RATS PRODUCED CHANGES IN THE KIDNEY, LIVER, (EFTS OF OVEREXP)

Signs & Symptoms of Overexposure:
HLTH HAZ:AND OTHER ORGAN SYSTEMS (REF #14). HOWEVER, THERE ARE NO REPORTS OF ADVERSE EFFECTS RESULTING FROM INDUSTRIAL EXPOSURE AND IN GENERAL, STRONTIUM SALTS ARE CONSIDERED TO EXHIBIT A LOW DEGREE O F TOXICITY. STRONTIUM NITRATE HAS NOT BEEN IDENTIFIED AS A SUSPECTED CARCINOGEN BY THE NTP, IARC, OR OSHA.

Medical Conditions Aggravated by Exposure:
NONE SPECIFIED BY MANUFACTURER.

LD50 LC50 Mixture: SEE INGREDIENTS.

Route of Entry Indicators:
- **Inhalation:** YES
- **Skin:** YES
- **Ingestion:** NO

Carcenogenicity Indicators
- **NTP:** NO
- **IARC:** NO
- **OSHA:** NO

Carcinogenicity Explanation: NOT RELEVANT.

Section 4 - First Aid Measures
STRONTIUM NITRATE

First Aid:
EYE:IMMED FLUSH EYES, INCL UNDER EYELIDS, W/LRG AMTS OF RUNNING H*2O FOR AT LEAST 15 MIN. GET PROMPT MED ATTN. SKIN:FLUSH CONTAMD SKIN W/PLENTY OF H*2O. SEEK MED ATTN IF IRRIT PERSIST. INHAL:REMOVE FR OM EXPOS. SEEK MED ATTN FOR TREATMENT OF ANY SYMP. INGEST:IF PERS IS CONSCIOUS, GIVE HIM LRG QTY OF MILK OR H*2O TO DRINK. INDUCE VOMIT & GET PROMT MED ATTN. MED ATTN-IN PLANT, COMMUNITY, PARAMEDIC.

Section 5 - Fire Fighting Measures
STRONTIUM NITRATE

Fire Fighting Procedures:
TOXIC GASES CAN BE EVOLVED UNDER FIRE CONDITIONS. USE NIOSH/MSHA

APPROVED SCBA & FULL PROTECTIVE EQUIPMENT (FP N).
Unusual Fire or Explosion Hazard:
NONE SPECIFIED BY MANUFACTURER.
Extinguishing Media:
THIS MATL IS NOT COMBUST. HOWEVER, AS OXIDIZER, IT CAN INITIATE & INTENSIFY COMBUST. USE EXTING AGENTS THAT (SUPDAT)
Flash Point: Flash Point Text: N/A

Autoignition Temperature:
Autoignition Temperature Text: N/A
Lower Limit(s): N/K
Upper Limit(s): N/K

Section 6 - Accidental Release Measures
STRONTIUM NITRATE

Spill Release Procedures:
VENT SPILL AREA. CLEANUP PERSONNEL SHOULD WEAR PROT EQUIP AS NEC TO PVNT SKIN & EYE CNTCT & DUST INHAL. SCOOP UP SPILLED MATL & PLACE IN SUITABLE CNTNR FOR RECLAIM/DISPOSAL. AVOID DUST GENERATION. WAS H RESIDUE ON CONTAMD SURFACES W/LRG AMTS OF H*2O.

Section 7 - Handling and Storage
STRONTIUM NITRATE

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
STRONTIUM NITRATE

Repiratory Protection:
USE NIOSH/MSHA APPROVED RESPIRATORS WHERE DUSTY CONDITIONS EXIST. RESPIRATOR USAGE MUST BE IN ACCORDANCE WITH OSHA REQUIREMENTS (29 CFR 1910.134)
Ventilation:
PROVIDE LOCAL EXHAUST VENTILATION TO MINIMIZE AIRBORNE DUST CONCENTRATIONS.
Protective Gloves:
IMPERVIOUS GLOVES (FP N).
Eye Protection: ANSI APPROVED CHEM WORKERS GOGGS (FP N).
Other Protective Equipment: EYE WASH FOUNTAIN & DELUGE SHOWER WHICH MEET ANSI DESIGN CRITERIA (FP N). WEAR OTHER PROT CLOTHING (BOOTS, APRON, ETC.)
Work Hygenic Practices: FOLLOW GOOD PERS HYGIENE PRACTICE. WASH HANDS THORO AFTER HNDLG & BEFORE EATING & SMOKING. LAUNDER CONTAMD (SUPDAT)
Supplemental Health & Safety Information: EXTING MEDIA:ARE APPROP FOR BURNING MATL. MATLS TO AVOID:PAPER, PLASTICS, SULFUR, ALUMINUM, ETC.). IGNIT OF THESE MATLS MAY OCCUR. MIXTS OF STRONTIUM NITRATE & REDUCING AGENTS CAN BE

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EXPLOS & MAY DETO NATE BY HEAT & SHOCK. WASTE DISP METH:VIRTUE OF THEIR SOLUBLE BARIUM CONTENT. HYGIENE PRACT:CLOTHING BEFORE REUSE.

Section 9 - Physical & Chemical Properties
STRONTIUM NITRATE

HCC:
NRC/State License Number:
Net Property Weight for Ammo:
Boiling Point: Boiling Point Text: DECOMPOSES
Melting/Freezing Point: Melting/Freezing Text: 1058F,570C
Decomposition Point: Decomposition Text: N/K
Vapor Pressure: NEGLIGIBLE **Vapor Density:** N/K
Percent Volatile Organic Content:
Specific Gravity: 2.986
Volatile Organic Content Pounds per Gallon:
pH: N/K
Volatile Organic Content Grams per Liter:
Viscosity: N/P
Evaporation Weight and Reference: N/K
Solubility in Water: 100 G/CC @ 90C
Appearance and Odor: WHITE CRYSTALLINE POWDER. NO ODOR.
Percent Volatiles by Volume: N/K
Corrosion Rate: N/K

Section 10 - Stability & Reactivity Data
STRONTIUM NITRATE

Stability Indicator: YES
Materials to Avoid:
STRONTIUM NITRATE IS OXIDIZER & CAN REACT W/OXIDIZABLE SUBSTANCES SUCH AS FLAM LIQS & COMBUST MATLS (WOOD, (SUPDAT)
Stability Condition to Avoid:
NONE SPECIFIED BY MANUFACTURER.
Hazardous Decomposition Products:
DECOMPOSITION BEGINS AT APPROXIMATELY 500C WITH THE EVOLUTION OF OXIDES OF NITROGEN (TOXIC).
Hazardous Polymerization Indicator: NO
Conditions to Avoid Polymerization:
NOT RELEVANT.

Section 11 - Toxicological Information
STRONTIUM NITRATE

Toxicological Information:
N/P

Section 12 - Ecological Information
STRONTIUM NITRATE

Ecological Information:
N/P

Section 13 - Disposal Considerations
STRONTIUM NITRATE

Waste Disposal Methods:
RECLAIM MATL WHEN POSS. CNTCT SUPPLIER/LICENSED CHEM WASTE DISP CONTRACTOR FOR TREATMENT/DISP INSTRUCTIONS. FOLLOW LOCAL, STATE, & FED REGS. EPA HAZ WASTE NO.:D001 (OXIDIZER, 40 CHR 261.21). NOTE:SOME GRADES MAY BE CONSIDERED HAZ WASTE BY (SUPDAT)

Section 14 - MSDS Transport Information
STRONTIUM NITRATE

Transport Information:
N/P

Section 15 - Regulatory Information
STRONTIUM NITRATE

SARA Title III Information:
N/P
Federal Regulatory Information:
N/P
State Regulatory Information:
N/P

Section 16 - Other Information
STRONTIUM NITRATE

Other Information:
N/P

HAZCOM Label Information

Product Identification: STRONTIUM NITRATE
CAGE: 5Z768
Assigned Individual: N
Company Name: GENIUM PUBLISHING CORPORATION
Company PO Box:
Company Street Address1: 1145 CATALYN ST
Company Street Address2: SCHENECTADY, NY 12303-1836 US
Health Emergency Telephone: 518-377-8854
Label Required Indicator: Y
Date Label Reviewed: 12/05/1995
Status Code: C
Manufacturer's Label Number:
Date of Label: 12/05/1995
Year Procured: N/K
Organization Code: G
Chronic Hazard Indicator: N
Eye Protection Indicator: YES
Skin Protection Indicator: YES
Respiratory Protection Indicator: YES
Signal Word: DANGER

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Health Hazard: Moderate
Contact Hazard: Severe
Fire Hazard: None
Reactivity Hazard: None

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Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format)
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STYRENE MONOMER

Section 1 - Product and Company Identification	Section 9 - Physical & Chemical Properties
Section 2 - Compositon/Information on Ingredients	Section 10 - Stability & Reactivity Data
Section 3 - Hazards Identification Including Emergency Overview	Section 11 - Toxicological Information
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Section 7 - Handling and Storage	Section 15 - Regulatory Information
Section 8 - Exposure Controls & Personal Protection	Section 16 - Other Information

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Cornell University does not in any way warrant or imply the applicability, viability or use of this information to any person or for use in any situation.

Section 1 - Product and Company Identification
STYRENE MONOMER

Product Identification: STYRENE MONOMER
Date of MSDS: 01/03/1991 **Technical Review Date:** 01/25/1994
FSC: 6810 **NIIN:** 00-987-4126
Submitter: D DG
Status Code: C
MFN: 01
Article: N
Kit Part: N

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Manufacturer's Information

Manufacturer's Name: ARCO CHEMICAL COMPANY, DIV OF ATLANTIC RICHFIELD
Post Office Box: 7258
Manufacturer's Address1: 3801 WEST CHESTER PIKE
Manufacturer's Address2: NEWTOWN SQUARE, PA 19073
Manufacturer's Country: US
General Information Telephone: 800-321-7000
Emergency Telephone: 215-353-8300/800-424-9300
Emergency Telephone: 215-353-8300/800-424-9300
MSDS Preparer's Name: N/P
Proprietary: N
Reviewed: Y
Published: Y
CAGE: 3D253
Special Project Code: N

Item Description

Item Name: STYRENE,ANALYZED REAGENT
Item Manager: S9G
Specification Number: UNKNOWN
Type/Grade/Class: NONE
Unit of Issue: EA
Unit of Issue Quantity: 1
Type of Container: CAN

Contractor Information

Contractor's Name: ARCO CHEMICAL COMPANY, DIV OF ATLANTIC RICHFIELD
Post Office Box: 7258
Contractor's Address1: 1500 MARKET STREET
Contractor's Address2: PHILADELPHIA, PA 19101
Contractor's Telephone: 215-353-8300,CHEMTREC 800-424-9300
Contractor's CAGE: 3D253

Contractor Information

Contractor's Name: TEXTILE CHEMICAL CO
Contractor's Address1: POTTSVILLE PIKE & HULLER LANE
Contractor's Address2: READING, PA 19605
Contractor's Telephone: 215-926-4151
Contractor's CAGE: 2H096

Section 2 - Compositon/Information on Ingredients
STYRENE MONOMER

Ingredient Name: P-TERTIARY BUTYL CATECHOL
Ingredient CAS Number: 98-29-3 **Ingredient CAS Code:** M
RTECS Number: RTECS Code: X
=WT: =WT Code:

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=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: 10-60PP
% Enviromental Weight:
Other REC Limits: NONE RECOMMENDED
OSHA PEL: NOT ESTABLISHED **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: NOT ESTABLISHED **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity:
DOT Reporting Quantity:
Ozone Depleting Chemical: N

Ingredient Name: STYRENE, MONOMER (SARA III)
Ingredient CAS Number: 100-42-5 **Ingredient CAS Code:** M
RTECS Number: WL3675000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: 99.8%
% Enviromental Weight:
Other REC Limits: NONE RECOMMENDED
OSHA PEL: 100 PPM **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: S,50PPM/100STEL;9394 **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity: 1000 LBS
DOT Reporting Quantity: 1000 LBS
Ozone Depleting Chemical: N

Section 3 - Hazards Identification, Including Emergency Overview
STYRENE MONOMER

Health Hazards Acute & Chronic: ACUTE:INHAL:IRRIT TO RESP TRACT & OTHER MUC MEM. EYE:MODERATE IRRIT. SKIN:DELAYED IRRIT. INGEST:SLIGHT HEALTH HAZARD IF SKIN ABSORPTION EXPOSURE. CHRONIC:CNS DEPRESSANT, ALLERGIC SENSITIZER,

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ASPIRATIO N HAZARD.

Signs & Symptoms of Overexposure:
INHAL:COUGHING, SHORTNESS OF BREATH, SNEEZING, SORE THROAT. EYE:BURNING SENSATION, TEARING, REDNESS OR SELLING. SKIN:BLISTERING, REDNESS, SWELLING, ITCHING, DISCOMFORT. OTHER SYMPTOMS MAY BE NAUSEA, L OSS OF APPETITE, CNS DEPRESSION AND GENERAL WEAKNESS.

Medical Conditions Aggravated by Exposure:
PRE-EXISTING CNS DISORDERS.

LD50 LC50 Mixture: ORAL LD50 (RAT) IS 5000 MG/KG

Route of Entry Indicators:
Inhalation: YES
Skin: YES
Ingestion: YES

Carcenogenicity Indicators
NTP: NO
IARC: YES
OSHA: NO

Carcinogenicity Explanation: PER IARC STYRENE "IS PROBABLY CARCINOGENIC TO HUMANS" HOWEVER "NO ADEQUATE EVIDENCE" IS AVAILABLE.

Section 4 - First Aid Measures
STYRENE MONOMER

First Aid:
INHAL:REMOVE TO FRESH AIR.GIVE OXYGEN OR ARTIFICIAL RESP AS NEEDED. EYE:RINSE W/WATER FOR 20MIN OPENING EYELIDS. SKIN:REMOVE CONTAMINATED CLOTHING. WASH THOROUGHLY W/MILD SOAP/WATER. FLUSH W/LUKEWARM WATER FOR 15MINS. IF STICKY USE WATERLESS CLEANER FIRST. INGEST:IF LG AMT GIVE LUKEWARM WATER "PINT" IF CONSCIOUS/ALERT. DO NOT INDUCE VOMITING. SEEK MEDICAL ATTENTION IN ALL CASES.

Section 5 - Fire Fighting Measures
STYRENE MONOMER

Fire Fighting Procedures:
DON'T ENTER FIRE AREA W/O PROPER PROTECTION. FIGHT FIRE FROM SAFE DISTANCE/PROTECTED LOCATION. HEAT MAY INCREASE CONTAINER'S PRESSURE RUPTURING & SPREADING FIRE
Unusual Fire or Explosion Hazard:
HEAT/EXPSORUE TO AIR/IMPURITIES CAUSE SPONTANEAOUS REACTION/CREATE HEAT/PRESSURE.VAPORS MAY CONDENSE AS SOLIDS,PLUGGING PRESSURE RELIEF DEVICES,CAUSING RUPTURE.
Extinguishing Media:
DRY CHEMICL, CARBON DIOXIDE, FOAM, USE WATER SPRAY/WATER FOG FOR COOLING.

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Flash Point: Flash Point Text: 90.0F,32.2C

Autoignition Temperature:
Autoignition Temperature Text: N/A
Lower Limit(s): 1.1
Upper Limit(s): 6.1

Section 6 - Accidental Release Measures
STYRENE MONOMER

Spill Release Procedures:
WEAR PROPER SAFETY EQUIP.REMOVE IGNITION SOURCES.PREVENT FLOW TO SEWERS/PUBLIC WATERS.RESTRICT WATER USE FOR CLEANUP;MATERIAL FLOATS/INSOLUBLE.SOAK SM SPILLS W/INERT SOLIDS & COLLECT HARDEN SPILLS FOR DISPOSAL.REPORT ENVIRONMENTAL AUTHORITIES.

Section 7 - Handling and Storage
STYRENE MONOMER

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
STYRENE MONOMER

Repiratory Protection:
USE NIOSH/MSHA APPROVED AIR-PURIFYING OR SUPPLIED AIR RESPIRATOR AS APPROPRIATE.
Ventilation:
LOCAL EXHAUST VENTILATION MAY BE REQUIRED TO MEET EXPOSURE STANDARD IN ADDITION TO GENERAL ROOM VENTILATION.
Protective Gloves:
CHEM GLOVES (NOT RUBBER).
Eye Protection: CHEM SPLASH GOGGLES, FACE SHIELD.
Other Protective Equipment: APRON, SLEEVES, BOOTS, FULL HEAD/FACE PROTECTION. EYEWASH FOUNTAINS & SAFETY SHOWERS.
Work Hygenic Practices: WASH HANDS BEFORE EATING/DRINKING/SMOKING/TOILET FACILITIES.WASH CONTAMINATED CLOTHING & SHOWER AFT WORK W/LOTS SOAP/WAT
Supplemental Health & Safety Information: DO NOT WEAR CONTACT LENS WHILE WORKING W/MATERIAL.

Section 9 - Physical & Chemical Properties
STYRENE MONOMER

HCC: F4
NRC/State License Number: N/R
Net Property Weight for Ammo: N/R
Boiling Point: Boiling Point Text: 295F,146C

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Melting/Freezing Point: Melting/Freezing Text: N/D
Decomposition Point: Decomposition Text: UNKNOWN
Vapor Pressure: 4.5 **Vapor Density:** 3.6
Percent Volatile Organic Content:
Specific Gravity: 0.90 @ 77F
Volatile Organic Content Pounds per Gallon:
pH: N/A
Volatile Organic Content Grams per Liter:
Viscosity: N/P
Evaporation Weight and Reference: COMPLETE
Solubility in Water: NEGLIGIBLE
Appearance and Odor: COLORLESS LIQUID WITH AROMATIC, SWEET ODOR.
Percent Volatiles by Volume: 100
Corrosion Rate: UNKNOWN

Section 10 - Stability & Reactivity Data
STYRENE MONOMER

Stability Indicator: NO
Materials to Avoid:
OXIDIZERS, PEROXIDES, STRONG ACIDS, OLEUM, ALUMINUM CHLORIDE, ALKAL, METALGRAPHITE, PURE OXYGEN, VINYL POLYMERS.
Stability Condition to Avoid:
AVOID HEAT, FLAME, CONTAMINANTS. CORROSIVE TO COPPER & COPPER ALLOYS. DISSOLVES RUBBER.
Hazardous Decomposition Products:
EMITS ACRID FUMES, INCOMPLETE COMBUSTION MAY PRODUCE CARBON MONOXIDE AND CARBON DIOXIDE.
Hazardous Polymerization Indicator: YES
Conditions to Avoid Polymerization:
PRODUCT IS STABLE W/AN APPROPRIATE LEVEL OF INHIBITOR, BUT REACTIVE "UNSTABLE" WITHOUT. CONTACT ARCO SALES REP FOR INFO.

Section 11 - Toxicological Information
STYRENE MONOMER

Toxicological Information:
N/P

Section 12 - Ecological Information
STYRENE MONOMER

Ecological Information:
N/P

Section 13 - Disposal Considerations
STYRENE MONOMER

Waste Disposal Methods:
CONTAMINATED MATERIAL MAY BE RCRA/OSHA HAZ WASTE DUE TO POTENTIAL FOR INTERNAL HEAT GENERATION. LANDFILL SOLIDS @ PERMITTED SITES. BURN CONC LIQ IN SYS THAT USE COMPATIBLE FUEL;DILUTE W/CLEAN LOW VISC OSITY FUEL. DISPOSE

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IAW FED/STATE/LOCALREGULATION

Section 14 - MSDS Transport Information
STYRENE MONOMER

Transport Information:
N/P

Section 15 - Regulatory Information
STYRENE MONOMER

SARA Title III Information:
N/P
Federal Regulatory Information:
N/P
State Regulatory Information:
N/P

Section 16 - Other Information
STYRENE MONOMER

Other Information:
N/P

HMIS Transportation Information

Product Identification: STYRENE MONOMER
Transporation ID Number: 96856
Responsible Party CAGE: 3D253
Date MSDS Prepared: 01/03/1991
Date MSDS Reviewed: 01/25/1994
MFN: 01/25/1994
Submitter: D DG
Status Code: C

Container Information
- **Unit of Issue:** EA
- **Container Quantity:** 1
- **Type of Container:** CAN
- **Net Unit Weight:** 7.5 LBS

Article without MSDS: N
Technical Entry NOS Shipping Number:
Radioactivity:
Form:
Net Explosive Weight:
Coast Guard Ammunition Code:
Magnetism: N/P
AF MMAC Code:
DOD Exemption Number:
Limited Quantity Indicator:
Multiple Kit Number: 0
Kit Indicator: N

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Kit Part Indicator: N
Review Indicator: Y
Additional Data:
FLAMMABLE LIQUID

Department of Transportation Information

DOT Proper Shipping Name: STYRENE MONOMER, INHIBITED
DOT PSN Code: NNJ
Symbols:
DOT PSN Modifier:
Hazard Class: 3
UN ID Number: UN2055
DOT Packaging Group: III
Label: FLAMMABLE LIQUID
Special Provision(s): B1,T1
Packaging Exception: 150
Non Bulk Packaging: 203
Bulk Packaging: 242
Maximimum Quanity in Passenger Area: 60 L
Maximimum Quanity in Cargo Area: 220 L
Stow in Vessel Requirements: A
Requirements Water/Sp/Other:

IMO Detail Information

IMO Proper Shipping Name: STYRENE MONOMER, INHIBITED
IMO PSN Code: OCX
IMO PSN Modifier: P
IMDG Page Number: 3381
UN Number: 2055
UN Hazard Class: 3.3
IMO Packaging Group: III
Subsidiary Risk Label: -
EMS Number: 3-07
Medical First Aid Guide Number: 310

IATA Detail Information

IATA Proper Shipping Name: STYRENE MONOMER, INHIBITED
IATA PSN Code: XDS
IATA PSN Modifier:
IATA UN Id Number: 2055
IATA UN Class: 3
Subsidiary Risk Class:
UN Packaging Group: III
IATA Label: FLAMMABLE LIQUID
Packaging Note for Passengers: 309
Maximum Quantity for Passengers: 60L
Packaging Note for Cargo: 310
Maximum Quantity for Cargo: 220L
Exceptions:

AFI Detail Information

AFI Proper Shipping Name: STYRENE MONOMER, INHIBITED
AFI Symbols:
AFI PSN Code: XDS

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AFI PSN Modifier:
AFI UN Id Number: UN2055
AFI Hazard Class: 3
AFI Packing Group: III
AFI Label:
Special Provisions: P5
Back Pack Reference: A7.3

HAZCOM Label Information

Product Identification: STYRENE MONOMER
CAGE: 3D253
Assigned Individual: N
Company Name: ARCO CHEMICAL COMPANY, DIV OF ATLANTIC RICHFIELD
Company PO Box: 7258
Company Street Address1: 1500 MARKET STREET
Company Street Address2: PHILADELPHIA, PA 19101 US
Health Emergency Telephone: 215-353-8300/800-424-9300
Label Required Indicator: Y
Date Label Reviewed: 01/25/1994
Status Code: C
Manufacturer's Label Number: N/R
Date of Label: 01/25/1994
Year Procured: N/K
Organization Code: G
Chronic Hazard Indicator: Y
Eye Protection Indicator: YES
Skin Protection Indicator: YES
Respiratory Protection Indicator: YES
Signal Word: DANGER
Health Hazard: Severe
Contact Hazard: Slight
Fire Hazard: Severe
Reactivity Hazard: None

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CORNELL

Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format)
For Cornell University Convenience Only

POLY (TETRAFLUOROETHYLENE), 203

Section 1 - Product and Company Identification	Section 9 - Physical & Chemical Properties
Section 2 - Compositon/Information on Ingredients	Section 10 - Stability & Reactivity Data
Section 3 - Hazards Identification Including Emergency Overview	Section 11 - Toxicological Information
Section 4 - First Aid Measures	Section 12 - Ecological Information
Section 5 - Fire Fighting Measures	Section 13 - Disposal Considerations
Section 6 - Accidental Release Measures	Section 14 - MSDS Transport Information
Section 7 - Handling and Storage	Section 15 - Regulatory Information
Section 8 - Exposure Controls & Personal Protection	Section 16 - Other Information

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Section 1 - Product and Company Identification
POLY (TETRAFLUOROETHYLENE), 203

Product Identification: POLY (TETRAFLUOROETHYLENE), 203
Date of MSDS: 03/01/1992 **Technical Review Date:** 11/08/1995
FSC: 6810 **NIIN:** **LIIN:** 00N047321
Submitter: N EN
Status Code: C
MFN: 01
Article: N
Kit Part: N

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Manufacturer's Information

Manufacturer's Name: SCIENTIFIC POLYMER PRODUCTS INC
Manufacturer's Address1: 6265 DEAN PARKWAY
Manufacturer's Address2: ONTARIO, NY 14519
Manufacturer's Country: US
General Information Telephone: 716-265-0413
Emergency Telephone: 716-265-0413
Emergency Telephone: 716-265-0413
MSDS Preparer's Name: N/P
Proprietary: N
Reviewed: N
Published: Y
CAGE: 0MWG0
Special Project Code: N

Contractor Information

Contractor's Name: SCIENTIFIC POLYMER PRODUCTS INC
Contractor's Address1: 6265 DEAN PARKWAY
Contractor's Address2: ONTARIO, NY 14519
Contractor's Telephone: 716-265-0413
Contractor's CAGE: 0MWG0

Section 2 - Compositon/Information on Ingredients
POLY (TETRAFLUOROETHYLENE), 203

Ingredient Name: EHTYLENE, TETRAFLUORO-, POLYMER; (POLY (TETRAFLUOROETHYLENE))
Ingredient CAS Number: 116-14-3 **Ingredient CAS Code:** M
RTECS Number: KX4025000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: 100
% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: N/K (FP N) **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: N/K (FP N) **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity:
DOT Reporting Quantity:
Ozone Depleting Chemical: N

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Section 3 - Hazards Identification, Including Emergency Overview
POLY (TETRAFLUOROETHYLENE), 203

Health Hazards Acute & Chronic: MAY CAUSE SKIN AND EYE IRRITATION UPON CONTACT. AVOID BREATHING DUST AS IT MAY CAUSE RESPIRATORY TRACT IRRITATION.

Signs & Symptoms of Overexposure:
SEE HEALTH HAZARDS.

Medical Conditions Aggravated by Exposure:
NONE SPECIFIED BY MANUFACTURER.

LD50 LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.

Route of Entry Indicators:
Inhalation: YES
Skin: NO
Ingestion: NO

Carcenogenicity Indicators
NTP: NO
IARC: NO
OSHA: NO

Carcinogenicity Explanation: NOT RELEVANT.

Section 4 - First Aid Measures
POLY (TETRAFLUOROETHYLENE), 203

First Aid:
INGEST:CALL MD IMMEDIATELY (FP N). INHAL:REMOVE FROM EXPOSURE. IF BREATHING STOPS, BEGIN MOUTH TO MOUTH. EYES:FLUSH WITH WATER FOR AT LEAST 15 MINUTES. SKIN:WASH AFFECTED AREA WITH SOAP AND WATER. REM OVE DIRTY CLOTHING.

Section 5 - Fire Fighting Measures
POLY (TETRAFLUOROETHYLENE), 203

Fire Fighting Procedures:
USE NIOSH/MSHA APPROVED SCBA & FULL PROTECTIVE EQUIPMENT (FP N). **SELF-EXTINGUISHING AWAY FROM FLAME SOURCE.
Unusual Fire or Explosion Hazard:
IN A FIRE, HYDROGEN FLUORIDE COULD BE EVOLVED. MATL WILL DEGRADE W/EVOLUTION OF IRRIT VAPS AT TEMPS ABOVE 200C. HAZ GASES/VAPS PRODUCED IN FIRE ARE (SUPDAT)
Extinguishing Media:
WATER SPRAY, CO*2, FOAM, DRY CHEMICAL.
Flash Point: Flash Point Text: N/A

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Autoignition Temperature:
Autoignition Temperature Text: N/A
Lower Limit(s): N/A
Upper Limit(s): N/A

Section 6 - Accidental Release Measures
POLY (TETRAFLUOROETHYLENE), 203

Spill Release Procedures:
SWEEP UP AND PLACE IN CONTAINER FOR DISPOSAL. USE APPROPRIATE SAFETY EQUIPMENT.

Section 7 - Handling and Storage
POLY (TETRAFLUOROETHYLENE), 203

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
POLY (TETRAFLUOROETHYLENE), 203

Repiratory Protection:
NIOSH/MSHA APPROVED RESPIRATOR APPROPRIATE FOR EXPOSURE OF CONCERN (FP N).
Ventilation:
LOCAL EXHAUST ADEQUATE.
Protective Gloves:
IMPERVIOUS GLOVES.
Eye Protection: SAFETY GOGGLES.
Other Protective Equipment: EYEBATH AND/OR SAFETY SHOWER.
Work Hygenic Practices: NONE SPECIFIED BY MANUFACTURER.
Supplemental Health & Safety Information: EXPLO HAZ:HYDROGEN FLUORIDE, CARBONYL FLUORIDE, CARBON MONOXIDE AND LOW MW FLUOROCARBONS.

Section 9 - Physical & Chemical Properties
POLY (TETRAFLUOROETHYLENE), 203

HCC: N1
NRC/State License Number:
Net Property Weight for Ammo:
Boiling Point: Boiling Point Text: N/A
Melting/Freezing Point: Melting/Freezing Text: 648F,342C
Decomposition Point: Decomposition Text: N/A
Vapor Pressure: N/A **Vapor Density:** N/A
Percent Volatile Organic Content:
Specific Gravity: 2.1-2.3
Volatile Organic Content Pounds per Gallon:
pH: N/A
Volatile Organic Content Grams per Liter:

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Viscosity: N/P
Evaporation Weight and Reference: NOT APPLICABLE
Solubility in Water: NEGLIGIBLE
Appearance and Odor: WHITE GRANULES; ODORLESS
Percent Volatiles by Volume: N/A
Corrosion Rate: N/K

Section 10 - Stability & Reactivity Data
POLY (TETRAFLUOROETHYLENE), 203

Stability Indicator: YES
Materials to Avoid:
NOT APPLICABLE
Stability Condition to Avoid:
NOT APPLICABLE
Hazardous Decomposition Products:
HYDROGEN FLUORIDE, CARBONYL FLUORIDE, CARBON MONOXIDE AND LOW MW FLUROCARBONS.
Hazardous Polymerization Indicator: NO
Conditions to Avoid Polymerization:
NOT RELEVANT.

Section 11 - Toxicological Information
POLY (TETRAFLUOROETHYLENE), 203

Toxicological Information:
N/P

Section 12 - Ecological Information
POLY (TETRAFLUOROETHYLENE), 203

Ecological Information:
N/P

Section 13 - Disposal Considerations
POLY (TETRAFLUOROETHYLENE), 203

Waste Disposal Methods:
LANDFILL IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS.

Section 14 - MSDS Transport Information
POLY (TETRAFLUOROETHYLENE), 203

Transport Information:
N/P

Section 15 - Regulatory Information
POLY (TETRAFLUOROETHYLENE), 203

SARA Title III Information:
N/P
Federal Regulatory Information:

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N/P
State Regulatory Information:
N/P

Section 16 - Other Information
POLY (TETRAFLUOROETHYLENE), 203

Other Information:
N/P

HAZCOM Label Information

Product Identification: POLY (TETRAFLUOROETHYLENE), 203
CAGE: 0MWG0
Assigned Individual: N
Company Name: SCIENTIFIC POLYMER PRODUCTS INC
Company PO Box:
Company Street Address1: 6265 DEAN PARKWAY
Company Street Address2: ONTARIO, NY 14519 US
Health Emergency Telephone: 716-265-0413
Label Required Indicator: Y
Date Label Reviewed: 01/13/1994
Status Code: C
Manufacturer's Label Number:
Date of Label: 01/13/1994
Year Procured: N/K
Organization Code: G
Chronic Hazard Indicator: N
Eye Protection Indicator: YES
Skin Protection Indicator: YES
Respiratory Protection Indicator: YES
Signal Word: CAUTION
Health Hazard: Slight
Contact Hazard: Slight
Fire Hazard: None
Reactivity Hazard: None

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Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format) For Cornell University Convenience Only

THALLIUM, 100058-1

Section 1 - Product and Company Identification	Section 9 - Physical & Chemical Properties
Section 2 - Compositon/Information on Ingredients	Section 10 - Stability & Reactivity Data
Section 3 - Hazards Identification Including Emergency Overview	Section 11 - Toxicological Information
Section 4 - First Aid Measures	Section 12 - Ecological Information
Section 5 - Fire Fighting Measures	Section 13 - Disposal Considerations
Section 6 - Accidental Release Measures	Section 14 - MSDS Transport Information
Section 7 - Handling and Storage	Section 15 - Regulatory Information
Section 8 - Exposure Controls & Personal Protection	Section 16 - Other Information

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Section 1 - Product and Company Identification
THALLIUM, 100058-1

Product Identification: THALLIUM, 100058-1
Date of MSDS: 02/05/1996 **Technical Review Date:** 08/28/1996
FSC: 6810 **NIIN: LIIN:** 00N072343
Submitter: N EN
Status Code: C
MFN: 01
Article: N
Kit Part: N

00064974

Manufacturer's Information

Manufacturer's Name: HIGH-PURITY STANDARDS
Post Office Box: 80609
Manufacturer's Address1:
Manufacturer's Address2: CHARLESTON, SC 29415-0609
Manufacturer's Country: US
General Information Telephone: 803-556-3411
Emergency Telephone: 803-556-3411
Emergency Telephone: 803-556-3411
MSDS Preparer's Name: N/P
Proprietary: N
Reviewed: N
Published: Y
CAGE: 0YZE5
Special Project Code: N

Contractor Information

Contractor's Name: HIGH-PURITY STANDARDS INC
Post Office Box: 30180
Contractor's Address1: 2040 SAVAGE RD
Contractor's Address2: CHARLESTON, SC 29417
Contractor's Telephone: 803-556-3411
Contractor's CAGE: 0YZE5

Section 2 - Compositon/Information on Ingredients
THALLIUM, 100058-1

Ingredient Name: NITRIC ACID; (HNO*3)
Ingredient CAS Number: 7697-37-2 **Ingredient CAS Code:** M
RTECS Number: QU5775000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: 2
% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: 2 PPM **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: 2 PPM/4 STEL **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity: 1000 LBS
DOT Reporting Quantity: 1000 LBS

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Ozone Depleting Chemical: N

Ingredient Name: THALLIUM (SARA 313) (CERCLA)
Ingredient CAS Number: 7440-28-0 **Ingredient CAS Code:** M
RTECS Number: XG3425000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: 0.1
% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: S, 0.1 MG/M3 **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: S, 0.1 MG/M3 **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity: 1000 LBS
DOT Reporting Quantity: 1000 LBS
Ozone Depleting Chemical: N

Section 3 - Hazards Identification, Including Emergency Overview
THALLIUM, 100058-1

Health Hazards Acute & Chronic: ACUTE:LIQUID MAY CAUSE BURNS TO SKIN AND EYES. CHRONIC:NONE LISTED BY MANUFACTURER.

Signs & Symptoms of Overexposure:
SEE HEALTH HAZARDS.

Medical Conditions Aggravated by Exposure:
NONE IDENTIFIED.

LD50 LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.

Route of Entry Indicators:
- **Inhalation:** YES
- **Skin:** YES
- **Ingestion:** NO

Carcenogenicity Indicators
- **NTP:** NO
- **IARC:** NO
- **OSHA:** NO

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Carcinogenicity Explanation: NOT RELEVANT.

Section 4 - First Aid Measures
THALLIUM, 100058-1

First Aid:
INHAL:REMOVE TO FRESH AIR. SUPPORT BREATHING (GIVE O*2/ARTF RESP) (FP N). INGEST:CALL A PHYSICIAN. IF SWALLOWED, DO NOT INDUCE VOMITING, IF CONSCIOUS GIVE WATER, MILK. EYES:FLUSH WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES. SKIN:FLUSH WITH PLENTY OF WATER.

Section 5 - Fire Fighting Measures
THALLIUM, 100058-1

Fire Fighting Procedures:
USE NIOSH APPROVED SCBA & FULL PROTECTIVE EQUIPMENT (FP N).
Unusual Fire or Explosion Hazard:
TOXIC GASES PRODUCED:NO, NO*2.
Extinguishing Media:
USE APPROPRIATE.
Flash Point: Flash Point Text: N/A

Autoignition Temperature:
Autoignition Temperature Text: N/A
Lower Limit(s): N/A
Upper Limit(s): N/A

Section 6 - Accidental Release Measures
THALLIUM, 100058-1

Spill Release Procedures:
REMOVE SOURCE OF IGNITION IF HYDROGEN IS A HAZARD. PROVIDE OPTIMUM VENTILATION. FLUSH TO HOLDING AREA FOR NEUTRALIZATION.

Section 7 - Handling and Storage
THALLIUM, 100058-1

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
THALLIUM, 100058-1

Repiratory Protection:
NIOSH APPROVED RESPIRATOR.
Ventilation:
LOCAL EXHAUST.
Protective Gloves:
IMPERVIOUS GLOVES (FP N).

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Eye Protection: ANSI APPRVD CHEM WORKERS GOGGS (SUPDAT)
Other Protective Equipment: LAB COAT/APRON; VENT HOOD. ANSI APPRVD EMERGENCY EYE WASH & DELUGE SHOWER (FP N).
Work Hygenic Practices: NONE SPECIFIED BY MANUFACTURER.
Supplemental Health & Safety Information: EYE PROT:& FULL LENGTH FACESHIELD (FP N).

Section 9 - Physical & Chemical Properties
THALLIUM, 100058-1

HCC:
NRC/State License Number:
Net Property Weight for Ammo:
Boiling Point: Boiling Point Text: 212F,100C
Melting/Freezing Point: Melting/Freezing Text: N/A
Decomposition Point: Decomposition Text: N/K
Vapor Pressure: N/A **Vapor Density:** N/A
Percent Volatile Organic Content:
Specific Gravity: 1.0122 (H*2O=1)
Volatile Organic Content Pounds per Gallon:
pH: N/K
Volatile Organic Content Grams per Liter:
Viscosity: N/P
Evaporation Weight and Reference: NOT KNOWN
Solubility in Water: COMPLETE
Appearance and Odor: CLEAR, COLORLESS ODORLESS SOLUTION.
Percent Volatiles by Volume: N/K
Corrosion Rate: N/K

Section 10 - Stability & Reactivity Data
THALLIUM, 100058-1

Stability Indicator: YES
Materials to Avoid:
STRONG REDUCING AGENTS.
Stability Condition to Avoid:
METALS, HYDROXIDES, CARBONATES, CYANIDES.
Hazardous Decomposition Products:
NO, NO*2 GAS.
Hazardous Polymerization Indicator: NO
Conditions to Avoid Polymerization:
NOT RELEVANT.

Section 11 - Toxicological Information
THALLIUM, 100058-1

Toxicological Information:
N/P

Section 12 - Ecological Information
THALLIUM, 100058-1

Ecological Information:

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N/P

Section 13 - Disposal Considerations
THALLIUM, 100058-1

Waste Disposal Methods:
FOLLOW FEDERAL, STATE AND LOCAL REGULATIONS FOR ACID WASTE. EPA HAZARDOUS WASTE #P113.

Section 14 - MSDS Transport Information
THALLIUM, 100058-1

Transport Information:
N/P

Section 15 - Regulatory Information
THALLIUM, 100058-1

SARA Title III Information:
N/P
Federal Regulatory Information:
N/P
State Regulatory Information:
N/P

Section 16 - Other Information
THALLIUM, 100058-1

Other Information:
N/P

HAZCOM Label Information

Product Identification: THALLIUM, 100058-1
CAGE: 0YZE5
Assigned Individual: N
Company Name: HIGH-PURITY STANDARDS INC
Company PO Box: 30180
Company Street Address1: 2040 SAVAGE RD
Company Street Address2: CHARLESTON, SC 29417 US
Health Emergency Telephone: 803-556-3411
Label Required Indicator: Y
Date Label Reviewed: 08/28/1996
Status Code: C
Manufacturer's Label Number:
Date of Label: 08/28/1996
Year Procured: N/K
Organization Code: G
Chronic Hazard Indicator: N
Eye Protection Indicator: YES
Skin Protection Indicator: YES
Respiratory Protection Indicator: YES
Signal Word: DANGER
Health Hazard: Slight

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Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format)
For Cornell University Convenience Only

TOLUENE

Section 1 - Product and Company Identification	Section 9 - Physical & Chemical Properties
Section 2 - Compositon/Information on Ingredients	Section 10 - Stability & Reactivity Data
Section 3 - Hazards Identification Including Emergency Overview	Section 11 - Toxicological Information
Section 4 - First Aid Measures	Section 12 - Ecological Information
Section 5 - Fire Fighting Measures	Section 13 - Disposal Considerations
Section 6 - Accidental Release Measures	Section 14 - MSDS Transport Information
Section 7 - Handling and Storage	Section 15 - Regulatory Information
Section 8 - Exposure Controls & Personal Protection	Section 16 - Other Information

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Section 1 - Product and Company Identification
TOLUENE

Product Identification: TOLUENE
Date of MSDS: 01/01/1987 **Technical Review Date:** 07/06/1988
FSC: 8010 **NIIN:** **LIIN:** 00F006676
Submitter: F BT
Status Code: C
MFN: 01
Article: N
Kit Part: N

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Manufacturer's Information

Manufacturer's Name: SHERWIN-WILLIAMS/CLEVELAND, OH 44115
Manufacturer's Address1:
Manufacturer's Address2: N/P, NK 00000
Manufacturer's Country: NK
General Information Telephone:
Emergency Telephone: (216) 556-2917
Emergency Telephone: (216) 556-2917
MSDS Preparer's Name: N/P
Proprietary: N
Reviewed: Y
Published: Y
CAGE: 54636
Special Project Code: N

Contractor Information

Contractor's Name: SHERWIN-WILLIAMS CO THE
Contractor's Address1: 101 PROSPECT AVE NW
Contractor's Address2: CLEVELAND, OH 44115-1042
Contractor's Telephone: 216-566-2902/216-566-2917
Contractor's CAGE: 54636

Section 2 - Compositon/Information on Ingredients
TOLUENE

Ingredient Name: TOLUENE (SARA III)
Ingredient CAS Number: 108-88-3 **Ingredient CAS Code:** M
RTECS Number: XS5250000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: 100%
% Enviromental Weight:
Other REC Limits: N/P
OSHA PEL: 200 PPM/150 STEL **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: 50 PPM; 9293 **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity: 1000 LBS
DOT Reporting Quantity: 1000 LBS
Ozone Depleting Chemical: N

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Section 3 - Hazards Identification, Including Emergency Overview
TOLUENE

Health Hazards Acute & Chronic: N/P

Signs & Symptoms of Overexposure:
EYES, SKIN/RESPIRATORY IRRITATION/HEADACHE/DIZZINESS/NAUSEA/STAGGERING GAIT/UNCONSCIOUSNESS/DEATH.

Medical Conditions Aggravated by Exposure:
N/P

LD50 LC50 Mixture: N/P

Route of Entry Indicators:
Inhalation: N/P
Skin: N/P
Ingestion: N/P

Carcenogenicity Indicators
NTP: N/P
IARC: N/P
OSHA: N/P

Carcinogenicity Explanation: N/P

Section 4 - First Aid Measures
TOLUENE

First Aid:
INHALATION: REMOVE FROM EXPOSURE. SKIN: WASH W/SOAP & WATER. REMOVE CONTAMINATED CLOTHING/LAUNDER BEFORE RE-USE. EYES: FLUSH W/WATER FOR 15 MINUTES. INGESTION: NEVER GIVE ANYTHING IF UNCONSCIOUS. DON' T INDUCE VOMITING. GIVE WATER. SEEK MEDATT.

Section 5 - Fire Fighting Measures
TOLUENE

Fire Fighting Procedures:
FULL PROTECTIVE EQUIPMENT SCBA. WATER FOG COOL CONTAINERS.
Unusual Fire or Explosion Hazard:
WATER COOL CLOSED CONTAINERS TO PREVENT PRESSURE BUILDUP/AUTOIGNITION/EXPLOSION WHEN EXPOSED TO HEAT
Extinguishing Media:
CO2, DRY CHEMICAL, FOAM
Flash Point: Flash Point Text: 40F TCC

Autoignition Temperature:
Autoignition Temperature Text: N/A
Lower Limit(s): 1.0%

Upper Limit(s): N/K

Section 6 - Accidental Release Measures
TOLUENE

Spill Release Procedures:
REMOVE ALL SOURCES OF IGNITION. VENTILATE AND REMOVE WITH INERT ABSORBENT.

Section 7 - Handling and Storage
TOLUENE

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
TOLUENE

Repiratory Protection:
WEAR RESPIRATORY DEVICE APPROVED BY NIOSH/MSHA AS NEEDED.
Ventilation:
PROVIDE LOCAL EXHAUST VENTILATION TO KEEP **Protective Gloves:**
RECOMMENDED
Eye Protection: WEAR SAFETY SPECTACLES
Other Protective Equipment: N/K
Work Hygenic Practices: N/P
Supplemental Health & Safety Information: MSDS DATE: 10/29/86. WT/GAL: 7.18

Section 9 - Physical & Chemical Properties
TOLUENE

HCC:
NRC/State License Number:
Net Property Weight for Ammo:
Boiling Point: Boiling Point Text: 222-238F
Melting/Freezing Point: Melting/Freezing Text: N/A
Decomposition Point: Decomposition Text: N/A
Vapor Pressure: N/K **Vapor Density:** >AIR
Percent Volatile Organic Content:
Specific Gravity: N/K
Volatile Organic Content Pounds per Gallon:
pH: N/P
Volatile Organic Content Grams per Liter:
Viscosity: N/P
Evaporation Weight and Reference: SLOWER THAN ETHER
Solubility in Water: N/K
Appearance and Odor: N/K
Percent Volatiles by Volume: 100%
Corrosion Rate: N/P

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Section 10 - Stability & Reactivity Data
TOLUENE

Stability Indicator: YES
Materials to Avoid:
N/K
Stability Condition to Avoid:
HEAT, SPARKS, OPEN FLAME, HOT SURFACES.
Hazardous Decomposition Products:
CO2, CO
Hazardous Polymerization Indicator: NO
Conditions to Avoid Polymerization:
N/K

Section 11 - Toxicological Information
TOLUENE

Toxicological Information:
N/P

Section 12 - Ecological Information
TOLUENE

Ecological Information:
N/P

Section 13 - Disposal Considerations
TOLUENE

Waste Disposal Methods:
INCINERATE IN APPROVED FACILITY. DO NOT INCINERATE CLOSED CONTAINER. DISPOSE OF IN ACCORDANCE WITH FEDERAL, STATE, & LOCAL REGULATIONS REGARDING POLLUTION. WASTE MAY BE HAZARDOUS AS DEFINED UNDDER RCR A AND TESTED FOR IGNITABILITY.

Section 14 - MSDS Transport Information
TOLUENE

Transport Information:
N/P

Section 15 - Regulatory Information
TOLUENE

SARA Title III Information:
N/P
Federal Regulatory Information:
N/P
State Regulatory Information:
N/P

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Section 16 - Other Information
TOLUENE

Other Information:
N/P

HAZCOM Label Information

Product Identification: TOLUENE
CAGE: 54636
Assigned Individual: N
Company Name: SHERWIN-WILLIAMS CO THE
Company PO Box:
Company Street Address1: 101 PROSPECT AVE NW
Company Street Address2: CLEVELAND, OH 44115-1042 US
Health Emergency Telephone: (216) 556-2917
Label Required Indicator: Y
Date Label Reviewed: 12/16/1998
Status Code: C
Manufacturer's Label Number:
Date of Label: 12/16/1998
Year Procured: N/K
Organization Code: G
Chronic Hazard Indicator: N/P
Eye Protection Indicator: N/P
Skin Protection Indicator: N/P
Respiratory Protection Indicator: N/P
Signal Word: N/P
Health Hazard:
Contact Hazard:
Fire Hazard:
Reactivity Hazard:

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Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format)
For Cornell University Convenience Only

TRICHLOROETHYLENE

Section 1 - Product and Company Identification	Section 9 - Physical & Chemical Properties
Section 2 - Compositon/Information on Ingredients	Section 10 - Stability & Reactivity Data
Section 3 - Hazards Identification Including Emergency Overview	Section 11 - Toxicological Information
Section 4 - First Aid Measures	Section 12 - Ecological Information
Section 5 - Fire Fighting Measures	Section 13 - Disposal Considerations
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Section 1 - Product and Company Identification
TRICHLOROETHYLENE

Product Identification: TRICHLOROETHYLENE
Date of MSDS: 01/01/1985 **Technical Review Date:** 01/10/1983
FSC: 6810 **NIIN:** 00-285-4318
Submitter: D DG
Status Code: C
MFN: 01
Article: N
Kit Part: N

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Manufacturer's Information

Manufacturer's Name: J.T.BAKER CHEM. CO,CHEM COMMOD AGY,INC-DIST
Manufacturer's Address1: 222 RED SCHOOL LANE
Manufacturer's Address2: PHILLIPSBURG, NJ 08865-2219
Manufacturer's Country: US
General Information Telephone: 201-859-2151
Emergency Telephone: 201-859-2151
Emergency Telephone: 201-859-2151
MSDS Preparer's Name: N/P
Proprietary: N
Reviewed: Y
Published: Y
CAGE: KO749
Special Project Code: N

Item Description

Item Name: TRICHLOROETHYLENE,ACS
Item Manager: S9G
Specification Number: O-C-265
Type/Grade/Class: NK
Unit of Issue: GL
Unit of Issue Quantity: 6
Type of Container: BOTTLE

Contractor Information

Contractor's Name: J.T.BAKER CHEM. (CHEM COMMODITIES-DIST)
Contractor's Address1: 222 RED SCHOOL LANE
Contractor's Address2: PHILLIPSBURG, NJ 08865-2219
Contractor's Telephone: 201-859-2151
Contractor's CAGE: KO749

Contractor Information

Contractor's Name: MALLINCKRODT BAKER, INC. (FORMERLY J.T. BAKER INC)
Contractor's Address1: 222 RED SCHOOL LANE
Contractor's Address2: PHILLIPSBURG, NJ 08865-2219
Contractor's Telephone: 800-582-2537
Contractor's CAGE: 70829

Section 2 - Compositon/Information on Ingredients
TRICHLOROETHYLENE

Ingredient Name: TRICHLOROETHYLENE (SARA III)
Ingredient CAS Number: 79-01-6 **Ingredient CAS Code:** M
RTECS Number: KX4550000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:

>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: 100
% Enviromental Weight:
Other REC Limits: N/P
OSHA PEL: 100 PPM/100 STEL **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: 50 PPM/100,A5STEL;93 **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity: 100 LBS
DOT Reporting Quantity: 100 LBS
Ozone Depleting Chemical: N

Section 3 - Hazards Identification, Including Emergency Overview
TRICHLOROETHYLENE

Health Hazards Acute & Chronic: N/P

Signs & Symptoms of Overexposure:
VAPOR HARMFUL,DIZZY,DROWSY,HIGH CONCENTRATIONS OF HALOCARBONS CAN CAUSE ASPHYXIATION,EVEN DEATH

Medical Conditions Aggravated by Exposure:
N/P

LD50 LC50 Mixture: N/P

Route of Entry Indicators:
Inhalation: N/P
Skin: N/P
Ingestion: N/P

Carcenogenicity Indicators
NTP: N/P
IARC: N/P
OSHA: N/P

Carcinogenicity Explanation: N/P

Section 4 - First Aid Measures
TRICHLOROETHYLENE

First Aid:
INHALED:REMOVE TO FRESH AIR.GIVE CPR/OXYGEN IF NECESSARY.KEEP PATIENT WARM & QUIET.MAINTAIN NORMAL BODY TEMP.EYE CONTACT:FLUSH WITH WATER 15

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MIN.SKIN:FLUSH W.WATER.REMOVE CONTAMINATED CLOTHES.SAFEST T O DESTROY LEATHER THAT IS CONTAMINATED.

Section 5 - Fire Fighting Measures
TRICHLOROETHYLENE

Fire Fighting Procedures:
WEAR SELF-CNTND BRTHG APP IN FIRE.COOL CONTAINERS WITH WATER
Unusual Fire or Explosion Hazard:
HYDROGEN CHLORIDE-GAS,PHOSGENE,OTHER TOXIC CPDS MAY BE GENERATED IF INVOLVED IN FIRE.
Extinguishing Media:
PRESENC IN FIRE DOES NOT HINDER USE OF ANY ST ANDARD MEDIUM.
Flash Point: Flash Point Text: N/A

Autoignition Temperature:
Autoignition Temperature Text: N/A
Lower Limit(s): N/A
Upper Limit(s): N/A

Section 6 - Accidental Release Measures
TRICHLOROETHYLENE

Spill Release Procedures:
DIKE LARGE SPILLS FOR LATER DISPOSAL.SMALL SPILLS.RECOVER OR ABSORB & RECOVER INTO WASTE CONTAINERS.FLUSH RESIDUES WITH WATER.DO NOT FLUSH TO SEWERS OR WATER WAYS.

Section 7 - Handling and Storage
TRICHLOROETHYLENE

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
TRICHLOROETHYLENE

Repiratory Protection:
NONE REQUIRED WITH ADEQUATE VENTILATION.
Ventilation:
MECHNICAL ADEQUATE TO MAINTAIN EXPOSURE BELOW TLV.
Protective Gloves:
RUBBER
Eye Protection: CHEM SAFETY GOGGLES.
Other Protective Equipment: N/P
Work Hygenic Practices: N/P
Supplemental Health & Safety Information: N/P

Section 9 - Physical & Chemical Properties

TRICHLOROETHYLENE

HCC: T4
NRC/State License Number:
Net Property Weight for Ammo:
Boiling Point: Boiling Point Text: 187-189F
Melting/Freezing Point: Melting/Freezing Text: N/A
Decomposition Point: Decomposition Text: N/A
Vapor Pressure: N/A **Vapor Density:** 4.5
Percent Volatile Organic Content:
Specific Gravity: 1.46
Volatile Organic Content Pounds per Gallon:
pH: N/P
Volatile Organic Content Grams per Liter:
Viscosity: N/P
Evaporation Weight and Reference: 0.001 MAX
Solubility in Water: NEGLIGIBLE
Appearance and Odor: COLORLESS,CHLOROFORM-LIKE ODOR.
Percent Volatiles by Volume: N/A
Corrosion Rate: N/P

Section 10 - Stability & Reactivity Data
TRICHLOROETHYLENE

Stability Indicator: YES
Materials to Avoid:
AVOID STRONG OXIDIZERS
Stability Condition to Avoid:
N/P
Hazardous Decomposition Products:
HYDROGEN CHLORIDE,PHOSGENE,OTHER HIGHLY TOXIC COMPOUNDS.
Hazardous Polymerization Indicator: NO
Conditions to Avoid Polymerization:
N/P

Section 11 - Toxicological Information
TRICHLOROETHYLENE

Toxicological Information:
N/P

Section 12 - Ecological Information
TRICHLOROETHYLENE

Ecological Information:
N/P

Section 13 - Disposal Considerations
TRICHLOROETHYLENE

Waste Disposal Methods:
DISPOSAL IN ACCORDANCE WITH FEDERAL,STATE AND LOCAL REGULATIONS.

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Section 14 - MSDS Transport Information
TRICHLOROETHYLENE

Transport Information:
N/P

Section 15 - Regulatory Information
TRICHLOROETHYLENE

SARA Title III Information:
N/P
Federal Regulatory Information:
N/P
State Regulatory Information:
N/P

Section 16 - Other Information
TRICHLOROETHYLENE

Other Information:
N/P

HMIS Transportation Information

Product Identification: TRICHLOROETHYLENE
Transporation ID Number: 66350
Responsible Party CAGE: KO749
Date MSDS Prepared: 01/01/1985
Date MSDS Reviewed: 07/31/1991
MFN: 07/31/1991
Submitter: D DG
Status Code: C

Container Information
- **Unit of Issue:** GL
- **Container Quantity:** 6
- **Type of Container:** BOTTLE
- **Net Unit Weight:**

Article without MSDS: N
Technical Entry NOS Shipping Number:
Radioactivity:
Form:
Net Explosive Weight:
Coast Guard Ammunition Code:
Magnetism: N/P
AF MMAC Code:
DOD Exemption Number:
Limited Quantity Indicator:
Multiple Kit Number: 0
Kit Indicator: N
Kit Part Indicator: N

Review Indicator: Y
Additional Data:

Department of Transportation Information

DOT Proper Shipping Name: TRICHLOROETHYLENE
DOT PSN Code: OQK
Symbols:
DOT PSN Modifier:
Hazard Class: 6.1
UN ID Number: UN1710
DOT Packaging Group: III
Label: KEEP AWAY FROM FOOD
Special Provision(s): N36,T1
Packaging Exception: 153
Non Bulk Packaging: 203
Bulk Packaging: 241
Maximimum Quanity in Passenger Area: 60 L
Maximimum Quanity in Cargo Area: 220 L
Stow in Vessel Requirements: A
Requirements Water/Sp/Other: 40

IMO Detail Information

IMO Proper Shipping Name: TRICHLOROETHYLENE
IMO PSN Code: OVL
IMO PSN Modifier: P
IMDG Page Number: 6273
UN Number: 1710
UN Hazard Class: 6.1
IMO Packaging Group: III
Subsidiary Risk Label: -
EMS Number: 6.1-02
Medical First Aid Guide Number: 340

IATA Detail Information

IATA Proper Shipping Name: TRICHLOROETHYLENE
IATA PSN Code: YMD
IATA PSN Modifier:
IATA UN Id Number: 1710
IATA UN Class: 6.1
Subsidiary Risk Class:
UN Packaging Group: III
IATA Label: TOXIC
Packaging Note for Passengers: 605
Maximum Quantity for Passengers: 60L
Packaging Note for Cargo: 612
Maximum Quantity for Cargo: 220L
Exceptions:

AFI Detail Information

AFI Proper Shipping Name: TRICHLOROETHYLENE
AFI Symbols:
AFI PSN Code: YMD
AFI PSN Modifier:

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AFI UN Id Number: UN1710
AFI Hazard Class: 6.1
AFI Packing Group: III
AFI Label:
Special Provisions: P5, N36
Back Pack Reference: A10.5

HAZCOM Label Information

Product Identification: TRICHLOROETHYLENE
CAGE: KO749
Assigned Individual: Y
Company Name: J.T.BAKER CHEM. (CHEM COMMODITIES-DIST)
Company PO Box:
Company Street Address1: 222 RED SCHOOL LANE
Company Street Address2: PHILLIPSBURG, NJ 08865-2219 US
Health Emergency Telephone: 201-859-2151
Label Required Indicator: Y
Date Label Reviewed: 12/16/1998
Status Code: C
Manufacturer's Label Number:
Date of Label: 12/16/1998
Year Procured: N/K
Organization Code: F
Chronic Hazard Indicator: N/P
Eye Protection Indicator: N/P
Skin Protection Indicator: N/P
Respiratory Protection Indicator: N/P
Signal Word: N/P
Health Hazard:
Contact Hazard:
Fire Hazard:
Reactivity Hazard:

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Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format)
For Cornell University Convenience Only

TRIETHYLENETETRAMINE

Section 1 - Product and Company Identification	Section 9 - Physical & Chemical Properties
Section 2 - Compositon/Information on Ingredients	Section 10 - Stability & Reactivity Data
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Section 1 - Product and Company Identification
TRIETHYLENETETRAMINE

Product Identification: TRIETHYLENETETRAMINE
Date of MSDS: 01/01/1985 **Technical Review Date:** 04/05/1979
FSC: 6810 **NIIN:** 00-476-3470
Submitter: D DG
Status Code: C
MFN: 01
Article: N
Kit Part: N

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Manufacturer's Information

Manufacturer's Name: CHEMICAL COMMODITIES(DIST) UNION CARBIDE CORP,(MFR
Manufacturer's Address1: 27447 PACIFIC STREET
Manufacturer's Address2: HIGHLAND, CA 92346-2640
Manufacturer's Country: US
General Information Telephone: 714-864-2310
Emergency Telephone: 714-864-2310
Emergency Telephone: 714-864-2310
MSDS Preparer's Name: N/P
Proprietary: N
Reviewed: Y
Published: Y
CAGE: 60777
Special Project Code: N

Item Description

Item Name: CURING AGENT
Item Manager: NK
Specification Number: NK
Type/Grade/Class: NK
Unit of Issue: BT **Quantitative Expression:** NK
Unit of Issue Quantity: 1 PT
Type of Container:

Contractor Information

Contractor's Name: CHEMICAL COMMODITIES AGENCY, INC.
Contractor's Address1: 27447 PACIFIC STREET
Contractor's Address2: HIGHLAND, CA 92346-2640
Contractor's Telephone: 909-864-2310
Contractor's CAGE: 60777

Section 2 - Compositon/Information on Ingredients
TRIETHYLENETETRAMINE

Ingredient Name: TRIETHYLENETETRAMINE(TETA)
Ingredient CAS Number: 112-24-3 **Ingredient CAS Code:** M
RTECS Number: YE6650000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: 100

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% Enviromental Weight:
Other REC Limits: N/P
OSHA PEL: N/P **OSHA PEL Code:**
OSHA STEL: OSHA STEL Code:
ACGIH TLV: NONE **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity:
DOT Reporting Quantity:
Ozone Depleting Chemical: N

Section 3 - Hazards Identification, Including Emergency Overview
TRIETHYLENETETRAMINE

Health Hazards Acute & Chronic: N/P

Signs & Symptoms of Overexposure:
CAUSES SKIN & EYE BURNS.VAPORS MAY CAUSE NAUSEA & VOMITING & MAY BE IRRITATING.STRONG SENSITIZER.

Medical Conditions Aggravated by Exposure:
N/P

LD50 LC50 Mixture: N/P

Route of Entry Indicators:
Inhalation: N/P
Skin: N/P
Ingestion: N/P

Carcenogenicity Indicators
NTP: N/P
IARC: N/P
OSHA: N/P

Carcinogenicity Explanation: N/P

Section 4 - First Aid Measures
TRIETHYLENETETRAMINE

First Aid:
IMMEDIATELY FLUSH SKIN & EYE CONTACT WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES.GET MEDICAL CARE FOR EYES.IF INHALED,REMOVE TO FRESH AIR.GIVE OXYGEN IF BREATHING IS DIFFICULT.CALL A PHYSICIAN.

Section 5 - Fire Fighting Measures
TRIETHYLENETETRAMINE

Fire Fighting Procedures:
ADDITION OF LARGE VOLUMES OF WATER TO BURNING LIQUID
Unusual Fire or Explosion Hazard:

NONE
Extinguishing Media:
CARBON DIOXIDE,OR DRY CHEMICAL(SMALL FIRES),POLYMER FOAM.
Flash Point: Flash Point Text: 290F COC

Autoignition Temperature:
Autoignition Temperature Text: N/A
Lower Limit(s):
Upper Limit(s):

Section 6 - Accidental Release Measures
TRIETHYLENETETRAMINE

Spill Release Procedures:
FLUSH SPILLED MATERIAL WITH LARGE VOLUMES OF WATER.OVERSPREAD SUFFICIENT SODIUM BISULFATE & SPRINKLE WATER.DRAIN INTO APPROVED STORAGE CONTAINERS FOR CORROSIVE LIQUIDS

Section 7 - Handling and Storage
TRIETHYLENETETRAMINE

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
TRIETHYLENETETRAMINE

Repiratory Protection:
AIR SUPPLIED MASK IN CONFINED AREAS.
Ventilation:
AS REQUIRED TO CONTROL MISTS OR VAPORS IN AIR
Protective Gloves:
RUBBER
Eye Protection: MONOGOGGLES
Other Protective Equipment: SAFETY SHOWER & EYE BATH
Work Hygenic Practices: N/P
Supplemental Health & Safety Information: N/P

Section 9 - Physical & Chemical Properties
TRIETHYLENETETRAMINE

HCC: B3
NRC/State License Number:
Net Property Weight for Ammo:
Boiling Point: Boiling Point Text: 531.3F
Melting/Freezing Point: Melting/Freezing Text: N/A
Decomposition Point: Decomposition Text: N/A
Vapor Pressure: 0 **Vapor Density:** 5.0
Percent Volatile Organic Content:

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Specific Gravity: 0.9818
Volatile Organic Content Pounds per Gallon:
pH: N/P
Volatile Organic Content Grams per Liter:
Viscosity: N/P
Evaporation Weight and Reference: <0.01 BUTYL ACET.
Solubility in Water: COMPLETE
Appearance and Odor: LIGHT-STRAW COLORED LIQUID;MILDLY AMMONIACAL ODOR
Percent Volatiles by Volume: 0
Corrosion Rate: N/P

Section 10 - Stability & Reactivity Data
TRIETHYLENETETRAMINE

Stability Indicator: YES
Materials to Avoid:
ACIDS.
Stability Condition to Avoid:
FIRES
Hazardous Decomposition Products:
NITROGEN OXIDES,CARBON MONOXIDE
Hazardous Polymerization Indicator: NO
Conditions to Avoid Polymerization:
N/P

Section 11 - Toxicological Information
TRIETHYLENETETRAMINE

Toxicological Information:
N/P

Section 12 - Ecological Information
TRIETHYLENETETRAMINE

Ecological Information:
N/P

Section 13 - Disposal Considerations
TRIETHYLENETETRAMINE

Waste Disposal Methods:
INCINERATE IN A FURNACE UNDER APPROVED CONTROLLED PROCEDURES.

Section 14 - MSDS Transport Information
TRIETHYLENETETRAMINE

Transport Information:
N/P

Section 15 - Regulatory Information
TRIETHYLENETETRAMINE

SARA Title III Information:
N/P
Federal Regulatory Information:
N/P
State Regulatory Information:
N/P

Section 16 - Other Information
TRIETHYLENETETRAMINE

Other Information:
N/P

HMIS Transportation Information

Product Identification: TRIETHYLENETETRAMINE
Transporation ID Number: 73112
Responsible Party CAGE: 60777
Date MSDS Prepared: 01/01/1985
Date MSDS Reviewed: 04/05/1979
MFN: 04/05/1979
Submitter: D DG
Status Code: C

Container Information
Unit of Issue: BT
Container Quantity: 1 PT
Type of Container:
Net Unit Weight:

Article without MSDS: N
Technical Entry NOS Shipping Number:
Radioactivity:
Form:
Net Explosive Weight:
Coast Guard Ammunition Code:
Magnetism: N/P
AF MMAC Code:
DOD Exemption Number:
Limited Quantity Indicator:
Multiple Kit Number: 0
Kit Indicator: N
Kit Part Indicator: N
Review Indicator: Y
Additional Data:

Department of Transportation Information

DOT Proper Shipping Name: TRIETHYLENETETRAMINE
DOT PSN Code: OSE
Symbols:
DOT PSN Modifier:
Hazard Class: 8

00064999

UN ID Number: UN2259
DOT Packaging Group: II
Label: CORROSIVE
Special Provision(s): B2,T8
Packaging Exception: 154
Non Bulk Packaging: 202
Bulk Packaging: 242
Maximimum Quanity in Passenger Area: 1 L
Maximimum Quanity in Cargo Area: 30 L
Stow in Vessel Requirements: B
Requirements Water/Sp/Other: 40

IMO Detail Information

IMO Proper Shipping Name: CORROSIVE LIQUID, N.O.S. o
IMO PSN Code: ESH
IMO PSN Modifier:
IMDG Page Number: 8147
UN Number: 1760
UN Hazard Class: 8
IMO Packaging Group: I/II/III
Subsidiary Risk Label: -
EMS Number: 8-15
Medical First Aid Guide Number: 760

IATA Detail Information

IATA Proper Shipping Name: TRIETHYLENETETRAMINE
IATA PSN Code: YNW
IATA PSN Modifier:
IATA UN Id Number: 2259
IATA UN Class: 8
Subsidiary Risk Class:
UN Packaging Group: II
IATA Label: CORROSIVE
Packaging Note for Passengers: 808
Maximum Quantity for Passengers: 1L
Packaging Note for Cargo: 812
Maximum Quantity for Cargo: 30L
Exceptions:

AFI Detail Information

AFI Proper Shipping Name: TRIETHYLENETETRAMINE
AFI Symbols:
AFI PSN Code: YNW
AFI PSN Modifier:
AFI UN Id Number: UN2259
AFI Hazard Class: 8
AFI Packing Group: II
AFI Label:
Special Provisions: P5
Back Pack Reference: A12.3

HAZCOM Label Information

Product Identification: TRIETHYLENETETRAMINE
CAGE: 60777
Assigned Individual: N

00065000

Company Name: CHEMICAL COMMODITIES AGENCY, INC.
Company PO Box:
Company Street Address1: 27447 PACIFIC STREET
Company Street Address2: HIGHLAND, CA 92346-2640 US
Health Emergency Telephone: 714-864-2310
Label Required Indicator: Y
Date Label Reviewed: 12/16/1998
Status Code: C
Manufacturer's Label Number:
Date of Label: 12/16/1998
Year Procured: N/K
Organization Code: F
Chronic Hazard Indicator: N/P
Eye Protection Indicator: N/P
Skin Protection Indicator: N/P
Respiratory Protection Indicator: N/P
Signal Word: N/P
Health Hazard:
Contact Hazard:
Fire Hazard:
Reactivity Hazard:

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Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format)
For Cornell University Convenience Only

TUNGSTEN, 8090-11XX

Section 1 - Product and Company Identification	Section 9 - Physical & Chemical Properties
Section 2 - Compositon/Information on Ingredients	Section 10 - Stability & Reactivity Data
Section 3 - Hazards Identification Including Emergency Overview	Section 11 - Toxicological Information
Section 4 - First Aid Measures	Section 12 - Ecological Information
Section 5 - Fire Fighting Measures	Section 13 - Disposal Considerations
Section 6 - Accidental Release Measures	Section 14 - MSDS Transport Information
Section 7 - Handling and Storage	Section 15 - Regulatory Information
Section 8 - Exposure Controls & Personal Protection	Section 16 - Other Information

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Section 1 - Product and Company Identification
TUNGSTEN, 8090-11XX

Product Identification: TUNGSTEN, 8090-11XX
Date of MSDS: 10/01/1997 **Technical Review Date:** 06/10/1998
FSC: 3439 **NIIN:** **LIIN:** 00N086596
Submitter: N EN
Status Code: C
MFN: 01
Article: N
Kit Part: N

Manufacturer's Information

Manufacturer's Name: OSRAM SYLVANIA INC
Manufacturer's Address1: HAWES ST
Manufacturer's Address2: TONAWANDA, PA 18848
Manufacturer's Country: US
General Information Telephone: 316-946-8308
Emergency Telephone: 717-265-2121
Emergency Telephone: 717-265-2121
MSDS Preparer's Name: DENNIS WILSON
Proprietary: N
Reviewed: N
Published: Y
CAGE: FO606
Special Project Code: N

Preparer Information

Preparer's Name: OSRAM SYLVANIA INC OFFICE HEADQUARTERS
Post Office Box: N/K
Preparer's Address1: 100 ENDICOTT ST
Preparer's Address2: DANVERS, MA 01923-3754
Preparer's CAGE: FO606
Assigned Individual: Y

Contractor Information

Contractor's Name: GTE PRODUCTS CORP PRECISION MATERIALS PRODUCTS
Post Office Box: 70
Contractor's Address1: UNKNOWN
Contractor's Address2: TOWANDA, PA 18848-0070
Contractor's Telephone: 717-265-2121
Contractor's CAGE: 98251

Contractor Information

Contractor's Name: OSRAM SYLVANIA INC OFFICE HEADQUARTERS
Post Office Box: N/K
Contractor's Address1: 100 ENDICOTT ST
Contractor's Address2: DANVERS, MA 01923-3754
Contractor's Telephone: 508-777-1900
Contractor's CAGE: FO606

Section 2 - Compositon/Information on Ingredients
TUNGSTEN, 8090-11XX

Ingredient Name: TUNGSTEN
Ingredient CAS Number: 7440-33-7 **Ingredient CAS Code:** M
RTECS Number: YO7175000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:

>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: 100
% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: N/K (FP N) **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: 1 MG/M3; 3 STEL **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity:
DOT Reporting Quantity:
Ozone Depleting Chemical: N

Section 3 - Hazards Identification, Including Emergency Overview
TUNGSTEN, 8090-11XX

Health Hazards Acute & Chronic: MOST STUDIES HAVE FOUND TUNGSTEN TO BE TOXICOLOGICALLY INERT. INHALATION OF FUMES GENERATED DURING WELDING: BREATHING DIFFICULTY, HEADACHE, NAUSEA, DRYNESS OR IRRITATION OF NOSE, THROAT, EYES. BURNING SENSATION OF SKIN OR EYES. UNCONSCIOUSNESS.

Signs & Symptoms of Overexposure:
SEE HEALTH HAZARDS.

Medical Conditions Aggravated by Exposure:
RESPIRATORY PROBLEMS, ERYTHMAS.

LD50 LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.

Route of Entry Indicators:
Inhalation: YES
Skin: NO
Ingestion: NO

Carcenogenicity Indicators
NTP: NO
IARC: NO
OSHA: NO

Carcinogenicity Explanation: NOT RELEVANT

Section 4 - First Aid Measures
TUNGSTEN, 8090-11XX

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First Aid:
INGEST: CALL MD IMMEDIATELY (FP N). EYES: IMMEDIATELY FLUSH W/POTABLE WATER FOR A MINIMUM OF 15 MINUTES, SEEK ASSISTANCE FROM MD (FP N). SKIN: FLUSH W/COPIOUS AMOUNTS OF WATER. CALL MD (FP N). INHAL: REMOVE TO FRESH AIR. IF BREATHING IMPAIRED, ASSISTED RESPIRATION MAY BE REQUIRED. TREAT UV EXPOSURE SIMILAR TO SEVERE SUNBURN. SEEK MEDICAL ATTENTION!

Section 5 - Fire Fighting Measures
TUNGSTEN, 8090-11XX

Fire Fighting Procedures:
USE NIOSH APPROVED SCBA AND FULL PROTECTIVE EQUIPMENT (FP N).
Unusual Fire or Explosion Hazard:
WELDING ARC AND SPARKS CAN IGNITE COMBUSTIBLE MATERIALS. REFER TO ANSI Z49.1 "SAFETY IN WELDING AND CUTTING" PUBLISHED BY THE AMERICAN WELDING SOCIETY.
Extinguishing Media:
NOT FLAMMABLE. MEDIA SUITABLE FOR SURROUNDING FIRE (FP N).
Flash Point: Flash Point Text: N/A

Autoignition Temperature:
Autoignition Temperature Text: N/A
Lower Limit(s): N/A
Upper Limit(s): N/A

Section 6 - Accidental Release Measures
TUNGSTEN, 8090-11XX

Spill Release Procedures:
NOT APPLICABLE.

Section 7 - Handling and Storage
TUNGSTEN, 8090-11XX

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
TUNGSTEN, 8090-11XX

Repiratory Protection:
USE A NIOSH APPROVED RESPIRABLE FUME RESPIRATOR WHEN WELDING IN CONFINED SPACES & WHENEVER FUME CONCENTRATIONS EXCEED APPLICABLE LIMITS FOR ZIRCONIUM, TUNGSTEN OR OTHER WELDING FUMES. ALL REQS SET FOR TH IN 29 CFR 1910.134 SHOULD BE MET.
Ventilation:
GEN &/OR LOCAL EXHAUST AT WELDING ARC RECOM. IF SUCH EQUIP IS NOT AVAIL, USE NIOSH APPRVD RESPS AS SPECIFIED (SUPDAT)
Protective Gloves:

WELDERS GLOVES.
Eye Protection: ANSI APPRVD CHEM WORKERS GOGGS (SUPDAT)
Other Protective Equipment: ANSI APPROVED EYE WASH & DELUGE SHOWER (FP N). FOOTWEAR SUITABLE FOR METAL WORKING. DARK, SUBSTANTIAL CLTHG - (SUPDAT)
Work Hygenic Practices: OPERATOR TRAINED TO AVOID ELECTRICAL SHOCK AND UV RAY EXPOSURE.
Supplemental Health & Safety Information: HAZ DECOMP PRODS: DEPENDING ON PROCESS, PROCEDURE & METAL WELDED. SOME LOSS OF ELECTRODE WILL OCCUR. VENT: ABOVE. AIR SAMPLING IF NECESSARY TO DETERMINE CORRECTIVE MEASURES. EYE PROT: & FULL LENGTH FA CESHIELD (FP N) W/PROPER FILTER LENS. OTHER PROT EQUIP: APRONS, ETC. OTHER-AS RECOMMENDED BY ANSI Z49.1.

Section 9 - Physical & Chemical Properties
TUNGSTEN, 8090-11XX

HCC:
NRC/State License Number:
Net Property Weight for Ammo:
Boiling Point: Boiling Point Text: 10701F,5927
Melting/Freezing Point: Melting/Freezing Text: 6170F,3410C
Decomposition Point: Decomposition Text: N/K
Vapor Pressure: N/A **Vapor Density:** N/A
Percent Volatile Organic Content:
Specific Gravity: 19.3
Volatile Organic Content Pounds per Gallon:
pH: N/A
Volatile Organic Content Grams per Liter:
Viscosity: N/P
Evaporation Weight and Reference: N/A
Solubility in Water: NOT SOLUBLE
Appearance and Odor: GRAY METAL CYLINDER; NO ODOR.
Percent Volatiles by Volume: N/K
Corrosion Rate: N/K

Section 10 - Stability & Reactivity Data
TUNGSTEN, 8090-11XX

Stability Indicator: YES
Materials to Avoid:
BROMINE TRIFLOURIDE, CHLORINE TRIFLUORIDE, FLUORINE, IODINE PENTAFLUORIDE.
Stability Condition to Avoid:
NOT APPLICABLE.
Hazardous Decomposition Products:
WELDING FUMES (OXIDES OF METAL BEING WELDED & GASES SUCH AS CARBON MONOXIDE, OZONE & OXIDES OF NITROGEN) (SUPDAT)
Hazardous Polymerization Indicator: NO
Conditions to Avoid Polymerization:
NOT RELEVANT

Section 11 - Toxicological Information
TUNGSTEN, 8090-11XX

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Toxicological Information:
N/P

Section 12 - Ecological Information
TUNGSTEN, 8090-11XX

Ecological Information:
N/P

Section 13 - Disposal Considerations
TUNGSTEN, 8090-11XX

Waste Disposal Methods:
DISPOSE OF IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS.

Section 14 - MSDS Transport Information
TUNGSTEN, 8090-11XX

Transport Information:
N/P

Section 15 - Regulatory Information
TUNGSTEN, 8090-11XX

SARA Title III Information:
N/P
Federal Regulatory Information:
N/P
State Regulatory Information:
N/P

Section 16 - Other Information
TUNGSTEN, 8090-11XX

Other Information:
N/P

HAZCOM Label Information

Product Identification: TUNGSTEN, 8090-11XX
CAGE: FO606
Assigned Individual: Y
Company Name: OSRAM SYLVANIA INC OFFICE HEADQUARTERS
Company PO Box: N/K
Company Street Address1: 100 ENDICOTT ST
Company Street Address2: DANVERS, MA 01923-3754 US
Health Emergency Telephone: 717-265-2121
Label Required Indicator: Y
Date Label Reviewed: 06/10/1998
Status Code: C
Manufacturer's Label Number:
Date of Label: 06/10/1998
Year Procured: N/K
Organization Code: M

00065007

Chronic Hazard Indicator: N
Eye Protection Indicator: YES
Skin Protection Indicator: YES
Respiratory Protection Indicator: YES
Signal Word: WARNING
Health Hazard: Moderate
Contact Hazard: Slight
Fire Hazard: None
Reactivity Hazard: None

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Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format)
For Cornell University Convenience Only

ZINC METAL POWDER

Section 1 - Product and Company Identification	Section 9 - Physical & Chemical Properties
Section 2 - Compositon/Information on Ingredients	Section 10 - Stability & Reactivity Data
Section 3 - Hazards Identification Including Emergency Overview	Section 11 - Toxicological Information
Section 4 - First Aid Measures	Section 12 - Ecological Information
Section 5 - Fire Fighting Measures	Section 13 - Disposal Considerations
Section 6 - Accidental Release Measures	Section 14 - MSDS Transport Information
Section 7 - Handling and Storage	Section 15 - Regulatory Information
Section 8 - Exposure Controls & Personal Protection	Section 16 - Other Information

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Section 1 - Product and Company Identification
ZINC METAL POWDER

Product Identification: ZINC METAL POWDER
Date of MSDS: 04/06/1989 **Technical Review Date:** 06/29/1993
FSC: 6810 **NIIN:** **LIIN:** 00F027517
Submitter: F BT
Status Code: C
MFN: 01
Article: N
Kit Part: N

Manufacturer's Information

Manufacturer's Name: MALLINCKRODT INC
Post Office Box: 800
Manufacturer's Address1: PARIS BYPASS
Manufacturer's Address2: PARIS, KY 40362
Manufacturer's Country: US
General Information Telephone: 314-539-1600
Emergency Telephone: 314-539-1600
Emergency Telephone: 314-539-1600
MSDS Preparer's Name: N/P
Proprietary: N
Reviewed: Y
Published: Y
CAGE: 62910
Special Project Code: N

Preparer Information

Preparer's Name: MALLINCKRODT SPECIALTY CHEMICALS CO
Preparer's Address1: 222 RED SCHOOL LANE
Preparer's Address2: PHILLIPSBURG, NJ 08865
Preparer's CAGE: 62910
Assigned Individual: N

Contractor Information

Contractor's Name: MALLINCKRODT SPECIALTY CHEMICALS CO
Contractor's Address1: 222 RED SCHOOL LANE
Contractor's Address2: PHILLIPSBURG, NJ 08865
Contractor's Telephone: 908-859-2151
Contractor's CAGE: 62910

Section 2 - Compositon/Information on Ingredients
ZINC METAL POWDER

Ingredient Name: ZINC
Ingredient CAS Number: 7440-66-6 **Ingredient CAS Code:** M
RTECS Number: ZG8600000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: N/K
% Enviromental Weight:

Other REC Limits: N/K
OSHA PEL: N/K **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: 10 MG/CUM **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity: 1000 LBS
DOT Reporting Quantity: 1000 LBS
Ozone Depleting Chemical: N

Section 3 - Hazards Identification, Including Emergency Overview
ZINC METAL POWDER

Health Hazards Acute & Chronic: INHALATION: MECHANICAL IRRITATION, DIFFICULTY BREATHING, SNEEZING, COUGHING. INGESTION: GASTROINTESTINAL DISTURBANCES, PAIN, STOMACH CRAMPS, & NAUSEA. SKIN/EYES: MECHANICAL IRRITATION.

Signs & Symptoms of Overexposure:
INHALATION: WHEN HEATED, THE FUMES ARE HIGHLY TOXIC & MAY CAUSE FUME FEVER.

Medical Conditions Aggravated by Exposure:
SKIN DISORDERS, IMPAIRED RESPIRATORY FUNCTION

LD50 LC50 Mixture: N/K

Route of Entry Indicators:
Inhalation: YES
Skin: NO
Ingestion: YES

Carcenogenicity Indicators
NTP: NO
IARC: NO
OSHA: NO

Carcinogenicity Explanation: NONE

Section 4 - First Aid Measures
ZINC METAL POWDER

First Aid:
INHALATION: REMOVE TO FRESH AIR. INGESTION: INDUCE VOMITING BY GIVING TWO GLASSES OF WATER & STICKING FINGER DOWN THROAT. NEVER GIVE ANYTHING BY MOUTH IF UNCONSCIOUS. SKIN: WASH W/SOAP & WATER. EYES: FLUSH W/WATER FOR AT LEAST 15 MINS. OBTAIN MEDICAL ATTENTION IN ALL CASES.

Section 5 - Fire Fighting Measures
ZINC METAL POWDER

Fire Fighting Procedures:

WEAR FULL PROTECTIVE CLOTHING & NIOSH APPROVED SELF-CONTAINED BREATHING W/FULL FACEPIECE OPERATED IN PRESSURE DEMAND OR OTHER POSITIVE PRESSURE MODE.

Unusual Fire or Explosion Hazard:
ZINC WILL BURN IN AIR AT ELEVATED TEMPS. AUTOIGNITION: 680C (DUST CLOUD), 460C (LAYER). BULK DUST IN DAMP STATE MAY HEAT SPONTANEOUSLY/IGNITE ON AIR EXPOSURE.

Extinguishing Media:
DRY POWDER, SODIUM CHLORIDE, MAGNESIUM OXIDE

Flash Point: Flash Point Text: N/K

Autoignition Temperature:
Autoignition Temperature Text: N/A
Lower Limit(s): N/K
Upper Limit(s): N/K

Section 6 - Accidental Release Measures
ZINC METAL POWDER

Spill Release Procedures:
REMOVE ALL IGNITION SOURCES. PROVIDE MILD VENTILATION IN AREA. WEAR PROTECTIVE EQUIPMENT. SWEEP OR VACUUM UP IN MANNER THAT DOES NOT DISPERSE ZINC POWDER IN AIR & PLACE ZINC IN CLOSED CONTAINER FOR RE COVERY OR DISPOSAL.

Section 7 - Handling and Storage
ZINC METAL POWDER

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
ZINC METAL POWDER

Repiratory Protection:
USE NIOSH APPROVED DUST/MIST RESPIRATOR. FOR EMERGENCIES, USE SELF-CONTAINED BREATHING APPARATUS.

Ventilation:
LOCAL EXHAUST SYSTEM

Protective Gloves:
RECOMMENDED

Eye Protection: CHEMICAL SAFETY GOGGLES
Other Protective Equipment: EYE WASH FOUNTAIN & QUICK-DRENCH FACILITIES
Work Hygenic Practices: WASH THOROUGHLY AFTER HANDLING.
Supplemental Health & Safety Information: N/K

Section 9 - Physical & Chemical Properties
ZINC METAL POWDER

HCC:
NRC/State License Number:
Net Property Weight for Ammo:
Boiling Point: Boiling Point Text: 907C/1665F
Melting/Freezing Point: Melting/Freezing Text: 419C/787F
Decomposition Point: Decomposition Text: N/K
Vapor Pressure: 1 **Vapor Density:** N/K
Percent Volatile Organic Content:
Specific Gravity: 7.14
Volatile Organic Content Pounds per Gallon:
pH: N/K
Volatile Organic Content Grams per Liter:
Viscosity: N/P
Evaporation Weight and Reference: N/K
Solubility in Water: INSOLUBLE
Appearance and Odor: GRAY OR BLUISH-GRAY POWDER, ODORLESS
Percent Volatiles by Volume: N/K
Corrosion Rate: N/K

Section 10 - Stability & Reactivity Data
ZINC METAL POWDER

Stability Indicator: YES
Materials to Avoid:
SULFUR & HALOGENS, STRONG OXIDIZING AGENTS, LOW MOLECULAR WEIGHT CHLORINATED HYDROCARBONS, STRONG ACIDS & ALKALIES
Stability Condition to Avoid:
N/K
Hazardous Decomposition Products:
HYDROGEN IN MOIST AIR, ZINC OXIDE W/OXYGEN AT HIGH TEMPERATURE, ZINC VAPOR & ZINC FUME
Hazardous Polymerization Indicator: NO
Conditions to Avoid Polymerization:
N/K

Section 11 - Toxicological Information
ZINC METAL POWDER

Toxicological Information:
N/P

Section 12 - Ecological Information
ZINC METAL POWDER

Ecological Information:
N/P

Section 13 - Disposal Considerations
ZINC METAL POWDER

Waste Disposal Methods:
DISPOSE IN A RCRA APPROVED FACILITY IN ACCORDANCE W/FEDERAL, STATE, &

LOCAL REGULATIONS.

Section 14 - MSDS Transport Information
ZINC METAL POWDER

Transport Information:
N/P

Section 15 - Regulatory Information
ZINC METAL POWDER

SARA Title III Information:
N/P
Federal Regulatory Information:
N/P
State Regulatory Information:
N/P

Section 16 - Other Information
ZINC METAL POWDER

Other Information:
N/P

HAZCOM Label Information

Product Identification: ZINC METAL POWDER
CAGE: 62910
Assigned Individual: N
Company Name: MALLINCKRODT SPECIALTY CHEMICALS CO
Company PO Box:
Company Street Address1: 222 RED SCHOOL LANE
Company Street Address2: PHILLIPSBURG, NJ 08865 US
Health Emergency Telephone: 314-539-1600
Label Required Indicator: Y
Date Label Reviewed: 06/29/1993
Status Code: C
Manufacturer's Label Number: N/R
Date of Label: 06/29/1993
Year Procured: N/K
Organization Code: F
Chronic Hazard Indicator: N
Eye Protection Indicator: YES
Skin Protection Indicator: YES
Respiratory Protection Indicator: YES
Signal Word: WARNING
Health Hazard: Moderate
Contact Hazard: None
Fire Hazard: Slight
Reactivity Hazard: None

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Material Safety Data Sheets

Division of Facilities Services

DOD Hazardous Material Information (ANSI Format) For Cornell University Convenience Only

ZIRCONIUM, 220004

Section 1 - Product and Company Identification	Section 9 - Physical & Chemical Properties
Section 2 - Compositon/Information on Ingredients	Section 10 - Stability & Reactivity Data
Section 3 - Hazards Identification Including Emergency Overview	Section 11 - Toxicological Information
Section 4 - First Aid Measures	Section 12 - Ecological Information
Section 5 - Fire Fighting Measures	Section 13 - Disposal Considerations
Section 6 - Accidental Release Measures	Section 14 - MSDS Transport Information
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Section 1 - Product and Company Identification
ZIRCONIUM, 220004

Product Identification: ZIRCONIUM, 220004
Date of MSDS: 09/01/1989 **Technical Review Date:** 11/27/1995
FSC: 6810 **NIIN:** **LIIN:** 00N055254
Submitter: N EN
Status Code: C
MFN: 01
Article: N
Kit Part: N

00065015

Manufacturer's Information

Manufacturer's Name: ICN BIOMEDICALS
Manufacturer's Address1: 1263 S CHILLICOTHE RD
Manufacturer's Address2: AURORA, OH 44202
Manufacturer's Country: US
General Information Telephone: 216-562-1500
Emergency Telephone: 800-424-9300 (CHEMTREC)
Emergency Telephone: 800-424-9300 (CHEMTREC)
MSDS Preparer's Name: N/P
Proprietary: N
Reviewed: N
Published: Y
CAGE: IO030
Special Project Code: N

Contractor Information

Contractor's Name: ICN BIOCHEMICALS
Post Office Box: N/K
Contractor's Address1: 4911 COMMERCE PARKWAY
Contractor's Address2: CLEVELAND, OH 44128
Contractor's Telephone: 216-831-3000/800-424-9300(CHEMTREC)
Contractor's CAGE: 30060

Contractor Information

Contractor's Name: ICN BIOMEDICALS INC
Post Office Box: 28050
Contractor's Address1: UNKNOWN
Contractor's Address2: CLEVELAND, OH 44128-0250
Contractor's Telephone: 216-831-3000
Contractor's CAGE: IO030

Section 2 - Compositon/Information on Ingredients
ZIRCONIUM, 220004

Ingredient Name: ZIRCONIUM
Ingredient CAS Number: 7440-67-7 **Ingredient CAS Code:** M
RTECS Number: ZH7070000 **RTECS Code:** M
=WT: =WT Code:
=Volume: =Volume Code:
>WT: >WT Code:
>Volume: >Volume Code:
<WT: <WT Code:
<Volume: <Volume Code:
% Low WT: % Low WT Code:
% High WT: % High WT Code:
% Low Volume: % Low Volume Code:
% High Volume: % High Volume Code:
% Text: N/K

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% Enviromental Weight:
Other REC Limits: N/K
OSHA PEL: 5 MG/M3 **OSHA PEL Code:** M
OSHA STEL: OSHA STEL Code:
ACGIH TLV: 5 MG/M3 10 STEL **ACGIH TLV Code:** M
ACGIH STEL: N/P **ACGIH STEL Code:**
EPA Reporting Quantity:
DOT Reporting Quantity:
Ozone Depleting Chemical: N

Section 3 - Hazards Identification, Including Emergency Overview
ZIRCONIUM, 220004

Health Hazards Acute & Chronic: ESSENTIALLY NON-TOXIC.

Signs & Symptoms of Overexposure:
SEE HEALTH HAZARDS.

Medical Conditions Aggravated by Exposure:
NONE SPECIFIED BY MANUFACTURER.

LD50 LC50 Mixture: NONE SPECIFIED BY MANUFACTURER.

Route of Entry Indicators:
Inhalation: NO
Skin: NO
Ingestion: NO

Carcenogenicity Indicators
NTP: NO
IARC: NO
OSHA: NO

Carcinogenicity Explanation: NOT RELEVANT.

Section 4 - First Aid Measures
ZIRCONIUM, 220004

First Aid:
SKIN: RINSE LIBERALLY W/SOAP & WATER FOR CONSIDERABLE PERIOD. INGEST: IF W/IN 15 MINS AFTER OCCUR, MAKE PATIENT DRINK 1 OR 2 GLASSES OF WATER. EYES: RINSE LIBERALLY W/WATER FOR AT LEAST 15 MINS. INHAL : TAKE PATIENT INTO FRESH AIR & ALLOW TO REST.

Section 5 - Fire Fighting Measures
ZIRCONIUM, 220004

Fire Fighting Procedures:
WEAR NIOSH/MSHA APPROVED SCBA & FULL PROTECTIVE EQUIPMENT(FP N).
Unusual Fire or Explosion Hazard:

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NONE SPECIFIED BY MANUFACTURER.
Extinguishing Media:
USE MEDIA SUITABLE FOR SURROUNDING FIRE(FP N).
Flash Point: Flash Point Text: N/K

Autoignition Temperature:
Autoignition Temperature Text: N/A
Lower Limit(s): N/K
Upper Limit(s): N/K

Section 6 - Accidental Release Measures
ZIRCONIUM, 220004

Spill Release Procedures:
SWEEP INTO SUITABLE CONTAINER FOR DISPOSAL.

Section 7 - Handling and Storage
ZIRCONIUM, 220004

Handling and Storage Precautions:

Other Precautions:

Section 8 - Exposure Controls & Personal Protection
ZIRCONIUM, 220004

Repiratory Protection:
NIOSH/MSHA APPRVD DUST MASK.
Ventilation:
LOCAL EXHAUST SYSTEM REQUIRED.
Protective Gloves:
IMPERVIOUS GLOVES (FP N).
Eye Protection: ANSI APPRVD CHEM WORKERS GOGGLES(FP N).
Other Protective Equipment: NONE SPECIFIED BY MANUFACTURER.
Work Hygenic Practices: NONE SPECIFIED BY MANUFACTURER.
Supplemental Health & Safety Information: MATL TO AVOID: TUNGSTATES, BORAX, CCL*4, CUO, PB, PBO, P, KCLO*3, KNO*3, NITRYLFLUORIDE.

Section 9 - Physical & Chemical Properties
ZIRCONIUM, 220004

HCC: N1
NRC/State License Number:
Net Property Weight for Ammo:
Boiling Point: Boiling Point Text: 6471F,3577C
Melting/Freezing Point: Melting/Freezing Text: 3366F,1852C
Decomposition Point: Decomposition Text: N/K
Vapor Pressure: N/A **Vapor Density:** N/K
Percent Volatile Organic Content:
Specific Gravity: 6.506 @ 20C

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Volatile Organic Content Pounds per Gallon:
pH: N/K
Volatile Organic Content Grams per Liter:
Viscosity: N/P
Evaporation Weight and Reference: N/K
Solubility in Water: INSOLUBLE.
Appearance and Odor: SOLID.
Percent Volatiles by Volume: N/K
Corrosion Rate: N/K

Section 10 - Stability & Reactivity Data
ZIRCONIUM, 220004

Stability Indicator: YES
Materials to Avoid:
POWDER FORM-CHEM RXN W/AIR, ALKALI HYDROXIDES, ALKALI METAL CHROMATES, DICHROMATES, MOLYBATES, SALTS, SULFATES(SUPDAT)
Stability Condition to Avoid:
NONE SPECIFIED BY MANUFACTURER.
Hazardous Decomposition Products:
NONE SPECIFIED BY MANUFACTURER.
Hazardous Polymerization Indicator: NO
Conditions to Avoid Polymerization:
NOT RELEVANT.

Section 11 - Toxicological Information
ZIRCONIUM, 220004

Toxicological Information:
N/P

Section 12 - Ecological Information
ZIRCONIUM, 220004

Ecological Information:
N/P

Section 13 - Disposal Considerations
ZIRCONIUM, 220004

Waste Disposal Methods:
LANDFILL. DISPOSE OF IN ACCORDANCE WITH LOCAL, STATE & FEDERAL REGULATIONS (FP N).

Section 14 - MSDS Transport Information
ZIRCONIUM, 220004

Transport Information:
N/P

Section 15 - Regulatory Information
ZIRCONIUM, 220004

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SARA Title III Information:
N/P
Federal Regulatory Information:
N/P
State Regulatory Information:
N/P

Section 16 - Other Information
ZIRCONIUM, 220004

Other Information:
N/P

HAZCOM Label Information

Product Identification: ZIRCONIUM, 220004
CAGE: IO030
Assigned Individual: Y
Company Name: ICN BIOMEDICALS INC
Company PO Box: 28050
Company Street Address1: UNKNOWN
Company Street Address2: CLEVELAND, OH 44128-0250 US
Health Emergency Telephone: 800-424-9300 (CHEMTREC)
Label Required Indicator: Y
Date Label Reviewed: 11/14/1994
Status Code: C
Manufacturer's Label Number:
Date of Label: 11/14/1994
Year Procured: N/K
Organization Code: G
Chronic Hazard Indicator: N
Eye Protection Indicator: YES
Skin Protection Indicator: YES
Respiratory Protection Indicator: YES
Signal Word: CAUTION
Health Hazard: Slight
Contact Hazard: Slight
Fire Hazard: None
Reactivity Hazard: Slight

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