

SET 1
October 09, 1998

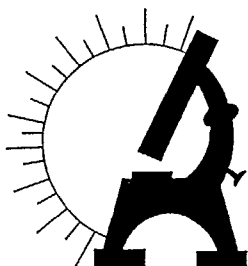
*Abatement Plan for the Removal
of Asbestos at
Converter Cottrell Outlet Distribution Flue
ASARCO, INC.*

Prepared for:

ASARCO, INC.

ATTN: Peggy Munsell
2301 Paisano Drive
El Paso, Texas 79922

Prepared by:



Sun
City
Analytical,

ENVIRONMENTAL SERVICES

1409 Montana
El Paso, Texas 79902
(915) 533-8840
Fax (915) 533-8843
E-mail SCAI@flash.net

NOTE: This project manual was designed for work directed herein and is designed to be used with Sun City Analytical, Inc. air monitoring SOP's and manuals. This booklet may not be used for any other purpose. SUN CITY ANALYTICAL, INC. assumes no responsibility for any other use or misuse of this project manual. Copyright (C) 1998 SUN CITY ANALYTICAL, INC. All rights reserved. No portion may be reproduced without expressed written consent from Sun City Analytical, INC.

Specification for the Removal of Asbestos at
Asarco Converter Cottrell Outlet Distribution Flue
El Paso, Texas

ADDENDUM NO. 1: October 15, 1998

TO: ALL PRIME CONTRACTOR BIDDERS OF RECORD

General:

1. The following changes and/or additions to the Contract documents shall apply to proposals made for and to the execution of the project manual and drawings, date October 09, 1998. This addendum shall be signed and submitted with bid form to acknowledge receipt of. Failure to do so may subject bidder to disqualification.

DRAWINGS

- A. No changes at this time.

PROJECT SPECIFICATION

- A. The project completion date has been extended to **DECEMBER 30, 1998**.
- B. The technical specifications remain unchanged.

Bidder's Signature of Acknowledgment

_____ Date

ADDENDUM 1
October 15, 1998

Asarco Converter Cottrell Outlet Flue
SHEET __ OF __

October 9, 1998

ABATEMENT PLAN

Design For:

ASBESTOS ABATEMENT
at
Converter Cottrell Outlet Distribution Flue

FOR
ASARCO, INC.
ATTN: Peggy Munsell
2301 W. Paisano
El Paso, Texas 79922

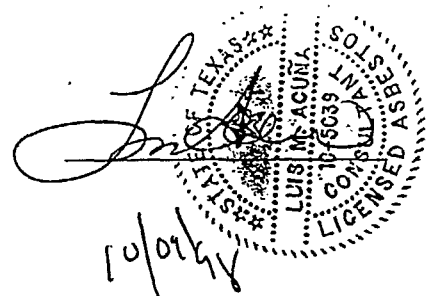
LICENSED ASBESTOS CONSULTANT AGENCY:



TEXAS LICENSE #10-0011
SUN CITY ANALYTICAL, INC.
1409 MONTANA
EL PASO, TEXAS 79902

LICENSED INDIVIDUAL ASBESTOS CONSULTANT:

Luis M. Acuña P.E.A.
TEXAS LICENSE #10-5039
SUN CITY ANALYTICAL, INC.
1409 MONTANA AVENUE
EL PASO, TEXAS 79902



ASARCO ELP 0011608

TABLE OF CONTENTS

ADVERTISEMENT FOR BIDS (4)

ASARCO, INC. CONTRACT DOCUMENTS (Blue Pages)

SUPPLEMENTARY CONDITIONS (6)

BID FORM (8)

PROJECT SCHEDULES (10)

SECTION 01010 SUMMARY OF WORK (11)

1.01	Statement of Work	11
1.02	Project Objectives	11
1.03	Description of Work	11

SECTION 01030 SPECIAL PROCEDURES OR CONDITIONS (12)

1.01	ASARCO Converter Cottrell Outlet Distribution Flue	12
1.02	Alternate Procedures	12
1.03	Pre-abatement Inspection	12
1.04	Schedule of Abatement	12
1.05	Site Security	12
1.06	Emergency Repairs	13
1.07	Medical Emergencies	13
1.08	Rental Equipment	13
1.09	Patented Products	13
1.10	Electrical Work	13
1.11	Scaffolds/Platforms	13
1.12	Confined Space	14
1.13	Procedures Regarding Conflicts or Questions	14
1.14	Dispute Resolution	14
1.15	Pigeon Waste and Associated Danger	14

SECTION 01043 PROJECT COORDINATION (15)

1.01	Work Requirements:	15
1.02	Personnel Qualifications:	15
1.03	Permits:	16

SECTION 01091 DEFINITIONS AND STANDARDS (17)

1.01	Applicable Publications:	17
1.02	Definitions:	18

SECTION 01300 SUBMITTALS (23)	
1.01	Submittals with Contractor's Proposal: 23
1.02	Submittals required at Pre-Abatement Meeting: 23
1.03	Submittals required Daily during Abatement: 25
1.04	Submittals Required at Conclusion of Project 25
1.05	Disapproved Submittals: 25
SECTION 01410 TESTING LABORATORY SERVICES (26)	
1.01	Air Monitoring and Sampling: 26
1.02	Third-Party Air Monitoring 26
1.03	Methods of Analysis: 27
1.04	Clearance Samples 28
SECTION 01500 TEMPORARY FACILITIES & CONTROLS (29)	
1.01	Temporary Buildings 29
1.02	Telephone Service 29
1.03	Water for Construction 29
1.04	Electricity for Construction 29
1.05	Employee Conduct 29
1.06	Advertising 29
1.07	Barricades 30
1.08	Security 30
1.09	Toilets 30
1.10	Scaffolds 30
SECTION 01513 AIR FILTRATION SYSTEM (31)	
1.01	Air Filtration System 31
SECTION 01527 WORK AREA PROTECTION (36)	
1.01	Preparation 36
SECTION 01528 ENTRY INTO CONTROLLED AREAS (38)	
1.01	Entry and Exit of Work Area 38
SECTION 01560 RESPIRATORY PROTECTION (39)	
1.02	Respiratory Protection 39
SECTION 01562 PERSONNEL PROTECTION (40)	
1.01	Personnel Protection: 40
1.02	Worker Protection 40

SECTION 01563 DECONTAMINATION UNITS (42)	
1.01	Enclosures: 42
SECTION 01632 PRODUCTS (44)	
1.01	Materials: 44
1.02	Equipment: 45
SECTION 01712 CLEANING AND DECONTAMINATION (46)	
1.01	Cleanup procedures: 46
SECTION 01714 WORK AREA CLEARANCE (47)	
1.01	Clearance Air Monitoring: 47
SECTION 01716 DISPOSAL PROCEDURES (48)	
1.01	Disposal Procedures 48
SECTION 02081 GENERAL REMOVAL PROCEDURES (50)	
1.01	Procedures: 50
SECTION 02088 REMOVAL OF ACM FLUE INSULATION (52)	
1.01	Procedures: 52

DRAWING AA-1

ATTACHMENTS

- I. Material Safety Data Sheet for Converter Cottrell Dust
- II. Histoplasmosis

**ADVERTISEMENT FOR PROPOSALS
FOR**

**ASBESTOS ABATEMENT AT
ASARCO, INC.
Converter Cottrell Outlet Distribution Flue
2301 W. Paisano
El Paso, Texas 79922**

Notice is hereby given that sealed proposals will be accepted **only from invited contractors** for asbestos abatement of the above location. The proposal shall be in accordance with Plans and Specifications designed by:

SUN CITY ANALYTICAL, INC.
1409 Montana
El Paso, Texas 79902
(915) 533-8840

The Proposal will be accepted until 11:00 a.m. (MST), Wednesday October 28, 1998 at:

SUN CITY ANALYTICAL, INC.
1409 Montana
El Paso, Texas 79902
(915) 533-8840

where they will be privately opened by Owner and Consultant.

Bid proposal when submitted indicates the offer will furnish all insurance called for in the provisions. The offer also certifies that each project will be completed on or before the specified date.

Successful offer shall complete project in accordance with dates set forth in Project Schedule included in this project manual. If bidder fails to finish project in said dates, he is liable to ASARCO, Inc. or have deducted from funds owed, as liquidated damages the sum of five-hundred (\$500.00) dollars per day plus Consultant and/or Air monitoring costs per day for each calendar day of delay until the project is substantially completed.

There will be a mandatory pre-bid walk-thru of the project on October 15th, 1998, at 10:00 A.M. (MST). All invited offers are required to attend. Prospective contractors should arrive no later than 10:00 A.M. (MST) on October 15th, 1998 at ASARCO Main Gate at 2301 W. Paisano, El Paso, Texas. **In order to tour the work site the contractor shall have a hard hat (meets OSHA requirements) steel toe boots, eye protection, hearing protection, and respiratory protection (HEPA with Acid Mist filter). Individuals are reminded that proper use of respirators shall be enforced and beards and/or hair growth shall be grounds for denying access to project site.**

Owner reserves the right to refuse any and all offers for any reason that serves the best interest of the Owner or building Occupants. Owner reserves the right to waive any technicality or irregularity in this plan or any offer.

Conflicts and questions arising during the bid phase and throughout any asbestos abatement activities will be resolved on a basis of whether an asbestos or non-asbestos related activity is involved. Any asbestos related conflicts and questions will be governed by the appropriate project manual sections. Otherwise, the Owner's supplementary and/or up-front "boiler plate" documents and any other non-asbestos related sections of the project manual will be applicable.

Conflicts and questions which the selected Contractor fails to bring to the attention of Owner and/or Consultant prior to being awarded the contract will be resolved at no additional cost to Owner and/or the Consultant.

Contractors desiring Plans and Specifications may obtain Bid Documents from SUN CITY ANALYTICAL, INC., after October 09, 1998 and at the Bid walk through. A fifty dollar (\$50.00) non-refundable deposit is required per set of plans and specifications.

TO WHOM IT MAY CONCERN:

EFFECTIVE IMMEDIATELY, ALL SUPPLIER'S WHO ENTER ASARCO PROPERTY TO PERFORM ANY SERVICES, OTHER THAN DELIVERING MATERIAL, ARE REQUIRED TO FILL OUT THE UNDERSIGNED.

THIS APPROVAL WILL BE GOOD FOR ONE YEAR AT WHICH TIME THE SAME PROCEDURES WILL HAVE TO BE FOLLOWED. (PROVIDED THAT SUPPLIER/CONTRACTOR MAINTAINS A GOOD RATING.)

THERE ARE TWO CATEGORIES: LOW RISK AND HIGH RISK (DEPENDING ON WHAT AREA OF THE PLANT SUPPLIER OR CONTRACTOR WILL BE VISITING ,

LOW RISK REQUIRES:

- . HSC 005 - CONTRACTOR SAFETY AND HEALTH SCREEN QUESTIONNAIRE
- . HSC 006 - SITE ENTRY AND LIABILITY RELEASE
- . SCHEDULE AN ORIENTATION CLASS WITH SAFETY (APPROX 15 MIN)
- CONTACT LEROY BATES: 915-521-3645

HIGH RISK REQUIRES:

- . HSC 005 - ASARCO CONTRACTOR EMPLOYEE HEALTH QUESTIONNAIRE
(Pertinent sections must be filled out and signed by management personnel)
- . HSC 006 - SITE ENTRY AND LIABILITY RELEASE
- . HSC 001 - CONTRACTOR SAFETY AND HEALTH SCREEN QUESTIONNAIRE
- . HSC 002 - CONTRACTOR SAFETY AND HEALTH SCREEN QUESTIONNAIRE
- . HSC 003 - CONTRACTOR SAFETY AND HEALTH SCREEN QUESTIONNAIRE
- BIOLOGICAL MONITORING MAY BE REQUIRED!
- MEDICAL EVALUATION RELEASE IS REQUIRED TO WEAR A RESPIRATOR (1910.134)
A STATEMENT LETTER (LIST PERSONNEL) FROM MANAGEMENT OR AUTHORIZED
PERSONNEL IS ADEQUATE.
- . SCHEDULE AN ORIENTATION WITH LEROY BATES AT 915-521-3645
(APPROX 2-4 HOURS DURATION)
- . Typical Contractor Safety and Health Program Elements (Informational Only)
- . FORM FP/10-97 - FIXED PRICE CONSTRUCTION OR REPAIR CONTRACT
(FOR REVIEW)

Contact Peggy Munsell (915-521-3640) for safety related questions or Elizabeth Yzaguirre (915-541-1860) for contractual questions.

PLEASE FILL OUT AS SOON AS POSSIBLE AND RETURN BACK TO ELIZABETH YZAGUIRRE, PURCHASING AT FAX #915-521-3605.

IF YOU HAVE ANY QUESTIONS OR COMMENTS I CAN BE REACHED BY TELEPHONE AT 915-541-1860.

NOTICE TO SUPPLIER: PURCHASING CANNOT ISSUE A PURCHASE ORDER FOR ANY SERVICES UNTIL THE ABOVE HAS BEEN SATISFIED. THANK YOU!

f:\users\peggy\cflsht.doc

FLYSHEET NO. 2

TO WHOM IT MAY CONCERN:

Attached please find ASARCO Incorporated's requirements concerning contractor's insurance. Since you are currently performing work for Asarco's El Paso Plant or are anticipating being awarded a contract, all insurance requirements must be met and a copy of such Certificate of Insurance must be on file with Asarco.

The following statements also MUST be included in each policy and shown on the Certificate of Insurance:

- (1) "ASARCO Incorporated is named as an additional insured as its interest may appear with respect to the above liability policies."
- (2) "Insured hereby waives the insurer's right of subrogation against ASARCO Incorporated, its subsidiaries, agents and affiliated companies, and their directors, officers, agents and employees."

Please fax a copy of the insurance certificate to Elizabeth Yzaguirre, Purchasing at 915-521-3605 or call if there are any questions 915-541-1860 and mail the original to : Asarco, Inc. PO Box 1111, El Paso, TX 79999 with the attention to the same as the fax.

f:\users\peggy\cflsht.doc

FLYSHEET NO. 3
1 OF 2

INSURANCE REQUIREMENTS FOR CONTRACTORS
ASARCO, INC.

The Contractor shall, for the mutual protection and benefit of both Owner and Contractor, procure, pay for and maintain in full force and effect, at all times during the performance of the work and until final acceptance of the work, policies of insurance issued by a responsible carrier or carriers acceptable to Owner which afford the following coverages:

Workers' Compensation

- Statutory

Employers' Liability

- Not less than \$500,000

Comprehensive General Liability including Independent Contractors' Broad Form Contractual, Broad Form Property Damage, Personal Injury, Completed Operations and Products coverages (such Completed Operations and Products coverages shall be provided for a period of two (2) years after final completion of the work and final acceptance by the Owner), and deletion of any exclusion pertaining to explosion, collapse, underground property damage, radiation and pollution hazards.

- Not less than \$2,000,000 combined single limit for both bodily injury and property damage

Comprehensive Automobile Liability including Owned, Non-Owned, and Hired Car coverages.

- Not less than \$2,000,000 combined single limit for both bodily injury and property damage

Contractors' Professional Liability Insurance including but not limited to errors and omissions coverage.

- Not less than \$1,000,000

All policies, with the exception of Workers' Compensation and Contractor's Professional Liability, shall name Owner, its subsidiaries, directors, officers, agents and employees as additional insureds, and shall expressly provide that the interest of same

FLYSHEET NO. 3

2 OF 2

therein shall not be affected by any breach by Contractor of any policy provision. All policies shall expressly provide that no less than thirty (30) days prior written notice shall be given to Owner in the event of material alteration to or cancellation of the coverages evidenced by such policies. Further, the Workers' Compensation policy shall contain an endorsement waiving the insurers' right of subrogation against Owner, its subsidiaries, agents and affiliated companies, and their directors, officers, agents and employees.

Prior to any equipment or personnel being brought onto Owner's premises in accordance with the terms of this Agreement, Contractor shall deliver to Owner a Certificate of Insurance for each policy obtained pursuant to this Agreement evidencing each of the provisions specified in this Article along with the signed Agreement.

Upon renewal of each policy, Contractor shall provide to Owner a certificate of insurance evidencing all of the provisions specified in this Article.

Contractor will maintain the original of all policies, endorsements and certificates, and provide Owner with copies of same upon request of Owner.

FCNTRINS.DOC

ASARCO CONTRACTOR EMPLOYEE HEALTH INFORMATION FORM

I. CONTRACTOR EMPLOYEES EXPECTED TO WORK AT ASARCO'S FACILITY MEDICAL/EXPOSURE HISTORY FOR EACH EMPLOYEE

Employee: _____ S.S. # _____ Address: _____ Tel. # _____ Expected Hours or Days at Facility _____
 Job Assignment/Task _____ Expected Plant/Job Location(s): _____ Expected Departure Date: _____
 Date of Birth: _____ Company: _____ Contractor Site Representative: _____

Days at Any Facility Within Last 12 mos. _____ Medical Examination: _____
 with air exposures above OSHA action levels (e.g., _____ Date: _____ Doctor: _____
 lead - 30 ug/m³; Arsenic - 5 ug/m³; Cadmium - _____ Telephone # _____ City: _____
 2.5 ug/m³ _____
 Does your Company have a Substance Abuse Program? _____ Is Drug Testing Performed? _____
 Smoking History: Yes _____ No _____ *List Any Reported or Suspected Physical or Health Impairment or
 Quit Date: _____ Years Smoking _____ Problem That May Interfere with Job Performance: _____
 Packs Per Day: _____

As: _____
 Pb: _____
 Cd: _____
 Other: _____

Cleared for Respirator Use by Doctor: Yes _____ No _____

Fit Tested for Respirator Use: By Contractor: Yes _____ No _____ Date: _____
 By ASARCO: Yes _____ No _____ Date: _____

II. IF EMPLOYEE EXPECTED TO WORK IN AREAS WITH EXPOSURES ABOVE ACTION LEVELS

*List Any Reported or Suspected Adverse Health or _____ Last Chest X-Ray Date: _____ Last 2 Blood Lead Analysis (Dates & Levels): _____
 Medical Conditions or Symptoms _____ Clinics, Doctors or Employment Sites performing such _____ Last 2 Cadmium in Urine Analysis (Dates & Levels) _____
 _____ exams, tests or biological monitoring: _____ Last 2 Beta-2 Microglobulin in urine (Dates & Levels) _____
 _____ Last 2 Cadmium in Blood Analysis (Dates & Levels) _____
 Last 2 Urine Arsenic Analysis (Date & Level) _____ Last 2 Cadmium in Blood Analysis (Dates & Levels) _____

III. EXIT HEALTH INFORMATION

Exit Date: _____ MRP Info: _____ Exit Blood Lead: _____
 Other: _____ Reported Symptoms _____
 Days On Site: _____

The Contractor certifies and agrees that the above information was provided directly by the employee(s) or contained within the contractor's personnel file and that each employee consented to providing this information to ASARCO. The Contractor further certifies, acknowledges and promises to provide immediately to ASARCO any updated information, follow up information or changes needed to this form, and that he has instructed his employees of the need and requirement to report such information as well.

Date: _____ Name _____ Title _____ Company _____
 *Any positive responses require further evaluation by Contractor and ASARCO personnel. _____ CONTRACTOR POLICY APP 5 (HSC # 005) _____ Doc #259442 v. 3

**SITE ENTRY AGREEMENT AND LIABILITY RELEASE LOG¹
AND ACKNOWLEDGMENT OF SITE HAZARDS,
PROTECTIVE MEASURES, TRAINING, RULES, POLICIES**

I seek ASARCO Inc.'s permission and agreement to enter its facility for the purpose of performing work for my employer or myself or visiting and/or touring the facility. I understand that access to ASARCO's facility is restricted to its own employees and only those other persons who read, understand and sign this form, to indicate their voluntary agreement to the terms of this form, in exchange for ASARCO's granting a limited right of entry onto its property.

Since I am not an ASARCO employee, I acknowledge that I understand that the ASARCO facility contains numerous dangerous and hazardous materials, conditions, equipment and operations. For example, I understand that the ASARCO facility utilizes: (1) potentially hazardous and dangerous equipment, both mobile and stationary; (2) potentially dangerous and hazardous chemicals and materials such as respirable silica dust, lead, cadmium, arsenic, zinc, silver and copper, other dusts and fumes, solvents, lubricants, process chemicals and laboratory chemicals; and, (3) potentially dangerous and hazardous production processes, traffic and storage areas where the procedures, equipment, and materials used could pose both severe and immediate risks of injury and illness and death, and long term, chronic risks of illness. By complying with government regulations, my company's safety and health programs, and ASARCO rules and policies, I understand that the risks and hazards on ASARCO's facility are minimized. I also understand that it is ASARCO policy and first priority to protect all persons who enter its facilities and the environment and that I and my employer are under a duty to comply with this policy.

In consideration of permitting me to enter this ASARCO facility, I acknowledge, certify and agree that:

1. I have been provided and understand the warnings and training related to the hazards and potential hazards on this site.
2. I have been provided and understand the site's rules and policies and agree to abide by them.

¹ This document is in two forms so that it can be used as a stand-alone document (one for every person that enters an ASARCO facility) or as the introduction to a log entry, signature book, so long as each individual is required to read the materials, the last paragraph is repeated on each page of the book and the text is posted at the entry location.

3. I have been provided with and understand the requirements and need to wear personal protective equipment (and respirators in certain areas) such as a hard hat, safety glasses, gloves, coveralls, and agree to wear and use such equipment properly.
4. I am restricted to the specific route of travel and work site as initially assigned to me by my employer and described and/or shown to me by ASARCO personnel, unless otherwise approved by ASARCO personnel.
5. I have been instructed on and understand the emergency evacuation routes and procedures and agree to follow those instructions and procedures if necessary.
6. I am experienced and competent in, and have been trained to perform the job assigned to me, and I hold all government required training certificates and licenses needed to perform this job.
7. I grant ASARCO permission to review my personnel file, medical records, biological monitoring records, air monitoring records and any other records of mine or my employer(s)' or physician(s)' related to the contract terms for my work or government regulations.
8. On behalf of myself, my dependents, my estate and my heirs and assigns, I agree to waive any and all claims against ASARCO, Inc. and its employees and agents, and release and hold them harmless from any and all damages, costs and expenses resulting from my death or any injuries or illnesses I may suffer as a result of my presence, exposure, activity, accident or event at this facility, except in cases of gross negligence or intentional acts on the part of ASARCO. In the event of my death, injury or illness in any way related to the ASARCO facility I agree and acknowledge that my sole remedy and that of my dependents, heirs and assigns will be the worker's compensation coverage and benefits provided by my employer, or any insurance benefits provided by my employer or myself.

I acknowledge and agree that my signature below indicates that I have read, understand and agree to the terms and conditions set forth above in consideration and in exchange for ASARCO granting me permission to enter its facility.

1)	_____	_____	_____	_____
	Date	Company	Signature	Soc. Sec. No.
	_____	_____	_____	_____
	Admitting Guard/Emp	Project/Work	Printed Name	Work Location

I acknowledge and agree that my signature below indicates that I have read, understand and agree to the terms and conditions set forth above in consideration and in exchange for ASARCO granting me permission to enter its facility.

2)	_____	_____	_____	_____
	Date	Company	Signature	Soc. Sec. No.
	_____	_____	_____	_____
	Admitting Guard/Emp	Project/Work	Printed Name	Work Location
3)	_____	_____	_____	_____
	Date	Company	Signature	Soc. Sec. No.
	_____	_____	_____	_____
	Admitting Guard/Emp	Project/Work	Printed Name	Work Location
4)	_____	_____	_____	_____
	Date	Company	Signature	Soc. Sec. No.
	_____	_____	_____	_____
	Admitting Guard/Emp	Project/Work	Printed Name	Work Location
5)	_____	_____	_____	_____
	Date	Company	Signature	Soc. Sec. No.
	_____	_____	_____	_____
	Admitting Guard/Emp	Project/Work	Printed Name	Work Location
6)	_____	_____	_____	_____
	Date	Company	Signature	Soc. Sec. No.
	_____	_____	_____	_____
	Admitting Guard/Emp	Project/Work	Printed Name	Work Location
7)	_____	_____	_____	_____
	Date	Company	Signature	Soc. Sec. No.
	_____	_____	_____	_____
	Admitting Guard/Emp	Project/Work	Printed Name	Work Location

CONTRACTOR SAFETY AND HEALTH SCREENING QUESTIONNAIRE # HSC 001

Please complete this form and return it to the undersigned at your earliest convenience. This information will be kept on file and used to evaluate contractors for our various projects.

SEND COMPLETED QUESTIONNAIRE TO: P. Munsell, Safety & Health Director

ASARCO

PO Box 1111

El Paso, TX 79999

PHONE: 915-521-3640 FAX: 915-541-1811

Obtain from your insurance agent (or state fund, if possible) your workers' compensation insurance experience modification rate (EMR) for the three most recent rating periods and complete the following:

POLICY YEAR:	EMR:	IF your EMR is exactly 1.0 for any policy year, is it because your firm is (or was) too new or too small to have an EMR calculated?
Most recent policy year:		YES ☐ NO ☐
1 year prior:		
2 years prior:		

We require verification of the above information. Any of the following methods will be acceptable:

- Furnish a letter from your insurance agent, insurance carrier, or state fund (on their letterhead) verifying the EMR data listed above;
- Provide a copy of the last three years' "Experience Rating Calculation Sheets" which your insurance carrier should forward to you annually; or
- Provide a copy of the pages of your last three years' insurance policies that show the experience modification rate and the coverage period.

If you were required to complete OSHA 200-S Reports for the last three years, please attach copies as well as completing this section. If you were not required to complete OSHA 200-S Reports, please provide the following information:

Three previous calendar years:	19	19	19
Number of employees:			
Number of medical treatment cases*:			
Number of lost workday cases**:			
Number of fatalities:			
Exposure hours***:			
Number of lost workdays****:			

DEFINITIONS

* Medical Treatment Case - A case resulting from a work accident or illness that does not result in lost time or restricted work where the contractor employee receives treatment administered by a physician or by registered personnel under the standard orders of a physician. Medical treatment does not include first-aid cases, even though first aid is administered by a physician or registered professional personnel, but does not include loss of consciousness or incidents that require more than one dose of a prescription medicine.

** Lost workday case - Any injury or illness that results in the employee being unable to work the next scheduled shift, or any injury or illness where the employee, following medical treatment is:

- assigned to a temporary job;
- working at a permanent job less than full time; or
- working at a permanently assigned job but unable to perform all the duties normally required.

*** Exposure hours - Number of actual hours worked by employees during the calendar year.

**** Lost workdays - Number of days injured or ill employees were scheduled to work but could not.

INCLUDE IN CONTRACTOR FILE
Doc # 110298

ASARCO CONTRACTOR POLICY APPENDIX 2

ASARCO ELP 0011622

CONTRACTOR SAFETY AND HEALTH SCREENING QUESTIONNAIRE #HSC 002

Type of work (Bureau of Labor Statistics Standard Industrial Classification Code)

Non-Residential Building (SIC 15) Heavy (Non-Highway) Construction (SIC 16) Special Trade Contractors (SIC 17) Other

You must identify your entire SIC Code number.

ARE INJURY AND ILLNESS REPORTS OR REPORT SUMMARIES SENT TO THE FOLLOWING?		(Check One) YES NO		HOW OFTEN?
Field Superintendent				
Vice President of Construction				
President of Firm				
Safety Officer/Dept. in Company (If yes, list name, title, and telephone number)				
Name: Title: # ()				
Project Safety, Health, and Housekeeping Management and Inspections				
(If yes, list, name and title of persons who perform inspections)				
Names: Titles:				
List names and expected positions of key supervisory personnel planned for work at ASARCO facilities:				
NAME		POSITION		
Written safety program used? ☐ Yes ☐ No (Attach copies)		Site safety meetings held? ☐ Yes ☐ No		
Written health program used? ☐ Yes ☐ No (Attach copies)		How often?		
Safety and health training program used for new employees?		Disciplinary program available for safety violations?		
☐ Yes (see below) ☐ No		☐ Yes ☐ No		
IF PROGRAMS AND TRAINING AVAILABLE AND USED, DO THEY INCLUDE THE FOLLOWING?		OSHA 29 CFR		Meets OSHA Requirements
				yes no
General Safety and Health Provisions and Rules				
Occupational Health and Environmental Controls and Rules				
Personal Protective and Life Saving Equipment and Rules				
Fall Protection, Prevention, Rules and Equipment				
Fire Protection, Prevention, Rules and Equipment				
Signs, Signals, and Barricades, Rules and Equipment				
Tools - Hand and Power, Rules, and Protective Equipment				
Welding and Cutting, Rules and Protective Equipment				
Electrical, Rules and Protective Equipment				
Ladders and Scaffolding, Rules and Protective Equipment				
Cranes, Derricks, Hoists, Elevators, Conveyors, Rules and Protective Equipment				
Motor Vehicles, Mechanized Equipment, Marine Operations				
Excavations, Trenching, and Shoring				
Concrete, Concrete Forms and Shoring				
Steel Erection				
Tunnels and Shafts, Compressed Air				
Demolition				
Blasting and Use of Explosives				
Power Transmission Distribution				
Asbestos Standard (OSHA)				
Arsenic Standard (OSHA)				
Lead Standard (OSHA)				
Cadmium Standard (OSHA)				
Hazard Communication Standard (OSHA)				
Lock out/Tagout (OSHA)				
Confined Space Standards (OSHA)				
Construction Lead Standards (OSHA)				
DO YOU CONDUCT?				
Pre-employment Physicals ☐ Yes ☐ No		Audiometric Baselines ☐ Yes ☐ No		
Pulmonary Function Tests ☐ Yes ☐ No		Blood Lead Baselines ☐ Yes ☐ No		
Respirator Use Medical Clearance ☐ Yes ☐ No		Cadmium Baselines ☐ Yes ☐ No		

INCLUDE IN CONTRACTOR FILE
Doc #180382

ASARCO CONTRACTOR POLICY APPENDIX 2

ASARCO ELP 0011623

CONTRACTOR SAFETY AND HEALTH SCREENING QUESTIONNAIRE # HSC 003

TRAINING PROGRAM AVAILABLE FOR NEWLY HIRED OR PROMOTED SUPERVISORS YES (See below) _____ NO _____		
IF YES, DOES IT INCLUDE THE FOLLOWING?		(Check One) YES NO
Safe work practices		
Inspection techniques		
Toolbox safety meetings		
Emergency procedures		
First-aid procedures		
Accident prevention		
Fire protection and prevention		
Prework orientation		
Post construction clean-up and orientation		
Hazard communication		
Health and Safety regulatory standards		
QUESTIONS		(Check One) YES NO
Have you ever been inspected by OSHA or MSHA?		
If yes, have citations been issued in the last three years? (Attach copies of citations)		
Do you conduct inspections and tests of construction equipment, for example, slings,		
Are records prepared and maintained as required by federal and state laws?		
If operators of equipment are certified, enter name of person/organization/consultant providing certification for:		
Cranes		
Mobile Equipment		
Fork Lift Trucks		
COMMENTS BY CONTRACTOR OFFICIAL REFLECTING COMPANY SAFETY AND HEALTH POLICY:		
QUESTIONNAIRE COMPLETED BY:		
NAME:	TITLE:	
COMPANY:		
ADDRESS:		
TELEPHONE:	DATE:	

17. Reporting unsafe acts or conditions
18. Safe work areas
19. Safe and healthful orientation for supervision
20. Special instructions and/or information
21. Supervising for safety and health
22. Toolbox safety meetings
23. Task training
24. Training mandated by OSHA or MSHA
25. Process safety management procedures

C. General Requirements for Contractors

1. Each contractor shall be directly responsible for initiating and maintaining a safety effort to prevent his employees from working under conditions which are unsafe, unhealthy, or unsanitary. The contractor's compliance with the Mine Safety and Health Act, the Occupational Safety and Health Act, state and local codes governing safe work practices, and ASARCO's site Safety Manual is mandatory.
2. Each contractor is required to conduct substance abuse screening for all prospective employees.
3. Carelessness or disregard for accepted health, safety, and fire protection standards will not be tolerated.
4. The contractor shall prohibit the use of unsafe machinery, tools, material, or equipment. These shall be identified as unsafe by tagging or by locking the controls to render them inoperable or they shall be removed from service in accordance with applicable regulations.
5. The contractor shall permit only employees who are qualified and competent by virtue of training or experience to operate equipment and machinery.
6. Contractors shall instruct their employees to recognize and avoid unsafe conditions. Employees should know the regulations applicable to their work environments to control or eliminate any hazards that cause exposure, illness, or injury.
7. Contractors shall instruct and train each of their employees required to handle or use flammable liquids, gases, toxic materials, poisons, caustics, and other harmful substances in their safe handling and use. Contractors

shall provide training to their employees on potential hazards, necessary personal hygiene, personal protective measures, and all other matters required by the OSHA Hazard Communication Standard and any other applicable OSHA or MSHA standards governing exposure to specific hazardous substances.

8. Contractors shall instruct and train their employees required to enter confined or enclosed spaces in accordance with OSHA confined space requirements.
9. Any contractor employee reporting to work intoxicated or apparently under the influence of intoxicants or drugs will not be permitted on job site.
10. Designations of areas posted as "OFF LIMITS," "RESTRICTED ACCESS," or the like shall be obeyed by all employees.
11. Alcohol and firearms are prohibited on Facility property.
12. Any physical impairment, handicap, or medication taken regularly must be reported to a supervisor and the first aid facility.
13. Contractor employees must know the symptoms, as well as the causes, treatment, and prevention of heat stroke and exhaustion. Symptoms may be due to a combination of high heat, humidity, low air movement, tyvek suits, or job conditions.
14. Contractors working in restricted areas must ensure that biological and/or air monitoring, if required, is conducted. While ASARCO prefers that such monitoring be conducted by the contractor, any such monitoring performed by ASARCO for contractor employees is voluntary and done to enhance safety and health in the workplace. Such actions do not change or diminish the contractor's responsibilities regarding biological monitoring. If monitoring is performed by ASARCO, the delivery of monitoring results to contractor and its employees must be documented along with any preventive action required by contractor. Furthermore, any such voluntary services provided by ASARCO will be addressed in contract provisions.

D. Contractor Safety Education, Training and Promotion

1. A proven means of instituting and reinforcing a safety program is through carefully planned and conveyed safety education, training and informational activities. These activities must be presented logically and systematically to ensure that all employees know their obligations and responsibilities for achieving a safe work environment.
2. ASARCO requires contractors to convey the message that safety is a priority through a variety of activities. These activities include, but are not limited to:

- a. New hire safety and health orientation/indoctrination by contractor safety representative.
 - b. Contractor foreman safety and health orientations for employees.
 - c. Weekly contractor "Toolbox" safety and health meetings.
 - d. Project safety and health bulletin boards.
3. All newly-hired contractor employees must be required to attend a safety and health orientation on the first day of employment. The orientation will be conducted by the contractor and ASARCO prior to assigning employees to begin work. This includes all contractor personnel as well as subcontractor personnel.
4. Employees of a low risk contractor, as defined in ASARCO's Contractor Policy at Section C(1), may not require all aspects of safety and health training if accompanied by an authorized ASARCO representative but must be given appropriate hazard recognition and emergency training.
5. The contractor has primary responsibility to maintain a safe and healthy working environment.
6. Employees shall take all necessary precautions to ensure their own personal health and safety and that of other workers and to cooperate with ASARCO's safety effort.
7. The contractor must know and follow the reporting procedures for occupational injuries and illness. Every injury and illness shall be reported as required by the site and to the employee's supervisor. Any employee who has obtained outside medical treatment for an alleged work site injury or illness must report his or her injury or illness and the name of the attending physician to the first aid facility and his/her supervisor no later than the first normal scheduled workday following his or her outside medical treatment.
8. Every employee shall be informed that attendance at scheduled weekly contractor "Toolbox" safety and health meetings is mandatory. This weekly meeting will allow employees to ask questions, offer suggestions, and air complaints about safety on the project.
9. Employees shall be instructed that they are to report all unsafe acts or conditions. ASARCO's representative must be informed of any such reports. Any unresolved problems shall be reported to the Contractor Safety Coordinator and to ASARCO's representative. **IN CASES OF "IMMINENT DANGER," THE HAZARD SHALL BE IMMEDIATELY ABATED OR PROTECTIVE ACTION SHALL BE IMMEDIATELY TAKEN TO PREVENT INJURY. THE EMPLOYEE SHALL NOTIFY THE FIRST CONTRACTOR AND/OR ASARCO SUPERVISOR THE EMPLOYEE CAN FIND OF THE SITUATION. THE EMPLOYEE SHALL COMPLETE SUCH NOTIFICATION WITH ALL DUE SPEED!**

10. A safety discipline, warning letter, suspension or termination or other appropriate written notification is to be utilized in disciplining employees for unsafe acts.
11. Each employee is to be informed on established emergency procedures so that he/she may render voluntary assistance in case of serious injury, fires, evacuation, etc.
12. Every contractor employee is required to wear personal protective equipment, as mandated by applicable regulations, and ASARCO site policy. Minimum requirements for personal protective equipment are referenced in Section H.
13. All "air contaminants" regulated areas are marked throughout the Facility by posted signs. Approved respirators must be worn in these regulated areas by all contractor employees. Although the Facility has extensive controls to minimize air contaminants, systems can malfunction, or employees may be working in an area where controls are not feasible. Contractors must emphasize that employee protection depends upon proper respirator use. Again, in instances where ASARCO voluntarily provides respirators for contractor personnel, such action does not diminish or change the contractor's responsibility in connection with respiratory protection for its personnel, and such voluntary actions by ASARCO will be addressed in the contract.
14. If a contractor's employees may be exposed to hazardous substances for which OSHA has established specific compliance requirements, in addition to the permissible exposure level, e.g., arsenic, cadmium, and lead, the contractor must develop a written compliance program that meets all applicable OSHA requirements, including the following:
 - a. A description of each operation in which the hazardous substance is emitted, e.g. machinery used, material processed, controls in place, crew size, employee job responsibilities, operating procedures, and maintenance practices.
 - b. A description of the specific means that will be employed to achieve compliance, including engineering plans and studies used to determine methods selected for controlling exposure, as well as, where necessary, the use of appropriate respiratory protection to achieve the Permissible Exposure Limit (PEL).
 - c. A report of the technology considered in meeting the PEL.
 - d. Air monitoring data that document the source of the regulated emissions.
 - e. A detailed schedule for implementation of the program, including documentation such as copies of purchase orders for equipment, construction contracts, etc.

- f. A work practice program that includes all elements required by OSHA with regard to emergency situations and a written emergency situation plan, protective clothing and equipment, and hygiene areas and practices.
- g. Any other relevant information.
- h. An administrative control plan provision and schedule, if appropriate.
- i. A description of the compliance arrangements made between the contractor and any sub-contractors that assure subcontractor compliance with applicable regulations and with these requirements.

The contractor's written compliance program must be updated at least every six (6) months, and more frequently if necessary. The contractor may be provided a copy of ASARCO programs to assist in the development of its own program. However, ASARCO's program can not be substituted for the contractors; and the contractor's program must address the specific job/project at ASARCO's facility.

E. Weekly Contractor Toolbox Safety and Health Meetings

- 1. The contractor will hold weekly safety and health meetings with the workers to discuss work practices and conditions related to safety and health.
- 2. Upcoming activities, additional materials such as health risk reminders or prior week's accidents, and the "topic of the week" will be provided by the contractor.
- 3. The contractor will make records of these meetings.
- 4. Attendance at these safety and health meetings is mandatory. Once established, the day, time, and location of these meetings should not be changed unless absolutely necessary.
- 5. Copies of records of safety and health meetings shall be available to ASARCO upon request.

F. Project Safety Bulletin Boards

- 1. In order to promote safety and maintain a highly visible safety profile on the work site, contractors shall establish safety bulletin boards.
- 2. Bulletin boards will be of sufficient size to accommodate the following material:
 - a. Appropriate Mine Safety and Health, Occupational Safety and Health, and Workers' Compensation information posters.

- b. Emergency phone numbers, e.g., fire department, ambulance, hospital, etc.
- c. ASARCO Site Safety Manual.
- d. ASARCO Independent Contractor Safety and Health Policy.
- e. Contractor Safety and Health Program.
- f. Appropriate safety posters.
- g. Green and white metal safety placard stating:

**NOTICE
YOUR CONTINUED EMPLOYMENT
ON THIS PROJECT IS DEPENDENT
UPON YOUR WILLINGNESS TO
OPERATE SAFELY.
YOU MUST FOLLOW THESE SAFETY RULES.
BELIEVE IN AND INSIST
UPON SAFETY.**

- h. Location of Material Safety Data Sheets and name and phone number of person to contact (right-to-know).
- 3. Bulletin boards will be located where they are readily accessible, may be easily read by employees, and will not be destroyed.
- 4. Each contractor has the responsibility to see that the material on the bulletin board is current.

G. SAFETY EQUIPMENT & POLICY

- 1. It is the responsibility of contractor and subcontractor management to assure strict compliance with established safety rules, regulations and policies.
- 2. Safety offenders are to be disciplined and terminated when necessary.
- 3. The safety orientation or training held for all employees shall specify verbally that violations of the Mine Safety and Health Act, Occupational Safety and Health Act and/or ASARCO's Site Safety Manual and/or Contractor Guidelines may result in penalties up to and including termination.
- 4. It is the responsibility of the contractor to communicate, to all management and hourly employees, that safety and health is the number one priority on the job site.

H. PERSONAL PROTECTIVE EQUIPMENT -- Minimum Requirements for Contractors

1. Hard Hats: ANSI approved (Z-89.1) hats or caps. Aluminum headgear is not permitted.
2. Safety Glasses or Goggles: ANSI approved clear with side shields appropriate to the job. No shade/tint glasses permitted. No contact lenses are permitted in designated work areas. Note: Should your employee wear non-safety prescription glasses he or she will wear a pair of safety goggles (OSHA approved) over the glasses.
3. Hearing: Hearing protection devices, such as ear plugs or muffs, must be provided which provide protection that meets or exceeds OSHA standards.
4. Work Clothes (where applicable): Contractors will furnish, clean and maintain all required work clothes.
5. Respirators:
 - a. Furnish, clean, and maintain appropriate respirators and cartridges that meet OSHA and ANSI standards.
 - b. Contractor employees must be fit tested to ensure a proper face seal.
 - c. Beards are not permitted. Contractor employees using respirators must be clean shaven daily to ensure proper face seal.
6. Work Gloves: Contractors will supply work gloves appropriate for the job and meeting all ANSI and OSHA standards.
7. Safety toe shoes: Must meet OSHA and ANSI minimum standards and be provided by contractors.
8. Burners: Welders will wear OSHA/ANSI approved fire resistant gloves, leathers, fire retardant jackets (long sleeve) and required eye/face protection when welding, and such protective gear will be provided by contractors.
9. Safety Belts and Lanyards: ANSI approved safety belts and lanyards must be worn at all times in areas where the danger of falling exists and contractors must provide them as required by OSHA standards. Workers must tie off, i.e., secure themselves to a part of the structure they are working on or a static line.
10. Acid Suits: Required in designated areas or in area where the potential for contact with acid exists, and OSHA required, ANSI approved suits must be provided by contractors.
11. Face Shields/Goggles: Must be worn when working with liquid metals, chemicals, or when safety glasses do not provide adequate protection.

Such protective devices must be ANSI approved, meet OSHA standards, and be provided by contractors.

I. Mobile Equipment

1. Mobile heavy equipment has the right-of-way.
2. Use installed seat belts while operating equipment.
3. Do not exceed lifting capacities of equipment.
4. Use hooks with safety latches only.
5. When using man lifts, fall protection must be in place. Safety protection checklists must be maintained for the condition of lift equipment.
6. Heavy equipment as well as light duty vehicles must be inspected at the beginning of each shift to ensure safe operating condition. Equipment operators must complete an "operator inspection card". Equipment found to have defects that affect safety must not be put into service until corrected.

J. Flammable & Combustible Materials

1. Gasoline, diesel fuel, kerosene, and flammable solvents such as naphtha, xylene, or acetone shall be handled only in approved safety cans. Containers must be properly labeled and shall not be used for other purposes.
2. All oxygen and acetylene bottles shall be kept capped (except when gauges are in use) and secured in an upright position. Oxygen and acetylene shall be stored separately.
3. All hoses and gauges must be inspected before use. They must be separated by a minimum of 20 feet or a fire wall with a burn rate of 1 hour. Fire fighting equipment must be provided and available in the work area prior to welding or cutting.
4. Compressed oxygen and fuel cylinders (tanks) must be kept upright and secured, with the regulator and valve caps on at all times. Hoses must be gathered and arranged to eliminate tripping or other hazards.
5. All flammable chemicals must be sealed in properly marked containers and stored in an OSHA approved cabinet.

K. Other Rules

1. Contractor employees are required to inspect their work sites for hazards prior to initiating work and perform repeated hazard inspections throughout the day.

2. Compressed air lines shall not be used to blow down clothing or clean work areas.
3. Contractor employees will notify the site supervisor of any exposed electrical contact points.
4. Crane hooks and headache balls shall not be ridden nor shall steel columns be climbed or used as a means of descent.
5. When working overhead, a warning sign must be posted in a visible location and the area barricaded if necessary. Tools and materials must be secured to prevent them from falling below where they may cause an accident.
6. All tools and equipment must be physically inspected for damage. Those found to be unsafe must be taken out of service for repair. Power tools cannot have a lock-on switch and must be grounded.
7. All excavated fill must be kept a minimum of 3 feet away from the hole. An access/egress ladder must be in the hole any time an employee is working in the hole. The perimeter of the hole must be barricaded and warning lights used at night.
8. Ladders must be the proper size for the job to be performed and equipped with safety shoes. Inspect each ladder for damage before using it. Do not use a ladder that is broken or shows signs of fatigue! Take it out of service. Extension ladders will be tied off and secured against a stationary rest. When climbing or descending a ladder, use both hands.
9. Scaffolds must be set up by qualified personnel only. Only appropriate scaffold sills, posts, and base plates will be used. Braces must be fastened securely. All stages or planks must have rails, toe boards, and cleats in accordance with OSHA regulations.
10. Guards, safety devices, and limit switches must be in place and operational before using any equipment.
11. Do not remove guards or safety devices to operate any equipment.
12. Use the appropriate device to block equipment being repaired. Never depend on hoist or chain blocks to do the job.
13. Use hand tools only for the purpose for which they were designed.
14. Regular housekeeping must be performed to avoid health or safety hazards.
15. In areas of potential toxic exposure, consumption of food, beverages or tobacco is prohibited.

16. In areas of potential toxic exposure, shoveling, dry or wet sweeping and brushing may be used only where vacuuming or other equally-effective methods have been tried and found not to be effective.
 17. Construction projects with potential lead exposures must independently comply with OSHA's lead construction standard.
- L. Contractor Safety Representative: Each contractor will designate a Facility Contractor Safety Representative who will be directly responsible for safety and health within that contractor's scope of work. This representative will communicate with ASARCO to eliminate unsafe acts/conditions at the site as required by ASARCO's contract with the contractor.
- M. Contractor Safety Representative Must Be Required To:
1. Conduct daily safety and health inspections of work areas to monitor contractor's safety and health activities.
 2. Work with all subcontractors and their safety representatives to eliminate unsafe conditions and/or acts.
 3. Assist with (but not limited to) the following:
 - a. Attend the contractor's "Toolbox" safety meetings.
 - b. Required employee training including voluntary first aid, CPR, self-rescuer, etc.
 - c. Industrial hygiene, environmental and biological monitoring for noise pollution, air quality, blood levels, etc., as required.
 - d. Development of statistical information for accident, injury, and illness tracking, trending and workers' compensation.
- N. Contractors and their subcontractors are responsible for the safety and health of their own employees and must:
1. Provide and execute all work in compliance with federal regulations, all state and local codes, ASARCO's Safety Manual and the Contractor Health and Safety Guidelines.
 2. Provide and enforce the use of required personal protective equipment.
 3. Provide supervisory investigation reports for all accidents, property damage, and environmental incidents.
 4. Attend orientation sessions addressing safety.
 5. Schedule and attend weekly "Toolbox" safety meetings for all employees.

6. Take immediate action to correct or protect against unsafe practices or conditions when discovered.
7. Comply with OSHA's Hazard Communication Program, Construction Industry standard for lead and all other standards applicable to specific hazardous substances, Walking and Working Surface Standards, and all other applicable OSHA or MSHA standards.
8. Report observed unsafe conditions or practices or violations of job security which are not within contractor's jurisdiction.
9. Inspect work places, tools and equipment as required by OSHA, MSHA, manufacturer, ASARCO Safety Manual, and this guide.
10. Provide a copy of written safety program to ASARCO.

O. Statutory Safety And Health Requirements and Inspection:

1. The Mine and Occupational Safety and Health Acts (MSHA/OSHA)
 - a. The contractor and its employees are expected to know the requirements of MSHA/OSHA and to work diligently to comply with applicable requirements.
 - b. It is the contractor's responsibility to keep up with changes in MSHA/OSHA legislation and regulations and to comply with these changes.
 - c. The safety and health regulations and standards promulgated by MSHA/OSHA, ASARCO's Site Safety Manual and these guidelines are considered to be the minimum performance acceptable for contractors while completing a contract for ASARCO.
 - d. ASARCO facilities are regulated by MSHA and/or OSHA standards. Every effort to achieve compliance must be made by each contractor. The contractor must initiate immediate corrective action in the event a violation of these standards is discovered.
2. OSHA/MSHA Compliance Inspections
 - a. Periodically, MSHA/OSHA compliance officers may be required to inspect workplaces for the purpose of ensuring that employers are complying with the health and safety standards.
 - b. ASARCO is to be promptly notified when an MSHA/OSHA compliance officer visits the site, or any telephone or written inquiry is received by the contractor from any MSHA or OSHA official.

- c. An MSHA/OSHA compliance officer must present his/her credentials and state specifically the nature and scope of the visit.
- d. MSHA/OSHA representatives must be treated in a courteous manner.
- e. Copies of any MSHA/OSHA citations, penalties, notices, orders, or correspondence issued to the contractor or subcontractor will be provided to ASARCO.

**"FIXED PRICE" CONSTRUCTION OR REPAIRS CONTRACT
(FORM FP-10/97)**

CONTRACT FOR

(Insert name of job)

THIS AGREEMENT is made the _____ day of _____, 199____,
by and between: _____,
whose address is: _____
(hereinafter called the "Contractor") and _____,
whose address is: _____
(hereinafter called the "Owner").

Whenever used in this Agreement, the terms "Owner" and "Contractor" shall include their respective directors, officers, employees, servants, affiliates, subsidiaries, agents, successors and assigns. The term "Contractor" shall also include any and all subcontractors and their officers, employees, servants, affiliates, subsidiaries and/or agents, suppliers and any other parties in privity with the Contractor or under the Contractor's direction or control in connection with the Work.

W I T N E S S E T H :

The Contractor and the Owner, for and in consideration of the mutual covenants set forth herein, agree as follows:

Article 1. Scope of the Work

The Contractor shall furnish all such plans, shop drawings, field engineering, labor, materials, transportation, tools, equipment and other facilities in strict accordance with the requirements and provisions set forth herein and in strict accordance with the specifications, drawings and other requirements listed below and those drawings and specifications which may be supplied by the Owner or prepared by the Contractor at the Owner's direction subsequent to the execution of this Agreement and approved by the Owner. This Agreement, the Appendices hereto and all documents listed below are incorporated herein by reference and made a part hereof and are hereinafter referred to collectively as the "Contract" or the "Contract Documents." All work required to be performed under the Contract and the Contract Documents shall be referenced herein as the "Work" or the "Project."

(Identify and Attach Specifications, Drawings and Other Requirements)

**"FIXED PRICE" CONSTRUCTION OR REPAIRS CONTRACT
(FORM FP-10/97)**

Article 2. Time of Completion

The Work to be performed under this Contract shall begin on _____ and shall be substantially completed as defined in Article 5 by _____ and fully and finally completed by _____, plus any applicable extensions of time granted by the Owner.

Article 3. The Contract Price

The Owner shall pay the Contractor for the performance of this Contract, subject to any additions and deductions herein provided, the sum of _____ dollars (\$ _____), in lawful currency of the United States of America under the conditions hereinafter provided.

Article 4. Schedule of Values and Progress Payments

Within ten (10) days after the effective date of this Contract, the Contractor shall submit to the Owner a preliminary schedule of values for all of the Work which will include quantities and prices of items aggregating the Contract price. The schedule of values shall subdivide the Work into component parts in sufficient detail to serve as the basis for progress payments during construction. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work. Subject to the Owner's approval, the schedule of values will provide the basis for the Contractor's progress payments.

As soon as practicable after the first day of each calendar month, the Contractor shall present to the Owner an invoice equal to the percentage of the total amount of the Contract which has been completed from the start of the Project up through the end of the preceding month, plus the cost of materials purchased during the preceding month for the Project, together with such supporting evidence as may be required by the Owner. This invoice shall be based upon the schedule of values submitted by the Contractor. Subject to verification and approval of such invoice by the Owner, payment shall be due from the Owner on the thirtieth (30th) day after the Owner's receipt of an invoice from the Contractor. The amount due from the Owner to the Contractor shall be ninety percent (90%) of the total amount due under the Contract for the Work completed, less the total of previous payments. Upon the Owner's final acceptance of all Work required under the Contract, in accordance with Article 6 below, the Owner shall pay the Contractor a sum sufficient to increase the total payments to one hundred percent (100%) of the Contract price.

Article 5. Substantial Completion

"Substantial Completion" is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with all Contract Documents so the Owner can occupy or utilize the Work for its intended use. When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Owner a comprehensive list of items

**"FIXED PRICE" CONSTRUCTION OR REPAIRS CONTRACT
(FORM FP-10/97)**

Contractor a sum sufficient to increase the total payments to one hundred percent (100%) of the Contract price.

Article 5. Substantial Completion

"Substantial Completion" is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with all Contract Documents so the Owner can occupy or utilize the Work for its intended use. When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Owner a comprehensive list of items which remain to be completed or corrected relating to that portion of the completed Work. This list shall be identified by the Contractor as the "Contractor's Draft Punch List." Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract. Upon receipt of the Contractor's Draft Punch List, the Owner will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Owner's inspection discloses any item, whether or not included on the Contractor's Draft Punch List, which in the Owner's opinion prevents the Work from being substantially complete, the Contractor shall complete or correct such item upon receipt of notification by the Owner. The Contractor shall then submit a written request for another inspection from the Owner to determine Substantial Completion. When the Owner determines that the Work or designated portion thereof is substantially complete, the Owner will prepare and provide to the Contractor a Certificate of Substantial Completion which shall establish the date of Substantial Completion, and shall fix the time (if a change is required in the date originally established for final completion) within which the Contractor shall finish any remaining items of Work itemized by the Owner. This listing of remaining items of Work shall be identified as the "Owner's Final Punch List" and shall be provided to the Contractor along with the Certificate of Substantial Completion.

Article 6. Acceptance and Final Payment

(a) Upon receipt of written notice from the Contractor that the Owner's Final Punch List is complete and the Work is ready for final inspection and acceptance, the Owner shall promptly make such inspection. If and when the Owner finds the Work fully performed and acceptable under the Contract, the Owner shall promptly issue a Certificate of Final Completion. After all appropriate adjustments have been made to the Contract price, the entire remaining balance shall be paid to the Contractor by the Owner within thirty (30) days after the date of issuance of said Certificate of Final Completion.

(b) Before issuance of the Certificate of Final Completion, the Contractor shall submit evidence satisfactory to the Owner that all payrolls, material bills, and other indebtedness connected with the Work have been paid, and that the Work is free of all liens and encumbrances. The Contractor shall provide the Owner with releases of claims and liens for all of its subcontractors. In the case of disputed indebtedness or liens, the Contractor must submit a surety bond satisfactory to the Owner guaranteeing payment of all such disputed amounts when adjudicated.

**"FIXED PRICE" CONSTRUCTION OR REPAIRS CONTRACT
(FORM FP-10/97)**

Article 8. Insurance Certificate

The Contractor shall deliver to the Owner, along with the signed Contract and prior to any equipment or personnel being brought onto the Owner's premises a Certificate of Insurance evidencing the insurance coverages described in Article 37 of this Contract.

Article 9. Compliance with Laws and Ordinances

This Contract shall be performed and all equipment, goods, services or work furnished hereunder shall be produced, sold or delivered in strict compliance with all federal, state and local laws, rules, regulations, standards and other governmental requirements in effect as of the date hereof including, but not limited to, the Occupational Safety and Health Act of 1970, 29 U.S.C. §§ 651 *et seq.* (the "Occupational Safety and Health Act"), the Mine Safety and Health Act of 1977, 30 U.S.C. §§ 801 *et seq.* (the "Mine Safety and Health Act"), the statutes enforced by the United States Environmental Protection Agency ("U.S. EPA") and all applicable regulations and standards. The Contractor will furnish to the Owner certificates of such compliance in a form acceptable to the Owner. If the Contractor performs any Work or delivers any services or goods contrary to any laws, ordinances, rules or regulations, the Contractor shall bear all costs and expenses of any kind arising therefrom. The inclusion in this Contract of any specific requirements or agreements to comply with specific laws, regulations or ordinances does not and is not intended to relieve the Contractor of its obligation to comply with all laws, rules, statutes, regulations and ordinances.

Article 10. Employment and Related Laws

To the extent the goods and services to be provided hereunder are being utilized by the Owner to fulfill obligations pursuant to a contract with the federal government or any agency thereof or to the extent otherwise applicable as a matter of law to the contracting and/or subcontracting of services or Work hereunder, the following provisions are incorporated by reference and the Contractor represents that it will comply with them: The Equal Employment Opportunity Act, E.O. 11246 and 41 CFR Secs. 60-1.4 and 60-1.7; the Employment of Veterans Act, 41 CFR Sec. 60-250; and the Employment of Handicapped Act, 41 CFR Sec. 741-4, Drug Free Workplace Act of 1988 (Pub.L. 100-690); Walsh-Healey Public Contracts Act, 41 U.S.C. § 35-45; Service Contract Act of 1965, as amended, 41 U.S.C. 351, *et seq.*; Americans with Disabilities Act of 1990, 42 U.S.C. § 12101, *et seq.*, such other laws or regulations as the federal government may require the Owner to flow down to its contractors; and all rules and regulations issued pursuant to the foregoing.

Article 11. Intent of Contract Documents

**"FIXED PRICE" CONSTRUCTION OR REPAIRS CONTRACT
(FORM FP-10/97)**

The intention of this Contract is to include all labor and materials, equipment, supplies, services and transportation necessary for the proper execution and completion of the Work. All services, materials, equipment, activities or Work that are not specifically identified in Article 1, shown on the drawings, stated in the specifications or other Contract Documents, or listed herein, but that are reasonably necessary for the proper completion of all Work on the Project in accordance with the highest industry standards, shall be provided by the Contractor the same as if specifically identified in Article 1, shown on the drawings, stated in the specifications or other Contract Documents, or listed herein. Contract terms which have a well-known technical or trade meaning shall be interpreted accordingly. In the event of any inconsistency, conflict or ambiguity between or among the Contract Documents, such conflict shall be resolved by referring to the Contract Documents in the following order of precedence: (1) the most recent change orders and written amendments to this Contract signed by the Owner and Contractor; (2) the terms and conditions of this Contract.

Article 12. Drawings and Specifications

The Owner agrees to furnish, without charge to the Contractor, one (1) set of reproducible specifications and prints of all drawings listed in the specifications. Where revised or additional drawings and specifications are prepared as hereinafter provided, the Owner will furnish one (1) set of such revised or additional drawings and specifications to the Contractor.

The Owner agrees to furnish supplemental drawings as may be required to clarify the Contract drawings. Supplemental drawings shall neither enlarge nor decrease the scope of the Work. Where alterations in the Contract drawings and specifications affect the extent of the Work, the changes shall be governed as provided in Article 27 of this Agreement.

The Contractor agrees to furnish to the Owner for approval three (3) sets of prints of the following drawings before proceeding with the Work covered therein:

- A. All of the Contractor's drawings which are required or produced for this Project.
- B. Any shop drawings, detail sheets or erection diagrams required for any phase of the Work.
- C. Certified dimension sheets, wiring diagrams and performance curves covering any equipment purchased by the Contractor for the Project.

The Contractor shall make any corrections required by the Owner in drawings submitted for the Owner's approval. The Owner's approval as to the design of such drawings shall not relieve the Contractor of responsibility for errors or discrepancies of any sort.

The Contractor also agrees to furnish to the Owner five (5) sets of operation and installation instructions and parts lists for all equipment furnished by the Contractor, not later than the date the equipment is shipped, including two (2) certified copies of dimension sheets, wiring diagrams and performance curves of same.

**"FIXED PRICE" CONSTRUCTION OR REPAIRS CONTRACT
(FORM FP-10/97)**

As soon as the drawings referred to in subparagraphs A and B above are completed, checked and approved by the Owner, the Contractor shall furnish three (3) complete final sets of prints to the Owner.

Upon completion of the Project and as a condition for final payment, the Contractor shall provide the Owner with three (3) sets of record drawings showing all as-built conditions on the Project.

Article 13. Order of Completion and Schedules

The Contractor shall complete any portion or portions of the Work in such order of precedence as the Owner shall require, and the time for completion of the various stages or divisions of the Work will be determined by the schedules issued by the Contractor to the Owner and mutually agreed upon by the Owner and the Contractor. Within ten (10) days after the effective date of this Contract, the Contractor shall submit to the Owner a preliminary progress and schedule indicating start and completion dates for the various stages or divisions of the Work. The Contractor shall be responsible for maintaining and providing the Owner with written schedule updates on at least a monthly basis or as otherwise requested by the Owner. The schedules and updates shall be prepared by the Contractor in a form acceptable to the Owner.

Article 14. Contractor's Understanding

To the extent reasonably practicable or consistent with trade or industry practice, the Contractor shall satisfy itself as to the nature, physical condition and location of the Work, including but not limited to all subsurface conditions, the character of equipment and facilities needed prior to and during the execution or performance of the Work, the general and local conditions, and all other matters which can in any way affect the Work under this Contract. The Owner's subsurface investigations (if provided) are made for design purposes only. The Owner does not warrant that the conditions indicated by these investigations are representative of those throughout the Work area, or in any part of it. Where reasonably practicable or consistent with trade or industry practice, the Contractor is responsible to make its own subsurface investigation to determine the impact of the subsurface conditions on its Work. Information supplied by the Owner regarding subsurface conditions is provided to supplement the Contractor's own subsurface investigation, and such information is not to be relied upon by the Contractor. The Contractor's right to recovery or relief for any condition, whether or not anticipated, obvious or latent, shall be governed by Article 44 of this Contract and shall be limited solely to an extension of the Contract performance period.

Article 15. Utilities and Temporary Facilities

~~The Owner will not supply electricity, water, light, power, steam, compressed air or other utilities required for construction purposes unless specifically so provided in the Contract.~~

**"FIXED PRICE" CONSTRUCTION OR REPAIRS CONTRACT
(FORM FP-10/97)**

Where such items are not supplied by the Owner, they shall be furnished by the Contractor, and the Contractor shall, in either case, be required to make the necessary connections, provide approved shut-off and safety devices and furnish and install all temporary lines required to bring them to the point of use. The Contractor shall construct and maintain all necessary temporary facilities for the completion of the Work. The Contractor shall provide and maintain adequate sanitary facilities at the Project site. Upon completion of the Work, all such facilities shall, unless the Owner shall otherwise direct, be removed from the premises and the site cleared.

Article 16. Status and Responsibility of the Contractor and its Personnel

It is understood and agreed that the status of the Contractor and its subcontractors hereunder is that of an independent contractor, that their personnel performing services or Work hereunder shall under no circumstances be deemed to be employees of the Owner, and that any Worker's Compensation Insurance coverage and Occupational Safety and Health Administration ("OSHA") or Mine Safety and Health Administration ("MSHA") training required for such personnel will be the sole responsibility of the Contractor. Notwithstanding the aforesaid understanding, the general instructions of the Owner in connection with accomplishing the Work to be done hereunder shall be followed by the personnel of the Contractor.

The Contractor shall at all times enforce strict discipline and good order among its employees, and shall seek to avoid employing on the Work any unfit person or anyone not skilled in the Work assigned to him.

During the term of the Contract, it shall be the Owner's prerogative to require changes in the personnel of the Contractor's employees assigned to the Work when in the opinion of the Owner, their work is not conducive to the required scope of Work.

If for any reason the Contractor's employees or any of its subcontractor's employees or agents acquire a status imposing liability on the Owner for employers' contributions or taxes under the Federal Insurance Contribution Act, the Federal Unemployment Tax Act, any State Unemployment Tax or Wage Protection Act, any savings, profit sharing, pension, equity participation, or other benefit plans or for the violation of any federal, state or local act, statute or regulation, then the Contractor shall be solely and exclusively liable for, and shall indemnify, defend and hold harmless the Owner against the same so as to relieve the Owner from any and all liability, loss or damage therefor and from the responsibility for making reports or keeping records with respect thereto.

Article 17. Environmental Safety and Health Policy & Training

By accepting this Contract and beginning performance hereunder, the Contractor acknowledges that providing a safe and healthy workplace and protecting the environment is the Owner's first priority. The Contractor further agrees that any of its officers, agents, employees or subcontractors that enter the Owner's premises will be trained by the Contractor in the following areas: (a) applicable safety and health protection procedures, laws and regulations of federal, state and local governmental agencies, including but not limited to, OSHA and MSHA and/or

**"FIXED PRICE" CONSTRUCTION OR REPAIRS CONTRACT
(FORM FP-10/97)**

their state or local equivalents; (b) applicable environmental protection laws, procedures and regulations enforced by federal, state and local governmental agencies including, but not limited to, the U.S. EPA and/or their state or local equivalents; and (c) the Owner's site policies, rules and procedures.

Article 18. General Safety and Health Provisions

a. The Contractor agrees to fully comply with all Owner control procedures relating to facility access, including but not limited to, employee identification and information requirements, sign in/out and Work initiation/termination notification procedures. The Contractor agrees to comply with all Owner requirements applicable to the Contractor employee presence on site, including but not limited to, the use of respirators and personal protection equipment (e.g., hard hats, seat belts, gloves, safety glasses and coveralls) and the general safety and health provisions set forth below. The Contractor and its subcontractors and employees will complete and provide to the Owner the forms contained within Owner's Contractor Policy, and any other requested forms relating to safety, health and environmental protection.

b. The Contractor shall designate a job site representative to be its safety supervisor and that person shall be responsible for promoting safety, health, and accident prevention, interest in compliance with applicable laws, rules and regulations among its employees, and coordinating such activities with the Owner and any subcontractors and suppliers of the Contractor.

c. The Contractor shall convey in writing and orally to its employees that they must notify the Contractor and the Owner immediately of any safety or health concerns, newly discovered hazards or problems they may have at the Project, regardless of whether such concerns or problems relate to any job site policy, law, rule, regulation or any physical condition or process involving the Project premises or any circumstances, or any actions or inactions of the Owner or the Contractor. Upon receipt of such notice from an employee, or as follow-up to any oral or written notice issued by the Owner to the Contractor's site personnel, the Contractor must notify the Owner in writing within twenty-four (24) hours, of the stated concern, hazard or problem and what corrective and/or protective action has been taken and/or remains to be taken to evaluate the problem, mitigate the problem, prevent its recurrence, and effectively communicate with affected employees.

d. The Contractor acknowledges and agrees that it has been provided with and reviewed the Owner's Contractor Policy, safety and health rules and training materials and agrees to institute and follow such rules and apply them to the Work performed under this Contract.

e. The Contractor shall take all reasonable precautions to ensure the safety and health of all persons working at the Project and all persons who may in any way be affected by the Work, including but not limited to:

1. The Contractor agrees to limit its travel on the Owner's premises and facilities solely to that necessary for performing the contracted Work or services, and to be

**"FIXED PRICE" CONSTRUCTION OR REPAIRS CONTRACT
(FORM FP-10/97)**

accompanied by the Owner's personnel, unless authorized in writing to be unaccompanied following initial Work site arrival.

2. The Contractor agrees to comply with the Owner's substance abuse policies.
 3. The Contractor agrees to become familiar with and train its employees in the physical characteristics of the worksite, including, but not limited to, any hazards, restricted areas, protective measures and applicable emergency and evacuation procedures.
 4. The Contractor agrees to provide safe, functional equipment and materials and any training, testing or certifications that are necessary, appropriate or required to utilize such materials and equipment, including all equipment and tools needed to perform the job, and to provide approved personal protective equipment and clothing and respirators appropriate for the type of Work and Work location. The Contractor also agrees to maintain such equipment, materials and tools in good working condition.
 5. The Contractor agrees to be subject, at any time, to the Owner's Contract compliance monitoring, including inspections, testing, and the Owner's acceptance or rejection of Contractor-provided equipment, materials and tools employed or used to complete the Work.
 6. The Contractor agrees to obtain the Owner's written approval of its subcontractors and their employees before utilization on the Owner's premises. The Contractor must ensure that subcontractors meet the same safety and health requirements and provide the same information to the Contractor as the Owner requires of the Contractor. The Contractor in turn must provide copies of all such information to the Owner.
- f. The Contractor shall take all reasonable precautions to assure that it discovers, is made aware of and corrects any unsafe or unhealthy conditions, circumstances, actions or inactions that arise at the Project and that directly or indirectly affect any of the Contractor's personnel or the personnel of any other contractor or the Owner at the site.
- g. The Contractor shall promptly advise the Owner of any investigation or inspection of the Project site or the Contractor's workplace by any federal, state or local governmental agency and shall permit the Owner to participate fully in such inspections, and shall provide copies of inspection reports and notices of violations, and advise the Owner in writing of the progress and outcome of any such inspection or investigation or related litigation.
- h. The Contractor shall immediately notify the Owner (and if requested provide a detailed written report) of every accident involving injury to personnel or occupational illnesses or damages to the Owner's property occurring in connection with the Work or on the Owner's facility, and agrees to assist the Owner with any accident investigation in which the Contractor

**"FIXED PRICE" CONSTRUCTION OR REPAIRS CONTRACT
(FORM FP-10/97)**

has any involvement by providing access to and preserving the Work area and by producing any and all related documents and records and any employees who have knowledge of, were involved in, or may have witnessed the accident for interviews. The Contractor also agrees to record and report all required information to all appropriate federal, state and local regulatory agencies and to provide copies of such reports and information to the Owner. The Contractor shall also report to the Owner employee days and hours worked while on company premises.

i. The Contractor acknowledges and agrees that any safety or health advice or training, inspections, safety or health equipment, health or biological monitoring or other safety or health services that may be provided or performed by the Owner for itself or the Contractor, its subcontractors or their employees is strictly voluntary and is provided solely to enhance safety and health in the workplace. Any such actions by the Owner shall not be alleged to change or diminish or relieve the Contractor or its subcontractors of contractual, legal or governmental responsibilities in these areas and shall not constitute, nor be alleged in any inspection, investigation or legal proceeding to constitute control, supervision or direction by the Owner of the Contractor's or its subcontractor's employees.

j. The Contractor agrees to provide the Owner with its written safety program and certify that all required training has been completed in a timely manner pursuant to the applicable federal and state laws and regulations, and provide such completed forms as requested by the Owner to demonstrate compliance with this provision.

k. The Contractor agrees to use and employ a safety and health program at least as comprehensive as that included in Owner's Contractor Policy and to conform to all requirements and information requests set forth in said policy. If additional precautionary requirements are agreed to, they are set forth in Appendix A hereto and the Contractor agrees to comply with them.

Article 19. General Environmental Provisions

a. The Contractor is responsible for proper management, storage, removal and disposal of all supplies and materials utilized in the Work and waste materials generated in the course of performance of the Contract pursuant to the Owner's rules, and all applicable laws, ordinances, rules, regulations, standards and/or other governmental requirements related thereto, including but not limited to, those of OSHA, MSHA, the U.S. EPA, the Department of Transportation and all federal, state, municipal and local governmental agencies, and the applicable fire codes, including but not limited to, appropriate containers, labels, warnings and placards, and secondary containment for materials containing hazardous substances or petroleum.

b. The Contractor may store supplies, materials and wastes only in areas designated by the Owner. The Contractor may not store any wastes on the Owner's property in excess of ninety (90) days. If the Contractor utilizes any materials designated by federal, state or local law as a hazardous substance or hazardous waste, such materials must be stored in appropriate containers and spill control equipment must be available in the storage areas.

**"FIXED PRICE" CONSTRUCTION OR REPAIRS CONTRACT
(FORM FP-10/97)**

c. In the event of a fire or a spill or release of hazardous materials or wastes on the Owner's property, the Contractor will take actions necessary to prevent harm to the environment and human health, and immediately notify the Owner in accordance with the notice provision contained in Article 52, as well as the appropriate governmental authorities.

d. The Contractor is responsible for all costs associated with removal and off-site disposal of all hazardous and non-hazardous wastes. The Contractor must inform the Owner in accordance with the notice provision contained in Article 52 at least ten (10) days before any waste material is transported off-site for recycling or disposal.

e. In the event that the Contractor leaves any materials, supplies or wastes on the Owner's property (except those placed in a designated on-site land disposal unit with the Owner's written permission) after completion of the Work, said materials, supplies or wastes will be disposed of by the Owner at the Contractor's expense.

f. Prior to commencement of the Work, the Contractor will provide the Owner with a Material Safety Data Sheet for all materials and supplies to be utilized on the Owner's property in the course of performance of the Contract. At the Owner's discretion, the Owner may require that the Contractor utilize a substitute product that is less hazardous.

g. The Contractor is responsible for making all such Material Safety Data Sheets available to its own employees and those of its subcontractors pursuant to the Occupational Safety and Health Act.

h. Unless the Owner provides prior written approval to the Contractor, the Contractor may not bring any materials onto the Owner's property nor utilize any products that contain the following substances: asbestos, chlorofluorocarbons (CFCs), chlorinated solvents, or polychlorinated biphenyls (PCBs).

Article 20. Assessment For Contractor Violations And Audit Of Contractor Compliance

The Contractor recognizes and acknowledges that violations by the Contractor of health, safety, environmental and other statutory and regulatory authority may result in civil and/or criminal fines and penalties or in other damages and losses to both the Owner and the Contractor. The Contractor agrees that the Owner shall have the right to assess or backcharge the Contractor in an amount equal to that which OSHA, MSHA or U.S. EPA is authorized to assess for health and safety or environmental violations where the Owner reasonably determines that the Contractor, its agents, subcontractors or employees have committed such a violation. The Owner also shall have the right to inspect or audit the Contractor's records, conduct or actions during the performance of this Contract for the purpose of monitoring the Contractor's compliance with and enforcement of the terms of Articles 17 through 20. The Owner's remedies against the Contractor for violation of the terms of this Article shall not be limited to those set forth herein.

Article 21. Patents and Other Intellectual Property Rights

**"FIXED PRICE" CONSTRUCTION OR REPAIRS CONTRACT
(FORM FP-10/97)**

The Contractor shall indemnify, defend and hold harmless the Owner against and from any and all claims, losses, costs, damages, expenses, actions or other proceedings growing out of or resulting from the alleged infringement or infringement of any patent or other intellectual property rights by the Contractor in the performance of this Contract. This provision shall not apply to patented articles or processes specified in drawings or specifications furnished by the Owner provided any such claim is not attributable to the Contractor's negligence in the use of such patented articles or processes.

Article 22. Surveys, Permits and Regulations

If involved in the subject matter of this Contract, the base lines and mean datum will be established by the Owner; the control lines and levels and all general layout Work will be the responsibility of the Contractor. All controls established by the Contractor shall be preserved and maintained throughout the life of the Contract.

Unless otherwise specified, the Owner shall furnish all land surveys required. Permits and licenses of a temporary nature necessary for the prosecution of the Work shall be secured and paid for by the Contractor. Permits, licenses and easements for any permanent structures or any permanent changes in existing facilities shall be secured and paid for by the Owner, unless otherwise specified.

The Contractor shall provide all notices required by law which bear on the conduct of the Work as drawn and specified. If the Contractor observes that drawings and specifications are at variance therewith, the Contractor shall promptly notify the Owner in writing. If the Contractor performs any Work knowing it to be contrary to any such law, rule or regulation, and without such notice to the Owner, the Contractor shall bear all costs arising therefrom.

Article 23. Protection of the Public, the Work and Property

The Contractor shall provide and maintain all necessary watchmen, barricades, red lights and warning signs and take all necessary precautions for the protection and safety of employees on the Project, of all other persons and of adjacent private and public property. The Contractor at all times shall maintain adequate protection of the Work from loss and damage and shall protect the Owner's property and all persons thereon from injury, damage or loss by reason of any act or omission of the Contractor or any subcontractor.

In an emergency affecting safety, life or the Work or of adjoining property, the Contractor is, without special instructions or authorization from the Owner, hereby authorized to act at the Contractor's discretion to prevent such threatened loss or injury. The Contractor shall also so act if instructed by the Owner.

Any compensation claimed by the Contractor on account of an emergency of this nature shall be determined by mutual agreement and failing which, shall be resolved pursuant to Article 45.

**"FIXED PRICE" CONSTRUCTION OR REPAIRS CONTRACT
(FORM FP-10/97)**

Article 24. Inspection of Work

The Owner and its representatives shall at all times have access to the Work, and the Contractor shall provide safe and proper facilities for such access and for inspection. However, the mere fact that the Contractor's facilities or Work have been inspected is not to be interpreted as a determination by the Owner that the Contractor's Work is acceptable or that Contract requirements have been waived.

If the specifications, the Owner's instructions, laws, ordinances or any public authority require any item of material, equipment or Work to be specially tested or approved, the Contractor shall give the Owner timely notice in writing of its readiness for inspection. If the inspection is by an authority other than the Owner, the Contractor shall give the Owner notice of the date fixed for such inspection. The Owner shall conduct all inspections promptly. Where practicable, such inspections shall occur at the source of supply.

If any Work should be covered up by the Contractor before examination by the Owner without approval or consent of the Owner, it must, if required by the Owner, be uncovered for examination and properly covered again at the Contractor's expense. Even though the Owner has examined a particular item of Work, the Owner may order re-examination of such Work, and if so ordered, the Work must be uncovered by the Contractor. If such Work is found to be in accordance with the Contract, the Owner shall pay the cost of re-examination and replacement. If such Work is not in accordance with the Contract, the Contractor shall pay such cost.

Article 25. Contractor's Covenants/Supervision and Superintendence

The Contractor shall maintain a competent staff at all times to supervise and perform the Work. The Contractor shall maintain on the Project during its progress, a competent superintendent and any necessary assistants, all satisfactory to the Owner. Directions for contract compliance by the Owner may be given to the superintendent and shall be binding on the Contractor. Directions for contract compliance shall be confirmed in writing upon the written request of the Contractor. The Owner maintains the right to direct the Contractor to increase or modify the method or manner of supervision or superintendence on the Project if it deems necessary for contract compliance.

The Contractor shall use its best judgment and skill in dealing with labor matters, and take all reasonable steps to avoid labor disputes. In the event of any strike or threat of strike, slowdown, featherbedding or other like practices, the Contractor shall apprise the Owner of all relevant facts and implications of the particular labor problem involved, and shall consult in good faith with the Owner in an effort to reach a mutually satisfactory solution to such labor problem and, so far as reasonably possible, to protect the Owner against delays affecting the Work or damage or losses to its other operations.

Article 26. Qualification and Performance of the Contractor's Employees

**"FIXED PRICE" CONSTRUCTION OR REPAIRS CONTRACT
(FORM FP-10/97)**

The Contractor shall at all times supply a sufficient number of skilled workmen to diligently pursue the Work. Where required by applicable statutes, codes, rules, regulations and ordinances, all workmen engaged in such Work shall present evidence by certificate or otherwise that they are qualified to do the Work in conformity with such statutes, codes, rules, regulations and ordinances.

Article 27. Changes in the Work

The Owner, without invalidating this Contract, may at any time order extra Work or initiate changes in the Work by altering, adding to or deducting from the Work. If such extra Work or change involves a change in cost or in the time required for completion, the Contract price and Contract performance period shall be increased or decreased in accordance with the terms hereof and the instructions contained in Appendix B to this Contract. The Owner will initiate the change process by issuing to the Contractor the form in Appendix B entitled "Change Order Directive Form" ("CODF"). The Owner shall describe or itemize in the CODF the changes to be made by the Contractor. Upon receipt of the CODF, the Contractor shall complete and submit promptly to the Owner, the "Contractor Change Order Proposal Form" included in Appendix B and include therein an itemized statement of the extension or reduction in the time for completion of this Contract which the Contractor deems reasonable, and the Contractor's calculation of the adjustment in the Contract price resulting from the changes or extra Work. The Contractor's calculation of its proposed adjustment to the Contract price shall be completed in accordance with the form in Appendix B entitled "Instructions For Preparing Change Order Proposal." The Owner and the Contractor both must execute the completed CODF to memorialize a change order. The CODF must be fully executed by the Owner and the Contractor before Work on the changes is begun unless the Owner issues a written order to the Contractor to proceed immediately with the Work identified in the CODF. Where the circumstances require it, the Owner shall have the right to direct the Contractor to use a pricing methodology other than that set forth herein.

In the event the parties cannot agree upon the increase or decrease in the time for completion or in the amount of the Contract price adjustment under this Article 27, then the Contractor shall nevertheless proceed with the Work, including any extra Work or changes, and the dispute shall be settled in accordance with Article 45 hereof. Any dispute as to the amount of a change shall be resolved in accordance with the formula contained in the form attached hereto entitled "Instructions For Preparing Change Order Proposal."

No extra Work shall be performed or change shall be made except by written order of the Owner, and no claim for an increase in the Contract price or an increase in the time for completion shall be valid unless the extra Work or change was ordered in writing.

The Contractor may initiate the change order process under this Article 27 by requesting that the Owner issue a Change Order Directive Form. However, unless the Owner issues a Change Order Directive Form to the Contractor, this Article 27 shall not apply to and shall not provide the basis for a Contractor-initiated change, constructive change or equitable adjustment request, or claims of any nature, including but not limited to claims for changed conditions,

**"FIXED PRICE" CONSTRUCTION OR REPAIRS CONTRACT
(FORM FP-10/97)**

differing site conditions, defective specifications, delay, disruptions, or loss of productivity and efficiency.

Article 28. Warranty and Quality

The Contractor warrants that all goods, materials and services shall: conform to the specifications, drawings, samples or other description agreed to by the Contractor and the Owner; meet the highest industry standards for merchantability and workmanship; be free from all defects; and comply with all applicable laws and regulations. All goods and materials incorporated into the permanent Work shall be new. Such warranties shall survive the Owner's inspections, tests and acceptance for a period of twelve (12) months from the date the Owner issues a Certificate of Final Completion covering the Work. The Contractor's obligations and the Owner's rights hereunder shall remain in full force and effect beyond the twelve (12) month period to cover any defects that are latent or could not have been discovered through reasonable use of the goods or the services provided. If any goods or services performed are defective or otherwise not in conformity with the requirements of this Contract, the Owner, in addition to its other rights including the right to recover direct, consequential or incidental damages, attorney's fees and costs, may reject the same for full credit or require proper correction, replacement or completion thereof at the Contractor's expense. All rejected goods may either be returned to the Contractor at the Contractor's expense, or may be held by the Owner for disposition at the Contractor's risk and expense. The Contractor shall at all reasonable times permit inspection and testing by the Owner of all items, work in process, materials and workmanship covered by this Contract. The Contractor's warranty obligations shall survive termination.

Article 29. Deduction for Uncorrected Work

If the Owner deems it inexpedient to correct Work that has been damaged through the fault or neglect of the Contractor, or that was not done in accordance with the Contract, an amount to compensate the Owner fully for such damage or non-compliance shall be deducted from the Contract price. If the parties cannot agree on the amount of such deduction, it shall be determined in accordance with Article 45 hereof.

Article 30. Correction of Work Before Final Payment

The Contractor shall, within ten (10) days of receipt of written notice, remove from the premises all materials whether incorporated in the Work or not, and take down all portions of the Work, where the Owner has advised the Contractor that such materials or Work fail to meet Contract requirements. The Contractor shall within ten (10) days replace and re-execute the Contractor's own Work in accordance with this Contract and without expense to the Owner and shall bear the expense of making good all Work of other contractors destroyed or damaged by such removal or replacement.

If the Contractor does not remove such Work and materials within ten (10) days after service of written notice, the Owner may remove them and may store the materials at the expense of the Contractor. If the Contractor does not pay the expense of such removal and storage within ten

**"FIXED PRICE" CONSTRUCTION OR REPAIRS CONTRACT
(FORM FP-10/97)**

(10) days thereafter, the Owner may, upon ten (10) days' written notice, sell such materials at auction or at private sale and shall pay to the Contractor the net proceeds thereof, after deducting all the cost and expense that should have been borne by the Contractor. Should such cost and expense exceed the auction or sale price, the Contractor shall pay such difference promptly to the Owner upon the presentation of a substantiating invoice by the Owner. The Contractor waives all rights to claim damages or any other remuneration, except as required by law, for sale of materials at auction or private sale. Any dispute under this Article shall be determined in accordance with Article 45 hereof.

Article 31. Inspection and Correction of Work After Final Payment

Neither inspection by the Owner or its representative, nor the Owner's Certificate of Final Completion or final payment, nor any provision in this Contract shall relieve the Contractor of liability for providing faulty materials or workmanship.

Article 32. Owner's Right to Terminate Contract for Cause

Any of the following reasons shall provide the Owner with a basis for terminating the Contractor's Contract for cause: (1) any proceeding is instituted by or against the Contractor seeking to adjudicate it as bankrupt or insolvent, or seeking liquidation, winding up, reorganization, arrangement, adjustment, protection, relief or composition of its debts under any law relating to bankruptcy, insolvency or reorganization or relief of debtors or seeking the entry of an order of relief or the appointment of a receiver, trustee or other similar official for it or any substantial part of its property; or (2) the Contractor admits its inability or fails to pay its debts generally, or shall make a general assignment for the benefit of its creditors; or (3) the Contractor at any time fails, refuses or neglects to supply enough properly skilled workmen or proper materials; or (4) the Contractor fails to make prompt payments to subcontractors or for material or labor; or (5) the Contractor disregards laws, ordinances or the instructions of the Owner; or (6) the Contractor violates any provision of this Contract; or (7) the Owner reasonably determines that the Contractor has not timely or satisfactorily performed its Contract Work. If the Contractor shall fail to remedy any such default or deficiency to the satisfaction of the Owner within ten (10) days after the Owner's issuance of written notice to the Contractor, then the Owner may, without prejudice to any other right or remedy it may have under this Contract or as a matter of law, terminate the employment of the Contractor for the Contractor's default and take possession of the premises and of all material, tools and appliances thereon and finish the Work by whatever method the Owner deems appropriate and expedient.

If the unpaid balance due on the Contract for Work performed to the date of termination of the Contractor exceeds all loss or damages of the Owner caused in whole or in part by the Contractor's default, including but not limited to, any financial losses or expenses incurred or suffered by the Owner as a result of a delay in completion of the Work and the expense of finishing the Work and compensation to the Owner for the Owner's managerial and administrative services, and attorneys' fees and expenses, then such excess shall be paid to the Contractor within a reasonable time after final completion of the Project. If such loss or damages to the Owner shall exceed such unpaid balance, the Contractor shall not be entitled to payment of

**"FIXED PRICE" CONSTRUCTION OR REPAIRS CONTRACT
(FORM FP-10/97)**

the unpaid balance and shall further pay to the Owner all damages incurred by the Owner which were caused in whole or in part by the Contractor. Following termination, the Owner may complete the Contract Work and reprocure the necessary services for completing the Work, and the Contractor shall be liable for any additional damages or costs incurred by the Owner.

Article 33. Owner's Right to Terminate Contract for Convenience (Without Cause)

The Owner may, at any time, terminate the Contractor's services under the Contract for any reason whatsoever or for its convenience by giving the Contractor not less than fifteen (15) days' written notice of termination setting forth the effective date of termination. In the event of such termination, the Owner shall pay to the Contractor the balance due on the Contract price for Work actually performed, accepted and approved by the Owner prior to the effective date of such termination, less payment previously made by the Owner on account thereof and less any damages or loss the Owner may have incurred as a result of the Contractor's performance or conduct. The Owner shall have the right to audit and review all amounts claimed by the Contractor pursuant to this Article. The Contractor shall not be entitled to demand any damages, consequential or otherwise, compensation or indemnity of any kind as a consequence of such termination.

Article 34. Removal of Equipment

In the case of termination of this Contract before completion for any cause whatsoever, the Contractor shall promptly remove any part or all of the Contractor's equipment and supplies from the property of the Owner, failing which the Owner shall have the right to remove such equipment and supplies at the expense and at the risk of the Contractor, without liability of the Owner for any damage to, or loss of the same.

Article 35. Use of Completed Portions

The Owner shall have the right to take possession of and use any completed or partially completed portions of the Work, notwithstanding the time for completing the entire Work or such portions may not have expired; but such taking possession and use shall not be deemed an acceptance or approval of any Work not completed in accordance with this Contract.

Article 36. Payments Withheld

The Owner may withhold all or part of any progress or final payment to the extent necessary to protect the Owner from loss or damage on account of:

- a) Damaged or defective Work not remedied;
- b) Claims filed or reasonable evidence indicating probable filing of claims by other parties against the Contractor or the Owner;

**"FIXED PRICE" CONSTRUCTION OR REPAIRS CONTRACT
(FORM FP-10/97)**

- c) Failure of the Contractor to make payments properly to subcontractors or for material or labor;
- d) A reasonable doubt that this Contract can be completed for the balance then unpaid or within the time specified;
- e) Damage to the Owner's property or the work of another contractor;
- f) Failure of the Contractor to make satisfactory progress or to meet the established schedule or milestones;
- g) The Contractor's violation of any applicable laws, ordinances, rules, regulations, instructions and/or other general regiments; and
- h) Any other penalty, fine, damage or cost incurred or sustained by the Owner or that may be incurred or sustained.

Article 37. Contractor's Insurance

The Contractor shall, for the mutual protection and benefit of both the Owner and the Contractor, procure, pay for and maintain in full force and effect, at all times during the performance of the Work through the Owner's issuance of a Certificate of Final Acceptance of the Work, and for completed operations, policies of insurance issued by a responsible carrier or carriers acceptable to the Owner which afford the following coverages:

- a. Workers' Compensation - Statutory.
- b. Employer's Liability - Not less than \$500,000.
- c. Comprehensive General Liability including Independent Contractors' Broad Form Contractual, Broad Form Property Damage, Personal Injury, Completed Operations and Products coverages (such Completed Operations and Products coverages shall be provided for a period of two (2) years after final completion of the Work and final acceptance by the Owner), and deletion of any exclusion pertaining to explosion, collapse, underground property damage, radiation and pollution hazards. - Not less than \$2,000,000 combined single limit for both bodily injury and property damage.
- d. Comprehensive Automobile Liability including Owned, Non-Owned, and - Not less than \$2,000,000 combined single limit for both bodily injury

**"FIXED PRICE" CONSTRUCTION OR REPAIRS CONTRACT
(FORM FP-10/97)**

Hired Car coverages.

and property damage.

All policies, with the exception of Workers' Compensation, shall name the Owner, its subsidiaries, directors, officers, agents and employees as additional insureds, and shall expressly provide that the interest of same therein shall not be affected by any breach by the Contractor of any policy provision. All policies shall expressly provide that no less than thirty (30) days' prior written notice shall be given to the Owner in the event of material alteration to or cancellation of the coverages evidenced by such policies. Further, all policies shall contain endorsements waiving the insurer's right of subrogation against the Owner, its subsidiaries, agents and affiliated companies, and their directors, officers, agents and employees.

Upon renewal of each policy, the Contractor shall provide to the Owner a Certificate of Insurance evidencing all of the provisions specified in this Article.

The Contractor will maintain the original of all policies, endorsements and certificates, and provide the Owner with copies of same upon request of the Owner.

Article 38. Indemnity by the Contractor

The Contractor agrees to indemnify, defend and hold harmless the Owner from and against all claims, suits or demands of any kind and description, and from and against all alleged or actual damages, loss, fines or penalties which the Owner or the Owner's property may sustain, incur, suffer or receive and which arise or allegedly arise in whole or in part from the Contractor's performance under this Contract or from any other conduct, actions or inactions by the Contractor. The Contractor's indemnity obligations include, but are not limited to payment of all judgments, legal fees and expenses incurred by the Owner. The Owner's rights and the Contractor's indemnity obligations hereunder shall apply with full force and effect even if the Owner or any third party is or may be liable or responsible in part for the claim, suit, demand, damage, loss, fine or penalty sustained, incurred, suffered, or received. However, the Contractor's indemnity obligation shall apply for the amount and to the extent that the Contractor is at fault for or the cause of such loss or damages. The Owner's rights and the Contractor's obligations hereunder shall survive the expiration or termination of this Contract.

The Contractor's duty of indemnity shall apply with full force and effect even if the Owner provides the Contractor with environmental safety, health and training materials, goods or services or otherwise voluntarily assists the Contractor in protecting people and property and meeting its compliance obligations hereunder. The Contractor acknowledges that any such services provided by the Owner are provided voluntarily and solely for the purposes of assisting the Contractor in protecting the environment and people.

Article 39. Surety Bonds

Unless otherwise provided in writing by the Owner, the Contractor shall furnish a bond covering the faithful performance of this Contract and the payment of all obligations arising

**"FIXED PRICE" CONSTRUCTION OR REPAIRS CONTRACT
(FORM FP-10/97)**

thereunder, in such form as the Owner may prescribe and with such sureties as it may approve. If such bond was required by instructions given prior to the receipt of bids, the premium shall be paid by the Contractor; if subsequent thereto, it shall be paid by the Owner. If any change in Work is authorized pursuant to the terms of this Contract, the Contractor will be solely responsible for securing and maintaining bonds reflecting such change.

Article 40. Liens

Where permitted by applicable law, the Contractor shall not file a lien or encumbrance on the property in connection with the Project. Where the applicable law prevents the Owner and the Contractor from agreeing that the Contractor will not file a lien or encumbrance, neither the final payment nor any progress payment shall become due until the Contractor, if required, shall deliver to the Owner a complete release of all liens and claims arising on account of labor, materials, machinery or equipment in respect of which such payment is to be made and an affidavit that so far as the Contractor has knowledge or information, the releases include all the labor and materials for which a lien could be filed. The Contractor may, if any subcontractor refuses to furnish a release or receipt in full, furnish a bond satisfactory to the Owner to indemnify the Owner against any lien. If any lien remains unsatisfied after all payments are made, the Contractor shall pay to the Owner all monies that the Owner may be compelled to pay in discharging such a lien, including all costs and attorneys' fees.

Article 41. Assignment

The Contractor shall not assign or sublet this Contract in whole or in part, nor shall the Contractor assign any monies due or to become due hereunder, without the prior written consent of the Owner.

Article 42. Coordination of Work

The Contractor shall conduct and coordinate all Work on the Project so as to cause no interference when possible, or a minimum of interference when such interference is unavoidable, with the Owner's activities and operations. Where interference with the Owner's operations becomes absolutely necessary, permission shall be requested by the Contractor not less than seventy-two (72) hours in advance.

When other contractors or the Owner's personnel are working on the Project on the immediate premises, the Contractor agrees to so schedule the Contractor's Work so as not to make it necessary for the Contractor to damage or otherwise alter any Work that has been completed by such other persons. If the Contractor fails to do so, then the Contractor shall replace or repair the damaged Work at the Contractor's own expense and in a manner satisfactory to the Owner.

If any part of the Contractor's Work depends upon the proper execution of the Work of any other person, the Contractor shall inspect and promptly report in writing to the Owner any defects in such Work that render it unsuitable for such proper execution and results. The

**"FIXED PRICE" CONSTRUCTION OR REPAIRS CONTRACT
(FORM FP-10/97)**

Contractor's failure to so inspect and report in writing shall constitute an acceptance of such other Work as fit and proper for the reception of the Contractor's Work.

Article 43. Subcontractors and Suppliers

The Contractor will not employ any subcontractor without the prior written approval of the Owner, and the Contractor agrees to be responsible for any failure by the subcontractor to comply with the terms and conditions of this Contract which are in any way applicable to such subcontractor. Nothing herein shall be deemed to create a contractual relationship between any such subcontractor and the Owner or provide a basis for any claim by a subcontractor against the Owner.

All of the Contractor's subcontractors and suppliers shall be apprised of the terms and conditions of this Contract and shall be held liable, accountable for and subject to these terms and conditions in their own subcontract work and supply contracts to the same extent and degree that the Contractor is or would be liable, accountable for and subject to these terms and conditions in its Contract Work. It shall be the Contractor's duty to ensure that its subcontractors and suppliers accept and comply with the terms and conditions of this Contract and the Contractor shall supply to the Owner evidence of such compliance in a form acceptable to the Owner or provide a basis for any claim by a subcontractor against the Owner.

Article 44. Contractor Claims

If the Contractor is delayed, disrupted or interfered with or suffers damage or loss of any kind at any time in the progress of the Work by an act or neglect of the Owner, or a separate contractor employed by the Owner, or by changes or alleged changes ordered in the Work, or by an event giving rise to a claim of any nature (except changes that the Owner initiates under Article 27 above), or by a force majeure event (as defined in Article 51), then the Contractor's sole remedy against the Owner shall be the award of a change order extending the Contract performance period for such reasonable time as the Owner may determine. All claims for extension of the Contract time shall be made in writing to the Owner no more than twenty-one (21) days after the occurrence of the event giving rise to the claim, otherwise they shall be waived. An extension of the performance period of the Contract, to the extent permitted by the Owner, shall be the Contractor's sole and exclusive remedy from and against the Owner for any and all damages, losses, expenses or costs (consequential or otherwise) sustained by the Contractor in connection with or arising from changes or alleged changes, delays, suspension, acceleration, hindrance, obstruction, unanticipated or differing site conditions, costs, duration-related economic injury, loss of productivity, extended home office overhead or any damages or expenses of whatever type and amount to the Contractor. The Contractor hereby waives its rights to claim and be compensated for monetary damages, losses, expenses or costs (consequential or otherwise) in connection with, or arising from such events or circumstances. This Article shall not preclude the Owner from recovering from the Contractor all direct, consequential or other damages it may sustain, including but not limited to procurement costs that are caused by or arise in any way from the actions of the Contractor, its subcontractors or any of their officers, agents, affiliates or employees.

**"FIXED PRICE" CONSTRUCTION OR REPAIRS CONTRACT
(FORM FP-10/97)**

Article 45. Disputes

Claims, disputes or other matters in question between the parties to this Contract shall first be subject to mediation before arbitration. A demand for mediation shall be made within thirty (30) days after one party has notified the other party in writing that a dispute or claim has arisen. After the expiration of the thirty (30) day period, the parties may nevertheless agree in writing to submit the claim or dispute to mediation. Any mediation shall be held in accordance with the Construction Industry Mediation Rules of the American Arbitration Association in effect when the dispute arises, unless the parties mutually agree otherwise. The mediation shall take place at a mutually convenient location in the city closest to the Owner's facility originating this Contract. Demand for mediation shall be filed in writing with the other party to this Contract and with the American Arbitration Association. Any dispute or difference arising out of, or in connection with, this Contract which cannot be amicably settled between the parties by mediation shall be finally settled by arbitration under the Rules of Construction Arbitration of the American Arbitration Association. The arbitration shall take place at a mutually convenient location in the city closest to the Owner's facility originating this Contract. The resulting decision of the arbitrators shall be final and binding on the parties. Judgment upon any award rendered by the arbitrators may be entered in any court having jurisdiction thereof. In no event shall the demand for mediation or arbitration be made after the date when institution of legal or equitable proceedings based upon such claim, dispute or other matter in question would be barred by the applicable statute of limitations.

Article 46. Title

Title to all Work completed or in the course of construction shall be in the Owner; and title to all machinery, equipment and materials to be incorporated in the Work shall be in the Owner as soon as they are delivered on the site of the Project.

Article 47. Technical Information

The term "technical information" as used in this Contract includes, but is not limited to, technical data, reports, models, drawings, specifications, operating manuals, designs, computations, formulas, apparatus, processes, patentable or unpatentable inventions and other engineering data. The Contractor agrees to accept the Owner's decision as to whether any particular information is technical information which has been made or conceived under this Contract.

It is understood that in the course of the Contractor's performance hereunder, the Contractor may learn or have access to technical information of the Owner. Unless otherwise required by law, the Contractor agrees that it and its personnel will keep in confidence all such technical information of the Owner and will not use or disclose the same without the Owner's written consent, either during the term of this Contract or at any time thereafter.

The Contractor agrees to disclose to the Owner all technical information made or conceived by it or its personnel in performance, or resulting from performance, under this

**"FIXED PRICE" CONSTRUCTION OR REPAIRS CONTRACT
(FORM FP-10/97)**

Contract. The Contractor agrees that all such technical information or inventions made or conceived by it or its personnel shall become and remain the free and unrestricted property of the Owner and that the Contractor shall assign or cause the same to be assigned to the Owner. The Contractor agrees that it and its personnel will keep in confidence all such technical information made or conceived by the Contractor or its personnel and that the Contractor and its personnel will not use or disclose the same without the Owner's written consent, either during the term of this Contract or at any time thereafter.

The Contractor agrees, upon the request and at the expense of the Owner, to make or cause its personnel to make applications for patents in such countries as the Owner may designate on those of the aforesaid assigned technical information or inventions which the Owner believes to be patentable and to assign all such applications to the Owner or its order; and to give the Owner, its attorneys and solicitors all reasonable assistance in preparing such applications, and in prosecuting such applications in the patent office or offices involved and in defending and enforcing any patent that may be issued upon any such application; and to execute all papers that may be reasonably required in the prosecution of such applications or to vest in the Owner or its assigns said inventions, applications and patents.

Article 48. Cleaning Up

The Contractor shall at all times keep the premises free from accumulations of waste material or rubbish caused by the Contractor or the Work. At the completion of the Work, the Contractor shall remove all of its rubbish, tools, scaffolding and surplus materials from and about the site and the Contractor shall leave the Work "broom clean" or its equivalent, unless more exactly specified.

Article 49. Adaptability of Plans and Specifications

Except in the case of patented products for which there is no adequate substitute, the Contractor will not, without the prior written approval of the Owner, prepare any drawings or specifications or do any engineering or planning for the prospective use or installation of any tool, piece of equipment, or material in the Work which is of such a character that such drawings, specifications, engineering or planning could not be used with equal facility in connection with the product of all or most manufacturers of such tools, equipment or materials, or any substitute therefor.

Article 50. Engineering Approval

The Contractor agrees to order no material or equipment and to do no actual construction, and to permit no Work to be done by any subcontractor or supplier of materials or equipment until the drawings relating thereto, the lists and specifications of materials, the equipment to be used and the supplier have been approved by the Owner. During construction, the Contractor shall make no substitution of material without the prior written approval of the Owner.

Article 51. Force Majeure

**"FIXED PRICE" CONSTRUCTION OR REPAIRS CONTRACT
(FORM FP-10/97)**

"Force majeure" shall be any cause beyond the control of the parties hereto which they cannot reasonably have foreseen and guarded against. Force majeure includes but is not limited to, acts of God, labor disputes, financial crises, fires, riots, civil commotions or civil unrest, incendiarism, interference by civil or governmental authorities, and acts of war (declared or undeclared). Should any dispute arise between the Owner and the Contractor regarding a force majeure event, such dispute will be resolved pursuant to Article 45 of the Contract.

Article 52. Notice

Written notice shall be deemed to have been duly served if delivered by hand or sent by certified or registered mail, in each case to the address or addresses of each party set forth on the first page of this Contract and to the attention of the facility, plant, or contract manager as appropriate. Also, where written notice is required under the Contract from the Contractor to the Owner, the Contractor shall also send separate notices to the Owner's Plant Manager, Project Manager and Environmental Manager at the plant address set forth on the first page of this Contract. Each party shall advise the other in writing of any applicable address change.

Article 53. Governing Law

This Contract including all Contract Documents as well as performance and all disputes hereunder, shall be governed by and construed in accordance with the laws of the state or commonwealth where the Owner receives the beneficial use of the Work. The Owner shall be deemed to receive the beneficial use of the work at the permanent location where the structure or facility is being or will be constructed.

Article 54. Entirety Clause/Waiver

The terms and conditions of this Contract constitute the sole, exclusive and entire agreement between the Owner and the Contractor. Any modifications must be set forth in writing and signed by the Owner's and the Contractor's duly authorized representatives. If any provision herein is held to be invalid by any competent court, the remaining provisions of this Contract shall survive and remain in full force and effect. Any waiver by the Owner of any term, right or obligation under this Contract shall not be construed as a waiver for all purposes or for all subsequent opportunities for performance under this Contract.

"FIXED PRICE" CONSTRUCTION OR REPAIRS CONTRACT
(FORM FP-10/97)

IN WITNESS WHEREOF, the parties by their duly authorized representatives have executed this Contract and entered into this Contract on the dates set forth below. The date provided below by the final signatory to this Contract shall be the effective date of this Contract.

_____, **CONTRACTOR**

By: _____

Print Name: _____

Address: _____

Title: _____

Date: _____

_____, **OWNER**

By: _____

Print Name: _____

Address: _____

Title: _____

Date: _____

SUPPLEMENTARY CONDITIONS TO THE CONTRACT

- 1.01 All protective equipment required for all employees and Owner's representative the IH and any authorized visitors shall be provided by the Contractor.
- 1.02 Contractor shall submit construction, proposed completion, and proposed work schedule to the IH at the pre-construction meeting.
- 1.03 Contractor shall post competent person at entrance to regulated area at all times during working hours. After working hours and when regulated area has been established Contractor shall post security guard at entrance to regulated area. The primary duty of person at entrance to regulated area is to prevent anyone from entering regulated area without wearing proper protective equipment and otherwise complying with all applicable requirements in this Project Manual.
- 1.04 Contractor hereby agrees to indemnify and hold Sun City Analytical and Asarco free and harmless from any obligations, costs, claims, judgments, attorneys' fees, and attachments arising from or growing out of this any damage to property or injury or death to persons (including any damage or injury caused to property or person of any party including any employee of Contractor and/or associated with companies and/or any third party) arising from or growing out of the performance of these services under this Contract, except when the same are caused by the willful misconduct or negligence of the Consultant.
- 1.05 Conflicts and questions arising throughout any asbestos abatement activities will be resolved on a basis of whether an asbestos or non-asbestos related activity is involved. Any asbestos related conflicts and questions will be governed by the appropriate project manual sections. Otherwise, the Owner's supplementary and/or up-front "boiler plate" documents and any other non-asbestos related sections of the project manual will be applicable.
- 1.06 As the representative of the Owner, the IH shall perform air monitoring of all areas of work to insure compliance with this Project Manual and all applicable asbestos laws. This air monitoring does not relieve the contractor from monitoring required for compliance with all applicable asbestos laws. IH has the right to take action or direct Contractor to take whatever means deemed necessary to protect the environment, persons in the work area, and the general public when his air monitoring results indicate non compliance airborne concentrations of Asbestos fiber levels established by this Project Manual or applicable asbestos laws. IH shall retain at site daily air monitoring results for Contractor, Contractor employees, on regulatory agency to view at their discretion. In the event of any job-related injury, requirements of first aid or accident the IH shall be notified and Contractor shall take appropriate action.
- 1.07 When Contractor Crew consist of personnel whose predominant language is not English Contractor shall insure:
 - A. All training respiratory, supervisor, worker, etc., is conducted in predominant language. Contractor shall submit proof of all documents and proof that workers passed appropriate test.

- B. All instructions and safety procedures and emergency instructions shall be posted in both English and Spanish. Contractor shall have an interpreter fluent in English and dominant language for communications between IH and workers.
 - C. All workers shall be under direct supervision of fluent interpreters especially in the regulated area.
- 1.08 The following airborne fiber levels have been established for IH to use as grounds for stoppage of abatement work or and/or ordering immediate clean up of all area
- A. When air samples reveal 0.20 F/CC in containment IH may warn Contractor of high levels and may stop work if he continues to exceed 0.20 F/CC in containment.
 - B. When air samples reveal 0.01 F/CC inside clean room or during load-out IH shall stop work and insure proper clean-up procedures are used.
 - C. Any time air samples reveal air levels of greater than 0.01 F/CC outside regulated area, work must stop until corrective action is taken.
- 1.09 Contractor shall complete project in accordance with dates set forth in Project Schedule included in this project manual. If bidder fails to finish project in said dates, he is liable to ASARCO, Inc. or have deducted from funds owed, as liquidated damages the sum of five hundred (\$500.00) dollars per day for Consultant and/or Air monitoring costs per day for each calendar day of delay until the project is substantially completed.

END OF SECTION

BID FORM

(Company Name)

Submits following proposal for asbestos removal at:

ASARCO Converter Cottrell Outlet Distribution Flue
2301 W. Paisano
El Paso, Texas

Submittal of this form by the undersigned, hereafter referred to as bidder, is a representation that the bidder has visited the site, became familiar with conditions affecting the work. Successful bidder agrees to furnish all labor, materials, equipment, and pay any expenses incurred (travel, per diem, taxes, etc.) to complete work in total compliance with Contract Documents such as but not limited to, Plans, Specifications, Invitation to bidders, Instructions to bidders, and any addendum's issued thereto.

The successful bidder agrees to complete project with conditions set forth in contract documents, Plans and Specifications and time schedule set forth in the Project Schedule in this specification, furthermore successful bidder understands that five hundred dollars (\$500.00) per day plus Industrial Hygienist and/or air monitoring costs will be the measure of liquidated damages assessed for each calendar day in excess thereof required to complete the work under this contract.

Bidder agrees to execute the Asarco Contract within three (3) working days for date of notification of Award. Bidder agrees to furnish within five (5) working days from notice to proceed, all required insurance policies covering public and property damage, asbestos occurrence liability, and workman's compensation in the amounts specified in the supplementary conditions of the project. Successful Bidder shall furnish performance and payment bonds equal to the amounts of the Contract within (5) working days were applicable.

Bidder represents that he understands the exact scope of the project and that he is willing to perform any increase or decrease in the work in accordance with set provisions of these contract documents. Bidder further guarantees he has become familiar with local conditions, local laws and ordinances, local permits, and rules that may in any manner affect cost, progress or performance of this contract.

Owner reserves the right to disqualify any and all bids. **Bidder understands that to be considered a successful bidder, he must include with the Bid Proposal all submittals required below. Failure to submit required documents and submittals shall be basis to disqualify bidder at bid opening. Disqualified bidder shall be considered non-responsive and his bid shall not be recorded.**

A. Proof of Asbestos Abatement experience:

1. Documentation of at least 3 years experience using OSHA, EPA, 763 AHERA regulations (letters of recommendation will be accepted).

2. Name of contact person on at least one on going abatement project.
3. Notarized statement that offerer's firm or company performing work for the past three (3) years has not received any notice of violation regarding compliance with any applicable asbestos law. If notice of violation has been received by the offerer, circumstances involved should be described in the notarized letter for consideration by the Owner and its Consultant.

B. Proof of personnel qualifications, training and experience:

1. Submit Texas State Contractor License to be able to do asbestos abatement work in Texas.
2. Submit name of supervisor and alternate to be used on project. Submit his current medical, EPA approved supervisor training certificate, and Texas State License. This will be used on TDH 10 day notification.
3. Submit name of every worker to be used on project. Submit his current medical, EPA approved worker training certificate, and Texas State License.

BASE BID: Remove and dispose of approximately 4,800 square feet of ACM flue insulation from the Converter Cottrell Outlet Distribution Flue.

_____ Dollars \$ _____

UNIT PRICES:

Bidder must submit unit prices. These unit prices shall be used to calculate any additions or deletions to this contract.

ACM Flue Insulation \$ _____ per SF _____ Dollars per SF

Respectfully submitted:

(Firm Name)

By

(Authorized Signature)

(Title)

Firm's Address: _____

Seal _____

Phone (____) _____

END OF SECTION

**PROJECT SCHEDULE
ASARCO CONVERTER COTTRELL**

ACTIVITY	DATE AND TIME	LOCATION
Bid Advertisement	By invitation only	By ASARCO
Pre-bid walk-thru	October 15, 1998 10:00 a.m. (MST)	ASARCO 2301 Paisano El Paso, Texas
Bids Due	October 28, 1998 11:00.a.m. (MST)	Sun City Analytical 1409 Montana El Paso, Texas
Bids Open	October 28, 1998 11:00 a.m. (MST) Public Opening	Sun City Analytical 1409 Montana El Paso, Texas
Contract Award	TBA	
Pre-Construction	TBA	
Begin Project	November 30, 1998 8:00 a.m. (MST)	ASARCO 2301 Paisano El Paso, Texas
Project Complete	December 18, 1998 3:30 p.m. (MST)	ASARCO 2301 Paisano El Paso, Texas
Final Acceptance	TBA	ASARCO 2301 Paisano El Paso, Texas

SECTION 01010 SUMMARY OF WORK

PART I - GENERAL

- 1.01 Statement of Work: The work consists of furnishing all labor, plant, and materials and performing all work in strict accordance with this plan. Work shall include but not be limited to: preparation, removal of ACM hopper insulation, Transite panels, and all OSHA, EPA air monitoring and air sampling.
- 1.02 Project Objectives:
- A. Remove All asbestos containing flue insulation material from areas described in the Scope of Work, Drawings, and this Project Manual and any addendum.
 - B. No individual shall be exposed to asbestos fibers in excess of levels shown in these specifications.
 - C. The Contractor shall ensure that no asbestos contamination occurs outside any containment erected.
 - D. The Contractor shall ensure that all asbestos waste is disposed of in accordance to these specification and all applicable laws. All construction waste contaminated with asbestos containing waste from this project shall be disposed of in an EPA approved landfill.
 - E. The Contractor shall document all activities pertaining to this project in accordance with these specifications and all applicable laws. At the conclusion of the project, contractor shall submit this documentation to the Owner after it has been reviewed by the Industrial Hygienist (IH).
 - F. Contractor shall ensure that all special precautions, as stated in these documents, have been taken to protect from water damage and contamination into adjacent areas to the work area.
- 1.03 Scope of Work:
- A. Remove Asbestos Containing Materials from the Outlet Distribution Flue on the Converter Cottrell area as indicated by the Owner and/or his representative in the initial walk through. The estimated amounts are:
 - a. Remove and dispose of approximately 4,800 sq. feet of ACM flue insulation on the converter cottrell using full containment method described in this manual.
 - b. Set up necessary barriers for traffic control of vehicles and pedestrains.
 - c. Set up scaffolds to access ACM

END OF THIS SECTION

SECTION 01030 SPECIAL PROCEDURES OR CONDITIONS

1.01 ASARCO Cottrell Outlet Distribution Flue

A. Before beginning abatement the Contractor shall do the following:

1. Ensure that no high voltage exists in the containment.
2. Ensure all necessary permits are obtained.
3. Ensure that all parties involved in the project are notified of start date.
4. Ensure that all personnel working in the area are in respiratory protection, hearing protection, and other safety requirements of ASARCO safety plan.

1.02 Alternate Procedures

- A. Any alternate abatement procedure other than those specified herein shall be submitted in writing to IH for approval. IH has final authority to approve or disapprove or discontinue any procedure used if it violates any provision of this specification or applicable asbestos regulations.
- B. Any alternate procedure shall provide equal to or greater protection than the procedure it is intended to replace.

1.03 Pre-abatement Inspection

- A. Contractor shall inspect the work area and shall document all items which are broken or inoperative, and those which shall be retained by Owner. This Contractor inspection is intended to protect the Contractor from any claims made by the Owner following the completion of the Scope of Work. The results of the Contractor's inspection shall be reported to the Owner prior to initiation of the Scope of Work.

1.04 Schedule of abatement

- A. The Contractor shall schedule all work to be done between the hours of 7:00 A.M. and 4:00 P.M. Monday through Friday. Contractor shall begin asbestos abatement on Monday November 30, 1998 at 8:00 A.M. (MST) and be completed by Friday December 18, 1998 at 3:30 P.M. (MST).

1.05 Site Security

- A. The Contractor shall provide a qualified site security during all the abatement phase. The intent of this precaution is to guard against unauthorized entry into the regulated areas as well as a fire watch.
1. Site Security shall have EPA certification to enter the containment
 2. Site Security shall have an OSHA physical.
 3. Site Security shall have communication equipment to notify the IH, contractor, fire and or police if the need arises.
 4. Site Security shall have a state license to do asbestos work.
 5. Site Security shall be licensed as a TDH worker as a minimum.
- B. Site security personnel shall ensure that air filtration equipment is operational at all times, shall restrict unauthorized entry into the regulated area and ensure that the containment is intact at all times. Site security personnel shall keep a daily log of all events.

1.06 Emergency Repairs

- A. The Contractor shall immediately notify the IH of any damages, repair any pipe leaks, or electrical failures that might occur during abatement.
- B. All personnel on job site shall know where a telephone is located and what the emergency phone number are.
- C. Emergency phone numbers shall not be limited to but shall include the Industrial Hygienist (IH), Project Manager, Contractor, Etc). All emergency phone numbers shall be posted at the control center.

1.07 Medical Emergencies

- A. The Contractor shall provide at least one person on site who is qualified in First Aid and Cardiac Pulmonary Resuscitation (CPR). The contractor shall submit this persons name and qualification to the IH at the pre-construction meeting.

1.08 Rental Equipment

- A. The Contractor shall obtain written permission for any rental equipment (includes rental trucks or vehicles) to be used on the asbestos project. The rental company shall be notified of the intended use of equipment and shall submit notice to the Industrial Hygienist (IH) that the equipment may be used on this asbestos abatement project. The Industrial Hygienist (IH) has the right to reject any rental equipment that does not confirm with said letter of understanding. The Contractor assumes all liability for failure to disclose the use of rental equipment for an asbestos abatement project.

1.09 Patented Products

- A. The Contractor shall submit a license or equivalent, or written permission to use any patented product and/or procedure in connection with this project. In the event that no patented product and/or procedure is used, the contractor shall submit a notarized statement acknowledging that he is not using patented products or procedures on this project. The contractor assumes all liabilities for failure to disclose the use of a patented product and/or procedure.

1.10 Electrical Work

All electrical work shall be coordinated with ASARCO safety personnel and/or ASARCO electricians.

- A. All of the electrical work shall be performed by either a licensed electrician or a licensed apprentice electrician under direct supervision of a licensed electrician. All electrical work shall meet electrical code requirements.
- B. Any electrical work performed in the regulated area shall be done by a licensed electrician who has met the requirements of OSHA 1910.1001, AHERA 40 CFR 763 (32 hour worker Course), OSHA medical exam, respirator fit test.

1.11 Scaffolds

- A. During this project the Contractor will need to erect scaffolding to gain access to the duct. Contractor shall comply with OSHA 1910 subparts D walking-Working surfaces.
- B. When powered work platforms are used the Contractor shall comply with OSHA 1910 Subpart F. Powered Platforms, Manlifts, and Vehicle-Mounted work platforms.

1.12 Confined Space Entry

- A. Any crawlspace, attic or other areas in this project may be considered by OSHA as confined spaces and are subject to 29 CFR 1910.146. The contractor shall inspect and test all work areas to insure the space is not a permitted confined space area. The contractor shall issue entry permit for his workers if required.
- B. Contractor shall insure that all applicable sections of 1910.146 and 1910.120 are met.

1.13 Precedence Regarding Conflicts And/Or Questions

- A. Conflicts and questions arising during the bid phase and throughout any asbestos abatement activities shall be resolved on a basis of whether an asbestos or non-asbestos related activity is involved. Any asbestos related conflicts and questions will be governed by the appropriate project manual sections.
- b. Otherwise, the owner's supplementary and/or up-front "boiler plate" documents and any other non-asbestos related sections of the project manual shall be applicable.
- c. Conflicts and questions which the selected Contractor fails to bring to the attention of Owner and/or Consultant prior to being awarded the contract shall not be considered.

1.14 DISPUTE RESOLUTION:

- a. In an effort to resolve any conflicts that arise during the construction of the project or following the completion of the project, the owner and contractor agree that all disputes between them arising out of or relating to this agreement shall be submitted to non-binding mediation, unless the parties mutually agree otherwise. Mediation shall be prior to the initiation of arbitration or litigation.
- b. Mediation shall be in accordance with the Construction Industry Mediation Rules of the American Arbitration Association.

1.15 PIGEON WASTE AND ASSOCIATED DANGER:

- a. Contractor shall inform all employees of the potential dangers of working around pigeon dropping. This subject should be brought up at the tool box meeting on site. Enclosed as Attachment 2 to this specification is material relating to the dangers of working with pigeon dropping.

END OF SECTION

SECTION 01043 PROJECT COORDINATION

1.01 Work Requirements:

- A. The contractor shall schedule his work-hours to accomplish the abatement as specified in this project manual, drawing and any addenda. Contractor shall not perform any work on days other than those specified working days without the written permission of the owner.
- B. Before starting work at any location the Contractor shall inform the Owner and his representative the Industrial Hygienist (IH) or his authorized representative of the intent to start such work. Strict adherence with NESHAPS 10 day notice is required.
- C. Before beginning any work under the contract the Contractor shall provide in writing to the Owner and the IH the name of the person assigned as project supervisor and alternate. If a different person is assigned during the performance period, written notification and all documentation required under these specifications shall be provided to the IH before the new person assumes responsibility as project superintendent.
- D. Working Conditions:
 - 1. The contractor shall visit the site to thoroughly familiarize himself with all the details of the work and the existing conditions, and to verify all dimensions in the field. The Contractor shall notify the IH, in writing, when a discrepancy is found in the contract drawings, specifications, and/or field conditions.
 - 2. The contractor will not be compensated for any unauthorized work.
 - 3. The contractor shall maintain the interior and exterior of the building clean of any and all debris that result from the performance of this project.
 - 4. The contractor shall insure safe working conditions and abide by all applicable OSHA safety regulations during the performance of the contract with the occupants in the building.
 - 5. The Industrial Hygienist (IH) on site does not have the authority to approve any additional work or change the scope of work set forth in these documents. Contractor shall not be paid for any unauthorized work. For any additional work or change of scope of work the Contractor shall follow the directions for addition work set forth in these documents.

1.02 Personnel Qualifications:

- A. All Contractor personnel involved with this project must be trained and have EPA approved certification showing they are fully qualified to do asbestos removal. Contractor shall ensure every worker is thoroughly familiar with the standard operating procedure of the Contractor for abatement work and with all Applicable Laws. All personnel shall have current OSHA (1910.1001) medical examinations and be trained in the use and care of respirators. Anyone without the proper qualifications listed herein shall not be allowed to work in the abatement area at any time. **ALL PERSONNEL ARE REQUIRED TO ATTEND THE ASARCO SAFETY ORIENTATION PRIOR TO ENTERING THE PLANT. THIS CLASS SHALL BE SCHEDULED WITH ASARCO PRIOR TO PERFORMING ANY WORK.**
- B. Supervisor Qualifications are as follows:
 - 1. Meet requirements of OSHA competent person.
 - 2. Shall have knowledge of methods and procedures of the removal, treatment, handling, and disposal of asbestos

- and asbestos containing materials and subsequent cleaning of affected environment.
3. This person shall be knowledgeable of Federal, State and Local regulations pertaining to the handling of asbestos.
 4. This person shall remain on the job site during working hours at all times. In the event the supervisor leaves the job site, the Industrial Hygienist (IH) has an obligation to stop work until the supervisor returns to the site. Any and all extra cost arising from said event shall be the responsibility of the Contractor.
 5. Persons shall have all current OSHA Medical & EPA approved Supervisors Certificates.
 6. Shall have proof of attending an OSHA safety course on the hazards of working with lead, arsenic, cadmium, Sulfuric Acid (H_2SO_4), and sulfur dioxide (SO_2).
 7. Biological monitoring is required for personnel working in the locations where As, Cd, Pb contaminants are present.

C. Worker Requirements:

1. Meet requirements of OSHA (1910.1001).
2. Must have knowledge of methods and procedures of the removal, treatment, handling, and disposal of asbestos and asbestos containing materials and subsequent cleaning of affected environment.
3. This person shall be knowledgeable of Federal, State and Local regulations pertaining to the handling of friable asbestos.
4. Workers shall have all current OSHA Medical & EPA approved 32 hour Abatement Worker Certificates.
5. Shall have proof of attending an OSHA safety course on the hazards of working with lead, arsenic, cadmium, Sulfuric Acid (H_2SO_4), and sulfur dioxide (SO_2).
6. Biological monitoring is required for personnel working in the locations where As, Cd, Pb contaminants are present.

1.03 Permits:

- A. The Contractor shall coordinate with ASARCO Engineering Department in obtaining all necessary permits. Some permits required are, but not limited to:
1. Electrical Permits where new or reinstalled electrical devices are performed.
 2. Building Permits where any structure of the building is disturbed. This includes removal of asbestos pipe insulation.
 3. EPA NESHAPS 10 day notice shall be sign and sent by owner. Contractor nor consultant are allowed to send notification.
 4. Texas State Health Department Notice
 5. Local permits such as fire, police etc.

END OF THIS SECTION

SECTION 01091 DEFINITIONS AND STANDARDS

1.01 Applicable Publications:

- A. The regulations listed below form a part of this specification to the extent referenced. The regulations are referred to in the text by basic designation only. The following regulations shall be on site during all operations of this project.
- B. OSHA Regulations:
 - 1. 29 CFR 1910.20 Access to Employee Exposure and Medical Records
 - 2. 29 CFR 1910.134 Respiratory Protection
 - 3. 29 CFR 1910.1001 OSHA - Asbestos Industry Standard. *
 - 4. 29 CFR 1926.1101 Asbestos, Tremolite, Anthophyllite, and Actinolite Construction Standard.
 - 5. 29 CFR Parts 1910 and 1926 Occupational Exposure to Asbestos, Tremolite, Anthophyllite, and Actinolite; Final Rules; Amendment
 - 6. 29 CFR 1910.1200 Hazard Communications
 - 7. 29 CFR 1910 Occupational Safety and Health Standards
 - 8. 29 CFR 1926.55 Gases, Vapors, Fumes, Dusts and Mists
 - 9. 29 CFR 1926.57 Ventilation
 - 10. 29 CFR 1018 Arsenic
 - 11. 29 CFR 1025 Lead
 - 12. 29 CFR 1027 Cadmium
 - 13. 29 CFR 1910.95 Occupational Noise Exposure
 - 14. All applicable OSHA regulations such as but not limited to Heat Stress, Noise, Electrical Standards (Lockout and Tagout) Scaffolding, Ladders, OSHA 200, Slips, Trips, and Falls, and Fire Safety-Contingency Plans.
- C. Environmental Protection Agency
 - 1. 40 CFR 61 Subparts A & M (Revised Subpart B) National Emission Standards for Hazardous Air Pollutants.
 - 2. 40 CFR Part 763, Subpart E Asbestos Containing Material in Schools; Find Rules and Notice.
 - 3. 40 CFR Part 763, Subpart G Asbestos Abatement Projects; Worker Protection; Final Rule.
 - 4. Environmental Protection Agency (EPA) Publication, Guidance for Controlling Friable Asbestos-Containing Materials in Buildings, June 1985.
- D. Department of Transportation (DOT):

1. 49 CFR Part 173, Subpart J.
 2. 49 CFR 172 Hazardous Materials Tables & Communications Regulations
 3. 49 CFR 178 Shipping Container Specification
- E. American National Standards Institute, Inc., (ANSI), Standards:
1. ANSI Z88.2-1980 Practices for Respiratory Protection
 2. ANSI Z9.2-1979 Fundamentals Governing Design & Operation of Local Exhaust Systems
- F. Testing Standards
1. NIOSH Method 7082 Lead (AA)
 2. NIOSH Method 7300 Arsenic, Cadmium, and Lead (ICP)
 3. NIOSH Method 7400 Fiber Analysis of Asbestos using PCM
 4. NIOSH Method 7402 Fiber Analysis of Asbestos using TEM

1.02 Definitions:

- A. Abatement - Means all activities associated with the control of Asbestos containing materials for Buildings during removal.
- B. ACGIH - American Conference of Governmental Industrial Hygienists 6500 Glenway Avenue Building D-5 Cincinnati, Ohio 45211
- C. AIHA - American Industrial Hygiene Association, 345 White Pond Dr. Akron, Ohio 44320
- D. Aggressive Air Sampling - Means using extreme efforts to simulate actual building conditions. Occupancy characteristics by causing air circulation patterns with equipment such as fans or leaf blowers.
- E. Airlock - A system for permitting ingress and egress with minimum air movement between a contaminated area and an uncontaminated area, typically consisting of two curtained doorways separated by a distance of at least 3 feet such that one passes through one doorway into the airlock, allowing the doorway sheeting to overlap and close off the opening before proceeding through the second doorway, thereby preventing flow through contamination.
- F. Air Monitoring - Means the process of collecting air samples on a fiber membrane cassette and then having them analyzed to determine the number of fibers present. Analytical results are expressed in terms of fibers per cubic centimeter of air.
- G. Air Monitoring Professional - A specially trained individual, who has successfully completed a NIOSH 582 Training Course, employed by the Owner, who is qualified by education and/or experience to obtain and test air samples in and around the work areas to determine airborne concentrations of asbestos fibers.
- H. Amended Water - Water to which surfactant has been added. Surfactant should be 50% polyoxyethylene ester and 50% polyethylene ether according to EPA recommendations.
- I. A.N.S.I. - American National Standards Institute, 1430 Broadway, New York, New York 10018.

- J. Asbestos - means a mineral that readily separates into long flexible fibers suitable for use as a noncombustible, nonconducting or chemically resistant material. Asbestiforms include chrysotile, amosite, crocidolite, tremolite, anthophyllite, and actinolite.
- K. Asbestos Containing Material (ACM) - Material composed of asbestos of any type and in an amount greater than 1% by weight, either alone or mixed with other fibrous or non-fibrous materials.
- L. Asbestos Containing Waste Material - Asbestos containing material or asbestos contaminated objects requiring disposal.
- M. Asbestos Fibers - Means asbestos fibers longer than 5 micrometers.
- N. Asbestos Project Manager - An individual designated as the Owner's representative and responsible for overseeing the asbestos abatement project.
- O. Asbestos Worker - Means employees that meet all the requirements outlined in OSHA Regulations 29 CFR 1910.1001.
- P. ASTM - American Society For Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.
- Q. Authorized Visitor - The Building Owner [and any designated representatives] and any representative of a regulatory or other agency having jurisdiction over the project.
- R. Bidder - Each prospective Contractor who bids on the work specified herein, and has been pre-qualified by Sun City Analytical, Inc.
- S. Building Owner - Owner of the building or his representative.
- T. Bulk Sample - The collection of any building material section suspected of containing asbestos. A small portion of suspected material is removed from sample area and placed in a plastic bag or air tight container.
- U. CIH- An Industrial Hygienist who by virtue of their education and passing the American Board of Industrial Hygiene Core Examination in either the Comprehensive Practice or an Aspect Examination has been given the right to use CIH by AIHA.
- V. Clean Room - An uncontaminated area or room which is a part of the worker decontamination enclosure system with provisions for storage of worker's street clothes and clean protective equipment.
- W. Clean Air Sample - Means air sample collected immediately following the completion of corrected action. These samples are routinely collected to determine the effectiveness of the corrected action and establish the contractual requirements of acceptable fiber concentrations levels prior to breaking down of abatement control area.
- X. Containment - When used in this specifications means the same as regulated area, shrouding, bubble, temporary enclosure, or controlled area. The means of using plastic to establish work areas and using air filtration pressure to prevent fiber contamination of building and occupants.
- Y. Contractor - Means the Asbestos Abatement Contractor performing the abatement.
- Z. Control Center - Means the area in close proximity of the entrance to the regulated area where the supervisor or outside man is stationed. This center should be where all documentation required by specifications are, along with emergency numbers and first-aid kits, are available.

- AA. CSP - A Safety Professional who by virtue of their education and passing the Board of Certified Safety Professionals Core Examination has been given the right to use CSP by BCSP.
- AB. Curtained Doorway - Means a device to allow ingress or egress from one room to another while permitting minimal air movement between the rooms, typically constructed by placing two overlapping sheets of plastic over an existing or temporarily framed doorway, securing each along the top of the doorway, securing the vertical edge of one sheet along one vertical side of the door and along the opposite vertical side of the doorway. Other effective designs are permissible.
- AC. Designated Decontamination Area - Means an area designated by the Industrial Hygienist (IH). The area is used for the purpose of decontaminating asbestos contaminated objects and shall be located adjacent to the work area and meet Industrial Hygienist (IH) approval.
- AD. Designated Clean Area - Means an area designated by Industrial Hygienist (IH). The area is within site of the work area free of any asbestos for the purpose of storing decontaminated objects.
- AE. Designated Holding Area - Means an enclosed area designated by Industrial Hygienist (IH). The enclosure is used for the storing of sealed containers of asbestos containing materials and asbestos contaminated waste.
- AF. Decontaminate - Means to remove all visible asbestos dust from the surface to be decontaminated by the means of damp cleaning and/or vacuuming with HEPA filtration equipment.
- AG. Encapsulant - A liquid material which can be applied to asbestos containing material which controls the possible release of asbestos fibers from the material either by creating a membrane over the surface (bridging encapsulant) or by penetrating into the material and binding its components together (penetrating encapsulant).
- AH. Enclosure - The construction of an air-tight, impermeable, permanent barrier around asbestos containing material to control the release of asbestos fibers into the air.
- AI. EPA - U.S. Environmental Protection Agency 401 M Street S.W., Washington, D.C. 20460
- AJ. Equipment Decontamination Enclosure System - Means that a portion of a decontamination enclosure system designed for controlled transfer of materials and equipment into or out of the work area, typically consisting of a washroom and holding area.
- AK. 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.
- AL. Filtered Exhaust System - A portable exhaust system equipped with HEPA filtration and capable of maintaining a constant low velocity air flow through contaminated areas from adjacent uncontaminated areas and maintaining a lower pressure in the containment area as compared to the adjacent uncontaminated areas.
- AM. Fixed Object - A piece of equipment or furniture in the work area which cannot be removed from the work area.
- AN. Friable Asbestos - Asbestos containing material which can be crumbled to dust, when dry, under hand pressure.
- AO. HEPA Filter - Means High Efficiency Particulate Air Filter that is capable of trapping and retaining at least 99.97 percent of all mono-dispersed particles of 0.3 micro meters in diameter or larger.
- AP. HEPA Vacuum - Means a special type of vacuum cleaner used in the abatement project that must be equipped with a HEPA filter.

- AQ. Glovebag - Means a special purpose custom containment bag with protective gloves and arm sleeves, tool pouch and side port for the use of repairing or removing pipe insulation.
- AR. HVAC - Means heating, ventilation and air conditioning system.
- AS. Industrial Hygiene - "Is that science and art devoted to the recognition, evaluation, and control of those environmental factors or stresses, arising in or from the work place, which may cause sickness, impaired health and well-being, or significant discomfort and inefficiency among workers or among the citizens of the community."
- AT. Industrial Hygienists (IH) - An individual who by education or experience has gained competence in the field of industrial hygiene. In this manual the IH is the owners representative and/or the air monitoring professional.
- AU. Movable Object - A piece of equipment or furniture in the work area which can be removed from the work area.
- AV. Air Filtration System - A portable exhaust system equipped with HEPA filtration and capable of maintaining a constant low velocity air flow into contaminated areas from adjacent uncontaminated areas.
- AW. NESHAPS - The National Emission Standards for Hazardous Air Pollutants.
- AX. NIOSH - The National Institute for Occupational Safety and Health. CDC -NIOSH Building J N.E. Room 3007 Atlanta, GA 30333
- AY. OSHA - The Occupational Safety and Health Administration, 200 Constitution Avenue, Washington, D.C. 20210. For work in New Mexico the regional office the Environmental Improvement Division (505) 827-2452. In Texas the Regional OSHA office is 1-800-692-4202.
- AZ. Regulated Area - The demarcated areas in which asbestos train personnel activity takes place. This includes any area roped off by the contractor or owner with asbestos warning signs and/or tape.
- BA. Shower Room - A room between the clean room and the equipment room in the worker decontamination enclosure with hot and cold or warm running water controlled at the tap and suitably arranged for complete showering during decontamination.
- BB. Shrouding (Full) - Means the process of covering all the interior surfaces (floor, walls, doorways, windows, ceiling) of a room with polyethylene sheeting.
- BC. Semi-Shrouding - Means the process of covering a portion of the interior surfaces (floor, walls doorways, windows, ceiling, etc.) of a room with polyethylene sheeting.
- BD. Surfactant - A chemical wetting agent added to water to improve penetration.
- BE. Tunneling - Means the forming of connected enclosed corridors with plastic sheeting for passageways between shrouded and/or semi-shrouded enclosures.
- BF. Visible Emissions - Any emissions containing particulate asbestos material that are visually detectable without the aid of instruments. This does not include condensed uncombined water vapor.
- BG. Waste Transfer Airlock - A decontamination system utilized for transferring containerized waste from inside to outside of the work area.

- BH. Wet Cleaning - The process of eliminating asbestos contamination from building surfaces and objects by using cloths, mops, or other cleaning utensils which have been dampened with water and afterwards thoroughly decontaminated or disposed of as asbestos contaminated waste.
- BI. Work Area - Means the portion of the building (or structure) comprised of the room(s) and connecting passageway(s) (such as other rooms, hallway, corridors, etc.) required to gain access to the designated material(s) to be removed.
- BJ. Work day - Means any day between the project start and the completion date, with the exception of weekends. Weekends may become work days if authorized by the Owner.

END OF THIS SECTION

SECTION 01300 SUBMITTALS

1.01 Submittal with Proposal

A. Proof of Asbestos Abatement experience:

1. Documentation of at least 3 years experience using OSHA, EPA, 763 AHERA regulations (letters of recommendation will be accepted).
2. Name of contact person on at least one on going abatement project.
3. Notarized statement that offerer's firm or company performing work for the past three (3) years has not received any notice of violation regarding compliance with any applicable asbestos law. If notice of violation has been received by the offerer, circumstances involved should be described in the notarized letter for consideration by the Owner and its Consultant.

B. Proof of personnel qualifications, training and experience:

1. Submit Texas State Contractor License to be able to do asbestos abatement work in Texas.
2. Submit name of supervisor and alternate to be used on project. Submit his current medical, EPA approved supervisor training certificate, and Texas State License.
3. Submit name of every worker to be used on project. Submit his current medical, EPA approved worker training certificate, and Texas State License.

1.02 Submittals required 5 working days prior to the Pre-Construction Meeting. This submittal shall be sent to Sun City Analytical, Inc. at 1409 Montana in El Paso, Texas 79902.

A. Prior to starting project Contractor shall submit to the Industrial Hygienist the following data on all materials, fixtures or equipment intended for use on this project. All material, equipment, and fixtures shall be approved by the Industrial Hygienist. Each item not meeting standard shall be repaired or replaced by Contractor at no added expense to Owner. Each item on the list submitted by the Contractor shall be clearly identified as to proposed location with appropriate reference to drawings and/or specifications. Catalogs, drawing and similar literature shall be clearly marked to identify the items as noted on the lists submitted, and shall be cross-reference therewith. Approval of such items will not relieve the Contractor of the responsibility for any error which may exist, as the Contractor shall be responsible for the dimensions and design of adequate connections, details and satisfactory construction of all work. Contractor shall submit complete narrative, pictorial or manufactures' specifications and technical data brochure(s) to describe:

B. All enclosures, shrouding complete with detailed layout of decon facilities, air filtration system units, emergency exit waste load out and control center.

C. Air filtration system machines shall have the following:

1. HEPA filter set, along with primary and secondary filter.
2. Time meter and filter pressure drop gauge.
3. All accessories of air filtration system as: automatic shut-down if HEPA ruptures or air discharge is blocked, lockout to prevent usage without HEPA filter.
4. Air Filtration System pressure recorder, water gauge or equivalent for use to verify pressure differential.

D. Work force to be used, supply number and work schedule for completion of project. Show back up personnel

capabilities in the event Contractor falls behind schedule.

- E. Truck or vehicle to be used to transport ACM waste to landfill. Show load capabilities and condition of vehicle.
- F. RESERVED
- G. Submit disposal plan that includes the transfer of the ACM waste to ASARCO holding facility.
- H. Decontamination center to be used:
 - 1. Pre-fab or portable showers to be used have Hot and Cold water taps, and made of non-porous materials.
 - 2. Waste water filtration system to be used that have 20 micron primary filter and 5 micron secondary filter. Also submit data on replacement filters.
- I. All respiratory protection equipment brochures describing:
 - 1. Air purifying respirator with HEPA filters and NIOSH approval number. (Only to be used during preparation on this project).
 - 2. Powered Air Purifying respirators with full-facepiece, HEPA filters with acid gas/ HEPA cartridges required for abatement.
 - 3. Type C Supplied air complete with full face piece, pressure demand regulator, NIOSH approval number, back up egress system. Panel board complete with compressor failure alarm, high temperature alarm, carbon monoxide alarm, in line filtration to assure Grade D air, low pressure compressor, and proper CO alarm calibration procedure.
- J. Submit samples of the following:
 - 1. Fire Retardant plastic sheeting.
 - 2. Duct tape.
 - 3. Plastic bags.
 - 4. Glove bag.
 - 5. Warning signs, labels and barrier tape.
 - 6. Disposable clothing.
- K. Submit brochures for other equipment and supplies:
 - 1. Wetting agent (surfactant).
 - 2. Encapsulants.
 - 3. Plastic lined drum.
 - 4. Vacuum equipment along with HEPA filter to be used.
 - 5. Air sampling apparatus.
 - 6. Ground fault interpreters.
 - 7. Communication system between regulated area and control area.
- L. Submit company Standard Operating Procedures for asbestos abatement projects.
- M. Submit company fire and emergency procedures and spill response plan.
- N. Submit company Respiratory Program.

- O. Submit company Hazard Communication Program.

1.03 Submittals required Daily during Abatement:

- A. Daily, during the project the following items shall be maintained by the contractor and may be verified by the IH.
- B. Air monitoring results from previous day of sampling. The results shall be hard copy from the approved lab. All air sample results must be posted within twenty four (24) hours.
- C. Daily narrative log of work progress, to include delays, potential change orders, stoppage of work and results of visitors' inspections.
- D. Documentation of inspection of all areas and equipment. Contractor shall note corrections or planned actions for correction.
- E. Notification of any accident or emergency requiring a doctor's treatment or evacuation of any employee.
- F. Documentation of all personnel entering and leaving regulated area.
- G. A receipt from ASARCO for any waste transported to the ASARCO holding area.
- H. Updated construction schedule and abatement plan.
- I. Documentation of filter changes on respirators, HEPA vacuums, filtered Air Filtration System, and other engineering controls.
- J. When Grade D air is required Contractor shall provide compliance with OSHA 1910.134 and document that CO monitor is calibrated on daily basis.
- K. Site Security daily logs submitted to the IH.

1.04 Submittals Required at Conclusion of Project

- A. All receipts or proof of transferring ACM waste to ASARCO .
- B. All air sample results from testing lab that were not previously submitted.
- C. A complete log book of all documentation acquired during the project. Contractor shall insure that minutes of final walk-thru with IH, and Owner are incorporated into final project documents along with corrective action taken by Contractor.
- D. Complete written reports on proper OSHA forms of any accident, emergency or other safety and/or health incident.
- E. Summary of corrective actions taken of punch list, if any, drawn up by Owner and IH.

1.05 Disapproved Submittals:

- A. Submittal which have been disapproved, the Contractor shall re-submit within 5 days of receipt of the disapproved submittals.

END OF THIS SECTION

SECTION 01410 TESTING LABORATORY SERVICES

1.01 Personnel Air Monitoring and Sampling:

- A. General Requirements: Air monitoring and sampling shall be in accordance with standards and methods required by all applicable regulations.
- B. The Contractor shall obtain the services of an Industrial Hygienist or Professional Air Monitor specialized with the OSHA medical, and his EPA approved air monitoring technician and supervisor training certificates.
- C. The Contractor shall retain a list of qualifications and experience of the individuals who shall be responsible for air monitoring and sampling.
- D. Throughout the removal and subsequent cleaning operations, AMBIENT (AREA) MONITORING will be conducted by the Owner's representative to ensure compliance with all regulations and is conducting the work in a manner which minimizes airborne asbestos levels as well as minimizes the contamination of other areas of the building. Analytical results will be available at the Control Center.
- E. For each set of air samples submitted to the laboratory by the Contractor for analysis, the Contractor shall submit blank cassettes for analysis (minimum of 10%). Each blank cassette shall be submitted as a part of the Contractor's quality control program.
- F. The Industrial Hygienist (IH) may request to QC sample taken by the Contractor. The Industrial Hygienist (IH) will randomly ask for wedge of cassette filter or read a percentage of the Contractor's samples.
- G. Air monitoring results shall include as a minimum for each sample the following: sample ID, laboratory ID, date sample taken, flow (liters/minutes), time (minutes), blank count (fibers/field), fibers/cc, detection limit (fibers/cc), location, employee's name, type of activity and the name of the analyst and the date the sample was analyzed.
- H. All personnel samples for asbestos shall be in accordance with 29 CFR 1910.1001 and as specified in this manual. The Contractor shall sample employees who are anticipated to have the greatest risk of exposure as determined by the industrial hygienist. At least 25% of the work crew or a minimum of two employees, whichever is greater, during a work shift shall be sampled.
- I. Contractor shall also be responsible for monitoring for arsenic following 29 CFR 1910.1018, lead following 1910.1025, cadmium following 29 CFR 1910.1027, and occupational noise exposure following 1910.95. All sampling shall be posted on site during the entire project.

1.02 Third-party Air Monitoring:

- A. General Requirements: Third party area monitoring and project clearance for airborne concentrations of asbestos fibers during an abatement project shall be performed by a project monitor under contract to the building owner to collect samples by and for the owner of the facility being abated.
- B. Project monitors observe abatement activities performed by contractors and generally serve as a building owner's representative to ensure that abatement work is completed according to specification and in compliance with all relevant statutes and regulations.
- C. Project monitors perform the vital role of air monitoring for purpose of determining final clearance.

- D. Project monitor is required to comply with ASHARA, have EPA 5-day supervisor course, NIOSH 582 or 3-day Air Monitoring course and the OSHA medical.

E. Schedule of Air Samples:

1. Baseline: The owner's representative will secure the following air samples to establish a baseline before start of work.

The samples will be taken in accordance with the following schedule:

LOCATION	SAMPLES	VOLUME	RATE
Inside work area	3	1.250 liters	< 10 LPM
Outside work area	2	1.250 liters	< 10 LPM

Baseline will be an action level expressed in fibers per cubic centimeter (f/cc) which is the larger of the following:

- Average of PCM samples collected in work areas.
- 0.01 fibers per cubic centimeter.

2. Daily: From start of work through the end of the project, the owner's representative shall take the following samples on a daily basis. The samples should be taken in accordance with the following schedule:

LOCATION	VOLUME	RATE
Inside containment	1,250 liters	< 10 LPM
Outside containment but inside the building	1,250 liters	< 10 LPM
At negative air unit discharge	1,250 liters	< 10 LPM
Immediately outside the entrance to the decontamination facility	1,250 liters	< 10 LPM
Outside the bag out facility (during gag out activities)	1,250 liters	< 10 LPM

3. Additional samples may be taken at the owner's representative's discretion. If airborne fiber counts exceed allowed limits, additional samples may be taken as necessary to monitor fiber levels.

1.03 Methods of Analysis:

- A. Air samples shall be analyzed by Phase Contrast Microscopy method using the NIOSH 7400 method.

B. Air samples shall be analyzed by an analytical laboratory who possess the following:

1. Lab shall use the NIOSH 7400 method for analysis according to 29 CFR 1910.1001, Appendices A or B which describes the OSHA ORM method and which utilizes the acetone/triacetin sample preparation or equal.
2. Lab to used shall be independent of the Contractor and shall be approved by the Industrial Hygienist.
3. Lab shall have technicians who have their NIOSH 582 Class. Certificate must be submitted to Industrial Hygienist (IH) upon request.
4. Lab shall be a successful participate in the Proficiency Analytical Testing Program (PAT) for the last 4 rounds and have National Institute of Standards and Technology (NIST) certification.
5. Lab shall be capable of delivering results within 24 hours of sampling to the client so the can be posted on the job site.
6. Lab shall have current Texas State License.

1.04 Clearance Samples

- A. Transmission Electron Microscopy - is not required on this contract. If the contractor requests such testing, then he shall bear all costs associated with TEM sampling and analysis.
1. Any TEM analysis shall follow 40 CFR 763 AHERA regulations sampling and analysis protocols.
- B. On this project Phase Contrast Microscopy with NIOSH 7400 method in accordance with SECTION 01714 WORK AREA CLEARANCE, shall be the method used for clearance testing. Clearance samples shall be done in the normal work shift of the contract and shall be noted in the contractors construction schedule and abatement plan. The clearance level has been established as <.005 f/cc.

END OF THIS SECTION

SECTION 01500 TEMPORARY FACILITIES AND CONTROLS

1.01 Temporary Buildings

- A. Contractor shall provide first aid facilities at control center and in waste disposal vehicle.

1.02 Telephone Service

- A. The Owner will not furnish telephone service, Contractor shall designate a telephone for emergencies. Contractor shall not use any owner's or site phone.

1.03 Water for Construction

- A. The Owner will furnish water used during construction so long as the required amounts are within the capacity of the existing building systems. Contractor shall provide piping, valves, and any other appurtenances required to properly convey the water to the location where it is needed.
- B. No water connection from any potable public water supply system shall be made inside the containment area or from any other area where there could be a potential for contamination of the public water source unless connected with an internal air gap or a mechanical back-flow prevention device. No water hoses or pipes shall be brought into the containment area or from any other area where there could be a potential for contamination of the public water source can occur unless hoses or pipes are connected to the previously described devices in this section, 1.03.
- C. All internal air gap or mechanical back-flow prevention devices shall conform to American Water Works Association (AWWA) C150, C151, and manual M14 in accordance with Texas Natural Resources Conservation Commission (TNRCC) Title 30 Environmental Quality Part 1, Chapter 290, Sub-Chapter D.

1.04 Electricity for Construction

- A. Any electrical hook up shall be coordinated with Asarco personnel.
- B. The Owner will provide electrical energy from existing panels as required to operate power tools and equipment and to provide temporary light so long as the required amounts are within the capacity of the existing building systems. Contractor shall provide temporary wiring and outlets as required and temporary lighting if necessary. Contractor is responsible to verify quantity quality of the electrical source provided to them.

1.05 Employee Conduct

- A. The Contractor shall be responsible for ensuring that all employees comply with all Applicable Laws and perform work in a safe manner. Any employees entering the work area under the influence of alcohol or drugs shall be immediately removed by the Contractor from the job site.
- B. The Contractor shall instruct all his employees to refrain from talking with anyone about this project. Any interviews or discussions about the asbestos project shall be done only by written consent from the building owner or his representative.

1.06 Advertising

- A. At no time will any kind of advertisement be displayed, published, or reported to news media without the expressed written consent of the Owner and IH.

1.07 Barricades

- A. The Contractor shall provide sufficient barricades, walkways to protect all personnel from injury or exposure to asbestos. All work areas shall be barricaded with proper signs.

1.08 Security

- A. Site security shall be provided by Contractor at Contractor's expense. See Section 01030.

1.09 Toilets

- A. Contractor may use the ASARCO facilities but shall insure that his employees follow all ASARCO procedures. The bathhouse is not close to this facility, therefore the contractor may need to provide transportation to the bathhouse or provide chemical toilets on site. The contractor shall be responsible for maintaining this facility clean. Contractor shall lose privilege of these facilities if they are not kept clean at all times. Contractor shall provide chemical latrines whenever the ASARCO facilities are not available.

1.10 Scaffolds / Platforms

- A. During this project the Contractor shall erect scaffolding to reach high work areas. Contractor shall comply with OSHA 1910 subparts D walking-Working surfaces.
- B. When powered work platforms are used the Contractor shall comply with OSHA 1910 Subpart F. Powered Platforms, Manlifts, and Vehicle-Mounted work platforms.
- C. Contractors work involves work to be performed on high areas. Contractor shall insure the safety of all employees entering in this area. Walking planks or platforms (secured properly) shall be provide by the contractor above the ceiling.

END OF THIS SECTION

SECTION 01513 AIR FILTRATION SYSTEM

1.01 Air filtration system

- A. Air Filtration must be established in the work area by means of a local exhaust system. The equipment shall exhaust through a three-(or more) stage HEPA filtration system to outside of the building. The equipment shall be in operation for 24 hours per day until final air clearance.
- B. The system shall have the following characteristics:

- 1. Filtration equipment in compliance with ANSI Z9.2, Local Exhaust Ventilation.
- 2. Capable of maintaining a minimum pressure differential of minus 0.02 inches of water (4.98 Pa) gauge in the work area relative to adjacent areas.
- 3. Air filtration system pressure system units shall be employed in sufficient quantity to provide four (4) air changes per hour in the work place. Use the formula to determine total air flow requirement.

Total CFM = Volume of work area/ 15 min

(Total M³/min = Volume of work area/ 15 min)

Number of units = Total CFM/ 80% capacity of unit

(Number of units = [Total M³/min] / [80% capacity of unit])

- 4. The hose used to duct the exhaust shall be either new temporary plastic tubing or new wire reinforced ducts
 - 5. The air filtration unit shall have a warning sound or horn if any restriction is found in the intake or exhaust.
- C. Provide a chart recording measuring device or equivalent for use to verify the pressure differential. This data shall be submitted to the IH at the end of the work shift.
 - D. Contractor shall install on the containment one fully operational (including filters) backup ventilation machine.
 - E. Units shall be placed to provide maximum air flow and prevent short circuiting air flow.
 - F. Pre-filter shall be changed as needed as conditions warrant or when directed by the I.H.
 - G. The HEPA filter will be checked by Industrial Hygienist (IH) for integrity and usage, and shall be changed by Contractor if damaged or overloaded.
 - H. **Any electrical work performed by the Contractor in association with this section will be done by a licensed electrician. Any electrical work performed in the regulated area shall be done by a licensed electrician who has met the requirements of OSHA 1926.1101, AHERA**

40 CFR 763 (24 hour worker Course), OSHA medical exam, respirator fit test and any license required by any Local, State or Federal Asbestos Law. All electrical work will conform to current National Electrical Codes (NEC) requirements.

- I. All fan unit(s) will be factory made and certified by current industry standards related to air movement equipment and air filters.
- J. When practicable, only use the windows located on the south end of the Santa Fe building for air filtration equipment exhaust discharge points.

2.01 Fan Unit Instrumentation

The Contractor shall provide but not limited to the following:

- A. Manometer: Factory installed manometer to measure the pressure drop across filters and indicate when filters have become loaded and need to be changed
- B. Static Pressure Table: A table indicating the usable air-handling capacity for various static pressure readings on the manometer affixed near the gauge for reference, or the manometer reading indicating at what point the filters should be changed, noting Cubic Feet per Minute (Cubic Meter per Minute) air delivery at that point
- C. Time Meter: Factory installed or equivalent elapsed time meter to show the total accumulated hours of operation
- D. Pressure Chart Recorder: Provide factory installed chart recording measuring device or equivalent for use to verify the pressure differential. This data shall be submitted to the IH at the end of the work shift.

3.01 Fan Unit Safety and Warning Devices: All fan unit safety and warning devices will be factory installed. All fan unit safety and warning devices will meet current National Electric Codes (NEC) , National Electrical Manufacturers Association (NEMA) requirements, and any other pertinent safety industry standards and government regulations related to fan unit air movement equipment as required in this section. The Contractor will need prior approval for the factory installed safety and warning devices from the IH before installing and operating any fan unit(s) in the containment area.

- A. Lockout(s): Electrical and/or mechanical lockout(s) to prevent fan from operating without a HEPA filter.
- B. Automatic Shutdown: An automatic shutdown system to stop fan in the event of a rupture in the HEPA filter or blocked air discharge.
- C. Warning Lights: The color of the warning lights will be of the type which meet current acceptable industry standards and government regulations.

1. Normal operation--GREEN LIGHT or equal
2. Too high a pressure drop across the air filters due to but not limited to a filter overloading--YELLOW LIGHT or equal
3. Too low of a pressure drop due to but not limited to a rupture in HEPA filter, obstructed discharge, etc.--RED LIGHT or equal

D. Audible Alarm:

1. If fan unit(s) shut down due to any operation of previously described of safety systems, an audible alarm will be activated to alert the Contractor and/or site security.
2. The audible alarm will generate a sound level, dbA scale, which currently meets local, state, and federal government safety regulations. If local, state, and federal regulations to not exist, the sound level will be as the manufacture recommends for the working conditions at the project site. The warning device such as bell or horn if should sound if:
 - a. any restriction is found in the intake or exhaust, or
 - b. any rupture occurs in the HEPA filter, or
 - c. any loss of electrical power occurs.

E. Smoke and Heat Detector(s):

1. At least one, smoke and heat detector shall be placed near the fan inlet to alert security, the Contractor and any workers in the containment area that a fire heat and/or smoke danger is in progress.
2. Site security and/or containment worker supervisor shall have a readily accessible "kill switch" to de-energize the electrical power to all negative air fan units.
3. The smoke and heat detector(s) shall be approved by but not limited to Underwriters Laboratory (UL), National Electrical Codes (NEC), or Federal Mutal (FM).
4. The factory installed smoke and heat detector(s) shall be an integral ancillary component of the fan unit(s) used by the asbestos abatement Contractor.
5. In the case of fan unit(s) that do not have factory installed smoke and heat detectors, the Contractor shall need to follow the manufacturer's recommends to the use and location of their product(s).
 - a. The recommendations shall also adhere to current industry, local, state, and

federal regulations.

- b. The Contractor will obtain prior approval from the IH before locating and installing the smoke and heat detectors.

- 6. The smoke and heat detector(s) shall be "hard wired" and/or battery powered as per manufacturer requirements. If the smoke and heat detector(s) are "hard wired" by the Contractor, the wiring will be performed by a licensed electrician and all electrical work will conform to current NEC codes.

F. Fan Unit Electrical Components:

- 1. The fan unit's electrical components shall be approved by but not limited to the National Electrical Manufacturers Association (NEMA) and Underwriter's Laboratories (UL) requirements.
- 2. Each fan unit shall be equipped with factory installed overload protection sized for the respective electrical components. The fan electric motor shall be equipped with factory installed manual reset thermal overload protection. Automatic reset thermal overload shall not be permitted unless current local, state, or federal regulations allow the use of this type of reset under specific work site conditions.
- 3. Fan unit components including but not limited to the electric motor, fan, fan housing, and cabinet shall be grounded in accordance with current National Electrical Codes (NEC) and National Electrical Manufacturers Association (NEMA) standards.

4.01 Auxiliary Generator(s):

If the availability of electrical power is insufficient and/or unreliable at any of the building project sites, the asbestos abatement Contractor shall provide auxiliary generator(s) to operate, as a minimum, the negative air fan unit(s) and any other ancillary equipment related to asbestos abatement activities. The Contractor may use other alternate sources of electrical power with prior approval from the Project Manager and/or IH.

- A. Auxiliary Generator(s): Provide generator(s) with the capacity to power all the required HEPA filtered fan unit(s) and any other ancillary equipment related to asbestos abatement activities. The generator(s) shall be of the self-starting type or manually start type depending on the project site conditions. The starting method shall be reviewed and approved by the Project Manager prior to operating any generator(s).
- B. Power Outages: In buildings where power outages are possible, the Contractor shall connect auxiliary generator output power to the building's existing power panel(s) or provide other electrical power routes that conform to current industry standards and/or current NEC

requirements.

- A. State-of-the-art solid state automatic power switching shall be provided to start the operation of auxiliary generator(s). State-of-the-art solid state automatic switch-over components shall provided the transfer of electrical power generated from the auxiliary generator(s), at a switch-over rate as recommended by the generator manufacturer, to the HEPA filtered fan unit(s) and/or any other ancillary equipment being used in abatement activities.
 - B. There shall be no electrical conflicts between the switch-over and "kill switch" electrical circuits of auxiliary generator(s).
 - C. The Contractor's licensed electrician shall coordinate any electrical work related to asbestos abatement activities with the ASARCO Engineering Department.
- C. Location of Auxiliary Generator(s):
- 1. Provide auxiliary generator(s) outside of the building in a location protected from the weather and/or as recommended by the manufacturer.
 - 2. The asbestos abatement Contractor will insure that the location of the auxiliary generator(s) will not create a fire and/or safety hazard to the workers and any structures in the vicinity or in the structure where asbestos abatement activities are occurring. Any fire damage or injury costs related to the use and location of the auxiliary generator(s) will be at the Contractors own expense.

END OF SECTION

SECTION 01527 WORK AREA PROTECTION

1.01 Preparation of Work Areas

- A. Post warning signs meeting the specifications of OSHA 29 CFR 1910.1001 at any location and approaches to a location where airborne concentrations of asbestos may exceed ambient background levels. Signs shall be posted at a distance sufficiently far enough away from the work area to permit an employee to read the sign and take the necessary protective measures to avoid exposure. Additional signs may need to be posted following construction of workplace enclosure barriers. Contractor shall post warning signs in both English and Spanish.
- B. All electrical power to all work areas shall have GFI hookups. Ensure safe installation (including ground faulting) to temporary power sources and equipment by compliance with all applicable electrical code requirements and OSHA requirements for temporary electrical systems.
- C. Abatement workers shall don PPE then proceed to pick up and dispose of any loose ACM debris. Any damaged asbestos material shall be encapsulated prior to any work being done.
- D. Install floor plastic sheeting in the work area with fire rated polyethylene sheeting. Floor shall be covered with two layers of 6 mil (minimum) sheeting.
- E. Floor sheeting shall extend at least 12" up the sidewalls of the work area. Sheeting shall be installed in a fashion so as to prevent slippage between successive layers of material. (Vinyl sheeting may be used for improved traction on floors.)
- F. Install plastic sheeting on walls in the work area with fire rated polyethylene sheeting.
- G. Walls shall be covered with two layers of 4 mil polyethylene sheeting. Plastic shall be sized to minimize seams. Seams shall be staggered and separated by a distance of at least 6 feet. Wall sheeting shall overlap floor sheeting by at least 12 inches beyond the wall/floor joint to provide a better seal against water damage and for establishing air filtration pressure.
- H. Wall sheeting shall be secured adequately to prevent it from falling away from the walls. This will require additional support/attachment when air filtration ventilation systems are utilized.

1.02 Fire Protection

- A. General Requirements:
 - 1. The Contractor shall employ his supervisor or a designated safety control officer to provide training to the workers of the proper use of fire extinguishers, implementation of Fire Safety Program and proper evacuation of the containment area.
 - 2. Training shall meet the minimum requirements of OSHA 1926.150(a)(5).
 - 3. All fire protection equipment shall be in place before any preparation or removal of asbestos will be allowed. Such equipment shall be clearly identified with an appropriate sign.
 - 4. All combustible rubbish, including bagged asbestos, shall be removed from the containment on a daily basis. Absolutely no bulk debris shall be allowed to remain in the containment over night..
 - 5. Contractor shall provide a safe means of egress from fire and like emergencies.

B. Work Area:

1. Polyethylene plastic that is used on this project shall be limited to certified fire retardant brands. MSDSs shall be maintained on the site for the inspection of the building owner to prove the presence of this type of poly.
2. Smoke/heat detectors shall be adequately spaced about the containment/work area. A minimum of one per 1000 square feet of floor space is required. One shall be placed 15 feet from the decontamination station.
3. Contractor shall provide a 4A/60BC chemical extinguishers for every 1000 square feet, or fraction thereof in the containment area (IAW Texas Department of Health regulations 295.60 (m)(1). All Workers shall be with-in a maximum of 100 feet travel distance of a fire extinguisher.
4. All air filtration units shall be able to be switched off from a single switch located at the control center. In the event that a fire starts or a smoke/heat detector is activated, the air filtration units shall be immediately switched off. The machines shall remain in the off mode until such time as it has been verified that a fire does not truly exist.

C. Cleanroom/Decontamination Unit:

1. A smoke/heat detector shall be located in the cleanroom area. Also, a 4A/60BC chemical extinguishers shall be located at either end of the decontamination unit.

D. Viewing Inspection Window

1. Where feasible, a minimum of one clear 1/8 inch thick acrylic sheet measuring approximately 18" x 24" may be installed by the Contractor as a viewing inspection window at eye level on a wall in each containment enclosure.
2. All such windows shall be sealed leak-tight with industrial grade duct tape.

END OF THIS SECTION

SECTION 01528 ENTRY INTO CONTROLLED AREAS

1.01 Entry and Exit of Work Area:

- A. General Requirements: Unless otherwise indicated (such as contract drawing, emergency evaluation, and these specifications) entry and exiting of the work area shall be through the "Worker and Equipment Enclosure" or an "Airlock".
- B. Entry and Exit through "Worker and Equipment Enclosure":
- C. Entering the Work Area: Each worker and/or authorized visitor shall enter the clean room, remove street cloths, put on a clean approved respirator and protective clothing (and disposable footwear if used). From this point, workers and visitors shall not eat, drink, smoke, chew gum or tobacco while in the work area. Respirator shall be tested for proper fit and operation. Then proceed through shower room to the equipment room. At the discretion of the IH smoke testing of respirator shall be performed on all personnel donning respirators.
- D. In the Equipment Room any tools, equipment, etc. needed shall be picked up here. Non-Disposable footwear (if used) shall be put on then proceed to work area.
- E. Exiting the Work Area: Prior to entering the equipment room, worker and/or authorized visitor shall brush off any gross contamination. Use the buddy system, by having a second visually check clothing for contamination.
- F. In the equipment room, any tools, equipment, etc. shall be stored, all clothing except respirator shall be removed. Undergarments requiring laundering shall be stored and handled as required by OSHA Regulations, 29 CFR 1926.1101; disposable type clothing shall be placed in a disposable container(plastic bag). Non-disposable footwear (if used) shall be removed and stored. Still wearing respirator, proceed naked to showers.
- G. Still wearing respirator, while showering wash and soak filters; remove respirator and continue to wash respirator with soap and water. Then proceed to wash body and hair with soap and shampoo. Then drying off and proceed to clean room.
- H. In the clean room, worker and/or visitor dresses in street clothes or clean coveralls. Coveralls worn outside (outside the clean room of the enclosure) shall be of a different color or marked and easily identified from those worn in the work area.
- I. Before re-entering the work area from the clean room, each worker and/or authorized visitor shall put on a clean respirator and dress in clean protective clothing follow the above procedures.
- J. In the airlock (vestibule), remove protective clothing (still wearing respirator) and place into a disposable bag. The exterior of the respirator shall then be wiped with a damp rag (or disposable towel) which is placed in the disposable bag, bag shall then be sealed and left in the vestibule with respirator on, proceeds out of the airlock.
- K. Once outside the airlock, respirator shall be removed, respirator cartridges removed and disposed of as asbestos contaminated waste. Respirator shall then be washed, new cartridges installed and placed in a storage container.

END OF THIS SECTION

SECTION 01560 RESPIRATORY PROTECTION

1.01 Respiratory Protection

- A. Respiratory protection shall be provided to workers in conjunction with a Respiratory Protection Program which shall meet the requirements of 29 CFR 1910.134. This program shall be posted at the work site and shall meet the new April 1998 version of OSHA 1910.134 which requires the program to be work site specific. Respirators shall be personally issued, fitted and marked. All workers shall be familiar with the contents of the respiratory program.
- B. The Contractor shall provide documentary evidence that all personnel required to wear respiratory protection have been trained in accordance with 40 CFR Part 763, 29 CFR 1910.134, 1910.1001 and 1926.1101.
- C. The Contractor shall provide the workers with clean and properly maintained respiratory equipment approved by NIOSH/MSHA during all work phases in this project.
- D. Air purifying respirators with (APR) with high efficiency particulate (HEPA) filters and acid gas/ HEPA cartridges are the minimum respirator for this project. This APR shall be used even when prep work is preformed, bagging out and demobilization.
- E. Type C supplied air shall be the initial respirator worn when beginning any asbestos abatement on this project because due to all the other contaminants such as lead, cadmium, arsenic and asbestos. Contractor shall have on site all historic data for all other contaminants and documentation in accordance with OSHA 1926.1101 when any other respirator is used.
- F. Type C supplied air or SCBA with full face piece operated in a pressure demand mode shall be used inside any containment utilizing pressure differential to maintain inward air flow. The Type C air supply must also have an auxiliary self-contained SCBA operating in a pressure demand mode, or high efficiency particulate (HEPA) filter which provides a 15 minute escape time in the event of compressor failure or malfunction. See Section 01030 for respiratory protection specified.
- G. When Type C respirators are employed, the air supply system shall provide grade "D" or better breathing air in accordance with OSHA 29 CFR 1910.34 and ANSI Z862.1 Commodity Specification for Air.
- H. The air shall be tested by the Contractor to verify that certain criteria established by the Compressed Gas Association, Inc., has been met or exceeded. The Contractor must provide a written copy of the analytical test results prior to using system. The Contractor shall be responsible for all fees associated with these tests. All tests will be performed at the job site and in the presence of the Owners representative.
- I. For bottled air filled with compressed air, or manufactured air Contractor shall follow the same test as above. For bottled air the Contractor must provide a certificate from the supplier stating the air is grade "D" or better.
- J. It is the Contractor's responsibility to provide adequate respiratory protection for any foreseeable contingency.
- K. Anytime the compressor or the Grade D Panel is moved, the Contractor shall perform a new Grade D air Test as stated in G and H. above.
- L. The Carbon Monoxide (CO) calibration of the panel shall be done and recorded in the log book daily.

END OF THIS SECTION

SECTION 01562 PERSONNEL PROTECTION

1.01 Personnel Protection:

- A. General Requirements: The Contractor shall provide all personnel training, equipment, materials, services and liability insurance required to perform the work in accordance with applicable Federal, State and Local regulations and this specification.
- B. Prior to commencement of work, workers shall be instructed, and be knowledgeable of the specific Asbestos Removal Procedures to be used in this project. In addition to the instructions, on-site training in the use of equipment and facilities unique to the job site shall be performed, to include emergency procedures, such as equipment power failures, fires, evacuations, etc.

1.02 Worker and Visitor Protection

- A. Provide workers with sufficient sets of protective full-body clothing. Such clothing shall consist of full-body coveralls and respirator. Provide eye protection and hard hats as required by applicable safety regulations. Non-disposable type protective clothing and footwear shall be left in the contaminated equipment room until the end of the abatement work, at which time such items shall be disposed of as asbestos waste, or shall be thoroughly cleaned of all asbestos containing waste. Disposable type clothing, and footwear may be used and shall be disposed of as asbestos waste. Bare feet will not be permitted.
- B. Provide authorized visitors with suitable protective clothing, respirator, headgear, eye protection and footwear, as described in paragraph A. above, whenever they are required to enter the work area.
- C. Each worker shall, upon entering the job site: Remove street clothes in the clean change room, put on a respirator and clean protective clothing before entering the equipment room or work area, the exception shall be that workers intending to reuse contaminated protective shall enter equipment room wearing respirators.
- D. Each time the worker leaves the work area: the worker shall remove gross contamination from clothing before leaving the work area; proceed to the equipment room and remove all clothing except respirators; Still wearing the respirator, proceed to the shower; clean the outside of the respirator with soap and water while showering; remove the respirator; thoroughly shampoo and wash themselves, remove filters (where required) and place them in the container provided for the purpose; and wash and rinse the inside of respirator.
 - 1. Contractor is responsible for providing soap, shampoo, clean and dry towels daily to employees and visitors.
- E. After showering, each worker shall proceed directly to the clean change room and dress in clean clothes at the end of each day's work, or before eating, smoking or drinking. Before re-entering the work area from the clean change room, each worker and authorized visitor shall put on a clean respirator with filters (where required) and shall dress in clean protective clothing, the exception shall be that workers intending to reuse contaminated protective clothing stored in the equipment room shall enter the equipment room wearing respirators.
- F. Asbestos contaminated footwear shall be stored in the equipment room when not in use in the work area. Upon completion of abatement, dispose of footwear as asbestos contaminated waste or clean thoroughly inside and out using soap and water before removing from work area or from equipment and access area. Store asbestos contaminated protective clothing in the equipment room for reuse or place in receptacles for disposal with other asbestos contaminated materials.
- G. Workers shall not eat, drink, smoke or chew gum or tobacco, or utilize sanitary toilet facilities at the worksite

except in established locations outside the work and containment areas, and enclosures.

- H. Workers shall be fully protected with respirators and protective clothing immediately prior to the first disturbances of asbestos-containing or asbestos contaminated waste materials and until final clean-up is completed. This includes removal of fixtures, ceilings, or anything else which may disturb the ACM.
- I. Provide and post, in the Equipment Room and Clean Room, the decontamination and work procedures to be followed by workers.

END OF THIS SECTION

SECTION 01563 DECONTAMINATION UNITS

1.01 Enclosures: (Used as a Backup System)

- A. General Requirements: Several types of enclosures are used, one for the workers and equipment entry and exit of the work area, a second as a holding area for waste storage and load-out area, and a third as a separation between the work area and the non-work area. Enclosure types required for this project shall be governed by special instructions on this specification.
- B. Enclosures can be portable pre-fabricated units or site fabricated units. Contractor shall submit for approval the type of enclosures to be used for this project. The submittal shall be submitted in conjunction with Section 1300 of this specification and included, but not be limited to the following:
 - 1. Floor Plan layout with dimensions showing all components.
 - 2. Material list with sizes and thickness.
 - 3. Plumbing layout showing shower(s), piping, drains, filtration systems(s) and water heater (if used).
 - 4. Electrical (if used) a layout showing lighting and/or outlets.
 - 5. Photographs may be submitted in conjunction with the above items.
- C. The minimum width of any way of exit access shall in no case be less than 28 inches. Where a single way of exit access leads to an exit, its capacity in terms of width shall be at least equal to the required capacity of the exit to which it leads. Where more than one way of exit access leads to an exit, each shall have a width adequate for the number of persons it must accommodate.
- D. Worker and Equipment Enclosure: Shall consist of 3 (three) compartments; clean room, shower room and equipment room separated by airlocks. The envelope of the enclosure shall be leak free.
- E. Clean Room: This room shall be provided with a locker or container for each worker's street clothing, respirators, respirator cartridges, clean work clothing, towels, and personnel supplies. Joint use of this space for other functions, such as office, storage of equipment, materials or tools, shall be prohibited.
- F. Shower Room: This room shall have an adequate number of showers, soap, shampoo and containers (plastic bags) for respirator cartridges. Shower(s) shall be piped with hot and cold or warm water. The room is to be free of any leaks. Under no circumstance shall the shower room be used for cleaning equipment.
- G. Equipment Room: This room shall be used for storage of equipment such as ladders, vacuums, scraping tools, non-disposable footwear, hardhats, goggles and any additional asbestos contaminated work items. This room shall be provided with receptacles, such as plastic bags or approved containers, for the use of disposable coveralls (if used) and asbestos contaminated waste before exiting to the shower. The room may also be provided with a wash area for equipment.
- H. This area shall be cleaned daily (several times a day is recommended) to prevent asbestos debris from being tracked into the shower area.
- I. Airlocks: Airlock curtain (door) shall be formed by two (2) overlapping sheets of plastic (4 mil, minimum) the full height and width of the passageway, each sheet being attached at the ceiling and one side. Each sheet is to be attached on opposite sides of the passageway. The sets of curtains (overlapping sheets) are required, one at each end of a space forming a vestibule, dead space. The space (vestibule) shall be two (2) feet in length by the width of passageway for enclosures and four (4) to six (6) feet in length by width of passageway for other location requiring airlocks.

- J. Filtration System: The shower drain and equipment room drain (if any) shall be connected to a filtration system before being discharged to the sanitary sewer. Filters shall be arranged in parallel banks with a 100 micron pre-filters feeding into a 1 micron final filters. Replaced filters shall be treated as asbestos contaminated waste and disposed of properly.
- K. Holding Area (Waste Storage and Load-Out): Shall consist of at least 1 (one) compartment with an air lock between the compartment and the intended disposal vehicle. The envelope of the compartment and air-lock shall be leak free. Passage between compartment and work area shall have two sheets of plastic overlapping each other.
- L. Separation(s) shall be constructed as follows:
 - 1. Framing of suitable materials such as 2 x 4 wood or metal studs shall be erected between floor with a bottom plate and ceiling with a top plate for distance. Support as required.
 - 2. Cover both sides with double layer of plastic sheeting(4 mil) with joints staggered and sealed with tape.
 - 3. Seal all edges of separation at floor, walls and ceiling with caulking to be airtight.
- M. Maintenance of enclosure systems shall be performed by the Contractor.

END OF THIS SECTION

SECTION 01632 PRODUCTS

1.01 Materials:

- A. General Requirements: Materials shall conform to the following:
1. All material shall be delivered to the job site in the original packages, containers, or bundles bearing the name of the manufacturer and the brand name.
 2. Store all materials subject to damage off the ground, away from wet or damp surfaces, under cover sufficient to prevent damage or contamination.
 3. Damaged or deteriorating materials shall not be used and shall be removed from the premises and properly disposed of.
 4. All material not in original containers will be reviewed by Industrial Hygienist (IH).
- B. Plastic (polyethylene) sheets, of four (4) mil thickness or greater as specified in scope of work of this document, in sizes to minimize the frequency of joints. Submit a sample of each thickness intended to be used.
- C. Tape: Capable of sealing joints of adjacent sheets of plastic sheets and for attachment of plastic sheet to finished or unfinished surfaces or dissimilar materials and capable of adhering under both dry and wet conditions, including use of amended water. Submit a sample of each type to be used.
- D. Surfactant (Wetting Agent): Shall consist of 50 percent polyoxyethylene ether and 50 percent of polyoxyethylene polyglycol ether, or equivalent, and shall be mixed with water to provide a concentration of one ounce surfactant to five (5) gallons of water.
- E. Impermeable Containers shall be suitable to receive and retain any asbestos-containing or contaminated materials until disposed of. The containers must be both airtight and watertight. The containers shall be labeled in accordance with OSHA Regulations 29 CFR 1910.1001. The container shall be of six (6) mil plastic bag (submit sample), or plastic lined drum (submit brochure), etc. Submittal required for each type intended to be used in this delivery order.
- F. The Glovebag shall consist of a 6-12 mil bag equipped with long-sleeve gloves, a tool pouch, and side port opening used for water and vacuum application. The glovebag with a zipper arrangement is preferable but not mandatory.
- G. Warning Labels: Container shall have the following notation in accordance with Applicable Laws 29 CFR 1926.158.
- DANGER
CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST
CANCER AND LUNG DISEASE
HAZARD
- H. Encapsulant: A sealant specifically designed to be used after the removal of asbestos to capture any fibers which may be left on surfaces in accordance with requirements of the U.S. Environmental Protection Agency (EPA).
- I. Warning Signs: Signs shall have the following notation in accordance with Applied Laws:

DANGER

ASBESTOS
CANCER AND LUNG DISEASE
HAZARD
AUTHORIZED PERSONNEL ONLY
RESPIRATORS AND PROTECTIVE CLOTHING
ARE REQUIRED IN THIS AREA

- J. Other Materials - provide all other materials as specified in drawings; also, other materials such as lumber, nails, and hardware, which may be required to construct and dismantle the decontamination area and the barriers that isolate the work area.

1.02 Equipment:

- A. Local exhaust ventilation systems shall be designed, constructed, installed, and maintained in accordance with the American National Standard Fundamentals Governing the Design and Operation of Local Exhaust Systems, ANSI 29.2-79. See Section 01513. This equipment:
1. Shall be portable and equipped with a high efficiency particulate absolute (HEPA) Filtration systems in compliance with ANSI 29.2-79.
 2. Deliver its rated volume of air with a clean first stage filter, an intermediate filter and a primary HEPA filter in place.
 3. The HEPA filter shall be certified capable of removing particles to 0.3 microns at a minimum efficiency of 99.97 percent.
 4. Shall be able to deliver no less than 70 percent rated capacity when the HEPA filter is installed or measure 2.5 inches of static pressure differential on a magnehelic gage.
 5. Shall provide manometer-type negative pressure differential monitor with minor scale division of 0.02 inch of water and accuracy within plus or minus 1.0%.
 6. Shall have an electric mechanism which automatically shuts the machine off in the event of a filter breach or absence of a filter.
 7. Shall have an audible horn which sounds an alarm when the machine has shut itself off.
 8. Shall have an automatic safety mechanism which prevents a workman from improperly inserting the main HEPA filter.
- B. Vacuum equipment: Shall be portable and equipped with High Efficiency Particulate Absolute (HEPA) filters.
- C. Respirator Equipment:
1. Respirators shall be selected from among those approved by the Bureau of Mines, Department of the Interior, or the National Institute for Occupational Safety and Health Department, of Health, Education and Welfare, under the provisions of 30 CFR Part II and shall be used in accordance with Applied Laws 29 CFR 1910.1001.

END OF THIS SECTION

SECTION 01712 CLEANING AND DECONTAMINATION PROCEDURES

1.01 Clean-up Procedures:

NOTE: The clean up procedures can be started by the Contractor whenever his supervisor and the Industrial Hygienist inspect and approve the asbestos abatement areas. The encapsulation shall not be done until the contractor is given approval by the Industrial Hygienist on site.

- A. Remove and containerize all visible accumulations of asbestos containing material and asbestos contaminated debris. Do not use metal shovels to pick up or move accumulated waste. Special care shall be taken to minimize damage to floor sheeting. All equipment not required on the project shall be decontaminated and removed from the area. All ACM disposal bags shall be removed from the containment prior to receiving approval for encapsulation or lockdown.
- B. Wet clean all surfaces in the work area using rags, mops and sponges as appropriate. (Note: Some HEPA vacuums may not be wet-dry vacuums. To pick up excess water and gross wet debris, a wet-dry shop vacuum may be used. This will be contaminated and require cleaning prior to removal from the work area).
- C. Visually inspect all areas where asbestos removal has taken place. Any dust, debris or residue in the containment area shall be considered to be contaminated and shall be treated as asbestos. The area inspection shall be accomplished using good Industrial Hygiene practices and ASTM E-1368-90, AHERA 40 CFR 763 and all applicable asbestos regulations concerning clearance and testing.
- D. The Contractor shall provide the Industrial Hygienist with all proper lighting, ladders, or scaffolding and any necessary tools to perform the clearance inspection.
- E. The Industrial Hygienist (IH) shall ensure that a thorough job of removal and clean up has been conducted. The IH has the right to terminate his inspection and re-direct further cleanup of the whole area if upon discovery of incomplete removal or discovery of debris.
- F. Upon written approval by the Industrial Hygienist in the Contractors logbook, encapsulation or lockdown shall be done on all surfaces including all poly. If the inspection fails, Contractor shall re-clean using all the above mentioned steps.
- G. When encapsulation or lockdown has been applied the Contractor shall wait for a drying period of not less than six (6) hours or at the discretion of the on-site Industrial Hygienist.
- H. When encapsulation has dried, the Contractor shall remove all poly and properly dispose of it.
- I. Following the satisfactory removal of all poly, another inspection shall be performed by the on-site Industrial Hygienist (IH). If any debris is found, the IH shall instruct the Contractor to re-clean the entire area. If the area is clean the IH shall begin with his first step of pre-clearance testing. (See section 01714) Clearance Testing).
- L. Upon achieving the clearance criteria for final clearance the Contractor can begin to remove all critical barriers, air filtration machines and begin his demobilization process.

END OF THIS SECTION

SECTION 01714 WORK AREA CLEARANCE

1.01 Clearance Air Monitoring:

- A. Following the completion of clean-up operations, the Contractor shall notify the Building Owner that work areas are ready for clearance air monitoring.
- B. The Owner shall then arrange for an Industrial Hygienist to sample the air in the work area for airborne fiber concentrations.
- C. The air sampling shall otherwise be conducted using sampling pumps calibrated at a flow rate of at not more than 10 liters per minute using collection media and procedures in accordance with 40 CFR Part 763 and the AHERA regulations. Air volumes shall be sufficient to provide reliable results down to a concentration of 0.005 fibers per cubic centimeter of air (f/cc) or lower. (Volume requirements for transmission electron microscope methods should be in accordance to 40 CFR 763 AHERA and the analytical laboratory).
- D. The number of samples that are required and the specific locations where they shall be taken should be established by the Industrial Hygienist.
- E. All samples at all locations shall indicate concentrations of airborne fibers less than 0.005 f/cc for release of the work area.
- F. When Contractor fails to achieve clean air in any of the above said clearance sampling methods, contractor shall reclean area till samples achieve standards set forth above. Any and all cost arising from this failure to attain clearance levels and the additional cleaning shall be the responsibility of the Contractor. Any penalties due to lost time or additional clearance sampling will be deducted from the final contract payment.
- G. At the discretion of ASARCO and/or Industrial Hygienist the contractor may be required to pass a soil sample test below the work area. These samples shall be required if any leaks or debris is found on the floor.

END OF THIS SECTION

SECTION 01716 DISPOSAL PROCEDURES

1.01 Disposal Procedures

- A. The Contractor shall not be responsible for final disposal of all the asbestos waste contaminated with lead, arsenic, and cadmium. All cost associated with disposal of asbestos waste shall not be part of this contract. The final disposal shall be the responsibility of ASARCO. However, the contractor shall be responsible for proper packaging and labeling. Contractor shall abide by all regulations and policies for handling regulated waste set forth by all regulatory agencies. ASARCO shall provide the lined waste container (roll off) as close to the site as possible.
- B. On a daily basis or at the discretion of the Industrial Hygienist (IH) contractor shall remove ACM waste from containment. Contractor shall not allow excess debris to accumulate on the floor of the containment, Industrial Hygienist (IH) has the right to stop work and direct clean-up.
- C. The Contractor shall coordinate transportation of waste to the ASARCO roll off with the owners representative on site. Any other waste that will be transported by contractor shall follow the following:
 - 1. Prior to bringing waste transportation vehicle on site, Contractor shall coordinate with the Environmental Section of ASARCO through point of contact Ms. Peggy Munsell at (915) 521-3640.
 - 2. Environmental Section shall brief the operator and contractor on the steps require to enter into ASARCO. Highlight of some rules are as follows:
 - 3. Transportation vehicle shall be totally enclosed.
 - 4. Contractor shall have empty weight and exit weight recorded through ASARCO weight station.
 - 5. Contractor shall provide a bill of ladden along with manifest.
 - 6. Vehicle carry proper insurance requirements.
 - 7. Vehicle shall have fire extinguisher, safety kit, and spill plan available.
- D. ASARCO shall fill out and sign the Waste Manifest. A copy of this manifest will be provided to contractor upon request.
- E. All manifests shall be returned and retained by ASARCO.
- F. Whenever the waste container is not contiguous with the containment then the ACM waste shall be transported in an enclosed compartment vehicle. The truck driver shall be knowledgeable of ACM spill plan carried in the vehicle. The Contractor shall be responsible for developing a spill plan in accordance with current city, state, federal regulations.
- G. All double bagged ACM shall be placed inside approved safety containers prior to being removed from site. Approved safety containers shall be:
 - 1. DOT approved steel drums.
 - 2. Cardboard type drums with sealable tops.
- H. Approved containers shall be moved by use of buddy system, hand trucks, or carts.
- I. Proper asbestos labeling of all waste, waste container (roll off) and vehicle in accordance with applicable laws shall be the responsibility of the contractor. Warning signs in accordance with 40 CFR part 61 NESHAPS regulations shall be placed on the vehicle when loading and unloading vehicle.

- J. Personnel loading asbestos containing waste shall be protected by disposable clothing including head, body and foot protection and at a minimum, half-facepiece, air-purifying, dual cartridge respirators equipped with high efficiency filters.
- K. Loading of any vehicle shall be closely monitored to avoid overloading vehicle capacity. Contractor shall ensure proper load bearing distribution of ACM waste.
- L. The disposal Contractor shall have a spill plan in effect for spills that may occur in transportation or handling. Any bag found to be broken shall be re-bagged and area of contamination shall be cleaned up immediately.
- M. Personnel unloading containers at the Storage Site shall wear protective equipment consisting of disposable head, body and foot protection and, at a minimum, half-facepiece, air-purifying, dual cartridge respirators equipped with high efficiency filters.
- N. Upon completion of un-loading vehicle the poly used to protect the vehicle shall be discarded as ACM waste. Any spillage discovered shall be cleaned and area decontaminated immediately by the disposal contractor.

END OF THIS SECTION

SECTION 02081 GENERAL REMOVAL PROCEDURES

1.01 Removal Procedures

NOTE: No asbestos removal shall be done without the Industrial Hygienist (IH) being on site. Prior to starting any work the contractor shall insure that all personnel are trained in the hazards of working with lead, arsenic, cadmium, working with Sulfur Dioxide and in high nose areas. Attachments to this manual contain material safety data sheets for Sulfur Dioxide to aid in training asbestos personnel.

- A. See Section 01560 and Section 01563 for minimum personnel protection. Industrial Hygienist (IH) shall authorize commencement of removal procedures. Clean and isolate the work area in accordance with Section 01527. Containers or drum shall mean containers that meet DOT 49 CFR 178.
- B. Spray all asbestos containing material with amended water solution, removal encapsulant, or chemical remover using spray equipment capable of delivering a low pressure mist to reduce the release of asbestos fibers. Adequately wet the ACM to the substrate and spray the ACM continuously during the removal practices to maintain adequate wet conditions and minimize fiber release and dispersion. Follow all manufacturers recommended procedures if a manufactured product is used for removal processes.
- C. Saturated asbestos containing material shall be removed in manageable sections. As ACM is removed, material will be placed in a suitable 6 mil polyethylene bags or drum. Material shall not be allowed to dry out prior to containerizing. Surrounding areas shall be periodically sprayed and maintained in a wet condition until visible material is cleaned up.
- D. All material removed shall not be thrown or dropped to the floor. Removal of intact and manageable sections is highly recommended as it will reduce fiber dispersion. All ACM containerized shall be carefully lowered to the ground floor by asbestos personnel.
- E. Containers (6-mil polyethylene bags or drums) shall be sealed when full. All ACM containerized shall be double lined. Bags shall not be overfilled as wet material is heavier than dry material. All containerized material shall be sealed with suitable duct tape, do not use wire or cord as it may break the container. All containerized material shall be decontaminated on the exterior surfaces before leaving the work area.
- F. Large components removed intact shall be wrapped in 2 layers of 6-mil polyethylene sheeting secured with tape for transport to the landfill.
- G. Asbestos containing waste with sharp-edged components (e.g. nails, screws, metal lath, tin sheeting) will tear the polyethylene bags and should be placed into drums for disposal.
- H. After completion of all stripping work, surfaces from which asbestos containing materials have been removed shall be wet brushed and sponged or cleaned by some equivalent method to remove all visible residue.
- I. Clean-up shall proceed in accordance with Section 01712.
- J. After the work area has been rendered free of visible residues, and the Industrial Hygienist (IH) has inspected and approved the area, a thin coat of a satisfactory encapsulating agent shall be applied to all surfaces in the work area including structural members, building components and plastic sheeting on walls, floors and covering non-removable items, to seal in non-visible residue. (Note: 1) High temperature components such as boilers and pipes may not permit the application of some encapsulants. 2) If insulation or acoustical materials are to be reapplied to the abated area, be certain that the encapsulant selected will permit good adhesion to the substrate. A small area should be tested before application).

- K. Special circumstances (e.g. live electrical equipment, high amosite content of material, materials previously coated with an encapsulant or paint) may prohibit the adequate use of wet methods to reduce fiber concentrations. For these situations, a dry removal method may be required. The contractor will have to acquire special permits, different from those mentioned herein from the NESHAP enforcement agency.

END OF THIS SECTION

SECTION 02088 REMOVAL OF ACM FLUE INSULATION

1.01 Procedures

- A. Lock out all electrical power where actual asbestos removal will occur.
- B. Asbestos removal of asbestos containing flue insulation material shall be performed using all personal protective equipment to include Type C Respirator. A decontamination station shall be erected, as specified, in its respective section on all areas of abatement.
- C. Prior to starting any work the contractor shall insure that all personnel are trained in the hazards of working with lead, arsenic, cadmium, working with Converter Cottrell Dust, and in high nose areas. Attachments to this manual contain material safety data sheets for Converter Cottrell Dust to aid in training asbestos personnel.

1.02 Removal of ACM Flue Insulation

- A. Set up barrier tape, warning signs, and control center. Minimum respirator shall be a full-face APR with HEPA and Acid Gas filter. A full body coverall such as the tyvek suit (or equivalent) shall be used during all work..
- B. Contractor shall follow all procedures in this manual which are applicable to full containment procedures.
- C. Removal shall be accomplished using a two man team. One man shall be equipped with water sprayer (amended water) while the other man removes the insulation from the tank.
- D. All ACM material and debris shall be double bagged and disposal procedures in SECTION 01716 of this Manual shall be followed. Contractor is warned that all ACM waste shall be placed in approved steel or cardboard drums. Contractor shall insure that the tank insulation wire lath does not cut plastic containment and if it does the Contractor shall insure that immediate repair methods are taken.
- F. SECTION 01712 CLEANING AND DECONTAMINATION PROCEDURES shall be followed when IH approves abatement.
- G. When directed by the IH, proceed with SECTION 01714 CLEARANCE TESTING PROCEDURES.
- H. Follow SECTION 01701 PROJECT CLOSEOUT AND DEMOBILIZATION.

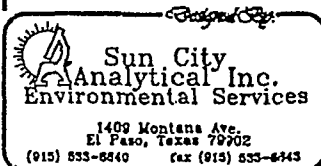
END OF THIS SECTION

GENERAL NOTES

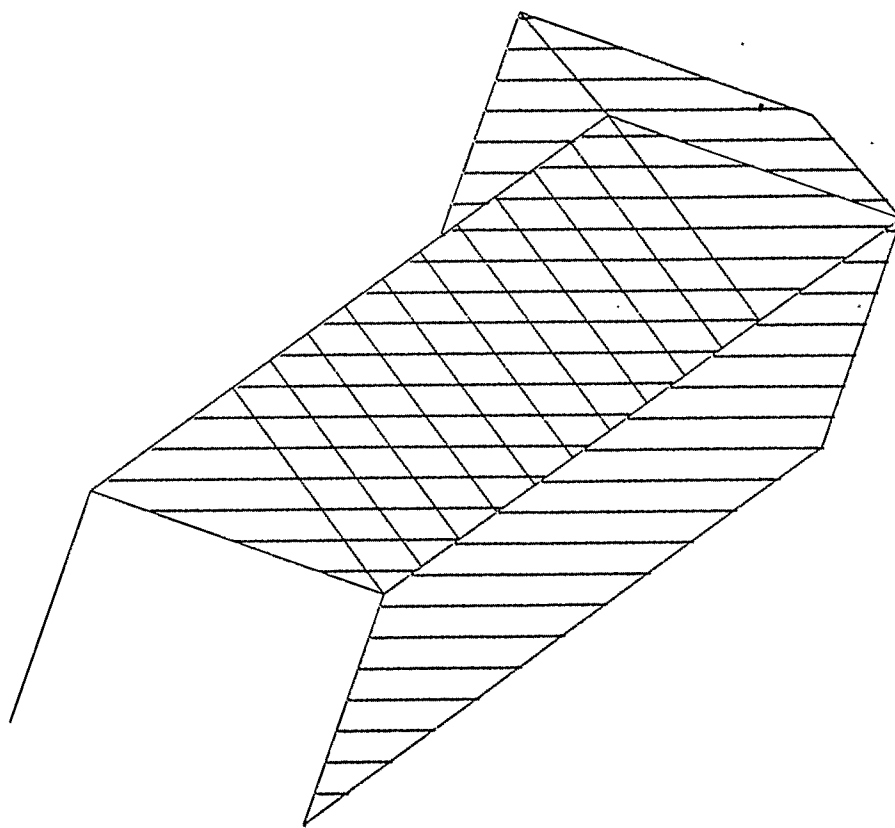
1. Drawing includes walls, partitions, columns, doors, windows, openings, and other building features assimilated from various sources and do not necessarily reflect current or comprehensive additions. They are for orientation purpose only. Contractor shall verify dimensions, quantities, and field conditions prior to starting project.
2. Project Manual (specifications) includes Conditions of the Contract, Technical Specifications, and any addendum which are integral parts of the contract.
3. A staging area will be supplied at the site for the Contractor's placement of any lifts, waste containers, office trailers, control stations, ... Exact locations for these placements include for the supply of electricity and water will be addressed at the Pre-Construction conference.

SPECIAL CONDITIONS

1. The contractor is to ensure that their personnel and equipment do not damage or litter the exterior of any building requiring work under this Contract. Any damage to the environment shall result in monetary damages or replacement by the Contractor.
2. The contractor shall ensure daily that the exterior of the building is organized and free of objects, material, or waste generated by their work or personnel.
3. The Contractor shall be responsible and/or repair of any damages to areas of the building which are not scheduled for removal or demolition in the plan and specification.
4. Vehicle entry to Asarco shall follow instruction per specification. (See disposal section-01716)
5. Contractor shall insure that workers are warned about exposure to pigeon waste. The work includes removal of pigeon droppings.



ASBESTOS ABATEMENT



 Sun City Analytical Inc.
Environmental Services
1400 Montana Ave.
El Paso, Texas 79902
(915) 833-8540 fax (915) 833-8543

ASARCO
CONVERTER COTTRELL
NOT TO SCALE



WORK DESCRIPTION:
ASBESTOS ABATEMENT
ASARCO-AA1/

DRAWN BY:
RE

PROJECT NUMBER:
98C-EP-193

INSPECTOR:
JA

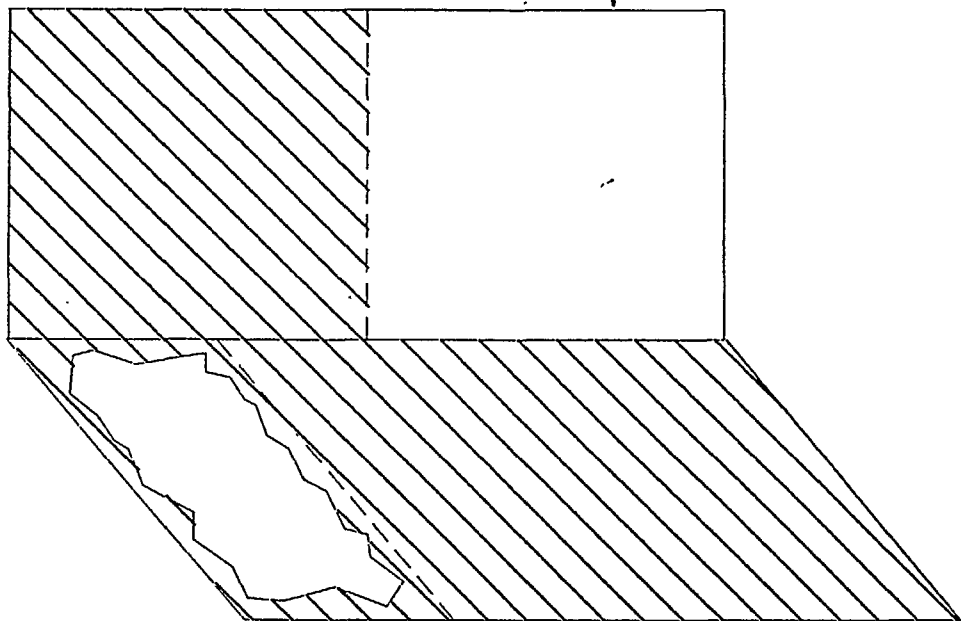
DRAWING:
AA-1

LEGEND
 REMOVE ACM FLUE
INSULATION (APPROX.
3,400 S.F.)

ASARCO ELP 0011711

ASBESTOS ABATEMENT

NORTH FACE



BOTTOM FACE

ASARCO
CONVERTER COTTRELL
NOT TO SCALE

 Sun City
Analytical Inc.
Environmental Services
1409 Montana Ave.
El Paso, Texas 79902
(915) 533-8840 fax (915) 533-8843

WORK DESCRIPTION
ASBESTOS ABATEMENT

PROJECT NUMBER
98C-EP-193

ACAD TITLE
../AsarcoAA-2/.

DRAWN BY:
RE

INSPECTOR:
JA

DRAWING
AA-2

LEGEND

- ⊘ REMOVE ACM FLUE
INSULATION (APPROX.
1,400 S.F)

ASARCO ELP 0011712

ATTACHMENT I

ASARCO

EP CONVERT COTTRELL DUST MATERIAL SAFETY DATA SHEET

92902

PRODUCT/COMPANY IDENTIFICATION

TRADE NAME (COMMON NAME OR SYNONYM) Converter Cottrell Dust		ASARCO PRODUCT CODE# 6140215	
CHEMICAL NAME Complex Mixture	FORMULA Complex Mixture	MOLECULAR WEIGHT Not Applicable	
ADDRESS (No., STREET, CITY, STATE AND ZIP CODE) ASARCO Incorporated 180 Maiden Lane New York, New York 10038 Phone: 212-510-2000			
CONTACT General Information - Department of Environmental Sciences DAY 801-262-2459 NIGHT 801-561-3044		ISSUED DATE 2/04/86	REVISED DATE 11/1/93
First Aid Information - (Medical Dept.) 415-457-0383 Transportation Emergencies - CHEMTREC 800-424-9300			

B. COMPOSITION/INFORMATION ON INGREDIENTS

MATERIAL OR COMPONENT	C.A.S. #	WT. %	PERMISSIBLE AIR CONC.(mg/cu.m.)	
			OSHA	ACGIH
Lead	7439-92-1	30-40	0.05	0.15
Zinc	7440-66-6	3	None Published	None Published
Cadmium	7440-43-9	2-5	0.005 as Cd	Cd & its cmpds 0.01 total/0.002 resp
Copper	7440-50-8	1	1.0 as dust	1.0 as dust
Arsenic	7440-38-2	10	0.01	0.2
Antimony	7440-36-0	1-2	0.5	0.5

C. HAZARDS IDENTIFICATION

PRIMARY ROUTES OF ENTRY INGESTION ☐ INHALATION ☒ SKIN ☐	CARCINOGENICITY IARC and NTP classify cadmium and certain cadmium compounds Group 2A carcinogens (probably carcinogenic to humans). IARC classifies lead, lead compounds and antimony trioxide as Group 2B carcinogens (possibly carcinogenic to humans). IARC, NTP and OSHA classify arsenic and compounds as Group 1 carcinogens (carcinogenic to humans)
ACUTE OVEREXPOSURE (SYMPTOMS AND EFFECTS) Extremely high doses of lead may cause encephalopathy, a brain condition that can result in seizures, coma and death. It should be recognized, however, that exposures of this magnitude in an industrial environment are extremely unlikely. Arsenic and antimony compounds may cause irritation of the respiratory system, skin and eyes, and gastrointestinal disturbances. Inhalation of dust or fume from cadmium compounds may cause irritation of the nose and throat. Inhalation of high concentrations of freshly-formed fume may cause a delayed reaction of pulmonary edema with symptoms of coughing, chest pain, chills, shortness of breath and weakness. Metal fume fever with symptoms of fever, chills, metallic taste, chest tightness or nausea may result from inhalation of zinc oxide fume or dust. Soluble copper salts can cause respiratory irritation, and irritation and/or burns to the skin and eyes.	
CHRONIC OVEREXPOSURE (SYMPTOMS AND EFFECTS) Chronic overexposure to lead may cause diseases of the blood-forming organs, kidneys and liver, damage to the reproductive systems, a decrease in fertility in men and women, damage to the fetus of a pregnant woman, anemia, muscular weakness and kidney dysfunction. Symptoms include: tiredness, uneasy stomach, irritability, poor appetite, metallic taste and loss of sleep. Prolonged overexposure to arsenic compounds may cause liver and kidney abnormalities, peripheral neuritis of the hands and feet and an increased risk of lung cancer. Symptoms include weight loss, nausea, diarrhea, weaknesses, loss of appetite and skin lesions. Long term overexposure to cadmium may cause lung injury(emphysema),lung cancer, and kidney dysfunction(proteinuria). Bone lesions characterized by pain in the back and extremities have been reported.	
LOCAL CONDITIONS POSSIBLY AGGRAVATED Diseases of the blood and blood-forming organs, hypertension, kidneys, nervous and possibly reproductive systems.	

ASARCO ELP 0011714

D. FIRST AID MEASURES

Inhalation: Remove from exposure; place individual under care of a physician.
Ingestion: Induce vomiting in conscious individual and call a physician.
Skin or Eyes: Flush with plenty of water. If symptoms develop, consult a physician.

E. FIRE FIGHTING MEASURES

FLASH POINT Not Applicable	AUTO IGNITION TEMPERATURE Not Applicable	FLAMMABLE LIMITS IN AIR (% BY VOL) Not Applicable
UNUSUAL FIRE AND EXPLOSION HAZARDS Not Applicable	FIRE EXTINGUISHING AGENTS RECOMMENDED No specific agents recommended	FIRE EXTINGUISHING AGENTS TO AVOID No specific agents
SPECIAL FIRE FIGHTING PRECAUTIONS Use NIOSH/MSHA approved self-contained breathing apparatus and full protective clothing if involved in fire.		

F. RELEASE MEASURES

SPILLS OR LEAKS

Any method which keeps dust to a minimum is acceptable. Vacuuming is preferred for dust. Use approved respiratory protection if possibility of dust or fume exists. Do not use compressed air for cleaning.

G. HANDLING AND STORAGE

NORMAL HANDLING

Use of approved respirators is required for applications where adequate ventilation cannot be provided. Activities which generate dust or fume should be avoided. When melted, the temperature should be kept as low as possible.

STORAGE

General storage procedures acceptable.

H. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS

Local exhaust ventilation is recommended for dust and/or fume generating operations where airborne exposures may exceed permissible air concentrations.

PERSONAL HYGIENE

Avoid inhalation or ingestion. Practice good housekeeping and personal hygiene procedures. No tobacco or food in work area. Wash thoroughly before eating or smoking. Shower and change clothes at end of work shift. Do not wear contaminated clothing home. Do not blow dust off clothing with compressed air.

SPECIAL PRECAUTIONS/PROCEDURES/LABEL INSTRUCTIONS

Where airborne exposures may exceed the OSHA action level and or PEL, refer to the OSHA Lead Star 29CFR1910.1025, OSHA Arsenic Standard 1910.1018, or the OSHA Cadmium Standard 1910.1027
LABEL SIGNAL WORD: WARNING

RESPIRATORY PROTECTION

Where airborne exposures may exceed OSHA/ACGIH permissible air concentrations, the minimum respiratory protection recommended is a negative pressure air purifying respirator with cartridges that are NIOSH/MSHA approved against dust, fumes and mists having a TWA less than 0.05 mg/cu.m.

EYES AND FACE

Safety glasses recommended where the possibility of getting particles in eyes exists.

OTHER CLOTHING AND EQUIPMENT

Full protective clothing is recommended for exposures that exceed permissible air concentrations. All contaminated clothing should be removed before leaving plant premises.

I. PHYSICAL/CHEMICAL PROPERTIES

MATERIAL IS (AT NORMAL CONDITIONS) Solid		APPEARANCE AND ODOR Gray Powder, odorless	
MELTING POINT (DEGREES C) Not Available	BOILING POINT (DEGREES C) Not Available	SPECIFIC GRAVITY (H ₂ O = 1) Not Available	VAPOR DENSITY (AIR = 1) Not Applicable
SOLUBILITY IN WATER (% BY WT.) Not Available	pH Not Available	VAPOR PRESSURE (mm Hg) Not Applicable	EVAPORATION RATE Not Applicable

J. STABILITY AND REACTIVITY

STABILITY Stable	CONDITIONS TO AVOID Not Applicable	
COMPATIBILITY (MATERIALS TO AVOID) None known		HAZARDOUS DECOMPOSITION PRODUCTS At temperatures above the melting point, metal oxide fumes may be evolved.
HAZARDOUS POLYMERIZATION Will not occur	CONDITIONS TO AVOID Not Applicable	

K. TOXICOLOGICAL INFORMATION

LD50(SPECIES, ROUTE) Arsenic: 763 mg/kg(rat, oral) Lead oxide: 630mg/kg(rat, intraperitoneal) Cadmium: 225 mg/kg(rat, oral) Antimony Oxide: 700 mg/kg(rat, oral)	LC50(SPECIES) Cadmium: 25mg/cu.m./30min.(rat)	MUTAGENICITY Lead, cadmium and antimony tested positive as mutagens in the Ames test. Rats given 580ug/kg of arsenic orally showed developmental abnormalities.
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L. ECOLOGICAL

ECOTOXICITY LC50s are given for the following materials and species: Lead: 3600 ug/mL - daphnia magna Cadmium: 50 ug/mL - daphnia magna Copper: 20 ug/mL - daphnia magna	ENVIRONMENTAL FATE Lead and cadmium are bioaccumulative in most aquatic life and mammals. Lead is highly mobile as dust or fume, yet forms complexes with organic material which limits its mobility. Arsenic is found as As ⁵⁺ in water, making it mobile in aqueous solution. Copper and Antimony are not bioaccumulative.
--	--

M. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHODS (DISPOSER MUST COMPLY WITH FEDERAL, STATE, AND LOCAL DISPOSAL OR DISCHARGE LAWS) If hazardous under 40 CFR 261, Subparts B and C, material must be treated or disposed in a facility meeting the requirements of 40 CFR 264 or 265. If non-hazardous, material should be disposed in a facility meeting the requirements of 40 CFR 257. EPA Hazardous Waste Numbers: Lead - D008, Arsenic - D004, Cadmium - D006	40 CFR 261
RCRA STATUS OF UNUSED MATERIAL If discarded in unaltered form, material should be tested to determine if it must be classified as a hazardous waste for disposal purposes. Under specific circumstances, application can be made to the EPA Administrator to have a particular waste designated non-hazardous.	

N. TRANSPORT

DOT REGULATION AND ID (OR PIN) NUMBER This material is regulated by the DOT as a Class 9, PG III and has an ID no. of UN3077.
--

O. REGULATORY INFORMATION

WHMIS CLASSIFICATION, SARA REGULATION AND OTHER INFORMATION

WHMIS classifies this material as a Class D-2A poison.
TSCA Status.....: On TSCA Inventory
Regulated under SARA Title III:
Sect. 302.....: None
Sect. 311/312.....: Immediate and Delayed
Sect. 313 Chemicals.....: Arsenic, Lead, Zinc, Cadmium, Copper, Antimony
CERCLA Reportable Quantity.....: Arsenic cmpds = 1#

WARNING: the state of California has listed lead and cadmium as chemicals known to cause cancer, birth defects or other reproductive harm, and has listed arsenic as a chemical known to cause cancer.

P. REFERENCES

PERMISSIBLE CONCENTRATION REFERENCES

OSHA regulations for airborne contaminants 29 CFR 1910.1000 and 1018; ACGIH Threshold Limit Values for Chemical Substance:

P. REFERENCES (Continued)

HAZARD INFORMATION REFERENCES

Documentation of the Threshold Limit Values, 6th Ed., ACGIH
Patty's Industrial Hygiene and Toxicology, Vol. 2A, 3rd Rev. Ed., 1981
NFPA Fire Protection Guide on Hazardous Materials, 10th Ed., 1991
Handbook of Toxic and Hazardous Chemicals; Sittig, Marshall; 1981
TOMES Plus Database; Micromedex, Inc., Vol. 17, 1993
DATATOX Database; Spectrum Research, Inc., Version 2.0, 1992

GENERAL

Handbook of Chemistry and Physics, 57th Ed., 1976-77, Weast, R.C., Editor, CRC Inc.

Q. ADDITIONAL INFORMATION

INFORMATION (HAZARDS, FIRST AID, ETC.) IS ABBREVIATED. MORE INFORMATION IS CONTAINED IN REFERENCES FOUND IN SECTION P.

OSHA Biological Limit for Blood-Lead level is a 3-sample/6-month average of 50^μmcg per 100 g of blood and/or two consecutive samples of 60 mcg per 100 g.

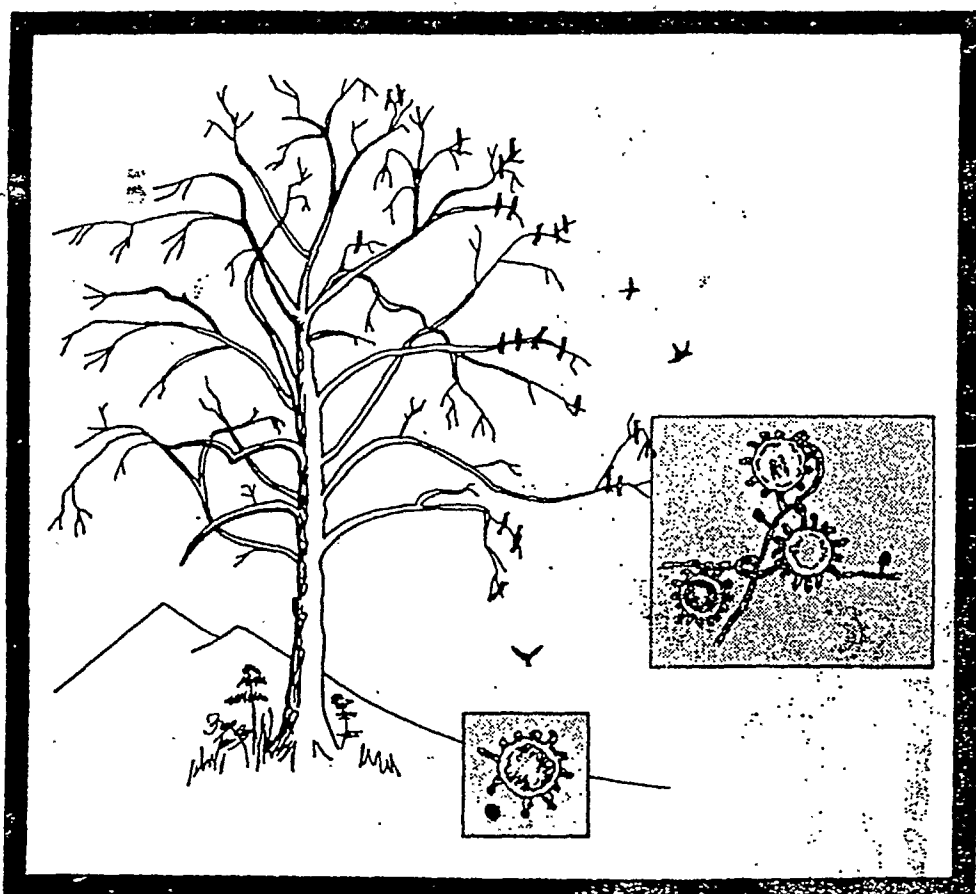
The ASARCO recommended airborne exposure for antimony trioxide is 0.2 mg/cu.m. measured as antimony.

THIS MATERIAL SAFETY DATA SHEET IS OFFERED SOLELY FOR YOUR INFORMATION, CONSIDERATION, AND INVESTIGATION. ASARCO INCORPORATED PROVIDES NO WARRANTIES, EITHER EXPRESS OR IMPLIED, AND ASSUMES NO RESPONSIBILITY FOR THE ACCURACY OR COMPLETENESS OF THE DATA CONTAINED HEREIN.

ATTACHMENT II

HISTOPLASMOSIS

Sources of Infection and Methods of Control



Department of Health and Human Services/Public Health Service/Centers for Disease Control

HISTOPLASMOSIS

Sources of Infection and Methods of Control

Robert J. Weeks

JULY 1984

**U.S. DEPARTMENT OF HEALTH AND HUMAN
SERVICES**

PUBLIC HEALTH SERVICE

Centers for Disease Control

Center for Infectious Diseases

Division of Mycotic Diseases

Atlanta, Georgia 30333, U.S.A.

ASARCO ELP 0011720

HISTOPLASMOSIS:

A Disease From the Environment

(Sources of Infection and Methods of Control)

Histoplasmosis

What It Is

Histoplasmosis is a respiratory disease caused by the fungus *Histoplasma capsulatum*. It is often called "cave sickness," "summer flu," or various other descriptive common names. The disease was first recognized in Panama in 1905, and until the 1940's was believed to be rare and fatal. An estimated 30 million living Americans, however, have been afflicted with this respiratory disease. Relative to the number of cases, fatalities are few. The disease in its severe form is often mistaken for tuberculosis, and in its milder form often simulates other respiratory diseases.

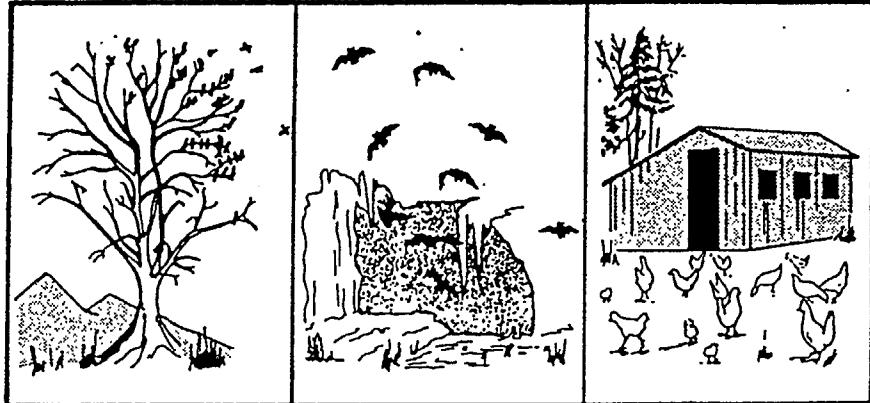
Medical Aspects

Histoplasmosis is normally a disease of the lungs acquired by inhaling air borne spores of *H. capsulatum* from the environment. It is not transmitted from person to person or from animals to humans. Many of these infections are overlooked, since they either induce no perceivable symptoms or cause such a minor, transitory respiratory illness that they elicit little or no concern. Infections, in general, are of low virulence, and severe or fatal cases occur relatively infrequently. Histoplasmosis may become chronic and persist for a number of years. In rare cases, the infection may spread throughout the body through the bloodstream and infect organs other than the lungs. If the disease progresses and spreads from the lungs, the outlook for survival is poor unless the illness is correctly and promptly diagnosed and the patients receive proper treatment.

Infection Sources

Histoplasmosis is found in both urban and rural settings in the United States. The mould that produces infections is most often found in soil enriched with bird or bat droppings. The conditions that the fungus needs to flourish are found where the droppings from bats, blackbirds, starlings, chickens, gulls, and pigeons have accumulated usually for 3 or more years. Infections in humans normally result from disturbing the accumulation in barns, belfries, blackbird-starling roosts, bat caves, chicken houses, and pigeon lofts, and other sites where these droppings are

found. Birds, it is believed, are not infected by *H. capsulatum* and do not carry the disease, but their droppings serve to enrich the soil so that it favors and supports the growth of *H. capsulatum*. Bats are susceptible to infection and theoretically could infect new sites through their droppings, but this has not been proven to occur.



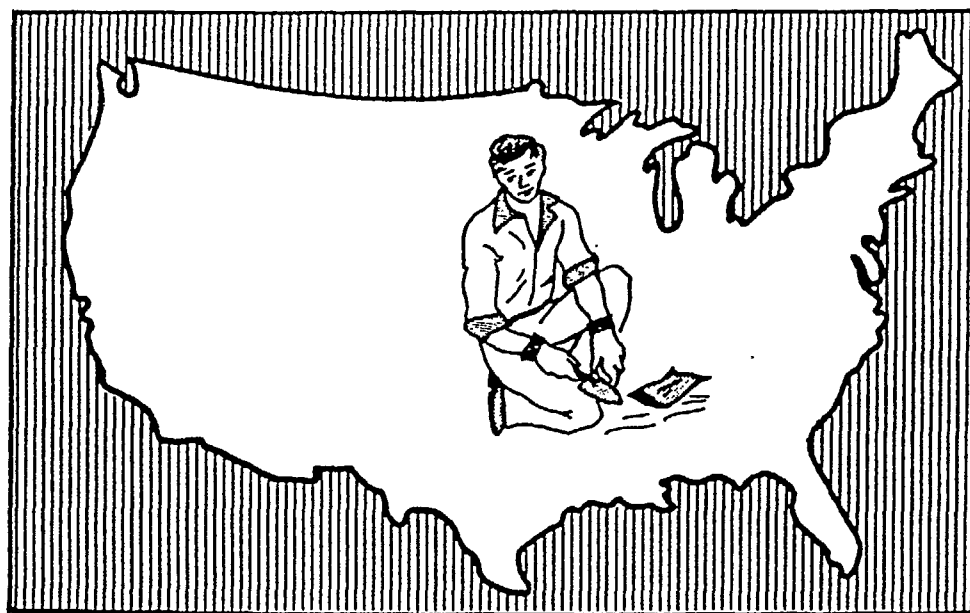
Transmission to Humans

Most people who come in contact with *H. capsulatum* for the first time will become infected. Young children in particular, and adults who move into areas where this fungus is in the environment are especially susceptible. A large percentage of the permanent adult residents of such areas experience mild infections at some time in their lives, but, once recovered from the disease, they generally have a degree of resistance to further infection. However, reinfection may occur in some persons, especially if they inhale a massive dose of spores. More severe or symptomatic cases of histoplasmosis may occur in persons who clean out silos, church towers, basements, or attics, demolish or clean chicken houses, explore caves, or clear underbrush or cut trees where birds or bats have habitually roosted. Infections may also occur in persons who are in the vicinity of such activities. Domestic and wild animals also are susceptible to infection.

Histoplasma capsulatum in Roost Soil

Histoplasma capsulatum is widely distributed throughout the world, and in the United States it is found in many areas. Its natural habitat is soil that has been enriched with bat or bird droppings. In such soil the fungus is able to survive and propagate itself over a broad range of environmental conditions. The mould grows normally in the upper 2 inches of the soil and is able to survive wide temperature and moisture fluctuations. *Histoplasma capsulatum* is not haphazardly distributed in nature; it is most frequently found in blackbird roosts that have been in use for 3 or more years. This period of time seems necessary for the soil to reach a state that enables *H. capsulatum* to overcome the normal mycolytic competition from other soil microorganisms. The distribution of *H. capsulatum* in nature, therefore, is dependent on the quantity and availability of nutrients, which permit it to become established and to compete successfully with other soil organisms. Once established in soil, it is not easily eliminated, even after the source of the nutrients—bats or birds—is removed.

Bird roost soil positive for *H. capsulatum* is the source of infections in susceptible persons who live near the roost. Higher rates of positive histoplasmin skin test sensitivity occur in persons who live close to roosts than those who live at a distance from them. Studies have shown that these bird roosts play a significant role in the epidemiology of this disease.



Control of Histoplasmosis

Protection of Individuals

Avoiding accumulations of soil mixed with bird or bat droppings is the best way to prevent symptomatic cases of histoplasmosis. But at times this is not always possible, and on occasions when persons who must be in contact with such sites, they should wear a self-containing breathing ap-



paratus or face masks capable of filtering out particulate matter above 1 millimicron in diameter.

The person should wear protective clothing, such as coveralls that can be removed after exposure, drenched with formaldehyde, and bagged until washed with a detergent. They should also wash their boots to remove contaminated soil before leaving the site. These precautions are suggested to prevent the spread of the fungus outside the infected site. Working when the

worksite is wet helps to minimize spore dispersal. Only persons with positive histoplasmin skin tests should work in positive sites, since they have acquired a degree of immunity that others do not have.

Control of Bats

Batproofing: This is the best way to handle bat problems. If structures are to be batproofed, all four sides should be monitored at dusk when the bats are emerging to determine where their exits are located. Bats can squeeze through openings as small as 3/8 inches. To exclude bats, foam sealants can be sprayed into small openings. The foam then expands and hardens into place. Plastic netting, like that used to protect grapes from birds, can be draped or cut to fit. Materials such as wood, hardware cloth, caulking, aluminum flashing, and sheet metal can also be used. Batproofing should be carried out after mid-August when the young have left, but before the advent of cold weather.

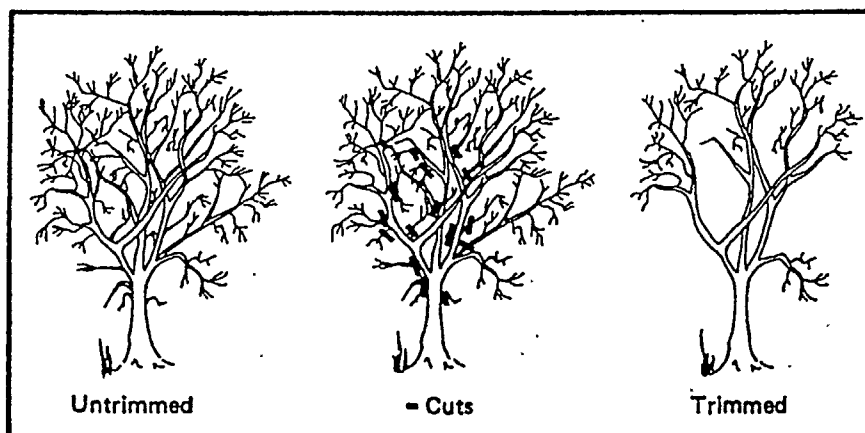
Repelling Bats: Napthalene is the only chemical repellent registered for removing bats from structures. It is most effective where bats are roosting in confined areas. As with exclusion measures, it should be used only in late summer and early fall. This technique is only temporarily effective.

Killing Bats: This should be out of the question. Toxicants are difficult to apply and may be only temporarily effective. Bat populations can recover and return to the site. Dead bats are a potential health hazard to humans and pets.

Control of Birds

Dispersing of birds: Dispersing birds from a roosting site is an obvious way to prevent the roost from becoming positive for *H. capsulatum*. Devices that can be used to scare birds include whistle and racket bombs fired from special pistols, shellcrackers fired from 12-gauge shotguns, and recorded bird distress and alarm calls. Any serious attempt at dispersal should involve local authorities, who may be able to conduct the effort. These steps should be followed: 1) notify local residents and authorities before initiating the control measures; 2) begin scaring as soon as possible after a roost forms; 3) begin the scaring operation as soon as the birds start arriving in the evening; 4) be persistent—efforts sometimes need to be continued for four nights in a row or more; 5) use a combination of scaring devices; and 6) locate and include all accessible roost habitats in the dispersal effort.

Habitat alteration is another way to disperse birds. Rather than complete elimination of roosting vegetation, removing one-third or more of the tree canopy has been shown to cause dispersal. Vegetation, however, usually has to be thinned annually unless some of the roost trees are removed completely. The habitat should only be altered in areas found to be negative for *H. capsulatum*.



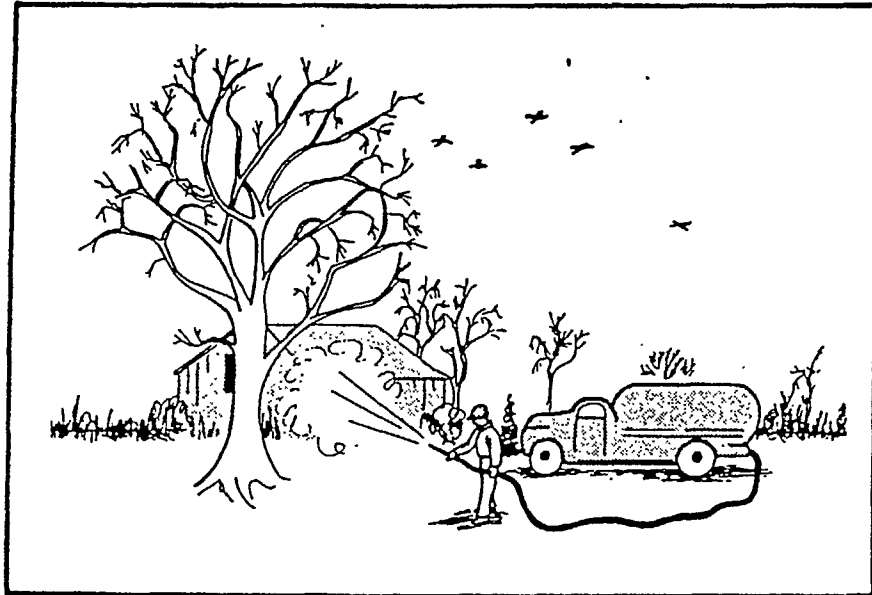
Lethal Control of Birds: Under certain conditions, local governments may decide to kill roosting birds. The only registered material for doing this is an industrial surfactant, PA-14, which removes the protective oils from the feathers and allows the birds to die of exposure. It is usually sprayed over the birds from a helicopter while temperatures are in the 30°s and low 40°s and 0.5 inches of rain is expected to fall before day-break. Some constraints exist, however, which severely limit the usefulness of this technique. Satisfactory weather for spraying birds only occurs about five or six times a winter. Because of the hazard from low-flying aircraft, roosts located next to residential areas cannot be treated. Care must be taken to keep PA-14, which is toxic to aquatic animal species, out of lakes, ponds, and flowing streams. If a substantial bird kill does result from a PA-14 operation, the local community must be prepared to cope with the potential stench and fly problem caused by thousands of carcasses. The dead birds should be picked up (normally an impractical solution) or bulldozed and covered with soil.

Timing and Choice of Roost Control Measures: It has been found that only roosts occupied by birds for 3 or more years (rarely 2) become infected with *H. capsulatum*. Therefore, from the standpoint of preventing histoplasmosis, birds roosting at a site for the first winter might be allowed to remain. If birds return the following fall or winter, then steps should be taken to remove them.

Whether the roosting birds are dispersed or killed should depend on the availability of likely alternate roost sites. If there are a number of nearby sites that birds have not occupied in the past, then dispersal might be the best option. If few sites are available to the birds and most of these have already been occupied for one or two years, further roosting might induce the growth of *H. capsulatum*, and the drastic decision to kill the birds might be considered.

Decontamination of Soil

If soil is tested and found to contain *H. capsulatum*, the mould should be eliminated, especially if the site is scheduled for clearing or construction. A successful technique has been developed to eliminate the fungus from the soil. A 3%-5% solution of formalin must be evenly applied to the site at a rate of 33 gallons per 100 square feet for each of 3 applications. The applications should be made on separate days so that the solution will penetrate deeply into the soil.



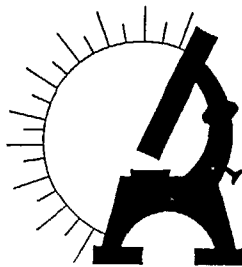
Suspected but unconfirmed sites: It is neither realistic nor practical to chemically decontaminate all confirmed or unconfirmed *H. capsulatum*-infested sites, but steps can be taken to reduce exposure and infections due to this mould.

1. Avoid, if possible, areas that may harbor the fungus.
2. Encourage groups that come into close contact with suspected positive soil to restrict such contact to individuals who have a positive histoplasmin skin test.
3. Those whose histoplasmin skin tests are negative and who must enter areas that may contain *H. capsulatum* may reduce their exposure risk by wearing masks capable of removing particulate matter larger than 1 millimicron in diameter. They should also wear disposable clothing, which includes coveralls, shoe and head covers, and plastic or rubber gloves. After leaving the positive area they should remove this equipment, seal it in a plastic bag, and either decontaminate or incinerate it.

This brochure was prepared under an Interagency Reimbursable Agreement funded by the U.S. Fish and Wildlife Service. For further information, contact the U.S. Fish and Wildlife Service, Denver Wildlife Research Center, Building 16, Denver Federal Center, Denver, Colorado 80225.

The following references may be consulted for more detailed information:

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