



United States Air Force
611th Civil Engineering Squadron
Elmendorf AFB, Alaska

Environmental Health & Safety Plan
Quality Program Plan, Part 1

Galena Landfill Closure
Galena, Alaska

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**SITE-SPECIFIC HEALTH & SAFETY PLAN
QUALITY PROGRAM PLAN – PART 1
GALENA LANDFILL CLOSURE
GALENA, ALASKA
CONTRACT NO. F41624-98-C-8001**

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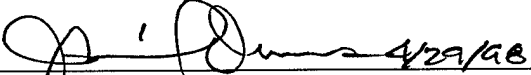
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Appendix B	Activity Hazard Analysis and Risk Assessment Forms
Appendix C	Key Personnel
Appendix D	Safety and Health Forms
Appendix E	Physical Agent Data Sheets and Material Safety Data Sheets
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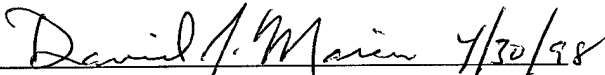
APPROVALS

We, the undersigned, have read and understand this Site-Specific Health and Safety Plan and its appendices and will ensure that all of its provisions are complied with during the Galena Landfill Closure project.

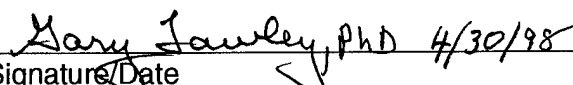
Project Manager



Signature/Date

JV Manager


Signature/Date

Safety and Health Manager


Signature/Date


Site Superintendent


Signature/Date

NOTE: Plan not valid until listed personnel have signed it.

**SITE-SPECIFIC HEALTH & SAFETY PLAN
QUALITY PROGRAM PLAN – PART 1
GALENA LANDFILL CLOSURE
GALENA, ALASKA
CONTRACT NO. F41624-98-C-8001**

1.0 INTRODUCTION

This Site-Specific Health and Safety Plan (SSHP) was prepared by the Ahtna/Clearwater Environmental Joint Venture (JV) for the Galena Landfill project. This plan will be used in conjunction with the Corporate Health and Safety Program, the Work Plan, the Project Sampling and Analysis Plan (SAP), the Quality Assurance Program Plan (QAPP) and various other submittals to guide its field personnel and contract laboratories in safe execution of activities associated with this project. Work performed will be in accordance with applicable federal and state safety regulations. The Corps Safety Manual, EM 385-1-1, will be used where a specific topic is not covered in this plan.

The JV is committed to the protection of its employees and physical assets. In fulfilling this commitment, the JV provides and maintains a safe and healthy working environment through management commitment and common sense application of regulatory standards. The JV strives to foresee and eliminate hazards which could result in injury, illness, damage or property loss. Accidents are reduced through proper management, combined with active employee involvement. Careful development of work practices, on-going education and thorough contingency planning help assure protection of employees, our property, the public and the environment.

JV policy in the form of a Corporate Safety and Health Program mandates that each SSHP be completed to the extent possible at the time, approved by the client and discussed with the crew prior to working at the site. As items arise that are not included in this plan, an Activity Hazard Analysis (see form in Appendix B) will be completed and discussed with the crew prior to the work. Reading, understanding and complying with this SSHP is mandatory for all workers, contractors and third-party personnel entering the project work area.

1.1 Approval of the Plan

Prior to submittal to the AFCEE, the SSHP will be signed and dated by the Project Manager, Site Superintendent and the Safety and Health Manager on the approvals page. The approved SSHP will be available for review at least 30 days prior to the field work. This plan will be reviewed with the crew prior to commencement of on-site activities. Deficiencies in the plan will be discussed and resolved. This SSHP will be updated continually during site activities.

1.2 Modifications to the Plan

As work proceeds, the SSHP will be made more site specific and adapted to changes in site conditions or activities. Changes to the plan will be by handwritten strikeovers or by lining out items, with the new information shown beside the information that was replaced. The changes will be initialed and dated by the person making the change. When the number or magnitude of changes requires, the SSHP will be retyped and redistributed to all users. Copies of the original plan showing strikeovers and other changes will be retained in project records. Significant changes to this document must be signed by both the Health and Safety management and the Project Superintendent.

The approved plan will be made available to all project personnel and subcontractors prior to going on the site and their input and understanding solicited. All project personnel, including subcontractors, will be asked to sign an acknowledgment form attesting that they have read and understand the plan (see Form D6 in Appendix D). A copy of the approved plan will be kept in the on-site office during the project and will be available to the crew at all times. Key aspects of this plan will be the topic of safety meetings prior to and during the project.

2.0 HEALTH AND SAFETY PERSONNEL

The following sections describe the project organization. The organization for health and safety and their responsibilities are found in Section 11.0.

2.1 Project Organization

The following lists key project individuals, their titles and phone numbers.

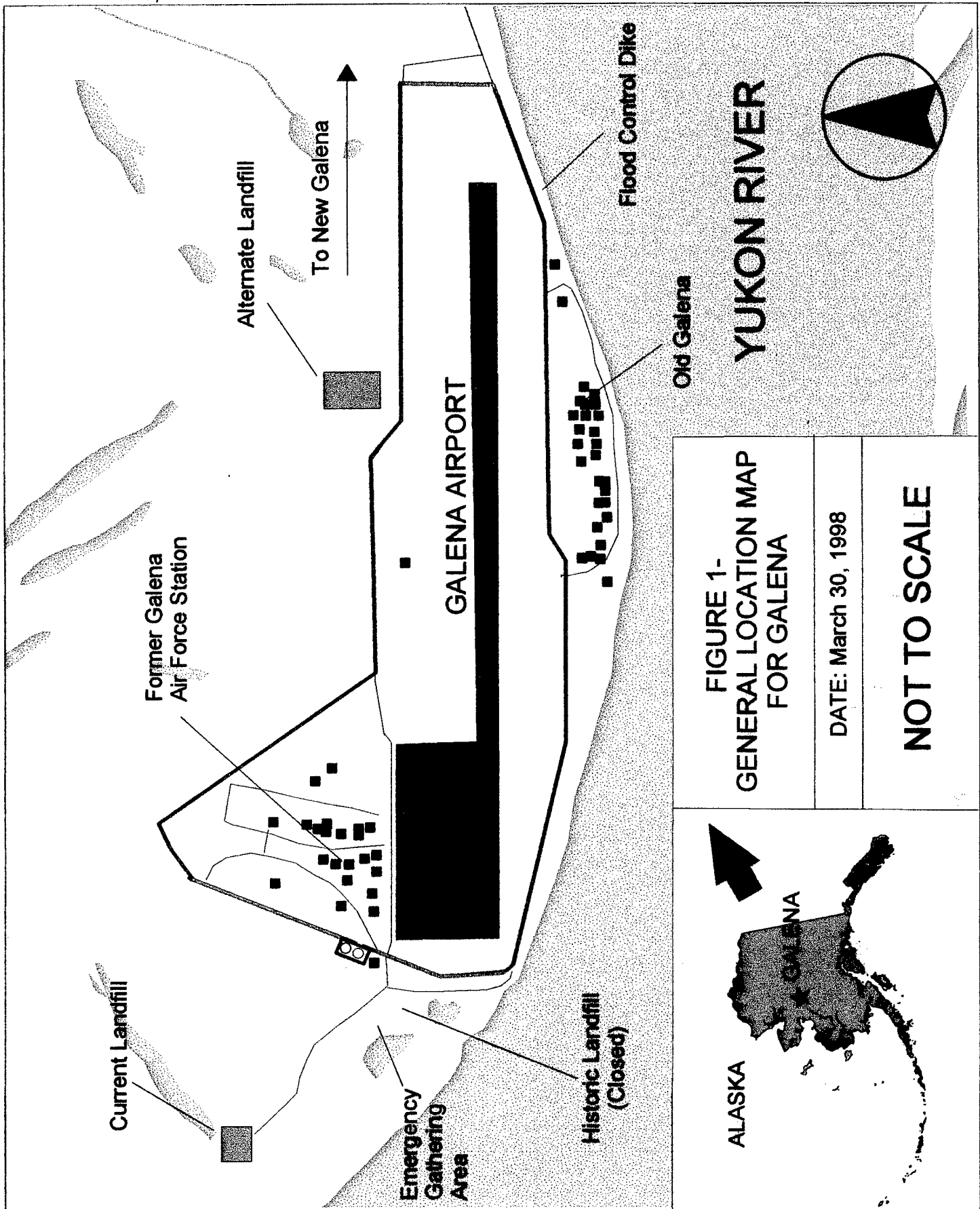
TITLE	NAME	TELEPHONE
611 CES/CEVC Project Manager	Jill Chouinard	(907) 552-4530
AFCEE Contracting Officer's Representative (COR)	Samer Karmi	(907) 552-4112
JV Manager	Dave Maiero	(907) 272-7961
Project Manager (PM)	Dan Owens	(907) 272-7961
Project Health and Safety Manager	Gary Lawley	(907) 522-3638
Site Superintendent	Bill D'Atri	(907) 272-7961
Site Health and Safety Officer	To be Determined	

3.0 SITE BACKGROUND AND CHARACTERIZATION

3.1 Environmental Setting and Climate

The Galena Landfill is located in west-central Alaska in the Yukon River Physiographic Region of Interior Alaska. It occupies land adjacent to the Yukon River and is located 260 miles west of Fairbanks, about one mile west of Galena and approximately 350 air miles northwest of Anchorage. Galena is accessible only by barge and air. (See Figure 1.)

The area is composed of a flood plain and by nearby interior highlands that are drained by the Yukon River and its tributaries. Galena lies in the Continental Climatic Zone; precipitation and surface winds are generally light with a mean annual precipitation of about 12 inches. Temperature variations between winter and summer can be extreme, with summer highs of about 80° F. The site area is about 30 acres and includes mostly flood plains and some wetlands.



3.2 Brief History of Site

The landfill site at Galena was officially opened for use in 1985. The current landowner is the Alaska Department of Transportation and Public Facilities (ADOT/PF). The facility was recently operated by the United States Air Force (USAF) under a Memorandum of Agreement between the two agencies. The landfill was used for general municipal waste disposal by several state and federal entities as well as the city of Galena. The site was closed for public use in October, 1997 (See Figure 2).

Based on historical and site investigative evidence, the following types of materials have been identified at the site:

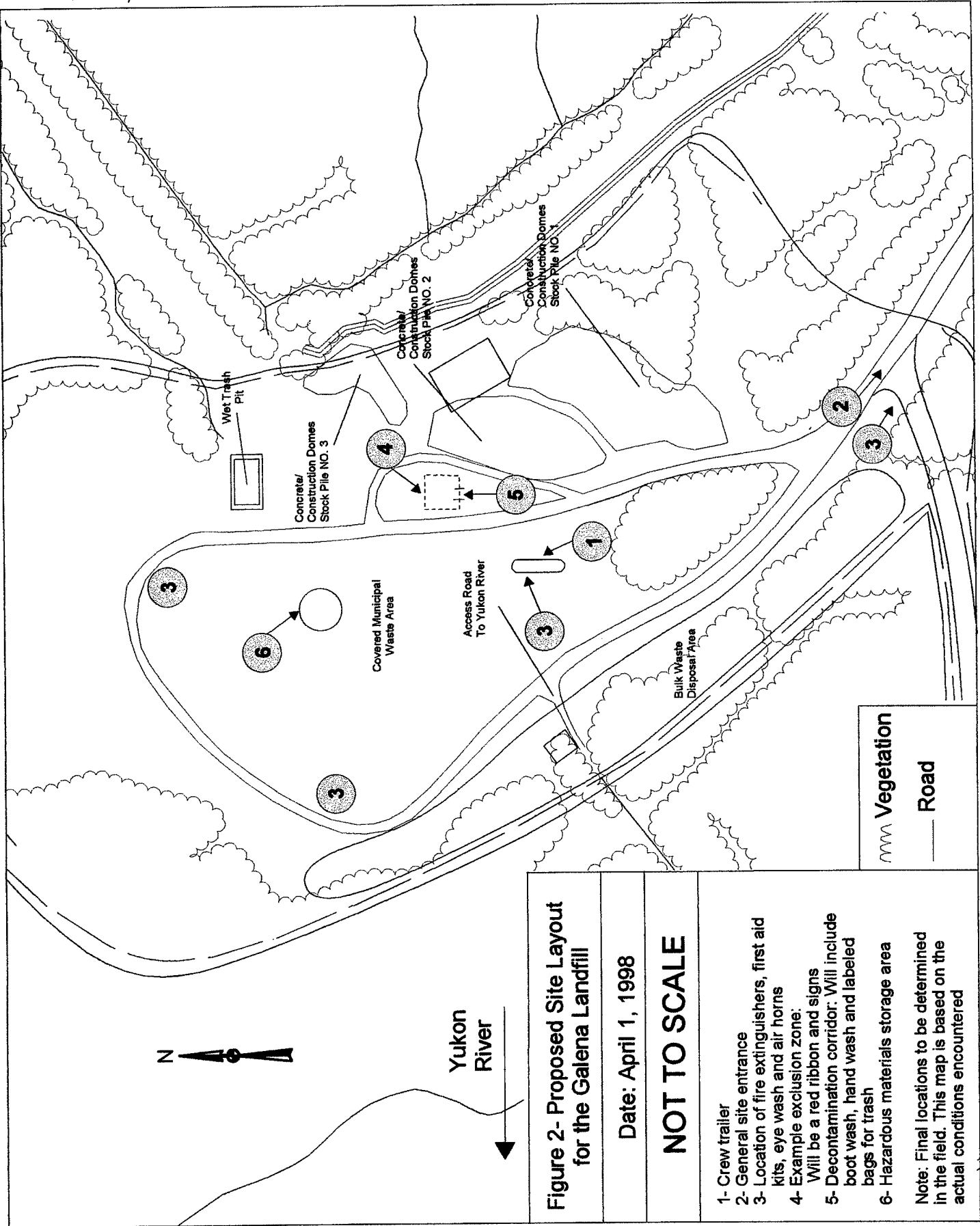
- automobiles potentially containing fluids and batteries
- heavy equipment such as dump trucks and graders
- asbestos containing materials, including a large boiler
- abandoned drums with unknown liquids
- potentially contaminated soils
- human wastes and garbage
- debris such as wood, concrete, paper and metal
- white goods (refrigerators) possibly containing freon
- transformers
- used batteries
- a barge
- spoiled meat from moose and caribou
- potentially infectious wastes from local clinics

3.3 Site Characterization and Available Information

The Galena Landfill Closure Plan (July, 1997) confirmed the presence of some soil and groundwater contamination in the landfill area. Hydrocarbons and other waste material suspected at the site include:

- Diesel Range Organics (DRO)
- Gasoline Range Organics (GRO)
- Benzene, toluene, ethylbenzene and xylene (BTEX)
- Possible PCBs (from transformers, light ballast, etc...)
- Asbestos
- Freon
- Human and animal wastes
- Pesticides-Herbicides, small quantities from spray cans, etc...

The Contractors past experience with landfills, suggest electrical transformers and electrical light ballasts may be buried at the landfill site. Experience also indicates that, the light ballasts contain PCBs and may have been burned at the site, creating the potential for dioxins and dibenzofurans. In the event these are discovered, the Contracting Officer's Representative will be immediately contacted for direction. Intrusive exploration slated for this project, such as test pits are not expected to yield PCB contamination. As a precaution, personnel will utilize proper PPE, as necessary and dust control measures will be instituted.



4.0 REFERENCES, PUBLICATIONS AND REGULATORY REQUIREMENTS

The following references and regulations were used as guidelines for preparing the SSHP and will be used for conducting all site safety related activities:

- American Conference of Governmental Industrial Hygienists (ACGIH) 1997-98 Threshold Limit Values (TLV)
- ANSI Z358.1, Emergency Shower and Eyewash Equipment
- 29 CFR 1904, Occupational Injury Recording
- 29 CFR 1910.120, Hazardous Waste Operations and Emergency Response (Sections (a) to (n))
- 29 CFR 1910.1200, Hazard Communications
- Vehicle Safety – Company Requirements
- 29 CFR 1910.1030, Bloodborne Pathogens
- Chainsaw Safety – Company Policy
- 29 CFR 1910, General Industry Safety Regulations
- 29 CFR 1910, Hearing Conservation
- 29 CFR 1926, Construction Safety Regulations
- 29 CFR 1926, Lockout/Tagout
- 49 CFR 171, 173, Hazardous Materials Shipping Regulations
- 29 CFR 1910.132, 133, 135, 136, PPE Plan
- EM 385-1-1, U.S. Army Corps of Engineers Safety and Health Requirements Manual (9/96 version)
- 29 CFR 1910.134, Respiratory Protection
- NIOSH Publication No. 85-115, Guidance Manual for Hazardous Waste Activity
- Contract No. F41624-98-C-8001, Technical Specifications
- Operations Plan 19-3, 3RD Wing, Hazardous Waste, Used Oil, and Hazardous Materials Management Plan, June, 1997.

5.0 ACCIDENT PREVENTION PLAN

Prior to initiation of on-site work, the detailed Accident Prevention and Reporting Plan found in Appendix A will be reviewed and implemented by the JV and all subcontractors. This Accident Prevention Plan has been developed in accordance with EM-385-1-1 and encompasses the accident prevention activities associated with the Corporate Health and Safety Program. It includes measures to prevent accidents, details of daily site inspections, accident reporting procedures and forms. The plan also discusses emergencies which could affect site workers

and preparations for emergencies so that employees will have the safest working environment possible.

Administrative responsibility for implementing the Accident Prevention Plan is shown by the statement of policy signed by management personnel (see page iv). Contents of this plan will be discussed in detail during the initial safety meeting and with the crew during subsequent site safety meetings. Key aspects of the plan, such as reporting and responding to accidents, may be practiced as a tabletop exercise prior to or during field activities. A copy of this SSHP, including the Accident Prevention Plan, will be maintained on-site and in the home office at all times.

6.0 TRAINING

On-site personnel will receive training according to OSHA requirements as follows:

REFERENCE	DESCRIPTION	WHO NEEDS TRAINING
29 CFR 1910.120(e) (3)	40-hour classroom training	All on-site personnel
29 CFR 1910.120(e) (3)	3 days hands-on training	All on-site personnel
29 CFR 1910.120(e) (4)	8-hour supervisors training	On-site managers
29 CFR 1910.1200	Hazard communication	All project personnel
29 CFR 1910.1030	Bloodborne Pathogens	All project personnel
49 CFR Part 173	Hazardous Materials Handling	All personnel sampling, packing or manifesting hazardous materials
Company Policy	CPR and First Aid Training	Supervisors and H&S personnel

Training (except the hands-on portion) will take place prior to assignment at the work site. All personnel who intend to enter a work site Exclusion Zone will have completed 40 hours of hazardous waste operations classroom training. New workers will spend the first three days on the site under close supervision of an experienced supervisor. Supervisors will have completed at least eight hours of training in addition to the 40 hours and 3 days mentioned previously. Documentation of the training in the form of copies of original certificates will be obtained for each employee before they arrive on the site. These records will be kept in the Anchorage office and the on-site project files.

In addition, all personnel on-site will complete a Certificate of Worker Acknowledgment (See Appendix D) which will be maintained in the project records.

Initial on-site training will include discussion of the SSHP, use of required PPE, decontamination of personnel, equipment and topics pertaining to the work that arise periodically. Some training will occur during daily site safety meetings; other training will occur whenever time is available. On-site training will be documented and will include the date, name of the attendees, subjects discussed and name of the person conducting the meetings.

Periodic training of on-site personnel may be required for specific work procedures or practices, changes in the SSHP, discussion of the Activity Hazard Analyses Forms and review of the Accident Prevention and Contingency Plans. Training may also be necessary for new site personnel, visitors or vendor representatives arriving at the site. The assigned AFCEE representative(s) are invited to participate in any or all of the training, either on- or off-site.

Documentation of all required training (per 29 CFR 1910.120) will be maintained on-site and will be available for inspection. Personnel safety training logs are included in form D2 of Appendix D.

Personnel entering the various work areas of the site will be briefed prior to entry. Site personnel must read, understand and comply with provisions of this SSHP. A sign-off sheet is provided (see Form D6 of Appendix D) to verify that all site employees (including sub-contractor personnel and visitors) comply with this requirement. Site-specific training will address all elements of the SSHP, including use of engineering controls. Additional training will be given to workers who may be exposed to unique or special hazards.

Daily safety meetings will include continued training on all elements of the SSHP. This orientation will include topics such as:

- Use of engineering controls and equipment onsite
- Work practices to minimize employee risk
- Required PPE; donning and doffing of PPE
- Medical surveillance requirements
- Recognition of symptoms and signs of overexposure
- Site status and work activity
- Zone updates
- Review of hazards and protective measures
- The buddy system
- Hazard Communication
- Airborne contaminant exposure potential and respiratory protection
- Equipment safety hazards and procedures
- Accident prevention, accidents and near-miss recognition and reporting
- Accident/emergency response procedures

7.0 SCHEDULED SITE WORK ACTIVITIES

The Environmental Cleanup Plan, Sampling and Analysis Plan (SAP) and Quality Assurance Program Plan (QAPP) (other submittals of this project) jointly define the activities to be conducted during this project. Key elements of field activities include the following:

- Travel from Anchorage to Galena by air
- Loading and unloading barges
- Mobilization of equipment from Anchorage to Nenana by rail and by barge from Nenana to Galena
- Crushing vehicles, banding and loading for transport

- Slip, trip and fall hazards on the site
- Asbestos abatement (will be discussed in a separate plan)
- Using a cutting torch
- Use of and working around heavy equipment such as a crusher, excavator, cat, loader end dump and possibly a hydroaxe.
- Covering human waste pits
- Use of chainsaws, jack hammers, compactors and other specialty tools
- Moving banded, crushed drums
- Driving vehicles and trucks on gravel roads with no shoulder
- Breaking concrete
- Laying mat sections
- Sampling soils and liquids

This activity list will be updated or modified as project tasks are completed or changed. This Environmental Health and Safety Plan provides the basis for the initial hazard analyses. Any hazards not discussed in this plan will be evaluated through completion and discussion of the Activity Hazard Analysis forms in Appendix B. Hazard analyses forms will be discussed with project employees involved with the work prior to activities so the various safety aspects and hazard controls are understood by everyone.

8.0 ON-SITE CONTROL ZONES AND SECURITY

Work zones will be established and maintained during the project. The zones are:

- **Exclusion Zones:** This area includes sample locations where active soil or liquid sampling or contact with hazardous materials may occur. In these areas, there is a possibility of contact with solids or liquids containing hazardous wastes. Areas where human wastes are found will be Exclusion Zones.
- **Contamination Reduction/Work Zones:** These areas include heavy equipment operations and normal site construction activities.

Because the bulk of the site contamination is below the ground surface or in batteries or drums, potential contact with site hazardous materials may occur only during sampling activities or when soil or liquids are being bulked or loaded into drums.

The Site Health and Safety Officer and Site Superintendent will coordinate site access and security. A safe perimeter will be established around the site. No unauthorized personnel will be allowed within the site perimeter. Zones designated by red tape and signs will be placed around areas of potential contamination. Entrances and exits to Exclusion Zones will be clearly marked and discussed with the crew before entry.

All visitors will complete the Site Control Log and Certificate of Acknowledgment (see Appendix D, Form D1). Visitors will be briefed and escorted by supervisory personnel when onsite. The Project Manager and the Site Safety Officer will determine if visitors meet all necessary training

and medical requirements prior to entering an exclusion zone. All personnel with sign in and out (Form D5 of Appendix D) when they enter the site so the Site Superintendent will know who is on the site at all times.

The SSHO will conduct daily inspections on the proper use of these zones. Any problems will be documented and reported to the Site Superintendent for resolution.

9.0 POTENTIAL HEALTH AND SAFETY HAZARDS

The required work at the landfill (see Sections 3.3 and 7.0) presents the potential for a variety of chemical, physical and biological hazards. This section discusses the nature of these potential hazards and the measures to be employed to minimize exposure.

9.1 Chemical Hazards

On the basis of information presented in the 1997 Air Force Closure Plan, the potential chemicals of concern are listed on Table 1.

Chemical hazards may include organic vapors from liquid fuels and solvents. Concentrations of these contaminants might pose an occupational hazard to site personnel. Workers will be briefed on the hazards of various vapors and site air monitoring activities.

Contaminant dispersions may involve contaminated dusts or vapors being carried by the wind, as well as the potential for spills or liberation of vapors during various site operations. The JV will exercise extreme care when performing sampling, bulking and other field duties involving contaminated soils. Dust suppression will be employed if necessary.

In addition, other chemicals may be present on this site. The descriptions in the following paragraphs are only general overviews of the compounds. Federal or recommended airborne exposure limits have not been established for all these vapors, but the JV recognizes the need to incorporate them into the SSHP and sample for their presence to ensure protection of workers.

- **No. 2 Fuel Oil (Heating Oil, Diesel Fuel):** No. 2 fuel oil is generally considered to be of moderate to low toxicity. Inhalation of low concentrations of the vapor may cause mucous membrane irritation. Inhalation of high concentrations may cause pulmonary edema (i.e.; filling of the lungs with fluid. Ingestion of small quantities of the liquid may produce nausea and vomiting. Chronic skin contact with these liquid may produce skin irritation as a result of defatting or contact dermatitis.

Because of the relatively low vapor pressure of No. 2 fuel oil at standard temperature and pressure, overexposure to its vapors is not expected to occur in an outdoor environment. For obvious reasons, ingestion and aspiration of the liquid is not expected to occur. Therefore, the major route of exposure is likely to be the skin through direct contact with contaminated soil or liquids.

TABLE 1
Suspected Chemical Contaminants at Each Site

SUSPECTED CONTAMINANTS	MEDIA
Petroleum, oil and lubricants	soil and liquids
Diesel Fuel	soil and liquids
Gasoline	soil and liquids
Waste oil and grease	soil and liquids
Heavy metals	soil
Benzene/dichlorobenzene	soil and liquids
Toluene	soil
Xylene	soil
Polyaromatic hydrocarbons (PAH)	soil and drums
Human wastes including pathogens, viruses and bacteria	in landfill
Chlorinated solvents	in drums or soil
PCBs from transformers	in transformers or soil
Dioxin from burned PCBs	in soil
Jet fuel (Jet A and others)	in soil
Pesticides/Herbicides	in cans on site
Compressed Gases	in white goods
Asbestos	in boiler and soil
Tar	in drums
Chlorinated solvents	in cans or soil
Sulfuric acid	in batteries or container
Unknown liquids	in drum

- **Gasoline and Jet Fuel:** Gasoline and jet fuel consist of a mixture of hydrocarbons, including aliphatic hydrocarbons, aromatic hydrocarbons and a variety of branched and unsaturated hydrocarbons. Extremely high levels of exposure, which are unlikely to occur at the site, could produce symptoms such as dizziness, coma, collapse and death. Exposure to non-lethal doses is usually followed by complete recovery, although cases of permanent brain damage following massive exposure have been reported. In general, the toxicity is related to content of benzene and other aromatic hydrocarbons.
- **Other Chemicals:** There is sulfuric acid, possibly PCBs, antifreeze, lube oils, etc., on the site. The Site Safety Officer will be aware of exposure to these hazards at all times and set up zones and hold impromptu discussions when potentially contaminated areas may be encountered.

9.2 Physical Hazards

Personnel will face many physical hazards during site activities (see Table 2). These include the potential for fire; slipping, tripping and falling; heavy equipment and vehicle operation; meteorological phenomena, such as lightning; and heat/cold stress. The following activities will be used to mitigate such hazards:

9.2.1 Fire/Explosion Hazard

In the event of a fire or explosion, the local fire department will be summoned. Upon their arrival, the SSHO or Site Superintendent will advise the fire commander of the location, amount and identification of any hazardous materials onsite. If it is safe to do so, trained site personnel may:

1. Use fire fighting equipment available onsite to control or extinguish the fire.
2. Remove or isolate flammable or other hazardous materials which may contribute to the fire.

Emergency numbers will be posted for the closest fire department, located at Galena (see Section 19.1).

9.2.2 Slip, Trip and Fall Hazards

These potential hazards are more likely to occur during excavation activities. Discussing this hazard frequently, wearing appropriate footwear and avoiding obviously hazardous areas will help prevent injuries due to slipping, tripping and falling.

9.2.3 Vehicle Operation

Operators must be knowledgeable of local surface conditions and the presence of site personnel on the ground in the vicinity of their vehicles. Speed limits, use of seat belts, valid drivers licenses, etc., will be discussed with site personnel.

TABLE 2
Project Hazard Analysis & Risk Assessment Potential

TASK/ACTIVITY	POTENTIAL HAZARDS	*	CONTROLS
Site Mobilization/Demobilization Loading and offloading equipment on trucks, barges, etc.	Heavy equipment related accidents	2	Forklift operator training. Make eye contact if in the area. Spotter as necessary, establish traffic patterns.
	Manual lifting hazards – muscle strain, crushed toes, pinched fingers or hands, falling hazards	2	Proper procedures, training, safety meetings, PPE and inspections.
Sampling Environmental Obtaining and handling samples of soil or liquids	Operation of excavator to obtain sample	1	Follow proper excavator procedures. Trained spotter.
	Skin contact with contaminated liquids or sample preservatives	2	Wear PPE as prescribed; use good techniques.
Decontaminating sampling and other equipment	Inhalation of gases or vapors	2	Perform air monitoring; proper PPE
	Skin contact with decontamination solution (e.g., hexane or methanol)	2	Wear PPE as prescribed, proper procedures
	Inhalation of vapors from hexane or methanol	1	Perform monitoring
	Splattering by steam cleaners		Wear PPE Ensure adequate ventilation
Earthwork, Trenching, Excavating, Hauling Dirt, Excavating Clean Soil, Burying Debris	Excavation collapse	2	Use trenching/excavating procedures
	Fall hazards		Post and barricade around excavation
	Dermal contact with contaminated material	1	Wear PPE as prescribed
	Hazards working around heavy equipment	2	Follow procedures for heavy equipment operation. Make eye contact with operators.
			Use a spotter for equipment operators
	Slips, Trips, Falls	3	Maintain good housekeeping
			Clean up slippery surfaces
			Eliminate or barricade tripping hazards; wear foot gear with good traction.
	Musculoskeletal injuries from shoveling or lifting	2	Use good techniques. Take breaks to stretch.
	Manual lifting hazards-muscle strain, crushed toes, pinched fingers or toes.	2	Use legs, stretch, don't lift heavy weights.
	Hazards associated with falling rocks, etc.	1	Proper PPE
	Inhalation of vapors, dust or gases	1	Perform air monitoring Wear PPE as appropriate Use wet methods to suppress dust

* Risk Potential: 1=Low risk or low degree of harm if it should occur 2=Moderate risk 3=High risk or extreme consequences

TASK/ACTIVITY	POTENTIAL HAZARDS	*	CONTROLS
Operating, Maintaining and Materials and Equipment			Wear PPE as appropriate Use wet methods to suppress dust
	Musculoskeletal injuries from improper use of hand tools	1	Follow proper procedures; good machine guards, PPE
	Hot work	2	Permit for torch cutting operations; follow procedures; adequate PPE
	Crushing hazards	1	Follow applicable JSA
	Dermal contact with contaminated media	1	Wear PPE as prescribed
	Inhalation of vapors	1	
	Manual lifting hazards-muscle strain, crushed toes, pinched fingers or hands	2	Use legs, stretch, don't lift heavy weights.
Use of Generators/Electrical Equipment			
	Electrical shock hazards	1	
Filling, Regrading	Hearing hazards	3	Engineering controls, hearing protection
	Hazards working around heavy equipment	1	Stay away from bucket and swing zones
	Slips, trips, falls	2	Maintain good housekeeping. Clean up slippery surfaces. Eliminate or barricade tripping hazards. Wear shoes with good traction.
Using Absorbent Materials for Contaminated Materials	Musculoskeletal injuries from lifting or shoveling	2	Take breaks, warm up, don't lift heavy loads.
	Dermal contact with contaminated media	1	Wear PPE as prescribed, work upwind
	Inhalation of vapors	1	Perform monitoring
Removing, Sampling, Packaging Hazardous and Non-hazardous Materials	Manual lifting hazards-muscle strain, crushed toes, pinched fingers or hands	2	Observe good procedures, wear proper PPE
	Dermal contact with contaminated media	1	Wear proper PPE
	Inhalation of vapors from contamination	1	Perform air monitoring
	Skin contact with decontamination liquid	2	Wear required PPE
Decontamination Procedures	Inhalation of vapors from hexane or methane during decontamination	1	Perform air monitoring
	Splattering by steam cleaners	2	Proper techniques, wear 2 kinds of eye protection
Sorting/Moving/Burying Debris	Contamination in contact with skin	2	Proper technique, PPE
	Falling material, pinched fingers, toes	2	Use of tie lines. Stay from under loads. Use proper PPE

* Risk Potential: 1=Low risk or low degree of harm if it should occur 2=Moderate risk 3=High risk or extreme consequences

TASK/ACTIVITY	POTENTIAL HAZARDS	*	CONTROLS
	Viruses, bacterial pathogens, etc.	2	Keep from contact with material. Wear proper PPE. Good decon including change of clothes, washing hands.
Remove Liquids from Vehicles; Bulking Liquids	Explosion and fire from fuels	2	Inspect tanks, inert as required.
	Punch hole in tanks, splattering liquids, exposure to skin, eyes and lungs, spills, crushed toes, etc.	2	Careful work, good equipment, proper PPE.
Move, Crush, Transport Vehicles and Recyclables	Crushed extremities, back strain, flying metal	1	Careful work, staying back from crusher, proper PPE, tie lines if necessary.
Load, Move Bails of Crushed Drums	Falling loads, bails coming apart, crushing fingers and toes, tar contamination	1	Proper techniques, good safety meetings, proper PPE.
Cutting Metal and Torch	Eye injury, inhalation problems, hot sparks	2	Keep area clean of burnables, proper PPE, careful work.
Breaking Up, Moving Concrete	Flying rocks, falling rocks, crushing people	1	People stay back, wear good PPE, i.e., gloves, hard hat.
Burning Brush	Fire spreading, burning fingers	1	Careful work, proper gloves, eye protection
Misc., Strapping, Using a Knife	Cut fingers, legs, flying metal, etc.	2	Careful, proper procedures, proper PPE.
Clearing and Grubbing	Cuts and severe injuries from chain saw	2	Keep equipment in good repair, use proper cutting techniques, wear appropriate PPE (leather chaps, hard-toed boots, leather gloves)

* Risk Potential: 1=Low risk or low degree of harm if it should occur 2=Moderate risk 3=High risk or extreme consequences

9.2.4 Lightning

Weather in central Alaska can be very unpredictable. Workers will be given site-specific training in meteorological hazards such as lightning. In the event of a severe thunderstorm, the site supervisor will stop work and workers will seek shelter.

9.2.5 Heat Stress

When the ambient air temperature has exceeded 70° F for one hour, the SSHO will begin monitoring personnel for signs and symptoms of heat stress. When impervious clothing is worn, monitoring for heat stress will begin when ambient temperatures exceed 60° F. Heat stress will be monitored as determined by the SSHO, including potential use of physiological parameters such as skin temperature, oral temperature, deep body temperature and heart rate.

A fluid/electrolyte/water replacement will be used as necessary to replace liquid loss. This liquid supplement will be stored in a clearly marked cooler at the edge of the decontamination zone or in a water cooler or other appropriate means as approved by the SSHO. Disposable paper cups will be provided.

9.2.6 Cold Stress

Cold-related injuries may occur at sites when ambient temperatures drop and wind speed increases especially during wet weather. Hypothermia, a decrease in body temperature, is more likely to occur when workers are wearing wet or damp PPE. The single most important aspect of life-threatening hypothermia is the fall in the deep core temperature of the body. Workers will be protected from exposure to cold so that the deep core temperature does not fall below 96.8° F. This protection will be assured by personnel wearing clothing appropriate for the climatic conditions (i.e. rain gear, rubber boots, gloves, and warm coats). A warm up trailer will be at the site to allow for rest breaks and as a dry location for lunch.

9.2.7 Confined Spaces

No confined spaces onsite are anticipated to be entered at this time. Should a permit-required confined space entry become necessary, properly trained individuals following a completed, approved entry permit will be allowed to enter.

9.2.8 Trenching/Excavating

Any trenches or excavations will be managed in accordance with OSHA regulations (29 CFR 1926.46). These regulations stipulate that workers will not enter excavations deeper than five feet unless acceptable sloping, shoring or other means of protection is provided. A daily inspection of excavations is also required where there is potential for exposure of employees or equipment.

Trenches deeper than four feet will be dug onsite. Such excavations will be treated as dangerous work areas. They will be inspected daily by a competent person trained in trenching and excavating. Their entry will be prevented unless absolutely necessary. If

there is potential for exposure to excavations, the SSHO will inspect the area prior to entry and be nearby at all times the excavation is occupied.

9.2.9 Hearing Conservation

There will be noises onsite that exceed the 85 Decibels on the A Scale (DBA) Threshold Limit Value (TLV). These areas include working near heavy equipment, compressors, chain saws, or low flying aircraft. Workers will have hearing protection available at all times and use their protection whenever required.

9.2.10 Electrical Energy

There will be remote power sources such as generators onsite. When extension cords or power tools are plugged in, a GFCI will be placed between the plug and the power tool. If outside energy is required to be shut off during some aspect of the work, standard lockout/tagout procedures from our Corporate Health and Safety Program will be used to ensure the safety of the workers.

9.2.11 All Terrain Vehicles

There may be the need for using all terrain vehicles (4-wheelers) on and near the site. If these are used in the course of work, the rider will be briefed on safety rules and will drive safely and wear an approved helmet.

9.2.12 Compressed Gases

Should cylinders of compressed gas be discovered onsite where they have to be moved or handled, we will try to open the valve and vent the gas to the atmosphere unless it is an extremely toxic gas such as chlorine. If we can't open the cylinder valve, we will drill a pinhole into the fuse plug with a tiny brass drill bit and let it vent. The person doing this will wear appropriate PPE and be supervised by the SSHO.

9.3 Biological Hazards

Various viruses, bacteria and human pathogens may be present onsite in human wastes and animal parts. Workers will be inoculated for Hepatitis A if they work near human wastes. Care will be taken to prevent contamination of boots or clothes.

Depending on the season, vegetation, insects and wildlife (bears and moose) may present a potential hazard. Persons who are allergic to insect bites or bee stings are encouraged to bring appropriate self medications before assignment. Head nets and insect repellent will be provided to the crew as needed. Personnel not current with tetanus shots will be inoculated prior to leaving for the field.

Bear mace will be located with first aid kits onsite for protection in the event of a bear encounter. There were a number of bears at the site eating garbage and moose meat late in 1997 and they will undoubtedly return this summer. Prevention of bear problems will include covering the garbage and loose carcasses immediately after arrival at the site. Food or edible trash will be kept in the crew trailer or disposed of in town. Also, workers won't venture into the nearby woods alone. If a bear enters the site, the air horn will be sounded (3 blasts) and work will stop.

for the people on the ground and heavy equipment that might injure the bear. Workers will walk to vehicles or trailers and stay in there until the bear goes away. Problem bears will be reported to the Fish and Wildlife protection off in old town.

Should a bear attack or threaten, workers will stand still (never run), talk softly but continually, or make noise, as appropriate. If a black bear grabs a worker, fight back vigorously (don't play dead) and scream for help. Bear mace will be used only as a last resort. No firearms will be allowed onsite.

Another unlikely but possible biological hazard involves moose with young calves. These animals will not be approached. All work will stop in their vicinity should one be spotted onsite until they leave. Noise making such as blowing air horns, is acceptable as long as there is a suitable distance between any humans and the moose. The key is distance and avoidance, especially in late May, early June during calving season.

10.0 ACTIVITY HAZARD ANALYSIS

It is obvious that all the activities and hazards can't be included in this SSHP. Therefore, prior to beginning any activity not covered in this plan, the Site Supervisor will complete an Activity Hazard Analysis Form (see Appendix B). This analysis will describe activities to be performed and identify the sequence of work, anticipated hazards and the control measures to be implemented. Both probability and severity are rated for potential hazards.

Upon completion, the Activity Hazard Analysis Form will be submitted to the Project Manager, the Contracting Officers Representative (COR) and eventually the Health and Safety Manager. These completed forms will be discussed with the crew and appended to this plan when completed.

11.0 ORGANIZATION AND RESPONSIBILITIES FOR HEALTH AND SAFETY

Individuals assigned project health and safety responsibilities will fulfill their roles to ensure an effective site program. The organization chart for health and safety for this project is shown in Figure 3. The ESHP will be administered by the Project Manager, the Safety and Health Manager and the Site Safety and Health Officer, whose duties are described below. It is JV policy that the Site Safety and Health Officer be independent of project management and report to Corporate Health and Safety during the project. The Site Superintendent can act as the Health and Safety Officer for brief periods when the SSHO is away from the site.

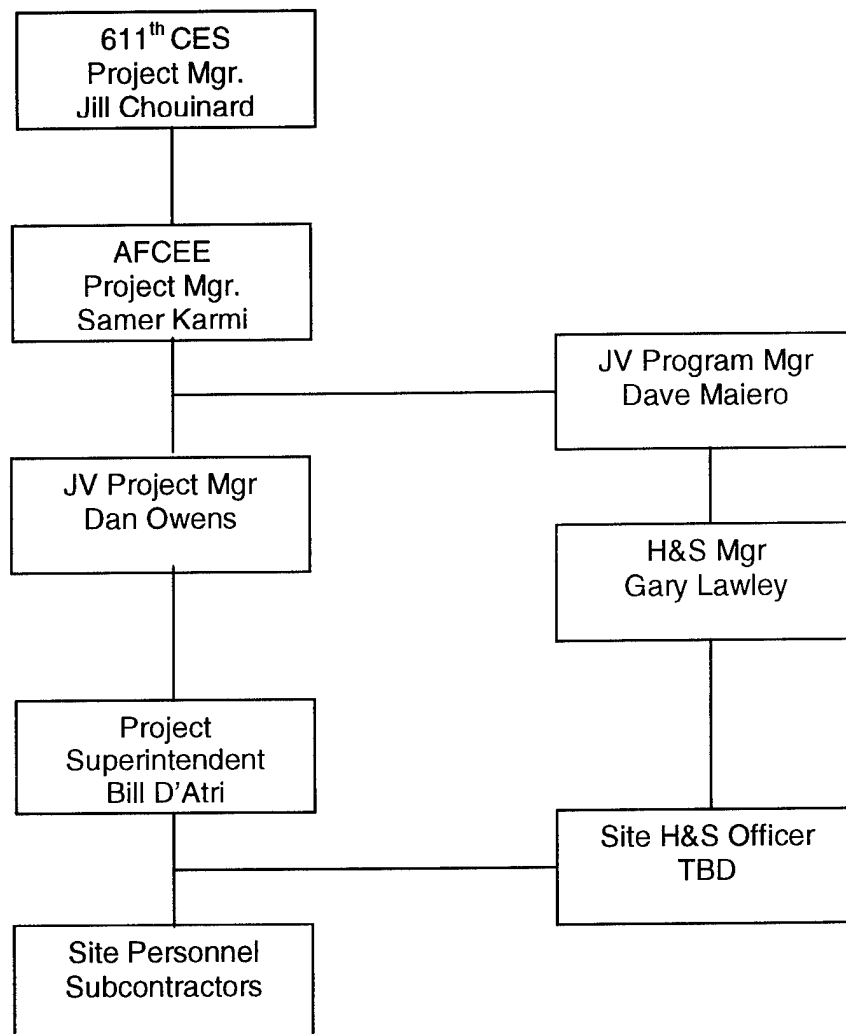
11.1 Site Safety and Health Officer Responsibilities

The SSHO will report functionally and administratively to the Safety and Health Manager. Their duties include:

- Ensure the approved Environmental Health and Safety Plan is in place and operating.
- Ensure proper site control for workers, equipment and materials.
- Provide advice pertaining to health and safety to the Project Manager.
- Provide continuous health and safety input in the field while construction work is in progress.

- Shut down any unsafe operations.
- Inspect the site often using a checklist prepared from this environmental health and safety plan and the Activity Hazard Analysis forms.
- Ensure that the field safety procedures specified in the SSHP are rigorously observed.
- Ensure the medical monitoring of site personnel has occurred.
- Ensure all site employees are properly trained in appropriate work practices and procedures for specific site hazards and use of required PPE.
- Attend to any emergencies or accidents associated with the site.
- Has authority to stop any activity if the risk to personnel health or safety becomes unacceptable.
- Conduct daily safety inspections of all site activities to ensure that the applicable OSHA standards for site operations are met.
- Handle situations to avoid illness or injury during the execution of the project.
- Report any and all unexpected hazards that occur at the site or any safety infractions committed by site personnel to the Project Manager.
- Determine proper air sampling methods, times, locations and conduct monitoring.
- Determine location of exclusion and contamination reduction zones and keep them clearly marked.
- Determine proper levels of PPE for each activity.
- Develop work practices to reduce exposure to hazardous materials.
- Inspect PPE frequently to determine adequacy.
- Monitor work practices as they relate to industrial hygiene.
- Participate in daily safety and QC activities which pertain to health and safety.

Figure 3
Organization for Health and Safety



11.2 Safety and Health Manager Responsibilities

The Safety and Health Manager reports administratively to the General Manager of the JV. The Site Safety and Health Manager will have the responsibility for and control over all matters relating to health and safety on the project. The Safety and Health Manager has the following responsibilities:

- Supervise the development, implementation, oversight and enforcement of the SSHP.
- Supervise initial activities and start-up of each new phase.
- Conduct site inspections to monitor compliance with the Work Plan and approved SSHP.
- Provide or coordinate training sessions.
- Coordinate the medical monitoring program.
- Coordinate the acquisition, calibration and maintenance of air monitoring equipment, respirators and other safety equipment.
- Upgrade or downgrade protection levels as required.
- Suspend work involving SSHP violations, health related incidents and other increased risk situations.
- Request removal of personnel from site if their actions endanger the health and safety of other personnel.
- Authorize personnel to enter based on medical and training requirements.
- Participate in QC activities that pertain to safety and health.

11.3 Project Manager Responsibilities

- See that SSHP is appropriate to the tasks to be performed and approved.
- Support the Health and Safety Department in their responsibilities regarding site health and safety.
- Provide the resources to execute the requirements of the SSHP.
- Ensure the crew complies with the letter and spirit of the plan.
- Maintain a positive attitude toward health and safety at all times with the crew and client.
- Allow the Health and Safety Program to be an independent check and balance to project management on the project.

11.4 Site Superintendent Responsibilities

- Provide the SSHP with appropriate transportation and resources to do their job.
- Ensure the crew complies with the SSHP.
- Follow up on and resolve all listed items of non-conformance identified by the SSHP.

- Notify the Health and Safety Manager and Project Manager when there is an accident or incident within 24 hours. This includes near misses, illnesses, visits to the clinic, etc.
- See that Activity Hazard Analyses forms are completed for all items not in the SSHP.
- Allow the SSHO to stop any activities they consider dangerous until resolved between the Health and Safety Manager and Project Manager.
- Attend and contribute at safety meetings when they are held.

11.5 Site Personnel Responsibilities

JV site personnel and subcontractor site personnel have the following responsibilities:

- Ensure they understand all site rules/procedures and obey them.
- Pursue their daily activities with a health and safety strategy that minimizes risk.
- Attend and participate in training and safety meetings with an attitude to protect themselves and their co-workers.
- Make the Buddy System work on this project.

12.0 MEDICAL SURVEILLANCE PROGRAM

All site personnel are required to complete an Employee Safety and Health Questionnaire (see Appendix D). All onsite personnel allowed into the exclusion zone must be in a medical surveillance monitoring program. At a minimum, the acceptable medical monitoring program for this project will consist of the following actions.

12.1 Baseline or Pre-assignment Monitoring

All personnel involved in site work will receive a pre-work medical examination prior to participating in onsite operations. This entrance examination, conducted in accordance with 29 CFR 1910.120(e)(3)(i)(C), will establish the worker's state of health, baseline/current physiological data and the ability to wear PPE. The exam will include:

- complete medical and occupational history;
- general physical exam;
- pulmonary function testing (FVC and FEV 1);
- blood work (i.e.; CBC, SMAC, serum lead);
- urinalysis;
- eye exam and visual acuity tests;
- audiometer tests, including industrial hearing loss sound frequencies;
- chest x-ray (required every three years); and
- electrocardiogram.

Exams will be performed at least annually. Personnel who have recently undergone a medical examination (within six months prior to the Notice to Proceed) and have had no other significant interim exposure may need only designated blood work and pulmonary function testing.

Examinations will be evaluated by a licensed physician who is familiar with OSHA requirements and has knowledge of both the site conditions and employee's level of involvement (including required PPE), as well as the employee's medical history. A physician's written opinion will be issued following each exam and kept on file. As worker's prepare for site work, they will complete a Certificate of Acknowledgment and Medical Data Sheet (see Appendix D) to be maintained in the project records.

12.2 Exposure/Injury Follow-Up Exam

All employees are entitled to medical attention following an injury or possible overexposure. The company will see that the employee receives medical attention if symptoms of exposure are manifested. Typically, follow-up testing is performed within 48 hours of the injury or exposure. All medical exams are arranged for and paid by the company. The nature of any follow-up exam is determined by the attending physician or the company's medical consultant.

12.3 Exit Exam

At termination of employment or the conclusion of their work assignment, an employee is entitled to an exit physical. If the employee's last physical was within the past six months, the company's advising medical consultant has the right to determine the adequacy of the recent physical and the necessity of an additional exam. If it has been more than six months since the last exam, the employee will be offered the exam. If they choose not to take it, they will be asked to sign a statement to that effect.

Results of exams and medical opinion forms, as well as other pertinent project records, will be kept as part of the employees safety and health records for a period of 30 years after termination of employment, as required by 29 CFR 1910.20.

13.0 INDUSTRIAL HYGIENE MONITORING

The SSHO will implement an air monitoring program. The program will be designed to identify potentially hazardous situations and to confirm the PPE being worn is adequate. The program is also intended to provide data relating to airborne exposure to toxic contaminants. Hazards due to ingestion, skin absorption and inhalation will be managed through work practices and proper use of PPE.

13.1 Direct Readout Air Monitoring

Air monitoring will be performed to monitor conditions which can be dangerous to site personnel. Direct readout monitoring will be conducted with appropriate instrumentation to identify any potentially dangerous conditions especially during sampling, removal of contaminated dirt and asbestos abatement. The purpose of using real-time monitoring equipment is to determine if an upgrade (or downgrade) of PPE is required while performing onsite work and to implement engineering controls, protocols or emergency procedures if established action levels are exceeded.

Real-time monitoring will be conducted using the following equipment, as determined by the Site Safety and Health Officer.

- **PID:** The PID will be used to check for the presence of organic vapors and will be calibrated before each use, using a benzene surrogate standard gas. A 10.6 eV lamp will be used in the Microtip PID and a 10.2 eV in the HNU PID. The PID will be maintained in operational condition at all times.
- **Draeger Pump and Tubes:** This instrument will be used to confirm the presence of a specific gas such as benzene when a reading above 5 occurs on the PID.
- **Aerosol/Dust Monitor:** The Miniram (for Miniature Real-time Aerosol Monitor) Model PDM-3 is an personal-size airborne particulate monitor whose operating principle is based on the detection of scattered electromagnetic radiation in the near infrared. The Miniram measures the concentration of any airborne particles, both solid and liquid, and the digital display indicates this level in units of mg/m^3 (will read from .01 to 9.99 mg/m^3). The unit is designed to compute both shift and time-weighted averages. A Miniram may be used if dust is created at the site. A reading of 1.0 or higher is cause for dust suppression.

13.2 Frequency of Monitoring

Although hazardous levels of gases or vapors are not anticipated during excavation, bulking of liquids, sampling or other activities, a PID will be used to monitor the breathing zone of workers performing some of these tasks.

The project work location will be monitored initially with a PID to determine the site background levels, and then during the intrusive work activities listed below.

PID readings will be documented in the worker's breathing zone at least once at the start of intrusive activities. PID monitoring will be conducted for the following work activities conducted onsite:

- Excavating contaminated soils
- Asbestos abatement
- Sampling of soils or drums
- Bulking of liquids

If the instrument exceeds the action levels, the SSHO will notify the Project Manager immediately and recommend a proper course of action. The SSHO will report data resulting from such air monitoring to the crew at the next safety meeting. If at any time the results indicate change in conditions, the SSHO will notify the Health and Safety Director and the Project Manager immediately and follow up with a written report. The SSHO and the Site Superintendent will decide on the proper course of action.

A sustained reading of 5 units on the PID requires that a test be performed to test for benzene. Work will also stop in this area until it is determined the proper PPE is in use in case benzene is present.

In the absence of an identified gas or vapor hazard (i.e., benzene, etc.), an action limit of 10 PID units above background is in effect. When the PID indicates sustained breathing zone vapor concentrations in excess of 10 units or more, engineering controls will be used to reduce the level of contamination as appropriate and respiratory protection will be donned. PID levels of

above 50 units require the immediate cessation of all work and a reevaluation of the Work Plan by the Project and Health and Safety Managers. Confirmation that the contaminant producing such instrument readings is not exceeding a listed PEL or TLV will countermand these upgrades.

14.0 ENGINEERING CONTROLS

OSHA regulations require implementation of engineering controls on a hazardous waste site, to the extent feasible. Engineering controls will be used to prevent contamination of personnel and heavy equipment so that extensive decontamination of personnel or equipment will not be necessary, thereby, reducing disposal of contaminated decontamination water and materials.

Engineering controls considered for this job include the following: keep unauthorized personnel out of work zones, control dust and stay upwind from contaminants. Other engineering controls will be used if required. These could include keeping employees out of certain areas, taking frequent breaks, etc.

15.0 PERSONAL PROTECTIVE EQUIPMENT

Most site work will involve hazardous wastes and therefore will involve basic Level D PPE. This will include:

- hard hat
- hard-toed boots or boot covers
- leather chaps if using a chainsaw
- proper gloves
- safety glasses
- standard welding helmet, glasses and leather.
- rain gear as required

Some work such as sampling soil or liquids or decon activities may require Level C respiratory protection. This PPE will include:

- half-face respirators with combination organic vapor-acid-gas-dust cartridges
- tyveks or other disposable outer garments
- safety glasses or goggles
- face shields on hard hat (if using high pressure washer)
- appropriate gloves
- hard-toed boots or boot covers
- hard hats

PID readings will be used to determine if respirators are required (and what type).

15.1 Respiratory Protection

It is not anticipated that a gas or vapor respiratory hazard will exist at the site during the activities covered by this plan. However, some activities may create potentially contaminated dust, and possibly low levels of organic vapors. Therefore, it is necessary that workers wear respiratory protection when the photoionization detector (PID) indicates sustained levels of 10

units or greater or when Draeger tube tests indicate 1.0 ppm or greater for benzene.

Negative pressure respiratory protection will be donned if odors or dust levels become objectionable at any time. During periods of respirator use the combination cartridges will be changed each day of use, whenever break-through is detected, or when dust loading makes breathing difficult, whichever occurs first.

16.0 SPILL PREVENTION AND CLEANUP

Care will be taken to prevent spills of any type. Onsite fueling may occur for this project. Drips from the operating equipment will be prevented by proper maintenance. Sorbent pads in pans will be placed beneath heavy equipment being refilled to prevent small spills from reaching the ground.

A spill response kit will be strategically located onsite so any unanticipated release can be cleaned up quickly and efficiently. This kit will consist of an 85-gallon plastic drum containing shovels, a bundle of absorbent pads and miscellaneous small spill clean-up equipment, as well as PPE for two people (i.e., half face respirators, organic vapor cartridges, nitrile gloves and poly-coated Tyveks).

Onsite personnel will be trained in basic spill response, taught how to don the PPE provided and clean up small spills using the spill kit and other materials on hand. Spills of any magnitude will be reported to the JV General Manager and Project Manager immediately regardless of the cause of the release. Workers not trained in spill response or not necessary for spill response will be kept out of the area. Waste management or spill derived materials will be handled appropriate to the spill material. ADEC Notification will be made after discussion with the AFCEE Project Manager.

17.0 SITE SECURITY, CONTROL AND COMMUNICATION

The following measures will be employed to maintain site security, control and appropriate communication.

17.1 Site Security

The Galena site is unsecured, with road access by the public or unauthorized visitors. A gate will be built to control entry by road during the early stages of the project. Site personnel will discourage visitors to the area and have them complete the Certificate of Worker/Visitor Acknowledgment Form in Appendix D (Form D1) if they are bonafide visitors.

The road to the site will be closed at night and public access controlled by signs and the site superintendent during the daytime. Children will not be allowed to remain on the site and will be immediately escorted off should they come in through the woods.

The Buddy System will be implemented on this project. For people that don't normally work together or where an air horn can not be easily heard a hand-held radio will serve as the "buddy".

17.2 Site Communications

Communication onsite will consist primarily of direct conversation, use of hand signals and use of hand-held radios. Typical hand signals used will include the following:

SIGNAL	DEFINITION
Hand on top of head	Need help
Thumbs up/down	Yes or I'm okay/No or I don't understand
Grip buddy's wrist	Leave the area immediately

Hand signals between equipment operators and spotters will be discussed and agreed upon prior to their use. There will be only one person spotting for an operator. Others will stand back and reduce talking and hand movement.

Hand-held radio usage, including who will have radios and protocols for use will be established just prior to site work commencement. There will be regular phones at the project office. Cellular phones do not work from Galena.

18.0 DECONTAMINATION

Decontamination is the orderly removal of contaminants from personnel or equipment. Although every effort will be made to prevent contamination, there will be some decontamination required for both personnel and equipment during this project.

18.1 Equipment Decontamination

Care will be taken to avoid contaminating heavy equipment and end dumps. This will be accomplished primarily by keeping tracks and tires out of contaminated areas, and samplers will wear appropriate PPE to avoid unnecessary contact with contaminated soils or liquids. A combination of good housekeeping practices and avoidance will be used to prevent unnecessary contact with contaminated materials.

18.2 Personnel Decontamination

When prevention fails to avoid some contaminants to workers or equipment, the following will be implemented:

All decontamination will take place in the Contamination Reduction Zone. While the sequence and the steps in decontamination are dependent on the type of work being done, the specific location and other factors, the following general steps will be followed in Level D decontamination:

1. Remove gloves and place them in the labeled bags or other containers or put them where they will be dry and can be reused. Gloves and hard hats will be marked individually.
2. Wash hands and face using waterless soap and dry using the paper towels provided. Used paper towels will be placed in labeled containers.

3. If Tyveks are worn, these will be removed from the inside out, rolled into a ball with the clean side out and placed in labeled containers for disposal at the new landfill.
4. Hard hats will be removed when leaving the site.
5. If boot covers are used, they will be removed when leaving the site. If no boot covers are used, boots will be removed when workers leave the site.

The decontamination area will be near the entry/exit point for the Exclusion Zone and will be kept clean and well stocked with the necessary clean PPE and decontamination materials. Personnel will don boot covers or different boots and gloves in the decontamination area. In case the outer covers become torn or ripped during use, a station will be set up where the boots can be changed before leaving the work area.

Emergency decontamination will be discussed with the crew should there be any circumstance where a contaminated worker is injured and emergency procedures must be performed before moving the injured party.

19.0 EMERGENCY RESPONSE AND CONTINGENCY PLANNING

There is the possibility of an emergency arising which requires support by off-site personnel, due to the remoteness and location of the site, the nature of the work, local weather conditions and the unlikely event of extreme natural occurrences such as floods, earthquakes, fire or volcanic eruptions. Emergencies which could also arise at this site potentially include severe injury or illness such as a heart attack or appendicitis; the Yukon River can flood at any time of the year and the site is in the flood zone. A nearby forest fire or volcano hundreds of miles away can prevent access by air to the site for days at a time. Severe wind or rain storms with lightning can occur during the spring or summer.

An emergency or Contingency Plan as required by 29 CFR 1910.120 is discussed for these eventualities in the following paragraphs. The Contingency Plan will be updated based on current site work activities and differing site conditions. A copy of this Contingency Plan will be available and response to emergencies will be reviewed with site personnel prior to beginning work.

Emergency equipment to be maintained onsite and checked on a weekly basis includes the following:

- 2-man first aid kit (one in each vehicle and piece of equipment)
- 25-man first aid kit (2)
- Fire extinguishers (3) (20 lb. ABC)
- Off-site communication with a rescue service or home office (local telephones)
- Spill kit with PPE (1)
- Emergency eye wash (one station) with one single-use eye wash bottle included with each vehicle and piece of equipment

Injuries requiring first aid will be stabilized onsite by the SSHO, who will be certified in first aid and CPR, and personnel will be transported to the Galena Medical Clinic. All injuries and near misses will be reported to the Project Manager and the Safety and Health Officer. Since this is a very remote site and any injury requiring professional medical attention can be quite serious,

every attempt will be made to prevent injuries or illnesses. Injuries will be reported immediately and followed up within 24 hours with an initial report per the Accident Prevention Plan in Appendix A.

The SSHO has been assigned as the on-scene emergency coordinator (OEC) for this project. Serious injuries may result in calling an emergency air service or using a local charter aircraft to transport the injured party to a Fairbanks medical facility or to Anchorage. In conjunction with the Site Superintendent, the SSHO will decide whether an off-site medical clinic or ambulance service needs to be contacted and whether the injured party should be transported immediately to a medical facility. In case emergency support is required, the Galena Medical Clinic is open from 8 a.m. to 5 p.m. and is on call 24 hours a day. Galena Medical Center is equipped with qualified personnel (a nurse practitioner) to make the decision to contact an air ambulance should that be necessary. In addition, an Alaska State Trooper Detachment is located in Galena and available for support in case of a major injury or incident at the site or a nearby event that threatens the site.

19.1 Emergency Information

The following list of emergency services, locations and telephone numbers will be posted conspicuously near the site, and all site personnel will be made aware of its location. Administrative arrangements will be made in advance with listed support functions:

EMERGENCY SERVICE	TELEPHONE NUMBER
Hospital (Galena Medical Clinic)	(907) 656-1266
Fire (Galena EMS)	911
Police, Alaska State Troopers	(907)656-1233
Fairbanks Memorial Hospital – Emergency Room	(907) 458-5555
Chemtrec	(800) 424-9300
National Response Center	(800) 424-8802
JV office	(907) 272-7961
Project Manager, home Cell Office	(907) 243-3009 (907) 227-0688 (907) 522-3638
JV Safety and Health Manager, Anchorage, home	(907) 349-1567

As part of the daily site inspections, the SSHO will check the emergency equipment, paying close attention to potential fire hazards, spill prevention and individual work practices which could result in an emergency.

In the event of a fire or other onsite emergency, the crew will leave the site by previously discussed routes and gather in the open area at the west end of the Galena airfield (See Figure 1). The crew may take part in responding to the emergency if the Site Superintendent determines it is necessary, they have the proper training to respond and it is safe to do so. As a minimum, site personnel will be trained when and how to use portable fire extinguishers and first aid equipment.

During extreme or adverse weather in the area, the SSHO and Site Superintendent will determine whether work can proceed without undue risk to the safety or health of the workers.

19.2 Emergency Procedures

In the event of an emergency, the SSHO will be the first to assume command of the situation until other responders (i.e., government, fire fighters, etc.) arrive. The established chain-of-command will then be followed. The Site Superintendent will be responsible for prompt notification of employees, the COR, and the home office and implementation of appropriate response procedures, including:

- **Preparation for Emergencies:** Sufficient equipment will be maintained onsite to handle typical emergencies, and capable site personnel will be designated and trained for emergency responsibilities. Fire extinguishers will be kept available in a state of readiness.
- **First Aid Equipment:** First aid equipment will be maintained onsite in an easily accessible location.
- **Exclusion Zone Incident/Accident:** The injured person should try to get out of the Exclusion Zone if they can do so without further injury. Co-workers should help if they feel they can do so without inducing further injury. If the injured person cannot be moved, his co-worker should evaluate the situation to determine if anything should be done for the injured person to avoid any further injuries, then seek help. A rescue team will be assembled to bring the injured person out of the Exclusion Zone to medical treatment if this is possible. Standby protective equipment will be used by rescue team if necessary. All work at the site will be stopped until the emergency is past and the SSHO and Site Superintendent determines that it is safe for work to resume.
- **Support Zone Incident/Accident:** The nature of the injury will be assessed. If the cause of the injury does not have the potential to affect the performance of other site personnel, then operations may continue with the SSHO initiating the necessary first aid and or follow-up requirements. If the injury increases the potential for risk to others, then operations will be shut down until the risk is removed or minimized.
- **Fire/Explosion:** In the event of a fire, explosion or gas release, all onsite personnel will proceed to the west end of the airport at a prearranged gathering location (See Figure

- 1). Small fires occurring within the job site area will be extinguished by trained personnel.
- **PPE Failure:** If any site worker experiences a failure or alteration of protective equipment that affects the protection factor, that person and his co-worker will leave the Exclusion Zone immediately. Re-entry will occur when the faulty equipment is either repaired or replaced.
- **Other Equipment Failure:** If any other equipment onsite fails to operate properly, the Site Superintendent and SSHO will determine the effect of this failure on continuing operations. If the failure affects the safety of personnel or prevents completion of the work task, then personnel will leave the work area until the situation is evaluated and appropriate action(s) taken.

In all situations when an onsite emergency results in evacuation of the Exclusion Zone, personnel will not re-enter until:

- The condition resulting in the emergency is corrected.
- The hazard has been assessed.
- The SSHP has been reviewed and changed to reflect the new information.
- Personnel have been briefed on resulting changes in the SSHP.

20.0 DAILY INSPECTIONS

It is the responsibility of SSHO to determine if the Safety and Health plan is being followed. This will be accomplished through daily inspections and audits. A checklist incorporating the key items from the Work Plan and this SSHP will be prepared by the SSHO and used for the daily inspections to ensure basic compliance with site safety and health requirements. A draft checklist is found in Appendix G. This list will be evaluated and updated on a weekly basis. Results of all inspections will be maintained in project files and included with the Safety and Health Close-out Report. Daily Safety Inspection Reports will be completed, signed by the SSHO and placed in the project files. This report will show the features of work inspected, PPE and equipment used, and related safety and health issues. Any deficiencies will be noted and corrective action recommended. Results of corrective action will also be indicated. In the event of an accident, the SSHO will complete and the Accident Report Form found in Appendix A.

21.0 SAFETY MEETINGS

Safety meetings will be conducted by the SSHO, the Site Superintendent or one of the experienced workers. These meetings will be brief (approximately 5 to 10 minutes) and will be held daily or whenever the work changes significantly. Safety meetings will cover pertinent topics involving project activities, typically from the SSHP, the Cleanup Plan or the Accident Prevention Plan. Meetings usually begin with a discussion of the work to be performed that day followed by a safety briefing on how to perform the work safely and efficiently and the safety procedures (i.e., zones, PPE, etc.) in effect for that activity phase.

Safety meetings will be documented using the forms shown in Appendix H with the topic(s) discussed, attendees, date and person conducting the safety meeting recorded on each form. The procedures to be used for conducting safety meetings are found in Appendix H.

22.0 HAZARD COMMUNICATION

The JV's compliance with the hazard communication requirements of 29 CFR 1910.1200 is detailed in Section 12.0 of the Accident Prevention Program (see Appendix A) and implemented by using the checklist for compliance with site-specific hazard communication procedures found in Appendix I.

23.0 SANITATION

At least one port-a-potty will be placed near the work area for each 10 workers. These facilities will be pumped as necessary and inspected frequently. They will be kept clean at all times.

24.0 RECORD KEEPING

The SSHO will keep a log of all health and safety items. This log will be in a permanent binder with numbered pages. The pages will be dated and initialed and all spaces closed up with an arrow so the record would be acceptable in court as evidence.

Results of daily inspections, copies of certificates, log books, this Environmental Health and Safety plan (the original), air monitoring results, documentation of safety meetings and other safety records will be kept onsite during the project and filed at the JV office after the project is complete. These records will be kept for 30 years.

Records to be maintained include the following:

- Hazardous Waste Operations Training
- Accident/Incident Report
- PPE worn by workers
- Physician's Medical Opinion Form
- Copy of Health and Safety Plan
- Respirator Fit-test Records
- Air monitoring Results
- American Red Cross CPR/First Aid training certificates
- Any reported exposures
- Safety meeting records
- OSHA Form 200 log

25.0 WORK ON BARGES OR BOATS

Should JV workers be required to board barges or water transport vehicles, approved Personnel Floation Devices (PFDs) will be worn and proper precautions taken. A safety meeting based on a written Activity Hazard Analysis will be conducted with employees prior to working on barges or vessels.

26.0 GENERAL SAFETY RULES AND PROCEDURES

The following policies for general conduct apply to all personnel onsite during environmental operations. Additional site safety rules are found in Appendix F. These safety rules will be discussed with the entire crew at the first site safety meeting.

1. No eating, drinking, gum or tobacco chewing, or any other practice in the work area that increases the probability of hand-to-mouth transfer of contaminants. Smoking in the exclusion zone is forbidden. The SSHO and Project Superintendent will set up an area where resting, eating and smoking is permitted.
2. Hands and face must be thoroughly washed upon leaving the work area and before eating, drinking or performing other activities.
3. During all onsite activities, site workers will use the buddy system and act as the safety backup to each other. Off-site or trained onsite personnel will provide additional emergency assistance whenever necessary.
4. Required posters will be in place in the crew meeting room. These will include at a minimum:
 - Hazard Communication poster
 - Emergency numbers
 - Safe practices
 - Safety & Health protection
 - Wage and Hour Act
 - Insurance Information
5. Caution tape or other means will be used to clearly cordon off sufficient space around the work areas. This will prevent unprotected or unauthorized personnel from entering the work area or risking exposure to a source of contamination.
6. A clean drinking water source and disposable cups will be made available to site workers.
7. At least two first aid kits adequate to service at least 25 people will be onsite and accessible near the work area. Another will be kept at the project office nearby.
8. A sealed, one-liter emergency eye wash bottle will be maintained onsite for each person in the work crew.
9. At least three strategically placed (crew shack, day fuels storage area and fluids bulking area) ABC dry chemical fire extinguishers will be maintained onsite and accessible to the work area. A smaller extinguisher and first aid kit will be kept in each vehicle and piece of heavy equipment. The extinguishers will be held in a bracket on the passenger side of the vehicle.

APPENDIX A

Accident Prevention Plan

Accident and Loss Prevention and Reporting Program

Accident & Loss Prevention and Reporting Program

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SECTION A: ACCIDENT AND LOSS PREVENTION PROGRAM

1.0 INTRODUCTION

Accidents are unplanned events that sometimes result in injury or losses. Good companies learn from accidents, especially those that don't result in injury. This Accident & Loss Prevention Program is the corporate approach to reducing or eliminating accidents at the home office or on field work sites.

2.0 RESPONSIBILITY

Management at all levels and the Health & Safety Department are responsible for implementation of this Program. Each Project Manager, with assistance from the Safety Department, is responsible for carrying out these provisions.

3.0 SITE CHARACTERIZATIONS

Workplace hazards will be identified and evaluated. Periodic inspections will be held to ascertain existing and new hazards to the workplace. Unsafe/unhealthy conditions or work practices will be corrected in a timely manner.

4.0 COMMUNICATION

Management and the Health & Safety Department will communicate with workers continually on health and safety matters, including providing the mechanism for employees to report work site hazards and accidents without fear of reprisal. The field crew will be totally involved in all aspects of Corporate Safety Programs, primarily through open communications.

5.0 COMPLIANCE

We fully intend that workers will be in compliance with safe and healthy work practices; failure to comply will include disciplinary action, even possible termination of employment.

6.0 SAFETY MEETINGS

Regular Safety Meetings will be conducted. Records of Safety Meetings will include:

- a. Date of meeting
- b. Attendance
- c. Items discussed

7.0 INSPECTIONS

A regular Inspection Program will be set up to include:

- a. A designated Safety Person at each site
- b. Regular site inspections, recording the following:
 - date inspected;
 - area(s) inspected;

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- conditions and/or practices found that need correction; and,
- date corrections are to be completed.

8.0 TRAINING PROGRAM

The training program will include all types of training (from 40-hour Hazwoper to job-specific tasks).

9.0 REPORTING LOSSES AND ACCIDENTS

All accidents and near misses, no matter how trivial, shall be reported to supervisors. Supervisors will follow-up on each incident and report results to the Safety Department and corporate management.

9.1 ACCIDENT & LOSS FORMS

- **Corporate Medical Data Sheet, Form 1**—All employees on a job site should complete this form.
- **Corporate Report of Injury, Form 2**—Needs to be completed by both supervisor and employee involved in an work-related accident, injury, or illness.
- **Description of Near Miss, Form 3**—Will be distributed to the crew and be filled out with no fear of reprisal. Supervisors should reinforce and encourage use of these forms.
- **Supervisor's Initial Actions at the Accident Scene, Figure 1**—guidelines for all supervisors.
- **Systematic Cause Analysis Flow Chart, Figure 2**—illustrative flow chart to help analyze causes for accidents, loss, or injury. Helpful for all employees to understand.

SECTION B: ACCIDENT INVESTIGATION/REPORTING

1.0 INTRODUCTION

Accident investigation and reporting is a systematic search and review for factual information on the extent and nature of an accident. The purpose of this investigation is to learn why an accident happened and how we can prevent similar accidents in the future.

2.0 RESPONSIBILITY

Management and employees at all levels and the Health & Safety Department are responsible for implementation of accident investigation and reporting.

2.1 Corporate Health & Safety Department Responsibilities

- a. Report injuries or illness to appropriate agencies, as required by law.
- b. Review all accident reports or forms, including near misses, accidents, and losses.
- c. Develop and coordinate report forms to ensure they are current and applicable.

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- d. Train supervisors in accident & loss responsibilities, reporting, investigating, and record keeping.
- e. Conduct follow-up investigations when required.
- f. Review accident investigation policy and adjust as necessary.

2.2 Supervisor/Project Manager Responsibilities

- a. Conduct complete investigations, using appropriate forms (see Appendix A). Report all:
 - recordable occupational injuries
 - occupational illness or disease
 - occupational deaths
 - occupational accidents involving any of the above
- b. Train and encourage employees to report all accidents, illnesses, and injuries as they occur.
- c. Identify and take required corrective measures to prevent similar accidents. Refer to the *Supervisor's Initial Actions at the Accident Scene* guidelines.
- d. Report all serious accidents and deaths within two (2) hours (or within reason) to the corporate Health & Safety Department.

2.3 Employee Responsibilities

- a. Report immediately all occupational injuries, accidents, illnesses, and near misses.
- b. Communicate all factors surrounding an incident.
- c. When requested, participate fully in an accident or injury investigation.

3.0 ACCIDENT REPORTING PROCEDURE

3.1 All Employees Reporting

All work-related accidents, injuries, and illnesses must be reported by employees as soon as they occur. In addition to verbal notification, employees should complete a corporate Report of Injury Form (Form 2 in the Appendix) or a Near Miss Form (Form 3 in the Appendix).

3.2 Supervisors/Project Managers Reporting

Supervisor will determine if the incident is work-related. All work-related illnesses or injuries will be reported on either Federal OSHA, Form 200, or a State Worker's Compensation Form, if applicable. OSHA Log of Occupational Injury, Form 200, needs to be maintained at all field offices. The log will be maintained by the Project Manager or their designee on a continuous basis from January to January of each year. For the month of February of the following year, the OSHA log will be posted in the work place.

All occupationally-related accidents, illnesses, or injuries that require treatment other than first aid need to be recorded and reported.

3.2.1 Recordable injuries

Require hospitalization or ongoing medical treatment beyond first aid, are serious in nature, and may include the following:

- HOSPITAL ADMISSION (or equivalent medical facility) for treatment
- LOSS OF CONSCIOUSNESS, RESTRICTION of work or motion, or requiring transfer to another job
- INFECTION Treatment;
- ANTISEPTICS application during second or subsequent visit to medical personnel;
- SECOND or THIRD DEGREE BURN(s) treatment;
- SUTURES (stitches), BUTTERFLY ADHESIVE DRESSING(s), or STERI STRIP(s) application;
- REMOVAL OF FOREIGN BODIES EMBEDDED IN EYE(s) or FROM WOUND, requiring complicated procedures because of the depth of embeddedness, size, or location;
- CUTTING AWAY DEAD SKIN (surgical debridement);
- PRESCRIPTIONS prescribed;
- HEAT or WHIRLPOOL BATH THERAPIES during second or subsequent visit to medical personnel;
- POSITIVE X-RAY DIAGNOSIS (fractures, broken bones, dislocations, etc.)

3.2.2 First aid criteria

Medical treatment for minor injuries or illnesses that does not require hospitalization other than for observation or subsequent visits to medical personnel. The following may be considered first aid in most circumstances:

- ANTISEPTIC applications during first visit to medical personnel;
- FIRST DEGREE BURN(s) treatment;
- BANDAGE(s) applied (including elastic) during first visit to medical personnel;
- REMOVAL OF FOREIGN BODIES FROM MINOR WOUNDS, NOT EMBEDDED IN EYE, requiring uncomplicated medical procedures such as using tweezers or other simple techniques);
- NONPRESCRIPTION medications
- SINGLE-DOSE PRESCRIPTION MEDICATION on first visit for minor injury or discomfort;
- SOAKING THERAPY or REMOVAL OF BANDAGES BY SOAKING on initial visit to medical personnel;
- OINTMENT applications to abrasions to prevent drying or cracking;
- HOT OR COLD COMPRESS(es) during first visit to medical personnel;
- HEAT or WHIRLPOOL BATH THERAPIES during first visit to medical personnel;

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- NEGATIVE X-RAY diagnosis;
- OBSERVATION OF INJURY during visit to medical personnel; and,
- TETANUS shot(s) or booster(s) if not given in conjunction with more serious injuries requiring them.

3.2.3 Occupational Illness and Disease

Occupational illnesses or an employee is any abnormal condition or disorder other than one resulting from an occupational injury caused by exposure to environmental factors associated with employment. Occupational illnesses include acute and chronic illnesses or diseases that may be caused by inhalation, absorption, ingestion, or direct contact.

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Medical Data Sheet [MDS]

FORM 1

This Medical Data Sheet will be completed by all field personnel. It is the responsibility of the employee and the Project Manager to ensure that a copy of this MDS is readily available at each job site.

This MDS must accompany the employee when medical treatment is needed or if transport to a hospital is required.

Section I. TO BE COMPLETED BY EMPLOYEE

Name:	Home phone:
Home Address:	
Name and phone of person to contact in an emergency:	
Personal physician's name, address, and phone:	
Do you wear contact lenses? <input type="checkbox"/> Yes <input type="checkbox"/> No	
Allergies (if any):	
Drug Sensitivities (if any):	
Health conditions relevant to your job:	
Section II TO BE COMPLETED BY SUPERVISOR OR SITE HEALTH & SAFETY OFFICER	
List all previous illnesses or medical conditions which may be important for a physician to know:	
Section II Medical Care Provider/Insurance Information	
Send all accident reports and medical reports for work-related injuries to: Health & Safety Department, Clearwater Environmental Inc., 1760 Abbott Road, Anchorage, AK 99507.	

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Report of Injury

FORM 2

This form needs to be completed by injured employee (if possible) and their supervisor ***immediately after an accident/injury.***

JOB SUPERVISOR TO COMPLETE THIS SECTION

Project:	Date & Time of Occurrence:
Project Location:	
Name of Injured Person:	
Employee's Job Title:	
Brief Description of Injury:	
Witness(es) to Accident:	
Describe what happened, what employee was doing immediately prior to the injury; what actual object or substance caused injury; who was notified; and any other relevant details (be specific):	
What corrective action (if any) can be taken to prevent a similar accident/injury?	
Other comments:	
Supervisor's Signature:	Date form completed:

**Description of Near Miss
FORM 3**

This Description of Near Miss form will be completed by field personnel experiencing and/or observing a near miss accident, injury, or loss. It is the responsibility of the employee and the Project Manager/Supervisor to ensure that a copy of this form is readily available at each job site.

Describe the Near Miss (include what, where, how, who, when, etc.):

(Use the back of this form if more space is needed)

Contributed by:

Name

Job Classification

Project Location

Action taken (if any):

(Use back of page if more space is needed)

Report of Injury/Damage to Property

EMPLOYEE TO COMPLETE THIS SECTION:

Date & Time of Occurrence:

Location:

Describe incident [what happened, who/what equipment was involved, what you were doing at the time, what do you feel caused the incident] and any other important information:

Suggestions to help avoid a similar accident/injury in the future:

Employee Signature:

Date Form Completed:

(Note to Employee: Please complete a Worker's Compensation Claim Form from your job supervisor or from the Corporate Department of Safety within two days after your injury/accident.)

ACKNOWLEDGEMENT (Signatures)

Date/Time
Signed

Project Manager (if applicable):

Site H & S Officer (if applicable):

Health & Safety Manager:

Date employee given *Worker's Compensation Claim Form*:

Date *Employer's Report of Injury or Damage and Claim Form* sent to insurance carrier:

Report of Injury/Damage to Property (continued)

JOB SUPERVISOR TO COMPLETE THIS SECTION

Project: _____ Date & Time of Occurrence: _____

Project Location: _____

Injured Person/Damaged Property: _____

Employee's Job Title: _____

Brief Description of Injury: _____

Witness(es) to Accident: _____

Describe what happened, what caused the incident; who was notified; and other relevant details (be specific):

What corrective action (if any) was or can be taken to prevent a similar incident?

Other comments: _____

ACKNOWLEDGEMENT (Signatures)	Date/Time Signed
Project Manager (if applicable):	
Site H & S Officer (if applicable):	
Health & Safety Manager:	

Supervisor's Initial Actions At The Accident Scene

Figure 1

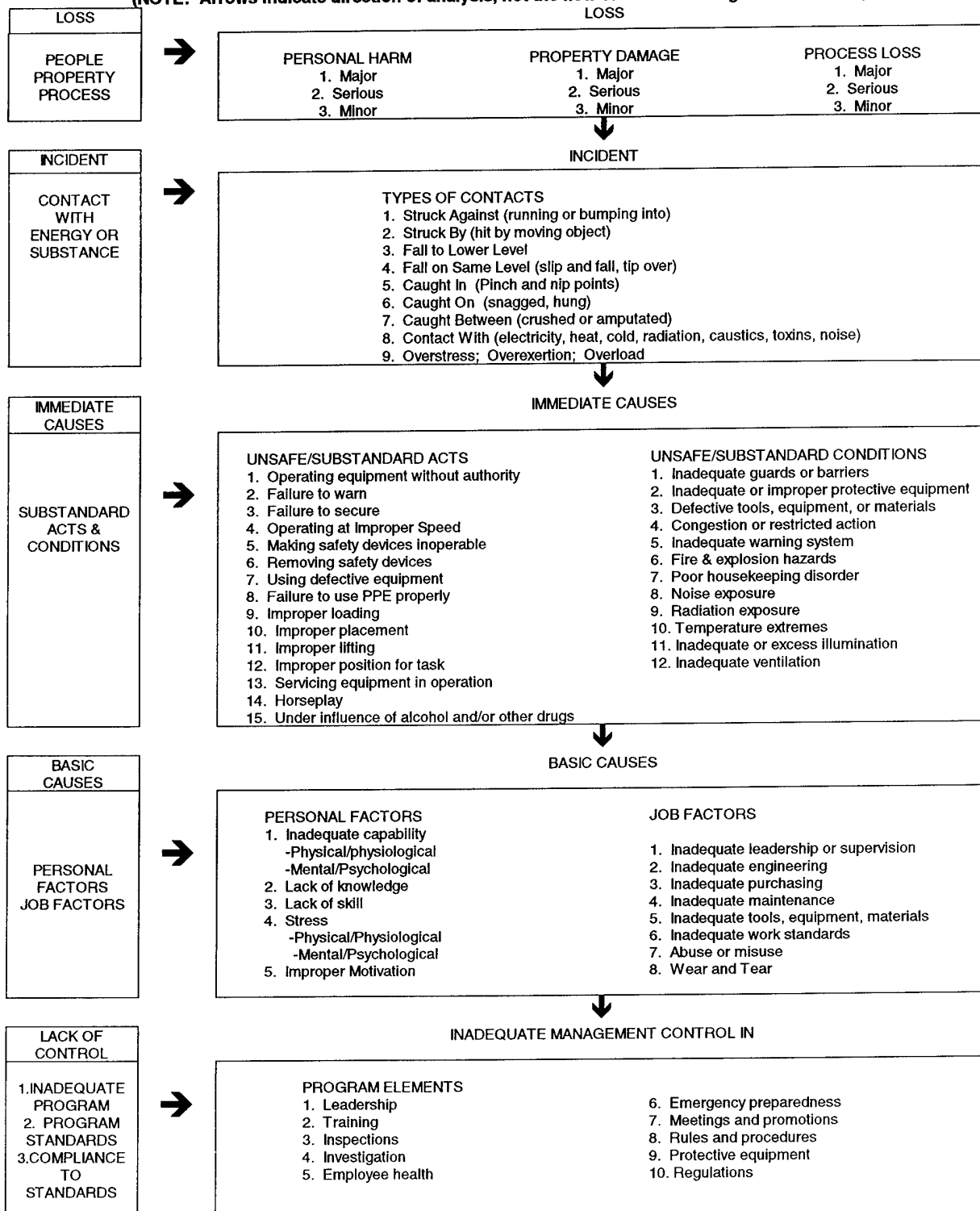
An adequately trained supervisor can both reduce the extent of the loss or injury and help get the investigation started properly. Often a supervisor has access to information faster than others investigating an accident/injury.

While a supervisor's initial actions vary for every accident, the person on the scene must be the judge of what is critical. The following steps are guidelines to apply as appropriate:

- 1 Take control at the scene.**
Incidents make people act differently. They are curious and want to help. However, in a crisis situation, people often overreact, are irrational, and do more harm than good. Unless a senior manager is there, the supervisor needs to take charge, directing and approving everything that is done.
- 2 Ensure first aid and call for emergency services.**
People's lives and their well-being come first. If medical help is not close by, given urgent first aid or ensure that it is done. Have someone call for help. Be specific. Tell what service to call, where the telephone is, and where the phone number can be found. Every telephone should have emergency numbers posted on or close to it to help get a prompt response.
- 3 Control potential secondary accidents.**
The explosion that follows a puncture, the collapse that follows an impact, and the absent-minded action that follows a minor trauma are common examples of "secondary accidents". Positive, temporary actions need to be taken after quick, but careful, consideration of the consequences.
- 4 Identify sources of evidence at the scene.**
Things can change quickly and information lost forever. Items can be moved during an emergency response or attempts at rescue work. People leave the scene. They take equipment and materials with them. Light, ventilation, sound, and other conditions change. Supervisors need to notice these things while taking other initial actions.
- 5 Preserve evidence from alteration or removal.**
If there seems to be a significant loss potential, good investigation is more important than getting back to work. Supervisors have the authority to keep things from being moved. They should also keep people out of the accident site so nothing is disturbed before they get to look it over.
- 6 Investigate to determine loss potential.**
It's easy to see how badly people are hurt and property is damaged. That's important, but what could happen is vital to future loss prevention. Supervisors should make a prompt appraisal of how bad the accident or incident could have been—and how likely it is to occur again. Then they can decide what help they need.
- 7 Notify appropriate managers.**
Some managers may need just a courtesy notification. Others may need to be on the scene right away. The investigation procedure should provide guidelines for these decisions.

SYSTEMATIC Cause Analysis— Figure 2

(NOTE: Arrows indicate direction of analysis, not the flow of events leading to the accident)



APPENDIX B

Activity Hazard Analysis and Risk Assessment Forms

ACTIVITY HAZARD ANALYSIS AND RISK ASSESSMENT

Activity/Definable Work Phase: _____ Date: _____ Reviewed By/Date: _____

Principal Steps	Potential Hazards	Degree of Risk	Probability of Occurrence	Recommended Controls
				Comments: _____
				The listed hazard risks and controls are acceptable:
				Project Superintendent _____ Site Safety and Health Officer _____
Equipment to be Used		Inspection Requirements		Training Requirements
<p>Legend: The degree of risk/probability of occurrence H = high risk H = high probability of the risk occurrence M = moderate risk M = moderate probability of risk occurrence L = low risk L = low probability of risk occurrence</p> <p>Note: As a rule, we do not proceed at a task or activity with H/H degree and probability</p>				

APPENDIX C

Key Personnel

David J. Maiero

Program Manager

Years of Experience: 25

EDUCATION

B.S., Marine Biological Sciences, 1970, California Polytechnic Institute at San Luis Obispo (now California State University at San Luis Obispo)

QUALIFICATIONS SUMMARY

Mr. Maiero, has 25 years experience in the environmental industry. He has extensive skills in all aspects of management, marketing and field operations. He has proven capabilities working with large nationally based firms, small Alaskan businesses and SDB and 8(a) companies. Mr. Maiero's specialty over the last 13 years has been the introduction of small firms into the environmental market and greatly expanding their capabilities and market share.

REPRESENTATIVE PROJECTS

- **Program Manager, Roberts Landfill Closure, Akak, Alaska**
Responsible for the administrative contract management and field support of this dynamic landfill closure project. Unique elements, aside from the contract tasks, included: unknown UXO, determination of UXO exclusion zones; discovery of infectious waste; and unknown buried metals.
- **Project Manager, Building Demolition and Removal, Elmendorf AFB, Alaska**
Project included the demolition of four concrete structures and one metal structure. In addition, ADC was required to "drop" 8,000 linear feet of vertical antennae. The antennae were dropped simultaneously and safely due extensive rigging and a singular pull point.
- **Marine Biologist, State of Alaska**
Contracted by NOAA to participate with Research Planning Institute of South Carolina in developing the shoreline sensitivity atlases which had become the basis for contingency planning and damage assessment from spills occurring in Alaska waters. Spent two years surveying Alaskan coastlines as a marine biologist with RPI geomorphologists and developing atlases (each a separate publication) for the entirety of Prince William Sound, Upper and Lower Cook Inlet, Shelikoff Straits, the Pribilof Islands, the Kotzebue Sound and the shoreline between Cape Prince of Wales and Cape Romanzof, including all of the Norton Sound islands.
- **Science Support Coordinator, Seldovia, Alaska**
Responsible for coordination of scientific studies for the Glacier Queen spill which occurred in Seldovia Bay, Alaska in 1978. Responsibilities included trajectory analysis, fish stocks sampling, damage assessment and clearing shellfish for consumption.
- **Science Support Coordinator, St. Paul Island, Alaska**

Mobilized with a U.S. Coast Guard strike team to perform trajectory analyses and assess damage to biological resources during the Ryuyu 2 oil spill. The vessel beached itself against the rock headlands adjacent to a highly productive lagoon and the spill threatened migrating bird and seal populations.

- **Scientist, Corpus Christi, Texas**
Contracted by NOAA to help perform damage assessment IXTOC I oil spill which contaminated shorelines from the Bay of Campeche, Mexico to Padre Island, Texas.
- **Scientist, Saint Lawrence Seaway, New York**
Contracted by the EPA to serve on the EPA oil spill strike team in NEPCO 140 spill in the Saint Lawrence Seaway. Responsibilities were centered on damage assessment of this bunker oil spill upon the local biota and aquatic vegetation. Helped to survey and assess approximately 80 miles of this seaway.
- **Scientist, Intracoastal City, Louisiana**
Contracted by the EPA to determine damages on upland birds and invertebrates occurring from a major well blowout which covered six square miles of marshlands with a heavy, waxy oil.
- **Marine Biologist, North Slope, Alaska**
Contracted by Shell Oil Company to help compile the shoreline sensitivity atlases for the shoreline between Barrow and Demarcation Point, Canada. As with the NOAA survey, transects were taking every 12 kilometers and all biota were characterized and classed in the sensitivity format.
- **Spill Response Instructor, State of Alaska**
Contracted by ARCO, Sohio, Texaco, Amstar, Hess, Gulf, Shell and spill response cooperatives including ABSORB (ACS), GOACO, CISO (CISPRI) to present spill response training and preparedness classes at locations on the North Slope, Prince William Sound, Aleutian Islands, Yakutat Peninsula, Pribilof Islands and Cook Inlet. The instruction included all forms of mechanical response and non-mechanical approaches including in-situ burning, helo-bucket, vessel dispersant applications and natural degradation.
- **Spill Response Management, Prince William Sound, Alaska**
Exxon Valdez spill response management of three field offices and 450 personnel at eight sites.
- **Project Manager, Nikiski, Alaska**
Managed clean-up operations for the Glacier Bay spill cleanup for both Bradbury, Bliss and Rearden and the U.S. Coast Guard. Operations included over 60 vessels and over 400 personnel working on both the west and east side of the Inlet and Kalgin Island.
- **Kodiak Support Center, Kodiak, Alaska**
Project involved operating and maintaining an active bioremediation cell. Responsibilities included cost tracking and monthly reporting to the U.S. Coast Guard.
- **Johnstone Point, Hinchinbrook Island, Alaska**

Removed two FAA tank farms and several single use storage tanks. Installed a 75,000 gallon capacity tank farm with overfill and leak detection. All materials and equipment were mobilized with shallow draft landing crew. A crew of 12 people were housed in a mobile tent camp for the duration of the project.

- **UST Prototype Module, Hanford, Washington**
Fabricated a prototype PICS (Pumping, Instrumentation Control Skid) module for the remote monitoring of USTs containing very hot radioactive wastes. The prototype was delivered in budget and on schedule. The success of this effort resulted in the construction of an additional nine units for the DOE.
- **Alaska Peninsula Wildlife Refuge Remediation, Swanson River, Alaska**
Project included removal and disposal of 300 cubic yards of POL contaminated soil. The soil was barge loaded and transported to a TSDF in Tacoma, Washington.
- **UST Removal, Elmendorf AFB, Alaska**
Removed and decommissioned nine FAA underground fuel tanks ranging in size from 20,000 to 50,000 gallons. Decommissioned pipelines and installed new pipe and tank systems.
- **Bethel and Fort Yukon Fuel System Upgrade, Alaska**
Removed and decommissioned 17 USTs and AGTs. Replaced new tanks, pipelines and pump housings.
- **Environmental Assessment, Wake Island, Alaska**
Performed an environmental, safety and quality control assessment and audit of the army and navy facilities and historical dumpsites and landfills. A report was authored presenting findings and steps to correct deficiencies.
- **White Alice Site Demolition, Unalakleet, Alaska**
This DERP project included demolition of "White Alice" sites including abatement of asbestos, thermal remediation of PCB and POL contaminated soils, and removal of UST's. Logistics were key to this effort as all construction equipment and the thermal destruction unit and fuel needed to be shipped to Unalakleet.
- **Soil Remediation, Lake Minchumina, Alaska**
FAA project required remediation of FO-27 waste contaminated soils (i.e. Dioxin and DDT), removal of USTs and stored chemicals.
- **Waste Characterization and Removal, Elmendorf AFB, Alaska**
Hazardous materials removal at this Superfund site located on Elmendorf AFB in Anchorage, Alaska, consisted of recovering approximately 4,500 rusted drums of asphalt, non-asphalt wastes, jet fuels and pesticides. Project required sampling, analysis and recycling of all asphalt.
- **Spill Cleanup, Fairbanks, Alaska**
Project included cleanup of a major toluene spill in the Fairbanks rail yard. The majority of the cleanup required Level B PPE (some Level A) in temperatures down to -30° F.
- **Ash Excavation, Swanson River, Alaska**

Excavation, stockpile management and responsibility for ash produced from the thermal remediation of 75,000 tons of PCB contaminated soils at the Swanson River field. Provided all support facilities for several contractors.

- **Spill Response Services, Kingdom of Saudi Arabia**
Worked with ARAMCO and Crowley Marine Services to provide spill response activities during the Iraqi war. Responsibilities included management of logistics, personnel, local subcontractors and field support camps necessary for the recovery of millions of gallons of oil.
- **Soil Remediation, Nikiski, Alaska**
Bioremediation of 5,000 yards of POL contaminated soil.
- **Soil Excavation, Fairbanks, Alaska**
Excavation and stockpiling of 10,000 yards of ethanol contaminated soils in the ARCO Fairbanks rail yard. Project completed while working within a potentially explosive environment and under the directive to maintain the integrity of the rail line.
- **Chemical Removal, 60 miles east of Kotzebue, Alaska**
BP Alaska project which required removal of all mining and laboratory chemicals from the defunct Bornite Mine operation. Included sampling and lab-packaging of chemicals for transportation to TSDFs.
- **Site Cleanup, 70 miles south of Prudhoe Bay, Alaska**
Assessment, clean-up and removal of contaminated material from the abandoned Kemic drill site. Removal was accomplished by "cat train."
- **Oil Spill Cleanup, Drift River, Alaska**
Crude oil spill cleanup of a failed 200,000 gallon tank. This fast track project included use of steam plants to melt oil contaminated ice, separation of recovered oil from melt waters and return of crude to onsite tanks.
- **Chemical Cleanup, Prudhoe Bay, Alaska**
Chemical cleanup from burned warehouse which contained a variety of exotic chemicals. Cleanup included the removal of debris, chemical containers and pools of water and chemicals resulting from fire fighting efforts.
- **Site Cleanup, Malispina, Alaska**
Directive was to clear and remediate a remote, abandoned drill site on U.S. Forest Service lands. More than 200 supersacs containing drilling mud were removed by helicopter sling loads to a vessel waiting offshore.

RECORD OF EXPERIENCE

1996 - Present; Program Manager; Ahtna Development Corporation

Mr. Maiero oversees environmental construction projects from the bid phase through operation and completion. He is responsible for business development, estimating, preparing proposals, writing project work plans, overseeing field staff, interfacing with clients and regulatory

agencies and ensuring all work is carried out in accordance with project plans, contract documents and regulatory requirements.

1995 - 1996; Vice President and Operations Officer; Clearwater Environmental, Inc.

Mr. Maiero is responsible for securing and estimating new work opportunities and assigning and supervising project management staff. In addition to business development, Mr. Maiero provides technical as well as managerial oversight for daily project operations.

1994 - 1996; Manager/Environmental Services Group; Chugach Development Corporation

Mr. Maiero assisted in the development of the Environmental Services Department of Chugach Development Corporation. In this position, he was responsible for contract management, project operations and business development in Anchorage, Alaska; Portland, Oregon; and Kennewick, Washington.

1988 - 1994; Vice President; Martech USA, Inc.

Mr. Maiero was involved in a variety of projects located in remote areas of Alaska, as well as in the Middle East. He procured and managed more than 550 environmental project delivery orders in Alaska between 1988 and 1994. Projects ranged from \$500 to \$24 million and included all aspects of remediation and emergency response. As Middle East Operations Manager, Mr. Maiero had oversight of oil spill response and restoration projects in Saudi Arabia and Kuwait, and marketed environmental projects in Thailand and Taiwan.

1986 - 1988; Co-Owner/Founder and Manager/Environmental Services Division, Unitech of Alaska, Inc.

As co-owner and co-founder of Unitech of Alaska, Inc., Mr. Maiero worked to provide the Alaskan environmental industry with a full range of environmental products and services. He successfully captured the environmental products market and increased the holdings of Unitech by offering additional environmental services. These services included oil spill cleanup and removal of fuel and hazardous wastes for different companies.

1983 - 1986; Manager/Environmental and Response Services; Alaska Offshore, Inc.

Mr. Maiero managed this full-service oil field response and marine services company. He was able to provide a variety of services throughout Alaska with special emphasis on North Slope Operations. He was responsible for overseeing a majority of the oil spill cleanup operations and providing prevention and training activities on the North Slope for several large oil companies.

1981 - 1983; Manager/Alaska Environmental Operations; Science Applications, Inc.

As manager of the Anchorage office, Mr. Maiero established statewide environmental contracts and was the primary author of the North Slope Sensitivity Atlas while working under contract to Shell Oil.

1978 - 1981; Manager/Alaska Region; URS Corporation

Mr. Maiero established and managed the URS Anchorage office. Under contract to NOAA, he was the key author to prepare the Shoreline Sensitivity Atlas for Upper and Lower Cook Inlet, Prince William Sound, Shelikoff Straits, the Pribilof Islands and two major segments of the

West Coast of Alaska. In doing so, he spent more than a year and a half in the field performing shoreline surveys. Under contract to NOAA, he acted as Science Support Coordinator for two major oil spills.

1973 - 1978; Project Manager and Marine Biologist; URS Corporation

Mr. Maiero participated in a wide variety of environmental projects and oil spills throughout the U.S.

1971 - 1973; San Francisco Marine Research Center

Mr. Maiero served as a marine biologist and benthic toxonomist.

CERTIFICATIONS

29 CFR 1910.120 40-hour HAZWOPER Training

29 CFR 1910.120 8-hour Supervisory Training

Corps of Engineers Construction Quality Management

Gary G. Lawley

Safety and Health Manager

Years of Experience: 30

EDUCATION

B.S., Biology, 1959, East Central University
M.S., Terrestrial Ecology, 1965, University of Oklahoma
Ph.D., Chemistry and Aquatic Ecology, 1973, North Texas State University
Postdoctoral Studies, University of California, Berkeley

QUALIFICATIONS SUMMARY

Dr. Lawley has more than 30 years of experience in the environmental site assessment and hazardous waste remediation fields. As Senior Project Manager, he is responsible for all technical and management aspects of projects under his direction. As Corporate Quality Assurance and Health and Safety Manager, he is responsible for those aspects of all projects. He has served as Program Manager or Technical Director for a number of major site investigations and multimedia compliance audits, including some of the largest hazardous waste, nuclear and environmental projects in the United States. Dr. Lawley served as Program Manager for a team of federal, state and university scientists who initiated environmental assessment of the impacts on the Columbia River the day following the Mt. St. Helens volcano eruption. He was a member of the Three Mile Island Nuclear Power Plant Incident Biological Field Investigation Team. Dr. Lawley was also involved with damage assessment for the Exxon Valdez Oil Spill in Alaska, and served as Training Director for the Saudi government on the Arabian Gulf Oil Spill during Desert Storm. Dr. Lawley was recipient of one the first 100 EPA fellowships granted, and has been on the cutting edge of technology development for the environmental and hazardous waste industries.

REPRESENTATIVE PROJECTS

- **Contractor Quality Control**
DERP Site Evaluation and Clean-up, Unalakleet, Alaska
Dr. Lawley provided quality control oversight for this major site clean-up of two formerly used defense sites at a remote location in Western Alaska.
- **Technical Director**
Rocky Mountain Superfund Site
Dr. Lawley was technically responsible for the initial aquatic and terrestrial studies at this huge Superfund project near Golden, Colorado.
- **Program Manager**
Environmental Studies and Regulatory Compliance
Dr. Lawley was the manager of environmental studies related to the proposed \$7 billion Susitna hydroelectric studies for the Alaska Power Authority.

- **Program Manager
Environmental Studies for Several Nuclear Fossil Fuel Power Plants**
For a five-year period, Dr. Lawley managed the environmental studies and EIS preparation for nuclear, fossil fueled and garbage-to-energy power plants in New York State. He testified in NRC hearings on seven occasions and was accepted as a technical expert in three different technical areas.

RECORD OF EXPERIENCE

1995 - Present; Senior Project Manager and Corporate Quality Assurance and Health and Safety Manager; Clearwater Environmental, Inc.

Mr. Lawley is responsible for providing overall management and technical oversight on a variety of environmental projects. As Corporate Quality Assurance and Health and Safety Manager, he is responsible for quality assurance/quality control for all company projects and provides overall health and safety management and training.

1994 - 1995; Technical Manager/Quality Assurance Manager; Chugach Development Corporation

Mr. Lawley was responsible for all aspects of this native-owned 8(a) corporation's technical excellence, health and safety programs and quality assurance for all environmental assessment and remediation projects, including Base Operating Services agreements. He was responsible for ensuring compliance with all regulations.

1988 - 1994; Technical Manager/Quality Assurance Manager; Martech

Dr. Lawley was involved in a variety of major projects throughout the U.S. and several foreign countries. Projects included site investigations, assessments, remediations, radioactive materials site assessments and clean-ups, asbestos abatement projects, spill response, and spill plan and contingency plan preparation and review. He consulted with ARCO Alaska and BP Exploration on the adequacy of existing spill response plans for their Prudhoe Bay, Kuparuk and Endicott, Alaska, facilities. He also did oil spill training for a number of clients, including CISPRI, Alyeska and Alaska Clean Seas. He was technical director of two remediation projects in Czechoslovakia and was the safety officer in charge of more than 100 oil spills and remediation projects.

1985 - 1988; Consulting Scientist and Industrial Hygienist, Adjunct Professor; Resource Management International

Dr. Lawley taught classes concerning oil spill response, asbestos abatement and hazardous waste operations for numerous clients in Alaska, California and Louisiana. He also taught EIS Preparation/Environmental Assessment as an adjunct professor for Alaska Pacific University. He prepared contingency plans for a number of clients statewide. He served as project manager for the Trans-Alaska Gas Pipeline EIS and worked on a mercury clean-up in Nome, as well as a number of oil spills and hazardous waste sites.

1978 - 1985; Regional Manager; Ebasco Envirosphere Company

Dr. Lawley's duties included management of multi-disciplinary environmental assessment studies for the oil and gas industry, coal and metals mining, hazardous waste clean-ups, and hydroelectric project EISs. He was environmental manager of major studies such as the Columbia River data development project, the Susitna hydroelectric studies, the waterflood project, the Endicott environmental studies and the Quartz Hill Mine EIS. He also managed large staffs on several multi-million dollar hazardous waste clean-ups.

1973 - 1978; Project Manager; Texas Instruments Ecological Services

Dr. Lawley acted as project manager for more than \$100 million of environmental impact and assessment projects in New York State, including EISs for nuclear power plant siting studies on the Hudson River, and on Lake Erie and Lake Ontario. Other projects included environmental assessment at the Nine Mile Point Nuclear Sites, Ellis Island Garbage to Energy Power Plant, Indian Point Nuclear Plant, Dunkirk Steam Generating Station and the Storm King Hydroelectric Project. He managed four of the seven Article 8 major project environmental assessment applications filed in New York State. During the 1970s, Dr. Lawley testified in three highly sensitive NRC and New York State court cases involving environmental aspects of nuclear and fossil fueled and garbage-to-energy power plants in New York State. He was accepted and testified as an expert witness in the environmental assessment fields of terrestrial ecology, water quality and fisheries biology.

CERTIFICATIONS

29 CFR 1910.120 HAZWOPER Instructor - all versions
Confined Space Entry Trainer
Trenching-Excavating Instructor
Corps of Engineers Construction Quality Management

Asbestos Instructor
Radiation Safety Instructor
Hazardous Waste Trainer

J. Daniel Owens

Project Manager

Years of Experience: 19

EDUCATION:

A.A.S., Spokane Community College, 1982

QUALIFICATIONS SUMMARY:

Mr. Owens has over 15 years construction and environmental remediation experience including all phases of project planning, site operations, site health and safety and project quality control. Mr. Owens has extensive construction management experience which include commercial buildings, bulk fuel storage facilities, prime power plants, wastewater treatment facilities, landfill caps and harbor dredging. Additionally, Mr. Owens is experienced in all phases of remediation including UST removals, drum cleanup and disposal, contaminated soil excavation and disposal as well as construction and operation of on-site soil treatment units. Mr. Owens is familiar with environmental sampling and hazardous waste site health and safety requirements.

REPRESENTATIVE PROJECTS:

- Project Manager
Galena Landfill Closure, Galena, Alaska
Mr. Owens is the Project Manager for the Galena Landfill Closure Project. He is in charge of overseeing all on-site construction activities, progress reports, updating project schedules and plan preparation for the U.S. Army Corps of Engineers.
- Project Manager
Asphalt Drum Removal, Bethel, Alaska
Mr. Owens was responsible for this \$989,000 environmental cleanup action consisting of asphalt drum removal in Bethel, Alaska.
- Project Manager
Lead-Based Paint Abatement, Kodiak Island
Mr. Owens was responsible for this \$441,000 lead-based paint abatement project for the U.S. Coast Guard on Kodiak Island, Alaska. This project required contaminated lead paint removal prior to the demolition of duplex housing units.

RECORD OF EXPERIENCE:

1/98 - Present; Project Manager; Clearwater Environmental, Inc.

Mr. Owens is responsible for oversight of various construction projects such as landfill closures. As a Project Manager, he is responsible for plan preparation, project scheduling and cost control.

9/95 – 12/97; Project Manager; ASRC Contracting Company, Inc. (ACCI)

Mr. Owens was responsible for assigned delivery orders on a five year, \$25 million cost reimbursable Air Force environmental contract. He maintained required project reporting to include progress schedules, financial controls and estimating. He assisted in the preparation of proposals and bids and estimated required equipment and materials. Mr. Owens was also in charge of site management in support of delivery orders, acting as Regional Safety Manager, coordinating purchasing and logistics for all projects in Alaska, and identifying potential revenue sources. Projects he managed included UST and AST installation, testing and decommissioning, waste characterization, bulking, transportation, metal drum cleanup and PCB handling, landfilling and capping.

7/95 – 9/95; Project Consultant; Nugget Construction, Inc.

Mr. Owens was in charge of overseeing environmental cleanup actions. As a Project Consultant, he prepared and updated appropriate project plans, revised project schedules and reviewed billings prior to submission to clients. He also coordinated transportation and disposal of collected drums. Additional responsibilities included business development, proposal preparation, estimating material needs and personal interaction with clients.

9/94 – 7/95; Project Consultant; Anchorage Enterprises, Inc.

Mr. Owens was responsible for overseeing various projects. As such, he prepared project plans and schedules, provided logistic coordination for equipment delivery and was involved in the procurement of materials and tools, and transportation of hazardous waste. Additional responsibilities included the successful preparation and negotiation of a \$2.5 million Corps of Engineers IDTRA contract, and marketing the DBE/8(a) status of the company.

10/91 – 9/94; Construction Project Manager; U.S. Army Corps of Engineers, Alaska District

Mr. Owens was responsible for projects valued up to \$8.5 million. His duties included review of all specific project plans, review and approval of project submittals, editing schedules and pay items. He prepared contract correspondence, reviewed project conflicts and provided clarification and direction to contractors. He also prepared cost estimates for change orders and assessed potential impacts for claims. Mr. Owens conducted on-site visits and inspections to assure compliance with contract plans and specifications. Projects included a bulk fuel storage facility upgrade, all phases of contaminated site cleanup and closure, harbor dredging and UST decommissioning and closure.

5/91 – 7/91; Facilities Manager; Alaska Commercial Company

As a Facilities Manager, Mr. Owens was responsible for bringing 22 physical plants into environmental and building code compliance. He held supervisory responsibility for a staff of five maintenance workers. These facilities were located in remote sites of Alaska and consisted of a commercial structure containing major refrigeration/freezer, heating systems, prime and backup power generation systems, and UST and AST bulk fuel storage. Mr. Owens was responsible for beginning a comprehensive plan for the upgrading of all facilities, conducted emergency repairs of failed systems and prepared the scheduling of routine maintenance.

5/88 – 4/91; Construction Project Manager; U.S. Army Corps of Engineers, Alaska District

Mr. Owens was responsible for managing various projects on Shemya Air Force Base under the Air Force military construction program. Projects ranged from \$900,000 to \$20 million. His duties included reviewed of all project plans, review and approval of project submittals, and editing schedules and pay items. Mr. Owens also prepared cost estimates for change orders and assessed potential impacts for claims. He conducted on-site visits and inspections to assure compliance with contract plans and specifications.

3/85 – 5/88; Civil Engineer Technician; U.S. Army Corps of Engineers, Alaska District

Mr. Owens was responsible for Construction Division coordination of design reviews prior to advertisement for construction. As Civil Engineer Technician, he calculated performance periods and liquidated damages, reviewed submittals and shop drawings for contract compliance, evaluated and provided solutions for field construction problems, and assisted in the preparation of sketches for contract modifications for both resident offices. He provided construction inspection services to the Municipality of Anchorage on various EPA funded Waste Water Treatment facility upgrades, and developed the District's laboratory testing and accreditation program for geo-technical testing laboratories in Alaska.

9/82 – 3/85; Civil Engineer Technician/Field Project Engineer; U.S. Army Corps of Engineers, Alaska District

Mr. Owens was responsible for coordination and management of both Civil and Military Construction projects through out the state of Alaska. His duties included review of specified project plans, review and approval of project submittals, and editing schedules and pay items. He prepared cost estimates for change orders and assessed potential impacts for claims. He also inspected project sites to assure compliance with contract plans and specifications. Projects included remodeling and upgrading of a Field Training Facility, construction of state-of-the-art Geodesic Domed facilities, harbor dredging, and hardrock tunneling for an alpine lake tap to support an underground power plant expansion.

7/79 – 9/82; Civil Engineer Technician/Survey Technician; Geological Field Assistant

Mr. Owens gained field experience as a summer field technician and geological assistant in which he accomplished route surveys, drafted plans, conducted corner and note research, and prepared legal descriptions of properties. He also prepared hardrock core samples for assay and analysis, conducted soil sampling, field compass surveying, and mineral exploration utilizing induced polarization mapping techniques.

CERTIFICATIONS:

29 CFR 1910.120 40-hour HAZWOPER Training
29 CFR 1910.120 8-hour Supervisory Training
Corps of Engineers Construction Quality Management
State of Alaska Certification for UST Installation, Tank Tightness Testing and Closure
(Alaska License No. 456)
First Aid and CPR Certified

William D'Atri

Project Manager

Years of Experience: 12

QUALIFICATIONS SUMMARY:

Mr. D'Atri has over ten years Alaska-based experience in various aspects of program and project senior management. He has a proven record of concise, quality and cost-conscious management actions resulting in increasingly challenging work environments. His project management experience includes project-related and program estimating with related contractual duties and responsibilities. In addition, he procures materials for on-site delivery, leads project mobilization and demobilization and corporate inventory and control programs. As on-site manager, he reports and verifies quality control, reports progress and productivity, cost accounting and final reporting. Mr. D'Atri is also experienced in division-level strategic planning and marketing, budget preparation and implementation, oversight and implementation of corporate safety programs and corporate logistics support programs. Mr. D'Atri has effectively demonstrated expertise in Federal Regulatory interpretation and compliance, which includes RCRA and TSCA contaminated site work-plan development, management, and documentation, and CFRs 29, 40 and 49 regulatory interpretation and implementation. His field experience includes CQM program application, burning, and submerged oil recovery, diving operations management and logistics, and liaison and on-site management of federal agency emergency response actions. He has hands-on familiarity with bulk soils excavation, transportation and placement, and has managed sub-surface soils borings (split spoon sampling), logging, and subsequent analysis and interpretation.

REPRESENTATIVE PROJECTS:

- Project Manager / Project Superintendent
Ahtna Development Corporation, Anchorage, Alaska
Mr. D'Atri provided on-site management and quality control for the 70-acre Roberts Landfill Closure Project, NAF Adak, Alaska, (\$2.188 million), 1997-1998. He negotiated multiple Change Orders with the client's management team in response to dynamic and differing site conditions encountered at the project site. As Project Superintendent, Mr. D'Atri provided on-site management for the 30-acre Galena Landfill Closure Project, Galena, Alaska, (\$1.920 million), 1998.
- HazMat Division Manager
Alcan Environmental, Inc., Anchorage, Alaska
Mr. D'Atri served as the Corporate Responsible Safety Officer (RSO) from 1995 to 1997. He was responsible for all phases of business development, project management, and related duties associated with site remediation and HazMat management. He oversaw and approved all RCRA regulatory compliance, hazardous materials management, documentation and related actions associated with Municipality of Anchorage's Hollywood Vista Apartment Demolition and Site Rehabilitation (\$1.774 million), 1996 to 1997. He served as Project Manager for the USAF Tracking Radar Remediation Project, Clear AFS, Alaska, 1996. Mr. D'Atri was the Emergency Response Coordinator for BLM Task Order 008 – Central Soils Project in Central, Alaska in 1996. He served as Project Manager in 1996 for the Cordova Roundhouse Project (Subcontractor to Chugach Development Corporation).

RECORD OF EXPERIENCE:**1991-1995; Project Manager, Project Specialist, Senior Account Representative; Philip Environmental, Anchorage, Alaska**

Mr. D'Atri served as the Diving Operations Manager in the Submerged Oil Recovery Operations at the USCG/Morris Berman Oil Spill in San Juan, Puerto Rico. He also served as Project Specialist for the Atigun Pass Remediation Project at Atigun Pass, Alaska, and as Project Manager for various clients on Incident Command system evaluation projects in Alaska.

1988-1991; Sales Manager; Unitech of Alaska, Anchorage, Alaska

Mr. D'Atri was the On-Scene Coordinator for Exxon Valdez Oil Spill support activities in Prince William Sound and Cook Inlet in Alaska. He assumed General Manager responsibilities during the absence of Unitech's president.

1981-1984; Private Contractor; EPD Services

Mr. D'Atri was the owner/operator of 12CY-end dump truck and pup trailer. He acquired extensive experience in soils, site preparation and site development.

1980-1981; Operations Manager; Alaska Explosives, Ltd.

Mr. D'Atri assumed responsibility of Operations Manager in Fairbanks, which overlooked all scheduling, production, and delivery of federally regulated and tracked products and materials. He managed operations in compliance with local, state, and BATF requirements and regulations and provided documentation to ensure regulatory compliance with pertinent agencies.

EDUCATION AND TRAINING:

Business, Engineering and Natural Sciences Courseware, UAA, Anchorage, Alaska.
Ongoing secondary education, working toward Business Management/Engineering Degree.

- Hazardous Waste Operations Training, 40 Hour; annual refresher
- Advanced Oil spill and Safety Training, 40 Hour
- First Aid and CPR; annual / bi-annual refresher
- Confined Space Entry Training, 16 Hour
- Construction Quality Management, US Army Corps of Engineers, 12 Hours

PUBLICATIONS:

"Flicking Your Bic at Twenty-Five Below (or: The Atigun Pass Diesel Spill Project)", *Proceedings of the Sixteenth Arctic and Marine Oil Spill Program Technical Seminar*, ppg. 669-677, 1993, with T. King.

MEMBERSHIPS:

Prince William Sound Regional Citizens' Advisory Council, Scientific Advisory Committee. Current projects include oil spill dispersants, *In-Situ* burning and bioremediation bibliographies and state-of-the-science reviews. Program Coordinator: Mr. Lisa Ka'aihue

APPENDIX D

Safety and Health Forms

D1 – Worker/Visitor Acknowledgment

D2 – Employee Training Record

D3 – Employee Health & Safety Questionnaire

D4 – Medical Data Form

D5 – Sign-in Sheet

D6 – Safety and Health Sign-off Sheet

Certificate of Worker/Visitor Acknowledgement
--

Project Name/Contract Number: _____

Project Address: _____

Contractor's Name: _____

Employee's/Visitor's Name: _____

The work order for the above-referenced project required that: (1) you be provided with and complete formal and site-specific training; (2) you be supplied with proper personal protective equipment, including respirators; (3) you be trained in PPE/respirator use; and (4) that you receive a medical examination to evaluate your physical capacity to perform your assigned work task, under the environment expected, while wearing the required PPE. These requirements are to be fulfilled at no cost to you. By signing this certification, you are acknowledging that your employer has met these obligations to you.

Formal Training: I have complete the following formal training courses that meet OSHA's requirements:

<u>Course Name</u>	<u>Date Completed</u>
40-hour training	_____
8-hour Supervisory	_____
8-hour Refresher	_____

Site-specific Training: I have been provided and have completed the site-specific training required by this work order. The Site Safety and Health Officer conducted this training. _____

Respiratory Protection: I have been trained in accordance with the criteria in [Clearwater's ____] [my employer's ____] Respiratory Protection Program. I have been trained in the proper work procedures and use and limitations of the respirator(s) I will wear. I have been trained in and will abide by the facial hair policy. _____

Respirator Fit-test Training: I have been trained in the proper selection, fit, care, cleaning, maintenance, and storage of the respirator(s) that I will wear. I have been fit-tested in accordance with the criteria in [Clearwater's ____] [my employer's ____] Respiratory Protection Program and have received a satisfactory fit. [I have been assigned my individual respirator ____]. I have been taught how to properly perform positive and negative pressure fit-check each time I don a negative pressure respirator. _____

Position: _____

[illegible]

Employee Safety and Health Questionnaire

The personal questions on this form are asked so that you can be assigned to work within your capabilities and to prevent accidents. All answers will be kept confidential. All employment practices will support equal employment opportunity guidelines and legislation. No employee will be discriminated against because of race, color, national origin, sex, age or handicap.

- | | | | |
|---------------------------------|-----------|------------|-------------|
| 1. Have you ever suffered from: | <u>No</u> | <u>Yes</u> | <u>Date</u> |
| Hernias | _____ | _____ | _____ |
| Back Injury | _____ | _____ | _____ |
| Heart Trouble | _____ | _____ | _____ |
| Epilepsy | _____ | _____ | _____ |
| Diabetes | _____ | _____ | _____ |

Any other major illness or injury in the last three years?

- | | | |
|---|------------|-----------|
| | <u>Yes</u> | <u>No</u> |
| 2. Do you agree to promptly report all incidents and accidents to your supervisor? | _____ | _____ |
| 3. Do you agree to report all unsafe conditions and unsafe acts to your supervisor? | _____ | _____ |
| 4. Have you ever drawn worker's compensation for a job related injury or illness? | _____ | _____ |
| 5. Do you have a worker's compensation claim pending at the present time? | _____ | _____ |

If yes, explain: _____

I, _____, certify that the statements made on this application are true and correct to the best of my knowledge and that any deliberate falsifications could result in termination of my employment. Permission is hereby granted to obtain verification of the statements made herein. I hereby acknowledge that I have received one copy of the Employee Manual, dated _____. I agree to comply with all the rules and regulations within.

Employee Signature

Date

I, _____, acknowledge that I have provided the Employee Manual to the above employee and informed him/her of the training required for his/her position.

Safety and Health Officer

Date

Medical Data Sheet/Field Team Review

This brief Medical Data Sheet will be completed by all on-site personnel and will be kept in the Support Zone during field activities. This sheet is not a substitute for the Medical Surveillance Program requirements consistent with the Safety and Health Program for field personnel. This data sheet will accompany any personnel if medical assistance or transport to hospital facilities is required. If more information is required, use the back of this sheet.

Project Name: _____ Location: _____
 Employee Name: _____ SSN: _____
 Address: _____ Home Phone: _____
 Date of Birth: _____ Height: _____ Weight: _____

Emergency Contact: _____ Phone: _____
 Personal Physician: _____ Phone: _____

Allergies: _____

Sensitivities: _____

Do you wear contacts? Yes _____ No _____

Please list all recent illnesses or exposures to hazardous chemicals: _____

Please list all medications are you presently using: _____

Please list any medical restrictions you currently have: _____

I, _____, have read and reviewed the Site-specific Safety and Health Plan and understand the information contained therein and agree to comply with this document and all company and project-specific training I have received.

 Signature

 Date

Site Control Log

Project Name: _____

Project Name/Location: _____

[illegible]

APPENDIX E

Physical Agent Data Sheets (PADS) and Material Safety Data Sheets (MSDS)

P1 Cold Stress

P2 Hand-Arm Vibration

P3 Noise

P4 Heat Stress

M1 #5 Fuel oil/Diesel

M2 Gasoline

ALASKA DEPARTMENT OF LABOR
LABOR STANDARDS AND SAFETY
3301 EAGLE STREET/PO BOX 107022
ANCHORAGE, AK 99510-7022
(907) 269-4955

PHYSICAL AGENT DATA SHEET

COLD STRESS

Exposure to cold can cause the body's internal temperature to drop to a dangerously low level. This is called hypothermia. Exposure to temperatures below freezing can cause frostbite of the hands, feet, and face.

Hypothermia Can Kill

Hypothermia occurs when a person's body loses heat faster than it can be produced. The body's "normal" deep body temperature is 99.6 degrees Fahrenheit. If your body temperature drops to 95 degrees Fahrenheit, uncontrollable shivering occurs. If cooling continues, these other symptoms may occur:

Vague, slow, slurred speech

Forgetfulness, memory lapses

Inability to use hands

Frequent stumbling

Drowsiness

Exhaustion, collapse

Unconsciousness

Death

Hypothermia impairs your judgement. You may not be able to make good decisions about your situation. Preventing hypothermia is the best way to avoid being a victim.

Preventing Hypothermia: Be Prepared

Hypothermia can occur at temperatures above freezing. Cold, wet, windy conditions make prime hypothermia weather.

Frostbite¹

Frostbite is the freezing of some part of the body. Fingers, toes, and even whole arms and legs can be lost as a result of frostbite. Such injuries have happened in cities and villages as well as in more isolated areas of Alaska.

Protection From the Cold

In extreme cold it is important to prevent heat loss from as many areas of the body as possible. Exposed limbs and head are major areas of heat loss, but keeping enough blood flowing to the hands and feet is the key to preventing frostbite. The trunk and the head, then, should be warm enough so that the brain is able to command the blood vessels in the hands and feet to open up.

Essential Clothing

This includes thermal underwear, insulated footwear or mukluks with liners, double mittens and a parka, preferably down-filled with a good ruff. A parka which can be opened at the neck to allow heat to escape will prevent overheating and sweating. Quilted or skin pants are necessary if no warm shelter is immediately available. Tight clothes, especially tight gloves or tight boots, should not be worn. They interfere with the blood flow and reduce insulation against the cold.

Traveling

The traveler, even on a snowmobile, or in a heated automobile, should always be prepared to walk in severe cold. This means carrying along proper clothing and more extensive survival gear. If an accident, mechanical breakdown, or other interruption occurs during travel, the clothes you have must provide enough warmth to sustain life. Hands and feet should be well protected at all times to hinder the development of frostbite until help arrives.

Some Special Warnings

Don't touch cold metal with bare or wet hands. You will freeze to the metal and tear away skin. If necessary, thaw gently with heat, warm water or urine.

Be careful when handling gasoline, kerosene or liquids other than water. Contact at cold temperatures can cause immediate frostbite.

Remember that frostbite is more likely to occur when you are injured, frightened or careless.

Early Treatment of Frostbite: Proper Rewarming

Next to the extent of freezing, inadequate or improper treatment of a frozen part is the most common cause of serious loss of tissue.

1. In many cases rewarming cannot be done without the part again becoming frozen. For example, removing clothing from other parts of the body to warm a frozen part may only result in the loss of more body heat, greater extent of injury, and the ultimate refreezing of the afflicted part.

Thawing and refreezing should always be avoided. It is best to continue, even if it means walking on a frozen foot, until shelter is available and rewarming can be done satisfactorily.

2. Limbs should be rewarmed in stirred water just above normal body temperature (about 100 - 105 degrees Fahrenheit). Using a thermometer is the only accurate way to measure this temperature. Never try to thaw in cold water or snow. Since feeling is lost, fires, stoves, exhaust pipes, etc., should never be used. Serious damage to the tissue could result.
3. If the major part of the limb is frozen when rewarming is started, deep body temperature will fall as the cooled blood begins to flow throughout the body. To prevent such cooling, warm liquids by mouth should be given. Even total immersion of the body in a warm bath may be necessary.
4. Rewarming is an acutely painful experience and medication to alleviate pain should be given if available. After thawing, a deep aching pain may persist for several days, depending upon severity of the injury. Pain is actually a good sign, since it indicates that nerve function is still present.
5. The afflicted part should be moved gently and voluntarily during rewarming.
6. A dull purple color indicates more serious injury and requires medical attention. So does swelling or blisters. Other means for improving circulation are available but must be administered by medical personnel..

Summary

Most cases of frostbite occur as a result of lack of knowledge, careless preparation, unavoidable accident, or the effects of alcohol on judgement. Intelligent forethought can prevent injury.

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PHYSICAL AGENT DATA SHEET

HAND-ARM VIBRATION

Description

Hand-arm vibration is caused by the use of vibrating hand-held tools, such as pneumatic jack hammers, drills, gas powered chain saws, and electrical tools such as grinders. The nature of these tools involves vibration (a rapid back and forth type of motion) which is transmitted from the tool to the hands and arms of the person holding the tool.

Health Hazards

Vibration Syndrome and Vibration-Induced White Finger (VWF) are the major health hazards related to the use of vibrating tools. Carpal Tunnel Syndrome is another health problem that has been linked in one study to the use of smaller hand-held vibrating tools.

Vibration Syndrome

Vibration Syndrome is a group of symptoms related to the use of vibrating tools and includes some or all of the following: muscle weakness, muscle fatigue, pain in the arms and shoulders, and vibration-induced white finger. Many researchers believe that other symptoms - headaches, irritability, depression, forgetfulness, and sleeping problems - should also be included in descriptions of Vibration Syndrome.

Vibration-Induced White Finger

Vibration-Induced White Finger (VWF), also known as "Dead Finger" or "Dead Hand" is the result of impaired circulation (poor blood supply in the fingers, caused by the prolonged use of vibrating tools. VF may appear after only several months on the job, or may not appear until twenty to forty years on the job.

The harmful health effects of vibrating tools are related to the length of time that a worker has been using vibrating tools and to the frequency of the vibration (how fast the tool goes back and forth). The longer a person uses a vibrating tool, and the faster the tool vibrates, the greater the risk of health effects. The

The technical name for VWF is Raynaud's Syndrome of Occupational Origin. Raynaud's Syndrome may also occur in people who do not use vibrating hand-held tools. Several different kinds of medical illnesses can cause Raynaud's Syndrome. Raynaud's Syndrome also appears in some people who are otherwise entirely healthy.

It is important that people with Raynaud's Syndrome avoid the extensive use of vibrating tools because they can develop the most severe complications of VWF very quickly.

Many of the symptoms of Vibration Syndrome will disappear shortly after a worker stops using the types of tools which transmit vibration to the hands and arms. Fatigue and muscular pain in the arms and shoulders will generally disappear. In the early stages, if a worker stops using vibrating tools, VWF will not get any worse and may get slightly better.

Carpal Tunnel Syndrome

Carpal Tunnel Syndrome (CTS) is a group of symptoms in the hand which arise from pressure on one of the nerves which passes through the palm side of the wrist. The early symptoms are similar to the early symptoms of white finger and consist of tingling in the fingers. For the most part only the thumb, index, and middle fingers are affected in CTS. Later, symptoms can progress to numbness. Pain in the wrist and fingers may also develop. CTS may occur in people using small hand tools like pneumatic screwdrivers. Carpal Tunnel Syndrome also occurs among people having repetitive motion of the wrist or fingers, such as using a cash register, or picking fish from a net; or with forceful motion of the wrist, such as in using a wrench. Pinching or flexing with the wrist bent upwards, downwards, or sideways increases the occurrence of CTS.

The symptoms of CTS are frequently worse at night and a person may be awakened from sleep by pain or the feeling of pins and needles in fingers, hand or wrist.

Carpal Tunnel Syndrome may improve if diagnosed in the early stages and exposure to the type of activity which caused it is stopped. In moderate cases most of the symptoms of CTS can be relieved by a surgical operation which relieves the pressure on the nerve which causes the CTS symptoms. If the surgery is performed too late, only some of the symptoms may be relieved. In very severe cases the symptoms are irreversible and may include weakness of the hand due to loss of muscle function.

A worker using a vibrating hand-held tool should let the tool do the work by grasping it as lightly as possible, consistent with safe work practice. The tighter the tool is held, the more vibration is transmitted to the fingers and hand. The tool should rest on a support or on the workpiece as much as possible. The tool should be operated only when necessary and at the minimum speed (and impact force) to reduce vibration exposure.

Tools should be regularly maintained to keep vibration to a minimum. Keeping chisels and chainsaws sharp, for example, will reduce vibration. Using new grinder wheels will also reduce vibration.

Education

Employees who use or will be using vibrating hand-held tools should receive training about the hazards of vibration and they should be taught how to minimize the ill effects of vibration.

Smokers are much more susceptible to VWF than non-smokers, and the VWF in smokers is usually more severe, therefore workers who use vibrating hand-held tools should not smoke.

Recommended Exposure Limits

Table 2 contains the American Conference of Governmental Industrial Hygienists (ACGIH) recommendations on the limits for exposure of the hand to vibration.

Table 2
Threshold Limit Values for Exposure of the Hand
to Vibration in Either X_h , Y_h , Z_h Directions

Total Daily Exposure Duration ^a	Values of the Dominant, ^b Frequency-Weighted, rms, Component Acceleration Which Shall Not be Exceeded	
	a_k ,	$(a_{k_{eg}})$
	m/s^2	g^c
4 hours and less than 8	4	0.40
2 hours and less than 4	6	0.61
1 hour and less than 2	8	0.81
less than 1 hour	12	1.22

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PHYSICAL AGENT DATA SHEET

NOISE

Description

Sound is created when a vibrating source (like a bell, motor or a stereo speaker) sends sound waves through the air to your ear. Every sound has two aspects: its pitch (frequency) and its loudness (intensity). On a stereo, frequency is determined by the bass/treble control. Intensity is determined by the volume control. Noise (unwanted sound) is usually made up of many frequencies. The disturbing and harmful effects of noise depend both on the loudness and the frequency of the tones making up noise.

Loudness is measured in units called decibels (dB). A conversational voice is about 65 dB. A shout is 90 dB or greater.

Frequency is measured in units called Hertz (Hz). The frequency of a locomotive horn is about 250 Hz. The frequency of a table saw is about 4,000 Hz.

Health Effects

Excessive noise can destroy the ability to hear, and may also put stress of other parts of the body, including the heart.

For most effects of noise, there is no cure, so that prevention of excessive noise exposure is the only way to avoid health damage.

Hearing

The damage done by noise depends mainly on how loud it is and on the length of exposure. The frequency or pitch can also have some effect, since high-pitched sounds are more damaging than low-pitched sounds.

Noise may tire out the inner ear, causing temporary hearing loss. After a period of time away from the noise hearing may be restored. Some workers who suffer temporary hearing loss may find that by the time their hearing returns to normal, it is time for another work shift, so, in that sense, the problem is "permanent".

With continual noise exposure, the ear will lose its ability to recover from temporary hearing loss, and the damage will become permanent. Permanent hearing loss results from the destruction of cells in the inner ear, cells which can never be replaced or repaired. Such damage can be caused by long-term exposure to loud noise or, in some cases, by brief exposures to very loud noises.

Normally, workplace noise first affects the ability to hear high frequency (high-pitched) sounds. This means that even though a person can still hear some noise, speech or other sounds may be unclear or distorted.

Workers suffering from noise-induced hearing loss may also experience continual ringing in their ears, called "tinnitus". At this time, there is no cure for tinnitus, although some doctors are experimenting with treatment.

Other Effects

Although research on the effects of noise is not complete, it appears that noise can cause quickened pulse rate, increased blood pressure and a narrowing of the blood vessels. Over a long period of time, these may place an added burden on the heart.

Noise may also put stress on other parts of the body by causing the abnormal secretion of hormones and tensing of the muscles.

Workers exposed to noise sometimes complain of nervousness, sleeplessness and fatigue. Excessive noise exposure also can reduce job performance and may cause high rates of absenteeism.

Permissible Exposure Limit

The Action level for noise is an average noise level of 85 dB for an eight-hour day. When employees are exposed to noise levels which exceed the Permissible Exposure Limit, the employer must install or use engineering or administrative controls to lower the noise levels. While these controls are being designed or installed employees must wear hearing protection. If the controls still do not reduce noise exposures to below 90 dB, hearing protection must continue to be worn.

Protective Measures

Suitable hearing protectors (ear plugs or muffs) must be made available at no cost to employees who are exposed to an average of 85 dB or greater for an eight-hour day. Employees must be given the opportunity to select from three different types of appropriate hearing protectors.

Hearing tests (audiometric exams) must be given to employees who are exposed to an average of 85 dB or greater for an eight-hour day. Hearing tests will show whether employees are experiencing any hearing losses. Hearing tests are also useful in showing how well the ear plugs and earmuffs are working. Hearing tests must be given annually.

Employees should also receive training in the effects of noise on hearing, an explanation of the hearing tests, and instruction on the proper fitting and care of ear plugs or muffs.

Noise away from work can also cause hearing loss. Hearing protectors should be worn when operating noisy equipment or tools such as chain saws, brush cutters, power lawn mowers, or when using firearms.

Refer to Alaska Administrative Code, Occupational Health and Environmental Control 04.0104 for specific regulations on Noise Exposure and Hearing Conservation Programs.

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PHYSICAL AGENT DATA SHEET

HEAT STRESS

Description

Heat stress is caused by working in hot environments like laundries, bakeries, or around boilers or incinerators. Four environmental factors affect the amount of heat stress felt by employees in hot work areas: temperature, humidity, radiant heat (such as from the sun or a furnace), and air velocity. How well or how poorly an individual reacts to heat stress is dependent on personal characteristics such as age, weight, fitness, medical condition, and acclimatization.

The body has several methods of maintaining the proper internal body temperature. When internal body temperature increases, the circulatory system reacts by increasing the amount of blood flow to the skin so the extra heat can be given off.

Sweating is another means the body uses to maintain stable internal temperatures. When sweat evaporates, cooling results. However, sweating is effective only if the humidity level is low enough to permit evaporation and if the fluids and salts lost are replaced.

Health Effects - Heat Disorders

Heat stroke, the most serious health problem for workers in hot environments is caused by the failure of the body's internal mechanism to regulate its core temperature. Sweating stops and the body can no longer rid itself of excess heat. Signs include: mental confusion, delirium, loss of consciousness, convulsions or coma; a body temperature of 106 degrees Fahrenheit or higher; and hot dry skin which may be red, mottled or bluish. Victims of heat stroke will die unless treated promptly. While medical help should be called, the victim must be removed immediately to a cool area and his/her clothing soaked with cool water. He/she should be fanned vigorously to increase cooling. Prompt first aid can prevent permanent injury to the brain and other vital organs.

Heat exhaustion develops as a result of loss of fluid through sweating when a worker has failed to drink enough fluids or take in

enough salt, or both. The worker with heat exhaustion still sweats, but experiences extreme weakness or fatigue, giddiness, nausea, or headache. The skin is clammy and moist, the complexion pale or flushed, and the body temperature normal or slightly higher. Treatment is usually simple: the victim should rest in a cool place and drink salted liquids. Salt tablets are not recommended. Severe cases involving victims who vomit or lose consciousness may require longer treatment under medical supervision.

Heat cramps, painful spasms of the bone muscles, are caused when workers drink large quantities of water but fail to replace their bodies' salt loss. Tired muscles, those used for performing the work, are usually the ones most susceptible to cramps. Cramps may occur during or after working hours and may be relieved by taking salted liquids by mouth or saline solutions intravenously for quicker relief, if medically determined to be required.

Fainting may be a problem for the worker unacclimatized to a hot environment who simply stands still in the heat. Victims usually recover quickly after a brief period of lying down. Moving around, rather than standing still, will usually reduce the possibility of fainting.

Heat rash, also known as prickly heat, may occur in hot and humid environments where sweat is not easily removed from the surface of the skin by evaporation. When extensive or complicated by infection, heat rash can be so uncomfortable that it inhibits sleep and impairs a worker's performance or even results in temporary total disability. It can be prevented by showering, resting in a cool place, and allowing the skin to dry.

Medical Conditions Aggravated By Exposure To Heat

Persons with heart or circulatory diseases or those who are on "low salt" diets should consult with their physicians prior to working in hot environments.

Preventing Heat Disorders

One of the best ways to reduce heat stress on workers is to minimize heat in the workplace. However, there are some work environments where heat production is difficult to control, such as when furnaces or sources of steam or water are present in the work area or when the workplace itself is outdoors and exposed to varying warm weather conditions.

Acclimatization

Humans are, to a large extent, capable of adjusting to the heat. This adjustment to heat, under normal circumstances, usually takes about 5 to 7 days, during which time the body will undergo a series of changes that will make continued exposure to heat more endurable.

On the first day of work in a hot environment, the body temperature, pulse rate, and general discomfort will be higher. With each succeeding daily exposure, all of these responses will gradually decrease, while the sweat rate will increase. When the body becomes acclimated to the heat, the worker will find it possible to perform work with less strain and distress.

Gradual exposure to heat gives the body time to become accustomed to higher environmental temperatures. Heat disorders in general are more likely to occur among workers who have not been given time to adjust to working in the heat or among workers who have been away from hot environments and who have gotten accustomed to lower temperatures. Hot weather conditions of the summer are likely to affect the worker who is not acclimatized to heat. Likewise, workers who return to work after a leisurely vacation or extended illness may be affected by the heat in the work environment. Whenever such circumstances occur, the worker should be gradually reacclimatized to the hot environment.

Lessening Stressful Conditions

Many industries have attempted to reduce the hazards of heat stress by introducing engineering controls, training workers in the recognition and prevention of heat stress, and implementing work-rest cycles. Heat stress depends, in part, on the amount of heat the worker's body produces while a job is being performed. The amount of heat produced during hard, steady work is much higher than that produced during intermittent or light work. Therefore, one way of reducing the potential for heat stress is to make the job easier or lessen its duration by providing adequate rest time. Mechanization of work procedures can often make it possible to isolate workers from the heat source (perhaps in an air-conditioned booth) and increase overall productivity by decreasing the time needed for rest. Another approach to reducing the level of heat stress is the use of engineering controls which include ventilation and heat shielding.

Number and Duration of Exposures

Rather than be exposed to heat for extended periods of time during the course of a job, workers should, wherever possible, be permitted to distribute the workload evenly over the day and incorporate work-rest cycles. Work-rest cycles give the body an opportunity to get rid of excess heat, slow down the production of internal body heat, and provide greater blood flow to the skin.

Workers employed outdoors are especially subject to weather changes. A hot spell or a rise in humidity can create overly stressful conditions. The following practices can help to reduce heat stress:

Postponement of nonessential tasks

Permit only those workers acclimatized to heat to perform the more strenuous tasks, or

Provide additional workers to perform the task keeping in mind that all workers should have the physical capacity to perform the task and that they should be accustomed to the heat.

Thermal Conditions in the Workplace

A variety of engineering controls can be introduced to minimize exposure to heat. For instance, improving the insulation on a furnace wall can reduce its surface temperature and the temperature of the area around it. In a laundry room, exhaust hoods installed over those sources releasing moisture will lower the humidity in the work area. In general, the simplest and least expensive methods of reducing heat and humidity can be accomplished by:

Opening windows in hot work areas,

Using fans, or

Using other methods of creating airflow such as exhaust ventilation or air blowers.

Rest Areas

Providing cool rest areas in hot work environments considerably reduces the stress of working in those environments. There is no conclusive information available on the ideal temperature for a rest area. However, a rest area with a temperature near 76 degrees Fahrenheit appears to be adequate and may even feel chilly to a hot, sweating worker, until acclimated to the cooler environment. The rest area should be as close to the workplace as possible. Individual work periods should not be lengthened in favor of prolonged rest periods. Shorter but frequent work-rest cycles are the greatest benefit to the worker.

Drinking Water

In the course of a day's work in the heat, a worker may produce, as much as 2 to 3 gallons of sweat. Because so many heat disorders involve excessive dehydration of the body, it is essential that water intake during the workday be about equal to the amount of sweat produced.

Most workers exposed to hot conditions drink less fluids than needed because of an insufficient thirst drive. A worker, therefore, should not depend on thirst to signal when and how much to drink. Instead, the worker should drink 5 to 7 ounces of fluids every 15 or 20 minutes to replenish the necessary fluids in the body. There is no optimum temperature of drinking water, but most people tend not to drink warm or very cold fluids as readily as they will cool ones. Whatever the temperature of the water, it must be palatable and readily available to the worker. Individual drinking cups should be provided, never use a common drinking cup.

Heat acclimatized workers lose much less salt in their sweat than do workers who are not adjusted to the heat. The average American diet contains sufficient salt for acclimatized workers even when sweat production is high. If, for some reason, salt replacement is required, the best way to compensate for the loss is to add a little extra salt to the food. Salt tablets should not be used. CAUTION: PERSONS WITH HEART PROBLEMS OR THOSE ON A "LOW SODIUM" DIET WHO WORK IN HOT ENVIRONMENTS SHOULD CONSULT A PHYSICIAN ABOUT WHAT TO DO UNDER THESE CONDITIONS.

Protective Clothing

Clothing inhibits the transfer of heat between the body and the surrounding environment. Therefore, in hot jobs where the air temperature is lower than skin temperature, wearing clothing reduces the body's ability to lose heat into the air.

When air temperature is higher than skin temperature, clothing helps to prevent the transfer of heat from the air to the body. The advantage of wearing clothing, however, may be nullified if the clothes interfere with the evaporation of sweat.

In dry climates, adequate evaporation of sweat is seldom a problem. In a dry work environment with very high air temperatures, the wearing of clothing could be an advantage to the worker. The proper type of clothing depends on the specific circumstance. Certain work in hot environments may require insulated gloves, insulated suits, reflective clothing, or infrared reflecting face shields. For extremely hot conditions, thermally-conditioned clothing is available. One such garment carries a self-contained air conditioner in a backpack, while another is connected to a compressed air source which feeds cool air into the jacket or coveralls through a vortex tube. Another type of garment is a plastic jacket which has pockets that can be filled with dry ice or containers of ice.

Table 1
Permissible Heat Exposure Threshold Limit Values
[Values are given in degrees Centigrade WBGT (Fahrenheit)]

Work - Rest Regimen	Work Load		
	Light	Moderate	Heavy
Continuous work	30.0 (86.0)	26.7 (80.1)	25.0 (77.0)
75% Work, 25% Rest/Hour	30.6 (87.1)	28.0 (82.4)	25.9 (78.6)
50% Work, 50% Rest/Hour	31.4 (88.5)	29.4 (85.0)	27.9 (82.2)
25% Work, 75% Rest/Hour	32.2 (90.0)	31.1 (88.0)	30.0 (86.0)

References

1. "Working in Hot Environments", US Department of Health and Human Services, Public Health Service, Centers for Disease Control, Natinal Institute for Occupational Safety and Health, 1986.
2. "Threshold Limit Values and Biological Exposure Indices for 1986 - 1987", American Conference of Governmental Industrial Hygienists, 6500 Glenway Avenue, Building D-7, Cincinnati, OH 45211-4438.

TESORO ALASKA

MATERIAL SAFETY DATA SHEET

P.O. Box 3369
Kenai, AK 99611
(907) 776-8191
Emergency 24 Hour NO. 776-8333

NO. 6
REVISION DATE: 9/1/92
PREPARED BY: *A. J. Miller*
APPROVED BY: *A. J. Miller*

SECTION I. MATERIAL IDENTIFICATION

CHEMICAL NAME & SYNONYMS:

TRADE NAME & SYNONYMS: Fuel Oil #2
Diesel #2
ASTM 0396
CAS #068476302
ASTM 0975

CHEMICAL FAMILY: Mixture of Petroleum Hydrocarbons

FORMULA:

SECTION II. INGREDIENTS & HAZARDS

INGREDIENTS

Fuel Oil #2 complex mixture of Paraffinic, Olefinic, Napthenic, and Aromatic Hydrocarbons
Sulfur Content
Benzene**

%

<0.5%
<100PPM

HAZARD DATA

8 - HR TWA

5 mg/m³

(Mineral Oil Mist)*

*Current OSHA standard and ACGIH (1990) TLV

**A low Benzene level reduces carcinogenic risk.

Fuel oils are exempted under the Benzene standard (29 CFR 1910.1028)

SECTION III. PHYSICAL DATA

Boiling point at 1 atm, deg F >340°F

Vapor pressure at (mm Hg) N/A

Vapor density (Air = 1) >1

Water solubility

Negligible

Specific gravity (H₂O = 1) 0.86 - 0.88

Evap. Rate (N/A = 1)

Volatiles, % by Volume N/A

Molecular weight N/A

Appearance & Odor: Clear, bright liquid with a mild petroleum odor.

SECTION IV. FIRE & EXPLOSION DATA

LOWER

Flash point & method:

>125°F Flash Pt. (PM)

Autoignition temperature:

495°F

Flammability limits in air:

% by volume

0.6

Extinguishing media: Although not particularly hazardous from a fire protection standpoint, it will become more of a hazard when heated. Dry chemical, carbon dioxide, foam, water spray.

Special firefighting procedures: Use a water spray to cool fire exposed containers. Use a smothering technique for extinguishing fire of this combustible liquid. Do not use a forced water stream directly on oil fire as this will only spread the fire. Material is an OSHA Class II combustible liquid. Firefighters should wear self-contained breathing apparatus full protective clothing.

Unusual fire and explosion hazards:

SECTION V. HEALTH HAZARD INFORMATION

TLV: 5 mg/m³ (oil) (mist) See Section II.

Effects of overexposure: Inhalation of excessive concentrations of vapor or mist can be irritating to the respiratory passage and cause the following symptoms: headache, dizziness, nausea, vomiting, and loss of coordination. Chemical pneumonitis result when ingestion occurs and oil is aspirated in the lungs.

FIRST AID:

Eye contact: Flush thoroughly with running water for 15 minutes, including under eyelids.

Skin contact: Remove contaminated clothing. Wipe excess oil off with a dry cloth. Wash affected area well with and water.

Inhalation: Remove to fresh air. Restore and/or support breathing as required.

Ingestion: Do not induce vomiting.

Seek medical assistance for further treatment, observation, and support.

(OF #2)

SECTION VI. REACTIVITY DATA

Stability	Stable	X	Conditions to avoid: Extreme heat and open flames.
	Unstable		

Incompatibility (materials to avoid): Incompatible with strong oxidizing agents.

Hazardous decomposition products: Thermal - oxidative degradation may yield various Hydrocarbons and partial oxidation products, CO₂, CO, and SO₂.

Hazardous polymerization	May occur		Conditions to avoid:
	Will not occur	X	

SECTION VII. SPILL, LEAK, & DISPOSAL PROCEDURES

Spills, leaks (steps to be taken): Notify safety personnel of leaks or spills. Small spills can be contained by using absorbents, such as rags, straw, polyurethane foam, activated carbon, and sand. Cleanup spills promptly to reduce fire or hazards. Advise EPA, state or local agencies if required.

Waste disposal method: Burn in an approved incinerator or furnace or dispose of via a licensed waste disposal company. Follow federal, state and local regulations.

SECTION VIII. SPECIAL PROTECTION INFORMATION

Respiratory protection (specify type): Provide approved respiratory apparatus for non-routine or emergency use. Use an approved organic vapor filter and vapor respirator when vapor/mist concentrations are high.

Ventilation	Local exhaust: Recommended	Special: Explosion Proof
	Mechanical (general): Recommended	Other:

Protective gloves: Impermeable Gloves.	Eye protection: Face Shield or Eye Glasses
--	--

Other protective equipment & precautions: Additional suitable protective clothing may be required depending on working conditions.

SECTION IV. SPECIAL PRECAUTIONS & COMMENTS

Storage & handling information: Store in closed containers in a cool, dry, well ventilated area away from sources of open flame, heat, strong oxidizing agents and ignition. Protect containers from physical damage. Use non-sparking tools and explosion-proof electrical equipment. prevent static electric sparks. Avoid prolonged skin contact and breathing of vapors/mists. No smoking in areas of use. Follow good hygienic practice in the use of this material. Do not wear oil contaminated clothing.

Other precautions: Do not put oily rags into pockets. Wash exposed skin areas several times a day with soap and warm water when working with this material.

DOT Class: NA 1993

Judgements as to the suitability of information herein for purchaser's purposes are necessarily purchaser's responsibility. Therefore, although reasonable care has been taken in the preparation of such information, Tesoro Alaska Petroleum Company extends no warranties, makes no representations and assumes no responsibility as to accuracy or suitability of such information for application to purchaser's intended purposes or for consequences of its use.

TESORO ALASKA

MATERIAL SAFETY DATA SHEET

P.O. Box 3369
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Emergency 24 Hour NO. 776-8333

NO. 2
REVISION DATE: 9/1/99
PREPARED BY:
APPROVED BY:

SECTION I. MATERIAL IDENTIFICATION

CHEMICAL NAME & SYNONYMS:

TRADE NAME & SYNONYMS: Premium Unleaded Gasoline
Regular Unleaded Gasoline
CAS #8006-61-9

CHEMICAL FAMILY: A Blended Motor Fuel

FORMULA:

SECTION II. INGREDIENTS & HAZARDS

INGREDIENTS	%	HAZARD DATA
Hydrocarbon mixture of normal and branched chain alkanes, cycloalkanes, alkenes, aromatics, and additives.**		NFPA H 1 F 3 R 0
Benzene (wt %)	<5	Use as a motor fuel only. Do not use for any other purpose. WHMIS Classification: Class B Div 2; Class D Div 2A for use as fuel only. Do not use for any other purpose.

SECTION III. PHYSICAL DATA

Boiling point at 1 atm, deg F	<100-435°F	Specific gravity (H ₂ O) = 1	Reg. 0.72 - 0.75
Vapor pressure at (mm Hg)	325 - 525	Evap. Rate (Rapid/Varies) = 1	
Vapor density (Air = 1)	4	Volatiles, % by Volume	100
Water solubility	NIL	Molecular weight	

Appearance & Odor: Pale green liquid. Gasoline odor.

SECTION IV. FIRE & EXPLOSION DATA

LOWER

Flash point & method:
-40°F (CC) estimated

Autoignition temperature:

Flammability limits in air:

1.5% vol

Extinguishing media: Water fog, mechanical foam, dry chemical powder, carbon dioxide.

Special firefighting procedures: Wear self-contained breathing apparatus when firefighting and appropriate personal protection equipment (including rubber outer-clothing, boots and gloves). Use water spray to cool fire exposed containers.

Unusual fire and explosion hazards: Extremely flammable liquid (flash point less than 20°F).

SECTION V. HEALTH HAZARD INFORMATION

PEL: Benzene 1 ppm / N-Pentane 600 ppm

Effects of overexposure: Excessive exposures may cause irritation to eyes, nose, throat. Dizziness, loss of balance or coordination; unconsciousness, coma; respiratory failure and death. Material has caused cancer in animal studies, the significance to human health is under study. Skin absorption of material may add significantly to exposure. Mild irritant removes natural oils & fats from skin with prolonged or repeated contact. Contact with the eye is expected to cause no permanent damage. Harmful or fatal if swallowed. Pulmonary aspiration hazard if swallowed and/or vomiting occurs. Carcinogen and cause damage. Contains material which has caused cancer in animal studies.

FIRST AID:

Eye contact: Flush with water for at least 15 minutes. If irritation persists, obtain medical assistance.

Skin contact: Wash with soap and water until no odor remains. If redness or swelling develops, obtain medical assistance. Immediately remove soaked clothing. Wash clothing before re-use.

Inhalation: Move person to fresh air. If not breathing, give artificial respiration, obtain medical assistance.

Ingestion: Do not induce vomiting. Do not give liquids. Obtain emergency medical attention. Small amounts which accidentally enter mouth should be rinsed out until taste of it is gone.

SECTION VI. REACTIVITY DATA

Stability	Stable	X	Conditions to avoid:
	Unstable		

Incompatibility (materials to avoid): Strong oxidizers.

Hazardous decomposition products: Carbon monoxide and asphyxiants on combustion.

Hazardous polymerization	May occur		Conditions to avoid:
	Will not occur	X	

SECTION VII. SPILL, LEAK, & DISPOSAL PROCEDURES

Spills, leaks (steps to be taken): Gasoline spills are toxic to fishes and aquatic flora. Prevent ignition; stop leak; ventilate area. Contain spill. Keep upwind of leak. Wear respiratory protection for large spill, leak, or release. Absorb with inert material. Advise EPA, state or local agencies if required.

Waste disposal method: Burn in an approved incinerator or furnace or dispose of via a licensed waste disposal company. Follow federal, state and local regulations.

SECTION VIII. SPECIAL PROTECTION INFORMATION

Respiratory protection (specify type): Provide NIOSH approved respirator equipped with organic vapor dust/mist filter cartridges when concentrations are high.

Ventilation	Local exhaust: Recommended	Special: Use only with adequate ventilation
	Mechanical (general): Recommended	Other:

Protective gloves: Impervious Gloves

Eye protection: Safety Glasses

Other protective equipment & precautions: Concentration in air determines protection needed. Use only NIOSH certified respiratory protection. If contact is unavoidable, wear impervious protective gear. Launder soiled clothes.

SECTION IV. SPECIAL PRECAUTIONS & COMMENTS

Storage & handling information: Keep away from heat, sparks, and flame. NFPA Class 1A storage. Transfer operations must be electrically grounded and bonded to dissipate static buildup. Avoid prolonged breathing of mist or vapor. Avoid prolonged or repeated contact with skin. Never siphon by mouth.

Other precautions: Precautionary labeling for pumps, portable containers, and drums is required. A "Hazardous when Empty" pictogram and DOT flammable liquid label are also required for drums. Details available upon request. Prolonged and repeated excessive exposures to benzene can result in blood disorders ranging from anemia to leukemia. For use as a motor fuel only. Do not use for any other purpose.

DOT Class: UN 1203

Judgements as to the suitability of information herein for purchaser's purposes are necessarily purchaser's responsibility. Therefore, although reasonable care has been taken in the preparation of such information, Tesoro Alaska Petroleum Company extends no warranties, makes no representations and assumes no responsibility as to accuracy or suitability of such information for application to purchaser's intended purposes or for consequences of its use.

APPENDIX F

Safety and Health Operating Rules

Contents

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Health & Safety Operating Rules and Procedures

The following basic rules and operating procedures must be read and understood by all employees. Form _____ must be signed by all employees to signify they have read and understood these procedures. Foremen and supervisors will go over all of these procedures and rules to be sure all employees are familiar with them.

1.0 Clothing.

Dress and footwear worn on the job site must be appropriate for the work and climatic conditions. Minimum dress will be: short-sleeve shirt, long trousers, and leather (or other protective) work shoes or boots. Canvas, tennis, or deck shoes are not acceptable. Steel toe approved safety shoes must be worn by all field employees while working. Cold weather gear that is not expected to get contaminated, as well as underwear, socks, and tee shirts, must be furnished by the employee except under special circumstances.

2.0 Accidents, Injuries, Losses, Damage, and Near Misses.

All accidents, whether they result in injury or damage to property—no matter how minor—must be IMMEDIATELY reported to the supervisor/foreman. An accident is defined as an unplanned event. Near misses are accidents.

3.0 Protective Equipment.

Defective safety protective equipment must immediately be replaced. All protective equipment provided by the company will be returned upon termination or after specific projects. Under certain circumstances, non-contaminated boots, gloves, and respirators may be given to employees.

4.0 Operation of Equipment, Vehicles.

Motorized equipment and vehicles will be operated in a safe and sane manner and in accordance with posted or communicated patterns and speed limits. Seat belts must be available in all vehicles, and on equipment where required. Seat belts must be worn at all times. People who, within the past year, have a Driving Under the Influence (DUI) charge may NOT operate company vehicles or equipment. The company may check your driving record at any time.

5.0 Work Area.

Each employee is responsible for the tidiness of their work area. This means proper storage or return of tools, equipment and materials, and cleanup of scrap, dirt, and grease. Clear access must be maintained at all times to work areas and walkways.

6.0 Heavy Equipment.

Cranes, yard equipment, trucks, and other heavy equipment must be operated only by qualified personnel with supervisor's authorization. Supervisors are responsible for checking training and previous experience.

7.0 Equipment Inspection.

Inspect all chains, slings, and chokers for safe conditions and capacity prior to and during the progress of any work task. Those having defects must not be used and, when no longer in use, will be immediately removed to their place of storage and not left laying in work areas.

8.0 Riding, Sliding on Equipment.

Employees will not ride directly on a hook, chain or cable sling suspended from a crane, or on any equipment or attachment, unless a seat is provided (except under emergency situations). Never ride on (or with) any load being raised or lowered or in a bucket of a loader of any type. Sliding down ropes, cables, or guys is also forbidden.

9.0 Mounting/Dismounting from Equipment.

Do not jump from moving equipment. Steps, ladders, handrails, or other equipment must be used when mounting and dismounting equipment.

10.0 Loitering.

Do not sit, stand, or lie down behind (or in front) of parked equipment, nor behind piles of dirt and materials.

11.0 Refueling, Smoking.

Do not refuel gasoline-powered tools machines, or vehicular equipment while the engine is running. No smoking or open fires will be allowed during refueling or around refueling stations; signs will be posted to emphasize this rule.

12.0 Unassigned Work Areas.

12.0 Unassigned Work Areas.

Do not enter other than assigned work area without supervisor's authorization.

13.0 Fires.

Fires or potential for fires must always be reported to the foreman. Fire extinguishers are to be used for fires of a minor nature. Know their location and how to operate them. Always return used or partially-used extinguishers to your supervisor for recharging. All operated equipment will contain a fire extinguisher of appropriate size.

14.0 Unsafe Conditions, Defects.

Immediately report all unsafe conditions and defects of tools and equipment to Supervisor/Foreman for verification and correction.

15.0 Lifting.

Proper lifting methods must be followed when lifting loads by hands (i.e., bending at the knees, keeping back straight, and pushing the load upward with the legs).

16.0 Safety Harnesses.

Safety harnesses, properly worn and secured, will be used when

- Working on an unguarded work platform six (6) feet or more above grade;
- Working off of or out of a work platform attached to a hook, rope, or cable.

17.0 Seat Belts.

Seat belts must be installed and worn at all times by personnel operating moving equipment or vehicles (such as forklifts, end loaders, dozers, graders, etc.).

18.0 Welding/Burning.

Welding and burning operations have a high potential for personnel injuries or fire. When either welding or burning, follow these precautions:

- a. **Inspect Work Area.** Before starting to burn or weld, you must inspect your work area to ensure that sparks or molten metal will not fall on combustible materials. Be sure to check the far side of any structure or wall you might cut through.
- b. **Obtain Hot Work Permit.** You must not weld or burn in a hazardous area without obtaining written authorization (Hot Work Permit) from the responsible authority.
- c. **Fire-Extinguishers Available.** You must make certain that suitable fire-extinguishing equipment is available for your work area before you begin welding or burning.
- d. **Maintenance.** You are responsible for maintaining your burning or welding equipment in safe operating condition.
- e. **Eye Protection.** When burning or welding, you must wear approved eye protection, with suitable filter lenses.
- f. **Approval Needed.** Never weld or burn on barrels, tanks, piping, or other systems that may contain or have contained either combustible or unknown products without first obtaining written approval from your supervisor or other responsible authority.
- g. **Screen or Warn Others.** When welding, set up a screen to protect nearby workers and public. If screens are not sufficient, adjacent workers must wear suitable eye protection. When screens are not practical (i.e. overhead structural welding, etc.), warn other workers and visitors in the area when and where welding will take place.
- h. **Use Receptacles.** Receptacles must be used for electrode stubs and scrap. The floor must be clear of hazards.
- i. **Spark Igniters, not Matches.** Do not use matches to light torches. Spark igniters must be used. Torches must not be used to light smoking materials.
- j. **Turn Off Machines.** Welding machines will be turned off when not in continuous use. Machines will also be turned off during coffee breaks and lunch breaks.
- k. **Air Testing.** The air will be tested where welding operations are conducted in closed areas or confined spaces.

- l. **Respiratory Protection.** Appropriate respiratory protection will be worn, as dictated by air monitoring results or industrial hygiene practices.

19.0 Cylinder Safety

The following rules apply when working with compressed gas cylinders of any type:

- a. **Secure Cylinders.** Cylinders must be secured from tipping by chain, strap, or cable during transport, storage, or when in use. Acetylene cylinders will be stored separately from oxygen cylinders, even when empty.
- b. **Confined Spaces.** Cylinders may not be taken into or used in confined spaces.
- c. **Use Wrenches, Caps.** Levering against the valve to force open tight caps could result in valve damage. Use a wrench carefully if the cap is too tight to open by hand. Caps must be replaced on all gas cylinders not in use.
- d. **Don't Hang Leads, Electrodes.** Arc welding electrode or ground leads may not be hung over compressed gas cylinders.

20.0 Ladder Safety

- a. **Inspect and Use for Climbing Only.** Inspect ladders before using. Ladders must be long enough and strong enough for the job. Ladders are for climbing. They are not to be used for levering, braking, or any other purpose that might weaken the structure. If a ladder must be placed in a doorway or walkway, set up a barricade and warning sign.
- b. **Brace, Secure.** Ladders must be braced against a strong, immovable object, tied off at the top, and placed on firm ground at the base. The base of the ladder should be: at least one-quarter of its supporting length out from the support structure and the top extended at least 36" above the top of the tank, etc., if applicable.
- c. **Keep Rungs Free.** Tools or equipment should never be hung from or placed on the rungs of any ladder. Ladders should never be modified or temporary repairs made.
- d. **Keep Hands Free.** Do not carry anything in your hands while climbing. Hold the ladder with both hands. Tools and equipment should be drawn up on a hand line.

- e. **Keep Base/Top Clear.** The areas around the top and base of ladders must be free of tripping hazards such as loose materials, trash, and electric cords.
- f. **Face Forward.** Face the ladder at all times when ascending or descending.
- g. **Check Shoes.** Be sure that your shoes are free of mud, grease, or other substances that could cause a slip or fall.
- h. **Use Both Feet.** When working from a ladder, keep both feet on the rungs. Climb down and reposition the ladder as often as necessary.
- i. **Avoid Top Rungs.** Worker must not stand on either of the top two rungs of any single or extension ladder while working.
- j. **Step Ladders.** Step ladders should be used only in the fully-opened position. They should be set level, with spreaders fully locked.
- k. **Don't Overreach.** Always move the ladder to avoid overreaching.

21.0 Hand and Power Tools.

- a. **Use Hand Line.** Power tools should be hoisted or lowered by a hand line, never by the cord or hose.
- b. **Inspect.** Inspect all hand and power tools before using; do not use unsafe tools.
- c. **Right One.** Use the right tool for the job.
- d. **Replace After Use.** Replace all tools in their proper storage area after use.

22.0 Safe Grinding and Bussing

- a. **Wear Protection, Inspect.** Always wear approved eye, respirator, and hand protection when working with or near grinders. Always visually inspect the grinding wheel for damage before each use and before mounting. Chipped or cracked wheels must be discarded.
- b. **Stand Aside, Test-Run.** Do not stand directly in line with a newly-mounted wheel when starting up. Before grinding, always test run a newly-mounted wheel at full speed.
- c. **Check Flanges.** Check mounting flanges for correct diameter (straight wheels at least one-third diameter of wheel) and for warpage. Do not use bent or dirty flanges.

- d. **Inspect Parts.** All spindles, adapters, flanges, and other parts should be inspected periodically and maintained in good condition.
- e. **Lubricate.** Proper lubrication of air motors and bearings is essential.
- f. **Wheel Care.** Avoid dropping or bumping the wheel. Do not allow anything to strike a wheel that is not in use. Handle and store wheels carefully. Use suitable racks or bins according to manufacturer's specifications.
- g. **Use Tool Rests.** A tool rest shall be used on all grinding wheels and kept at a distance of not more than 1/4 inch from the wheel.

23.0 Good Housekeeping.

Good housekeeping on the job is mandatory. Every employee must do his part daily in his activity to keep the job clean for safety and efficiency. The following is the responsibility of each employee:

- a. **Remove Scrap, Rubbish.** Scrap materials and rubbish are fire and accident hazards. If an excess of these materials exist in your work area, ask your supervisor to arrange for their removal.
- b. **Use Trash Containers.** You must use the trash barrels or containers that are located throughout the job site. If you need one in your immediate work area, notify your supervisor.
- c. **Keep Clear.** All stairways, corridors, ladders, catwalks, ramps, and passageways must be kept clear of all loose material and trash.
- d. **Return Materials.** Return all surplus materials to the stockpile at the completion of your job.
- e. **Return Tools.** Do not leave tools and materials where they will create a hazard for others. Put them in the gang box or return them to the tool room.
- f. **Contain Oily Rags.** Keep oily rags in approved fireproof metal containers with self-closing lids.
- g. **Maintain Clean Change Rooms.** Keep change rooms clean. Do not let soiled clothes, food scraps, or soft drink bottles accumulate. If drinking cups are used, deposit them in containers provided. Also place sandwich wrappers, paper bags, and other trash in these containers.

- h. **Maintain Clean Toilets/Drinking Fountains.** Toilets and drinking fountains are provided for your convenience and comfort. Please help to keep them clean and sanitary.
- i. **Empty Trash.** Trash containers shall be emptied at the end of each shift in an approved dumpster; the lid of the dumpster shall be closed at all times.

24.0 Other Items

- a. **Know Kits, Extinguisher Locations.** All employees will know where to find fire extinguishers, bloodborne pathogen kits, and first aid kits.
- b. **Find Answers.** All employees will know who to go to for answers to healthy and safety-related questions.
- c. **Identify Supervisor/Site Safety Personnel.** Employees must know the name of their direct supervisor and site safety person.
- d. **Alcohol/Drugs Forbidden.** Use of alcohol and drugs during, or just preceding work, is expressly forbidden. The company reserves the right to perform drug tests at any time. Personnel involved in serious accidents will be drug tested.
- e. **Other Prohibited Activities.** Horseplay, fighting, shuffling, and heavy joke playing are forbidden on the work site.

Important Notice to All Employees:

Your general knowledge of all items #1-24 above is required.

**Your employment can be terminated
for serious violations of ANY of the above.**

APPENDIX G

Safety Inspection Checklist

Daily Safety Inspection Report

Project Name: _____ Date: _____

1. Aspect of Work Inspected:

2. Employees Present:

3. PPE/Equipment In Use:

4. Applicable Safety and Health Policy:

5. Deficiencies:

6. Recommended Corrective Action:

7. Corrective Action Taken/Results:

Prepared By: _____

APPENDIX H

Safety Meeting Procedures and Forms

Safety Meeting Procedures

Safety meetings are critical to a successful Health and Safety Program. We emphasize having good ones. The following are some of the things to concentrate on in order to have effective safety meetings.

A good safety meeting coordinator is like a good supervisor; they must be familiar with the procedures and topics to be covered in the safety meetings and have the ability to communicate effectively with others. In many ways, the supervisor is training workers all day when they provide direction on how to perform various jobs, correct employees and show them proper procedures and is typically well suited to conduct safety meetings. Site safety personnel are also good sources of safety meeting topics and presenters.

Conducting a safety meeting is a more focused activity than many supervisory tasks. A couple of old slogans are useful:

- 1.0 Be prepared. Know your subject. Prepare yourself by reading, talking to safety experts and other supervisors and observing any problems in how workers are currently dealing with the particular topic on the job. Assemble examples; make notes the day before on the site, prepare materials and anything else you can think of that will help you get the message across.
- 2.0 The KISS rule. The KISS principle (Keep It Simple, Stupid) is a good one for conducting safety meetings. You have a particular message that you must get across to a group, so it is important to deliver that message in a way that everyone will understand. Don't give people more than they can absorb at one time.

While each meeting should and will be different, the following guidelines will help you hold the participants' attention and make your meetings flow more smoothly. You will also be more relaxed and confident when you get used to following a general format.

- 3.0 The Meeting - What, Why, When, Where
 - 3.1 Begin the meeting by explaining what you'll cover and why it's important. Try to use an anecdote or other "warm-up" to get people interested and relaxed.
 - 3.2 Position the meeting in terms of company safety objectives. Mention any relevant safety trends at the company or in the industry or any applicable regulations. Emphasize top management's commitment to safety and endorsement of this Safety Meeting Program.

- 3.3 Keep your tone informal during the meeting. It encourages participants to feel less distant and more involved in what's going on. A little humor may be appropriate, especially in a long meeting where workers may begin to feel overwhelmed by all they're learning. Let them know you appreciate that this is an effort.
- 3.4 Stick to your agenda. Be flexible enough to respond to questions or concerns you haven't thought of, but don't let the meeting go off into unrelated areas. If a lot of questions or concerns are voiced on a certain topic, note it as one that might require its own Safety Meeting.
- 3.5 Give examples of violations of safety rules and their consequences. Be as dramatic as possible while keeping your examples realistic. Hammer away at the risks to which employees expose themselves and others by not following the rules and not taking advantage of the engineering controls, protective equipment, etc., available to them.
- 3.6 Summarize continually as you go along. Try to connect any "theoretical" subjects (handling spills, proper lifting techniques, etc.) with actual events or tasks in your work unit. Be sure people see the value of what you're talking about.
- 3.7 Refer to specific examples whenever possible. Demonstrate with labels, protective clothing, etc. Make your meetings as "show and tell" as possible.
- 3.8 Ask regularly for examples and questions. If anyone is skeptical about the importance or relevance of your topic, deal with it immediately. If possible, get other workers to explain to the skeptic and the group why they think this safety issue is important to them.
- 3.9 End each Safety Meeting with a wrap-up that summarizes what was covered. It's also valuable to thank the participants for their interest and involvement.
- 3.10 Be specific about what you expect employees to do as a result of this meeting. Remind them how what they've learned will keep them safe and healthy.
- 3.11 Plan a positive ending for the meeting. Send participants off with some encouraging words as an incentive to really put what they've learned to work on the job. If you've scheduled the next Safety Meeting in an ongoing program, remind them of the time, place, and topic.
- 3.12 Keep meetings brief. Short, concentrated meetings are typically more effective than longer, more leisurely ones.

4.0 Conducting an Informal Meeting

An informal Safety Meeting is more like a casual "Oh, by the way," discussion than the formal type of presentation just covered. It may last only 5 to 10 minutes and may involve fewer people. It is less likely to include outside experts, audiovisuals, and handouts.

The informal meeting is often used to introduce a relatively simple new procedure or substance or to correct problems you've spotted on the job.

But just because the meeting is brief and informal, doesn't mean it doesn't need preparation. You don't need a detailed agenda, but you should make notes or prepare a checklist to make sure you cover everything important.

Once you've explained the procedure or problem, demonstrate how to do it correctly. Ask for and encourage questions and discussion, and, if appropriate, provide opportunities for hands-on practice.

5.0 Keeping Safety Meeting Records

It's important to keep records of all Safety Meetings for your reference, for your company's protection, and for OSHA and other regulatory agencies that may want to inspect your company's compliance with training requirements.

Keep track of the date and topic of each meeting, as well as who attended. This is particularly important when your meeting deals with an area where additional training is explicitly required by law, such as the Hazard Communication Standard. In fact, Hazard Communication Standard training programs--or lack thereof--generated the fourth largest number of OSHA violations.

You don't need elaborate Safety Meeting records, but you do need something on paper. The easiest way to do this is to have a sign-up sheet at each Safety Meeting, with your name, the date, and the topic at the top. Have each employee sign that he or she has attended the session, including any employee ID numbers.

When you consult with your manager and with your safety professionals on setting up your program schedule, find out if they want any reports on your safety meetings. If so, get specific information from them on exactly what they want in a report, whether they want one on each meeting or on the overall schedule, etc.

If such reports have been requested, be sure to submit them promptly while the experience is still fresh in your mind. Many companies use the results of safety meetings as a key part of their safety planning and training program.

6.0 Safety Meeting Schedule

A recommended schedule for Safety Meetings for the project referenced above is as follows:

- First week of a project: Daily
- Next two weeks of a project: Every third day
- Continuing weeks of a project: One/week unless it's a very dynamic site; then continue daily meetings.

Meetings will also be held when:

- Site conditions change
- Work changes or begin new task
- A near miss accident or injury occurs
- Severe weather conditions are a factor
- Unusual events (earthquake, vapor release, etc.) occur.

Safety Meeting Report

Department/Job: _____ Date: _____

Time Started: _____ Time Finished: _____

1. Open meeting. Present safety topic. Obtain names of persons on attached sheet.
2. Accidents: Discuss accidents and near misses that have occurred since the last meeting. Brief summary of accidents to date by number and type. Note any trends. Discuss corrective action taken, or needed.
3. Old business: status of previous recommendations. Discuss pending business, if any.
4. Inspection reports: report on findings and recommendations of any inspections made since last meeting.
5. New business: safety suggestions; new procedures, company policy, personal protective gear, equipment, etc.

Meeting Chaired By: _____
Signature Title

cc: _____

Safety Meeting Report

Department: _____ Date: _____ Time: _____

Topic: _____

Training Aids: _____

Chairperson: _____ Safety Dept.
Representative: _____

Personnel in Attendance:

_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Number of Personnel Absent: _____

Note: Additional names and comments on reverse side.

Discussion Item(s): _____

Recommendations: _____

APPENDIX I

Site-Specific Hazard Communication Plan Checklist

SITE-SPECIFIC HAZARD COMMUNICATION PLAN

Site-Specific Hazard Communication Plan

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List of Attachments

ATTACHMENT 1	Site Specific Hazard Communication Plan Checklist
ATTACHMENT 2	List of Potential Site Hazards
ATTACHMENT 3	Hazard Communication Certificate of Training

Site-Specific Hazard Communication Plan

Written Hazard Communication Plan

Project/Site: _____ Supervisor: _____

Date: _____ Prepared by: _____

1.0 INTRODUCTION

This Site-Specific Hazard Communication Plan has been developed to enhance our employees' Health and Safety and to comply with the law (29 CFR 1910.1200) while working at a variety of sites (remote and other).

We provide generic information about chemical and physical agent hazards and the control of these hazards via our comprehensive Corporate Hazard Communication Program, which includes information concerning container labeling, Material Safety Data Sheets (MSDS), Physical Agent Data Sheets (PADS) and training. This document should be completed for each work site and a copy of this completed Plan must kept at each site.

2.0 LIST OF HAZARDOUS CHEMICALS AND PHYSICAL AGENTS ON SITE

A list of all known hazardous chemicals and physical agents present in/on this site (or area) is attached. An MSDS (or PADS) for each chemical and/or physical hazard is also on-site. Information on the hazards of each chemical and physical agent can be obtained by reviewing the Material Safety Data Sheets.

_____ is responsible for the Hazard Communication Program on this Site.

3.0 CONTAINER LABELING

It is company policy that no container of hazardous chemicals or fuels be used unless it has a readable label containing at least the following information:

- Contents of container(s);
- Appropriate hazard warnings;
- PPE required to handle it; and
- The name and address of the manufacturer or source of the product.

On this site (or area) the responsibility for labeling has been assigned to: _____

To further ensure that employees are aware of the chemical hazards of materials used in their work areas, it is our policy to label all secondary containers prior to using.

The Site (or area) Supervisor will ensure that all secondary containers are labeled with either a copy of the original manufacturer's label or with generic labels that have fill-in-blocks for the identity of the materials hazard properties and required PPE to handle the material in case of a spill.

4.0 MATERIAL SAFETY AND PHYSICAL AGENT DATA SHEETS

Copies of Material Safety Data Sheets (MSDS) and Physical Agent Data Sheets (PADS) for all hazardous chemicals and physical agents to which employees may be exposed on this project (or area) will be kept at: _____.

MSDS and PADS are available to employees for review during each work shift. If MSDS or PADS are not available for a chemical in use, please contact _____ at _____.

5.0 EMPLOYEE TRAINING AND INFORMATION

All employees must attend a Site Health and Safety Orientation given by the Safety Department or the Area Supervisor prior to starting work or beginning a new assignment for training on the following:

- An overview of the company and employee requirements contained in the Hazard Communication Rules.
- Review of the chemicals and physical agents present at each employee's workplace.
- Location and availability of the company's written Hazard Communication Program and this Plan.
- Physical and health effects of the hazardous chemicals and physical agents at the site and the degree of risk posed by each.
- Methods used to determine the presence and amount of hazardous chemicals and physical agents in the work area.
- How to prevent exposure to these chemicals and physical agents through work practices and/or personal protective equipment.
- Emergency procedures to follow if there is a spill or employees are exposed to these chemicals and physical agents.
- How to read labels and review MSDS and PADS to obtain appropriate hazard and required PPE information.

Note:

It is critical that all of our employees understand this training. If you have any additional or new questions, please contact a Supervisor or the Site Safety Officer.

6.0 HAZARDOUS NON-ROUTINE TASKS

Periodically, employees are required to perform hazardous, non-routine tasks. Prior to starting work on such projects, each potentially-affected employee will be given information by their supervisor about hazards to which they may be exposed during such an activity; including:

- Specific chemicals present and their hazards.
- Protective/safety measures that must be used.
- Measures the company has taken to reduce hazards, including ventilation, respirators, present of another employee (buddy system) and emergency procedures in case of a spill or exposure.

Examples of non-routine tasks performed by employees of this company.

Task (example)	Hazardous Chemical/ Physical Agent	Briefing Completed
Removing compressed gas cylinder	Ammonia	done
Actual Task:		

7.0 CHEMICALS OR HYDROCARBONS IN UNLABELED PIPES OR TANKS

To ensure employees who work on or near unlabeled pipes or tanks have been informed as to the hazardous materials contained within, the following policy has been established.

Prior to starting work on or near unlabeled pipes or tanks, employees must contact _____ for the following information:

- Name of the chemical or fuel in the pipe or tank?
- Are liquids or gas present?

Site-Specific Hazard Communication Plan

- Potential hazards?
- Are the contents under pressure?
- Safety precautions that must be taken?
- Type required Emergency Response Procedures.

8.0 MULTI-EMPLOYER WORKSITES

If employees of other another company or subcontractor on this worksite could be exposed to hazardous chemicals or physical agents while on or near our workplace, it is the responsibility of the Site Safety Officer or area Supervisor to meet with the other employer(s) and:

- Either provide them with copies of MSDS and PADS, or information on the location and availability of MSDS and PADS for the substances and agents they may be working with or near;
- Inform them of the hazards present and any measures necessary during routine operations or emergencies;
- Inform the other employer(s) of the labeling system used at the worksite; or
- Discuss emergency procedures that have been developed.

9.0 VERIFICATION

All of the items listed in this Site-Specific Hazard Communication Plan have been complied with to the best of our ability:

Site Supervisor

Date

Site Safety Officer

Date

A copy of this completed Plan has been reviewed by the Corporate Health and Safety Director.

Safety Director/Supervisor

Date

ATTACHMENT 1
SITE-SPECIFIC
Hazard Communication Plan Checklist

**ATTACHMENT 1
SITE-SPECIFIC
Hazard Communication Plan Checklist**

Date: _____ Prepared by: _____

Project/Site: _____

This Hazard Communication Plan is designed to transmit information regarding the hazards of chemicals and physical agents present in the workplace. The following step-by-step process should be used in developing a site-specific Hazard Communication Plan. Please check (✓) each box when an item is completed.

Done

1. Review the Hazard Communication Rules.
2. Clearly identify the staff member responsible for developing, implementing and monitoring the program:
Name: _____
3. Develop an inventory of the chemicals and physical agents present in work areas or processes (see attached list). This list will be used as a basis for obtaining appropriate Material Safety Data Sheets (MSDS), Physical Agent Data Sheets (PADS), and conducting employee training.
4. Obtain current MSDS and PADS for all hazardous chemicals and physical agents in the workplace. Organize them and assure they are available to employees during the workshift.
5. See that original and secondary containers are properly labeled.
6. Conduct employee safety meetings that pull together the information required at this site to comply with Hazard Communication rules.
7. Develop a plan that ensures that:
 - New employees are trained.
 - New chemicals are received with proper labels, MSDS, and are added to Chemical List.
 - Current employees are retrained (in Safety Meetings) when new hazardous chemicals or physical agents are introduced into the workplace.
8. Use the Training Program Outline (see next page) to inform site workers about Hazard Communications.
9. The Hazardous Communication poster is posted at a convenient location.

ATTACHMENT 2
LIST OF POTENTIAL SITE HAZARDS

ATTACHMENT 2

LIST OF POTENTIAL SITE HAZARDS

The following list identifies some types of potentially hazardous chemicals that may be present in the workplace:

Acids	Greases	Water treatments
Adhesives	Industrial Oils	Wood preservatives
Aerosols	Inks	Xylene
Asbestos	Insecticides	<u>Physical Hazards</u>
Battery fluids	Herbicides	Burning
Benzene	Janitorial supplies	Cold
Catalysts	Kerosene	Compressed gas
Caustics	Lacquers	Confined spaces
Cleaning agents	Lead	Ditches
Coatings	Oxalic acid	Dust
Compressed Gas	Paints	Electricity
Degreasing agents	Pesticides	Flying objects
Diesel	Plastics	Grinding
Detergents	Resins	Heat
Dusts	Sealers	Heavy equipment
Fiberglass	Shellacs	Lifting
Flammables	Solders	Noise
Foaming resins	Solvents	Repetitive motions
Fuels	Strippers	Slips and falls
Fungicides	Surfactants	Water hazards
Gasoline	Thinners	
Glues	Varnishes	

ATTACHMENT 3
HAZARD COMMUNICATION
CERTIFICATE OF TRAINING

Hazard Communication

CERTIFICATE OF TRAINING

I, _____ (printed name), have received **Hazard Communication Training** as described in the *Corporate Hazard Communication Program*.

The training was conducted on _____ (date) at _____
_____ (location).

Employee Signature

Social Security Number

Work Area/Department

Instructor's Certification:

I certify that the above-named employee has been provided with Hazard Communication Training on _____ (date).

Instructor's Signature

Date