

Appendix D

Health and Safety Plan

Site Name DeLong Mountain Regional Transportation System Project No. 8601997.001 2200
 Proposed Activity Sediment, Surface Water, Soil, and Vegetation Sampling
 Prepared by Sheryl Law Date May 19, 2003
 Reviewed by Larry Peterson Date May 21, 2003
 Updated by Jane Sexton Date March 24, 2004
 Reviewed by _____ Date _____

1. INTRODUCTION

This site-specific health and safety plan, in conjunction with the Corporate Health and Safety Program, establishes procedures and practices to protect employees of Exponent and its subcontractors from potential hazards posed by field activities along the DeLong Mountain Regional Transportation System (DMTS). In this health and safety plan, measures are provided to minimize potential exposures, accidents, and physical injuries that may occur during daily onsite activities and adverse conditions. Contingency arrangements are also provided for emergency situations.

2. DISCLAIMER

Exponent cannot guarantee the health or safety of any person entering this site. Because of the potentially hazardous nature of this site and the activity occurring thereon, it is not possible to discover, evaluate, and provide protection for all possible hazards that may be encountered. Strict adherence to the health and safety guidelines set forth herein will reduce, but not eliminate, the potential for injury and illness at this site. The health and safety guidelines in this plan were prepared specifically for this site and should not be used on any other site without prior evaluation by trained health and safety personnel.

3. SITE DESCRIPTION

Site name: DeLong Mountain Regional Transportation System (DMTS)
 Site location or address: DMTS road is 50 miles long, east of the Chukchi Sea, in the western end of the Brooks Range of Northern Alaska.
 Owners/tenants: Teck Cominco, Alaska
 Current site use: Active road and port facility
 Past site use (if different): NA
 Designated hazardous waste site: No (federal, state, other) _____
 Industrial facility Yes Spill _____ Other _____
 Active Yes Inactive _____
 Topography: Road is raised above tundra ground and flat (compacted fill material). Tundra area is flat, with small vegetation, and can be soggy and wet.
 Name of and distance to nearest surface water body: Tundra ponds and freshwater creeks near DMTS road; brackish lagoons near the port facility and Chukchi Sea at barge loading area.
 Surrounding land use/nearest population: Red Dog port facility/Red Dog Mine, Kotzebue
 Site access: Foot, truck, helicopter, boat, 4-wheel ATV

Nearest drinking water/sanitary facilities: Red Dog port facility/Red Dog Mine

Nearest telephone (list number if possible): Red Dog Mine Environmental Department (907) 426-9152

All buried utilities must be located prior to drilling or excavating at the site. List procedures to be used to locate utilities or indicate that no subsurface excavation or sampling will occur:

No subsurface sampling (i.e., >10 cm) will occur during the proposed sampling event.

Site map attached: Yes (in field sampling plan)

4. PROJECT PERSONNEL

	Name/Affiliation	Work Telephone	Home Telephone
Project manager	<u>Scott Shock</u>	<u>(425) 643-9803</u>	<u>(206) 860-9132</u>
Field team leader	<u>Jane Sexton</u>	<u>(425) 643-9803</u>	<u>(206) 782-1754</u>
Site safety officer	<u>Jane Sexton</u>	<u>(425) 643-9803</u>	<u>(206) 782-1754</u>
Exponent field personnel	<u>Liz Maier</u>	<u>(425) 643-9803</u>	<u>(425) 788-6545</u>
	<u>Ian Ippolito</u>	<u>(518) 435-7560</u>	<u>(518) 842-8211</u>
Facility contact	<u>Kent Turner</u>	<u>(509) 892-2556</u>	<u>NA</u>
Client contact (if different)	<u>Jerry Booth</u>	<u>(907) 426-9152</u>	<u>NA</u>

5. WORK PROPOSED

Description of proposed work: This Phase II assessment is focused on addressing data gaps by evaluating concentrations of CoPCs in the biota in each environment: small mammals, ptarmigan, terrestrial and aquatic invertebrates, and vegetation, as well as in the primary media that these biota come into contact with: tundra soil and sediment. Small mammals and terrestrial invertebrates will be collected by trapping (live traps and snap traps). Ptarmigan will be shot by local hunters and provided to Exponent staff. Vegetation samples will be clipped and picked from the tundra. Surface tundra soil samples will be collected from stations extending to the north/west of the DMTS road with gloved hands. Aquatic invertebrates and surface sediment will be collected from the small tundra ponds, freshwater streams, and coastal lagoons using an Ekman grab sampler, petite-Ponar sampler, or drive rod check valve corer. The composition of the tundra vegetation community will also be surveyed.

Proposed work dates: Phase II sampling event: June/July 2004.

Assistance from
other personnel
(Not Exponent
subcontractors)

Name	Task	Contact	Telephone
E ³	Assist w/ sample collection; coordinate helicopter flying schedules, sampling team security (i.e., bear lookout with gun)	Devin Harbke	(907) 426-9152
Rare Earth Science	Assist w/ sample collection; assist w/ vegetation community survey	Dawn Reeder	(907) 527-8445
Teck Cominco staff	Coordinate sampling team activities with mine personnel	Kent Turner	(907) 426-9152

6. HAZARD EVALUATION

This section describes the chemical and physical hazards present at the site.

6.1 Chemical Hazard Evaluation

Potentially hazardous chemicals known or suspected to be onsite (including preservatives and decontamination chemicals):

Site Chemical Data								Chemical Characteristics ^a									Potential Chemical Exposure Routes ^a				
Chemical	Medium	Observed or Expected Concentration (ppm)	PEL	STEL	IDLH	Odor Threshold	IP (eV)	Carcinogen	Suspected Carcinogen	Combustible	Corrosive	Explosive	Flammable	Poison	Reactive	Other (See Note)	Inhalation	Ingestion	Skin Absorption	Skin Contact	Eye Contact
Lead	Sediment Soil Water Vegetation	215 1,500 2.3 600	0.05 mg/m ³	NA	100 mg/m ³	NA	NA	X						X			3	3		2	2
Zinc	Sediment Soil Water Vegetation	1,500 3,200 110 4,000	5 mg/m ³ (as zinc oxide)	NA	500mg/m ³ (as zinc oxide)	Odorless (as zinc oxide)	NA										3				
Cadmium	Sediment Soil Water Vegetation	5 24 0.1 61	0.005 mg/m ³	NA	9 m/m ³	Odorless	NA	X						X			3	3			
Formaldehyde	Preservative	4%	0.016 ppm	NA	20 ppm	Characteristic pungent odor	10.88 eV	X						X			1	3	1	1	2

Note: IDLH - immediately dangerous to life and health
 NA - not applicable
 PEL - permissible exposure level (8-hr time-weighted average)
 PPE - personal protective equipment
 STEL - short-term exposure level (15-min time-weighted average)

^a For each chemical enter a numeric code (1–3) for each applicable chemical characteristic and potential chemical exposure route (if not applicable, leave blank). Numeric codes mean the following:

- 1 It is known that the characteristic will be a hazard or workers will be exposed via the exposure route if PPE was not worn or engineering controls were not implemented at the site. This requires continuous air monitoring and/or engineering controls with the appropriate PPE.
- 2 It is possible that the characteristic will be a hazard or that employees could be exposed through the exposure route. Procedures need to be developed for periodic air monitoring and PPE/engineering controls instituted, as needed.
- 3 It is unlikely that the characteristic will be a hazard at the site or it is unlikely that employees will be exposed via the exposure routes. In these instances workers may use gloves at a minimum and practice good chemical hygiene procedures (i.e., wash hands, clean equipment, keep hands out of mouth)

6.1.1 Chemical Hazard Summary

The following summarizes the chemical hazards by task and describes the procedures that will be implemented to limit exposure to the chemicals of concern.

Summary of potential chemical hazards for each site activity:

Activity	Potential Hazard	Safety Procedures
Sample collection	Lead, zinc, and cadmium	Gloves will be worn to protect the skin from contact.
Preservation of aquatic invertebrates for taxonomy and community analysis	Formaldehyde	Gloves will be worn to protect the skin from contact. Formaldehyde will be added to the samples outside in a well-ventilated area. Sampling personnel will stand upwind of the sample container when the formaldehyde is added.

6.2 Physical Hazard Evaluation

Possible physical hazards present during site activities:

	Yes	No	Proposed Safety Procedure
Uneven terrain/tripping	X		Use caution; wear properly fitting shoes or boots: keep work area orderly.
Heat stress		X	
Cold/hypothermia	X		Keep warm and dry; bring changes of clothes; do not work in extreme conditions without proper equipment or training. Follow the procedures in the Cold Weather Field Work SOP HS-02 (attached).
Drowning	X		Wear personal flotation device when working on and above water and when wading in water if depth/velocity conditions warrant. Follow the procedures in the Safety During Aquatic Operations SOP HS-04 (attached).
Falling objects	X		Wear hard hat; be aware of and if possible stay away from overhead hazards (applies to accessing mine and port facilities only).
Noise		X	
Excavations		X	
Heights		X	
Heavy equipment		X	
Material handling	X		Lift properly; seek assistance if necessary; do not overfill coolers or boxes.
Compressed air equipment		X	
Confined spaces		X	
Adverse weather		X	
Work in remote areas	X		Use buddy system; carry radio; carry GPS; bring sufficient equipment in case of accident or injury (first aid kit, shelter if appropriate).

	Yes	No	Proposed Safety Procedure
Biohazard (i.e., rodent-borne illnesses)	X		Follow the procedures in the Safety Considerations when Handling Small Mammals SOP HS-12 (attached).
Marine operations		X	
Plant/animal hazards (i.e., mosquitoes and other insects, grizzly bears)	X		Wear gloves, long sleeves and pants, and other clothing to prevent insect bites, as appropriate. Wear insect repellent. An armed personnel from Teck Cominco will keep a lookout for bears, and will shoot if necessary.
Other			
Helicopter	X		Follow helicopter operator's safety instructions.
4-wheel ATV	X		Follow safety instructions in ATV manual.

6.2.1 Physical Hazards Summary:

The following shows the potential physical hazards for each site activity.

Sampling Activity	Potential Hazard
Terrestrial	Cold; slips, trips, and falls; material handling; snap traps; adverse weather; helicopter use; biohazards (i.e., grizzly bears, insect bites)
Freshwater streams and coastal lagoons	Cold; drowning; falling objects; slips, trips, and falls; material handling; adverse weather

7. PERSONAL PROTECTIVE EQUIPMENT

Based on the hazards identified above, the following personal protective equipment will be required for the following site activities (specify both an initial level of protection and a more protective level of protection in the event conditions should change):

Sampling	Level of Protection	
	Initial	Contingency
Terrestrial	MD	Leave site
Freshwater streams and coastal lagoons	MD	Leave site
Sample handling	D	MD

Each level of protection will incorporate the following equipment (specify type of coveralls, boots, gloves, respiratory cartridges or other protection, safety glasses, hard hat, and hearing protection):

Level D:

Long pants and shirt or work coveralls. Hat, work boots, nitrile gloves, eye protection, and hearing protection, as needed. Appropriate cold-weather clothing, as needed. A hard hat and safety glasses are required for access at the mine and port facility.

Modified D:

Same as Level D with addition of raingear, hat, and thicker nitrile gloves. Foot protection with ankle support, and chest waders, as needed. A hard hat and safety glasses are required for access at the mine and port facility.

7.1 Respirator/Respirator Cartridge Information

Is there potential for a respirator to be donned (excluding particulate protection only use) during fieldwork? No

If no, proceed to Section 8. If yes, the following section must be completed for each respirator/respirator cartridge combination that will be or potentially will be used during the course of the fieldwork. The Exponent Environmental Group health and safety manager can be contacted for resources to complete this section.

Respirator Manufacturer #1 _____

Respirator Cartridge Selected for Use _____

Respirator Cartridge Change Schedule _____

Justify the cartridge change schedule and present all data used to establish this schedule.

Respirator Manufacturer #2 _____

Respirator Cartridge Selected for Use _____

Respirator Cartridge Change Schedule _____

Justify the cartridge change schedule and present all data used to establish this schedule.

Note: Project personnel are not permitted to deviate from the specified levels of protection without the prior approval of the site safety officer or Exponent Environmental Group health and safety manager.

8. SAFETY EQUIPMENT

The following safety equipment will be onsite during the proposed field activities:

Air Monitoring (check the items required for this project)

- | | |
|--|--|
| <input type="checkbox"/> Photo Ionization Detector (PID) | <input type="checkbox"/> Personal Air Sampling Pumps |
| <input type="checkbox"/> Combustible Gas/Oxygen (CG/O) meter | <input type="checkbox"/> Miniram (dust monitoring) |
| <input type="checkbox"/> Hydrogen Sulfide (H ₂ S) meter | <input type="checkbox"/> Radiation meter |
| <input type="checkbox"/> Multigas (CO/O ₂ /CG/H ₂ S) meter | <input type="checkbox"/> Noise meter |
| <input type="checkbox"/> Air pump and chemical detector tubes | <input type="checkbox"/> Other: _____ |

First Aid Kit (mandatory, including adhesive band-aids, gauze, tape, gloves, CPR shield, triangle bandage) (check additional items required for the site)

- | | |
|---|---|
| <input checked="" type="checkbox"/> Emergency blanket | <input checked="" type="checkbox"/> Sunscreen |
| <input checked="" type="checkbox"/> Insect repellent | <input type="checkbox"/> Other: _____ |

Other (check the items required for this project)

- | | |
|---|---|
| <input type="checkbox"/> Eyewash | <input type="checkbox"/> Fit test supplies |
| <input checked="" type="checkbox"/> Drinking water | <input type="checkbox"/> Fire extinguisher |
| <input type="checkbox"/> Stopwatch for monitoring heart rate | <input type="checkbox"/> Windssock |
| <input type="checkbox"/> Thermoscan ear thermometer for heat stress monitoring | <input type="checkbox"/> Cellular phone |
| <input type="checkbox"/> Survival kit | <input checked="" type="checkbox"/> Radio |
| <input checked="" type="checkbox"/> Personal flotation device (when wading in water if depth/velocity conditions warrant) | <input checked="" type="checkbox"/> Global positioning system |
| <input type="checkbox"/> Cool vests | <input type="checkbox"/> Other: _____ |

9. SITE CONTROL

Describe location and designation of each zone:

Exclusion zone: The sample collection area will be located away from the sample processing area. Any extraneous mud or dirt will be washed from boots and sampling equipment prior to leaving this area.

Contamination/reduction zone: The contamination/reduction zone will be located away from where the samples are collected. Decontamination (i.e., Alconox scrub and water rinse) and sample handling will occur in this area. Preservative for the aquatic invertebrates community analysis will be added to the sample containers in the reduction zone.

Support zone: The sampling vehicle (i.e., truck or helicopter) will be the support zone.

Describe controls to be used to prevent entry by unauthorized persons:

Due to extremely limited access, unauthorized personnel are not allowed at the site.

10. AIR MONITORING

Air monitoring will be conducted when entering previously uncharacterized sites, when working in the vicinity of uncontaminated chemicals or spills, when opening containers and well casings, and prior to opening and entering confined spaces. Air monitoring must be conducted to identify potentially hazardous environments and determine reference or background concentrations. Air monitoring will be used to define exclusion zones. Air monitoring may also be conducted to evaluate the concentration of chemicals in samples.

The following equipment will be used to monitor air quality in the breathing zone during work activities:

Monitoring Instrument	Calibration Frequency	Parameters of Interest	Sampling Frequency
NA	NA	NA	NA

The following action levels have been established to determine the appropriate level of personal protection to be used during site investigation activities:

Instrument	Reading	Action ^a	Comments
NA	NA	NA	NA

^a Examples: "upgrade to Level C" or "leave site."

11. DECONTAMINATION

To prevent the distribution of contaminants outside the exclusion zone or cross-contamination of samples, the following procedures will be used to decontaminate sampling equipment (NOTE: At a minimum, all sampling equipment must be decontaminated by scrubbing off any gross contamination, rinsing with tap or clean water, and drying prior to shipping the equipment back to Exponent offices):

All sampling and sample compositing equipment will be decontaminated by removing any gross contamination (i.e., mud or dirt), scrubbing with Alconox or Liquinox, and rinsing with clean water. For sample compositing equipment, the final rinse will be distilled/deionized water.

To prevent the distribution of contaminants outside the exclusion zone and personal exposure to chemicals, vehicles will not be allowed inside the exclusion zone. If vehicles are required in the exclusion zone (e.g., drill rigs), the following procedures will be used to prevent contamination or decontaminate the vehicles:

No vehicles will be in the exclusion zone.

To minimize or prevent personal exposure to hazardous materials, all personnel working in the exclusion zone and contamination reduction zones will comply with the following decontamination procedures:

All excess mud or dirt will be removed from personnel and from sampling equipment prior to leaving the sampling area.

Decontamination equipment required on site will include the following:

Two 5-gallon buckets; backpack sprayers for distilled/deionized water; source of clean water; Alconox or Liquinox; scrub brushes; foil

Decontamination wastewater and contaminated materials will be disposed of in the following manner:

No solvents will be used during this sampling event.

The following personal hygiene practices will be used:

- Long hair will be secured away from the face so it does not interfere with any activities.
- All personnel leaving potentially contaminated areas will wash their hands and faces prior to entering any clean areas or eating areas.
- Personnel leaving potentially contaminated areas will shower (including washing hair) and change to clean clothing as soon as possible after leaving the site.
- No person will chew gum or smoke in potentially contaminated areas. Single-serving drink containers are allowed for replacement of fluids in heat stress conditions. Single-serving snacks (e.g., Powerbars) are allowed for consumption in remote conditions. Every attempt will be made to limit beverage consumption to areas that are free from contamination. Smoking is prohibited in all areas of the site because of the potential for contaminating samples and for health and safety reasons.

12. VEHICLE SAFETY

Exponent's vehicle safety program requires the following:

- All vehicles are to be operated in a safe manner and in compliance with statutory traffic regulations and ordinances
- Operators are to practice defensive driving and drive in a courteous manner
- Operators are required to have a valid driver's license and liability insurance (per local state laws)
- Seat belts are to be worn by the driver and all passengers
- No persons are allowed to ride in the back of any trucks or vans
- Vehicles are to be driven in conformance with local speed limits
- Personnel who are impaired by fatigue, illness, alcohol, illegal or prescription drugs, or who are otherwise physically unfit, are not allowed to drive
- Personnel are to avoid using cellular phones or engaging in other distractions while driving
- All Exponent-owned field vehicles are to be maintained in a safe and clean condition
- All Exponent-owned field vehicles are to be equipped with the following:
 - First-aid kit
 - Fire extinguisher
 - Flares
 - Spare tire and jack
 - Other equipment as required for the project (e.g., tire chains, towing cable, tools, cellular phone or radio)
- Motor vehicle accidents are to be reported to the responsible law enforcement agency and the Exponent safety manager.
- Employees who have experienced work-related vehicle accidents or citations may be required to complete a defensive driving program.

13. SPILL CONTAINMENT

Provisions must be made for spill containment at any site where bulk liquids will be handled.

Will the proposed fieldwork include the handling of bulk liquids, oil, or chemicals (other than water)?

Yes _____ No X

If yes, describe spill containment provisions for the site:

14. SHIPMENT OF RESTRICTED ARTICLES

Federal laws and international guidelines place restrictions on what materials may be shipped by passenger and cargo aircraft. In the course of this field investigation, the following items will be shipped to and from the site in the following manner:

Item	Hazardous Constituent	Quantity	Packaging	How Shipped
Samples	None			No special procedures will be required
Solvents	None			
Calibration gas (name)	None			
Preservatives (Formaldehyde)	NA	5 gals	Plastic cubitainer (as provided/used by chemical supplier)	Shipped directly to the site by chemical supplier
Other:				

Exponent has arranged with CHEM-TEL to provide a 24-hour emergency contact number for all chemical shipments. CHEM-TEL can also provide advisory services (i.e., information on how to label, ship, and package chemicals). EXPONENT PERSONNEL MUST PROVIDE THE 24-HOUR EMERGENCY NUMBER TO THE SHIPPER.

For ANY shipment (air, rail, sea, or ground) within the United States, Canada, Puerto Rico, and the U.S. Virgin Islands that requires a 24-hour emergency response number (on ANY documents, such as Uniform Hazardous Waste Manifests, Shipper's Declaration of Dangerous Goods, etc.), the telephone number to use is 1-800-255-3924. ANY shipment outside the North American continent should reference "813-979-0626 (use the AT&T collect call operator)" on the document. Having international users call collect will ensure a bilingual operator is available to identify the call as an emergency. After accepting the call, if needed, CHEM-TEL will network with a translation service to prevent communication difficulties if the caller speaks a language other than English. On the shipping documents, please remember to indicate that the phone number specified is an emergency response contact number.

Before shipping chemicals (and listing the CHEM-TEL emergency number), Exponent personnel must fax the shipping document (manifest, declaration of dangerous goods, etc.) to CHEM-TEL informing them of the shipment. The fax number is 813-979-4620.

Regulatory advisory services are available from CHEM-TEL during business hours: 9 a.m. to 5:30 p.m. at 813-979-0626 (EST). This assistance can include determining the proper packaging, labeling, and shipping requirements for shipping hazardous substances.

15. MEDICAL MONITORING

OSHA requires medical monitoring for personnel potentially exposed to chemical hazards in concentrations in excess of the PEL for more than 30 days per year and for personnel who must use respiratory protection for more than 30 days per year. Exponent requires at a minimum baseline medical monitoring for all employees potentially exposed to chemical hazards at HAZWOPER sites.

Will Exponent personnel working at this site be enrolled in a medical monitoring program? Yes X No

16. HEALTH AND SAFETY TRAINING

State and federal laws establish training requirements for workers at uncontrolled hazardous waste sites (including areas where accumulations of hazardous waste create a threat to the health and safety of an individual, the environment, or both).

Exponent and subcontractor personnel will be required to complete the following training requirements:

Duties	No Special Training ^a	24-hour	40-hour	Supervisory	First Aid/CPR	Other
Exponent Personnel						
Jane Sexton			X	X	X	
Liz Maier			X		X	
Ian Ippolito			X			

^a Provide explanation or justification: _____

17. SITE SAFETY MEETINGS

Site safety meetings must be held before beginning new tasks or when new staff enter a site. Site safety meetings should be held at a minimum of once a week and should be held daily on large projects. Attendance and topics covered must be documented. The original site safety meeting minutes shall be retained in the project files as part of the health and safety plan and a COPY SHALL BE FORWARDED TO THE SAFETY MANAGER at the completion of the field work or field task.

18. FACILITY SAFETY PROCEDURES

The client or facility operators require that the following procedures be followed for all personnel at the site:

Field staff will follow Teck Cominco’s policies on DMTS haul road travel and other activities, including two-way radio contact. Before entering the field, field staff will consult with the site safety officer regarding the mine’s policies on grizzly bear protection and safety procedures around mining vehicles and heavy equipment. Staff will follow the pilot’s instructions and safety procedures when traveling by helicopter.

Upon arrival, Exponent staff will also participate in onsite Mine Safety and Health Administration training at the mine.

19. EMERGENCY PLANNING

In case of fire, spill, or other emergency affecting the site, all affected personnel must immediately evacuate the work area and report to the site safety officer at a predetermined location. Field personnel must also immediately notify facility or community emergency response providers unless facility personnel have already initiated this notification.

Designated assembly point: Field vehicle or helicopter

In case of injury, field personnel should take precautions to protect the victim from further harm and notify local or facility emergency services. In remote areas, it will be necessary to have first aid-trained personnel on the field team. The victim may require decontamination prior to treatment—requirements will vary based on site conditions.

Emergency medical care will be provided by:

- Local emergency medical provider (i.e., fire department)
 Facility emergency medical provider
 First aid-trained field staff (for remote areas only)

Local Resources	Name	Telephone	Notified Prior to Work (Yes/No)?
Fire	<u>Kotzebue Fire Dept.</u>	<u>(907) 442-3404</u>	<u>No</u>
Police	<u>Kotzebue Police Dept.</u>	<u>(907) 442-3351</u>	<u>No</u>
Ambulance	<u>NA</u>	<u></u>	<u></u>
Hospital	<u>Red Dog Mine facilities</u>	<u>(907) 426-9152</u>	<u>No</u>
Site phone	<u>NA</u>	<u>NA</u>	<u></u>
Directions to hospital:	<u>Drive north along the DMTS road until you reach the mine facility.</u>		

Corporate Resources	Name	Work Telephone	Home Telephone
Exponent Environmental Group health and safety manager	<u>Larry Peterson</u>	<u>(303) 444-7270 (303) 809-7887 [cell]</u>	<u>(303) 255-1787</u>
Regional health and safety officer	<u>Jane Sexton</u>	<u>(425) 643-9803</u>	<u>(206) 782-1754</u>
Medical consultant	<u>Dr. Jones/Virginia Mason Clinic</u>	<u>(206) 242-3651</u>	<u>NA</u>
CHEM-TEL	<u>Emergency No. 1-800-979-0626</u>		

In case of serious injuries, death, or other emergency, the Exponent Environmental Group health and safety manager must be notified immediately. To contact the Exponent Environmental Group health and safety manager (or delegate), try calling Larry Peterson at the work, home, and cell phone numbers listed above. If no response, call the **emergency pager (888) 403-5918**. If no response, call Kevin Reichelderfer at (650) 688-6996 [work] or (888) 926-7105 [pager].

In case of accident or emergency the client or facility operators require that the following person be notified immediately:

Kent Turner or
Jerry Booth
(907) 426-9152

Other Resources	Agency Name/Location	Telephone
Local Federal OSHA office	Alaska Department of Labor and Workforce Development P.O. Box 21149 Juneau, Alaska 99801-1149 (Physical location) 1111 W. 8th Street, Room 304 Juneau, Alaska 99801-1149	(907) 465-5952 (ask for message to be relayed to LS & S)
State OSHA equivalent	NA	
Poison Control	American Association of Poison Control	1-800-222-1222

20. DOCUMENTATION

	Attached	In File	Not Applicable
Exponent health and safety plan consent agreement	X		
Federal OSHA or equivalent state poster	X		
Site safety meeting minutes	X		
OSHA onsite training documentation form	X		
Hospital route map			X
Site map	X (in FSP)		
Exponent safety incident report form	X		
Work plan		X	
Exponent heat stress monitoring form			X
Exponent confined space entry permit			X
Exponent confined space entry plan			X
Exponent air monitoring record (PID, etc.)			X
Exponent air sampling record (Drager/tubes)			X
Material safety data sheets (Decon/Preservatives)	X		
Health and safety training records		X	
Cold weather fieldwork SOP	X		
Heat stress prevention and monitoring SOP			X
Drager pump detector tubes SOP			X
Photovac Microtip HL-2000 PID SOP			X
MIE Miniram aerosol monitor SOP			X
Gastec GX-82 CG/O2/H2S detector SOP			X
Safety during aquatic operations SOP			X
Soil collection and sampling SOP (for excavations)			X
Rodent borne illness protection SOP	X		
Other: _____			

21. LIST OF ATTACHMENTS

Attachment 1. Regulatory Notices and Health and Safety Training Records

Federal OSHA poster

Attachment 2. Forms

Health and Safety Plan Consent Agreement

Site Safety Meeting Minutes

OSHA Onsite Training Documentation

Safety Incident Report

Attachment 3. Standard Operating Procedures

SOP HS-02—Cold Weather Field Work

SOP HS-12— Rodent Borne Illness Protection

Attachment 4. Material Safety Data Sheet

Material Safety Data Sheet for Formalin



HEALTH AND SAFETY PLAN CONSENT AGREEMENT

I have reviewed the health and safety plan prepared by _____, dated _____, for the _____
_____ site fieldwork. I understand the purpose of the plan, and I consent to adhere to its policies, procedures, and
guidelines while an employee of Exponent or its subcontractors.

_____ Employee signature	_____ Firm	_____ Date
_____ Employee signature	_____ Firm	_____ Date
_____ Employee signature	_____ Firm	_____ Date
_____ Employee signature	_____ Firm	_____ Date
_____ Employee signature	_____ Firm	_____ Date
_____ Employee signature	_____ Firm	_____ Date
_____ Employee signature	_____ Firm	_____ Date
_____ Employee signature	_____ Firm	_____ Date
_____ Employee signature	_____ Firm	_____ Date
_____ Employee signature	_____ Firm	_____ Date

Note: Attach additional pages if necessary. Send this form to the Exponent Environmental Group health and safety manager. Copies will be placed in the appropriate project files.



SITE SAFETY MEETING MINUTES

Site Name _____ Contract No. _____

Meeting Location _____

Meeting Date _____ Time _____ Conducted By _____

Pre-fieldwork Orientation _____ Weekly Site Meeting _____ Other _____

Subjects Discussed _____

Safety Officer Comments _____

Signatures of Participating Personnel

Employee Signature	Firm	Date
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Note: Attach additional pages if necessary. Send this form to the Safety Manager. Copies will be placed in the appropriate files.



Onsite OSHA Training Documentation Form

After completion of the OSHA 40-hour Training class, 29 CFR 1910.120 states that three (3) days of onsite experience under the direct supervision of a trained, experienced supervisor are required to complete the OSHA HAZWOPER training requirements. This form is to be used to document this requirement, and shall be completed by a qualified supervisor (i.e., someone who has completed the 8-hour supervisory training class). Upon completion of this form, please submit it to the Safety manager.

EMPLOYEE INFORMATION

Name: _____

Signature: _____

40-hour training completion date: _____

Dates of onsite training: _____

Name of site: _____

Type of site: _____

SUPERVISOR CERTIFICATION

Supervisor: _____

Signature: _____

Safety Incident Report

1. Details of Incident (to be completed by affected employee[s])

Date and time of incident:	
Location (office/area):	
Description of incident (list the activities being performed and safety equipment in use at the time, note any property damage, and include as many details as possible in your description):	
Affected employee(s) signatures:	
Witnesses:	
Supervisor's name:	Date/time supervisor(s) notified:
Description of any medical treatment or first aid received:	
HR notified? Yes / No	
Workers compensation case? Yes / No	
Any attachments to this form? Yes / No	
Preventive action recommendations:	

2. Corrective Action (to be completed by affected employee[s]' supervisor[s])

Unsafe condition or work practice:		
Determined cause and corrective action taken to eliminate unsafe condition or work practice:		
Supervisor(s) Name	Supervisor(s) Signature	Date of Approval/Acknowledgement

3. Review by Exponent Safety Management

Corrective action complete & effective?		If no, send back to responsible supervisor(s)	
Safety Manager Name	Safety Manager Signature	Date	

Attachment 1

Regulatory Notices and Health and Training Safety Records

You Have a Right to a Safe and Healthful Workplace. IT'S THE LAW!

- You have the right to notify your employer or OSHA about workplace hazards. You may ask OSHA to keep your name confidential.
- You have the right to request an OSHA inspection if you believe that there are unsafe and unhealthful conditions in your workplace. You or your representative may participate in the inspection.
- You can file a complaint with OSHA within 30 days of discrimination by your employer for making safety and health complaints or for exercising your rights under the *OSH Act*.
- You have a right to see OSHA citations issued to your employer. Your employer must post the citations at or near the place of the alleged violation.
- Your employer must correct workplace hazards by the date indicated on the citation and must certify that these hazards have been reduced or eliminated.
- You have the right to copies of your medical records or records of your exposure to toxic and harmful substances or conditions.
- Your employer must post this notice in your workplace.



The *Occupational Safety and Health Act of 1970 (OSH Act)*, P.L. 91-596, assures safe and healthful working conditions for working men and women throughout the Nation. The Occupational Safety and Health Administration, in the U.S. Department of Labor, has the primary responsibility for administering the *OSH Act*. The rights listed here may vary depending on the particular circumstances. To file a complaint, report an emergency, or seek OSHA advice, assistance, or products, call 1-800-321-OSHA or your nearest OSHA office: • Atlanta (404) 562-2300 • Boston (617) 565-9860 • Chicago (312) 353-2220 • Dallas (214) 767-4731 • Denver (303) 844-1600 • Kansas City (816) 426-5861 • New York (212) 337-2378 • Philadelphia (215) 861-4900 • San Francisco (415) 975-4310 • Seattle (206) 553-5930. Teletypewriter (TTY) number is 1-877-889-5627. To file a complaint online or obtain more information on OSHA federal and state programs, visit OSHA's website at www.osha.gov. If your workplace is in a state operating under an OSHA-approved plan, your employer must post the required state equivalent of this poster.

1-800-321-OSHA www.osha.gov

Attachment 2

Forms



HEALTH AND SAFETY PLAN CONSENT AGREEMENT

I have reviewed the health and safety plan prepared by _____, dated _____, for the _____
_____ site fieldwork. I understand the purpose of the plan, and I consent to adhere to its policies, procedures, and
guidelines while an employee of Exponent or its subcontractors.

_____ Employee signature	_____ Firm	_____ Date
_____ Employee signature	_____ Firm	_____ Date
_____ Employee signature	_____ Firm	_____ Date
_____ Employee signature	_____ Firm	_____ Date
_____ Employee signature	_____ Firm	_____ Date
_____ Employee signature	_____ Firm	_____ Date
_____ Employee signature	_____ Firm	_____ Date
_____ Employee signature	_____ Firm	_____ Date
_____ Employee signature	_____ Firm	_____ Date
_____ Employee signature	_____ Firm	_____ Date

Note: Attach additional pages if necessary. Send this form to the Exponent Environmental Group health and safety manager. Copies will be placed in the appropriate project files.



SITE SAFETY MEETING MINUTES

Site Name _____ Contract No. _____

Meeting Location _____

Meeting Date _____ Time _____ Conducted By _____

Pre-fieldwork Orientation _____ Weekly Site Meeting _____ Other _____

Subjects Discussed _____

Safety Officer Comments _____

Signatures of Participating Personnel

Employee Signature	Firm	Date
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Note: Attach additional pages if necessary. Send this form to the Safety Manager. Copies will be placed in the appropriate files.

Onsite OSHA Training Documentation Form

After completion of the OSHA 40-hour Training class, 29 CFR 1910.120 states that three (3) days of onsite experience under the direct supervision of a trained, experienced supervisor are required to complete the OSHA HAZWOPER training requirements. This form is to be used to document this requirement, and shall be completed by a qualified supervisor (i.e., someone who has completed the 8-hour supervisory training class). Upon completion of this form, please submit it to the Safety manager.

EMPLOYEE INFORMATION

Name: _____

Signature: _____

40-hour training completion date: _____

Dates of onsite training: _____

Name of site: _____

Type of site: _____

SUPERVISOR CERTIFICATION

Supervisor: _____

Signature: _____

Safety Incident Report

1. Details of Incident (to be completed by affected employee[s])

Date and time of incident:	
Location (office/area):	
Description of incident (list the activities being performed and safety equipment in use at the time, note any property damage, and include as many details as possible in your description):	
Affected employee(s) signatures:	
Witnesses:	
Supervisor's name:	Date/time supervisor(s) notified:
Description of any medical treatment or first aid received:	
HR notified? Yes / No	
Workers compensation case? Yes / No	
Any attachments to this form? Yes / No	
Preventive action recommendations:	

2. Corrective Action (to be completed by affected employee[s]' supervisor[s])

Unsafe condition or work practice:		
Determined cause and corrective action taken to eliminate unsafe condition or work practice:		
Supervisor(s) Name	Supervisor(s) Signature	Date of Approval/Acknowledgement

3. Review by Exponent Safety Management

Corrective action complete & effective?		If no, send back to responsible supervisor(s)
Safety Manager Name	Safety Manager Signature	Date

Attachment 3

Standard Operating Procedures

SOP HS-02 COLD WEATHER AND HYPOTHERMIA PREVENTION

INTRODUCTION

Overexposure to cold environments poses a serious threat to the health and safety of workers. Working in cold environments can lead to many injuries, including mild to severe frostbite, trench foot, eye injuries, and hypothermia. Although most of these injuries will occur at temperatures at or below freezing, it is possible for field crew members to experience these injuries at temperatures as warm as 60°F. Even a mild condition of these cold weather injuries can impair the functional ability of the worker and threaten the safety of the worker and his or her companions. This SOP presents information on cold-related injuries, factors that influence cold injuries, monitoring for cold injuries, and cold injury prevention.

COLD INJURIES AND HYPOTHERMIA

As the body is exposed to cold temperatures, the body experiences “cold response,” which reduces circulation to the limbs in order to maintain the core temperature of the body (vasoconstriction). As the skin gets colder, the top layers of skin may freeze and have a white, waxy look. This is called frostnip. As the freezing of tissue becomes deeper, severe frostbite sets in, and the skin turns white and has a “wooden” feel all the way through. Frostbite occurs below 28°F, where temperatures are cold enough to freeze salt water. Trench foot is caused by prolonged exposure of the feet to cool, wet conditions. This can occur at temperatures as high as 60°F. The body uses vasoconstriction to shut down peripheral circulation in the foot to prevent heat loss. Redness, numbness, tingling pain, and itching are among the first symptoms of trench foot. It is important to note that water increases the rate of heat loss from the body 25 times faster than air. Hypothermia occurs when the core body temperature decreases to a level at which normal muscular and cerebral functions are impaired. Workers experiencing mild hypothermia begin stumbling, mumbling, loose motor coordination, and will begin to shiver uncontrollably. Cold temperatures may also lead to eye injuries. Strong cold winds may freeze the cornea or freeze eyelashes together. It is also important to note that sunburn of the eyes is just as likely to occur on cloudy days as on sunny days when working in a snowy area.

COLD INJURY AND HYPOTHERMIA FACTORS

The temperature of body tissue is regulated by two factors, external temperature and the flow of internal heat. Cold injuries are intimately connected with the degree of peripheral (appendage) circulation. As peripheral circulation is reduced to prevent the loss of heat to the core of the

body, the more likely these factors will influence cold injury and hypothermia. The following is a list of factors that influence cold injuries:

- Low ambient temperature
- Wind chill—dramatically increases the rate of freezing
- Moisture—wet skin freezes at a higher temperature than dry skin
- Insulation
- Contact with metal or other super-cooled liquids (water, white gas)
- Exposed skin
- Vasodilation
- Vasoconstriction
- Previous cold injuries
- Constricting garments
- Local pressure
- Cramped position
- Body type (women stay warmer in cold than men, personal fitness)
- Dehydration
- Caloric intake
- Diabetes, some medications
- Alcohol, caffeine, nicotine.

MONITORING AND TREATMENT FOR COLD INJURIES

Depending on the extent of injury, it is possible for field personnel to treat cold injuries in the field. Although the injury has been treated in the field, it is important to seek medical attention to follow up with any additional treatments necessary. Table HS-02-1 summarizes the symptoms and treatment for cold injuries.

TABLE HS-02-1. SUMMARY OF COLD INJURY SYMPTOMS AND TREATMENTS

Injury	Sensation	Feels	Color	Treatment
Cold Response	Painful	Normal	Red or pale	Add layers, remove from cold.
Frostnip	May have sensation	Normal	White	Rewarm area gently by blowing warm air on it or placing the area against a warm body part. Seek medical attention.
Frostbite (superficial)	Numb	Soft	White	Small areas may be treated as frostnip. Larger areas are treated as severe frostbite. Seek immediate medical attention.
Frostbite (severe)	Numb	Hard	White	Seek immediate medical attention.
Trench foot	Numb, tingling, itching	Normal	Red, pale, gray or blue	Seek immediate medical attention. DO NOT walk.
Cornea freezing	None	Cold	Normal to red	Rewarm by placing palm of hand over eye. Seek immediate medical attention.
Frozen eyelashes	Can't open eye	--	--	Put hand over eye until ice melts.
Snowblindness	Dry and irritated eyes. May occur 8–12 hours after exposure	--	--	Cold compresses, dark environment. Seek medical attention.

TREATMENT

If you suspect frostbite, seek immediate medical attention. Cover frostbitten areas with dry, sterile gauze or soft, clean cloth bandages.

SPECIAL CONSIDERATIONS FOR FROSTBITE

DO NOT rub cold injuries! As tissues begin to freeze, ice crystals are formed within the cells. As intracellular fluids freeze, the extracellular fluids enter the cell and increase the level of extracellular salts due to the water transfer. Rubbing the skin may rupture cells because of the increased amount of water and/or from tearing by the ice crystals. As the ice melts, an influx of salts into the tissue further damages the cell membranes and will result in tissue loss.

DO NOT use dry heat to rewarm. It will damage the tissue further. Wrap the area with sterile gauze, and protect from movement and cold. It is essential that the frozen tissue does not refreeze. If you cannot guarantee that the tissue will stay warm, do not rewarm it. Keeping it frozen will not cause significant additional damage. Do not give alcohol or allow the person to smoke.

MONITORING AND TREATMENT OF HYPOTHERMIA

Monitoring

The first symptoms of hypothermia are demonstrated by shivering and the inability to do complex motor functions. The victim will become lethargic and mildly confused as the body temperature drops to around 95°F.

As hypothermia becomes more severe, the victim will begin to show symptoms of the “umbles” (i.e., the victim stumbles, mumbles, fumbles, and grumbles). At this stage, the victim will experience changes in motor coordination, dazed consciousness, and possible irritability.

The most severe state of hypothermia occurs when body temperature falls below 90°F. The body begins to hibernate, slowing the heart rate (only 2–3/minute) and breathing. Heart failure and unconsciousness may occur in this state.

Table HS-02-2 summarizes the various stages of hypothermia.

TABLE HS-02-2. HYPOTHERMIA SIGNS AND SYMPTOMS

Stage	Core Temperature	Signs and Symptoms
Mild Hypothermia	99–97°F	Normal shivering can begin.
	97–95°F	Cold sensation, goose bumps, unable to perform complex tasks with hands; shivering can be mild to severe.
Moderate Hypothermia	95–93°F	Shivering, intense muscle uncoordination becomes apparent, movements slow and labored, stumbling pace, mild confusion, may appear alert. Use sobriety test. If person can not walk a 30-ft straight line, person is hypothermic.
	93–90°F	Violent shivering persists, difficulty speaking. Amnesia starts to appear, gross muscle movements sluggish. Unable to use hands. “Umbles” symptoms begin.
Severe Hypothermia	90–86°F	Shivering stops. Exposed skin blue. Inability to walk but may be able to stand. Confusion.
	86–82°F	Muscle rigidity, semiconscious, stupor. Pulse and respiration rate decreases.
	82–78°F	Unconsciousness, heart beat and respiration erratic.
	78–75°F	Pulmonary edema, cardiac and respiratory failure, death.

Treating Hypothermia

For mild hypothermia, the following treatment can be applied:

1. Reduce heat loss
 - Additional layers of clothing

- Dry clothing
 - Increased physical activity
 - Shelter
2. Add fuel and fluids
- Food types
 - Carbohydrates—quickly released into blood stream for sudden brief heat surge
 - Proteins—slowly released—heat given off over a longer period
 - Food intake
 - Hot liquids—calories plus heat source
 - Sugars
 - GORP—has both carbohydrates and proteins.

Avoid alcohol. It increases peripheral heat loss by acting as a vasodilator. Caffeine causes water loss by increasing dehydration. Tobacco/nicotine is a vasoconstrictor and increases the risk of frostbite.

For severe hypothermia, the following treatment can be applied:

1. Seek medical help immediately.
2. Reduce heat loss by making sure the worker is dry. The idea is to provide a shell of total insulation that will allow the worker to internally rewarm themselves. Use multiple blankets (wool, not cotton). Isolate the worker from wind and water.
3. Add fuel and fluids. For people with severe hypothermia, the stomach has shut down and will not digest solid food but can absorb sugars and water. Give dilute Jell-O (warm) every 15 minutes. Full strength Jell-O is too concentrated and cannot be absorbed.
4. Have the person urinate. A full bladder is an additional place for heat loss.
5. Add heat. Heat can be applied to major arteries around the neck, armpits, and groin by means of chemical heat packs or hot water bottles.

Important Information Regarding Severe Hypothermic Victims

It is important to warm up the person internally. Warming externally will cause afterdrop. This situation is caused by peripheral heating of the arms and legs, allowing the blood vessels to dilate. This dilation sends cold, stagnant blood, full of lactic acid and CO₂, into the core of the body and may lead to cardiac arrhythmias and death.

Severe hypothermic persons may demonstrate blue skin, fixed and dilated pupils, no pulse, and no breath. The heart rate may drop to 2–3/minute and breathing may be 1/30 seconds. Even at this slow rate, the heart is distributing blood fairly effectively. Performing CPR may damage the victim further. Be absolutely sure that a pulse is absent before starting CPR. Due to vasoconstriction of the outer limbs, it will be necessary to check the carotid (neck) pulse for up to 1 minute.

COLD INJURY/HYPOTHERMIA PREVENTION

The best way to prevent cold injuries and hypothermia is to wear appropriate protective clothing and stay dry. Wear at least three layers of clothing:

1. An outer layer to break the wind and allow some ventilation (like Gortex or nylon)
2. A middle layer of down or wool to absorb sweat and retain insulation when wet
3. An inner layer of cotton or synthetic weave to allow ventilation.

Pay special attention to protecting hands, feet, face, and head. Up to 40 percent of body heat can be lost when the head is exposed. Water conducts heat away from the body 25 times faster than air. Metal will conduct away heat even faster than water. Warm, loose clothing in multiple layers covering the head, body, and extremities will help prevent heat loss. Wearing constrictive clothing will add to the effects of vasoconstriction and contribute to cold injuries. Drinking warm liquids will also help keep the core body temperature warm. Alcohol will cause vasodilation and lead to increased heat loss. High energy foods such as GORP are good sources of sugars, protein, and carbohydrates.

Table HS-02-3 provides an estimate of wind chill temperatures for various temperatures and wind speeds:

TABLE HS-02-3. WIND CHILL INDEX

		Environmental Temperature (°F)																				
Calm		40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45	-50	-55	-60
Wind Speed		Apparent Temperature (°F)																				
5 MPH		35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45	-50	-55	-65	-70
10 MPH		30	20	15	10	5	0	-10	-15	-20	-25	-35	-40	-45	-50	-60	-65	-70	-70	-80	-90	-95
15 MPH		25	15	10	0	-5	-10	-20	-25	-30	-40	-45	-50	-60	-65	-70	-80	-85	-90	-100	-105	-110
20 MPH		20	10	5	0	-10	-15	-25	-30	-35	-45	-50	-60	-65	-75	-80	-85	-95	-100	-110	-115	-120
25 MPH		15	10	0	-5	-15	-20	-30	-35	-45	-50	-60	-65	-75	-80	-90	-95	-105	-110	-120	-125	-135
30 MPH		10	5	0	-10	-20	-25	-30	-40	-50	-55	-65	-70	-80	-85	-95	-100	-110	-115	-125	-130	-140
35 MPH		10	5	-5	-10	-20	-30	-35	-40	-50	-60	-65	-75	-80	-90	-100	-105	-115	-120	-130	-135	-145
40 MPH		10	0	-5	-15	-20	-30	-35	-45	-55	-60	-70	-75	-85	-95	-100	-110	-115	-125	-130	-140	-150

Little danger of exposed flesh freezing
Increasing danger of exposed flesh freezing (flesh can freeze within 1 minute)
Great danger of exposed flesh freezing (flesh can freeze within 30 seconds)

REFERENCES AND OTHER SOURCES

OSHA Fact Sheet. Protecting workers in Cold Environments. 12/22/98.

Outdoor Action Guide to Hypothermia and Cold Weather Injuries. Rick Curtis. Outdoor Action Program, Princeton University. 1995.

Hypothermia. Hypothermia.org. 1998.

State of Alaska Cold Injuries and Cold Water Near Drowning Guidelines. 1996.

SOP HS-12

PROTECTION AGAINST RODENT-BORNE ILLNESS

Introduction

Ecological risk assessment activities often require the collection of small mammal tissue for chemical analysis or the trapping of small mammals for habitat characterization. In addition to the physical and chemical hazards associated with all field sampling, there are special hazards posed by handling mice and other rodents that may carry disease such as the hantavirus. This standard operating procedure provides guidance for ensuring the safety of Exponent and subcontractor personnel when collecting and sampling mice and other rodent species. It also provides guidance for those working in areas where mice or rodent species may be present, such as crawl spaces or outside storage areas. Because of the acute hazard posed by the hantavirus, personnel must exercise extreme caution when handling mice or other rodents. Since the outset of the hantavirus over a decade ago, the U.S. Centers for Disease Control (CDC) has developed recommendations for the use of personal protective equipment (PPE) and continues to track and report documented cases of the hantavirus in the United States. Much of the contents of this SOP comes from the CDC website. Prior to commencing field activities, staff should consult the CDC website [All About Hantaviruses \(CDC\)](#) for any new information regarding the hantavirus that postdates the completion of this SOP.

Background Information

The Sin Hombre virus (SNV) is a type of hantavirus that is rodent borne and causes acute respiratory illness, which has been named hantaviral pulmonary syndrome (HPS). The SNV was first identified in 1993, during an epidemic in the Four Corners region of the southwest United States. Since then, HPS has been documented over a much wider geographic area, and some earlier cases of people dying from unexplained adult respiratory distress syndrome have been confirmed as HPS (earliest confirmed case in 1959). Testing of trapped rodents during the initial investigation in 1993 revealed that the deer mouse (*Peromyscus maniculatus*) was the main carrier of the hantavirus, although several other types of rodents were infected in lesser numbers. Researchers also determined that, like other hantaviruses, SNV is not transmitted from person to person the way other infections, such as the common cold, may be. There have been no reported cases of person-to-person transfer to date, and in a study of health-care workers who were exposed to either patients or specimens infected with related types of hantaviruses, none of the workers showed evidence of infection or illness.

During the 1990s, researchers discovered that there are several hantaviruses that cause HPS. The first, named the Bayou virus, was discovered in Louisiana and was linked to a carrier, the

rice rat (*Oryzomys palustris*). A second hantavirus, named the Black Creek Canal virus, was discovered in Florida, and the cotton rat (*Sigmodon hispidus*) was identified as the carrier. A third hantavirus, discovered in New York, was linked to the white-footed mouse (*Peromyscus leucopus*) and was named the New York-1 virus. Recently, the hantavirus has been identified as a pan-hemispheric disease, as cases have been identified in Argentina, Brazil, Canada, Chile, Paraguay, and Uruguay.

Hantavirus Transmission

The hantavirus is transmitted from rodents infected with the virus, like the deer mouse and cotton rat, mainly when people inhale air contaminated with the virus. Air becomes contaminated when fresh rodent urine, droppings, or nesting material are stirred up, which causes tiny droplets containing the virus to become airborne (process of aerosolization). In the environment, the virus can live for several days. Transmission can happen any place that infected rodents have infested (deer mice, cotton rats, and rice rats in the Southwest, and the white-footed mouse in the Northeast). It should be noted that common house mice do not carry the hantavirus, although carrier rodents may infest houses. In addition, other rodent species may host other types of hantaviruses that cause a different type of infection, known as hemorrhagic fever with renal syndrome (HFRS). There are a number of other ways that rodents may spread the hantavirus to people:

- An infected rodent bites a person. This is very rare, but it could occur more frequently if one were live-trapping rodents for identification and/or tagging purposes.
- Researchers believe that you may be able to get the virus if you touch something that has been contaminated with rodent urine, droppings, or saliva and then touch your nose or mouth.
- Researchers also suspect that the virus could be transmitted if you consume food contaminated with rodent urine, droppings, or saliva.

Geographic Distribution of Reported Hantavirus Cases in the U.S.

Since the outbreak in 1993, the CDC has been monitoring reported hantavirus cases throughout the United States. As of March 3, 2004, a total of 362 cases have been reported in 31 states. Of these cases, 138 people have died from HPS (38%). The majority of cases (279, or 77%) have been reported in nine western/southwestern states. A summary for the 31 states with reported cases is shown below. A more recent update from the CDC may be available at [CDC: Case Information: Map of Cases By State](#).

Number of Cases (362 total)	Number of States	Range of Reported Cases	States
279	9	18–60	AZ, CA, CO, ID, MT, NM, TX, UT, WA
60	7	5–14	IA, KS, NV, ND, NE, OR, SD
14	6	2–3	IN, MN, NY, OK, PA, WY
9	9	1	FL, IL, LA, NC, RI, VT, VA, WV, WI

Symptoms of HPS

Early symptoms of HPS are universal and include *fatigue, fever, and muscle aches*, especially the larger muscle groups (thighs, hips, back, and sometimes shoulders). About half of all HPS patients also experience *headaches, dizziness, chills*, and/or abdominal problems, such as *nausea, vomiting, diarrhea, and abdominal pain*. The incubation time between exposure and the development of symptoms is not well understood at this time, but it could take between 1 and 5 weeks.

Late symptoms appear 4–10 days after the onset of the early symptoms, and include *coughing*, and *shortness of breath*, with the sensation of a tight band around the chest and a pillow over the face as the lungs fill with fluid. Earache, sore throat, and rash are very uncommon symptoms of HPS.

Treatment of HPS

There is currently no specific treatment or cure for hantavirus infection, but it is recognized that some infected patients may do better if an early diagnosis is made and the patient is incubated and given oxygen throughout the period of severe respiratory distress. If a patient is in full distress, the treatment is less likely to be effective. It is critical for anyone who has been exposed to rodents and is experiencing the early symptoms of HPS that they see a doctor immediately and communicate that they have been around rodents.

General Safety Precautions for Preventing HPS

General safety precautions should be taken when there is indirect evidence of the presence of rodents (i.e., rodent droppings, nesting material). Common signs of rodent infestation include the following:

- You see rodent droppings.
- You see nesting signs such as shredded paper, bunches of dry grass/twigs, fabric, or furniture stuffing.

- You find boxes, containers, or food itself that appears to have been nibbled (note that plastic bags do not make safe food storage containers).
- You see signs of rodent feeding stations where there may be larger amounts of droppings/urine plus food remnants.
- You find evidence of gnawing.
- You notice an odd, stale, musky odor, which typically develops in closed-up rooms.
- You see a mouse; sightings are rare because mice nocturnal and generally avoid humans.

If employees are conducting inspections where nesting locations are likely (enclosed crawl spaces or infrequently used storage facilities) or are performing trapping activities that place the person in direct contact with potentially infected rodents, then additional safety precautions may be required. It is highly unlikely that field staff will come in contact with a live rodent. Therefore, the two most common situations where exposure to infected rodents may occur is during the disposal of dead (trapped or poisoned) rodents and during cleaning of rodent-infested areas (droppings, urine, nesting material). It is critical to prevent the aerosolization of fresh urine, droppings, or urine-contaminated nesting material during cleanup. Mice tend to scurry and disappear as humans approach (simultaneously leaving fresh urine in the process), so it is not always clear whether nesting material is active or old. For this reason, all nesting material should be treated as infected, and the following precautions should be implemented during cleanup.

Decontamination

If evidence of rodents is observed when entering an infrequently used structure or space, the area should be opened up and aired out prior to initiating cleanup activities. Care should be taken not to stir up materials by vacuuming or sweeping, because this contributes to the virus becoming airborne. At a minimum, latex or nitrile gloves should be worn, and the dead rodent or contaminated areas should be thoroughly wetted with detergent or liquid to deactivate the virus. Most general-purpose disinfectants and household detergents are effective. A hypochlorite solution can be prepared by mixing 1½ cups of household bleach in one gallon of water and can be used in place of commercial disinfectant. The hantaviruses are surrounded by a lipid (fatty) envelope that can be destroyed by fat solvents, such as alcohol, ordinary disinfectants, or bleach. Once the envelope is compromised these same solvents kill the hantavirus. In addition to killing the virus, wetting down contaminated materials reduces the potential of anything becoming airborne. Once wetted, the contaminated materials should be wiped up with a damp rag and bagged for disposal. The area should then be mopped or wet sponged with disinfectant. Dead rodents should be double bagged along with all cleaning materials, which should then be burned or buried. Gloves should be disinfected before taking them off, and following removal, hands should be washed thoroughly with soap and water. In instances where a heavy rodent infestation is encountered or cleanup is required in a restricted

space (attic or crawl space) prior to inspection or work activities (such as wiring), additional safety precautions are likely warranted, as described below.

Safety Precautions for Field Staff (Inspections or Trapping)

Exponent employees could encounter the hantavirus in a number of work activities, including but not limited to:

- Accessing infrequently used storage facilities
- General field work
- Building inspections
- Rodent trapping.

Some onsite judgment is required in choosing the appropriate safety precautions that should be implemented during the first three work activities listed above. If the infestation is minor, staff may be able to simply implement the General Safety Precautions described previously. In the course of conducting field work, staff may observe droppings or nesting materials and simply choose to avoid the area. In cases where the infestation is larger or the employee is uncomfortable with simply using the General Safety Precautions, the employee may choose to employ one or more of the safety precautions recommended below for employees who are trapping rodents. Because trapping activities place the employee in direct contact with rodents potentially infected with hantavirus, this work poses a greater risk of exposure, and the following safety precautions are recommended in addition to the general precautions.

Rodent-Trapping Safety Precautions

Staff involved in trapping rodents should wear disposable coveralls, rubber boots or disposable shoe covers, rubber or latex gloves worn over the top of leather gloves (for protection from bites), and a half-mask respirator (negative-pressure) equipped with N-100 particulate filters or a powered air-purifying respirator equipped with N-100 particulate filters. Note that Exponent staff who wear respirators for work activities must comply with the medical and fit-test requirements contained in Exponent's Respiratory Protection Program.

PPE shall be decontaminated (as previously noted) upon removal at the end of the day or whenever it is necessary prior to traveling between sampling/trapping locations. All potentially infectious waste material from cleanup operations shall be double-bagged and labeled as potentially infectious waste (if transporting). Field personnel must practice good hygiene (i.e., washing hands thoroughly after handling mice and before eating, drinking, or smoking). All personnel wearing potentially contaminated gloves must wash and disinfect those gloves before taking them off.

Decontamination of Field and Laboratory Equipment

All coolers, counters, equipment, and other surfaces or items that come in contact with rodents, rodent excreta, or otherwise potentially contaminated items (including vehicles and boots) must be washed and disinfected as previously described. Contaminated reusable clothing should be double bagged for laundering using a detergent. After disinfection, warning signs or labels on equipment should be removed, indicating that it is clean. In the event of skin contact with potentially infected materials, the worker must thoroughly wash the infected area with soap and water (can also use disinfectant).

To prevent the spread of contaminants, traps (or other contaminated items) should be thoroughly decontaminated (including the use of disinfectant) in the field prior to being placed into a building or vehicle. If traps are not disinfected, then they must be double bagged prior to transporting (i.e., to a new sample location).

Disposal of Potentially Infectious Waste

All potentially infectious wastes (including animal tissue, gloves, paper towels) must be separated from non-infectious trash for disposal. PPE that is properly disinfected prior to being bagged shall not be considered infectious waste. The potentially infectious trash should be double bagged and labeled as “potentially infectious waste”. Actual disposal (in lieu of onsite incineration or deep burial) will depend on local regulations. Alternatives include contracting with a service that incinerates infectious wastes or thoroughly wetting waste materials with disinfectant prior to disposing of the materials as solid waste. Potentially infectious materials must not be placed into a dumpster or other receptacle for collection by municipal waste haulers.

Packaging Mice in the Field

The following procedures have been developed to control exposure to potentially infectious materials while collecting samples of mice. All mouse samples must be double bagged in the field using the following procedures:

- Each animal-trapping team must consist of two persons, each with the following roles:
 - The primary handler opens the traps and handles the mice. This person is equipped with the appropriate PPE.
 - The assistant provides support for the primary handler, but does not handle traps or mice unless the traps or mice have been disinfected or double bagged. The assistant must wear latex or rubber gloves.
- The mice will be placed in a sealable 1-quart plastic bag by the primary handler, who will then inspect the outside of the bag for evidence of gross contamination and clean the outside of the bag with disinfectant, if necessary.

- The assistant, wearing clean gloves (fresh, new gloves from the box), will hold open a 1-gallon resealable bag, allowing the primary handler to drop the first bag into the second, larger bag. The primary handler may not touch or handle the outside of the second larger bag. The bags should be pre-labeled with the sample number and the words “potentially infectious substance.” All resealable bags must be at least 2 mm thick.
- The second (outside) bag is sealed and placed in the cooler for shipping by the assistant.
- The outer bag and clean cooler must not come in contact with potentially contaminated gloves or equipment. This will ensure that the outside of the sample bags and the coolers are contamination free, which will protect any person opening the cooler or placing samples in the freezer for storage.

Storage of Mouse Samples

Mice or rodent samples must be stored in a separate compartment of a sample storage freezer or in a separate cooler while in the field. No other samples shall be stored with the mice. The freezer must be clearly labeled as containing potentially infectious substances, and all staff must be made aware of the hazards posed by the mouse samples. All personnel involved in the processing (e.g., packaging, handling, shipping, storage, dissecting, analysis) of the samples must be trained in the procedures for safe handling of potentially infectious substances. Training will consist of an in-house review of the procedures discussed in this SOP, plus any procedures necessary for securing the area from unauthorized access during the processing of the samples. Packages should be protected from damage so that the non-contaminated outer packages remain intact.

Laboratory Procedures

Laboratory personnel handling mice or processing samples must wear the same level of protective clothing as the field personnel (excluding leather gloves) to prevent contact or inhalation of airborne materials. Signs must be posted warning against the entrance of unauthorized persons into work areas containing potentially infectious substances. All mouse sample processing (including dissecting or homogenizing) must be completed in a biological safety cabinet (BSC). Unprotected personnel should not be allowed in the area during the handling and processing of mice samples. If a BCS is not available, personnel in full PPE must conduct any handling or processing outdoors in a secure location with brisk ventilation, and must stand upwind from the samples.

Shipment of Samples to Offsite Laboratories

Samples shipped via common carrier (e.g., UPS or Federal Express) do not require shipment as restricted articles (items must be declared “infectious substances” only if they are known to be infectious or if they are being shipped to a laboratory to determine whether they are infectious

substances). However, all samples must be double bagged, with the individual packages labeled as “potentially infectious.” A warning label or sign must be included inside the cooler to warn laboratory personnel about the contents.

In addition, any samples shipped on dry ice are subject to special shipping procedures and regulations. Procedures may vary based on the carrier.

Communication of Hazards to Subcontractors and Outside Laboratories

The project manager must provide all available information regarding the hantavirus to the outside laboratory prior to the shipment of any samples. All samples sent to the laboratory must be packaged as described above. Similarly, the project manager must notify any subcontractors of the hazards described above prior to allowing their participation in mouse or rodent collection or processing activities.

Attachment 4

Material Safety Data Sheet

Buffered Neutral Formalin 10%

Material Safety Data Sheet

Section 1. Product and Company Identification

Product Name	Buffered Neutral Formalin 10%	Product Code	VW3239
Manufacturer	EMD Chemicals Inc. P.O. Box 70 480 Democrat Road Gibbstown, NJ 08027 Prior to January 1, 2003 EMD Chemicals Inc. was EM Industries, Inc. or EM Science, Division of EM Industries, Inc.	Effective Date	3/27/2003
For More Information Call	856-423-6300 Technical Service Monday-Friday: 8:00 AM - 5:00 PM	In Case of Emergency Call	800-424-9300 CHEMTREC (USA) 613-996-6666 CANUTEC (Canada) 24 Hours/Day: 7 Days/Week
Synonym	None.		
Material Uses	Laboratory Reagent		
Chemical Family	Mixture.		

Section 2. Composition and Information on Ingredients

Component	CAS #	% by Weight
FORMALDEHYDE	50-00-0	4
Methanol	67-56-1	
Sodium Phosphate, Dibasic, Anhydrous	7558-79-4	
Sodium Phosphate, Monobasic, Monohydrate	10049-21-5	
Water	7732-18-5	>92.8

+ Section 3. Hazards Identification

Physical State and Appearance	Liquid.
Emergency Overview	WARNING ! CANCER HAZARD CONTAINS MATERIAL WHICH CAN CAUSE CANCER HARMFUL IF SWALLOWED. CAUSES RESPIRATORY TRACT, EYE AND SKIN IRRITATION. MAY BE HARMFUL IF INHALED OR ABSORBED THROUGH SKIN. WARNING: This product contains a chemical(s) known to the State of California to cause cancer.
Routes of Entry	Absorbed through skin. Dermal contact. Eye contact. Inhalation. Ingestion.
Potential Acute Health Effects	Eyes Hazardous in case of eye contact (irritant). Inflammation of the eye is characterized by redness, watering, and itching. Skin Hazardous in case of skin contact (irritant). Skin inflammation is

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characterized by itching, scaling, reddening, or, occasionally, blistering.
Non-permeator by skin.

Inhalation Hazardous in case of inhalation (lung irritant). Non-hazardous in case of inhalation.

Ingestion Hazardous in case of ingestion.

Potential Chronic Health Effects

Carcinogenic Effects Classified + (Proven.) by OSHA [FORMALDEHYDE]. Classified A2 (Suspected for human.) by ACGIH, 2A (Probable for human.) by IARC [FORMALDEHYDE].

Additional information See Toxicological Information (section 11)

Medical Conditions Aggravated by Overexposure: Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

Section 4. First Aid Measures

Eye Contact Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention immediately.

Skin Contact In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Inhalation If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion If swallowed, do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

+ Section 5. Fire Fighting Measures

Flammability of the Product Non-flammable.

Auto-ignition Temperature Not applicable.

Flash Points Not applicable.

Flammable Limits Not applicable.

Products of Combustion Not applicable.

Fire Hazards in Presence of Various Substances Not applicable.

Explosion Hazards in Presence of Various Substances **Risks of explosion of the product in presence of static discharge:**
Slightly explosive in presence of open flames, sparks and static discharge.

Risks of explosion of the product in presence of mechanical impact:
Slightly explosive in presence of shocks.

Fire Fighting Media and Instructions Not applicable.

Protective Clothing Not applicable.

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(Fire)

Special Remarks on Not available.

Fire Hazards

Special Remarks on Not available.

Explosion Hazards

+ Section 6. Accidental Release Measures

Small Spill and Leak	Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.
Large Spill and Leak	Stop leak if without risk. Do not get water inside container. Do not touch spilled material. Use water spray to reduce vapors. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.
Spill Kit Information	The following EM SCIENCE SpillSolv (TM) absorbent is recommended for this product: SX1340 Formaldehyde Treatment Kit

Section 7. Handling and Storage

Handling	Avoid prolonged contact with eyes, skin, and clothing. Avoid contact with eyes. Do not ingest. Avoid breathing vapors or spray mists. Avoid prolonged or repeated contact with skin. Use only with adequate ventilation. Wash thoroughly after handling.
Storage	Keep container tightly closed. Keep container in a cool, well-ventilated area.

+ Section 8. Exposure Controls/Personal Protection

Engineering Controls	Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective occupational exposure limits.
Personal Protection	
Eyes	Splash goggles.
Body	Lab coat.
Respiratory	Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate.
Hands	Gloves.
Feet	Not applicable.
Protective Clothing (Pictograms)	
Personal Protection in Case of a Large Spill	Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self-contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Product Name

FORMALDEHYDE

Exposure Limits

EH40-MEL (United Kingdom (UK), 1997).
STEL: 2.5 mg/m³ 15 minute(s).
STEL: 2 ppm 15 minute(s).
TWA: 2.5 mg/m³ 8 hour(s).
TWA: 2 ppm 8 hour(s).
ACGIH (United States, 2000).

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CEIL: 0.37 mg/m³

CEIL: 0.3 ppm

NIOSH REL (United States, 1994).

CEIL: 0.1 ppm 15 minute(s).

TWA: 0.01 ppm 10 hour(s).

OSHA Final Rule (United States, 1989).

STEL: 2 ppm 15 minute(s).

TWA: 0.75 ppm 8 hour(s).

OSHA Transitional Rule (United States, 1993).

STEL: 2 ppm 15 minute(s).

TWA: 0.75 ppm 8 hour(s).

Methanol

ACGIH (United States, 1994). Skin

TWA: 262 mg/m³

STEL: 328 mg/m³

OSHA (United States, 1989). Skin

TWA: 260 mg/m³

STEL: 325 mg/m³

ACGIH (United States, 1994). Skin

STEL: 328 mg/m³ 15 minute(s).

STEL: 250 ppm 15 minute(s).

TWA: 262 mg/m³ 8 hour(s).

TWA: 200 ppm 8 hour(s).

NIOSH REL (United States, 1994). Skin

STEL: 325 mg/m³ 15 minute(s).

STEL: 250 ppm 15 minute(s).

TWA: 260 mg/m³ 10 hour(s).

TWA: 200 ppm 10 hour(s).

OSHA Final Rule (United States, 1989). Skin

STEL: 325 mg/m³ 15 minute(s).

STEL: 250 ppm 15 minute(s).

TWA: 260 mg/m³ 8 hour(s).

TWA: 200 ppm 8 hour(s).

Sodium Phosphate, Dibasic,

Not available.

Anhydrous

Sodium Phosphate, Monobasic,

Not available.

Monohydrate

Water

Not available.

Section 9. Physical and Chemical Properties

Odor Pungent.

Color Clear. Colorless.

Physical State and Appearance Liquid.

Molecular Weight Not applicable.

Molecular Formula Not applicable.

pH 7 [Neutral.]

Boiling/Condensation Point The lowest known value is 64.55°C (148.2°F) (METHANOL).

Weighted average: 99.08°C (210.3°F)

Melting/Freezing Point May start to solidify at -0.1°C (31.8°F) based on data for: Water.

Weighted average: -5.72°C (21.7°F)

Specific Gravity Weighted average: 0.96 (Water = 1)

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Vapor Pressure	The highest known value is 12.9 kPa (97 mmHg) (@ 20°C) (METHANOL).
Vapor Density	The highest known value is 1.11 (Air = 1) (METHANOL). Weighted average: 1.06 (Air = 1)
Volatility	99.9% (v/v). (METHANOL.)
Odor Threshold	The lowest known value is 0.05 ppm (FORMALDEHYDE) Weighted average: 33.14 ppm
Evaporation Rate VOC	0.36 (Water) compared to (n-BUTYL ACETATE=1) 6 (%)
LogKow	Not available.
Solubility	Soluble in water.

+ Section 10. Stability and Reactivity

Stability and Reactivity	The product is stable.
Conditions of Instability	Not available.
Incompatibility with Various Substances	Highly reactive with oxidizing agents, acids, alkalis. Slightly reactive to reactive with metals.
Rem/Incompatibility	Not available.
Hazardous Decomposition Products	CO _x , Na ₂ O
Hazardous Polymerization	Will not occur.

Section 11. Toxicological Information

RTECS Number:

Formaldehyde	LP8925000
Methanol	PC1400000
Sodium Phosphate, Dibasic, Anhydrous	WC4500000
Sodium dihydrogen phosphate monohydrate	Not available.
Water	ZC0110000

Toxicity	Acute oral toxicity (LD50): 42 mg/kg [Mouse]. (FORMALDEHYDE). Acute dermal toxicity (LD50): 15800 mg/kg [Rabbit]. (METHANOL). Acute toxicity of the vapor (LC50): 64000 ppm 4 hour(s) [Rat]. (METHANOL).
Chronic Effects on Humans	CARCINOGENIC EFFECTS: Classified + (Proven.) by OSHA [FORMALDEHYDE]. Classified A2 (Suspected for human.) by ACGIH, 2A (Probable for human.) by IARC [FORMALDEHYDE].
Acute Effects on Humans	Hazardous in case of eye contact (irritant). Inflammation of the eye is characterized by redness, watering, and itching. Hazardous in case of skin contact (irritant). Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering. Non-permeator by skin. Hazardous in case of inhalation (lung irritant). Non-hazardous in case of inhalation. Hazardous in case of ingestion.
Synergetic Products (Toxicologically)	Not available.

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Irritancy	Draize Test: Not available.
Sensitization	Not available.
Carcinogenic Effects	Classified + (Proven.) by OSHA [FORMALDEHYDE]. Classified A2 (Suspected for human.) by ACGIH, 2A (Probable for human.) by IARC [FORMALDEHYDE].
Toxicity to Reproductive System	Not available.
Teratogenic Effects	Not available.
Mutagenic Effects	Not available.

Section 12. Ecological Information

Ecotoxicity	Not available.
BOD5 and COD	Not available.
Toxicity of the Products of Biodegradation	The products of degradation are less toxic than the product itself.

Section 13. Disposal Considerations

EPA Waste Number	U122 U154
Treatment	Incineration, fuels blending or recycle. Contact your local permitted waste disposal site (TSD) for permissible treatment sites. ALWAYS CONTACT PERMITTED WASTE DISPOSER (TSD) TO ASSURE COMPLIANCE WITH ALL CURRENT LOCAL, STATE AND FEDERAL REGULATIONS.

Section 14. Transport Information

DOT Classification	Not available.
TDG Classification	Not available.
IMO/IMDG Classification	Not available.
ICAO/IATA Classification	Not available.

Section 15. Regulatory Information

U.S. Federal Regulations	TSCA 8(b) inventory: FORMALDEHYDE ; Methanol; Sodium Phosphate, Dibasic, Anhydrous; Sodium Phosphate, Monobasic, Monohydrate; Water SARA 302/304/311/312 extremely hazardous substances: FORMALDEHYDE SARA 302/304 emergency planning and notification: FORMALDEHYDE SARA 302/304/311/312 hazardous chemicals: FORMALDEHYDE ; METHANOL; Sodium Phosphate, Dibasic, Anhydrous SARA 311/312 MSDS distribution – chemical inventory – hazard identification: FORMALDEHYDE : Fire Hazard, Immediate (Acute) Health Hazard, Delayed (Chronic) Health Hazard; METHANOL: Fire Hazard, Immediate (Acute) Health Hazard, Delayed (Chronic) Health Hazard; Sodium Phosphate, Dibasic, Anhydrous: Immediate (Acute) Health Hazard
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SARA 313 toxic chemical notification and release reporting:

FORMALDEHYDE 4%; METHANOL 1.98%

Clean Water Act (CWA) 307: No products were found.

Clean Water Act (CWA) 311: FORMALDEHYDE ; Sodium Phosphate, Dibasic, Anhydrous

Clean air act (CAA) 112 accidental release prevention:

FORMALDEHYDE

Clean air act (CAA) 112 regulated flammable substances: No products were found.

Clean air act (CAA) 112 regulated toxic substances: FORMALDEHYDE

WHMIS (Canada) Class D-2A: Material causing other toxic effects (VERY TOXIC).

Class D-2B: Material causing other toxic effects (TOXIC).

CEPA DSL: FORMALDEHYDE ; METHANOL; Sodium Phosphate, Dibasic, Anhydrous; Water

This product has been classified in accordance with the hazard criteria of the Controlled Product Regulations and the MSDS contains all required information.

International Regulations

EINECS

FORMALDEHYDE 200-001-8

Methanol 200-659-6

Sodium Phosphate, Dibasic, Anhydrous 231-448-7

Sodium Phosphate, Monobasic, Monohydrate 231-449-2

Water 231-791-2

DSCL (EEC)

R22- Harmful if swallowed.

R36/38- Irritating to eyes and skin.

International Lists

Australia (NICNAS): FORMALDEHYDE ; Methanol; Sodium Phosphate, Dibasic, Anhydrous; Sodium Phosphate, Monobasic, Monohydrate; Water

Japan (MITI): FORMALDEHYDE ; Methanol; Sodium Phosphate, Dibasic, Anhydrous; Water

Japan (MOL): FORMALDEHYDE

Korea (TCCL): FORMALDEHYDE ; Methanol; Sodium Phosphate, Dibasic, Anhydrous; Water

Philippines (RA6969): FORMALDEHYDE ; Methanol; Sodium Phosphate, Dibasic, Anhydrous; Water

China: No products were found.

State Regulations

Pennsylvania RTK: FORMALDEHYDE : (special hazard, environmental hazard, generic environmental hazard); METHANOL: (environmental hazard, generic environmental hazard); Sodium Phosphate, Dibasic, Anhydrous: (environmental hazard, generic environmental hazard)

Massachusetts RTK: FORMALDEHYDE ; METHANOL; Sodium Phosphate, Dibasic, Anhydrous

New Jersey: Buffered Neutral Formalin 10%

California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: FORMALDEHYDE

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California prop. 65 (no significant risk level): FORMALDEHYDE
California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer which would require a warning under the statute: FORMALDEHYDE

Section 16. Other Information

**National Fire
Protection
Association
(U.S.A.)**

**1 0
Health²**

Fire Hazard

Reactivity

Specific Hazard

**Changed Since Last
Revision** +

Notice to Reader

The statements contained herein are based upon technical data that EMD Chemicals Inc. believes to be reliable, are offered for information purposes only and as a guide to the appropriate precautionary and emergency handling of the material by a properly trained person having the necessary technical skills. Users should consider these data only as a supplement to other information gathered by them and must make independent determinations of suitability and completeness of information from all sources to assure proper use, storage and disposal of these materials and the safety and health of employees and customers and the protection of the environment. EMD CHEMICALS INC. MAKES NO REPRESENTATION OR WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE, WITH RESPECT TO THE INFORMATION HEREIN OR THE PRODUCT TO WHICH THE INFORMATION REFERS.
