



Hematite Decommissioning Project

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REVISION LOG

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0	Revision supersedes PO-EHS-001 Revision 2.1. This procedure has been extensively revised. The following changes have been made: <ul style="list-style-type: none">• Inclusion of Section 2.0 – Policy Statement.• Administrative changes including editorial changes and typographical corrections.• Removed procedural information that was not compliance driven to create a more effective policy document.	04/14/2009

Are quality records generated? Yes or **NO** If yes, list below and ensure that these completed records are retained in accordance with PR-QA-009.

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1.0 PURPOSE

This Health and Safety Plan (HASP) describes the policy requirements for protection of project personnel and the general public at the Hematite Decommissioning Project (HDP). It is the basis for compliance with Title 29 of the Code of Federal Regulations (CFR), Parts 1904 (Ref. 5.1), 1910 (Ref. 5.2), and 1926 (Ref. 5.3), as well as Westinghouse Electric Company (WEC) Environmental, Health and Safety (EH&S) policies.

2.0 POLICY

2.1 Within the scope of this plan, compliance with applicable regulations is the objective. The project's primary goal is that no harm should come to project personnel or the public as a result of remediation activities.

2.2 The project shall continue to identify and correct site health and safety issues by working in partnership with employees and contractors at all levels to:

2.2.1 Eliminate injuries and ill health at work.

2.2.2 Prevent incidents.

2.2.3 Learn lessons from events, and seek out and use best practices.

2.3 The project shall:

2.3.1 Openly report EH&S performance every year to the site personnel using the Corrective Actions Process (CAPs) process to track the status of issues.

2.3.2 Ensure activities, which may affect EH&S, are adequately resourced and carried out by, and under the control and supervision of, suitably qualified and experienced personnel.

2.3.3 Set and review EH&S objectives and targets every year.

2.4 Health and safety hazards shall be evaluated during the planning phase for each aspect of the project and in the course of lessons learned throughout the project. Engineering controls are the preferred means of addressing such hazards, followed by administrative controls, then by personal protective equipment (PPE).

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2.5 This plan will be implemented during demolition activities to provide safety guidelines to protect workers during the demolition activities as well as to establish documents and practices to protect the public and the immediate environment from hazards caused by the demolition.

2.6 Project personnel, subcontractor personnel, temporary personnel, and visitors, who do not follow HASP requirements, and associated programs or procedures, may be denied access to the site or be required to leave the site. An employee who is the cause of, or is involved in a non-compliance action or activity, or who

fails to comply with the requirements of the HASP or other referenced material, may be subject to disciplinary action up to and including termination.

- 2.7 Non-conformance incidents shall be recorded in accordance with CAPs.
- 2.8 Project personnel have the authority to stop work without risk of reprimand if someone is in danger, or if continuation of a task could result in injury or violation of a regulatory parameter. If a condition or practice exists that the employee is unsure of, notify supervision. Review and revise work packages, procedures, checklists, and/or permits associated with an accident, incident, or unsafe condition as necessary.

3.0 APPLICABILITY

The HASP applies to persons at the site, including WEC employees, contractors, subcontractors, temporary personnel, and visitors. Contractors may use their own plans, policies, instructions, or procedures after approval by HDP Management as compliant with the HASP. Otherwise, WEC procedures shall be used. Temporary personnel and visitors shall be briefed on the applicable requirements of the HASP as specified by the *Training Plan* (Ref. 5.4).

4.0 DEFINITIONS/ACRONYMS

4.1 Definitions

Competent person – A person who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

Qualified person – A person who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated his/her ability to solve or resolve problems related to the subject matter, the work, or the project.

4.2 Acronyms

ACGIH	American Conference of Government Industrial Hygienists
AHA	Activity Hazard Analysis
ALARA	As Low As Reasonably Achievable
ANSI	American National Standards Institute
BBS	Behavior-Based Safety
CAPs	Corrective Actions Process
CFR	Code of Federal Regulations
CO	Carbon Monoxide
EH&S	Environmental, Health & Safety
GFCI	Ground Fault Circuit Interrupters

H ₂ S	Hydrogen Sulfide
HASP	Health and Safety Plan
HDP	Hematite Decommissioning Project
LEL	Lower Explosive Level
LO/TO	Lockout/Tagout
MSDS	Material Safety Data Sheet
NFPA	National Fire Protection Association
NIOSH	National Institute for Occupational Safety and Health
O ₂	Oxygen
OSHA	Occupational Safety and Health Administration
PCB	Polychlorinated Biphenyl
PEL	Permissible Exposure Limit
PERC	Tetrachloroethylene (Perchloroethylene)
PPE	Personal Protective Equipment
REL	Recommended Exposure Limit
TCE	Trichloroethylene
TLV	Threshold Limit Value
TWA	Time-Weighted Average
UL	Underwriters Laboratories
VOC	Volatile Organic Compounds
WEC	Westinghouse Electric Company

5.0 REFERENCES

- 5.1 29 CFR 1904, *Recording and Reporting Occupational Injuries and Illnesses.*
- 5.2 29 CFR 1910, *Occupational Safety and Health Standards for General Industry.*
- 5.3 29 CFR 1926, *Safety and Health Regulations for Construction.*
- 5.4 HDP-PO-GM-002, *Training Plan*
- 5.5 National Fire Protection Association 70, *National Electric Code*
- 5.6 National Fire Protection Association 10, *Standard for Portable Fire Extinguishers*
- 5.7 National Fire Protection Association 25, *Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems*
- 5.8 National Fire Protection Association 72, *National Fire Alarm Code*
- 5.9 National Fire Protection Association 101, *Life Safety Code*
- 5.10 National Fire Protection Association 30, *Flammable and Combustible Liquids Code*
- 5.11 National Fire Protection Association 58, *Liquefied Petroleum Gas Code*
- 5.12 National Fire Protection Association 51B, *Standard for Fire Prevention During Cutting, Welding, and Other Hot Work*

- 5.13 ANSI Z89.1-1986, *American National Standard for Personnel Protection – Protective Headwear for Industrial Workers-Requirements*
- 5.14 ANSI Z-87.1-2003, *American National Standard Practice for Occupational and Educational Eye and Face Protection*
- 5.15 ANSI Z-41-1999, *American National Standard for Personnel Protection – Protective Footwear*
- 5.16 American Conference of Governmental Industrial Hygienists, *Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices*
- 5.17 EO-05-002, *Remedial Investigation Report*
- 5.18 EO-07-004, *Feasibility Study – Operable Unit 1*
- 5.19 29 CFR 1926.450 – 452, *Scaffolding*
- 5.20 29 CFR 1910.178, *Powered Industrial Trucks*

6.0 RESPONSIBILITIES

6.1 Project Director

6.1.1 The Project Director maintains ultimate responsibility for oversight of project personnel involved in decommissioning activities to ensure they comply with health and safety requirements. The Project Director shall:

6.1.1.1 Oversee the HDP Managers in planning, organizing, directing, and controlling project activities in a manner that safeguards project personnel.

6.1.1.2 Oversee the Environmental, Health & Safety (EH&S) Manager to ensure EH&S directions, oversight, planning, policies, and procedures support project activities in a manner that safeguards project personnel and visitors.

6.2 Department Managers

6.2.1 The Department Managers have primary responsibility for ensuring project operations are conducted in a safe manner. The Department Managers are specifically responsible for the following:

6.2.1.1 Coordinate activities with the EH&S Manager as they relate to planning, organizing, directing, and controlling project activities in a manner that meets the requirements of this Plan.

- 6.2.1.2 Allocate the necessary time and resources to ensure the health and safety of project personnel takes precedence over the expediency of work activities.
- 6.2.1.3 Approve work packages, plans, and procedures.
- 6.2.1.4 Perform formal and informal site inspections.
- 6.2.1.5 Generate and review incident reports:
 - 6.2.1.5.1 Ensure the Occupational Safety and Health Administration (OSHA) and other regulatory requirements are being met.
 - 6.2.1.5.2 Ensure pre-job briefings for Decommissioning tasks are conducted and documented.
 - 6.2.1.5.3 Ensure safety equipment is adequate and serviceable.
 - 6.2.1.5.4 Ensure engineered, administrative, and/or personal protective equipment (PPE) controls to mitigate hazards to personnel are adequate and implemented.
 - 6.2.1.5.5 Stop work if it is determined that requirements are not being met or an unsafe condition exists or may occur if work continues.
 - 6.2.1.5.6 Conduct periodic inspection of PPE.

6.3 EH&S Manager

- 6.3.1 The EH&S Manager is responsible for determining project health and safety requirements, and providing health and safety direction and oversight for the project. The EH&S Manager is specifically responsible for the following:
 - 6.3.1.1 Specify and oversee the administration of the overall project occupational health and safety program.
 - 6.3.1.2 Provide direction for comprehensive occupational health and safety related to the project.
 - 6.3.1.3 Ensure approved policies and procedures contain appropriate requirements for industrial safety and occupational hygiene necessary to provide safe and healthful working conditions, and to reduce occupational injuries and illnesses to the lowest practicable level.

- 6.3.1.4 Ensure common industrial hygiene practices are employed to protect against non-radioactive hazardous gases including but not limited to ammonia, hydrogen fluoride, organic solvent vapors, carbon monoxide, and nitrous oxides.
- 6.3.1.5 Ensure the project EH&S Program is conducted in compliance with Federal, State, and local regulations.
- 6.3.1.6 Provide liaison with the public and regulators for health and safety issues.
- 6.3.1.7 Coordinate EH&S program activities, including review and approval of contractor programs and procedures for compliance with the HASP.
- 6.3.1.8 Confirm current physician's written opinion regarding approval for personnel to wear a respirator.
- 6.3.1.9 Conduct surveillance to ensure the HASP is being followed.
- 6.3.1.10 Promptly investigate reported incidents and ensure appropriate corrective action is taken.
- 6.3.1.11 Initiate a stop work as necessary if an unsafe condition exists.
- 6.3.1.12 Maintain documentation and records associated with EH&S activities in accordance with applicable policies and procedures.
- 6.3.1.13 Control industrial hygiene instrumentation (including current calibration, source checks, and serviceability).
- 6.3.1.14 Conduct and document monitoring and surveillance as required.
- 6.3.1.15 Notify project personnel exposed at or above an action level, as indicated by monitoring.
- 6.3.1.16 Perform safety inspections, conducting surveillance, and monitoring of the workplace.
- 6.3.1.17 Implement and manage the training for health and safety program:
 - 6.3.1.17.1 Ensure proper training is conducted to assure the health and safety of the workforce.

6.3.1.17.2 Approve contactor safety training and contractor emergency action programs. These approvals may be delegated to qualified individuals. Ensure employees are adequately trained to the degree necessary to safely complete their assigned tasks.

6.4 Project Personnel

6.4.1 Each employee, contractor, subcontractor, or visitor is responsible for complying with the provisions of the HASP, and may be denied access to the site or required to leave the site for lack of compliance. Project personnel will:

6.4.1.1 Cooperate and participate in work package preparation.

6.4.1.2 Wear personal monitoring equipment and dosimeters as instructed by the EH&S Manager, or designees.

6.4.1.3 Wear PPE as prescribed by procedure or permit.

6.4.1.4 Assist in identifying and reporting hazards in the workplace resulting from a change in work activities, processes, or equipment.

6.4.1.5 Attend safety training, meetings, and pre-job briefings as required by their function, and sign the associated attendance forms.

7.0 GENERAL

7.1 This plan is implemented by placing conservative limits, investigation, and/or action levels to ensure occupational health and safety hazards and exposures are kept as low as reasonably achievable (ALARA). The following are key factors that affect occupational health and safety for the project, and shall be controlled, either by implementing procedure(s) or by specific instructions in a work package.

7.1.1 Accident and incident reporting and investigation.

7.1.2 Confined space entry.

7.1.3 Emergency preparedness.

7.1.4 Environmental hazards:

7.1.4.1 Animal bites and stings.

7.1.4.2 Toxic plants.

- 7.1.5 Physical hazards:
 - 7.1.5.1 Hearing conservation (noise).
 - 7.1.5.2 Temperature extremes (cold, heat).
- 7.1.6 Ergonomics.
- 7.1.7 Excavations.
- 7.1.8 Fall prevention and protection.
- 7.1.9 Fire prevention and protection:
 - 7.1.9.1 Hot work operations, including welding, cutting, and grinding.
 - 7.1.9.2 Detection and alarm systems.
 - 7.1.9.3 Means of egress.
 - 7.1.9.4 Suppression equipment (fixed and/or portable).
 - 7.1.9.5 Fitness for duty according to Security Procedures.
- 7.1.10 Hazardous chemicals:
 - 7.1.10.1 Hazard communication.
 - 7.1.10.2 Segregation and storage.
- 7.1.11 Hazardous energy:
 - 7.1.11.1 Electrical safety.
 - 7.1.11.2 Lockout/tagout.
 - 7.1.11.3 Machine guarding.
- 7.1.12 Housekeeping.
- 7.1.13 Ladders and scaffolds.
- 7.1.14 Mechanized equipment:
 - 7.1.14.1 Conveyors.
 - 7.1.14.2 Cranes, derricks, and hoists.
 - 7.1.14.3 Manlifts.
 - 7.1.14.4 Powered industrial trucks.
 - 7.1.14.5 Slings.
- 7.1.15 Personal protective equipment:
 - 7.1.15.1 Clothing (non-radiological).

- 7.1.15.2 Eyes and face.
- 7.1.15.3 Foot.
- 7.1.15.4 Head.
- 7.1.15.5 Body harnesses, lifelines, and lanyards.

- 7.1.16 Signs, signals, and barricades.
- 7.1.17 Hand and power operated tools.
- 7.1.18 Railway safety.
- 7.1.19 Working near and around large high pressure utility lines.
- 7.1.20 Hazardous Waste Operations and Emergency Response.

7.2 Biological Hazards

- 7.2.1 There is a potential for exposure to biological hazards during the decommissioning work at Hematite.
- 7.2.2 In the event of the potential for exposure, the following guidelines should be followed.
- 7.2.3 Animal Bites or Insect Stings:
 - 7.2.3.1 Insect bites or stings are usually nuisances that can be handled by minimal first-aid treatment.
 - 7.2.3.1.1 Symptoms may include localized swelling, itching, and minor pain.
 - 7.2.3.1.2 The biggest hazard and most common cause of fatalities from a bite or sting, particularly from bees and wasps is a sensitivity reaction.
 - 7.2.3.1.3 Individuals who are aware of a personal sensitivity or allergy shall make supervision aware of that sensitivity or allergy so that a record may be kept on file in the event of a reaction or exposure.
 - 7.2.3.2 Insect bites from spiders may pose a particular concern due to the potentially fatal nature of such bites.
 - 7.2.3.2.1 The Brown Recluse, *Loxosceles reclusa*, is found in Missouri.
 - Protection against bites includes recognition of hazards in an AHA and PPE including gloves.

- First aid involves the application of an ice pack to control inflammation, the application of aloe vera to soothe and help control the pain, and prompt medical care.

7.2.3.2.2 The Black Widow, *Latrodectus mactans* or *Latrodectus variolus* is found in Missouri.

- Protection against bites includes recognition of hazards in an AHA and PPE including gloves.
- Prompt medical attention is essential – pain relief may require the use of narcotics and antivenin (antitoxin to counteract the effects of the spider venom).

7.2.3.3 In addition to sensitivity reactions, there are diseases that can be transmitted by insects.

7.2.3.3.1 West Nile virus and forms of encephalitis may result from mosquito bites.

7.2.3.3.2 Lyme disease and Rocky Mountain Spotted Fever that are caused by bites from infected ticks that live in and near wooded areas, tall grass, and brush.

7.2.3.3.3 Ticks are small, ranging from the size of a comma up to about one quarter inch.

7.2.3.3.4 They are sometimes difficult to see.

7.2.3.3.5 The mosquito and tick season extends from spring through summer.

7.2.3.3.6 Personnel should wear appropriate clothing and consider the use of insect repellent for work involving credible exposure to such insects.

7.2.3.4 Avoid wild animals, particularly wild animals that are unusually passive or aggressive.

7.2.3.4.1 Report any such animals to the Operations Manager.

7.2.3.4.2 Skunks, raccoons, foxes, and bats are wild animals most frequently found to be infected with rabies; however, any warm-blooded animal could be infected.

7.2.3.4.3 Rabies is preventable, even after being bitten, if treatment is begun soon enough.

7.2.3.4.4 It is not curable once symptoms or signs appear.

7.2.3.4.5 Prompt medical attention and determining whether the biting animal is infected with rabies are very important actions.

7.2.3.4.6 Personnel should be aware of the hazards associated with wild animals when working in areas involving credible exposure to wild animals.

7.2.3.5 Snakes must also be avoided – personnel should be aware of the hazards associated with snakes in areas involving credible exposure to snakes.

7.2.4 Toxic Plants:

7.2.4.1 Toxic effects from plants are generally due to ingestion of nuts, fruits, or leaves.

7.2.4.1.1 Of more concern to project personnel are certain plants such as poison ivy, poison oak, and poison sumac, which will produce adverse effects from direct contact.

7.2.4.1.2 The usual effect is dermatitis or inflammation of soft tissues.

7.2.4.1.3 Proper personal hygiene will reduce effects from dermal contact of poisonous plants.

7.2.4.1.4 Project personnel shall be provided with information concerning toxic plants in areas where contact may take place – information shall include identifying toxic plants, effects, and precautionary measures.

7.2.5 Bloodborne Pathogens/Potentially Infectious Materials:

7.2.5.1 Soft tissue injuries and non-occupational illness can result in potential exposure of project personnel to bloodborne pathogens and other potentially infectious materials as defined by 29 CFR 1910.1030 (Ref. 5.2).

7.2.5.1.1 These exposures shall be addressed by work practice controls, such as universal precautions and appropriate waste disposal.

7.2.5.1.2 There shall be a procedure on *Bloodborne Pathogens Exposure Controls* to detail additional information on compliance with the regulations.

7.2.5.1.3 Potential exposures during the course of this project will mainly occur with emergency or injury type incidents.

7.2.5.1.4 Incidents or possible exposures shall be promptly reported to the EH&S Manager and the Operations Manager, and the exposure will be treated through the *Bloodborne Pathogens Exposure Controls* procedure.

7.3 Extreme Temperatures

7.3.1 Heat stress and cold stress prevention programs shall be implemented during periods of warm and cold weather. Environment-related physical hazards, along with action levels and responses that could occur in individuals, are stated in Appendix A.

7.3.2 Heat:

7.3.2.1 The heat stress prevention program shall include provisions for worker acclimatization and implementation of heat stress prevention measures.

7.3.2.1.1 During periods of hot weather or when workers may be affected by heat stress, an adequate supply of cool drinking water and a shaded rest area shall be made available.

7.3.2.1.2 Drinking stations and rest areas shall be in locations approved by EH&S Manager. These stations shall be coordinated with HP personnel when working with radioactive material.

7.3.3 Cold:

7.3.3.1 For cold stress prevention, project personnel shall use properly insulated clothing for the head, hands, feet, and body.

7.3.3.2 During cold weather periods, an approved, heated shelter area shall be readily available near the work site.

7.3.4 Monitoring:

7.3.4.1 Monitoring and assessment of thermal hazards shall be established in the temperature stress procedure.

7.3.4.1.1 The Operation's Manager, EH&S Manager and project team lead personnel will evaluate environmental conditions and conduct heat stress assessment and monitoring.

7.3.4.1.2 Measurements shall be recorded and documented.

7.4 Noise

7.4.1 An effective hearing conservation program, as described in 29 CFR 1910.95 (Ref. 5.2), shall be administered to minimize potential exposures to loud noises.

7.4.2 Noise monitoring shall be conducted during demolition.

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7.4.2.1 During building demolition, standard noise abatement measures will be implemented, as necessary, based on the type of work and noise levels. These noise abatement measures could include:

7.4.2.1.1 Scheduling work to minimize the impacts;

7.4.2.1.2 Locating stationary noise sources, such as generators, as far from sensitive uses as possible; and

7.4.2.1.3 Using the best available noise control techniques where possible.

7.4.2.2 Environment-related physical hazards, along with action levels and responses that could occur in individuals, are stated in Appendix A.

7.4.2.3 A program shall be implemented whenever employee noise exposures equal or exceed the action level of an 8-hour time-weighted average (TWA) sound level of 85 decibels measured on the A-scale (slow response), or an equivalent dose of 50%.

7.4.2.4 For purposes of the hearing conservation program, employee noise exposures shall be determined without regard to attenuation provided by the use of personal protective equipment.

- 7.4.3 Whenever feasible, engineered controls shall be instituted to attenuate noise at the source to attain noise levels below the action level.
- 7.4.3.1 Equipment brought on-site shall be fitted with proper noise control devices (mufflers, pads, etc.) to limit both worker exposure and ambient noise levels.
- 7.4.3.2 Equipment shall also be maintained to limit excessive noise.
- 7.4.4 The affected personnel's employer shall establish and maintain an audiometric testing program.
- 7.4.4.1 The employer shall obtain a new audiogram for each employee exposed at or above the action level at least annually after obtaining the baseline audiogram.
- 7.4.4.2 The audiogram will be evaluated by a health professional.
- 7.4.5 Training in the use and care of hearing protectors provided to employees in the hearing conservation program.
- 7.4.5.1 The employer shall provide, ensure proper initial fitting, and supervise the correct use of hearing protectors at no cost to the employees.
- 7.4.5.2 Hearing protectors shall be replaced as necessary.
- 7.4.6 Signs shall be posted near equipment and areas that routinely exhibit noise levels at or above 90 dBA.
- 7.4.7 Typical situations using equipment where noise levels may exceed the action level include, but are not limited to, the following:
- 7.4.7.1 Compressor use.
- 7.4.7.2 Drill rig operation.
- 7.4.7.3 Electrically or pneumatically powered hand tool use.
- 7.4.7.4 Gasoline-powered hand tool and equipment use.
- 7.4.7.5 Generator use.
- 7.4.7.6 Heavy equipment operations.
- 7.4.7.7 Manlift operation.
- 7.4.7.8 Vacuum use.
- 7.4.7.9 Wood chippers.

7.5 Ergonomics

7.5.1 Repetitive motion activities, awkward postures, excessive forces or reaches, etc. can develop into musculoskeletal and other health problems such as eye strain, neck/shoulder pain, and back pain.

7.5.1.1 The following can be performed to prevent the occurrence of work-related musculoskeletal disorders:

7.5.1.1.1 Position the office furniture and equipment correctly to relieve unnecessary awkward postures. Reduce harmful positions and avoid placement that requires extreme reaches, especially to the sides or rear.

7.5.1.1.2 Use appropriate posture, change positions often, and use proper seating.

7.5.1.1.3 Use multiple personnel or mechanical means to alleviate straining.

7.5.1.1.4 Relieve individuals conducting repetitive motion activities to enable a rest, pause, and/or stretching exercises.

7.5.1.2 Careful consideration shall be exercised before heavy and bulky loads are lifted or handled manually by personnel.

7.5.1.3 Mechanical equipment such as forklifts, hand-trucks, and cranes shall be used when possible and needed.

7.5.1.4 Employees shall ensure the load can be safely handled by considering the size, weight, and shape of the load.

7.5.1.5 Individuals should not lift loads greater than 50 pounds without assistance.

7.6 Sanitation

7.6.1 In the event the sanitary facilities should become unavailable for use, the following shall apply:

7.6.1.1 Make available an adequate supply of potable water.

7.6.1.2 Provide both a sanitary dispenser and a receptacle for disposal where single-service cups are supplied.

7.6.1.3 Clearly identify containers used to distribute drinking water.

7.6.1.4 Toilets shall be provided per 29 CFR 1926.51 (Ref. 5.3).

7.7 Electrical Hazards

- 7.7.1 Work shall not be performed on energized circuits without an approval by a competent person and written authorization in the form of an approved work package from the EH&S Manager and the HDP Manager responsible for the work.
- 7.7.1.1 Specific procedures on compliance with the regulations shall be established. Only qualified electricians as defined by Reference 5.2 may perform activities associated with potentially energized wiring or systems.
- 7.7.1.2 Personal protective equipment and clothing described by Reference 5.2 shall be used for protection against electrical hazards.
- 7.7.1.3 Only a qualified person may repair electrical equipment.
- 7.7.2 A qualified person shall approve new electrical installations before being energized.
- 7.7.2.1 Such installations shall comply with National Fire Protection Association (NFPA) 70 (Ref. 5.5), and 29 CFR 1926 Subpart K (Ref. 5.3).
- 7.7.2.2 Provide covers over equipment such as electrical panels, junction boxes, and similar equipment to which service is not connected and open knockouts are present.
- 7.7.2.3 Label 480-volt or greater lines with "High Voltage" or an equivalent warning.
- 7.7.3 Job trailers shall have a main service disconnect located at a readily accessible location outside and within 30 feet of the trailer, but not attached to the trailer.
- Label breaker boxes, electrical receptacles, and feed lines to identify the circuits they are feeding or are being fed from.
- 7.7.4 Provide breaker boxes and disconnects with unobstructed access 36 inches in front of the unit.
- 7.7.4.1 Wiring being disconnected and removed from service shall be air gapped from the panel before removing.
- 7.7.4.2 An additional hazard is capacitors that may retain a charge. Properly ground such items before handling.
- 7.7.5 Connect temporary lighting through a ground fault circuit interrupter (GFCI) unless the electrical connections are different from other electrical hookups and cannot be mistakenly exchanged.

- 7.7.5.1 Equip lights with protective, nonconductive covers, and ensure bulbs in light stringers are shatter resistant.
- 7.7.5.2 Exposed, empty light sockets or broken bulbs are not permitted. Replace defective light bulbs in a timely manner.
- 7.7.6 Flexible cords and cables (extension cords) shall be plugged into a GFCI, to protect from accidental electrocution.
 - 7.7.6.1 Avoid sharp corners and projections or take protective measures to protect the equipment from damage (softeners).
 - 7.7.6.2 Where passing through doorways or other pinch points, flexible cords and cables shall be provided with protection to avoid damage.
 - 7.7.6.3 Electrical cords shall be Underwriters Laboratory (UL) listed by way of a label attached to the cord and be free from fraying or any other damage.
 - 7.7.6.4 Electrical cords shall be used for their intended purpose, for example: only using exterior type cords for outdoor situations, using cords with the appropriate amperage rating for the equipment that will connected.
 - 7.7.6.5 If cords must extend across a walking working surface, proper marking shall be done with visible tape or covering the cord with commercially available covers.
 - 7.7.6.6 All equipment grounding conductors will be tested for continuity.
 - 7.7.6.7 Each receptacle and attachment cap or plug will be tested for correct attachment of the equipment grounding conductor ensuring the grounding conductor is connected to its proper terminal.
 - 7.7.6.8 Inspection and testing will occur at intervals not to exceed 3 months, except that cord sets and receptacles which are fixed and not exposed to damage shall be tested at intervals not exceeding 6 months.
- 7.7.7 Keep clear conductive equipment (such as drill rigs, backhoes, cranes, etc.) and their loads from energized power lines.
 - 7.7.7.1 For lines rated 50 kV or below, minimum clearance between the lines and any part of the equipment or load shall be 10 feet.

7.7.7.2 For lines rated over 50 kV, minimum clearance between the lines and any part of the equipment or load shall be 10 feet plus 0.4 inch for each 1 kV over 50 kV, or twice the length of the line insulator, but not less than 10 feet.

7.7.8 Lightning is a hazard during outdoor operation, particularly for workers handling metal containers or equipment.

To eliminate this hazard, weather conditions shall be monitored and outside work suspended during electrical storms.

7.8 Lockout/Tagout of Energized Sources

7.8.1 Project personnel shall administer a program consisting of energy control procedures, appropriate equipment, employee training, and periodic inspections to prevent the unexpected energizing or start-up of equipment, or release of stored or potential energy, that could occur and cause injury.

7.8.1.1 Specific procedures on compliance with the regulations shall be established.

7.8.1.2 The program shall ensure machinery or equipment is isolated from the energy source and rendered inoperative before an employee performs servicing, maintenance, or more than visual inspection.

7.8.2 Sources of active and potential energy shall be locked out/tagged out (LO/TO) in accordance with approved procedures.

7.8.2.1 Stored energy sources shall be locked out and a tag applied to the breaker, valve, etc., indicating the equipment or system could potentially injure a worker due to a sudden release of energy.

7.8.2.2 Piping, electrical lines, etc., shall be isolated before dismantling equipment to ensure a sudden release of energy is not encountered.

Once system-related sources of energy are isolated, verification shall be performed to confirm the system is properly isolated and will not become energized.

7.8.3 Implementation of the lockout/tagout will be as described in 29 CFR 1910.147 (Ref. 5.2).

7.9 Confined Space Entry

7.9.1 Permit Require Confined Spaces as defined by 29 CFR 1910.146 (Ref. 5.2), shall be communicated to site personnel by posting danger signs,

or other equally effective means, of the existence, location of, and the danger posed by such spaces.

- 7.9.2 Controls shall be implemented as described in 29 CFR 1910.146 (Ref. 5.2).
- 7.9.3 Specific procedures shall be established for compliance with the regulations.
- 7.9.4 Note: A sign reading:

**“DANGER
PERMIT REQUIRED
CONFINED SPACE, DO NOT ENTER”**

or similar language would satisfy the requirement for a sign marking a Permit-Required Confined Space.

If employees access permit spaces, the WEC HDP shall have available and implement a written permit space program available to employees and to Westinghouse inspection.

- 7.9.5 Air monitoring shall be provided to support confined space entries via a Confined Space Entry Permit in accordance with approved Westinghouse procedures used for compliance on the Hematite site.
- 7.9.6 As required by OSHA regulations, continuous monitoring shall be performed in spaces that cannot be isolated.

7.9.6.1 Entry into a confined space where atmospheric monitoring identifies contaminants (CO, H₂S, LEL, etc.) above permissible levels, or oxygen content below 19.5% or above 23.5%, requires direct supervision by the EH&S Manager or designee.

7.9.6.2 The source of such contaminants and oxygen depletion/enrichment shall be determined, and appropriately corrected and/or controlled.

7.10 Excavations

- 7.10.1 29 CFR 1926, Subpart P (Ref. 5.3) and HDP procedures, used for compliance on the Hematite site, are very specific with respect to excavations, whether made by powered equipment or by hand.

The work planning system will assist in regulating excavation methods that could cause a personnel safety hazard, damage to a buried or unburied utility or other item, or that could cause a spill.

- 7.10.2 The HDP Manager responsible for the excavation work and the EH&S Manager shall be notified at least two days before the commencement

of excavation work. A work package shall be completed and reviewed in accordance with applicable procedures prior to the start of work.

7.11 Ladders

- 7.11.1 Ladders shall be inspected upon arrival to the site and monthly thereafter.
- 7.11.2 Individuals will inspect each ladder prior to use – documentation of this pre-use inspection is not required.
 - 7.11.2.1 Ladders shall be at least visually inspected before use and properly stored when not in use.
 - 7.11.2.2 Tools and material shall not be left on the top platforms of unattended ladders, and material shall never be stored on ladders.
 - 7.11.2.3 Ladders shall be labeled with legible manufacturer instructions and warning labels.
 - 7.11.2.4 Ladders shall not be painted except for identification marks.
- 7.11.3 Ladders shall be type 1A and shall be wooden or have fiberglass side rails with metal rungs.
 - 7.11.3.1 The bases and landings of all ladders shall be kept clear of obstacles.
 - 7.11.3.2 Stepladders shall not be used as straight ladders, and extension ladders shall not be separated for use.
 - 7.11.3.3 Ladders shall be equipped with skid-resistant feet.
 - 7.11.3.4 If a ladder is used in a doorway, the doorway shall be barricaded or protected by an attendant.
 - 7.11.3.5 Ladders shall not be used in lieu of elevated work platforms.
- 7.11.4 Employees shall not carry material when climbing ladders, nor shall tools or equipment be thrown to or from personnel on ladders.
 - 7.11.4.1 Hand lines shall be used to hoist and lower material in those situations.
 - 7.11.4.2 Personnel shall not climb to the top step or top platform of any ladder.
 - 7.11.4.3 When in use, straight or extension ladders shall be held or secured by tying off, and at least 3 feet of the ladder shall

extend above the upper landing surface to which the ladder is used to gain access.

7.11.4.4 When such an extension is not possible because of the ladder's length, the ladder shall be secured at its top to a rigid support that meets the following:

7.11.4.4.1 Secured such that it will not deflect;

7.11.4.4.2 Provided a grasping device such as a grab rail.

7.11.4.5 Step ladders should be held when standing height exceeds 6 feet.

7.11.4.6 Personnel working on ladders shall not straddle the ladder or overreach so that the body is no longer between the side rails.

7.11.4.7 Ladders shall not be used within 3-feet of energized electric power lines.

7.11.4.8 Extension and straight ladders shall be used at a nominal slope of 4-feet rise to 1-foot run.

7.12 Scaffolds

7.12.1 Scaffolds shall be designed by a qualified person, as defined by 29 CFR 1926.450 (Ref. 5.8), and shall be constructed and loaded in accordance with that design.

Each scaffold and scaffold component shall be capable of supporting, without failure, its own weight and at least 4 times the maximum intended load applied or transmitted to it.

7.12.2 Before the scaffold is used, direct connections shall be evaluated by a competent person, as defined by 29 CFR 1926 (Ref. 5.3) who needs to confirm, based on the evaluation, that the supporting surfaces are capable of supporting the loads to be imposed.

A competent person shall inspect scaffolds at least at the beginning of the work shift to verify that the load bearing structures are secure.

7.12.3 Scaffolding shall be erected and used in accordance with 29 CFR 1926 Subpart S (Ref. 5.3).

7.12.4 Components and accessories shall be installed according to the manufacturer's instructions, utilizing parts and sections that came from the same manufacturer, or the equivalent.

7.12.4.1 Components and accessories shall not be altered. Decks shall be the full width of the scaffold at least two standard scaffold planks wide (each plank 12 inches).

7.12.4.2 Planks shall be cleated to prevent supports from slipping. Scaffold planks shall not be used for other purposes.

7.12.5 A competent person as referenced in 7.12.2 shall inspect scaffolds and properly tag when being erected, altered, moved, or dismantled.

7.12.5.1 Scaffolds shall not be overloaded. When accessing or exiting a scaffold, use only the attached ladder.

7.12.5.2 Personnel shall wear full body harnesses and be properly tied-off whenever required by the instructions on a "CAUTION" tag.

7.12.6 Rigging shall not be performed from ANY scaffold member, including top rails, mid-rails, or braces.

7.13 Slip/Trip/Fall Hazards

7.13.1 Some areas may have wet surfaces that will greatly increase the hazard of inadvertent slips.

7.13.1.1 Exercise caution when using steps and stairs due to slippery surfaces.

7.13.1.2 Use handrails when climbing steps and stairs. Good housekeeping practices are essential to minimizing hazards.

7.14 Fall Protection (Six Feet or more)

7.14.1 The Decommissioning project requires the use of fall protection systems so project personnel are protected from a potential fall of 6 feet or greater to the next level.

7.14.2 Such systems shall place primary reliance on engineered controls such as standard safety railings, then on administrative controls such as warning lines set at least 6 feet from the fall hazard, and finally on personal protective equipment such as lifelines and body harnesses.

7.14.2.1 The fall protection standards in 29 CFR 1926 Subpart M (Ref. 5.3) and Westinghouse procedures used for compliance at the Hematite Facility shall be strictly enforced.

7.14.2.2 This may require more than one fall protection system or a combination of prevention or protection measures.

7.14.3 Preventive Measures

7.14.3.1 Each special project will address the following applicable risks and preventive measures through work packages:

7.14.3.1.1 Identify fall hazards in the work area.

7.14.3.1.2 Describe the method of fall arrest or fall restraint to be provided, including drawings that may be deemed necessary.

7.14.3.1.3 Procedures for the assembly, maintenance, inspection, and disassembly of the fall protection system to be used shall be made available upon request.

7.14.4 Fall Restraint, Fall Arrest Systems

7.14.4.1 A full body harness, conforming to ANSI Standard Class III, shall be used when personal protective equipment is required for fall protection; safety belts shall not be permitted.

7.14.4.2 Vertical lifelines may be used only in conjunction with a manufactured rope-grab system.

7.14.4.3 Wire rope lifelines shall have a minimum of three wire rope clips.

7.14.4.4 Rope grab devices are prohibited for fall restraint applications unless they are part of a fall restraint system designed specifically for the purpose by the manufacturer and used in strict accordance with the manufacturer's recommendations and instructions.

The employer shall ensure component compatibility.

7.14.4.5 Components of fall restraint systems shall be inspected before each use for mildew, wear, damage, and other deterioration and defective components shall be removed from service if their function or strength has been adversely affected.

7.14.4.6 Anchorage points used for fall restraint shall be capable of supporting four times the intended load, with a minimum capacity of 5,000 pounds.

7.14.4.7 Restraint protection shall be rigged to allow the movement of employees only as far as the sides and edges of the walking/working surface.

7.14.4.8 Materials shall not be stored within 6 feet of a roof edge or equivalent fall hazard unless guardrails are erected.

7.15 Hoisting and Rigging

7.15.1 During hoisting and rigging operations, the potential exists for project personnel to have suspended loads dropped on them, be caught between the load and other stationary objects, be crushed, or be struck by loads.

7.15.1.1 Rigger's signalmen shall be properly trained, and documentation of training shall be provided.

7.15.1.2 Rigging shall be performed in accordance with 29 CFR 1926 (Ref. 5.3) and procedures established on the HDP Site.

7.15.1.3 Major rigging operations (e.g., greater than 10,000 pounds or greater than 75% of the rated capacity of the crane) shall be planned and supervised by competent personnel to ensure the best methods and most suitable equipment are employed.

7.15.2 Equipment Inspection and Testing:

7.15.2.1 When special fabricated devices are required for hoisting and rigging operations (e.g., lifting beams, material baskets, and spreader beams), the design and calculations for the device shall be reviewed and approved by qualified individuals. Such approvals shall be documented.

7.15.2.2 Job-built rigging and hoisting equipment shall be tested at 125% of rated capacity, and such tests shall be observed and documented by a qualified individual.

Hoisting and rigging equipment shall be load tested at least annually by a competent person, who, by training and experience, is capable of recognizing defects and taking the appropriate action to correct or eliminate them.

7.15.2.3 Hoisting and rigging equipment shall be visually inspected before each use by a competent person.

7.15.2.4 Reviews, approvals, tests, and other than visual inspections shall be documented.

7.15.2.5 Rigging shall be stored in a rigging loft or an equivalent area where it will not be exposed to the elements.

7.15.3 Safe Working Loads:

- 7.15.3.1 Hoisting and rigging equipment shall not be loaded in excess of the safe working load limits in Tables H-1 through H-20 of 1926.251 (Ref. 5.3).
- 7.15.3.2 For sizes, classifications, and grades not included in these tables, the safe working load recommended by the manufacturer for specific, identifiable products shall be followed, provided that a safety factor of not less than 5 is maintained.
- 7.15.3.3 Rigging equipment such as slings, chokers, hooks, clamps, or other lifting accessories shall be clearly marked to indicate their capacity, and shall be proof-tested before initial use to 125% of their rated load.
- 7.15.3.4 The load weight shall be determined before it is rigged. The gross load, which is the sum of the weight of the rigging, block, hooks, lifting beam, stowed or erected jibs, headache ball, other elements of rigging or equipment and the load, shall be accounted for when determining hoisting equipment.
- 7.15.3.5 The center of gravity shall be below the hook and below the lowest point of attachment to ensure stability.

7.15.4 Ropes and Slings:

- 7.15.4.1 Wire ropes shall be kept in good repair and without deformities.
- 7.15.4.2 Wire ropes with visual indication of kinking, crushing, unstranding, birdcaging, main strand displacement, core protrusion, loss of rope diameter, unevenness of outer strands, corrosion, heat damage, abrasion, broken wires or strands and cracked, worn, inappropriate, or deformed end attachments should be considered in evaluation of sling replacement.
- 7.15.4.3 Natural and synthetic rope or web slings shall be immediately removed from service if there is indication of acid or caustic burns, melting or charring of the sling surface, snags, punctures, tears or cuts, broken or worn stitches, distortion of fittings, discoloration or rotting, or showing of the red warning line.

7.15.4.4 Knotted or kinked slings shall be considered permanently damaged and shall be removed from service and rendered unusable prior to disposal.

7.15.4.5 When estimating sling capacity using multi-legged slings, only two of the legs shall be considered to carry the full load.

7.15.5 Lifting Practices:

7.15.5.1 Loose pieces of material shall be removed from the load before moving.

7.15.5.2 The load shall be kept under control, such as by the use of tag lines.

7.15.5.3 Personnel shall keep body parts out of pinch points, especially while slack is taken up.

7.15.6 Weather Conditions:

7.15.6.1 Outdoor rigging or hoisting operation shall not be carried out when weather conditions could cause the operation to be hazardous to personnel or property.

7.15.6.2 The size and shape of loads shall be examined to determine if a hazard exists during high winds.

7.15.6.3 Wind loading shall not exceed equipment capacity. The operation shall be suspended when wind speeds reach 25 or greater, or when visibility is impaired by darkness, snow, fog, or rain.

7.15.6.4 An incident occurring during hoisting/rigging activities that may affect personal safety or operational safety of equipment shall be promptly reported to the EH&S Manager and HDP Manager responsible for the work.

7.16 Heavy Equipment Operation and Inspection

7.16.1 Heavy equipment operations (excavators, dozers, compactors, etc.) pose a safety hazard to ground personnel.

7.16.1.1 Such equipment shall be operated and maintained to meet the design and construction requirements established by the manufacturer and applicable OSHA standards.

7.16.1.2 Certifications and test results shall be provided when the equipment is brought on site by the contractor.

7.16.1.3 Rated lifting capacities shall be marked in a prominent location, and shall not be exceeded.

7.16.2 Applicable procedures shall be followed when operating heavy equipment.

7.16.2.1 The employer shall certify that each operator has been trained and evaluated as required by OSHA standards.

7.16.2.2 The certification shall include the name of the operator, the date of the training, the date of the evaluation, the identity of the person(s) performing the training or evaluation, and the equipment for which the employee has been qualified.

7.16.2.2.1 Documentation shall be maintained by the HDP Manager responsible for the work, or designee.

7.16.2.2.2 The operator is responsible for performing inspections before the equipment is placed in service on each shift to identify defects or non-functioning safety devices that would render the equipment unsafe to operate.

7.16.2.2.3 Such equipment shall be tagged out of service until repaired.

7.17 Powered Industrial Trucks and Aerial Lifts

7.17.1 Powered industrial trucks shall meet the requirements of 29 CFR 1910.178 (Ref. 5.20).

7.17.2 At the HDP, aerial lifts shall meet the requirements of Reference 5.3 for design, construction, stability, inspection, testing, maintenance, and operation.

7.17.2.1 The operator is responsible for performing inspections before the equipment is placed in service on each shift to identify defects or non-functioning safety devices that would render the equipment unsafe to operate.

7.17.2.2 Such equipment shall be tagged out of service until repaired according the Powered Industrial Trucks and Aerial Equipment procedure.

7.18 Hand and Power Tools

7.18.1 Hand and power tools shall be maintained in a safe and proper working condition.

- 7.18.2 They shall be used only for their manufacturer's intended purpose. They shall be visually inspected at least at the beginning of each shift in which they are used; more frequent inspections may be necessary due to task-specific hazards.
- 7.18.3 Defective tools shall be promptly marked out of service with a tagout, and removed to the appropriate staging area for repair or disposal.
- 7.18.4 Supervisors should be informed of defective tools.
- 7.18.5 Hand Tools:
 - 7.18.5.1 Tools with mushroomed heads, split handles, worn or missing teeth or flats, or similar defects are prohibited.
 - 7.18.5.2 "Cheater pipes" are not allowed.
 - 7.18.5.3 Only non-sparking tools shall be used where there are flammable vapor concentrations.
 - 7.18.5.4 Tools used on or around electrical equipment or circuits shall have insulated handles.
- 7.18.6 Portable Electric Tools:
 - 7.18.6.1 Single-phase electrical hand tools shall be approved by a recognized agency.
 - 7.18.6.2 The exposed, non-current carrying, metal parts of such tools shall be grounded or double insulated.
 - 7.18.6.3 Only properly trained and qualified personnel may make electric tool repairs.
 - 7.18.6.4 Project personnel shall be trained in the proper use of their power tools.
- 7.18.7 Safe work practices, including the use of appropriate tooling, guards, and PPE, shall be required to avoid the following major hazards of portable electric tools:
 - 7.18.7.1 Torque.
 - 7.18.7.2 Flying debris.
 - 7.18.7.3 Contact with moving parts.
 - 7.18.7.4 Power source.

7.19 Life Safety and Fire Protection

- 7.19.1 The design, maintenance, inspection, and operation of fire protection systems and equipment shall be in accordance with NFPA 10, 25, 72

and 101 (Ref. 5.6, 5.7, 5.8 and 5.9, respectively), and 29 CFR 1926.150 (Ref. 5.3).

7.19.2 Fire Prevention

7.19.2.1 Necessary and appropriate precautions shall be taken to prevent fires and explosions.

7.19.2.2 Internal combustion engines or heaters shall not be permitted to operate in buildings unless authorized by EH&S.

7.19.2.3 Engines shall be turned off while refueling.

7.19.2.4 Storage of flammable fuels shall be carefully monitored. Handling and storage of liquid fuels such as gasoline and diesel shall be conducted in accordance with Reference 5.2 and Reference 5.10. Handling and storage of liquefied petroleum gas shall be conducted in accordance with Reference 5.11.

7.19.3 Means of Egress:

7.19.3.1 Exits and exit aisles shall be maintained not less than three feet of clear travel path.

7.19.3.2 Exit signs shall identify exit paths. At least two paths shall be provided from each work area.

7.19.3.3 Lighting shall be provided as necessary to maintain at least five foot-candles at indoor and outdoor work areas and along exit paths.

7.19.4 Alarm Systems:

7.19.4.1 Alarms shall be capable of being perceived above ambient environmental conditions.

7.19.4.2 Visual or tactile alarms should be used where environmental conditions or other circumstances significantly diminish an audible alarm's effectiveness.

7.19.4.3 The Fire Protection procedure will address system activation, identification, and impairment shall be established.

7.19.4.4 Alarm systems shall be tested quarterly to ensure their adequacy and reliability.

7.19.5 Portable Fire Extinguishers:

7.19.5.1 Fire extinguishers shall be made available for use by project personnel against incipient-stage fires, although those personnel are not required to fight fires.

7.19.5.2 Each fire extinguisher shall have a label which designates the extinguisher's type, and which identifies the materials on which it should be used.

7.19.5.3 A fire extinguisher, rated not less than 2A, shall be provided for each 3,000 square feet of the protected building area, or major fraction thereof.

7.19.5.3.1 Travel distance from any point of the protected area to the nearest fire extinguisher shall not exceed 100 feet.

7.19.5.3.2 The overall rating of the fire extinguisher in each protected area shall encompass the classes of fire hazards found in that area.

7.19.5.4 One or more fire extinguishers, rated not less than 2A 10BC, shall be provided on each floor.

In multistory buildings, at least one fire extinguisher shall be located adjacent to stairway.

7.19.5.5 Fire extinguishers subject to freezing shall be protected from freezing.

7.19.5.6 A fire extinguisher, rated not less than 10B, shall be provided within 50 feet of wherever more than 5 gallons of flammable or combustible liquids or 5 pounds of flammable gas are being used, excluding the integral fuel tanks of motor vehicles.

7.19.5.7 Carbon tetrachloride and other toxic vaporizing liquid fire extinguishers are prohibited.

7.19.5.8 Extinguishers shall be subject to inspections, maintenance, and periodic testing as required by NFPA 10 (Ref. 5.6), including those for use on Class D fires.

7.19.6 Fixed Suppression Systems:

7.19.6.1 Systems, where provided, shall be designed, installed, and maintained so they are protected from freezing, surface corrosion, and mechanical damage.

- 7.19.6.2 The condition of the hydrants and control valves shall be visually inspected at least monthly.
- 7.19.6.3 The operability of water flow and supervisory alarms shall be tested at least quarterly.
- 7.19.6.4 The operability of hydrants, control valves, and main drain valves shall be tested at least annually.

7.19.7 Detection Systems

- 7.19.7.1 Detectors, where provided, shall be compatible with the operating environment and securely installed in a manner protecting them from mechanical or physical damage.
- 7.19.7.2 Procedures shall be established to provide equivalent protection during system impairment.
- 7.19.7.3 Operable detection systems shall be tested at least annually to ensure their adequacy and reliability.

7.20 Hot Work

- 7.20.1 Hot work includes the use of an open flame or torch, high-intensity electric or plasma arc, or grinding that project sparks more than 3-feet from the point of operation.

Employees performing welding, cutting, or heating shall be protected by PPE that is appropriate for the hazards present.

- 7.20.2 Welding and cutting equipment and operations shall be in accordance with standards and recommended practices of 29 CFR 1926, Subpart J (Ref. 5.3) and NFPA 51B (Ref. 5.12).

- 7.20.2.1 Compatible fire extinguishing equipment shall be provided in the immediate vicinity of welding or cutting operations.

- 7.20.2.2 Before conducting hot work operations, the area shall be evaluated to ensure it is free of the following hazards.

- 7.20.2.3 Such hazards shall be removed, the work shall be relocated to a safer area, or the hazard shall be adequately protected by approved engineered or administrative controls.

- 7.20.2.3.1 Appreciable combustible materials within 35-feet.

- 7.20.2.3.2 Passage of sparks to adjacent areas.

- 7.20.2.3.3 The presence or possible generation of potentially explosive atmospheres (flammable gases, vapors, liquids, or dusts), and the

presence or nature of an oxygen-enriched atmosphere.

7.20.3 The Hot Work Procedure will control hot work and related activities by means of a permit noting the presence of a fire watch.

7.20.3.1 Project personnel who function as fire watches shall be trained in the proper method of providing such a service.

7.20.3.2 Fire watches shall remain for a minimum of 30 minutes after hot work has ceased to ensure that sparks or embers do not cause fire.

7.20.3.3 The time the fire watch remains after the termination of hot work may be shortened or extended but this shall be specified on the permit for that area and activity and approved by EH&S.

7.20.3.4 Hot work requirements shall be specifically called out in work packages so that sufficient planning may be performed in advance of the activity.

7.20.3.5 Cutting or burning shall be prohibited around manila or nylon lifeline ropes.

7.20.3.6 Fall protection equipment used around hot work activities shall be inspected before beginning or returning to work including breaks.

7.21 Personal Protective Equipment

7.21.1 Appropriate PPE shall be worn by individuals involved in operations where hazardous exposure conditions (either to contaminants, physical hazards or hazardous materials) may exist.

7.21.1.1 Westinghouse procedures established for compliance with general and chemical hazards on the Hematite site. PPE selection and use shall be in accordance with OSHA regulations and this HASP.

7.21.1.2 PPE requirements for each activity will be detailed in the work package for that activity.

7.21.2 Respiratory protection requirements are outlined in a separate policy and procedure document.

7.21.3 General Work Area Safety Apparel

7.21.3.1 Minimum safety apparel shall consist of durable work clothing consisting of a shirt and pants or coveralls. Shorts

will be allowed when heat stress is a hazard, and their use is not precluded by PPE considerations.

7.21.3.2 ANSI Z-89.1 Hard hats where overhead hazards are identified such as but not limited to overhead hazards.

7.21.3.3 ANSI Z-87.1 Eye and/or face protection, consisting of a face shield, goggles or safety glasses with side shields where flying chips, debris, chemicals, and similar hazards are identified.

7.21.3.4 ANSI Z-41 Safety shoes/boots or approved shoe covers where heavy objects, equipment, or similar hazards are identified.

7.21.3.5 Safety glasses with side shields and safety shoes are required for project personnel in active construction, demolition, excavation, remedial investigation, and similar work areas.

7.21.3.6 Additional PPE, such as chemical protective clothing, may be necessary. This shall be determined through the work planning process, and described in PPE Hazard Assessment Pages found in the established HDP procedure.

7.21.4 Donning and Doffing PPE

7.21.4.1 Instructions for donning and doffing PPE shall be posted at dress out and exit points for the radiation restricted areas and discussed in training sessions for chemical exposures as required.

7.21.4.2 PPE removal methods to minimize spread of radiological and chemical contamination of inner garments are a skill taught during training activities, and are monitored as part of the project surveillance program.

7.21.4.3 Personnel shall receive training on the donning and doffing of PPE before entering a restricted area.

7.21.4.3.1 Personnel shall be dressed in the proper PPE before entering a restricted area.

7.21.4.3.2 The user shall inspect PPE before its use. Defective or damaged PPE shall not be worn.

7.21.4.3.3 PPE shall be doffed after egress from the access control point in such a manner and order so as to minimize cross contamination.

- 7.21.5 Reassessment of PPE requirements.
 - 7.21.5.1 The level of protection provided by PPE selection may be upgraded or downgraded based upon site condition changes or investigation findings.
 - 7.21.5.2 When a significant change occurs, the hazards shall be reassessed.
 - 7.21.5.3 Some indicators of the need for reassessment are:
 - 7.21.5.3.1 Commencement of a new phase of work.
 - 7.21.5.3.2 Change in job tasks during a work phase.
 - 7.21.5.3.3 Individual medical considerations limiting the effectiveness of PPE.
 - 7.21.5.3.4 Contaminants other than those previously identified are encountered.
 - 7.21.5.3.5 Change in levels of contaminants in the work area.
 - 7.21.5.3.6 Change in the degree of contact with contaminants.

7.22 Potential Exposures

- 7.22.1 Although chemical hazards have not been identified as a problem, a potential exists for their presence during Decommissioning operations.
 - 7.22.1.1 Recommended Exposure Limits (REL), which are proposed by the National Institute for Occupational Safety and Health (NIOSH), provide non-mandatory guidance for exposure control based on the latest available information.
 - 7.22.1.2 Mandatory exposure limits are based on the lower of these two exposure guidances: OSHA Permissible Exposure Limits (PEL) from 29 CFR 1910, Subpart Z (Ref. 5.2) or ACGIH TLV (Ref. 5.16).
 - 7.22.1.3 Personal exposure above the PEL or the TLV require the immediate application of engineered or administrative controls, PPE, or cessation of the work activity.
 - 7.22.1.4 Such overexposures are not expected during this project because of appropriate work planning and controls.

- 7.22.1.5 An investigation into the cause of an overexposure shall be initiated by the HDP Manager responsible for the work or the EH&S Manager, and documented.
- 7.22.1.6 Nuisance dusts, such as from the conduct of various decontamination or demolition processes, are a credible hazard.
- 7.22.2 The goal is to utilize engineered controls as the primary means of chemical exposure control. If engineered controls cannot accomplish this, additional administrative controls shall be used to supplement them.
- 7.22.3 Appendix B provides a list of project-specific chemical hazards broken down into three separate categories:
 - 7.22.3.1 Chemical Contaminants.
 - 7.22.3.2 Metals and Metalloids.
 - 7.22.3.3 Natural and Manmade Fibers.
- 7.22.4 Included in Appendix B is the following information:
 - 7.22.4.1 Health effects and potential hazards associated with chemicals, the way project personnel can contact the material in the field, the acute and/or chronic responses accompanying exposure to the materials, and symptoms of exposure.
 - 7.22.4.2 Chemical and/or physical properties for each of the materials that include a description of the material, its solubility in various materials (usually stated as soluble in water) and relative volatility (in terms of vapor pressure) and provides information regarding the actual ability of a substance to be released upon disturbance by HDP activities.
 - 7.22.4.3 Routes of exposure to each of the contaminants are listed to aid in the selection of PPE. The four pathways of exposure to industrial contaminants are inhalation, ingestion, injection, and skin absorption.
- 7.22.5 In addition to exposure, several of the contaminants listed could cause injury from short-term (acute) exposure without chronic overtones (for example, skin burns from short-term exposure to an acid).

7.23 Airborne Hazardous Chemicals

7.23.1 This section describes the requirements to evaluate potential exposure of project personnel to airborne hazardous (non-radiological) chemicals, monitoring, and action levels requiring additional controls.

7.23.1.1 Summaries are found in Appendix C.

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7.23.1.2 Common industrial hygiene practices, such as: administrative (spend less time in exposure situation) or engineering controls (such as local ventilation), are employed to protect against non-radioactive hazardous gases including but not limited to ammonia, hydrogen fluoride, organic solvent vapors, and nitrous oxides.

7.23.2 Where feasible, engineered controls are used to maintain personnel exposures below the applicable TLV or PEL whichever is more stringent.

7.23.2.1 The EH&S Manager evaluates monitoring results to identify potential hazards.

7.23.2.2 Individuals are notified in writing within 15 days of air monitoring results, and the results are reviewed with monitored individuals and their Supervisor.

7.23.2.3 The EH&S Manager shall post air-monitoring results in a prominent location in the workplace for review by project personnel.

7.23.3 Generally, air monitoring is performed in an individual's breathing zone, the affected work area, and outside of that work area.

7.23.3.1 Such monitoring is performed to verify that the engineered controls, administrative controls, work practices, and/or PPE provide adequate protection to the individuals performing the work activity and personnel in adjacent areas.

7.23.3.2 The individual conducting monitoring shall be responsible to demonstrate proficiency to the EH&S Manager before performing air-monitoring activities.

7.23.4 Tampering with monitoring devices shall not be tolerated, and may result in immediate dismissal of the responsible individual from the project.

7.23.5 Asbestos:

7.23.5.1 Asbestos has been identified as a potential concern for this project.

7.23.5.1.1 Qualified project personnel are permitted to remove Category II non-friable asbestos that is below threshold quantities provided the work is performed under an approved work package.

7.23.5.1.2 If it becomes necessary to disturb and remove asbestos beyond that described above, the removal shall be performed by a certified asbestos remediation company.

7.23.5.1.3 Such a company shall make the notifications required by the Federal Government and the State of Missouri, and shall obtain required permits before commencing work.

7.23.6 Polychlorinated Biphenyls (PCBs):

7.23.6.1 PCB samples may be taken based upon evaluation of prior PCB surveys performed at the site or if PCB contamination is suspected.

7.23.6.2 If it is demonstrated that there is a potential PCB contamination concern, sampling shall be performed and analyzed by the NIOSH methods for area and breathing zone air samples, and surface samples shall be analyzed by approved EPA mandated methods.

7.23.7 Lead and Heavy Metals:

7.23.7.1 Representative exposure monitoring for airborne lead shall be performed in accordance with 29 CFR 1926.62 (Ref. 5.3) during work activities having the potential to liberate lead fume.

7.23.7.1.1 Cold cutting and abrasive operations shall also be sampled to determine potential for exposure to airborne lead contamination.

7.23.7.1.2 Medical surveillance shall be conducted in accordance with 29 CFR 1926.62 (Ref. 5.3).

7.23.7.2 Lead exposures shall be initially characterized, and then monitoring of lead workers as required by the lead exposure standard would be routinely performed.

7.23.7.2.1 This monitoring would include sampling of a representative number of employees, and collecting area air samples where appropriate, based upon the movement of air in the work area.

7.23.7.3 Heavy metals other than lead may be encountered when painted or primed surfaces are cut using either hot or cold cutting methods.

7.23.7.3.1 Air monitoring of size reduction operations on painted items shall be conducted to ensure that potential exposures are quantified for the various tasks, and that appropriate personal protection measures are taken.

7.23.8 Mercury Vapor Monitoring:

7.23.8.1 Should the project require mercury monitoring, it shall be performed by use of colorimetric detector tubes, direct reading mercury vapor instruments, or use of collection media via air sampling.

7.23.8.1.1 The method selected shall be dependent upon the operation's potential to generate airborne mercury.

7.23.8.1.2 Monitoring frequency and sample quantity shall be determined on a case-by-case basis.

7.23.8.1.3 High and medium risk activities shall receive greater quantification of sampling results and a higher degree of confidence.

7.23.9 Silica:

7.23.9.1 Silica may become present during concrete demolition activities.

Air samples shall be collected when there is a potential to generate airborne dust containing more than 1% crystalline silica.

7.23.10 Torch/Plasma Arc Cutting Monitoring:

7.23.10.1 Air monitoring during hot work operations may occur to determine potential exposure consequences from lead, heavy metals, and metallic components of steel or galvanized iron to employees.

7.23.10.1.1 This air monitoring shall be representative based on operational potentials to cause exposure to individuals, and may be tailored based on sampling results.

7.23.10.1.2 The monitoring shall ensure that potential exposures are identified, and that appropriate personal protective measures are taken.

7.23.10.2 Monitoring of the contents of piping or equipment shall also be performed prior to cutting to minimize the potential for cutting into closed systems having trapped flammable and/or explosive materials.

7.23.11 Volatile Organic Compounds (VOCs):

7.23.11.1 Volatile Organic Compounds (VOCs) are organic chemicals which have a high vapor pressure and easily form vapors at normal temperature and pressure.

7.23.11.2 The term VOC is generally applied to organic solvents, certain paint additives, aerosol spray can propellants, fuels (such as gasoline and kerosene), petroleum distillates, dry cleaning products and many other industrial and consumer products ranging from office supplies to building materials.

7.23.11.3 Trichloroethylene (TCE) and Tetrachloroethylene (Perchloroethylene or PERC) are two VOCs that have been detected in soils and groundwater at the Decommissioning project.

7.23.12 Oxygen Monitoring:

7.23.12.1 Oxygen monitoring, although mostly performed to support confined space entries, may also be performed in excavations, material handling, and hot cutting operations in enclosed areas.

7.23.12.2 Where conditions warrant, the EH&S Manager may require oxygen monitoring on a continual basis.

7.23.13 Explosive/Flammable Atmosphere:

7.23.13.1 Monitoring for explosive/flammable atmospheres, although mostly performed to support confined space entries, may also be performed in excavations, material handling and hot cutting operations in enclosed areas.

7.23.13.2 Where conditions warrant, the EH&S Manager may require explosive atmosphere monitoring on a continual basis.

7.24 Hazard Communication Program

7.24.1 Decommissioning project activities shall comply with HDP Policies and Procedures.

7.24.1.1 Project personnel will submit to EH&S a copy of the Material Safety Data Sheet (MSDS) for each hazardous chemical for review and approval before the chemical is brought onto the site.

7.24.1.2 EH&S has the authority to allow or deny use of hazardous chemicals, and to require the establishment of controls to ensure that ALARA principles are maintained.

7.24.2 Use of a hazardous chemical that has not been approved shall be considered a safety violation, and handled accordingly.

7.24.2.1 Project personnel shall maintain work site copies of each approved MSDS and the company's written Hazard Communication Program for their scope of work.

7.24.2.2 These shall be made available to project personnel who may be affected by that scope of work.

7.24.3 Project personnel are responsible for adherence to the rules and regulations of this site especially as they pertain to the storage, labeling, and the use of placards with chemical products as written in, but not limited to, NFPA and OSHA standards, and shall be trained regarding those requirements.

7.25 Material Handling and Storage

7.25.1 Compressed gas cylinders and cylinders of cryogenic liquids shall be stored vertically in cylinder racks or chained to walls and shall be secured to prevent falling.

7.25.1.1 Cylinders should be grouped together by their hazard class, and shall not be rolled in the horizontal position, dragged, or lifted by the cap or magnets.

7.25.1.2 Cylinders not in use shall be capped.

7.25.2 Walkways and aisles shall be kept clear.

7.25.2.1 Material shall be stored on level ground.

7.25.2.2 Material shall not be stored within 6 ft of hoist ways or floor openings.

7.25.2.3 Poles, pipe, and other similar materials that may roll shall be wedged to prevent spreading and rolling.

7.25.3 No material, tools, or equipment shall be leaned against other objects or walls unless they are secured from movement.

7.25.3.1 Materials shall be handled with mechanized equipment to the maximum practical extent.

7.25.3.2 Safe working load limits shall be labeled on all temporary elevated floors or platforms and these limits shall not be exceeded.

7.25.3.3 Employees moving material by hand shall use proper lifting techniques.

7.26 Activity Hazard Analysis and Work Planning

7.26.1 Site-specific and project oriented Activity Hazard Analyses (AHA) shall be developed as guidelines for safety and work practices for specific projects and tasks. These documents will be obtained from Document Control or EH&S.

7.26.2 Additionally, the HDP Manager responsible for the work shall ensure that the proper work package has been developed before a task or work activity commences.

7.26.3 Additional AHAs may be developed as work packages identify hazards and work practices.

7.27 Prioritization of Controls

7.27.1 Engineered controls are the preferred method for hazard management, followed by administrative controls and PPE.

7.27.1.1 Engineered controls may include but are not limited to physical barriers, ventilation, etc.

7.27.1.2 Administrative controls may include but are not limited to rope boundaries, stay times, etc.

7.27.1.3 PPE may be used as the final method for hazard management.

7.27.2 Barriers and postings, good housekeeping practices, training, measurements of potential health effects of physical hazards, or a combination of these provide the most effective means of control.

7.28 Signs and Barricades for Hazards, Overhead Work, and Fall Protection

- 7.28.1 Signs shall be properly colored and labeled as per 29 CFR 1910 Subpart J (Ref. 5.2) and 1926 Subpart G (Ref. 5.3) as applicable.
- 7.28.2 Signs shall be constructed of metal, fiberglass, plastic, or plastic laminated paper and shall be promptly removed when no longer needed.
- 7.28.3 Signs shall also be conspicuously placed in conjunction with barricades.
- 7.28.4 The types of barriers permitted on the project include rope, tape, and hard barricades. If hazard information is not printed on barricades, signs or tags shall be attached to the doorways.
- 7.28.5 Floor hole covers shall be labeled "**WARNING - TEMPORARY HOLE COVER**" or equivalent.
 - 7.28.5.1 Hole covers shall be cleated or secured and constructed of 3/4-inch plywood or equivalent material with supports 18 inches or less on center or of sufficient construction to support twice the anticipated load (e.g., walking or vehicle traffic).

7.29 Training/Briefings/Notifications

- 7.29.1 Health and safety training requirements are contained in the *Training Plan* (Ref. 5.4). Other requirements include:
- 7.29.2 Daily Safety Meetings
 - 7.29.2.1 Daily Safety Meetings shall be conducted at the beginning of each shift.
 - 7.29.2.2 The Operations Supervisor or EH&S Representative should conduct the meeting.
 - 7.29.2.3 The Operations Supervisor should present the activities planned for the day, changes to the schedule, updates, etc.
 - 7.29.2.4 The EH&S Representative should present a timely Safety Topic.
 - 7.29.2.5 The topic may be news/safety alert or other safety related topic.
 - 7.29.2.6 This meeting may be used to supplement training but is not intended as a substitute for formal training.

7.29.3 Pre-Job Safety Briefings

7.29.3.1 Pre-job safety briefings shall be conducted with operational personnel to define the objectives for the shift and associated health and safety concerns.

7.29.3.2 Personnel involved with the job/task shall attend such briefings.

7.29.3.2.1 At a minimum, the briefings shall address safety hazards, controls, bounding conditions (stop work order, hold points), PPE, work environment, permits required, and/or other specific details associated with the job/task.

7.29.3.2.2 The meeting may be part of the morning Plan of the Day meeting.

7.29.3.3 Attendance sheets shall be filled out and signed by the participants.

7.29.3.4 These records shall be stored with the applicable work package.

7.29.4 Personnel Notification/Information

7.29.4.1 Air monitoring results and MSDS for related site activities shall be made available to project personnel.

7.29.4.2 Personnel participating in air monitoring shall be informed of the results (exposure levels); work practice adjustments; and their health implications.

7.30 Site Control

7.30.1 Westinghouse shall control access to the work site, while contractors may control access to the areas within their scope of work.

7.30.2 Work in controlled areas shall be performed by crews of at least two persons (the buddy system) where there is potential for injury, illness, or emergency conditions, based on the nature of work.

7.30.3 An individual may work alone on occasions where there is minimal potential for such conditions.

7.30.4 Persons working alone shall be provided with appropriate means of communication to permit status checks.

7.31 Accident Prevention

7.31.1 Employee Participation:

7.31.1.1 Participation of site employees will include:

7.31.1.1.1 Accident prevention, and

7.31.1.1.2 Near miss and injury/illness investigation.

7.31.1.2 Reporting shall be actively promoted through:

7.31.1.2.1 Regular safety meetings,

7.31.1.2.2 Near miss and safety suggestions,

7.31.1.2.3 Posted safety information, and

7.31.1.2.4 Enforcement of site rules.

7.31.2 Inspections

7.31.2.1 Regular inspections of site equipment, work practices, and the facility shall be performed and documented by supervisors as part of their daily routine.

7.31.2.2 EH&S shall perform inspections on a regular basis as outlined in the HDP procedures established for this purpose.

7.32 Accident/Incident Procedures

7.32.1 The Emergency Plan and its implementing procedures shall be followed by project personnel and visitors to address emergency conditions.

7.32.1.1 Emergency response training shall be provided as specified by the *Training Plan* (Ref. 5.4).

7.32.1.2 The following practices shall be employed for non-emergency conditions:

7.32.2 First Aid/Medical Care for Injuries.

7.32.2.1 At least one individual having current first aid and CPR training as required by OSHA construction standards shall be available each working shift.

7.32.2.1.1 This individual shall respond and render appropriate assistance in the event of an injury or illness.

7.32.2.1.2 Such individuals provide only stabilization, and are not expected to administer long-term care.

7.32.2.1.3 Appropriate transportation, based upon evaluation of the case, shall be made available to an individual who has become injured or ill.

7.32.3 Unusual Occurrence

7.32.3.1 If unanticipated materials or substances are uncovered during operations, work shall cease in the affected work area and immediately notify EH&S Manager and Project Director.

7.32.3.2 An evaluation of the incident shall be made to determine if additional personal protective equipment or other protective measures are required.

7.32.4 Incident and/or Injury Investigation

7.32.4.1 Injuries/illness shall be promptly reported to the individual's supervisor, the EH&S Manager and the Operations Manager and in accordance with HDP procedures.

7.32.4.2 The Operations Manager or designee shall initiate an investigation immediately upon reporting of an injury, illness, or incident.

7.32.4.3 Such investigations should determine cause(s) and prevent recurrence of the incident.

7.32.4.4 Corrective action arising from investigations shall be tracked to resolution.

7.32.4.5 Notification outside of the project to the Corporate Westinghouse EH&S Department may be required within 24 hours of occurrence, and is the responsibility of the EH&S department.

7.32.4.6 Subcontractor personnel shall report injuries/illnesses and incidents to project supervision as well as their employer.

7.33 Logs and Records

7.33.1 OSHA 300 Logs shall be maintained in compliance with 29 CFR 1904 (Ref. 5.1).

7.33.2 Applicable PPE training certifications shall be maintained in accordance with 29 CFR 1910.132 (Ref. 5.2).

- 7.33.3 Medical records and analyses using medical records shall be retained for the duration of project personnel's employment plus thirty years.
- 7.33.4 Access should be granted to medical records at an employee's request within fifteen (15) working days of the request.
- 7.33.5 Accident reports, unusual occurrences, and associated investigations shall be maintained onsite during project operations, and maintained thereafter in accordance with HDP procedures.
- 7.33.6 Other records generated as a result of EH&S procedures will be maintained according to HDP policies and procedures.

7.34 Housekeeping

- 7.34.1 Good housekeeping will prevent accidents and help ensure a safe work environment. Project work areas shall be kept clean and orderly to the extent that the nature of the work allows.
 - 7.34.1.1 Have only those tools and materials necessary for the work being done.
 - 7.34.1.2 Scraps, trash, and other waste shall be placed in proper containers.
 - 7.34.1.2.1 Oily rags, waste, or other combustible debris shall be kept in properly labeled metal containers provided for that purpose.
 - 7.34.1.2.2 Covers shall be placed on containers of flammable or hazardous materials.
 - 7.34.1.2.3 Waste shall be disposed of at frequent intervals.
 - 7.34.1.3 Smoking is permitted only in outdoor designated areas. Stubs shall be placed in butt cans or other designated receptacles.
 - 7.34.1.4 Work areas and tools shall be cleaned up as work progresses.
 - 7.34.1.5 Floors shall be cleared of tools, materials and metal shavings. Floors shall be kept clean and dry.
 - 7.34.1.6 Materials, tools and equipment shall be kept tied, stacked, or blocked to prevent rolling or falling.
 - 7.34.1.7 Small items shall be kept in boxes or bins.
 - 7.34.1.8 Protruding nails, screws, sharp edges, etc. shall be promptly removed to prevent laceration or puncture injuries.

7.34.1.9 Clear pathways shall be maintained through and around work areas.

7.35 Medical Evaluations (Physicals)

Based upon work activities, individuals may be subject to medical surveillance commensurate with their potential for exposure to various chemical and physical hazards.

7.36 Working Around Rail Lines

7.36.1 If a site employee or contractor will be working near active track, employees should be trained and certified in Federal Railroad Authority Track Worker Safety.

7.36.2 If a Railroad's representative has given the site personnel or sub-contractor permission to use certain equipment on any track at the job site, the personnel or sub-contractor shall ensure that each and all of its employees responsible for operating any motive power including, without limitation, any high-rail equipment (such equipment hereafter is referred to as "Motive Power") on any track of the Railroad will be trained to know and understand, and will comply with Railroad's operating rules applicable to the operation and use of such Motive Power.

7.36.3 In active track operations, a distance of 25 feet from the track must be maintained unless the contract necessitates working in close proximity to the track. This includes anything working within 25 feet of the centerline of an active track, or has the potential to foul an active track, such as a crane working outside of 25 feet, but the boom could foul the track.

7.36.4 When doing so, the site operations personnel or sub-contractor, its employees and equipment must first have authorization of the Railroad.

7.36.5 When so authorized, where work is in close proximity to tracks, a Railroad flag person must be present.

7.36.6 The Contractor and its employees must be familiar with procedures to clear workers and equipment from track area for approaching trains. In addition, the following safety procedures shall be adhered to:

7.36.6.1 Always be on the alert for moving equipment while working near any Railroad tracks or facilities.

7.36.6.2 Do not step or walk on the top of the rail, frog, switches, guardrails, or other track components.

- 7.36.6.3 In passing around ends of standing cars, engines, railroad machinery, and other on-track equipment, leave at least one railcar length (50 feet) between yourself and the end of the equipment.
- 7.36.6.4 Avoid walking or standing on track at any time.
- 7.36.6.5 When it is necessary to walk or work on track, always keep a sharp lookout in both directions for approaching trains.
- 7.36.6.6 Before stepping or crossing tracks, look in both directions first. The same is true when walking around machinery and equipment on and about the tracks.
- 7.36.6.7 Do not sit on, lie under, or cross between cars except as required in performance of your duty and only when track and equipment are under proper protection.
- 7.36.6.8 In multiple track territory, do not stand on one track while a train is passing on another.
- 7.36.6.9 Always expect movement at any time, on any track, in either direction.
- 7.36.6.10 Always keep in mind that a split second of inattention can result in a serious accident.

7.37 Hazardous Waste Operations and Emergency Response (HAZWOPER) (29CFR1926.65)

- 7.37.1 The site has been characterized and contains buried waste, impacted soil and sediments and radioactive materials (Ref. 5.17 and Ref. 5.18).
- 7.37.2 Radioactive materials remediation is under the jurisdiction of the Nuclear Regulatory Commission.
- 7.37.3 The Missouri Department of Natural Resources has oversight for chemicals and waste materials.
- 7.37.4 The Environmental Contractor(s) selected to conduct the remediation work shall provide their HASP (Health and Safety Plan), detailed work packages, training documentation, worker certifications and other documentation required by 29 CFR 1926.65 to the HDP Department Managers for review and approval.
- 7.37.5 HDP site personnel will be trained to a level appropriate for their role (e.g.: monitoring, support or oversight) and specified in the in the *Training Plan* (Ref. 5.4) and training matrix.
- 7.37.6 Work packages will be reviewed and applicable requirements of 29 CFR 1926.65 will be implemented as required.

8.0 PROCEDURE

None

9.0 FORMS

None

10.0 APPENDICES

Appendix A – *Environment-Related Physical Hazards*

Appendix B – *Potential Site-Specific Chemical Hazards*

Appendix C – *Monitoring Program Summary*

APPENDIX A

ENVIRONMENT-RELATED PHYSICAL HAZARDS		
Hazard	Action Level	Health Effects
Cold Stress	Tympanic (ear) temperature of 35°C (95°F)	<p>Acute response: <u>Hypothermia</u> – Acute problem resulting from prolonged cold exposure and heat loss. If fatigued during physical activity, an employee will be more prone to heat loss. As exhaustion approaches, the blood circulatory system, which helps maintains body warmth is overcome. Shivering is one of the body mechanisms to produce heat for body heat maintenance. If body temperature continues to fall, shivering ceases. Rapid loss of heat then occurs and critical cooling begins. Normal muscular and neurological function is impaired and physical and mental functions are drastically impaired rapidly. <u>Frostbite</u> – Without proper cold weather attire, exposed skin in the presence of temperature or wind chill temperatures below freezing may result in sharp tingling sensations of exposed skin, numbness, and partial or complete loss of sensation to exposed skin areas. Continued exposure without preventive action may result in permanently damaged skin tissue.</p> <p>Chronic response: <u>Trench foot</u> – Without proper foot protection, swelling, tingling, itching, and painful foot tissue may occur due to a combination of cold temperatures and persistent dampness or wet feet. Small areas of skin may blister or skin tissue may be damaged due to the cold and wet condition.</p>
Heat Stress	Tympanic (ear) temperature of 38°C (100.4°F) and pulse rate of 110.	<p>Chronic response: Physical disability caused by excessive heat exposure - in order of severity: <u>Heat rash</u> – itching skin. Caused by the opening of sweat ducts becoming clogged due to swelling of the surface of the skin, which leads to inflammation of the sweat glands. <u>Heat cramps</u> – muscle spasm and pain in muscles of the abdomen and extremities. Caused by replacement of water without adequate replacement of salts (sodium, potassium, and calcium). <u>Heat exhaustion</u> – fatigue, exhaustion, headache, nausea, cool clammy skin, and appearance, which may be pale or flushed. Caused by extreme loss of fluids and salts. The supply of blood plasma and cardiac output is rapidly becoming inadequate to meet continuing demand to regulate body heat. <u>Heat stroke</u> – flushed skin, high body temperature (usually above 105°F), cessation of sweating, headache, numbness, fast pulse, rapid breathing rate, confusion, convulsions, and loss of consciousness. Complete breakdown of body heat regulatory system due to lack of fluids necessary for sweat production.</p>
Excessive Noise	85 dB(A) TWA: Suitable hearing protection. And Posting of area as noise hazard	<p>Acute loss: Sudden loss due to damage to the eardrum or the middle ear noise conductive network. May occur as a result of a severe head injury. Extremely loud noises or sudden intense pressure waves could cause acute loss; however, these are highly unlikely at this site.</p> <p>Chronic loss: Gradual loss as a result of some medications such as mycins, aspirin, and some diabetic medication, from some diseases such as mumps or diabetes, from aging, or from nerve deafness due to continuous and long-term exposure to high noise levels without use of hearing protection both at work and off work. Hearing loss due to nerve deafness is gradual and usually unrecognized. Initial symptoms may include ringing of the ears at the end of the workday or a temporary decrease in the ability to hear sound. The ringing and temporary decrease is a result of inner ear nerve fatigue; recovery is usually complete after a 14-hour quiet period. Without hearing protection, repeated noise exposures may damage the inner ear and permanent loss may occur.</p>

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APPENDIX B

Potential Site-Specific Chemical Hazards

Contaminant	Limits	Health Effects/Potential Chemical Hazards	Chemical or Physical Properties	Routes of Exposure
Chemical Contaminants				
Ammonia	ACGIH TLV: TWA 25 ppm STEL 35 ppm NIOSH REL: TWA 25 ppm STEL 35 ppm OSHA PEL: TWA 50 ppm	Acute response – Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin. Inhalation may result in spasm, inflammation and edema of the larynx and bronchi, chemical pneumonitis, Irritation eyes, nose, throat; dyspnea (breathing difficulty), wheezing, chest pain; pulmonary edema; pink frothy sputum; skin burns, vesiculation; liquid: frostbite.		
Carbon Monoxide	REL: 40 ppm PEL: 50 ppm Ceiling: 200 ppm IDLH: 1,200 ppm	Acute response – Severity dependent on air contaminant levels. 200 - 400 ppm may cause headache and nausea within 24 hours. 500 - 1000 ppm may cause headache, rapid breathing, nausea, weakness, dizziness and mental confusion in less than 1 hour and potential unconsciousness in 2 hours. 3000 - 4000 ppm usually causes transient weakness and headache in 5 minutes; coma may occur within 30 minutes. Recovery from exposures resulting in coma may not be complete. Reports of impairment have included permanent mental disorder, paralysis, cardiac disturbances, or impaired vision. Recovery from carbon monoxide poisoning is slow. Without medical intervention, biological half-life in blood is 4 to 5 hours. Chronic response – 50 ppm from 6-8 hours may cause temporary visual disturbances, which could cause secondary transportation safety problems at the end of the workday. Individuals with heart disease or individuals doing physical labor are at increased risk due to blood carrying decreased levels of oxygen to tissue.	Odorless, colorless, tasteless gas. Soluble 2% in water. IP 14.01 eV	Inhalation

APPENDIX B

Potential Site-Specific Chemical Hazards

Contaminant	Limits	Health Effects/Potential Chemical Hazards	Chemical or Physical Properties	Routes of Exposure
Hydrogen Sulfide	REL: 10 ppm PEL: 20 ppm TLV: 10 ppm IDLH: 100 ppm	<p>Acute response – Human poison and asphyxiant by inhalation. Severe irritant to eyes and mucous membranes. Sense of smell may be fatigued, so that odor and effects offer poor warning of exposure. 20 – 150 ppm cause irritation of the eyes. Slightly higher concentrations may irritate the upper respiratory tract. Further increased concentrations have more prominent effect on central nervous system. 500 ppm over 30-minutes results in headache, dizziness, excitement, staggered gait, diarrhea, and dysuria, sometimes followed by bronchitis or bronchopneumonia. 800 – 1,000 ppm over 30-minutes may be fatal.</p> <p>Chronic response – Low concentrations typically result in conjunctivitis, photophobia, corneal bullae, tearing, pain, and blurred vision. High concentrations may cause rhinitis, bronchitis, and occasionally pulmonary edema.</p> <p>Very dangerous fire hazards when exposed to flame, heat, or oxidizers. Moderately explosive when exposed to heat or flame.</p>	Colorless gas with a strong odor of rotten eggs. VP 13,400 mm	Inhalation
Nitrous Oxides	ACGIH TLV: TWA 50 ppm NIOSH REL: TWA 25 ppm	<p>Acute response – Inhalation in high concentrations for only a few seconds affects the central nervous system and may induce symptoms of intoxication. Dyspnea (breathing difficulty); drowsiness, headache; asphyxia; liquid frostbite are also responses. Concentrations of 50 to 500 ppm have been reported to cause subtle effects on the central nervous system.</p> <p>Chronic Response - reproductive effects may cause embryo fetal toxicity. Also causes anemia from repeated overexposure.</p>		

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APPENDIX B

Potential Site-Specific Chemical Hazards

Contaminant	Limits	Health Effects/Potential Chemical Hazards	Chemical or Physical Properties	Routes of Exposure
Sodium Hydroxide	Ceiling: 2 mg/M ³ IDLH: 10 mg/M ³	<p>Acute response – Strong corrosive. Severe caustic irritant to the eyes, nose, throat, esophagus, and skin.</p> <p>Inhalation – Since vapor pressure is so low, harmful vapors are not expected at room temperatures. Heated solutions or spraying may produce harmful vapors or mists, however.</p> <p>Eye or skin – Dusts or strong concentration solutions causes rapid destruction of the tissue of the eye or skin. Solution can penetrate the eyeball within 1 to 10 minutes and cause a chemical change of the fluid in the eye. Tissue damage and ulceration may result in permanent damage to the eye. On skin, solutions of 25 % cause sensation of irritation within about 3 minutes with a 4% solution this does not occur until after several hours.</p> <p>Ingestion – Severe abdominal pain, corrosion of the lips, mouth, tongue, throat, and esophagus. Cases of skin tissue cancers of the esophagus have occurred after a latency period of 12 to 42 years probably due to tissue damage and scar tissue formation.</p> <p>Chronic response – No reports of chronic conditions.</p>	Colorless to white solid flakes; Sol. 100% in water. Violent high heat release when mixed with water or acids. VP 0 mm (Solid)	Inhalation ingestion Direct contact with unprotected skin.
Sulfates & sulfites	Unique for each sulfate or sulfite compound.	Acute or chronic response – Toxicity depends on specific sulfate or sulfite compound. Ingested sulfites cause irritation of the stomach by liberating sulfurous acid. If heated to decomposition, toxic sulfur oxide gases are liberated.	Solids or liquids Varying degrees of solubility in water.	Ingestion
Tetrachloroethylene (Perchloroethylene)	<p>ACGIH TLV: TWA 25 ppm STEL 100 ppm</p> <p>OSHA PEL: TWA 100 ppm C 200 ppm (for 5 minutes in any 3-hour period), with a maximum peak of 300 ppm</p>	<p>Acute response -Irritation eyes, skin, nose, throat, respiratory system; nausea; flush face, neck; dizziness, incoordination; headache, drowsiness; skin erythema (skin redness).</p> <p>Chronic response - liver and kidney damage, narcotic effect; [potential occupational carcinogen]</p>		

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Contaminant	Limits	Health Effects/Potential Chemical Hazards	Chemical or Physical Properties	Routes of Exposure
Trichloroethylene (TCE)	<p>ACGIH TLV: TWA 10 ppm STEL 25 ppm</p> <p>NIOSH REL: TWA 25 ppm STEL C2 (60-min when used as a waste anesthetic gas)</p> <p>OSHA PEL: TWA 100 ppm C 200 ppm 300 ppm (5-minute maximum peak in any 2 hours)</p>	<p>Acute response - Irritation eyes, skin; headache, visual disturbance, lassitude (weakness, exhaustion), dizziness, tremor, drowsiness, nausea, vomiting; dermatitis; cardiac arrhythmias, paresthesia.</p> <p>Chronic response - liver injury; [potential occupational carcinogen]</p>		
Acids – Hydrofluoric, Hydrochloric	<p>5 ppm Ceiling for HCL 6 ppm Ceiling for HF</p>	<p>Acute response – irritation of nose, eyes, throat and skin at low concentrations. At high concentrations can cause immediate and severe eye, skin and lung damage and swelling.</p> <p>Chronic response – can cause corrosion of mucous membranes, esophagus, and stomach and possible death.</p>	Solids or liquids of various concentrations.	Inhalation, ingestion, skin absorption
Metals and Metalloids				
Antimony	<p>PEL: 0.5 mg/M³ IDLH: 50 mg/M³</p>	<p>Acute response – Dusts or fume: Eye, nose, and throat irritant; nosebleed; abdominal cramps, upper and lower GI tract irritation. Dust on warm moist skin may cause dermatitis or Antimony Spots, which causes intense itching and skin ulceration.</p> <p>Chronic response – Dusts or fume: Indigestion, loss of appetite, anemia; sores in throat and mouth, nosebleed, conjunctivitis; headache; chronic cough; small growths in lining of lung. Evidence of gynecological disorders and spontaneous late abortions.</p>	Silver-white soft metal or dark gray powder. Insoluble in water. VP 0 mm	Inhalation, ingestion

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Contaminant	Limits	Health Effects/Potential Chemical Hazards	Chemical or Physical Properties	Routes of Exposure
Cadmium Dust (as respirable dust)	PEL: 0.005 mg/M ³ IDLH: 9 mg/M ³	Acute response – Dust or fume: Metallic taste, respiratory tract irritation, constriction of throat, cough. After latency period of 1 to 8 hours, rapidly progressing shortness of breath, chest pain, flu-like symptoms; acute pneumonia-like symptoms with 24 hours reaches maximum in 7 days. Fatalities have occurred. Chronic response – Dust or fume: Pulmonary emphysema; kidney dysfunction; suspect lung or prostate cancer agent. Cadmium is classified as a suspect or confirmed human carcinogen.	Dust: Silver-white, soft metal. Fume: Yellow-brown finely divided particles evenly dispersed in air. Insoluble in water. VP 0 mm	Inhalation, ingestion
Cadmium Fume (as CdO/Cd)	PEL: 0.005 mg/M ³ IDLH: 9 mg/M ³	Acute response – Dust or fume: Metallic taste, respiratory tract irritation, constriction of throat, cough. After latency period of 1 to 8 hours, rapidly progressing shortness of breath, chest pain, flu-like symptoms; acute pneumonia-like symptoms with 24 hours reaches maximum in 7 days. Fatalities have occurred. Chronic response – Dust or fume: Pulmonary emphysema; kidney dysfunction; suspect lung or prostate cancer agent. Cadmium is classified as a suspect or confirmed human carcinogen.	Dust: Silver-white, soft metal. Fume: Yellow-brown finely divided particles evenly dispersed in air. Insoluble in water. VP 0 mm	Inhalation, ingestion
Chromium III	PEL/REL: 0.5 mg/M ³ IDLH: 25 mg/M ³	Chronic response – Skin sensitization dermatitis has been reported.	Brittle gray-white hard metal. Insoluble in water. VP 0 mm	Inhalation, ingestion
Chromium VI (Soluble)	REL: 0.001 mg/M ³ PEL: 0.1 mg/M ³ TLV: 0.05 mg/M ³ IDLH: 15 mg/M ³	Acute response – Severe irritant to nasal passages, throat, and lungs; excessive fluid in lung and asthma. Skin contact – Irritation, allergic contact dermatitis, and subsequent slow-healing skin ulcers. Chronic response – Evidence of kidney damage; Insoluble forms are human lung carcinogens. Chromium VI is classified as a suspect or confirmed human carcinogen.	Red crystals. Soluble and Insoluble forms. VP 0 mm	Inhalation, ingestion, absorption for soluble forms.

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Contaminant	Limits	Health Effects/Potential Chemical Hazards	Chemical or Physical Properties	Routes of Exposure
Cobalt	REL: 0.05 mg/M ³ PEL: 0.1 mg/M ³ TLV: 0.016 mg/M ³ IDLH: 20 mg/M ³	Acute response – Loss of appetite, upper and lower GI tract disturbances; muscle ache and fever; allergic dermatitis in areas subject to friction (sides of neck, elbows, ankle). Chronic response – Loss of sense of smell, allergic response in lung tissue characterized by labored breathing, coughing, wheezing, and asthma. Lower GI tract disturbances, weight loss. Hard metal disease lung ailment manifested by spreading fiber-like scarring of lung tissue. Cobalt is classified as a suspect or human carcinogen.	Silver-gray to black metal. Insoluble in water. Soluble in protein containing blood plasma and lung fluids. VP 0 mm	Inhalation, ingestion
Copper	REL/PEL (dust): 1 mg/M ³ REL/PEL (fume): 0.1 mg/M ³ IDLH: 100 mg/M ³	Acute response – Dusts: Respiratory tract irritant; ulceration of nasal passages from inhalation of dusts; green discoloration of skin, hair, and teeth. Acute response – Fume: Copper fume fever, characterized by headache, alternating fever and chills, upper and lower GI tract disturbances; eye damage from fine particles entering eyes. Chronic response – Dusts and fume: Upper and lower GI tract disturbances; allergic skin reactions in some workers.	Reddish metal. Insoluble in water. VP 0 mm	Inhalation, ingestion
Lead	REL/PEL: 0.05 mg/M ³ TLV: 0.05 mg/M ³ IDLH: 100 mg/M ³	Acute response – Rare condition because lead is a cumulative poison. Symptoms, if they occur, include fatigue, sleep disturbance, constipation, colic, anemia, or nervous condition. Chronic response – Lead poisoning is a result of cumulative exposures. Symptoms are weakness, weight loss, inability to sleep, headache, nervous irritability, muscle and joint pain, loss of appetite, lower GI tract disturbances and abdominal pain. Advanced cases include muscle weakness seen as wrist drop or foot drop, cure is slow. Lead is a bone seeker; biological half-life in bone is approximately 20 years. Being a bone seeker, lead is harmful to a fetus and is a mutagen in both male and female.	Soft gray metal. Insoluble in water Slightly soluble in acids including stomach acids. VP 0 mm	Inhalation, ingestion
Magnesium Fume (as Mn/MnO)	PEL: 15 mg/M ³ TLV: 10 mg/M ³ IDLH: 750 mg/M ³	Acute response – Eye and nasal passage irritant; metal fume fever: alternating fever and chills, chest pain, cough, flu-like symptoms. Magnesium in presence of water releases hydrogen. Embedded particles causes slow healing wounds, which may contain gas-filled pockets. No reports of chronic response.	Finely divided white particulate evenly divided in air. Soluble 0.009% in water. VP 0 mm	Inhalation

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Contaminant	Limits	Health Effects/Potential Chemical Hazards	Chemical or Physical Properties	Routes of Exposure
Mercury (Alkyl)	REL: 0.05 mg/M ³ PEL: 0.1 mg/M ³ IDLH: 10 mg/M ³	<p>Acute response – Vapor: Severe respiratory tract tissue damage; corrosive to skin and eyes; metal fume fever characterized by chills or fever, nausea, tightness in chest; pneumonia-like symptoms, bronchitis, chest pain, cough, salivation, diarrhea.</p> <p>Chronic response – Vapor: Inhalation and skin absorption are routes of exposure: uptake through skin may be 2% of that through lung tissue. Early symptoms include weakness, fatigue, loss of appetite, loss of weight, lower GI tract disturbances. At increased exposure duration or levels, characteristic tremors of fingers, eyelids, and lips may progress to body tremors and violent chronic spasms. Simultaneously, personality changes, excitability, memory loss, depression and hallucination may occur.</p> <p>Skin sensitivity to mercury vapor has been documented. Male reproductive effects have been reported in severe exposures. Vision changes and kidney impairment has been reported. Historical studies have indicated that levels above 0.1 mg/m³ may lead to tremors or behavioral changes.</p>	Silver-white heavy, odorless liquid metal. Vapor is colorless and odorless. Insoluble in water VP 0.0012 mm	Inhalation, absorption
Nickel	REL:0.015 mg/M ³ PEL/TLV: 1 mg/M ³ IDLH: 10 mg/M ³	<p>Acute response – Dusts: Nickel itch, contact dermatitis in sensitized individuals characterized by burning and itching skin progressing to small skin ulcers. Syndrome reportedly more common in female workers. Dusts have no other significant toxic properties.</p> <p>Chronic response – Nickel fume is a human lung carcinogen.</p>	Shiny solid metal. Insoluble in water. VP 0 mm	Dusts: Skin contact Fume: Inhalation
Selenium	REL/PEL: 0.2 mg/M ³ IDLH: 1.0 mg/M ³	<p>Acute response – Dust or fume: Skin, eye, nose, and throat irritant.</p> <p>Chronic response – Central nervous system disturbance, lower GI tract disturbance; upper respiratory tract and eye irritant; metal fume fever characterized by alternating fever and chills, headache, bronchitis, pneumonia-like symptoms; garlic breath; loss of hair and fingernails.</p>	Red or gray solid non-metal used in some metal alloys. Insoluble in water. VP 0 mm	Inhalation, ingestion, absorption
Silica, (concrete dust)amorphous, diatomaceous earth, containing < 1% crystalline silica	REL/PEL: 0.05 mg/M ³ TLV: 0.05 mg/M ³ IDLH 50 mg/M ³	<p>Irritant eyes, nose, cough ; chronic bronchitis</p> <p>Chronic response – Inhalation of respirable particulates may cause fibrosis (silicosis) which could lead to a form of cancer or scarring sufficient to hamper breathing process.</p>	Gray odorless powder	Inhalation

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Contaminant	Limits	Health Effects/Potential Chemical Hazards	Chemical or Physical Properties	Routes of Exposure
Uranium (natural) Soluble & in- soluble compounds, as U	ACGIH TLV: TWA 0.2 mg/m ³ STEL 0.6 mg/m ³ NIOSH REL: TWA 0.05 mg/m ³ (Soluble) 0.25 mg/m ³ (Insoluble) STEL 0.6 mg/m ³ (Insoluble) OSHA PEL: TWA 0.05 mg/m ³ (Soluble) 0.25 mg/m ³ (Insoluble)	Acute response – Lacrimation (discharge of tears), conjunctivitis; shortness breath, cough, chest rales; nausea, vomiting; skin burns; red blood cell, casts in urine; proteinuria; high blood urea nitrogen. Chronic response – Dermatitis; kidney damage; blood changes; [potential occupational carcinogen]; in animals: lung, lymph node damage [Potential for cancer is a result of alpha-emitting properties & radioactive decay products (e.g., radon).]		
Zinc (as ZnO)	REL/PEL: 5 mg/M ³ IDLH: 500 mg/M ³	Zinc dusts are inherently non-toxic. A response would essentially be that of a non-toxic nuisance dust. Acute response – Fume: Metal fume fever delayed about two hours after exposure. Alternating fever and chills, flu-like symptoms, nausea, muscle ache, GI tract disturbances.	Fine white metal particles dispersed in air. VP 0 mm	Inhalation

Natural and man-made fibers

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Asbestos Fibers	PEL 0.1 fibers/cubic centimeter air (f/cc) IDLH None	<p>Chronic response – <u>Asbestosis</u>: Non-cancerous lung disease characterized by slow developing fiber-like scarring of the lung. Symptoms are dry cough; shortness of breath due to reduced capacity of the lung; rales, or unusual lung sounds upon inhalation or exhalation. Latency period may be 15-30 years.</p> <p><u>Lung cancer</u> – Potentially induced by asbestos bodies in the lung. Tobacco smoking asbestos workers may be 10 times more likely to develop lung cancer than non-smoking asbestos workers. Latency period may be similar to asbestosis.</p> <p><u>Mesothelioma</u> – Rare but rapidly fatal cancer of the lining of the chest cavity or abdominal cavity. Latency period may be 20-30 years; however, cases in children under 19 years of age are reported.</p> <p><u>Other Effects</u> – Potentially causes cancers of the larynx, esophagus, stomach, or colon.</p>	Natural occurring crystalline mineral fibers Insoluble in water VP 0 mm	Inhalation
Man-made Mineral Fibers (MMF): Fibrous glass; Mineral wool.	REL: 3 fiber/cubic centimeter air (f/cc); PEL (respirable): 5 f/cc PEL (total): 15 f/cc IDLH: None.	<p>Acute response – Mechanical irritants to skin, eyes, and respiratory tract. Skin is most sensitive organ. Pneumonia-like diseases have not been confirmed from exposure to MMF. Based on animal studies, MMF is classified at a possible human carcinogen by International Agency for Research on Cancer (IARC); however, no evidence of cancer effects has been associated with inhalation of fibrous glass in animals or humans.</p> <p>Embedded fiberglass fibers may cause prolonged itching due to implanted splinters of fiberglass. These embedded fiberglass bodies or splinters may need surgical removal.</p> <p>NOTE: Refractory ceramic fibers (RCF) should be treated as asbestos fibers, based on manufacturers' recommendations.</p>	Man-made fibers Insoluble in water. VP 0 mm	Inhalation

APPENDIX C

MONITORING PROGRAM SUMMARY			
Hazard/Sample Type	Limit¹	Precaution if Limit Exceeded^{2,5}	Monitoring Frequency
CONFINED SPACE ENTRY			
Explosive gas	<10% LEL	Do not enter or immediately exit the Confined Space. Notify EH&S Manager.	Prior to confined space entry and as designated on the confined space entry permit.
Oxygen	<19.5% or >23.5% ³	Do not enter or immediately exit the Confined Space. Notify EH&S Manager.	Prior to confined space entry and as designated on the confined space entry permit.
Carbon monoxide	35 ppm	Do not enter or immediately exit the Confined Space. Notify EH&S Manager.	Prior to confined space entry and as designated on the confined space entry permit.
Hydrogen sulfide	10 ppm	Do not enter or immediately exit the Confined Space. Notify EH&S Manager.	Prior to confined space entry and as designated on the confined space entry permit.
Photoionizable substances (for undetermined air contaminants).	Lesser of applicable REL, PEL, TLV, or IDLH	Do not enter or immediately exit the Confined Space. Notify EH&S Manager.	Prior to confined space entry and as designated on the confined space entry permit.
Toxic atmosphere that may be present based on available information on previous use of the confined space.	Lesser of applicable REL, PEL, TLV, or IDLH	Do not enter or immediately exit the Confined Space. Notify EH&S Manager.	Prior to confined space entry and as designated on the confined space entry permit.
ASBESTOS			
Personal 8-hour	0.08 f/cc	Stop affected work activities. Place work area in a safe condition. Notify EH&S Manager.	As required by the EH&S Manager.
MAN-MADE MINERAL FIBERS			
Personal 8-hour	0.8 f/cc	Stop affected work activities. Place work area in a safe condition. Notify EH&S Manager.	Representative sampling in accordance with OSHA requirements.
TORCH/PLASMA ARC			
Explosive gas	>10% LEL	Stop affected work activities. Place work area in a safe condition. Notify EH&S Manager.	Prior to and during cutting in areas where utilities/tanks are present.
Oxygen for processes where inerting is required.	<19.5% (in process)	Stop affected work activities. Place work area in a safe condition. Notify EH&S Manager.	Prior to and during cutting.
PCB			
Personal	0.04 mg/m ³	Stop affected work activities. Place work area in a safe condition. Notify EH&S Manager.	Representative sampling in accordance with OSHA requirements.
Clearance	10 ug/100 cm ² (surface contamination).	Re-clean work area.	In accordance with §40CFR761.125.
LEAD			
Personal	0.050 mg/M ³	Stop affected work activities. Place work area in a safe condition. Notify EH&S Manager.	Representative sampling in accordance with OSHA requirements.
MERCURY VAPOR			

APPENDIX C

MONITORING PROGRAM SUMMARY			
Hazard/Sample Type	Limit¹	Precaution if Limit Exceeded^{2,5}	Monitoring Frequency
Personal	0.025 mg/M ³	Stop affected work activities. Place work area in a safe condition. Notify EH&S Manager.	Representative sampling in accordance with OSHA requirements.
EXPLOSIVE GAS (Other than Confined Space)			
Area	>10%	Stop affected work activities. Place work area in a safe condition. Notify EH&S Manager.	Representative sampling in accordance with OSHA requirements.
CARBON MONOXIDE			
Area	25 ppm	Stop affected work activities. Place work area in a safe condition. Notify EH&S Manager.	Representative sampling in accordance with OSHA requirements.
COLD STRESS			
Outdoor temperature and estimated wind speed measurements	ACGIH TLV Values from Tables.	Suitable protection from the elements, a warming area. Cease work under certain conditions.	As required by the EH&S Manager.
HEAT STRESS			
Tympanic (ear)temperature and/or heart rate monitoring	Tympanic temperature of 38°C (100.4°F) and/or a heart rate of 110 bpm.	Use of ice vests, reduction in work cycle duration, or other approved measures.	As required by the EH&S Manager.
AIRBORNE DUST (respirable)			
Personnel and area	5 mg/m ³	Stop affected work activities. Place work area in a safe condition. Notify EH&S Manager.	As required by the EH&S Manager.
OTHER CONTAMINANTS			
Other toxic atmospheric contaminants that may be present based on available information.	ALI, PEL, or TLV for the contaminant or 10% for carcinogens, whichever is more stringent.	Stop affected work activities. Place work area in a safe condition. Notify EH&S Manager.	As required by the EH&S Manager.

1. If limits are exceeded; ventilation should first be used to obtain acceptable conditions.
2. Report detectable levels of explosive gas, carbon monoxide, hydrogen sulfide or photoionizable substances to the EH&S Manager. The EH&S Manager will take immediate action to determine the source of the detectable readings and eliminate the source.
3. Report oxygen levels less than 20% or greater than 23.0% to the EH&S Manager to determine the source of the oxygen depletion or enrichment.
4. Perform monitoring when work area temperature exceeds 32°C (90°F), 29°C (85°F), when chemical protective clothing is required.
5. Project policy is to perform no work activities when the Action Level is exceeded. Determine the source of the contaminant and eliminate or control to levels below the Action Level.