

# PROJECT SPECIFIC HEALTH AND SAFETY PLAN (HASP)

FOR

**GE PITTSFIELD/HOUSATONIC RIVER SITE – RESPONSE ACTION OVERSIGHT**

EPA TASK ORDER NUMBER: 68HE0121F0005  
RESPONSE ACTION OVERSIGHT (RAO)  
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
PITTSFIELD, BERKSHIRE COUNTY, MASSACHUSETTS

Effective Dates:

JANUARY 2021 THROUGH SEPTEMBER 2023



HDR APTIM, LLC  
ONE INTERNATIONAL BOULEVARD  
10<sup>TH</sup> FLOOR SUITE 1000  
MAHWAH, NEW JERSEY 07495

PROJECT NUMBER  
10265786

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**List of Appendices**

- Appendix A: Incident Report Form
- Appendix B: Deviations and Additions Form
- Appendix C: Visitors Log
- Appendix D: Job Hazard Analysis  
(Including COVID-19 Hazard Control)

**List of Attachments**

- Slip, Trip, and Fall Prevention (HDR H&S Procedure #3)
- Hazard Communication (HDR H&S Procedure #6)
- Traffic Safety (HDR H&S Procedure #17)
- Water and Boating Safety (HDR SH&E Procedure #18)
- Personal Protective Equipment (HDR H&S Procedure #21)
- Noise (HDR H&S Procedure #26)
- Portable Fire Extinguishers (HDR H&S Procedure #27)
- Heat Stress (HDR H&S Procedure #28)
- Cold Stress (HDR H&S Procedure #29)
- First Aid and CPR (HDR H&S Procedure #30)
- Biological Hazards (HDR H&S Procedure #34), revised 7/21/20
- HDR Guidelines for Face Coverings, Face Masks, and Respirators for COVID-19 Hazard Control
- Additional procedures to be added as necessary



SITE SPECIFIC HEALTH AND SAFETY PLAN		TITLE PAGE																
<b>PROJECT NAME</b>	GE PITTSFIELD/HOUSATONIC RIVER SITE – Response Action Oversight (RAO)	<b>PROJECT COMPANY</b>	HDR ENGINEERING															
<b>SITE ADDRESS</b>	10 LYMAN STREET SUITE 2, PITTSFIELD, BERKSHIRE COUNTY, Massachusetts	<b>JOB NUMBER</b>	10265786															
<b>PROJECT MANAGER</b>	MELISSA LAMACCHIA (HDR)	<b>PHONE NUMBER</b>	1-201-335-9391															
<b>SITE CONTACT(S)</b>	DEAN TAGLIAFERRO (USEPA)	<b>PHONE NUMBER:</b>	1-617-918-1282															
<b>NOTE:</b>																		
<input type="checkbox"/> AMENDMENT NO. _____ TO EXISTING APPROVED HASP – DATE EXISTING APPROVED HASP _____																		
<b>OBJECTIVES OF FIELD WORK:</b>		<b>SITE TYPE (CHECK ALL THAT APPLY)</b>																
<p>Objectives:</p> <ul style="list-style-type: none"> <li>Conduct oversight of the responsible party’s (RP) remedial action for GE Pittsfield/Housatonic River Site; and</li> <li>Review RPs plans and RD documents and provide technical review of the remedial design submittals with consideration to the 2020 Consent Decree and the 2020 Final RCRA Permit and;</li> <li>Ensure that the remedies specified in the RD protect public health and the environment and are in accordance with the 2020 Consent Decree and the 2020 Final RCRA Permit and to observe and document that the responsible party has complied with all applicable laws, regulations, and requirements, and met all performance standards specified in the Administrative Order.</li> </ul> <p>Field Activities Include:</p> <ul style="list-style-type: none"> <li>Field Investigation Activities Oversight</li> <li>Oversight of Post-Removal Long-Term monitoring activities</li> <li>Air Sampling</li> <li>Split Sample Collection</li> </ul>		<table style="width: 100%; border: none;"> <tr> <td><input checked="" type="checkbox"/> ACTIVE</td> <td><input checked="" type="checkbox"/> LANDFILL</td> <td><input checked="" type="checkbox"/> NATURAL</td> </tr> <tr> <td><input checked="" type="checkbox"/> INACTIVE</td> <td><input type="checkbox"/> UNCONTROLLED</td> <td><input type="checkbox"/> MILITARY</td> </tr> <tr> <td><input checked="" type="checkbox"/> SECURE</td> <td><input checked="" type="checkbox"/> INDUSTRIAL</td> <td><input type="checkbox"/> OTHER (SPECIFY)</td> </tr> <tr> <td><input checked="" type="checkbox"/> UNSECURED</td> <td><input checked="" type="checkbox"/> RESIDENTIAL</td> <td></td> </tr> <tr> <td><input type="checkbox"/> ENCLOSED SPACE</td> <td><input type="checkbox"/> WELL FIELD</td> <td></td> </tr> </table>		<input checked="" type="checkbox"/> ACTIVE	<input checked="" type="checkbox"/> LANDFILL	<input checked="" type="checkbox"/> NATURAL	<input checked="" type="checkbox"/> INACTIVE	<input type="checkbox"/> UNCONTROLLED	<input type="checkbox"/> MILITARY	<input checked="" type="checkbox"/> SECURE	<input checked="" type="checkbox"/> INDUSTRIAL	<input type="checkbox"/> OTHER (SPECIFY)	<input checked="" type="checkbox"/> UNSECURED	<input checked="" type="checkbox"/> RESIDENTIAL		<input type="checkbox"/> ENCLOSED SPACE	<input type="checkbox"/> WELL FIELD	
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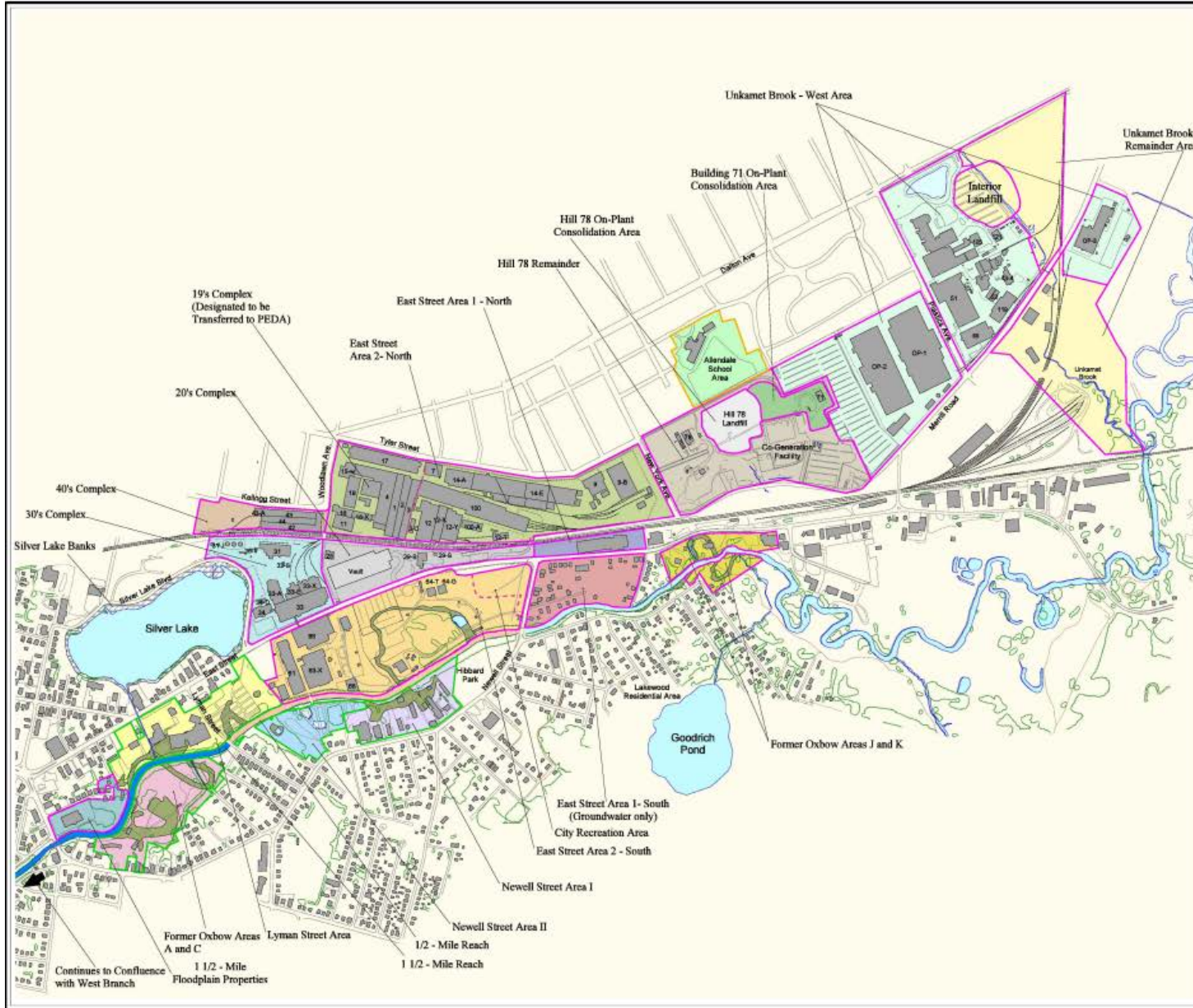
**SITE DESCRIPTION** Summarize below. Include principal operations and unusual features (i.e. containers, buildings, dikes, power lines, hills/slopes, rivers, etc....)

GE/Housatonic River Project. GE used polychlorinated biphenyls (PCBs) at its 254-acre facility in Pittsfield from 1932 to 1977. During this time, the transformer division manufactured and repaired transformers containing dielectric fluids, some of which included PCBs. PCBs and other hazardous substances were released to soil and groundwater, Silver Lake, the Housatonic River and these substances were also disposed of within and around the facility in landfills, former river oxbows, and other locations which have been subject to various remedial actions and investigations.

The Site consists of the Rest of River (ROR) Reach (river sediment, banks and floodplain soil downstream of the confluence of the East and West Branches of the Housatonic River), the Upper ½- Mile Reach (the portion of the East Branch of the Housatonic River between Newell Street and Lyman Street), the 1.5 Mile Reach (the portion of the East Branch of the Housatonic River between Lyman street and the confluence with the West Branch), floodplains associated with the upper 2 mile Reaches, the GE Plant site, Silver Lake, Former Oxbow Areas, Allendale School, Groundwater Management Areas, and other areas impacted by GE's operations and Unkamet Brook.

While PCBs are the primary contaminants of concern (COC) associated with the Site, additional hazardous substances that have been detected in soil, sediment, groundwater or surface water at the overall Site include dioxins, furans, volatile organic compounds (VOC), semi volatile organic compounds (SVOC), coal tars, and inorganic constituents.

**SURROUNDING POPULATION:**     RESIDENTIAL     INDUSTRIAL     RURAL     URBAN     COMMERCIAL     OTHER:



**LEGEND:**

**GE Plant Area:**

- 20's complex
- 30's complex
- 40's complex
- East Street Area 1 - North
- East Street Area 1 - South (Groundwater only)
- East Street Area 2 - North
- East Street Area 2 - South
- Building 71 On-Plant Consolidation Area
- Hill 78 On-Plant Consolidation Area
- Hill 78 Remainder
- Unkamek Brook - West Area
- Unkamek Brook - Remainder Area

**Silver Lake:**

- Silver Lake Sediment
- Silver Lake Banks

**Former Oxbow Areas:**

- Former Oxbow Areas A&C
- Former Oxbow Areas J&K
- Lyman Street Area
- Newell Street Area I
- Newell Street Area II
- Allendale School Area

- 1/2 - Mile Reach
- 1 1/2 - Mile Reach
- 1 1/2 - Mile Floodplain Properties
- Former Oxbows

- Notes:**
1. Some features provided by General Electric Contractors.
  2. Not all structural features are shown.
  3. Site boundaries are approximate.
  4. Map produced by Wilcox Solutions, Inc.




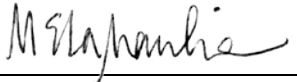

Scale in Feet



GE-PITTSFIELD/HOUSATONIC RIVER SITE

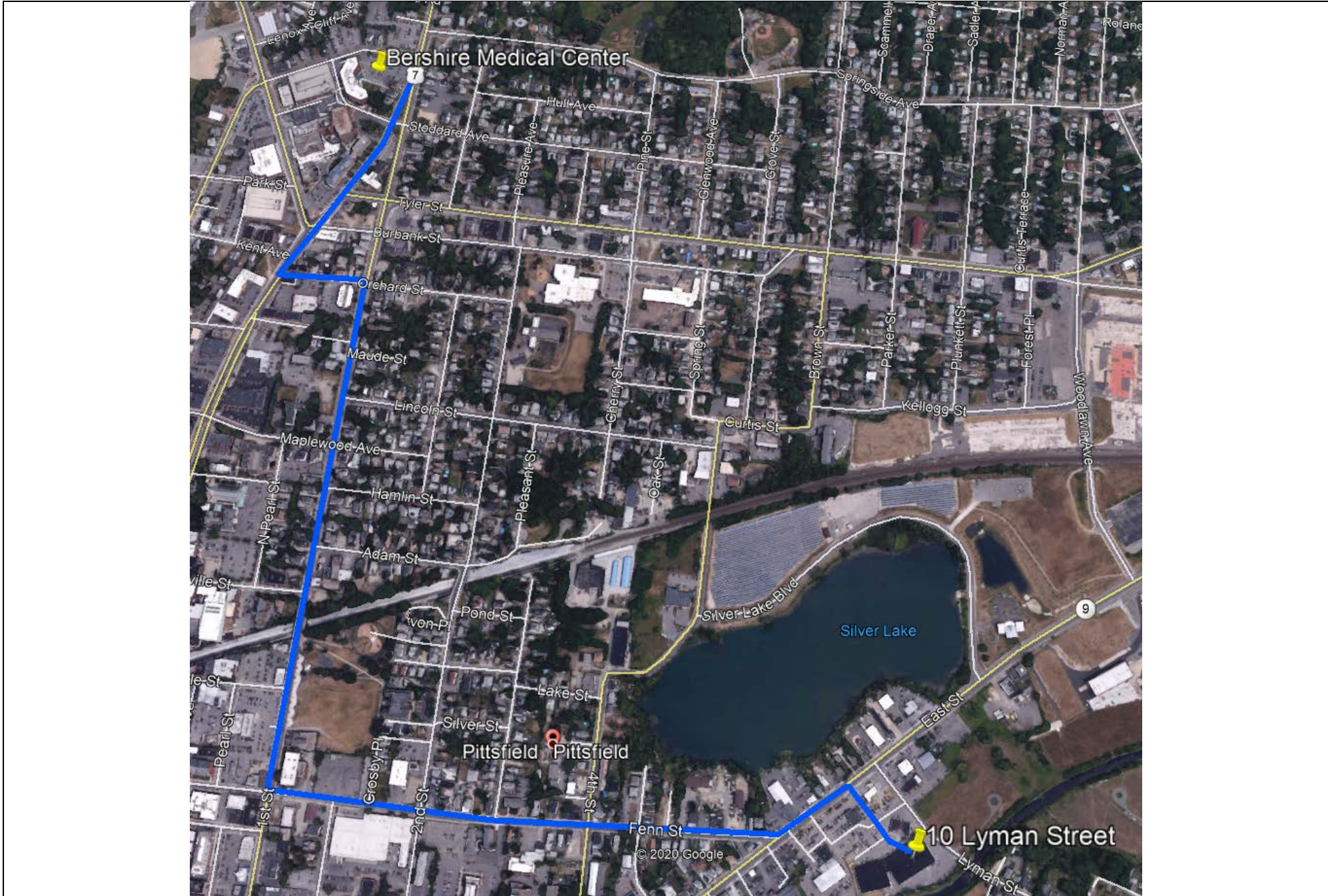
**SITE MAP**



SITE SPECIFIC HEALTH AND SAFETY PLAN			EMERGENCY CONTACTS & APPROVAL		
<b>EMERGENCY CONTACTS</b>					
TITLE	NAME	PHONE	TITLE	NAME	PHONE
EPA Region I	Dean Tagliaferro	617-918-1282	HDR Project Manager	Melissa LaMacchia	201-335-9391 (Direct) 845-548-6960 (Cell)
State EPA Office	Region I, 5 Post Office Square – Suite 100, Boston, MA	1-888-372-7341	HDR Office Safety Coordinator	John Guzewich	201-335-9371 (Direct) 845-548-5493 (Cell)
National Poison Control Ctr.	N/A	800-222-1222	HDR Onsite Personnel/Field Lead	Thomas Czelusniak	413-212-7375 (Cell)
Work Care (Occupational H&S)	Sheila Nghe	714-978-7488 x243	Police & Fire Departments		911
Work Care Incident Intervention (for non-emergency work-related injury/illness)		888-449-7787	Emergency Medical Services	Berkshire Medical Center, 725 North Street, Pittsfield, MA 01201	911 or 413-447-2000
National Response Center		800-424-8802			
<b>OTHER INFORMATION</b>			<b>HOSPITAL CONTACT INFORMATION</b>		
<ol style="list-style-type: none"> <li>1. Evacuation routes will be specified by the PRP’s Site Health &amp; Safety Officer (HSO) and communicated to all personnel on Site.</li> <li>2. Personnel will evacuate under conditions as specified by air monitoring requirements or as directed by the PRP’s HSO.</li> <li>3. An INCIDENT REPORT form shall be completed for ALL ACCIDENTS (see Appendix A) including any near miss incidents.</li> </ol>			<b>NEAREST HOSPITAL EMERGENCY DEPARTMENT PHONE NUMBER:</b>	Berkshire Medical Center 725 North Street, Pittsfield, MA 01201 ED: 413-447-2000	
			<b>NEAREST EMERGENCY CLINIC PHONE NUMBER:</b>	Berkshire Health Urgent Care 505 East Street, Pittsfield, MA 01201 Main: (413)-997-0930	
			<b>24-HOUR EMERGENCY SERVICES:</b>	911	
<b>QA REVIEW:</b> <u></u> DATE: <u>01/25/2021</u> HDR OFFICE SAFETY COORDINATOR					
<p><b>Note:</b> For all non-emergency incidents the field staff will contact the <b>WorkCare (888-449-7787)</b> early intervention team for medical consultation (within 1 hour of incident if possible). If it is determined that an injured staff member requires medical attention, WorkCare will provide the location and contact information for the nearest clinic in their network. However, 911 should be called immediately if there is an incident that appears to require immediate and/or advanced medical attention. All minor and major incidents, as well as all near-miss incidents should be reported in the HDR IndustrySafe system (<a href="http://www.industrysafe.com/hdrinc">www.industrysafe.com/hdrinc</a>) within 24 hours of the incident if possible.</p>					
<b>HEALTH AND SAFETY PLAN APPROVALS</b>			<b>Route to Hospital is described with a map on the following page</b>		
PROJECT MANAGER: <u></u> DATE: <u>01/25/2021</u>			SITE HEALTH & SAFETY OFFICER: <u></u> DATE: <u>01/25/2021</u>		



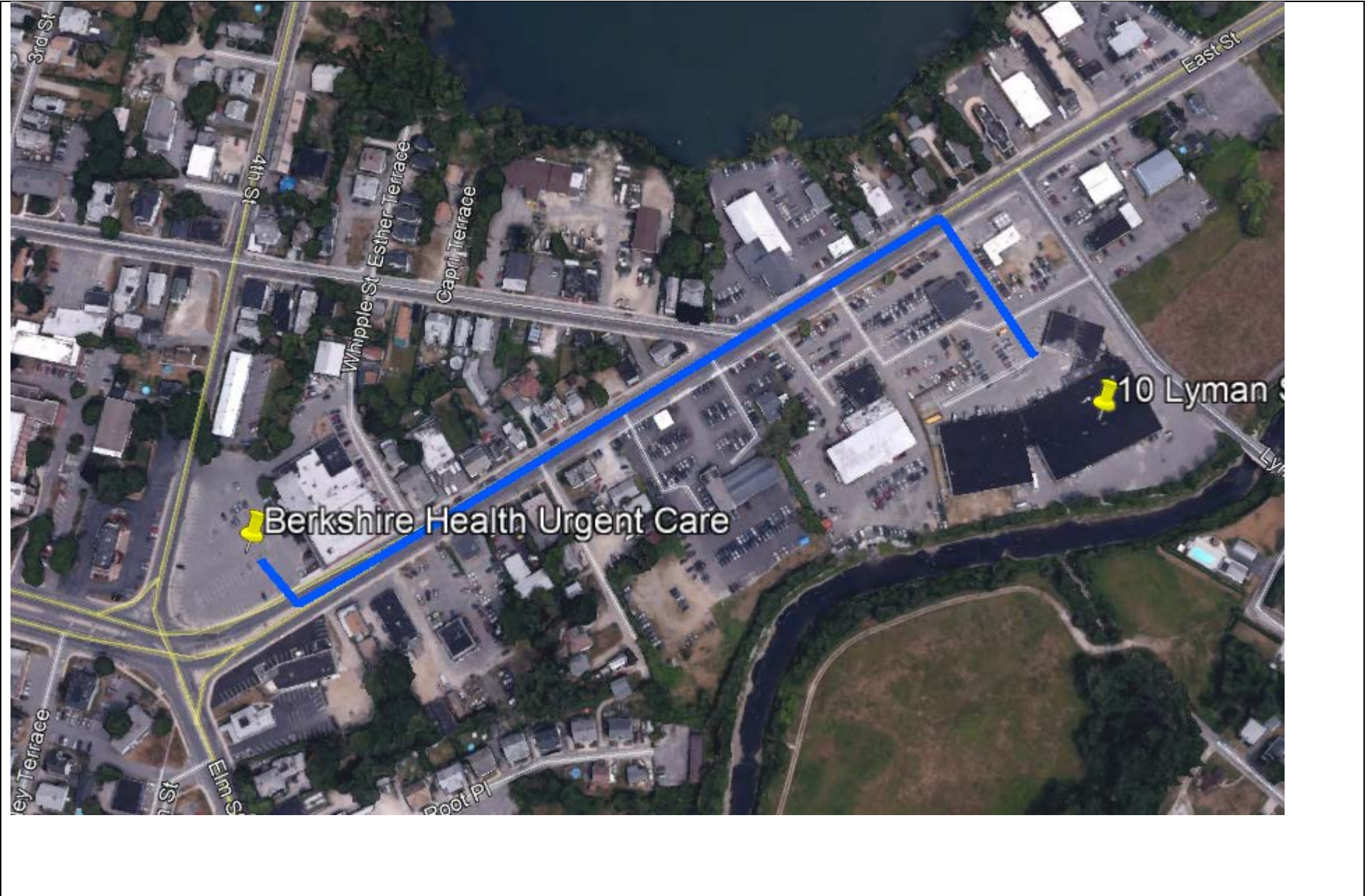
SITE SPECIFIC HEALTH AND SAFETY PLAN		PRIMARY HOSPITAL ROUTE
<b>ADDRESS</b>	<b>MAP TO HOSPITAL</b>	
<p><b><u>Nearest Hospital:</u></b></p> <p><b>Berkshire Medical Center</b> 725 North Street, Pittsfield, MA 01201</p> <p>Contact <b>WorkCare (888-449-7787)</b> for early intervention medical consultation if it appears an injury is minor and does not require immediate medical attention.</p>	Shown on the following page.	
<b>E.D. PHONE:</b> (413)-447-2000		
<b>ROUTE</b>		
<p><u>Directions to BERKSHIRE MEDICAL CENTER from the site: 10 LYMAN STREET</u></p> <ol style="list-style-type: none"><li>1. Head northwest toward East St (292 ft)</li><li>2. Turn left onto East St (436 ft)</li><li>3. Turn right onto Fenn St (0.5 mi)</li><li>4. Turn right onto 1st St (0.5 mi)</li><li>5. Turn left onto Orchard St (492 ft)</li><li>6. Turn right onto North St</li><li>7. Hospital is on left. Follow signs to the Emergency Department.</li></ol> <p>Directions to hospital acquired from <a href="http://maps.google.com/">http://maps.google.com/</a> on 12/21/2020.</p>		







SITE SPECIFIC HEALTH AND SAFETY PLAN		SECONDARY HOSPITAL ROUTE
<b>ADDRESS</b>		<b>MAP TO HOSPITAL</b>
<b><u>Nearest Emergency Clinic:</u></b>  Berkshire Health Urgent Care 505 East Street, Pittsfield, MA 01201		Shown on the following page.
<b>PHONE:</b>	(413)-997-0930	
<b>ROUTE</b>		
<u>Directions to BERKSHIRE HEALTH URGENT CARE from the site: 10 LYMAN STREET</u>  1. Head northwest toward East St (328 ft) 2. Turn left onto East St 3. <b>Destination will be on the right</b> (0.2 mi)  Directions to hospital acquired from <a href="http://maps.google.com/">http://maps.google.com/</a> on 12/21/2020.		





**HISTORY:**

GE has operated a large-scale industrial facility in Pittsfield, Massachusetts since the early 1900's. The primary industrial activities at the Pittsfield facility included manufacturing and servicing of power transformers, defense and aerospace (ordnance), and plastics. GE sold off their plastic division to SABIC Innovative Plastics and the defense and aerospace division to General Dynamics, both are currently operating on the former GE complex. The GE transformer division was closed.

The overall NPL Site, as proposed for the listing, consists of the 254-acre GE manufacturing facility; the Housatonic River, riverbanks, and associated floodplains from Pittsfield, Massachusetts to Rising Pond Dam (approximately 30 miles); former river oxbows that have been filled; neighboring commercial properties; Allendale School; Silver Lake (a 26-acre Commonwealth of Massachusetts designated Great Pond); and other properties or areas that have become contaminated as a result of GE's facility operations.

The Site has been subject to numerous investigations dating back to the early 1980s. The investigations were consolidated under two regulatory mechanisms: An Administrative Consent Order (the "ACO") with the Massachusetts DEP and a Corrective Action Permit with EPA pursuant to the Resource Conservation and Recovery Act (RCRA).

In addition to the investigations by GE, EPA has performed additional assessment activities at the Upper .5 Mile and 1.5 Reach as well as the rest of river and the adjacent Flood Plains. The Removal Site Evaluation described below is limited to the Upper Reach Removal Site. The primary contaminants of concern identified to date are PCBs.

Although GE performed many functions at the Pittsfield facility throughout the years, the activities of the Transformer Division were the likely primary source of PCB contamination. Briefly, GE's Transformer Division's activities included the construction and repair of electrical transformers utilizing dielectric fluids, some of which contained PCBs (primarily Aroclors 1254 and 1260). GE manufactured and serviced electrical transformers containing PCBs at this facility from approximately 1932 through 1977.

According to GE's reports, from 1932 through 1977 releases of PCBs reached the wastewater and storm systems associated with the facility and were subsequently conveyed to the East Branch of the Housatonic River and to Silver Lake (Supplemental Phase II/RCRA Facility Investigation Report for Housatonic River and Silver Lake, Volume I, by BBL, January 1996). Also, as documented by GE, in the late 1960's, a 1000-gallon storage tank of PCBs ruptured or imploded resulting in a release of PCBs in or around Building 68 and into the Housatonic River and its riverbank. GE responded to the spill at the time of release by excavating some of the impacted surface trap rock and river sediments, then transporting this material to a secure landfill. In 1996, however, additional contamination near Building 68 was discovered. Based on the light non-aqueous phase liquid (LNAPL) and dense non-aqueous phase liquid (DNAPL) plumes described below, it appears that there were additional releases of PCBs into the environment as well.

During the 1930's, approximately one mile of the Housatonic River from Newell Street to Elm Street was straightened and channelized to reduce flooding. This action resulted in eleven oxbows being isolated from the River channel. Some of these former oxbows were filled with material from GE later found to contain PCBs.

**WASTE TYPES:**     LIQUID     SOLID     GAS     UNKNOWN     OTHER:



SITE SPECIFIC HEALTH AND SAFETY PLAN	HAZARDOUS MATERIAL SUMMARY
<p><b>WASTE CHARACTERISTICS (CHECK ALL THAT APPLY):</b></p> <p> <input type="checkbox"/> Corrosive      <input type="checkbox"/> Flammable      <input type="checkbox"/> Radioactive  <input checked="" type="checkbox"/> Toxic            <input checked="" type="checkbox"/> Volatile        <input type="checkbox"/> Reactive  <input type="checkbox"/> Inert Gas        <input type="checkbox"/> Unknown       <input checked="" type="checkbox"/> Other: PCBs         </p>	<p><b>WORK ZONES (Describe how the exclusion, contamination reduction, and support zones will be delineated in terms that on-site personnel will recognize. Depict on Work Zone Map Page)</b></p> <ul style="list-style-type: none"> <li>For this oversight project assignment, HDR is not responsible for this task. The HSO for the PRP will have control of the work zones when HDR is observing their work.</li> </ul>
<p><b>HAZARDS OF CONCERN (Check all that apply):</b></p> <p> <input checked="" type="checkbox"/> Heat Stress (H&amp;S Proc. #28)      <input checked="" type="checkbox"/> Noise (H&amp;S Proc. #26)  <input checked="" type="checkbox"/> Cold Stress (H&amp;S Proc. #29)      <input checked="" type="checkbox"/> Inorganic Chemicals  <input type="checkbox"/> Explosives/Flammables            <input checked="" type="checkbox"/> Organic Chemicals  <input type="checkbox"/> Oxygen Deficient Atmospheres    <input checked="" type="checkbox"/> Motorized Traffic  <input type="checkbox"/> Radiological Hazards                <input checked="" type="checkbox"/> Heavy Machinery  <input checked="" type="checkbox"/> Biological Hazards (H&amp;S Proc. #34)   <input checked="" type="checkbox"/> Slips/Trips/Falls (H&amp;S Proc. #3)  <input type="checkbox"/> Other: <u>CONFINED SPACES WILL NOT BE ENTERED!</u> If confined spaces are to be entered, a specific confined space entry plan will be developed and implemented in accordance with HDR H&amp;S Policies. No confined space entry is anticipated.         </p>	<p><b>PRINCIPAL DISPOSAL METHODS AND PRACTICES (Summarize site specific procedures below):</b></p> <ul style="list-style-type: none"> <li>HDR is not responsible for this task. Any disposable PPE used by HDR (e.g. disposable coveralls, nitrile gloves, boot covers, etc.) will be left on site for proper disposal by the PRP.</li> <li>HDR will coordinate with the PRP and will adhere to the PRP's H&amp;S Program regarding requirements for specific or special PPE (e.g., rubber boot cover). Such PPE will be reviewed by HDR's Office Safety Coordinator, and direction for use provided to HDR field staff.</li> </ul>



<b>SITE SPECIFIC HEALTH AND SAFETY PLAN</b>	<b>HAZARDOUS MATERIAL SUMMARY</b>
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HAZARDOUS MATERIAL SUMMARY (Check all that apply, and estimate quantify by category if possible):

CHEMICALS	SOLIDS	SOLVENTS	OILS	MISCELLANEOUS	SLUDGES
AMOUNT:	AMOUNT:	AMOUNT:	AMOUNT:	AMOUNT:	AMOUNT:
<input type="checkbox"/> Acids <input type="checkbox"/> Pickling Liquors <input type="checkbox"/> Caustics <input type="checkbox"/> Pesticides <input type="checkbox"/> Dyes/Inks <input type="checkbox"/> Cyanides <input type="checkbox"/> Phenols <input type="checkbox"/> Halogens <input checked="" type="checkbox"/> Dioxins <input type="checkbox"/> Other:	<input type="checkbox"/> Fly ash <input type="checkbox"/> Asbestos <input type="checkbox"/> Millings/ Mine Tailings <input type="checkbox"/> Ferrous Smelter <input type="checkbox"/> Non-Ferrous Smelter <input checked="" type="checkbox"/> Metals <input type="checkbox"/> Other:	<input checked="" type="checkbox"/> Chlorinated Solvents <input checked="" type="checkbox"/> Hydrocarbons <input type="checkbox"/> Alcohols <input type="checkbox"/> Ketones <input type="checkbox"/> Esters <input type="checkbox"/> Ethers <input type="checkbox"/> Other:	<input type="checkbox"/> Oily Wastes <input type="checkbox"/> Gasoline <input type="checkbox"/> Diesel Fuel/Oil <input type="checkbox"/> Lubricants <input checked="" type="checkbox"/> PCBs <input type="checkbox"/> PAHs <input type="checkbox"/> Other:	<input type="checkbox"/> Laboratory Wastes <input type="checkbox"/> Pharmaceuticals <input type="checkbox"/> Hospital Waste <input type="checkbox"/> Radiological Waste <input type="checkbox"/> Municipal Waste <input type="checkbox"/> Construction Debris <input type="checkbox"/> Munitions <input type="checkbox"/> Other:	<input type="checkbox"/> Paint <input type="checkbox"/> Pigments <input type="checkbox"/> Metal Sludges <input type="checkbox"/> POTW Sludges <input type="checkbox"/> Aluminum <input type="checkbox"/> Distillation Bottoms <input type="checkbox"/> Other:

**OVERALL HAZARD EVALUATION:**     HIGH     MEDIUM     LOW     UNKNOWN (soil) (For tasks where the hazards are different, evaluate each one)  
**JUSTIFICATION:**    Limited exposure to contaminated soils and water. Field crew will wear personal protective equipment (PPE) as outlined in this HASP.

**FIRE/EXPLOSION HAZARD:**     HIGH     MEDIUM     LOW     UNKNOWN

**BACKGROUND REVIEW:**     COMPLETED     INCOMPLETE    HDR is continuing to review information for potential source areas.



SITE SPECIFIC HEALTH AND SAFETY PLAN				CHEMICAL HAZARD TABLE		
CONTAMINANT	HIGHEST OBSERVED CONCENTRATION (Specify units and matrix)	OSHA PEL / ACGIH TLV	IDLH	SYMPTOMS/ EFFECTS OF ACUTE EXPOSURE	PHYSICAL PROPERTIES	
Poly Chlorinated Biphenyl's (PCBs) CAS: 53469-21-9 CAS: 11097-69-1	Soil: +/- 250 mg/kg Sediment: 668 mg/kg Water: 0.0033 mg/l	PEL: 0.5 - 1mg/m <sup>3</sup> TLV: 0.5 - 1mg/m <sup>3</sup>	5mg/m <sup>3</sup>	Exposure Routes: Inh, Abs, Ing, Con Symptoms: Irrit eyes; chloracne; liver damage; repro effects; [carc] Target Organs: Skin, eyes, liver, repro sys [in animals: tumors of the pituitary gland & liver, leukemia]	Colorless to light-colored, viscous liquid with a mild, hydrocarbon odor to Colorless to pale-yellow, viscous liquid or solid (below 50°F) with a mild, hydrocarbon odor.	
					IP: NA	FLP: NA
					LEL: NA	UEL: NA
					VP: 0.00006 to 0.001 mmHg	
Lead CAS: 7439-92-1	Soil: 241 mg/kg Sediment: 303 mg/kg	PEL: 0.050 mg/m <sup>3</sup> TLV: 0.050 mg/m <sup>3</sup>	100 mg/m <sup>3</sup>	Exposure Routes: Inh, Ing, skin or eye contact Symptoms: lassitude (weakness, exhaustion), insomnia; facial pallor; anorexia, weight loss, malnutrition; constipation, abdominal pain, colic; anemia; gingival lead line; tremor; paralysis wrist, ankles; encephalopathy; kidney disease; irritation eyes; hypertension Target Organs: Eyes, gastrointestinal tract, central nervous system, kidneys, blood, gingival tissue	A heavy, ductile, soft, gray solid.	
					IP: NA	FLP: NA
					LEL: NA	UEL: NA
					VP: 0 mmHg	
Dioxin CAS: 1746-01-6	Soil (Floodplain): 0.989 ppb using the 1998 WHO TEF and 0.853 ppb using the 2010 USEPA TEF Sediment: 1,133 pg/g using the TEQ method (note TEQ is calculated using both dioxin and furans)	NA	Ca [N.D.]	Exposure Routes: Inh, Skin abs, Ing, skin or eye contact Symptoms: irritation eyes; allergic dermatitis, chloracne; porphyria; gastrointestinal disturbance; possible reproductive, teratogenic effects; In Animals: liver, kidney damage; hemorrhage; [potential occupational carcinogen] Target Organs: Eyes, skin, liver, kidneys, reproductive system	Colorless to white, crystalline solid.	
					IP: NA	FLP: NA
					LEL: NA	UEL: NA
					VP: (77°F): 0.00000 2 mmHg	
Benzene CAS: 71-43-2	Water: 0.55 mg/l	PEL: 1ppm TLV: 0.5ppm	500ppm	Exposure Route: Inh, Abs, Ing, Con Symptoms: Irrit eyes, skin, nose, resp sys; dizz; head, nau, staggered gait; anor, lass; derm; bone marrow depres; [carc] Target Organ: Eyes, skin, resp sys, blood, CNS, bone marrow [leukemia]	Colorless to light-yellow liquid with an aromatic odor. [Note: A solid below 42°F.]	
					IP: 9.24eV	FLP: 12°F
					LEL: 1.2%	UEL: 7.8%
					VP: 75mm Hg	
Toluene CAS: 108-88-3	Water: 1.5 mg/l	PEL: 200ppm TVL: 50ppm	500ppm	Exposure Route: Inh, Abs, Ing, Con	Colorless liquid with a sweet, pungent, benzene-like odor.	
					IP: 8.82eV	FLP: 40°F



				Symptoms: Irrit eyes, nose; lass, conf, euph, dizz, head; dilated pupils, lac; anxi, musc ftg, insom; pares; derm; liver, kidney damage Target Organs: Eyes, skin, resp sys, CNS, liver, kidneys	LEL: 1.1% UEL: 7.1% VP: 21 mm Hg
Ethylbenzene CAS: 100-41-4	Water: 0.0027 mg/l	PEL: 100ppm TVL: 100ppm	800ppm [10% LEL]	Exposure Routes: Inh, Ing, Con Symptoms: Irrit eyes, skin, muc memb; head; derm; narco, coma Target Organs: Eyes, skin, resp sys, CNS	Colorless liquid with an aromatic odor. IP: 8.76eV FLP: 55°F LEL: 0.8% UEL: 6.7% VP: 7 mm Hg
Xylenes CAS: 108-38-3 CAS: 95-47-6 CAS: 106-42-3	Water: 0.0075 mg/l	PEL: 100ppm TVL: 100ppm	900ppm	Exposure Routes: Inh, Abs, Ing, Con Symptoms: Irrit eyes, skin, nose, throat; dizz, excitement, drow, inco, staggering gait; corn vacuolization; anor, nau, vomit, abdom pain; derm Target Organs: Eyes, skin, resp sys, CNS, GI tract, blood, liver, kidneys	Colorless liquid with an aromatic odor. [Note: A solid below 56°F.] IP: 8.44 – 8.56eV FLP: 81 – 90°F LEL: 0.9 – 1.1% UEL: 6.7 – 7.0% VP: 7 – 9mm Hg
Trichloroethylene (TCE) CAS: 79-01-6	Water: 6.1 mg/l	PEL: 100ppm TLV: 50ppm	1,000 ppm	Exposure Routes: Inh, Abs, Ing, Con Symptoms: Irrit eyes, skin; head, vis dist, lass, dizz, tremor, drow, nau, vomit; derm; card arrhy, pares; liver inj; [carc] Target Organs: Eyes, skin, resp sys, heart, liver, kidneys, CNS [in animals: liver & kidney cancer].	Colorless liquid (unless dyed blue) with a chloroform-like odor. IP: 9.45eV FLP: NA LEL: 8% UEL: 10.5% VP: 58 mm Hg
Vinyl Chloride CAS: 75-01-4	Water: 0.0077 mg/l	PEL: 1ppm TLV: 1ppm	N.D.	Exposure Routes: Inh, Con (liquid) Symptoms: Lass; abdom pain, GI bleeding; enlarged liver; pallor or cyan of extremities; liquid: frostbite; [carc] Target Organs: Liver, CNS, blood, resp sys, lymphatic sys [liver cancer]	Colorless gas or liquid (below 7°F) with a pleasant odor at high concentrations. [Note: Shipped as a liquefied compressed gas.] IP: 9.99eV FLP: NA LEL: 3.6% UEL: 33.0% VP: 3.3 atm
Tetrachloroethylene (PCE) CAS: 127-18-4	Water: 0.36 mg/l	PEL: 100 ppm TLV: 25 ppm	150 ppm	Exposure Route: Inh, Abs, Ing, Con Symptoms: Irrit eyes, skin, nose, throat, resp sys; nau; flush face, neck; dizz, inco; head, drow; skin eryt; liver damage; [carc] Target Organs: Eyes, skin, resp sys, liver, kidneys, CNS [in animals: liver tumors]	Colorless liquid with mild chloroform like odor. IP: 9.32eV FLP: NA LEL: NA UEL: NA VP: 14 mmHg
Cadmium CAS: 7440-43-9	Water: 0.0273 mg/l	PEL: 0.005 mg/m <sup>3</sup> TLV: 0.01 mg.m <sup>3</sup>	9 mg/m <sup>3</sup>	Exposure Routes: Inh, Ing Symptoms: Pulm edema, dysp, cough, chest tight, subs pain; head; chills, musc aches; nau, vomit, diarr; anos, emphy, prot, mild anemia; [carc] Target Organ: Resp sys, kidneys, prostate, blood [prostatic & lung cancer]	Metal: Silver-white, blue-tinged lustrous, odorless solid. IP: NA FLP: NA LEL: NA UEL: NA VP: 0 mmHg



Chlorobenzene CAS: 108-90-7	Water: 4 mg/l	PEL: 75ppm TLV: 10ppm	1000ppm	Exposure Routes: Inh, Ing, Con Symptoms: Irrit eyes, skin, nose; drow, inco; CNS depres; in animals: liver, lung, kidney inj Target Organs: Eyes, skin, resp sys, CNS, liver	Colorless liquid with an almond-like odor.																										
					IP: 9.07eV	Fl.P: 82°F																									
					LEL: 1.3%	UEL: 9.6%																									
					VP: 9 mmHg																										
<b>Note:</b>																															
<b>SOURCES:</b> ACGIH Threshold Limit Values and Biological Exposure Indices (online resource); NIOSH Pocket Guide to Chemical Hazards (online resource)																															
<table border="0"> <tr> <td>NA = Not Available</td> <td>GW = Groundwater</td> <td>SD = Sediment</td> <td>IP = Ionization Potential</td> <td>VP = Vapor Pressure</td> </tr> <tr> <td>NE = Not Established</td> <td>T = Tailings</td> <td>U = Unknown</td> <td>eV = electron volts</td> <td>mmHg = milligrams of mercury</td> </tr> <tr> <td>A = Air</td> <td>SL = Sludge</td> <td>OFF = Offsite</td> <td>LEL = Lower explosive limit</td> <td>Fl.P = Flashpoint</td> </tr> <tr> <td>S = Soil</td> <td>W = Waste</td> <td></td> <td>UEL = Upper explosive limit</td> <td>NA = Not Available</td> </tr> <tr> <td>SW = Surface Water</td> <td>D = Drums</td> <td></td> <td></td> <td></td> </tr> </table>							NA = Not Available	GW = Groundwater	SD = Sediment	IP = Ionization Potential	VP = Vapor Pressure	NE = Not Established	T = Tailings	U = Unknown	eV = electron volts	mmHg = milligrams of mercury	A = Air	SL = Sludge	OFF = Offsite	LEL = Lower explosive limit	Fl.P = Flashpoint	S = Soil	W = Waste		UEL = Upper explosive limit	NA = Not Available	SW = Surface Water	D = Drums			
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S = Soil	W = Waste		UEL = Upper explosive limit	NA = Not Available																											
SW = Surface Water	D = Drums																														



**HAZARD COMMUNICATIONS STANDARD**

A notebook or binder containing this Site-Specific Health and Safety Plan for our oversight activities will be taken in the field with the crew and kept in the vehicle. It should be noted that HDR will be providing oversight / observation for this USEPA project investigation activities conducted by an environmental consultant for the PRP. H&S monitoring will be conducted by the PRP's environmental consultant. HDR will be collecting split samples for analysis.

As part of the HDR observation and split sampling activities, chemicals expected to be on-site as part of PRP's sampling activities include:

- Sample preservatives contained within pre-preserved sample containers. Quantities are small but sufficient for proper sample preservation.
  - Hydrochloric Acid (HCl)
  - Sodium Hydroxide (NaOH)
  - Nitric Acid (HNO<sub>3</sub>)
  - Sulfuric acid (H<sub>2</sub>SO<sub>4</sub>)

The PRP's environmental consultant will likely have preservation chemicals as well as the following chemicals on site:

- Calibration gasses in small, disposable cylinders
  - Isobutylene
  - Multi-Gas (Hydrogen sulfide, Methane, Oxygen, Carbon Monoxide, and Oxygen balance)
- Decontamination Chemicals
  - Non-Phosphate Detergent (i.e. Alconox or similar)
- Fuels and Oils
  - Gasoline
  - Motor Oil

A complete and current inventory of chemicals to be brought on-site by HDR and their appropriate Safety Data Sheets (SDS) will accompany these chemicals. The SDSs will be kept by the HDR field staff in the vehicle used for the oversight investigation activities.

Job Hazards Analysis forms for Field Oversight and Split Sampling are provided in Appendix D and will be reviewed and signed by all personal onsite daily.



SITE SPECIFIC HEALTH AND SAFETY PLAN				TASK DESCRIPTION		
FIELD ACTIVITIES COVERED UNDER THIS PLAN – ATTACH ACTIVITY HAZARD ANALYSIS FOR EACH TASK						
TASK DESCRIPTION	TYPE	PRIMARY	CONTINGENCY	HAZARD SCHEDULE		
1 Remedial Action Oversight Activities & Split Sample Collection (including Surface Water, Soil, Sediment and Potentially Groundwater/NAPL), Oversight of Post-Removal Long-Term Monitoring, Air Sampling	<input checked="" type="checkbox"/> Intrusive <input type="checkbox"/> Non-Intrusive	<input checked="" type="checkbox"/> LEVEL D <input type="checkbox"/> Modified	<input checked="" type="checkbox"/> EXIT AREA <input type="checkbox"/> Modified	<input type="checkbox"/> HIGH	<input type="checkbox"/> MED	<input checked="" type="checkbox"/> LOW
2 Dam Inspections	<input type="checkbox"/> Intrusive <input checked="" type="checkbox"/> Non-Intrusive	<input checked="" type="checkbox"/> LEVEL D <input type="checkbox"/> Modified	<input checked="" type="checkbox"/> EXIT AREA <input type="checkbox"/> Modified	<input type="checkbox"/> HIGH	<input type="checkbox"/> MED	<input checked="" type="checkbox"/> LOW
	<input type="checkbox"/> Intrusive <input type="checkbox"/> Non-Intrusive	<input type="checkbox"/> LEVEL D <input type="checkbox"/> Modified	<input type="checkbox"/> EXIT AREA <input type="checkbox"/> Modified	<input type="checkbox"/> HIGH	<input type="checkbox"/> MED	<input type="checkbox"/> LOW
	<input type="checkbox"/> Intrusive <input type="checkbox"/> Non-Intrusive	<input type="checkbox"/> LEVEL D <input type="checkbox"/> Modified	<input type="checkbox"/> EXIT AREA <input type="checkbox"/> Modified	<input type="checkbox"/> HIGH	<input type="checkbox"/> MED	<input type="checkbox"/> LOW

PERSONNEL AND RESPONSIBILITIES (Include subcontractors if applicable). Responsibilities and the reporting organizational structure are described on the following page.						
NAME	PHONE	DATE OF LAST TRAINING	DATE OF LAST HEALTH CLEARANCE	RESPONSIBILITIES	ON-SITE (YES/NO) List Task Numbers	
Melissa LaMacchia	201-335-9391	DECEMBER 2020	MARCH 2019 (2 YR)	PROJECT MANAGER	NO	1
John Guzewich	201-335-9371	DECEMBER 2020	APRIL 2019 (2 YR)	OFFICE HEALTH AND SAFETY COORDINATOR	NO	1
Thomas Czelusniak	431-212-7375	JANUARY 2020	MARCH 2020 (2 YR)	FIELD OVERSIGHT/FIELD LEAD	YES	1
TBD	TBD	TBD	TBD	FIELD TEAM MEMBER	YES	1

**1. Site Safety and Health Personnel:**

The HDR personnel conducting the oversight and split sampling activities on the site will be required to adhere to the Health & Safety protocols and procedures in place by the PRP's environmental consultant as well as the HDR HASP. H&S monitoring will be conducted by the PRP's environmental consultant and HDR will follow instructions/directions from the PRP's on-site HSO as far as health and safety and PPE requirements are concerned. It is anticipated that HDR will only have 1 staff member on site for these oversight and split sampling activities. The Project Manager and the Field Oversight Lead will ensure that the provisions of this HDR HASP are adequate and implemented effectively in the field. All in-field H&S related decisions will be the responsibility of the PRP. The HDR Project Manager is to take all necessary actions to guarantee Site Safety for the HDR Personnel and will coordinate with the PRP to ensure HDR will have the training and supplies to comply with the PRP's HASP requirements. Changing field conditions may require decisions to be made concerning adequate protection programs and may require deviations and/or additions to this HDR HASP. All deviations and/or additions must be documented and approved by the Field Oversight Lead on the DEVIATIONS AND ADDITIONS form located in Appendix B. Personnel assigned to the role of Field Oversight Lead must be experienced and meet the requirements specified by OSHA in 29 CFR 1910.120 and this HASP. The Field Oversight Lead is also responsible for conducting site inspections on a routine basis in order to ensure the effectiveness of this HDR plan and to ensure HDR/APTIM staff are adhering to this HASP and the PRP's HASP as required.

**2. Organizational Structure and Responsibilities:**

1. HDR Project Manager (PM)
  - Overall responsible for project schedule;
  - Develop cost estimates for work identified;
  - Identify scope of work and estimate schedule for work;
  - Determine the technical and field teams.
2. Site Coordinator / Field Oversight Lead (Reports to "1" – Project Manager when PM is onsite, otherwise in charge)
  - Attend all pre-entry Site Safety Briefings conducted by the HSO for the PRP;
  - Maintain daily field logbook and health and safety file for the project;
  - Monitor on-site hazards and conditions;
  - Monitor HDR staff for heat stress;
  - Confirm an employee's suitability for work based on physician's recommendation.
3. Other On-Site Personnel (Report to "2" – Site Coordinator)



SITE SPECIFIC HEALTH AND SAFETY PLAN										PERSONAL PROTECTIVE EQUIPMENT BY TASK																													
PROTECTIVE EQUIPMENT: Specify by task. Indicate type and/or material(s) as necessary.																																							
<b>SITE INVESTIGATION ACTIVITIES OBSERVATION &amp; SPLIT SAMPLE COLLECTION</b>																																							
<b>TASKS:</b>		1 2 3 4 5 6 7 8								<input checked="" type="checkbox"/> PRIMARY		<b>TASKS:</b>		1 2 3 4 5 6 7 8								<input type="checkbox"/> PRIMARY																	
<b>PPE LEVEL:</b>		A B C <b>D</b> MODIFIED								<input type="checkbox"/> CONTINGENCY		<b>PPE LEVEL:</b>		A B C D MODIFIED								<input type="checkbox"/> CONTINGENCY																	
<b>RESPIRATOR</b> <input checked="" type="checkbox"/> <u>Not Needed</u> <input type="checkbox"/> SCBA or Airline: <input type="checkbox"/> APR: <input type="checkbox"/> Cartridge: <input type="checkbox"/> Escape Mask: <input type="checkbox"/> Other:										<b>PROTECTIVE CLOTHING</b> <input type="checkbox"/> Not Needed <input type="checkbox"/> Encapsulated Suit: <input type="checkbox"/> Splash Suit: <input type="checkbox"/> Apron: <input checked="" type="checkbox"/> <u>Tyvek Coverall: as needed</u> <input type="checkbox"/> Saranex Coverall: <input type="checkbox"/> Cloth Coverall: <input checked="" type="checkbox"/> Other: Life vests and Float Suits as needed for work on the river.										<b>RESPIRATOR</b> <input type="checkbox"/> Not Needed <input type="checkbox"/> SCBA or Airline: <input type="checkbox"/> APR: <input type="checkbox"/> Cartridge: <input type="checkbox"/> Escape Mask: <input type="checkbox"/> Other:										<b>PROTECTIVE CLOTHING</b> <input type="checkbox"/> Not Needed <input type="checkbox"/> Encapsulated Suit: <input type="checkbox"/> Splash Suit: <input type="checkbox"/> Apron: <input type="checkbox"/> Tyvek Coverall: <u>Optional</u> <input type="checkbox"/> Saranex Coverall: <input type="checkbox"/> Cloth Coverall: <input type="checkbox"/> Other:									
<b>HEAD AND EYE PROTECTION</b> <input checked="" type="checkbox"/> <u>Safety Glasses:</u> <input type="checkbox"/> Face Shield: <input type="checkbox"/> Goggles: <input checked="" type="checkbox"/> <u>Hard Hat: depending on the task</u> <input type="checkbox"/> Other:										<b>GLOVES</b> <input type="checkbox"/> Not Needed <input type="checkbox"/> Under Gloves: <input checked="" type="checkbox"/> <u>Gloves: See Below</u> <input type="checkbox"/> Over Gloves: <input type="checkbox"/> Other:										<b>HEAD AND EYE PROTECTION</b> <input type="checkbox"/> Safety Glasses: <input type="checkbox"/> Face Shield: <input type="checkbox"/> Goggles: <input type="checkbox"/> Hard Hat: <u>Optional (depending on the task)</u> <input type="checkbox"/> Other:										<b>GLOVES</b> <input type="checkbox"/> Not Needed <input type="checkbox"/> Under Gloves: <input type="checkbox"/> Gloves: <u>See Below</u> <input type="checkbox"/> Over Gloves: <input type="checkbox"/> Other:									
<b>BOOTS / FOOT PROTECTION</b> <input type="checkbox"/> Not Needed <input checked="" type="checkbox"/> <u>Boots: See Below</u> <input checked="" type="checkbox"/> Over boots/Disposable booties: May be required depending on the work area <input type="checkbox"/> Rubber:										<b>OTHER PPE</b> <input checked="" type="checkbox"/> <u>Hi-Visibility Safety Vest: See Below</u> <input checked="" type="checkbox"/> <u>ANSI Rated ear plugs</u>										<b>BOOTS / FOOT PROTECTION</b> <input type="checkbox"/> Not Needed <input type="checkbox"/> Boots: <u>See Below</u> <input type="checkbox"/> Over boots: <input type="checkbox"/> Rubber:										<b>OTHER PPE</b> <input type="checkbox"/> Hi-Visibility Safety Vest: <u>See Below When near traffic</u> <input type="checkbox"/> ANSI Rated ear plugs <u>See Below</u>									
<b>ADDITIONAL COMMENTS:</b>										<b>ADDITIONAL COMMENTS:</b>																													
<ul style="list-style-type: none"> <li>▪ <b>VESTS:</b> Crews will wear hi-visibility safety vests when conducting work in the vicinity of active roadways, where heavy machinery is being operated, and/or when visibility increases safety of workers.</li> <li>▪ <b>GLOVES:</b> Crews will wear disposable nitrile gloves whenever handling potentially contaminated materials or equipment; whenever handling potentially hazardous substances (i.e. pre-preserved sample jars with acids); and/or whenever performing sampling. Gloves should be changed as necessary and disposed of properly.</li> <li>▪ <b>BOOTS:</b> ASTM rated safety-toe work boots (must meet ASTM F 2413).</li> </ul>																																							



<ul style="list-style-type: none"> <li>▪ <u>EAR PLUGS</u>: To be worn whenever working near heavy machinery (i.e. drill rigs) or whenever the individual is exposed to elevated noise levels as described in HDR H&amp;S Policy #26.</li> <li>▪ <u>PFD (Personal Floation Device)</u>: Crews will wear PFD while on or within 10 feet of the water.</li> <li>▪ <u>Waders</u>: crew will don waders when entering water deeper than 2 inches.</li> </ul>	
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SITE SPECIFIC HEALTH AND SAFETY PLAN		AIR MONITORING BY TASK	
MONITORING EQUIPMENT: Specify by task. Indicate type as necessary. Attach additional sheets as necessary.			
INSTRUMENT	APPLICABLE TASKS	ACTION GUIDELINES	COMMENTS (Include schedule of use)
Portable Gas Monitor / Multi-Gas Monitor (i.e. RAESystems MultiRAE or similar device)  NOTE: If multi-gas meter also contains a Photoionization Detector (PID) sensor and a separate PID is not used, follow the information and procedures provided under the PID equipment information.	See Comments.	HDR will adhere to instructions/guidance from PRP's HSO concerning action levels and PPE upgrade or downgrade conditions	(X) Not Needed  HDR providing oversight of work conducted by PRP. HSO for PRP will be conducting air monitoring.
Photoionization Detector (i.e. MiniRAE 3000 or similar monitor)  <b>Lamp:</b> <input type="checkbox"/> 11.7 eV <input type="checkbox"/> 10.6 eV <input type="checkbox"/> 9.8 eV <input type="checkbox"/> Other:		See above.	(X) Not Needed HDR providing oversight of work conducted by PRP. HSO for PRP will be conducting air monitoring. (see above)



SITE SPECIFIC HEALTH AND SAFETY PLAN		DECONTAMINATION INFORMATION	
<b>DECONTAMINATION PROCEDURES</b>			
<b>ATTACH SITE MAP INDICATING EXCLUSION, DECONTAMINATION, AND SUPPORT ZONES AS PAGE TWO OF THIS SECTION</b>			
<b>NOTE:</b> The PRP will be responsible for determining the exclusion zones, support zones, and decontamination procedures. HDR staff will adhere to the requirements of the PRP's HASP and the directions of the PRP's HSO when on the site.			
<p><b>PERSONNEL DECONTAMINATION</b> Summarize below and/or attach diagram; discuss use of work zones.</p> <p>Only disposable personal PPE will be used, and personnel decontamination is not anticipated to be required.</p> <p>HDR providing observation of investigation activities and collecting split samples. Sampler will wear disposable nitrile gloves when handling sample containers for split samples.</p> <p style="text-align: right;"><input checked="" type="checkbox"/> Not Needed</p>	<p><b>SAMPLING EQUIPMENT DECONTAMINATION</b> Summarize below and/or attach diagram; discuss use of work zones.</p> <p>HDR providing oversight of work and collecting split samples where the PRP is performing sampling and decontaminating equipment.</p> <p>In the event that HDR needs to self-perform sampling, disposable equipment will be used.</p> <p style="text-align: right;"><input checked="" type="checkbox"/> Not Needed</p>	<p><b>HEAVY EQUIPMENT DECONTAMINATION</b> Summarize below and/or attach diagram; discuss use of work zones.</p> <p>Not-Applicable. HDR providing oversight of work and collecting split samples</p> <p style="text-align: right;"><input checked="" type="checkbox"/> Not Needed</p>	
<p><b>CONTAINMENT AND DISPOSAL METHOD</b></p> <p>Disposable PPE used by HDR will be secured in plastic bags and will be disposed of by PRP.</p>	<p><b>CONTAINMENT AND DISPOSAL METHOD</b></p> <p>Not Applicable. HDR providing oversight of work and collecting split samples.</p>	<p><b>CONTAINMENT AND DISPOSAL METHOD</b></p> <p>Not Applicable. HDR providing oversight of work and collecting split samples.</p>	



**SITE SPECIFIC HEALTH AND SAFETY PLAN**

**WORK ZONE (EXCLUSION, DECONTAMINATION, AND SUPPORT ZONES MAP)**

**WORK ZONE SITE MAP**

**NOTE: The contractor or environment consultant for the PRP will be controlling the site. The PRP and/or their HSO will determine the appropriate work zone layout for the investigation and sampling activities.**

**CONCEPTUAL WORK ZONE LAYOUT**



The following personnel have read and fully understand the contents of this Site Health and Safety Plan and the referenced HDR Health & Safety Procedures and further agree to all requirements contained herein. Furthermore, the individuals are fully trained and have the required clearances in accordance with HDR Health & Safety Procedure #20.

ATTACH ALL COPIES OF CURRENT HTRW AND FIRST AID TRAINING, MEDICAL CLEARANCE, AND RESPIRATORY FIT TEST RECORDS AS NECESSARY.

<b>NAME (Print)</b>	<b>AFFILIATION</b>	<b>DATE</b>	<b>SIGNATURE</b>





## **APPENDIX A ACCIDENT REPORTING**

All accidents, injuries, illnesses, and near-miss incidents for HDR employees which occur from performing project related activities in this HASP require that the injured person(s) complete HDR's online incident/accident/near miss report through the IndustrySafe system. If access to the HDR Health & Safety portal or the IndustrySafe website is not available a hard copy version of the report will be filled out and forwarded to the local Safety Coordinator so the information can then be input into the IndustrySafe reporting system:

Mr. John Guzewich  
1 International Boulevard, 10th Floor, Suite 1000  
Mahwah, NJ 07495  
845-548-5493 (C); 201-335-9371 (O)

Industry Safe Support Team Contact Information:  
Tel: (215) 546-9110  
Email: [support@industrysafes.com](mailto:support@industrysafes.com)  
Web: [www.support.industrysafes.com](http://www.support.industrysafes.com)

Non-Emergency Injuries/Illnesses should be reported to WorkCare  
Tel: (888) 449-7787



### ACCIDENT / INCIDENT REPORTING FORM

<b>Name of Exposed/Injured Employee</b>	
<b>Name of Employee Completing Form</b>	
<b>Incident Date</b>	<b>Incident Time</b> AM or PM (circle one)
<b>Did incident occur within working hours?</b> <input type="checkbox"/> <b>YES</b> <input type="checkbox"/> <b>NO</b> (occurred during break or before or after shift)	
<b>Location</b> (Check applicable box and enter information as appropriate.) <input type="checkbox"/> Active Mine Site (Enter MSHA Mine ID Number) _____ <input type="checkbox"/> Client Office (Enter Name of Client) _____ <input type="checkbox"/> Field or Construction Site (Enter Project Name) _____ <input type="checkbox"/> HDR Office <input type="checkbox"/> Parking Lot or Roadway <input type="checkbox"/> Other	
<b>Locale</b> (Indicate state/province where incident occurred.)	
<b>Witnesses</b> (indicate name of any HDR or non-HDR witness to the incident)	
<b>Incident Type</b> <input type="checkbox"/> <b>YES</b> injury/illness occurred (Go to Part 2) <input type="checkbox"/> <b>NO</b> injury/illness put potential for it (Go to Part 3)	
<b>Part 2 – Incidents with Injury/Illness</b>	
<b>Medical Care</b> <input type="checkbox"/> No Medical Care Needed (Go to Part 3) <input type="checkbox"/> First Aid Given at Work Site (Go to Part 3) Off-Site Medical Care Required (indicate provider name and address)	
<b>Transitional Duty Evaluation</b> (for injuries that impact your ability to return to your normal job duties) Did you contact your HR Rep for a Transitional Duty Evaluation Form? (If not, do so ASAP!) <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Applicable	
<b>Workers Compensation</b> (for injuries that require medical care beyond first aid and/or impact your ability to work) Did you contact your HR Rep to file a Workers' Compensation claim? (If not, do so ASAP!) <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Applicable	
<b>Work Impact</b> <input type="checkbox"/> No Missed Time or Restricted Duties <input type="checkbox"/> One or More Full Workdays Missed (indicate dates not including date of incident) _____ <input type="checkbox"/> One or More Partial Workdays Missed (indicate dates not including date of incident) _____ <input type="checkbox"/> Restricted Duties (indicate dates not including date of incident)	



<b>Medication</b> <input type="checkbox"/> No Medication Needed <input type="checkbox"/> Over the Counter Medication (regular strength) <input type="checkbox"/> Prescription Written but Not Filled <input type="checkbox"/> Prescription Medication <input type="checkbox"/> Over the Counter Medication (prescription strength)
<b>Description of Medical Treatment</b> (indicate the type of treatment received and the body party affected (e.g., ER visit, hospitalization, physical therapy, MRI/x-Ray/CT scan; stiches/glue; hand splint/brace; soft splint/brace; etc.)
<b>Prognosis and Follow Up</b> (describe doctor's orders and indicate if follow up care/appointments are needed)
<b>Part 3 – Incident Description, Causative Factors, and Suggestions for Prevention</b>
<b>Incident Description</b> (Describe in detail what happened and where.)
<b>Causative Factors</b> (Describe circumstances contributing to the incident.)
<b>Suggestions for Prevention</b> (Describe changes that could prevent the circumstances from reoccurring.)
<a href="#"><u>When you are finished with this report, enter it into HDR's online reporting system or give it to your local OSC for entry.</u></a>



## **APPENDIX B DEVIATIONS AND ADDITIONS FORM**

Deviations from and additions to this HASP are permitted and sometimes required based on additional information obtained since the preparation date of this HASP. The DEVIATIONS AND ADDITIONS form shall be used to authorize and record all deviations and additions that occur after any one individual has signed this document. Changes in this HASP are only permitted with the following:

1. Written documentation of what the deviation and/or addition is and reference to the appropriate section of this HASP;
2. Written justification for the change;
3. Verbal communication of the change to all personnel who are directly affected by the deviation and/or change and answering all questions regarding the change(s) to the satisfaction of those same individuals; and
4. Signatures from all personnel who are affected by the change prior to commencing project activities on Site with an approval signature from the HDR Project Manager and the Office Safety Coordinator.



**HEALTH AND SAFETY PLAN DEVIATIONS AND ADDITIONS FORM**

CHANGE #: \_\_\_\_\_  
SECTION: \_\_\_\_\_  
EFFECTIVE DATE: \_\_\_\_\_  
AUTHOR & ROLE: \_\_\_\_\_

**DESCRIPTION OF CHANGE**

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**JUSTIFICATION**

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**SAFETY IMPACT**

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**SIGNATURES OF ACKNOWLEDGEMENT**

NAME	AFFILIATION / ROLE	DATE	SIGNATURE
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**APPENDIX C  
VISITORS LOG**

Visitors to the Site may be permitted entrance into the exclusion and contamination reduction zones based upon the approval of the Site Coordinator or they must otherwise remain in the support zone. The Site Coordinator will be responsible for documenting the identity (including name, company/agency, purpose, areas to be entered, date and time of arrival, and who checked the individual in) of all visitors on this VISITORS LOG.

<b>NAME</b>	<b>COMPANY / AGENCY</b>	<b>PURPOSE OF VISIT</b>	<b>AREA(S) TO BE ENTERED</b>	<b>DATE AND TIME ON SITE</b>	<b>CHECKED IN BY</b>



**APPENDIX D**  
**JOB HAZARD ANALYSIS FORMS**



## JOB HAZARD ANALYSIS FORM FIELD OVERSIGHT AND SPLIT SAMPLING

		<b>Overall Risk Assessment Code (RAC) (Use highest code)</b>				<b>L</b>		
Project Name: GE Pittsfield/Housatonic River Site Oversight		<b>Risk Assessment Code (RAC) Matrix</b>						
Project Location: Pittsfield, Berkshire County, Massachusetts	<b>E =Extremely High Risk</b> <b>H = High Risk</b> <b>M =Moderate Risk</b> <b>L =Low Risk</b>	<b>Probability (P)</b>						
Project Number: 10265786		Frequent (F)	Likely (L)	Occasional (O)	Seldom (S)	Unlikely (U)		
Prepared by (Name/Title): Brian Montroy, Sr. Geologist								
Notes: (Field Notes, Review Comments, etc.):		<b>Severity (S)</b>	Catastrophic (C)	E	E	H	H	M
			Critical (Cr)	E	H	H	M	L
			Marginal (M)	H	M	M	L	L
			Negligible (N)	M	L	L	L	L
		<p style="color: blue; font-size: small;">RAC is developed after correctly identifying all hazards and fully implementing all controls.</p> <p><b>Step 1:</b> Review each "Hazard" with identified safety "Controls" and determine RAC</p> <ul style="list-style-type: none"> <li>- P "Probability" is the likelihood to cause an incident, near miss, or accident.</li> <li>- S "Severity" is the outcome if an incident, near miss, or accident did occur</li> </ul> <p><b>Step 2:</b> Identify RAC for each "Hazard" and indicate overall highest RAC at the top of JHA</p>						
<b>Job Steps</b>	<b>Hazards</b>	<b>Controls</b>			<b>P</b>	<b>S</b>	<b>RAC</b>	
Emergency telephone numbers	Emergency numbers will be on site at all times	<ul style="list-style-type: none"> <li>Local emergency telephone numbers are to be available on site prior to beginning of work.</li> </ul>			U	Cr	L	
Preplanning	Crew unprepared	<ul style="list-style-type: none"> <li>Complete necessary preparation. Review Work Plan &amp; HASP and JHAs. Review potential hazards and the contaminants of concern.</li> <li>Have local emergency telephone numbers available on site prior to beginning of work.</li> </ul>			U	Cr	L	
	Unapproved travel	<ul style="list-style-type: none"> <li>Confirm with supervisor that travel is deemed business-essential.</li> </ul>			U	M	L	
	Access restrictions/closures due to COVID-19	<ul style="list-style-type: none"> <li>Check with client regarding potential access restrictions or specific guidance regarding COVID-19.</li> <li>Determine requirements of any local, state, federal government directives/ordinances applicable to the work area.</li> </ul>			S	M	L	



Job Steps	Hazards	Controls	P	S	RAC
	Lack of vital services due to COVID-19	<ul style="list-style-type: none"> <li>• Verify hotels and meal accommodations are available in vicinity of the field work.</li> <li>• Use only third-party services that have implemented proper CDC practices for sanitation.</li> </ul>	S	M	L
	Increased exposure potential to COVID-19	<ul style="list-style-type: none"> <li>• Consider working with subcontractors regarding possible means to reduce overall exposure by reducing the total number of individuals in the field at any one time and reducing workforce to only essential workers.</li> <li>• Educate team members about the sources of exposure to the virus, the hazards associated with that exposure, and appropriate workplace protocols to prevent or reduce the likelihood of exposure.</li> <li>• Provide adequate supplies for the task and access for all team members (hand washing and sanitation stations, PPE (gloves, face shields, masks, as applicable), etc.).</li> <li>• Follow hygienic practices to reduce the spread of germs:               <ul style="list-style-type: none"> <li>○ Wash hands regularly and thoroughly with soap and water, for a minimum of 20 seconds. While in the field keep hand sanitizer (containing greater than 60% alcohol - ethanol) and/or disinfectant wipes easily accessible.</li> <li>○ Avoid touching your nose, mouth, and eyes and sanitize hands before and after eating.</li> <li>○ Cover coughs and sneezes with a tissue, or cough and sneeze into upper sleeve if tissues are not available.</li> <li>○ Properly dispose of tissues immediately after use (do not place used tissues on desk surfaces or in clothing pockets).</li> <li>○ Wash hands or use hand sanitizer after coughing, sneezing or blowing your nose.</li> <li>○ Wipe-down frequently touched work surfaces, tools, and equipment with sanitizing wipes.</li> <li>○ Use disposable gloves if handling tools and equipment that may be contaminated.</li> </ul> </li> </ul>	S	M	L

Job Steps	Hazards	Controls	P	S	RAC
		<ul style="list-style-type: none"> <li>○ Avoid using other employees' work tools and equipment.</li> <li>● Post signs to control unauthorized personnel from entering work area.</li> <li>● Avoid close contact with others; maintain social distancing when possible (defined by the CDC as remaining out of congregate settings, avoiding mass gatherings, and maintaining distance (approximately 6 feet/2 meters) from others).</li> <li>● Avoid handshakes. Always wash/sanitize hands after physical contact with others.</li> </ul>			
	<p>HDR team member with high risk or with symptoms of COVID-19</p>	<ul style="list-style-type: none"> <li>● Screen field team for risk and symptoms in accordance with CDC recommendations (symptomatic personnel should stay home and report condition to their Supervisor):               <ul style="list-style-type: none"> <li>○ In the last 14 days have you or anyone you have been in close contact with had a confirmed case of COVID-19?</li> <li>○ Have you, or anyone in your family, been in close contact with a person that is in the process of being tested for COVID-19?</li> <li>○ Have you traveled internationally, been on a cruise ship, or been to any domestic location categorized as Level 3 by the CDC in the last 14 days?</li> <li>○ Have you had a fever of over 100.4 degrees in the last 72 hours, without the use of fever reducing medication?</li> <li>○ Are you currently, or in the past 72 hours experienced coughing or shortness of breath?</li> </ul> </li> <li>● If you start experiencing symptoms of COVID-19 or other illness, follow HDR's Isolation Protocol and notify your field team leader and supervisor and contact WorkCare (888-449-7787) for guidance.</li> </ul>	S	M	L
	<p>Inability to contact team members with emergency information</p>	<ul style="list-style-type: none"> <li>● Download the Preparis app (see instructions on the <a href="#">SH&amp;E Portal</a>) and enable location services to receive emergency notifications from HDR Alerts.</li> </ul>	U	Cr	L

Job Steps	Hazards	Controls	P	S	RAC
		<ul style="list-style-type: none"> <li>Confirm your mobile phone number is up-to-date in EBS.</li> </ul>			
Travel to and from Site	Vehicle accident	<ul style="list-style-type: none"> <li>Ensure vehicle is in good condition</li> <li>Plan travel route</li> <li>Avoid distracted driving activities and pay attention to the road and other drivers at all times</li> <li>When backing up use a spotter whenever possible</li> </ul>	U	Cr	L
	Inadequate social distancing for COVID-19	<ul style="list-style-type: none"> <li>Avoid public transportation when possible.</li> <li>Separate vehicle occupants as far as possible or plan to take individual vehicles/means of transportation to maintain social distancing.</li> <li>Carry sanitizing wipes to use on hands and surfaces you could frequently make contact with during travel. (rental cars)</li> </ul>	U	M	L
Pre-Job Briefing/Toolbox Talk	Inadequate social distancing for COVID-19	<ul style="list-style-type: none"> <li>Conduct briefing in an area conducive to allowing distance (ideally 6 ft) between personnel and provide access to the documented information.</li> <li>Where conditions do not allow for the space requirements, communicate information via email, phone and bulletin boards rather than by gathering personnel.</li> <li>Where individuals are required to meet in person and social distancing cannot be maintained (situations where six feet of separation from others at all times is not possible), wear a face covering or face mask (e.g., surgical mask). (See HDR Guidelines for Face Coverings, Face Masks, and Respirators for COVID-19 Hazard Control)</li> <li>Limit meeting duration and number of required participants physically located at the site in one area as much as possible to reduce potential exposure.</li> </ul>	S	M	L
	Non-HDR team member with high risk or with symptoms of COVID-19	<ul style="list-style-type: none"> <li>Work with subcontractors regarding possible means to reduce overall exposure by reducing the total number of individuals in the field at any one time and reducing workforce to only essential workers.</li> <li>Review posted display posters in designated areas that promote/remind staff about frequent and thorough hand washing.</li> </ul>	S	M	L

Job Steps	Hazards	Controls	P	S	RAC
		<ul style="list-style-type: none"> <li>• Review display informational posters on SH&amp;E awareness boards regarding epidemic/pandemic exposure symptoms.</li> <li>• Avoid close contact with others; maintain social distancing when possible (defined by the CDC as remaining out of congregate settings, avoiding mass gatherings, and maintaining distance (approximately 6 feet/2 meters) from others).</li> <li>• Avoid handshakes. Always wash/sanitize hands after physical contact with others.</li> <li>• Report to Project Management any observed non-HDR personnel with signs or symptoms of illness.</li> <li>• Notify Regional SH&amp;E Manager of presumed or confirmed positive cases of COVID-19 at project site involving HDR exposure for guidance on response actions.</li> </ul>			
Maintain job site trailer/office	Unhygienic conditions/lack of awareness of COVID-19 hazards	<ul style="list-style-type: none"> <li>• Provide cleaning supplies for high touch items (such as shared equipment, door handles, pens and other items).</li> <li>• Maintain an adequate supply of the following in personal/rented vehicles used during field work and in equipment staging areas:                             <ul style="list-style-type: none"> <li>○ Hand soap</li> <li>○ Hand sanitizers</li> <li>○ Sanitizing wipes</li> <li>○ Tissues</li> <li>○ Fully lined, hands free trash receptacles or drums, as applicable</li> <li>○ Disinfectants</li> </ul> </li> <li>• Display posters in designated areas that promote/remind staff about frequent and thorough hand washing.</li> <li>• Display informational posters on SH&amp;E awareness boards regarding epidemic/pandemic exposure symptoms.</li> </ul>	S	M	L
Split Sampling Activities	General Injury Concerns	<ul style="list-style-type: none"> <li>• Use caution when opening up the sample sleeves, watch for jagged edges on core sleeves</li> <li>• If opening sleeves with a utility knife cut away from the body and use a cut-resistant glove on the hand holding the core sleeve</li> <li>• Use table or truck to have cores at a good working level (avoid back strains)</li> </ul>	S	M	L

Job Steps	Hazards	Controls	P	S	RAC
	Inadequate social distancing for COVID-19	<ul style="list-style-type: none"> <li>• Use disposable nitrile gloves when contacting soil, sediments, surface water and groundwater that are potentially contaminated</li> <li>• Use disposable nitrile gloves and safety glasses when preserving water samples with preservative chemicals</li> </ul> <ul style="list-style-type: none"> <li>• In any environment near others where social distancing cannot be maintained (situations where six feet of separation from others at all times is not possible), wear a face covering or face mask (e.g., surgical mask). (See HDR Guidelines for Face Coverings, Face Masks, and Respirators for COVID-19 Hazard Control)</li> </ul>	S	M	L
Field work	Slips/Trips/Falls	<ul style="list-style-type: none"> <li>• Wear protective shoes with good gripping soles</li> <li>• Be aware of slippery sediment conditions</li> <li>• Adjust pace and look where you step. Do not rush</li> <li>• Be aware of uneven surfaces</li> <li>• Do not talk and text or make phone calls. Stand still, finish the text or call, then proceed walking.</li> <li>• Maintain a balanced center of gravity and walk carefully when crossing icy surfaces or wet area.</li> <li>• Stay out of cordoned off areas.</li> <li>• Keep hands out of pockets &amp; free of objects.</li> <li>• Do not walk on slippery surfaces; shorten stride if you must walk on wet or slippery surfaces.</li> <li>• Verify adequate lighting is available for work in dark areas or at night.</li> <li>• Always look and scan ahead of your route.</li> </ul>	S	M	L
	Environmental Sample Collection / Preservation / Shipment	<ul style="list-style-type: none"> <li>• Work upwind and in a well-ventilated area when filling pre-preserved sample containers</li> <li>• Wear disposable gloves and safety glasses when filling and handling pre-preserved sample containers</li> <li>• SDS for each preservation chemical will be maintained in the vehicle</li> <li>• Use proper lifting techniques for heavy shipping containers (lift with your legs not your back)</li> </ul>	S	M	L

Job Steps	Hazards	Controls	P	S	RAC
	<p><b>Poisonous Plants</b></p>	<ul style="list-style-type: none"> <li>• Know the types of plants expected at the job site and how to recognize them.</li> <li>• Complete training on HDR University - <i>Biological Hazards –Flora and Poisonous Plants</i>.</li> <li>• Be aware that some poisonous plant exposure may react when subjected to UV light or heat (e.g. wild parsnip).</li> <li>• Wear long sleeves, long pants, boots, and gloves.</li> <li>• Apply a barrier skin cream containing bentoquatam (such as an IVY-X), to exposed skin. Follow label directions and reapply as need.</li> <li>• Avoid touching your face.</li> <li>• Wash hands and scrub under nails immediately after exposure to remove plant oils (Urushiol oil). Use specialized poison plant washes (such as Tecnu), rubbing alcohol, or degreasing soap (such as dishwashing soap), and lots of water.</li> <li>• Be aware that you may be carrying the Urushiol on your clothing and tools. Urushiol can remain active on the surface of objects for up to 5 years.                         <ul style="list-style-type: none"> <li>○ Remove exposed clothing ASAP and wash separately in hot water.</li> <li>○ Wear disposable gloves to clean tools.</li> </ul> </li> <li>• If a light rash breaks out on your skin, contact WorkCare at 888-449-7787 for consultation and report the incident in IndustrySafe (<a href="https://www.industrysafe.com/hdrinc">https://www.industrysafe.com/hdrinc</a>).</li> <li>• If light rash persists, you may be re-contaminating yourself unknowingly. Wash sheets and any other area you may have contacted with your contaminated clothing.</li> <li>• Call 911 if suffering a severe allergic reaction, such as difficulty breathing.</li> </ul>	U	M	L

Job Steps	Hazards	Controls	P	S	RAC
	<p><b>Ticks</b></p>	<ul style="list-style-type: none"> <li>• Wear a hat and light-colored clothing, including long-sleeved shirts and long pants tucked into boots or socks. The light color assists in seeing small ticks on your clothing.</li> <li>• For additional protection, tape clothing joints, (i.e. wrists, waist, and boots/ankles.)</li> <li>• Apply an insect repellent that contains 20-30% DEET to exposed skin. Follow label directions and reapply as needed.               <ul style="list-style-type: none"> <li>○ Do not apply pump or aerosol products directly to the face. Spray onto the hands and carefully rub over the face, avoiding the eyes and mouth.</li> <li>○ If also applying sunscreen, apply sunscreen first and insect repellent second.</li> </ul> </li> <li>• Treat clothing, gear, boots, backpacks etc. with permethrin (do not apply directly to skin). One application of permethrin to clothing typically stays effective through several washings.</li> <li>• Always check for ticks on and under clothing several times during the workday and after work when working in tick-infested areas.               <ul style="list-style-type: none"> <li>○ A daily total-body skin inspection greatly reduces the risk of infection since ticks may take several hours to two days to embed in the skin and feed.</li> <li>○ Remember to check your hair, underarms, and groin for ticks.</li> </ul> </li> <li>• Wash and dry work clothes in a hot dryer to kill any ticks present.</li> <li>• Remove embedded ticks promptly with a fine pointed tweezers or tick removal tool.               <ul style="list-style-type: none"> <li>○ Grasp the tick firmly and as close to your skin as possible.</li> <li>○ Pull the tick's body away from your skin with a steady motion.</li> <li>○ Clean the area with soap and water.</li> </ul> </li> </ul>	S	M	L

Job Steps	Hazards	Controls	P	S	RAC
		<ul style="list-style-type: none"> <li>• Carry a lint roller to roll over clothing to pull off non-embedded ticks that may not be easily visible.</li> <li>• If a tick was embedded in your skin, call WorkCare at 888-449-7787 for consultation and report the incident in IndustrySafe (<a href="https://www.industrysafe.com/hdrinc">https://www.industrysafe.com/hdrinc</a>).</li> </ul>			
	<p><b>Insects</b></p>	<ul style="list-style-type: none"> <li>• Wear light-colored clothing, including long-sleeved shirts and long pants tucked into boots or socks. Wear hats with mosquito netting to protect face/neck.</li> <li>• Avoid perfumed soaps, shampoos, and deodorants and don't wear cologne or perfume.</li> <li>• Apply an insect repellent that contains 20-30% DEET to exposed skin. Carefully follow label directions and reapply as needed.               <ul style="list-style-type: none"> <li>○ Do not use repellent under clothing or on skin that is injured or irritated.</li> <li>○ Do not apply pump or aerosol products directly to the face. Instead, spray these products onto the hands and carefully rub them over the face, avoiding the eyes and mouth.</li> <li>○ If also applying sunscreen, apply sunscreen first and insect repellent second.</li> </ul> </li> <li>• Treat clothing, gear, boots, backpacks etc. with permethrin (do not apply directly to skin). One application of permethrin to clothing typically stays effective through several washings.</li> <li>• Avoid stagnant fresh water where mosquitos breed.</li> <li>• Avoid non-essential outdoor activities at sunrise, sunset, and early evening when mosquitoes are most active.</li> <li>• Avoid stepping on fire ant mounds.</li> <li>• Workers with a history of severe allergic reactions to insect bites or stings should consider carrying an epinephrine auto injector (EpiPen) and should wear a medical identification bracelet or necklace stating their allergy.</li> <li>• If you are having an allergic reaction to a bite/sting, seek medical attention ASAP.</li> </ul>	S	M	L



Job Steps	Hazards	Controls	P	S	RAC
		<ul style="list-style-type: none"> <li>• Employees who either are or may become pregnant should avoid areas known to have Zika virus present. Check the <a href="#">CDC website</a> for updated maps of areas with Zika transmission.</li> <li>• Be aware that symptoms from mosquito borne infectious diseases such as Zika virus and West Nile virus can take up to 14 days to appear. Contact WorkCare at 888-449-7787 for consultation regarding any bite/sting and report the incident in IndustrySafe (<a href="https://www.industrysafe.com/hdrinc">https://www.industrysafe.com/hdrinc</a>).</li> </ul>			
	<p><b>Spiders</b></p>	<ul style="list-style-type: none"> <li>• Inspect or shake out any clothing, shoes, towels, or equipment before use.</li> <li>• Wear protective clothing such as a long-sleeved shirt and long pants, hat, gloves, and boots.</li> <li>• Minimize the empty spaces between stacked materials.</li> <li>• Remove and reduce debris and rubble from around the outdoor work areas.</li> <li>• Trim or eliminate tall grasses from around outdoor work areas.</li> <li>• Store apparel and outdoor equipment in tightly closed plastic bags.</li> <li>• Keep your tetanus boosters up-to-date (every 10 years). Spider bites can become infected with tetanus spores.</li> <li>• If you suspect being bit by a black widow or brown recluse, contact WorkCare at 888-449-7787 and report the incident in IndustrySafe (<a href="https://www.industrysafe.com/hdrinc">https://www.industrysafe.com/hdrinc</a>).</li> </ul>	U	M	L
	<p><b>Snakes</b></p>	<ul style="list-style-type: none"> <li>• Be knowledgeable on the types of snakes in the area.</li> <li>• Complete training on HDR University - <i>Biological Hazards – Snakes</i></li> <li>• Wear protective chaps and above ankle boots.</li> <li>• Wear leather gloves when handling brush and debris.</li> <li>• Do not try to handle any snake.</li> </ul>	U	M	L

Job Steps	Hazards	Controls	P	S	RAC
		<ul style="list-style-type: none"> <li>• Do not reach into areas where snakes may be hiding or turn over rocks using hands.</li> <li>• Stay away from tall grass and piles of leaves when possible and avoid climbing on rocks or piles of wood where a snake may be hiding.</li> <li>• Have a rescue plan in case someone gets bit.</li> <li>• Seek immediate medical attention if bit.</li> <li>• Try to remember the color and shape of the snake for identification.</li> <li>• Lay or sit down with the bite below heart level and remain still and calm to slow the venom.</li> <li>• Do NOT do any of the following:               <ul style="list-style-type: none"> <li>○ Do not pick up the snake or try to trap it.</li> <li>○ Do not wait for symptoms to appear if bitten, seek immediate medical attention.</li> <li>○ Do not apply a tourniquet.</li> <li>○ Do not slash the wound with a knife.</li> <li>○ Do not suck out the venom.</li> <li>○ Do not apply ice or immerse the wound in water.</li> </ul> </li> <li>• Do not drink alcohol or caffeinated beverages.</li> </ul>			
	<p><b>Mammals</b></p>	<ul style="list-style-type: none"> <li>• Identify what animals are a threat in the area you will be working and receive training on potential infectious diseases associated with their presence (rabies, hanta virus, histoplasmosis, etc.).</li> <li>• Complete training on HDR University - <i>Biological Hazards – Mammals</i>.</li> <li>• Evaluate the need for respiratory protection if working around mammal waste/droppings.</li> <li>• Carry animal deterrent as applicable (Bear Spray)</li> </ul>	U	M	L

Job Steps	Hazards	Controls	P	S	RAC
		<ul style="list-style-type: none"> <li>• Do not feed or handle wild animals or unfamiliar domestic animals.</li> <li>• Do not disturb soil where there are bird or bat droppings and avoid stirring up rodent nests, droppings, or other rodent-contaminated materials into the air.</li> <li>• If bitten by any animal (domestic or wild), immediately wash the wound well with soap, contact WorkCare at 888-449-7787 for consultation, and report the incident in IndustrySafe (<a href="https://www.industrysafe.com/hdrinc">https://www.industrysafe.com/hdrinc</a>).</li> <li>• Contact animal control to assist in capturing the animal for observation or rabies testing.</li> </ul>			
	<b>Heat Stress</b>	<ul style="list-style-type: none"> <li>• Stay well hydrated throughout the evening prior to working and ensure a good intake of water or sports drink on the way to work.</li> <li>• Wear clothing that permits evaporation of sweat</li> <li>• Continue to drink water throughout the day, around a liter an hour if you are sweating heavily</li> <li>• take frequent breaks</li> <li>• avoid working in direct sunlight when possible</li> <li>• work in cooler part of the day if possible</li> </ul>	S	M	L
	<b>Sunburn</b>	<ul style="list-style-type: none"> <li>• wear long sleeve clothes and long pants</li> <li>• wear sunscreen on exposed skin</li> <li>• limit exposure to sun when possible</li> </ul>	S	M	L
	<b>Electrical Storms</b>	<ul style="list-style-type: none"> <li>• Take Shelter in a building or vehicle</li> <li>• Work can commence 30 minutes after last clap of thunder or bolt of lightning</li> </ul>	S	M	L
	<b>Cold Stress</b>	<ul style="list-style-type: none"> <li>• Get a weather report</li> <li>• Keep walkways, steps, porches and landings free from ice and snow</li> <li>• If possible, plan to use engineered heat to warm up the work area</li> </ul>	S	M	L

Job Steps	Hazards	Controls	P	S	RAC
		<ul style="list-style-type: none"> <li>• Wear layers of light clothing rather than a single heavy garment</li> <li>• Use helmet liners inside of hard hats to reduce heat loss</li> <li>• Wear warm leg coverings and heavy socks or multiple lighter socks</li> <li>• Wear waterproof boots with good traction</li> <li>• Discuss anticipated weather conditions with everyone during toolbox talks</li> <li>• Pack an additional pair of clothes to change into, at a minimum a pair of socks</li> </ul>			
Working on or Around Water	<p><b>Drownings</b></p>	<ul style="list-style-type: none"> <li>• Work in pairs</li> <li>• Wear a Class III or Class V Personal Floatation Device (PFD) when the risk of drowning exists. Class V PFD must be designated for Industrial or Commercial use</li> <li>• Per HDR safety procedures the risk of drowning exists when water is 2 feet or deeper</li> <li>• Complete review and training on HDR H&amp;S Procedure #18, Water and Boating Safety</li> <li>• If protected from falling into the water by a guardrail or other means, a PFD is not required</li> <li>• If wading into shallow water, waders must be worn in addition to a PFD</li> <li>• Rescue buoy (life ring) is readily available</li> <li>• Use the water safety checklist located in H&amp;S Procedure #18</li> <li>• If working in swift moving water, complete additional swift water rescue training</li> </ul>	S	M	L
	<p><b>Hypothermia/Cold Stress</b></p>	<ul style="list-style-type: none"> <li>• If the water and the air temperature do not add up to at least 110° Fahrenheit, an Anti-Exposure float coat or suit is required to be worn in addition to the PFD</li> <li>•</li> </ul>	S	M	L
	<p><b>Caught in Between</b></p>	<ul style="list-style-type: none"> <li>• Be careful with your hand placement to avoid pinch points</li> <li>• Wait until boat is stable before attempting to step onto it</li> </ul>	S	M	L

Job Steps	Hazards	Controls	P	S	RAC
Getting on, Docking and Getting Off Boat		<ul style="list-style-type: none"> <li>• Make good eye contact with everyone nearby to confirm your intentions of docking the boat. This will make sure nobody gets in the way of the boat</li> <li>• Alarm/alert system in place</li> <li>• Be careful of icing conditions while conducting boating efforts during the winter months</li> </ul>			
	<b>Drowning</b>	<ul style="list-style-type: none"> <li>• Wear PFD as described above</li> <li>• A PFD should be worn at all times while on a boat</li> </ul>	S	M	L
	<b>Slips/Trips/Falls</b>	<ul style="list-style-type: none"> <li>• Be aware that the steps and landing surfaces on the boat and dock might be wet and slippery</li> <li>• Step off of the boat hands-free to maintain your balance</li> </ul>	S	M	L

Equipment Requirements	Training Requirements	Inspection Requirements
Minimum: Class E Hardhat, Class 2 Hi-Vis Vest; Safety-Toed Boots; Safety Glasses (must be stamped Z-87+) Disposable Latex Booties Work Gloves Disposable Nitrile Gloves Rain suit (optional) First aid kit Waders hearing protection (ear plugs) Personal Floatation Device/Anti-Exposure float coat or suit	<ul style="list-style-type: none"> <li>• 40-Hr HAZWOPER training with current 8-Hr Refresher training</li> <li>• JHA training</li> <li>• Safety Orientation</li> <li>• Emergency Procedure</li> <li>• HDR H&amp;S Procedure #18, Water and Boating Safety</li> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>• PPE to be inspected daily.</li> <li>• Personnel entering areas with surface contamination will be required to wear disposable booties. Booties will be removed when exiting surface contamination area</li> <li>• All Employees are to report unsafe conditions as they are observed to their immediate supervisor and a project safety committee member. Effort should be made to communicate findings to contractor.</li> <li>• Anyone on the crew has the authority to stop work activities if an unsafe condition is observed.</li> </ul>
Poisonous plant barrier cream (e.g., IVY X) Poisonous plant wash/cleanser (e.g. Tecnu) Insect repellent with 20-30% DEET Permethrin Bear spray (as applicable)	Biological Hazards –Flora and Poisonous Plants Biological Hazards – Mammals Biological Hazards – Insects, Archnaids, Mites <ul style="list-style-type: none"> <li>• Biological Hazards – Snakes</li> </ul>	



## JOB HAZARD ANALYSIS FORM<sup>1</sup> PERIODIC DAM INSPECTIONS

		<b>Overall Risk Assessment Code (RAC) (Use highest code)</b>					
Project Name: GE Pittsfield/Housatonic River Site Oversight		<b>Risk Assessment Code (RAC) Matrix</b>					
Project Location: Pittsfield, Berkshire County, Massachusetts	<b>E =Extremely High Risk</b> <b>H = High Risk</b> <b>M =Moderate Risk</b> <b>L =Low Risk</b>	<b>Probability (P)</b>					
Project Number: 10265786		Frequent (F)	Likely (L)	Occasional (O)	Seldom (S)	Unlikely (U)	
Prepared by (Name/Title): Melissa LaMacchia, PM							
Notes: (Field Notes, Review Comments, etc.):	<b>Severity (S)</b>	Catastrophic (C)	E	E	H	H	M
		Critical (Cr)	E	H	H	M	L
		Marginal (M)	H	M	M	L	L
		Negligible (N)	M	L	L	L	L
	<p>RAC is developed after correctly identifying all hazards and fully implementing all controls.</p> <p><b>Step 1:</b> Review each "Hazard" with identified safety "Controls" and determine RAC</p> <ul style="list-style-type: none"> <li>- P "Probability" is the likelihood to cause an incident, near miss, or accident.</li> <li>- S "Severity" is the outcome if an incident, near miss, or accident did occur</li> </ul> <p><b>Step 2:</b> Identify RAC for each "Hazard" and indicate overall highest RAC at the top of JHA</p>						

Work Area: Job Steps	Hazards	Controls	P	S	RAC
1. Site Visit Preparation / Gather tools and equipment	1.1. Various Site Hazards	<ul style="list-style-type: none"> <li>Attend tailgate briefing to learn about potential hazards and how to avoid them.</li> <li>Pay attention to unsafe acts/conditions that are mentioned during the tailgate briefings.</li> </ul>	S	N	L
	1.2. Slips / Trips / Falls	<ul style="list-style-type: none"> <li>Lack of focus on general work area surroundings and field exposures based on attention to potential security issues could expose employees to S/T/F hazards. Always stay alert regarding these hazards as well.</li> <li>Adjust pace and look where you step. Do not rush or run.</li> <li>Be aware of any work area holes/excavations and the types of protective covers in regard to support and warnings.</li> <li>Never walk while you are on your phone and/or texting</li> </ul>	O	M	M

<sup>1</sup> See attached notification protocols to be followed by HDR employees as applicable when conducting services in the field.

	1.3. Strain / Sprain	<ul style="list-style-type: none"> <li>• Use proper lifting techniques. Anything over 50 pounds or awkward requires a 2 man lift. Use proper moving equipment when possible.</li> <li>• Conduct stretch and flex exercises to warm up the body before starting work</li> </ul>	S	M	L
	1.4. General Trespassing/Unsafe Work Area Hazards	<ul style="list-style-type: none"> <li>• Ensure that access to a job site has been authorized/approved prior to entering the work area</li> <li>• If required, maintain the appropriate identification, badge to validate your presence to the client, other employees or contractors working on the job site.</li> <li>• Observe all barricades &amp; demarcation. Never cross a red barricade. If the barricade is not red and you are unsure if it is safe to cross, always ask a supervisor in the work area before proceeding.</li> <li>• If you plan on taking photographs, ensure you have obtained the proper permission from the client/contractor to do so.</li> <li>• If in doubt about any job hazard contact your supervisor and/or the HDR regional/area safety manager</li> </ul>	S	M	L
	1.5. Personal Security based on work area and conditions	<ul style="list-style-type: none"> <li>• Review crime history using sites such as Trulia</li> <li>• Never visit unfamiliar area alone or at night</li> <li>• Check with client. PM or contractor for special security precautions.</li> </ul>	S	N	L
	1.6. Crime/ Security Hazards	<ul style="list-style-type: none"> <li>• Always use the buddy system if possible, never work alone</li> <li>• Have an exit strategy in mind before entering a space where security issues, or pets might initiate an early exit from the property.</li> <li>• If possible, stay near camera areas during course of work</li> <li>• Contact security and/or police if you identify a security issue or criminal activity on or near the work site</li> <li>• Request increased security to supervision if area of work is suspect of criminal/security breaches</li> <li>• Develop and maintain communications with security staff on the job site to ensure that timely responses to security/criminal issues are supported.</li> <li>• Utilize the 911 system or project security contact list on your phone and within your JHA to expedite security support as needed.</li> <li>• Assure that all employees understand and are trained in project/office Active Shooter protocols; Run/Hide/Fight</li> <li>• Confirm that the Emergency Action Plan has special rally points identified specifically for when hiding from an active shooter, i.e. Conex</li> </ul>	U	Cr	L

Inspection of Mechanical Equipment: Job Steps	Hazards	Controls	P	S	RAC
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1. Inspection of Mechanical Equipment.	1.1 Falls on level.	1.1.1 Verify designated walkway is clear. Avoid protruding parts of the equipment. Avoid stepping over obstacles such as tools, materials and cables. 1.1.2 Correct safety footwear should be worn. 1.1.3 No oil, grease, and other slippery substance on floors and shoes. Avoid slippery walkway surface. 1.1.4 Verify adequate illumination/lighting provided. 1.1.5 Follow mandatory signs.	S	M	L
	1.2 Exposure to contact injuries (e.g. entanglement, abrasions, cuts, crashed).	1.2.1 Attend site orientation / pre task briefing prior to start activity. 1.2.2 Do not wear loose clothing. 1.2.3 Verify guard or cover of the moving parts is in place. 1.2.4 Verify lock-out / tag-out procedure is implemented for any equipment to be inspected. 1.2.5 Maintain safe distance from the machine. Do not place/put any body part near any moving part of the equipment. 1.2.6 Do not operate the equipment unless trained and authorized. 1.2.7 Verify adequate illumination/lighting is provided. 1.2.8 Follow mandatory signs.	S	Cr	M
	1.3 Exposure to hot surface.	1.3.1 Verify contractor has identified and highlighted the hot parts of the equipment. 1.3.2 Maintain safe distance from the hot parts of the equipment. 1.3.3 Wear appropriate hand gloves if required. 1.3.4 Follow mandatory signs.	S	M	L
	1.4 Exposure to high noise level	1.4.1 Refer to Noise (Hearing Conservation) Pro #26 in SH&E Manual	S	M	L
	1.5 Exposure to fumes	1.5.1 Verify adequate ventilation is provided. 1.5.2 Wear appropriate masks 1.5.3 Avoid getting near the exhaust of the equipment. 1.5.3 Follow mandatory signs.	S	M	L
	1.6 Exposure to vibrations	1.6.1 Duration to exposure should be limited.	S	M	L
	1.7 Falling materials	1.7.1 Wear appropriate head protection (hard hat). 1.7.2 Verify no unsecured materials are placed overhead.	S	M	L

Driving: Job Steps	Hazards	Controls	P	S	RAC
1. Pre-Inspection of Vehicle	1.1. Unfamiliarity with Rental Vehicle	<ul style="list-style-type: none"> <li>Before driving a vehicle, get comfortable in the vehicle, lock your seat belt into place, adjust mirrors, and become familiar with the locations and operation of all controls (lights, windshield wipers, emergency flashers, defroster, etc.). This is especially critical when operating a rental vehicle for the first time. Resist the impulse to immediately drive off the rental lot: take a couple of minutes to find out the location and operation of the critical accessory controls.</li> </ul>	S	N	L
	1.2. Breakdown of Vehicle Due to Poor Maintenance	<ul style="list-style-type: none"> <li>Ensure that the vehicle has received the proper regular maintenance recommended by the manufacturer</li> <li>Ensure that the vehicle has a mechanical jack and spare tire. In addition, depending upon the remoteness of the area you will be traveling, you may consider packing any or all of the following emergency equipment: flashlight, first aid kit, fire extinguisher, flares and/or tools</li> <li>Make sure all lights are working properly and windshield wipers are in good shape</li> </ul>	U	N	L
	1.3. Head Injury	<ul style="list-style-type: none"> <li>Be careful to avoid hitting head when checking tire pressure and tread, and fluid levels under the hood</li> </ul>	U	M	L
	1.4. Slips / Trips / Falls	<ul style="list-style-type: none"> <li>Ensure area is clear of any obstructions</li> <li>Watch out for ice and snow while conducting inspection</li> </ul>	U	M	L
	1.5. Carbon Monoxide Poisoning	<ul style="list-style-type: none"> <li>Never warm up a vehicle in an enclosed area, such as a garage. Exposure to elevated carbon monoxide levels can be fatal</li> </ul>	U	M	L
2. Operation of Vehicle	2.1. Driver Error	<ul style="list-style-type: none"> <li>All HDR employees who may be using a motor vehicle for HDR company business should read and become familiar with HDR H&amp;S Procedure #32, <i>Defensive Driving</i>, and the HDR Vehicle Policy. Defensive Driving courses are encouraged and are offered through most State motor vehicle departments.</li> <li>All HDR employees using a vehicle on company business shall hold a valid driver's license. This license must be in the vehicle that is being driven.</li> <li>Drivers shall not be under the influence of alcohol</li> <li>Avoid driving while fatigued. Methods for fighting fatigue include pulling to the side of the road and resting, rolling down the windows and turning up the radio.</li> <li>Take extra care while backing. Use a spotter to help you back up safely if necessary. Do not rely just on mirrors.</li> <li>Do not exceed speed limits.</li> </ul>	S	M	L
	2.2. Flat Tire	<ul style="list-style-type: none"> <li>If you experience a tire blow out, your first reaction should be to remove your foot from the accelerator, and gain control of the vehicle, do not apply the brake. Applying the brake will increase the sideways momentum. Once you have regained control, pull over to a safe location so tire can be changed.</li> </ul>	U	N	L
	2.3. Vehicle Accident / Struck By	<ul style="list-style-type: none"> <li>Get safe distance away from the accident and moving traffic</li> <li>Call for professional assistance</li> <li>Fill out the required HDR accident report forms</li> <li>Call your supervisor</li> </ul>	U	C R	L



## NOTIFICATION PROTOCOLS

### Incident Reporting

Employees involved in or witness to an incident:

- All Incidents (including near miss incidents)
  - Contact emergency services and secure the scene as applicable
  - Notify Supervisor to arrange for post-incident drug and alcohol testing (if applicable)
  - Notify Project Manager (PM) for client reporting (PM is responsible for ensuring all client-specific requirements for reporting and investigation are met as applicable)
  - Submit Incident Report within 24 hours in IndustrySafe (<https://industrysafe.com/hdrinc>)
- Non-Emergency Injury/Illness Incidents
  - Contact WorkCare (888-449-7787) as soon as possible for medical consultation (HDR employees only)
- Serious Incidents (incidents involving actual or potential for death, hospitalization, amputation, loss of an eye, significant damage, and/or environmental impact)
  - Notify Director of SH&E or Regional SH&E Manager for regulatory reporting

### Regulatory Agency Inspections/Investigations

Contact your Area or Regional SH&E Manager or the Director of SH&E if an occupational SH&E inspector arrives onsite to conduct an investigation involving HDR personnel.

Be prepared to explain HDR's role and your role on the project to the inspector. Do not state or imply HDR has authority over the health and safety of non-HDR employees or non-HDR subcontractors unless we contractually have that authority.

### Encountering Hazardous/Unsafe Conditions Outside of HDR Control at Multi-Employer Worksites

This Notification Protocol applies to all unsafe conditions/practices that an HDR employee may encounter in the field, even if different than the subject of this JHA. If an HDR employee identifies an unsafe condition/practice by another employer that impacts the ability of HDR or HDR subcontractors to conduct project activities in a safe manner:

- The identifying HDR employee is to move away from the unsafe condition/practice to prevent exposure and instruct other HDR employees and HDR subcontractors to do the same.
- The identifying HDR employee is to notify the HDR Project Manager (PM).
- The PM is to notify the client of the unsafe condition/practice so that the unsafe condition/practice will be abated before HDR employees and HDR subcontractors proceed with the applicable project activities. If the client instructs the PM to notify the creating/controlling employer responsible for the unsafe condition/practice, the PM may do so but the notification should make it clear that the notification and request for abatement is being provided on behalf of the client.
- The PM is to document the notification of the unsafe condition/practice.
- The PM is to instruct HDR employees and HDR subcontractors to avoid the unsafe condition/practice until confirmation is received that the unsafe condition/practice has been corrected. In extreme circumstances (e.g., imminent danger situations), this may mean removing HDR employees and HDR subcontractors from the job to avoid the hazard.
- Upon receiving confirmation that the unsafe condition/practice has been corrected, the PM shall notify the HDR employees and HDR subcontractors that it is safe to resume project activities.
- The PM is to document receipt of the confirmation of corrective actions and the authorization to HDR employees and HDR subcontractors to continue work.



**ATTACHMENTS**  
**HDR H&S PROCEDURES**



## SH&E Procedure #003 – Slip, Trip, and Fall Prevention Table of Contents

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### Revision History

Rev	Description of Change	Issue Date
0	Initial Release	09/10/1998
1	Revisions	05/04/2002
2	Revisions	12/22/2006
3	Revisions	01/30/2007
4	Revisions	05/05/2008
5	Re-Formatting	06/11/2013
6	Re-Formatting; added safe work practices for slick and slippery surfaces and rough and rocky terrain, added section referencing training requirements	01/10/2017



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## 1.0 PURPOSE

This procedure establishes practices to prevent slips, trips, and falls.

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## 2.0 APPLICABILITY

This procedure applies to all HDR personnel working on horizontal surfaces. Fall hazards due to climbing or working on elevated surfaces are addressed in the following: SH&E Procedure #012, *Fall Protection* and SH&E Procedure #002, *Portable Ladders*.

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## 3.0 IMPLEMENTATION

Employees shall:

- Maintain work areas free from slip, trip, and fall hazards
- Correct or immediately report slip, trip, and fall hazards

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## 4.0 SAFE WORK PRACTICES

### 4.1 Slip, Trip, and Fall Hazards and Controls

Hazard	Control
Access Points	Access points and holes in gratings must be covered or surrounded by an adequate guard rail.
Climbing Surfaces	Personnel shall not walk or climb on piping, valves, fittings, diagonal cross-bracing, or any other equipment not designed as walking or climbing surfaces. When ascending ladders or fixed vertical stairs, do not carry tools, notebooks, etc. by hand, this is dangerous! Plan ahead prior to site arrival and either place these items in a backpack/fanny pack, or else ascend to the upper working surface and then hoist them by means of a rope and bucket.
Debris	Small, loose items such as pop cans, rope, trash or other small objects and debris shall not be left lying around in any place, particularly in areas where personnel walk.
Elevated Work Platforms	When working on scaffolds, stairwells, unfinished floors, or any area presenting restricted body movement, place all tools to one side/corner of the area to prevent stepping on or kicking them during site activities.
Extension Cords	Electrical extension cords and electrical wiring must be kept clear of walking and working areas. Extension cords should be covered, elevated, buried, or otherwise secured. Exposure to loose extension cords is one of the most common causes of trips in the office environment. (By definition, an extension cord is for temporary power only; it is not to be used as a substitute for permanent wiring.) If an extension cord must be left across a walkway, tape it in place or cover it with a non-conductive (e.g., rubberized) mat to prevent dislodgment.
Fall Protection	Fall hazards of four feet or more must be evaluated to determine what fall preventative steps might be implemented. Fall protection is required at heights of six feet or greater. Please read Procedure #12 – Fall Protection, for more information.



<b>Hazard</b>	<b>Control</b>
General Housekeeping	Personnel shall keep the working area clean and orderly. Tools must not be left lying on floors, walkways, or decking where they present tripping hazards. Aisles shall be kept clear and in good repair with no obstruction across or in aisles that could create a hazard.
Inspections	Workplaces are inspected on a regular basis to maintain safe conditions and immediately correct any unsafe conditions that are discovered.
Jumping	Personnel shall not jump from elevated places, the backs of trucks, or equipment. Employees should also refrain from jumping laterally across any excavation, even a shallow one. If excessive width prevents a normal stepping motion, then find another route of access.
Lighting	Adequate lighting allows employees to see potential obstructions and prevents many falls. Make sure that all halls, passageways, and stairs have adequate illumination. Replace all burned out bulbs or defective receptacles.
Lunch Areas	Lunch areas should be kept clear of empty bottles, containers, and papers. Trash receptacles should be provided and used.
Running	Running is prohibited on job sites unless under emergency conditions.
Spills	Oil spills, water (including ice cubes in break areas), and spills of other slippery materials must be cleaned up immediately. Tracking through even a small spill will significantly reduce the friction coefficient between your shoes and any hard floor material, making a slip more likely. Not only are oil spills a slip hazard, but combustible oils also present a fire hazard.
Stairways, Walkovers, and Ramps	Stairways, walkovers, or ramps shall be installed where personnel must walk or step over equipment in the course of their normal duties. In client facilities where these crossovers exist, use them! In our office buildings, it is particularly important to keep stairways and landings clear of any obstacles. <b>DO NOT USE STAIRWAYS OR LANDINGS AS STORAGE AREAS!</b>
Steel Deck	Personnel shall take extra precautions when walking on steel decking or catwalks during wet weather, such as establishing firm hand holds, wearing suitable footwear, and walking slowly. If possible, spread sand across the flooring to increase traction.
Tools	Personnel using hand and mechanical tools must position themselves properly to avoid slipping, consider required leverage, and anticipate likely consequences if the tool suddenly moves or gives way. This pre-planning becomes even more critical when working at heights.
Walkways and Grating	Walkways and grating must be kept free of obstacles that could cause trips. Openings in walkways and grating are very hazardous and should never be left unattended – either close, repair, or cover before leaving them. If not immediately repaired, the openings must be roped or barricaded off until corrected. Also, be alert for raised portions of walkway surfaces such as sidewalk section edges, which create trip hazards. If necessary, bank the raised portion with wood or sandbag to cover the abrupt raised edge and provide a gradual transition to the upper walkway surface.





<b>Hazard</b>	<b>Control</b>
Windy Conditions	Be aware of the hazards when working in high winds. Sudden gusts can cause a loss of balance or blow tools, papers, hardhats, etc., causing a distraction and corresponding quick body movement that could result in falls. When preparing for site activities in windy conditions, secure hardhats with chin straps, and use notebooks that will hold papers securely, eliminating the distraction caused by flapping papers. Also, preplan each body movement, anticipating sudden gusts and their effects on your body.
Winter Conditions	Walking and working surfaces must be properly maintained during inclement winter weather. Ice on sidewalks/parking lots account for many falls. Either physically remove the ice or apply a chemical de-icer to traveled pathways to remove the ice. As an immediate (but less effective) alternative, sand or cinders may be thrown over the ice to improve traction. Hard-packed snow can also reduce the traction of walkers and should be removed by physical or chemical means. Never walk on any elevated surface, such as a scaffold, outside fixed stairway, or ladder when ice is present!

#### **4.2 Slick and Slippery Surfaces**

- Wear proper footwear for better traction on slippery surfaces (non-slip soles). The harder and smoother the bottom of the shoe, the more slippery it is. Leather soles tend to be very slippery, on slick surfaces.
- Point your feet slightly outward, keeping your center of balance under you.
- Take slow, small steps.
- Use your feet as probes to detect possible slip, trip and fall hazards.
- Hold on to rails or other stable objects.
- Get your feet underneath your body quickly to maintain your balance after an initial step.
- Protect the more vulnerable parts of your body like your head, neck and spine if you do fall - make a conscious effort to tuck your chin so your head doesn't strike the ground with a full force.
- When moving from carpet to tile or dry tile to wet tile, etc. the friction (grip) between the sole of the shoe and the floor surface lessens. Alter your stride to take shorter, slower steps.
- When entering a building, remove as much snow and water from your boots as possible. Be alert for floors and stairs that may be wet and slippery.
- Use special care when entering and exiting vehicles--use the vehicle for support.
- Streets and sidewalks that have been cleared of snow and ice should still be approached with caution. Dew, fog or water vapor can freeze on cold surfaces and form an extra-thin, nearly invisible layer of ice that can look like a wet spot on the pavement. It often shows up early in the morning or in areas that are shaded from the sun.
- Never walk on any elevated surface (scaffold, outside fixed stairway, ladder) when ice is present!

#### **4.3 Rough and Rocky Terrain**

- Wear sturdy-soled lace up boots with ankle support.
- Double tie your boot laces and tuck the loops inside the boot to prevent tripping.



- Take regular rest breaks and stay hydrated. Fatigue and dehydration can contribute to slip, trip, and fall incidents (as well as heat related incidents).
- Wear flexible soled shoes when hiking around marshy, boggy areas. Big, heavy boots with flat, solid soles result in a much greater suction force that hinders you when you try to pull your foot out. Beware of stepping into mud and clay which may display strong suction forces.
- Carry a long stick or pole. Besides making hiking easier, you can use it to poke and prod any suspicious ground. If the stick sinks or makes the ground ripple, do not step! Also, if you do get stuck in mud, clay, or quicksand, you can push yourself out with the stick.
- Watch for rocks that may be unstable or slippery.
- Step lightly and check for firm ground on steep inclines.
- Stay alert and keep your eyes open to safely navigate uneven and slippery areas.
- Maintain distance from others to avoid collisions.
- Don't grab onto tree branches or brush. Wear safety glasses to prevent catching a limb in the eye (another repeat incident type for HDR field staff).
- Slow down so you will have more time to react to a problem.
- Take care of your feet (treat "hot spots" before they become blisters).
- In extreme conditions; use gaiters to prevent sand and gravel from entering your boots.
- If you are carrying a backpack or other gear/equipment, check the pack weight to make sure it is distributed evenly and centered on your back. A top-heavy pack will raise your center of gravity and make you more likely to stumble if you become off balance. The straps of the pack should be tightened to prevent sudden shifts of weight that could unbalance you.

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## 5.0 TRAINING

HDR personnel must complete the following training or an equivalent substitute.

- Review and confirm understanding of HDR SH&E Procedure #003, Slip, Trip, and Fall Prevention
- HDR University eLearning – *Slip, Trip, and Fall Prevention*



## SH&E Procedure #006 – Hazard Communication Table of Contents

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### Revision History

Rev	Description of Change	Issue Date
0	Initial Release	10/01/1998
1	Revisions	06/18/2007
2	Revisions	12/01/2008
3	Re-Formatting	06/05/2013
4	GHS requirements added	11/18/2013
5	Clarified container labeling and SDS requirements for chemicals purchased prior to June 1, 2015; added requirement for development of office and project-specific hazard communication binders; added OSHA interpretation regarding office products; added chemical inventory from Omaha office as example; added references to safe work procedures for chemicals that employees may encounter at project/client sites; clarified delivery of awareness and formal training.	01/10/2017
6	Added safe work practice attachments for specific chemicals	07/08/2019

## 1.0 PURPOSE

This document serves as the HDR written Hazard Communication Program and provides requirements to ensure employees are aware of chemicals in the workplace and are provided information regarding the potential hazards associated with exposure to these chemicals.

In 2012, OSHA revised the hazard communication standard (29 CFR 1910.1200, *Hazard Communication*) to be consistent with the United Nations (UN) Globally Harmonized System of Classification and Labeling of Chemicals (GHS). This program is designed to comply with the updated standard.

## 2.0 APPLICABILITY

This program applies to all HDR personnel in the United States who use and/or are impacted by the use of hazardous chemicals.

## 3.0 PROCEDURE IMPLEMENTATION

This program will be administered by the HDR Director of SH&E, Regional SH&E Managers, local safety coordinators (SCs), and project managers (PMs). The Director of SH&E shall periodically review, at least annually, the effectiveness of this procedure, identify any deficiencies, and ensure that they are corrected and this program is updated accordingly.

## 4.0 DEFINITIONS

Term	Definition
Article	A manufactured item other than a fluid or particle: (i) which is formed to a specific shape or design during manufacture; (ii) which has end use function(s) dependent in whole or in part upon its shape or design during end use; and (iii) which under normal conditions of use does not release more than very small quantities, e.g., minute or trace amounts of a hazardous chemical, and does not pose a physical hazard or health risk to employees.
Container	Any bag, barrel, bottle, box, can, cylinder, drum, reaction vessel, storage tank, or the like that contains a hazardous chemical. For purposes of hazard communication, pipes or piping systems, and engines, fuel tanks, or other operating systems in a vehicle, are not considered to be containers.
Exposure or exposure	Means that an employee is subjected in the course of employment to a chemical that is a physical or health hazard, and includes potential (e.g. accidental or possible) exposure. "Subjected" in terms of health hazards includes any route of entry (e.g. inhalation, ingestion, skin contact or absorption).
Global Harmonization Standard (GHS)	A system for harmonizing hazard classification criteria and chemical hazard communication elements worldwide. It provides a framework for classifying and labeling hazardous chemicals with the intent of providing harmonized information to users of chemicals to enhance protection of human health and the environment. The U.S. officially adopted the GHS on March 26, 2012.



Term	Definition
Hazardous chemical	Any chemical which is classified as a physical hazard or a health hazard, in accordance with OSHA 29 CFR 1910.1200(d).
Health hazard	A chemical which is classified as posing one of the following hazardous effects: acute toxicity (any route of exposure); skin corrosion or irritation; serious eye damage or eye irritation; respiratory or skin sensitization; germ cell mutagenicity; carcinogenicity; reproductive toxicity; specific target organ toxicity (single or repeated exposure); or aspiration hazard.
Physical hazard	A chemical that is classified as posing one of the following hazardous effects: explosive; flammable (gases, aerosols, liquids, or solids); oxidizer (liquid, solid or gas); self-reactive; pyrophoric (liquid or solid); self-heating; organic peroxide; corrosive to metal; gas under pressure; or in contact with water emits flammable gas.
Signal word	A word used to indicate the relative level of severity of hazard and alert the reader to a potential hazard on the label. The signal words used in hazard communication are "danger" and "warning." "Danger" is used for the more severe hazards, while "warning" is used for the less severe.
Safety Data Sheets	The Hazard Communication standard requires that the chemical manufacturer, distributor, or importer provide for each hazardous chemical to downstream users to communicate information on the hazards associated with the specific chemical.
Workplace	An establishment, job site, or project, at one geographical location containing one or more work areas.

## 5.0 GENERAL REQUIREMENTS

Local Safety Coordinators are to use the *Hazard Communication Compliance Checklist* to confirm site-specific implementation of the requirements of this procedure.

### 5.1 Hazard Communication Binder

Local Safety Coordinators in each HDR office are responsible for maintaining a hazard communication binder specific to their operations. When HDR project personnel take or use chemicals at project sites, the PM (or designee) is responsible for developing a project-specific hazard communication binder. Only those SDSs corresponding to the actual chemicals used on-site need be included.

The binder is to include a copy of this Hazard Communication Program, the hazardous chemical inventory specific to the office/project location, and the accompanying Safety Data Sheets (SDSs) for each chemical on the inventory. Each binder shall be placed in a known location that is readily accessible to all employees during working hours and, if requested, shall be made available to any representative of OSHA.

### 5.2 Chemical Inventory

SCs are responsible for maintaining a current inventory with the product name and manufacturer (at a minimum) of each hazardous chemical used in the workplaces under their coverage. Any chemical that presents a physical hazard or a health hazard (see definitions in Section 4.0) is considered a hazardous chemical. All hazardous chemicals except the following are to be included on the inventory:

- Hazardous waste under EPA, to include Resource Conservation Recovery Act (RCRA) and Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)



- Hazardous substances being remediated or removed
- Tobacco and tobacco products
- Wood and wood products (Not exempt are wood or wood products that have been treated with a substance considered hazardous under the OSHA standard and may be sawed or cut or might otherwise generate dust.)
- Articles (see definition in Section 4.0)
- Food or alcoholic beverages for consumption
- Drugs, including over-the-counter items
- Cosmetics
- Ionizing and nonionizing radiation
- Biological hazards
- Consumer products used as directed by the manufacturer and in the same manner (e.g., with the same frequency and duration of use) as would be used by a normal consumer

OSHA considers most office products (such as pens, pencils, adhesive tape) to be exempt from inclusion, either as articles or as consumer products. OSHA has also stated that intermittent or occasional use of a copying machine does not result in coverage under the standard. However, if an employee handles the chemicals to service the machine, or operates it for long periods of time, then the program would have to be applied. If there is any question as to which items to include on the inventory, contact your Regional SH&E Manager.

The hazardous chemical inventory must be updated annually and whenever a new chemical is introduced to the workplace. The inventory for this location is included in the attachments. *[Note, the attached inventory is for the HDR Omaha office and is provided as an example; offices are to replace this attachment with the inventory specific to their location.]*

### **5.3 Safety Data Sheets**

Under the revised OSHA standard, all hazardous chemicals shipped after June 1, 2015 require a Safety Data Sheet (SDS) (formerly called MSDSs or Material Safety Data Sheets). An SDS includes information such as the properties of the chemical; the physical, health, and environmental health hazards; protective measures; and safety precautions for handling, storing, and transporting the chemical. For each chemical included on the hazardous chemical inventory, an SDS must be acquired from the manufacturer or distributor and placed in the hazard communication binder. SDSs may also be available from HDR's online service.

1. Login at [www.msdsonline.com](http://www.msdsonline.com)  
Username: hdr  
Password: Sdsaccess1!
2. Click on the MSDSOnline Search Tab
3. Click on the PDF icon for the product you want.
4. Save the PDF to your computer and print it for your binder.



Note that MSDSs from hazardous chemicals purchased prior to June 1, 2015 do not need to be replaced with SDSs until the product is replaced unless there has been a significant change in the chemical's hazard information since purchase. SDSs (and MSDs until replaced) need to be cross-indexed to the chemical inventory and arranged in a manner which allows the reader to quickly find them.

The cross-indexed list and the collection of SDSs/MSDSs are considered part of the written Hazard Communication Program and must be included in the binder. Whenever a new SDS is received in the office, the SC shall place it into the binder and mark and enter it on the cross-indexed list. If the SDS corresponds to a product or chemical already in use, the SC is to substitute the new SDS for the older version. Replaced SDSs and SDSs for chemicals removed from the inventory should not be destroyed or discarded for at least 30 years past the last day of use of the chemical.

## **5.4 Container Labeling**

Labeling provides an employee the ability to quickly identify the chemical and determine safety precautions and health hazards. Under the revised OSHA standard, all hazardous chemicals shipped after June 1, 2015 require a GHS-style label. The label must be in English and must include the following elements:

- Product identifier
- Signal word, "Danger" or "Warning" (there may be non-hazardous chemicals that do not require a signal word)
- Hazard statements
- Precautionary statements
- Hazard pictograms
- Name, address and telephone number of manufacturer, importer, or other responsible party
- Supplementary info (optional)

Containers of hazardous chemicals purchased prior to June 1, 2015 do not need to be re-labeled as long as the original label provided by the manufacturer on the container has not been removed or defaced and there has not been a significant change in the chemical's hazard information since purchase.

SCs are responsible for examining each chemical container and verifying that it has an appropriate label. If non-English speaking employees will be using chemicals, information shall be presented in their language as well. Labels must be maintained in a manner which continues to be legible and the pertinent information (such as the hazards and directions for use) does not get defaced (i.e., fade, get washed off) or removed.

If HDR becomes aware of any significant new information regarding the hazards of a chemical, the SC shall revise the label for the chemical within six months of becoming aware of the new information.

## **5.5 Transference of Chemicals**

If chemicals are purchased in bulk and later transferred to smaller, temporary individual containers, labels must be affixed to the individual containers presenting the same label information as required on the label from the manufacturer, or the product identifier and words, pictures, symbols or a combination thereof.



For small temporary containers where the complete listing of the label information is impractical (due to container space restrictions), it is permissible to mark both the temporary container and the original bulk source container with a common referencing name or number, as long as all affected employees are trained on this identifying system and have other information immediately available to them regarding the hazards of the chemical.

## 5.6 Prohibited Actions

HDR employees are prohibited from bringing chemical products, including over-the-counter commercial products, into the office or onto a project site without first notifying the SC and receiving approval. Outside sales vendors are also prohibited from providing “free” samples of commercial/industrial office chemical products, unless such products are accompanied by an SDS, and approved for use by the SC.

## 5.7 Transport of Hazardous Substances

In the rare case that HDR employees need to transport hazardous substances, 49 CFR Part 171 will be followed accordingly.

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# 6.0 SAFE WORK PRACTICE GUIDELINES AND PROCEDURES

## 6.1 Common Tasks

Included in the attachments are safe work practice guidelines for various types of hazardous chemicals that could be used or encountered in HDR offices and at HDR project sites. As applicable, information on these chemicals should be included in the office/project-specific hazard communication program.

- Safe Work Practice Guidelines for Hazardous Chemicals
  - Solvents
  - Adhesives
  - Paints and Dyes
  - Lubricants
  - Compressed Gases
- Safe Work Practice Guidelines for Cement and Concrete
- Safe Work Practice Guidelines for Flammable and Combustible Liquids

In addition, project activities covered by the following safe work procedures could involve exposure to hazardous chemicals. As applicable, information on these chemicals should be included in the project-specific hazard communication program.

- HDR SH&E Procedure #001, *Permit-Required Confined Space Program*
- HDR SH&E Procedure #010, *Asbestos*
- HDR SH&E Procedure #011, *Lead and Lead-Based Paint*
- HDR SH&E Procedure #020, *Hazardous Waste Operations and Emergency Response*
- HDR SH&E Procedure #025, *Air Contaminants* (includes anhydrous ammonia, arsenic, benzene, cadmium, chlorine gas, hexavalent chromium, hydrogen sulfide, and silica)





## 6.2 Hazardous Non-Routine Tasks

Occasionally, employees at HDR may be required to perform tasks which are considered to be non-routine, and which may present new chemical contact or usage hazards. Examples include the manipulation of unlabeled piping in new construction or during renovation activities, or the entry into a vessel, pit, or tank that formerly contained chemicals.

As project personnel identify non-routine tasks, they are to discuss the situation with the PM. The PM must ensure a safety briefing is conducted with exposed employees to review the possible hazards they may encounter while completing the task, including:

- Hazard recognition
- Chemicals involved and their hazardous properties
- Physical hazards – fire/explosion
- Methods of avoiding hazards
- Location of medical facilities and proper response actions

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## 7.0 MULTI-EMPLOYER WORKSITE INFORMATION TRANSMISSION

### 7.1 Chemicals Used by HDR

It is the responsibility of HDR to provide all outside contractor employees (where the contractor's employees could be impacted by HDR use of chemicals) with information on the chemicals that HDR uses on any particular project site. It shall be the responsibility of the HDR senior project professional on-site to provide those impacted with the following information.

- Location of the HDR project-site hazard communication binder, which includes the following:
  - HDR Hazard Communication Program (this document)
  - Hazardous chemical inventory
  - SDS for each chemical on the inventory
- Labeling system employed (if unique).
- Any special precautionary measures to be employed by the outside contractor to protect their employees from chemical and/or physical hazards posed by HDR chemical usage.
- Location of nearest necessary emergency equipment (fire extinguisher, eyewash, shower, phone, first-aid kit, etc.)
- Emergency evacuation signals and evacuation rally locations (if applicable).

The HDR employee providing this information should document that this occurred in either the field notes, written minutes of the initial project kickoff, or daily tailgate safety meeting notes.

### 7.2 Chemicals Used by Others

Any contractor using a chemical or compound covered by this program on a project site, where contact or exposure to HDR employees is possible, is responsible for providing the information listed in Section 7.1 to HDR. The lead project-site HDR employee is to contact the other contractor's foreman, supervisor, or safety officer at the site, and request that the information be provided to HDR employees



on site. The lead project-site HDR employee is to document when the information was provided and by whom.

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## 8.0 TRAINING

All HDR employees receive awareness training on hazard communication requirements at the time of hire. This training is included in the New Hire Mandatory Learning Plan. Location-specific information, including the location of the Hazard Communication Plan, chemical inventory, and SDSs, is provided by the SC as part of the New Employee SH&E Orientation. In addition, employees are informed of hazard communication labeling requirements, and the prohibition of bringing new chemicals into the office without SC approval.

In addition to the awareness training, each of the following is required for employees who use or are impacted by hazardous chemicals in the office or at project sites:

- Formal hazard communication training (available on HDR University)
- Chemical-specific training (provided by the local SC or Regional SH&E Manager for chemicals in the office; provided by the PM (or a designee) during the initial project orientation meeting and/or during daily safety meetings or other meetings for chemicals at project sites)

Together, these sessions provide instruction on the following:

- An overview of this program, 29 CFR 1910.1200, and, if applicable, 49 CFR Part 171
- Chemicals and their hazards in the work area (including review of applicable safe work practice guidelines attached to this procedure and any other applicable procedures from the Corporate SH&E Manual)
- Location of SDS and written plan
- Physical and health risks of the hazardous chemical
- Symptoms of overexposure
- Chemical routes of exposure (inhalation, skin contact, ingestion)
- How to prevent exposure to the hazardous chemicals
- Procedures to follow if they are exposed to the chemicals
- How to read and interpret labels and SDSs for hazardous substances
- Emergency spill procedures
- Proper storage and labeling

Before any new hazardous chemical is introduced into the work area (either office or project site), the SC and/or PM must confirm affected employees have been given the information and training described above.

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## 9.0 CROSS REFERENCES

OSHA 29 CFR 1910.1200, *Hazard Communication*

United Nations (UN) Globally Harmonized System of Classification and Labeling of Chemicals (GHS)



DOT 49 CFR Part 171, *General Information, Regulations, and Definitions*

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## **10.0 LIST OF ATTACHMENTS**

*Hazard Communication Compliance Checklist*

*Hazardous Chemical Inventory*

*Safe Work Practice Guidelines for Hazardous Chemicals*

*Safe Work Practice Guidelines for Cement and Concrete*

*Safe Work Practice Guidelines for Flammable and Combustible Liquids*

**HAZARDOUS CHEMICAL INVENTORY**Omaha Office – 1917 S 67<sup>th</sup> St.

<b>Chemical Name</b>	<b>Manufacturer</b>	<b>Storage Location</b>	<b>#</b>
<b>Water Testing Chemical</b>			
Hardness Buffer Solution (Code 16)	Walling	Water Testing Cabinet	1
Hardness Buffer Solution (Code 20)	Walling	Water Testing Cabinet	2
Hardness Reagent (Code24)	Walling	Water Testing Cabinet	3
Ceric Sulfat Solution	Walling	Water Testing Cabinet	4
Thorium Nitrate Solution (Code 592)	Walling	Water Testing Cabinet	5
Conductivity Solution (Code ML-2)	Walling	Water Testing Cabinet	6
Molybdenum 1 Reagent Powder Pillows	Walling	Water Testing Cabinet	7
Molybdenum 2 Reagent	Hach	Water Testing Cabinet	8
Demineralizer Bottle	Hach	Water Testing Cabinet	9
Indicator Powder (Code 802 P)	Walling	Water Testing Cabinet	10
TDS Solution (3000 ppm)	Walling	Water Testing Cabinet	11
Acid Solution (Code 802)	Walling	Water Testing Cabinet	12
DEHA	Walling	Water Testing Cabinet	13
Thiosulfate Reagent (Code 774)	Walling	Water Testing Cabinet	14
Interferences Suppressor (Code 899)	Walling	Water Testing Cabinet	15
Nitrate Indicator (Code 590)	Walling	Water Testing Cabinet	16
<b>Water Treatment Chemicals</b>			
Algaecide (A165)	Walling	Corrosive Storage Pad	17
Algaecide (A261)	Walling	Corrosive Storage Pad	18
Algaecide (A268)	Walling	Corrosive Storage Pad	19
Brom-Mate (biocide)	Walling	Corrosive Storage Pad	20
Closed Loop Treatment (BWT 337LM)	Walling	Corrosive Storage Pad	21
Boiler Water Treatment (BWT 753)	Walling	Corrosive Storage Pad	22
Cooling Water Treatment (CWT 907)	Walling	Corrosive Storage Pad	23
Liquid Boil Out (boiler cleaner)	Walling	Corrosive Storage Pad	24
<b>General Cleaning Supplies</b>			
All Purpose Cleaner	Dickler Chemical Labs	Chemical Storage Cabinet	25
Chewing Gum Remover	Spartan Chemical	Chemical Storage Cabinet	26
Knock Out (soil and finish remover)	State Chemical	Chemical Storage Cabinet	27
Netcare Glass Cleaner NO5O	Network Services	Chemical Storage Cabinet	28
Germicidal Cleaner	National Paper	Chemical Storage Cabinet	29
Mr Muscle Oven and Grill Cleaner	SC Johnson	Chemical Storage Cabinet	30
Coil Cleaner (F584)	State Chemical	Chemical Storage Cabinet	31
Vandal Mark Remover	Share Corporation	Chemical Storage Cabinet	32
Multi-Allergen Remover	Bissell	Chemical Storage Cabinet	33
Floor Cleaning Formula	Bissell	Chemical Storage Cabinet	34
SPW (multipurpose silicone lubricant)	State Chemical	Chemical Storage Cabinet	35
Invisilube (multipurpose lubricant)	Sate Chemical	Chemical Storage Cabinet	36
GRS (multipurpose aerosol lubricant)	State Chemical	Chemical Storage Cabinet	37
321 Dry Film Lubricant	Dow Corning	Chemical Storage Cabinet	38
Grease B Gone	State Chemical	Chemical Storage Cabinet	39
CLR (Calcium Lime and Rust Remover)	Jelmar	Chemical Storage Cabinet	40
<b>Insecticides</b>			
SOK Multiuse Insect Killer	State Chemical	Chemical Storage Cabinet	41
Ortho Ant Stop (ant killer spray)	Ortho	Chemical Storage Cabinet	42
<b>Painting and Finishing Materials</b>			
DTM Acrylic Gloss Enamel	Sherwin Williams	Chemical Storage Cabinet	43



<b>Chemical Name</b>	<b>Manufacturer</b>	<b>Storage Location</b>	<b>#</b>
Industrial Enamel	Sherwin Williams	Chemical Storage Cabinet	44
3M Super 77 Spray Adhesive	3M	Chemical Storage Cabinet	45
Cleaner/Primer Products	E-Z Weld	Chemical Storage Cabinet	46
60-Sec Epoxy – Part A	Ace	Chemical Storage Cabinet	47
PVC Solvent Cements	E-Z Weld	Chemical Storage Cabinet	48
<b>Gases/Oils</b>			
Propane Gas		Chemical Storage Cabinet	49
WD-40 Aerosol	WD-40 Company	Chemical Storage Cabinet	50
AC 45280 PJ CMPD	William H Harvey Co	Chemical Storage Cabinet	51
THRD CUTG OIL	William H Harvey Co	Chemical Storage Cabinet	52
MAPP Gas (methyl acetylene propadiene)		Chemical Storage Cabinet	53
Motor Oil		Chemical Storage Cabinet	54
<b>Miscellaneous Solvents</b>			
Methyl Ethyl Ketone		Chemical Storage Cabinet	55
Mineral Spirits		Chemical Storage Cabinet	56
Toluene		Chemical Storage Cabinet	57
Xylene		Chemical Storage Cabinet	58



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	Traffic Safety Checklist	

### Revision History

Rev	Description of Change	Issue Date
0	Initial Release	07/07/2003
1	Revisions	12/26/2007
2	Revisions	08/16/2011
3	Re-Formatting	11/22/2013
4	Added HDR logo requirements for safety vests and minimum Class 2 safety vest requirement for HDR field activities	04/29/2014
5	Re-formatting; added Traffic Safety Checklist; added procedures for additional roadway field activities (mowing, debris pickup, patching/fixing, guardrail replacement, bridge inspection).	01/10/2017



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## 1.0 PURPOSE

This procedure establishes requirements for working safety around moving traffic. This procedure is not intended to give guidance for the design and development of traffic control plans. Traffic control plans must be designed by qualified professionals familiar with the standards contained in the latest version of the Manual on Uniform Traffic Control Devices (MUTCD) and/or other applicable local, state, or provincial guidelines.

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## 2.0 APPLICABILITY

This procedure is applicable to HDR personnel exposed to moving traffic. Specific assignments with such exposure include:

- Work within construction zones
- Field visits along roadways
- Surveying
- Mowing near a roadway
- Debris pickup on a roadway
- Bridge Inspection
- Patching or fixing a part of the roadway
- Replacing damaged guardrail

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## 3.0 PROCEDURE IMPLEMENTATION

This procedure will be administered by the HDR Director of SH&E and local Safety Coordinator (SC).

### 3.1 Director of SH&E

The Director of SH&E shall:

- Periodically review, at least annually, the effectiveness of this procedure, identify any deficiencies, and ensure that they are corrected.
- Assist SCs and project professionals, as requested, in the implementation of this procedure and regulatory interpretations.

### 3.2 Project Managers

Project Managers shall:

- Assure that the procedures outlined in this document are followed by project staff.

### 3.3 Safety Coordinators

SCs shall:

- Provide evaluation assistance to Project Managers during project planning and bidding.



- Arrange for training on this procedure for their respective staff and make sure that this procedure is readily available in each office.
- Interface with Corporate SH&E on questions and when guidance is necessary.
- Maintain traffic safety supplies (safety vests, yellow revolving lights, etc.).

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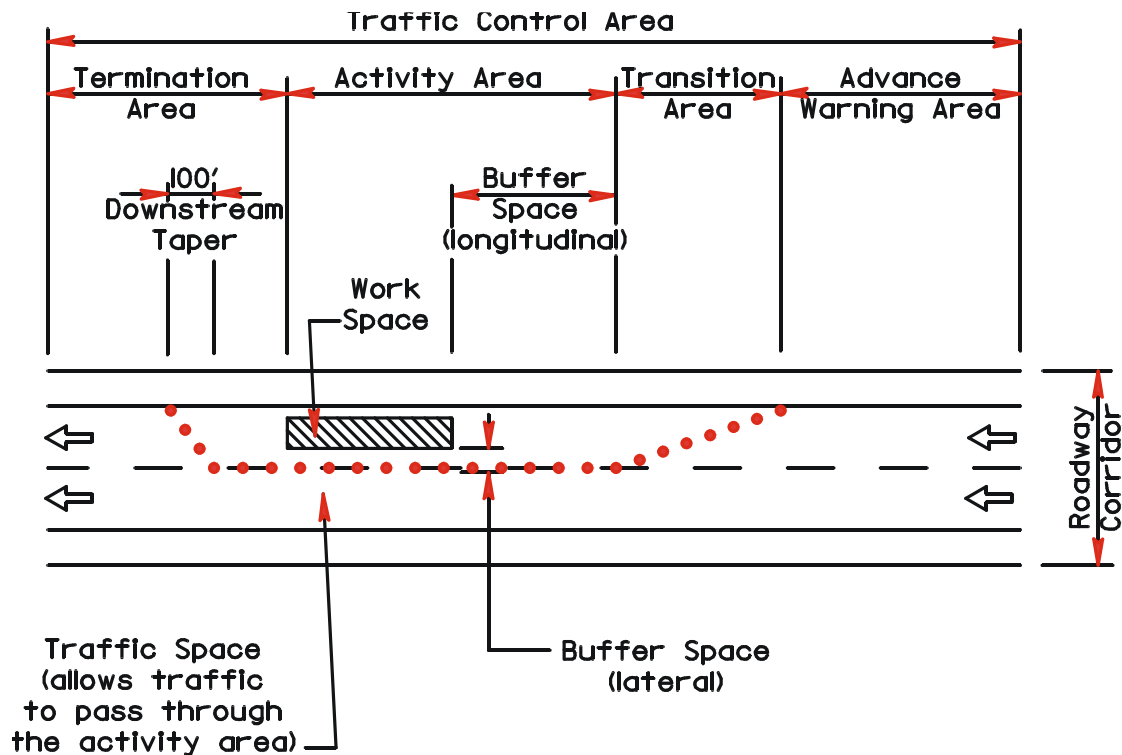
## 4.0 DEFINITIONS

Term	Definition
Activity Area	Where workers may be actively engaged in project activities, includes the Work Space and Buffer Space (see Figure 1).
Advanced Warning Area	The space between the warning signs and the transition section; tells motorists what to expect ahead (see Figure 1).
Barricade	A channeling device consisting of a horizontal panel or panels with orange stripes (orange and black stripes in Canada) and optional light. The stripes on the barricade should slope downward in the desired direction of traffic flow. Barricades are described by their number of horizontal panels, such as Type I (one panel), Type II (two panels), and Type III (three panels). In most applications, Type I barricades should be used as needed during the day, or at night with a warning light attached.
Buffer Space	The space between the transition area and the workspace which provides an additional margin of safety for both motorists and workers (see Figure 1).
Cone	A traffic-channeling device used to guide the motorist around the work area. Standard cones are 28 inches (70 cm) high. Local requirements may require the addition of orange flags and/or reflective collar to cones.
Drum	A traffic-channeling device made of plastic with two horizontal orange and white stripes, at least 3 feet in height and at least 18 inches in diameter. (Canadian drums typically measure 100 cm in height, minimum 55 cm diameter at base and 33 cm diameter at top. Drums have alternating orange and black stripes.) Drums are typically used in places where they will remain in place for a prolonged period of time.
Flagger (Traffic Control Person)	A worker whose sole job function is to alert motorists to the need to stop/slow down as they approach a temporary work area, or to direct vehicles through the work zone.
Flashing Arrow Panel	A sign panel with a matrix of lights capable of showing either flashing or sequential displays. A flashing arrow panel is intended to supplement other traffic control devices. The panel may be either trailer or truck mounted.
Flashing Vehicle Lights	A required or optional traffic control measure for vehicles within a work area.
High Speed Street or Highway	Any street or highway whose posted speed limit is greater than 50 mph (80 km/h).
Low Speed Street or Highway	Any street or highway whose posted speed limit is < 50 mph ( 80 km/h).
Roadway	That portion of a highway improved, designed, or ordinarily used for vehicular travel, exclusive of the berm or shoulder.
Right of Way (ROW)	Includes the roadway itself, the shoulder, and any adjacent buffer property.



Term	Definition
Termination Area	The space beyond the work area, which allows the motorist to resume normal driving (see Figure 1).
Traffic Control Area	The space between the first advance warning sign and the end of the termination area (see Figure 1).
Traffic Control Plan	A written plan/layout of traffic control devices (signs, barricades, etc.) that are typically used for permitting the safe movement of traffic through a construction work zone.
Transition Area	The space between the advance warning area and the buffer space, which allows the motorist to move out of the normal traffic path (see Figure 1).
Work Space	The portion of the roadway closed to traffic, which is set aside for equipment and material (see Figure 1).

**Figure 1. Traffic Control Area**



## 5.0 PROCEDURES

### 5.1 General Guidelines

The general guidelines presented below are to be followed whenever HDR employees are exposed to moving traffic, regardless of the service being provided.

- The project manager shall appoint an HDR supervisor to supervise HDR employees, sub-contractors, and sub-consultants during the activity exposing the project team to moving traffic hazards. At a minimum, all HDR supervisors overseeing this type of work will have received Traffic Control Technician certification.



- The supervisor must conduct a job briefing at the beginning of each shift and a Self-Audit/Take 5 as required during the shift. At a minimum, the job briefing must address the Job Hazard Analysis along with the individual responsibilities within it and, as applicable, should include completion of the **Traffic Safety Checklist** included in the attached forms.
- Prior to starting work, review any pertinent information contained in state/provincial/municipal regulations, the Manual of Uniform Traffic Control Devices (MUTCD), the Traffic Control Plan, contract documents, and this procedure.
- Temporary Traffic Control Devices shall not be tampered with, removed, or relocated unless allowed per the contract by a qualified employee.
- Park vehicles a safe distance from the traveled roadway and walk to their intended destinations whenever possible. If the vehicle must be parked on the shoulder of the roadway, park as far as possible from the edge of the traffic lane and a yellow revolving light or strobes need to be activated.
- If the vehicle is stopped, parked or slowly moving through the ROW, the vehicle shall have in user the four-way flashers and/or a 360 degree beacon light. Additionally, if the vehicle will be parked on the shoulder for greater than two hours, advance signing shall be used consistent with applicable guidelines.
- Where allowed by local jurisdiction and client, installation/use of strobe lights in the hazard warning light sockets, in lieu of an overhead light bar is permissible. At least one strobe must be visible from any direction (360 degrees) around the vehicle.
- If any measurements or other work tasks within the traveled roadway will be conducted (e.g., measurements along the roadway, sewer measurements, etc.), a minimum of two employees shall be used, such that one employee is available to monitor the traffic flow along the roadway within the vicinity of the fieldwork. The need for two employees is a prudent safety consideration to be observed in all circumstances.

## **5.2 High Visibility Clothing Requirements**

HDR employees exposed to or working in proximity to moving traffic or working in the ROW shall wear a minimum Class 2 safety vest (Class 3 safety vest required for traffic speeds greater than 50 miles per hour) with the HDR logo (see the HDR equipment catalog with MidContinent Safety on the SH&E portal). Safety vests must meet the requirements of ANSI/ISEA 107-2015: American National Standard for High-Visibility Safety Apparel and Accessories.

## **5.3 Work in Construction Zones**

Employees must take extra care when working near heavy construction equipment. Two-way communication is required with the equipment operator before walking near equipment.

## **5.4 Field Visits along Roadway**

Field visits may consist of driving or walking the roadway corridor and noting items such as entrances, culvert locations, observing traffic flow, conducting environmental surveys or performing similar tasks. Depending on the actual task, all general guidelines shall be followed and a proper worksite analysis shall be conducted to note any other specific guidelines that apply.



## **5.5 Surveying Crews**

HDR employees that are classified as surveyors have a significant level of exposure to moving traffic. Surveyors may be required, based on local guidelines, to set up traffic control devices. Applicable requirements shall be adhered to when setting up traffic control devices. When working as a surveyor along the roadway or in the ROW, the following actions shall be taken:

- Obtain and file with the local Safety Coordinator any permits required for work within the roadway.
- If a flagger is needed as part of the required traffic control, only those HDR employees who are Certified Flaggers shall be permitted to perform these duties.

## **5.6 Mowing Near a Roadway**

- Hearing protection shall be worn at all times during mowing operations
- Clearly understand the boundaries of the mowing operation in order to limit the time of exposure near the roadway.
- If using a weedeater, upgrade eye protection to goggles and consider an N95 respirator (see HDR SH&E Procedure #009, *Respiratory Protection Program* for requirements (medical clearance, fit testing, training)).

## **5.7 Debris Pickup on a Roadway**

- Truck-mounted attenuator (TMA) usage should be considered and used if at all possible
- If two employees are in the vehicle, the employee picking up the debris should be the one who does not have to open their door to active traffic lanes.
- If working alone, employees shall not exit vehicle until they are sure it is clear and safe to do so and then, if possible, exit on non-active traffic side of the vehicle.
- Proper lifting techniques shall be used for all debris
- Leather or cut-resistant gloves shall be worn in anticipation of debris having sharp edges

## **5.8 Patching or Fixing a Part of the Roadway**

- Temporary traffic devices shall be installed according to the Traffic Control Plan before HDR employees enter the work zone.
- Every effort shall be made to minimize the time employees work in the traffic lane.
- If using hot asphalt, long sleeved garments and leather gloves shall be used to avoid burns on the arms and/or hands.
- Wear hearing protection when using equipment such as quick-cut saws or walk-behind saws.
- Use water when cutting roadway materials with quick-cut saws or walk-behind saws.

## **5.9 Replacing Damaged Guardrail**

- Avoid pinch points when handling guardrail parts.
- Use proper lifting techniques when handling guardrail parts.



- Use leather or cut-resistant gloves when handling damaged guardrail.
- Use hearing protection when working on high-speed highway.
- When possible, work on the side of the guardrail that does not have active traffic.

### **5.10 Bridge Inspection**

- Temporary traffic devices shall be installed according to the Traffic Control Plan before HDR employees enter the work zone.
- Employees working inside of box girders should consider using hearing protection and an N95 respirator (see HDR SH&E Procedure #009, *Respiratory Protection Program* for requirements (medical clearance, fit testing, training). Many box girders have been known to be very dusty and if heavy traffic exists the can also be extremely noisy.

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## **6.0 INCIDENT REPORTING AND INVESTIGATION**

All incidents (near miss, injury/illness, damage, security, environmental) must be reported and investigated as per HDR SH&E Management System – 007, Incident Reporting and Investigation.

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## **7.0 TRAINING**

HDR will provide exposed employees general awareness training on the hazards of moving traffic and the safety measures and actions specified in this Procedure. In addition, Traffic Control for Construction Personnel training will be provided to employees assigned as supervisors in construction zones where traffic control devices (as defined in the Manual of Uniform Traffic Control Devices) are used.

Currently, HDR does not authorize employees to act as flaggers or traffic control persons, except during temporary emergency conditions. The flagging activities shall only be conducted by an HDR employee during an emergency until a qualified flagger is present. Qualified flaggers must obtain training from a certified or recognized trainer.

All training shall be documented in writing, with a copy forwarded to Corporate SH&E.

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## **8.0 CROSS REFERENCES**

- Manual On Uniform Traffic Control Devices (MUTCD) – United States and Canada Versions
- Alberta Occupational Health and Safety Code Part 12 General Safety Precautions, Section 194, Vehicle Traffic Control
- British Columbia Occupational Health and Safety Regulation, Part 18, Traffic Control and Part 8, Personal Protective Clothing and Equipment
- Manitoba Occupational Health and Safety Regulation, Part 20, Vehicular and Pedestrian Traffic and Part 6, Personal Protective Equipment
- Newfoundland and Labrador Occupational Health and Safety Regulation, 70/09, Part VII, s. 81, High Visibility Apparel and Part XVI, Traffic Control



- Ontario Occupational Health and Safety Regulations for Construction Projects, RRO 213/91, s.67-69, Traffic Control and s. 106, Protective Clothing
- Saskatchewan OHS Regulations 1996, compiled through 2009, PART IX, Section 13, Risk from Vehicular Traffic
- Part VI of the U.S. MUTCD – Revision 3 September 3, 1993 (or latest edition)
- Iowa Dept. of Transportation Standard Road Plan RS 1-2 & RS 61-62

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## 9.0 FORMS

Traffic Safety Checklist

## TRAFFIC SAFETY CHECKLIST

Project: \_\_\_\_\_ Date: \_\_\_\_\_

Location: \_\_\_\_\_

Completed by: \_\_\_\_\_

### General

- Guidelines given by the province or municipality and the Manual of Uniform Traffic Control Devices have been reviewed and are being followed.
- The approved Project Traffic Control Plan is being followed.
- All HDR employees have taken a Traffic Safety course and received local agency required certifications (if applicable).
- Municipality-required traffic control devices under the control of HDR remain in the field only while HDR employees are present.

### Construction Zones

- HDR-operated vehicles are equipped with a yellow revolving light.
- All HDR employees are wearing hard hats
- All HDR employees are wearing safety vests
- All HDR employees are wearing safety glasses
- All HDR employees are wearing protective toe boots Barricades and signs have been left intact.

### Field Visits

- HDR vehicles are parked away from the roadway
- Vehicles parked on the shoulder for less than two hours are equipped with a yellow revolving light.
- Advance signing has been installed for vehicles parked on the shoulder for more than two hours.
- If any work tasks are conducted within the traveled roadway, at least two employees are being used—one for the work and one to monitor traffic flow.

## Surveying Crews

Yes No NA

Do local guidelines require that traffic control devices be set up?

If Yes, have local requirements been adhered to?

Are HDR surveyors working within the vicinity of moving traffic?

If Yes, is closure of a travel lane required for performing surveying duties?

If Yes, has the roadway owner or responsible agency been notified in advance to provide any necessary traffic control devices that HDR cannot directly provide?

Have permits required for work within the roadway been obtained?

Is a flagger needed to complete the required traffic control?

If Yes, is the flagger trained in proper flagging techniques?

Are all employees working in or along a traveled roadway wearing safety vests?

Are all employees working in or along a traveled roadway wearing hard hats?

Is the survey vehicle equipped with a yellow revolving light?

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## Revision History

Rev	Description of Change	Issue Date
0	Initial Release	05/01/1999
1	Revisions	01/24/2001
2	Revisions	04/18/2006
3	Revisions	01/24/2007
4	Re-Formatting	06/13/2013
5	Depth for drowning hazard changed from four feet to two feet	08/19/2013
6	Added HDR logo requirements	04/29/2014
7	Re-formatting; added Water Safety Checklist	01/10/2017



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## 1.0 PURPOSE

This procedure presents information and guidelines on the safe performance of work on or near water, where the possibility of drowning exists. It conforms to the requirements of 29 CFR 1926.106 – Working Over or Near Water, 29 CFR 1926.802 – Cofferdams, and 29 CFR 1926.605 – Marine Operations and Equipment [Barges].

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## 2.0 APPLICABILITY

This procedure applies to all HDR personnel that perform surface services on or around water where the potential for drowning exists. This procedure also applies to boating and water operations associated with the use of large open water craft.

This Procedure excludes railroad structure inspections over water, addressed in HDR SH&E Procedure # 14 – Railroad Safety, and marine diving operations, which are addressed by HDR SH&E Procedure #23 – Scientific Diving. HDR field professionals are responsible for evaluating work locations and tasks to determine whether the requirements contained in this Procedure apply. If client project requirements differ from those presented herein, the more stringent requirements shall apply.

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## 3.0 PROCEDURE IMPLEMENTATION

This Procedure will be administered nationally by the HDR Director of SH&E, and locally by the Safety Coordinator(s).

### 3.1 Director of SH&E

The Director of SH&E shall:

- Review, at least annually, the effectiveness of the Procedure, identify any deficiencies, and ensure they are corrected.
- Provide guidance to SCs and HDR professionals concerning Water/Boating Safety issues.
- Assist SCs in the selection of equipment, Personal Flotation Devices (PFDs) and other necessary items to allow employees to work safely around water hazards.

### 3.2 Safety Coordinators

The SC Shall:

- Determine any additional State OSHA Water/Boating Safety requirements, and relay this information to their office staff and Corporate Safety.
- Provide technical assistance to Project Managers during project planning and proposal preparation.
- Provide Water/Boating Safety awareness level training to HDR professionals as necessary.
- Interface with Corporate Safety on related questions they have and when guidance is necessary.
- Provide technical assistance to project personnel, as possible.



### 3.3 Project Managers

Project Managers shall:

- Determine if any project task will subject HDR personnel to water hazards, and incorporate appropriate preplanning into the project design. Preplanning includes the identification and acquisition of necessary equipment (PFDs, skiffs, etc.) and the verification that exposed personnel have the knowledge and training to correctly use the equipment.

### 3.4 Project Personnel

Project personnel shall:

- Read, understand and follow the contents of this Procedure when engaged in site activities that present water hazards.

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## 4.0 DEFINITIONS

Term	Definition
Bulwark	The side of a ship extending above the upper deck.
Cofferdam	A temporary structure used to keep water (and earth) out of an excavation during construction of the permanent structure.
Coaming	The raised frame, curb or rim around a barge deck (e.g., hold) opening designed to keep out water. Presents trip hazard.
Gangway	Any ramp, stairway or ladder provided for personnel to board/leave a vessel.
Rode	A length of chain that connects an anchor to line (rope). This is used in lieu of attaching the rope directly to the anchor because the chain is stronger and more resistant to frictional abrasion than the rope.
Jacob's Ladder	A flexible ladder made of rope or chain with wood or metal rungs.
Life Ring	Type IV life ring, without a retrieval rope attached. Thrown to immersed personnel.
Personal Flotation Device (PFD)	Equipment designed to prevent drowning. The USCG is the approving agency and divides all PFDs into 5 current classifications. Three classes are approved for HDR use – Class III, IV and V. Types III and V are designed to be worn as apparel around the body during all times of exposure, and are commonly referred to as "life vests, life preservers, float coats, or float suits." Type IV are circular life rings designed to be thrown to personnel who are in the water, as a rescue measure.
Ring Buoy	Type IV life ring, with a retrieval rope attached.
Safety Blocks	Large floating blocks which may be quickly pushed into the water to protect individuals who have fallen in the water from being crushed by vessels. Used along wharves and docks.
Skiff	A shallow draft, flat bottomed open boat used for rescue.
Throw Bag	A nylon bag approximately 8x6 inches, containing a length of rope. During a rescue, the bag is opened, and the rescuer throws out the rope to the victim, who grabs it, and can then be retrieved. While considered a water rescue aid, it is not a PFD.
Trawling	As used herein, the dragging through the water of a dredge, net or other apparatus used as a fishing appliance.



Term	Definition
Waders	Water impermeable apparel worn in two styles – either as a single large pants unit, or as individual leg protectors. Worn when wading to prevent exposure of the leg or lower torso to water, when performing E&RM field sampling activities.
Work Vest	A Type V PFD that is designed to maximize freedom of movement, limiting the flotation material to the back and chest.

## 5.0 SAFE WORK PRACTICES FOR WORK ON OR AROUND WATER

The following subsections describe requirements for work on or around water. Prior to initiating activities, complete the **Water Safety Checklist** included in the attached forms.

### 5.1 PFDs And Personal Protective Equipment

A personal flotation device is a floating aid designed to keep the wearer from drowning, by adding sufficient buoyancy to the torso when the wearer is free floating in deep water. The classification “PFD” includes apparel such as life vests (commonly called “life preservers”), float suits, and float coats as well as retrieval life rings. PFDs must meet design and use criteria regulated by the United States Coast Guard (USCG) and must include the HDR logo. Table 5-1 presents the various USCG classifications and OSHA approvals:

**Table 5-1**  
**Personal Flotation Devices**

Classification	Design	OSHA / Comments
<b>Type I –</b> Offshore Life Jacket	Designed to turn an unconscious person in water to vertical position. Open ocean apparel. <i>Designed with minimum 35 lbs. buoyancy</i>	While acceptable, they are very bulky and will limit mobility. Emergency use only. Not for everyday use.
<b>Type II –</b> Nearshore Buoyant Vest	Designed to turn an unconscious person to a vertical position. Coastlines, Great Lakes, etc. <i>&gt;15½ lbs. buoyancy.</i>	While acceptable, they are very bulky and will limit mobility. Not for everyday use.
<b>Type III –</b> Flotation Aid	Designed to keep a conscious person in a vertical position. Designed for everyday water activities (e.g., boating, skiing) <i>Minimum 15½ lbs. buoyancy.</i>	Acceptable for all HDR activities. (New Type III inflatable PFDs are approved only if rated for commercial or industrial use).
<b>Type IV –</b> Throwable Device (Life Ring)	Throwings designed to be thrown into the water for rescue. Not worn on body. <i>Minimum 16½ lbs. buoyancy.</i>	Required in boats, on wharfs and in certain shore situations.
<b>Type V –</b> Special Use Device	Catchall category - various designs for specific water activities – includes deck suits, work vests, hybrid PFDs, etc. <i>Minimum 15½ lbs. buoyancy.</i>	Acceptable for HDR activities as long as mfg. label does not exclude from use in planned work activity. (See note below)

**NOTE:** There are many new Type V PFDs marketed recently. If a question arises as to whether they may be approved for HDR use, check the manufacturer’s instructions and limitations. OSHA specifies that only Type V PFDs approved for “commercial” or “industrial” use are allowed to be worn during employment activities. This prohibits the use, by HDR personnel, of some specialty PFDs, including inflatables, that are advertised for recreational use.



### 5.1.1 Life Vests/Preservers, Float coats, and Float Suits

For cold weather work on boats, or on floating docks where the risk of falling into the water is present, if the water plus air temperature is less than 110 degrees Fahrenheit a float coat or a float suit must be worn in lieu of a vest-type PFD.

- Water temperature + air temperature < 110°F = float coat or suit required.
- Water temperature + air temperature ≥ 110°F = vest-type PFD allowed.

USCG approved International Orange life vests\* classed as Type III or Type V shall be provided to, and worn by, all HDR employees in the following circumstances:

- On floating pipelines, pontoons, barges, rafts, or stages.
- On structures extending over or adjacent to water, except where guardrails (not safety nets) are provided for employees, or where the employee is protected from falling into water at all times through the use of a personal fall positioning or arrest system (harness, lanyard, anchorage, self-retracting lifeline, etc. PFDs are required when nets are the form of fall protection employed. See HDR SH&E Procedure #12 - Fall Protection).
- Working alone at night where there are drowning hazards, regardless of other safeguards (e.g., guardrails, etc.) provided.
- In skiffs, small boats, or launches.
- Wherever there is a drowning hazard. HDR considers any body of water with a depth of 2 feet or greater a drowning hazard. This depth could be shallower in some circumstances depending on factors such as flow velocities, water temperature, ability to rescue injured employees, and existence of other hazards.

Before and after each use, the PFD shall be inspected for defects which would alter its strength or buoyancy. The design requirements for PFDs specify that any device with less than 13 pounds buoyancy is defective, and shall be removed from service. While HDR has no field method of determining the buoyancy rating, employees should examine the PFD to determine the original float material is present, that all seams are sealed and securely stitched, and that all buckles and straps are in working order. If a defect is noticed, DO NOT USE!

All newly purchased PFDs shall be equipped with retro-reflective tape. These are required when working on US Corps of Engineers (USACE) projects. Existing HDR-owned PFDs without this tape, but otherwise acceptable, may continue to be used on non-USACE projects (daylight only).

PFDs provided on vessels used on the Great Lakes or ocean service shall be equipped with approved PFD lights (work vests are exempt from this lighting requirement if an additional approved PFD is available on board).

### 5.1.2 Life Rings/Ring Buoys

Type IV life rings (no rope attached) and ring buoys (rope attached) shall be U.S. Coast Guard approved. Ring buoys should have attached at least 90 feet of 3/8-inch solid braid polypropylene or equivalent. Life rings or ring buoys shall be readily available and shall be provided, regardless of the fall protection provided, at the following places:

- at least one on each safety skiff;



- at least one on all motor boats up to 40 feet in length and at least two for motor boats 40 feet in length or longer;
- at least two on any other piece or group of floating barge up to 100 feet in length and one additional for each increase in length of 100 feet or fraction thereof; and
- at least one at intervals of not more than 200 feet on pipelines, walkways, wharves, piers, bulkheads, lock walls, scaffolds, platforms, and similar structures extending over or immediately adjacent to water, unless the fall distance to the water is more than 45 feet, in which case a life ring shall be used. The length of line for ring buoys at these locations shall be evaluated based on the specific potential hazards, but may not be less than 70 feet.

PFD lights shall be required whenever there is a potential need for life rings to be used after dark. On shore installations, at least one life ring, and every third one thereafter, shall have a PFD light attached. PFD lights on life rings are required only in locations where adequate general lighting (e.g., floodlights, light stanchions) is not provided.

On Coast Guard certified vessels, Type IV PFDs are required to have automatic floating electric water lights: on all other floating barges or plants, at least one life ring, and every third one thereafter, shall have an automatic floating electric water light attached.

### **5.1.3 Waders**

Waders are worn by many HDR personnel to prevent immersion of their lower body in water when performing field sampling or collection activities. There are many different types of waders which can be used to coincide with field conditions. Please check with project manager's to see what the minimum standard is for each respective project. Various types of waders used within HDR are as follows:

- **Hip Waders** – Hip Waders are one-piece waders that cover the legs to the hips and generally come equipped with straps that attach to the belt or belt loops to keep the waders in place during work. Best used in slow or still water conditions; if the work is in areas of varying water conditions and levels hip waders may not be appropriate, as they can fill with water when exposed to waves or splashes, etc.
- **Chest Waders** – Chest Waders typically have shoulder straps and waist belts and typically extend to the users' upper chest. These are a more appropriate choice when working in varying or rough water conditions. Chest waders also come in a variety of materials.
- **Rubber Waders** – Typically booted waders constructed of outer rubber and interior cloth materials. These waders can be worn in various conditions with appropriate layering or undergarments, but can cause problems by retaining moisture. While readily available and offering a variety of insulation levels, tear resistant coatings, etc., rubber waders do not breathe well and may initiate heat or cold stress related problems (For more info, refer to Procedures # 28 – Heat Stress, and # 29 – Cold Stress).
- **Breathable Waders** – Typically made from synthetic materials such as Gortex which allow perspiration and moisture to pass through the material while keeping the ambient water out. For working in conditions where high temperatures are a concern or there is potential for overheating, these may be a good choice. Most are lightweight and not recommended for work in cold water or climates.



- Neoprene Waders - Appropriate when working in cold water conditions to help prevent exposure or possible hypothermia. Neoprene waders also provide extra buoyancy if the wearer slips and falls into the water.

The critical selection factors are that the wader be appropriate both seasonally and regionally, and be comfortable for the user. Some project work may necessitate that two sets of waders be acquired - e.g., rubber and either neoprene or breathable, for use depending on temperature of water and climate changes. The use of appropriate waders cannot be stressed too much – the weather, water conditions and task should drive this selection, NOT just what is currently available in the supply cabinet.

- **Wader Belts**

Most waders are belted to provide an extra barrier if a fall in the water should occur. Always use the provided belt to reduce the risk of taking on water which will add extra weight, and in rapid water can increase the risk of drowning. If work is being conducted in water where a drowning hazard is present, a Type III or V PFD is required, as described in Table 6.1.

- **Wader Soles Footing**

Another consideration when choosing waders is whether to purchase ones designed with felt soles or not. Felt soles aid in the prevention of slipping or falling when working on slippery surfaces such as rocks. However, felt soles are not good in very cold water, as they become frozen and hard – rubber soles provide better traction. Discuss site conditions with PM during project safety guide development to determine which soles are necessary. Some felt soled waders are studded, which provide additional traction when working in very slippery stream conditions (round rock, algae, fast flow, etc.) or winter work when ice is present.

Tip - Typically, rubber waders designed with a formed foot are not felt soled.

#### **5.1.4 Safety Blocks**

At navigation locks, docks, wharves or other shoreline installations where the movement of docked vessels presents a hazard to overboard employees, safety blocks should be available. These are quickly thrown into the water to protect employees who have fallen into the water from being crushed by the wave movement of docked vessels. If the use of blocks is found unacceptable, alternative safety measures (positive fall protection, barriers) shall be developed.

#### **5.1.5 Additional Personal Protective Equipment**

Hard Hats must be worn in specified areas, including plant sites and all boats equipped with boom and masts that are in use for towing equipment, and any other areas specified by the supervisor or designated Crew Chief.

Safety Glasses or Goggles must be worn if exposure exists from formalin or other chemicals used in the field/on board vessels.

### **5.2 Boat Equipment**

Many items of equipment are required for safe boat operation. Some are needed to meet legal requirements, others for safety in basic operations, or for the general comfort and health of the crew. HDR considers compasses, depth finders, radar, GPS, charts, cellular phones and basic boating equipment as safety equipment. Without such items, accidents could easily occur.



- When mounting radar equipment, note that a “safety distance” of ~3 feet must be maintained when the apparatus is in operation.

These basic items of required equipment, and the quantities required of each depend upon the size class of the vessel, the type of boating activities, the particular water body and other factors (e.g., the amount of electrical power available on board, work operations, and required professional gear).

### **5.3 Safety Rescue Skiffs**

Where HDR employees work over or immediately adjacent to water that presents a drowning hazard (i.e. inspections or work on bridges, piers, bulkheads, etc.), regardless of the fall protection employed, at least one skiff shall be immediately available for use in rescue. In quiet, indoor or protected locations like wastewater pools, an inflatable flat-bottomed boat may be substituted for a skiff, as long as it is equipped for rescue, and sufficiently stable so that rescue may be performed without fear of capsizing.

Personnel trained in launching and operating the skiff shall be readily available at all times while project exposure to the water hazard exists.

Skiffs shall be kept afloat or ready for instant launching.

Required equipment must be on board and meet or exceed U.S. Coast Guard requirements. Skiffs shall be equipped as follows:

- 4 oars (2 if the skiff is motor powered);
- oarlocks attached to gunwales or the oars;
- 1 ball-pointed boat hook;
- 1 ring buoy with 90 feet of 3/8-inch solid braid polypropylene or equivalent line attached, and
- PFD's in number equaling the skiff rating for the maximum number of personnel allowed on board.

In locations where waters are rough, swift, or where manually operated boats are not practical, a powerboat suitable for the waters shall be provided and equipped for lifesaving.

Skiffs and powerboats shall have flotation tanks or buoyant material capable of floating the boat and its equipment and the crew.

All boats will use navigation and running lights during night operations on bodies of water where other watercraft may be encountered.

On skiffs without permanently mounted navigation lights, portable battery-operated navigation lights will be available and used for night operations.

### **5.4 Cofferdams**

Work within cofferdams may present a severe water hazard, since a sudden rupture can result in the employees becoming instantly inundated. When engaged in project activities using cofferdams within waterways, the following requirements apply:

- If overtopping of the cofferdams by high water is possible, provisions for controlled flooding of the work area must be designed into the system.
- If personnel or equipment are required or permitted on cofferdams, standard railings or equivalent protection shall be provided.





- At least two means of rapid exit shall be provided for personnel and equipment working on cofferdam walkways, bridges or ramps.
- A plan (including warning signals) for evacuation of personnel and equipment in case of emergency and for controlled flooding shall be developed and posted in the immediate project area.
- Cofferdams located close to navigable shipping channels shall be protected from vessels in transit.

## 5.5 Work Near Dams

Dams, which impound water flow, are typically of two types and present different hazards to boating operations. These two types are discussed below.

- A highhead dam, which is a large structure, generally higher than ten feet and frequently much higher, designed to impound large reservoirs usually for the purpose of power generation and/or flood control. Large dams are usually marked well ahead of the approach to the structure. These dams may have a lock channel to allow for passage of vessels from one pool elevation to the other during navigation (either higher  lower or lower  higher elevations). Boat operations in the vicinity of dams should be limited to the approaches of the navigational channel. Boat operators, especially for small boats, should be aware and exercise caution in the area of locks due to turbulence, especially at the lower elevation, associated with lock operations.

When working below dams, boat operators should be aware of the potential for rapidly rising or receding water levels associated with adjusting impoundment levels, electric generation or dam bypass activities. Recreational fishing is also frequently present in the area below dams.

- The low-head dam is a man-made structure, typically constructed to back up water for a particular purpose. This structure pools water behind it as water flows over the crest to a lower elevation below the structure. Typically low-head dam structures span the entire width of a waterway and have a drop of less than ten feet. This drop in the water creates a “hydraulic” which is a backwash immediately below the structure that traps and recirculates anything that floats or is neutrally buoyant.

The dangers associated with a low-head dam structure are very real and extreme. Often the approach from the upstream direction can be misleading to the boat operator as the water surface can appear smooth and even across the entire water body. A boat operating below the low-head dam that approaches too closely can be drawn into the turbulent water (hydraulic zone) where, due to the tumbling action, it could be trapped at the face of the dam or swamped. A boat operating above the low-head dam may be drawn over the dam by the force of the current flow and subjected to the same dangers associated with the hydraulic condition at the downstream face of the dam.

The following actions will help ensure the safety of boats and crew when working in the vicinity of dams:

- Know the water body in which the work is to be conducted; refer to navigational charts and other sources for the locations of any dams, etc.
- Avoid working in close proximity above or below any dam.



- If a hydraulic line has been established by the entity responsible for the low-head dam, crews will not enter this area to perform any work unless safety protocols, specific to the particular structure, have been established.
- If it is essential to work above any dam the boat must be equipped with a second source of power (engine) and both the primary and secondary engines will both be running in the event of an emergency.
- The boat will always carry an anchor of adequate size for the craft, with a chain rode and sufficient line (equal to three to five times the water depth) ready to deploy, with the other end of the line attached to the boat, in the event of an emergency.
- Cutting implements should be readily available on the boat to clear any line that might become fouled on the boat or engine.
- Never approach the face of a low-head dam from downstream.
- Never attempt a rescue from the face of a low-head dam without a safety line securely attached to a second boat facing downstream to pull the rescue boat out of the hydraulic zone.

## **5.6 Floating Barges**

Whenever HDR personnel must work on, or travel on floating barges, the following requirements apply:

### **5.6.1 Access**

- Ramps for access of vehicles to or between barges shall be of adequate strength, provided with sideboards, well maintained and properly secured.
- Unless employees can step safely to or from the wharf, float, barge or river towboat, either a ramp, or a safe walkway shall be provided.
- Jacob's ladders shall be of the double rung or flat tread type. Prior to using, grab the rope lines and tug. They must be securely fastened at the top. Look at each of the rungs. They should be well maintained, with no visible cracks or defects.
- A Jacob's ladder must either hang without slack from its lashings or be pulled up entirely.
- When the upper end of the means of access rests on or is flush with the top of the bulwark, substantial steps, properly secured and equipped with at least one substantial hand rail approximately 33 inches in height, shall be provided between the top of the bulwark and the deck.
- Obstructions shall not be laid on or across the gangway.
- The means of access shall be adequately illuminated for its full length.
- The means of access shall not pass over employees' heads, if possible.

### **5.6.2 Working Surfaces of Barges**

- Employees shall not be permitted to walk along the sides of barges with coamings more than five feet high, unless there is a three-foot clear walkway, or a grab rail, or a taut hand line is provided.



- The deck and other working surfaces shall be maintained in a safe condition.
- HDR employees should not walk fore and aft, over, or around deckloads, unless there is a clear aisleway. Never climb over deckloads.
- If it is necessary to stand at the outboard or inboard edge of the deckload where less than 24 vertical inches of bulwark, rail, coaming, or other protection exists, all HDR employees must be provided with a suitable means of protection against falling from the deckload.

### **5.6.3 First Aid and Lifesaving Equipment**

- A first aid kit shall be available on the barge.
- OSHA requires that in the vicinity of each barge in use, there be at least one U.S. Coast Guard-approved 30-inch ring buoy with not less than 90 feet of line attached, and at least one portable or permanent ladder which will reach the top of the apron to the surface of the water. If the above equipment is not available at the pier, the HDR employee should request the barge owner/renter/operator furnish it during the time the HDR employee is working on the barge.

HDR employees walking or working on the unguarded decks of barges shall be protected with U.S. Coast Guard-approved Type III or V PFDs.

## **5.7 Trawling Activities**

For any survey that requires the towing of sampling equipment off the stern of a boat that is greater than 20 ft. in length and on bodies of water where other traffic may be encountered, HDR follows the Procedures outlined in the United States Code – Title 33 Navigation and Navigable Waters – Chapter 34 Inland Navigational Rules – Subchapter I Rules – Part C Lights and Shapes – Section 2026 Fishing Vessels (Rule 26). The following guidelines for trawling activities are outlined in this rule and must be followed:

- A vessel (greater than 20 ft. yet less than 150 feet), when engaged in trawling (i.e., the dragging through the water of a dredge, net, or other apparatus used as a fishing appliance), shall exhibit:
  - Two all-around lights in a vertical line, the upper being green and the lower white to indicate that gear is in tow at night, or a shape consisting of two cones with their apexes together in a vertical line one above the other to indicate that gear is in tow during daylight hours.

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## **6.0 LARGE CRAFT SAFETY PROCEDURES**

This section presents information applicable to the operation of large open water craft (e.g., powered boats designed for use in large open lakes/estuaries/rivers or coastal salt water operations), used primarily in the HDR New York and Alaska departments. Job titles used herein have been adopted by these organizations.

### **6.1 Boat Inspection Checklists**

There are three ways in which the condition of each HDR boat is inspected for safety:



- The Facility Safety Officer or their designee will visually inspect the boat on a quarterly basis and review the boat's maintenance records and incident sheets.
  - The Facility Safety Officer will review the Crew Chief Reports before making the quarterly visual inspection. Each boat will be inspected, keeping in mind any safety incidents that have occurred during the period, and checked to see that all deficiencies have been corrected.
- The Warehouse Coordinator (or someone assigned the responsibilities of boat maintenance) will check it once a month.
- Each time a boat is taken out the Crew Chief will visually inspect its condition. The Crew Chief will notify the Warehouse Coordinator or Field Supervisor of any problems and will make sure the boat is in good operating condition before the survey is initiated. The Crew Chief will record the results of this inspection, along with any mishaps or malfunctions that occur during a field activity, on a Crew Chief Report Form and submit a copy to the Warehouse Coordinator.
- At the beginning of each survey, the Crew Chief will visually inspect the boat for the condition and/or presence of the following:
  - Sufficient fuel
  - Oil
  - Transmission fluid
  - Engine coolant
  - Fire extinguishers
  - Marine Radio
  - Tool kit
  - Properly functioning navigational lights
  - Sheath knife
  - Oars/paddles (outboards)
  - Boat hook
  - Properly functioning depth finder
  - First aid kit and blanket
  - Distress equipment (flares and flags)
  - Mast and boom rigging (if applicable)
  - General condition (cleanliness, orderliness, etc.)
  - Life raft (if applicable)
  - PFDs



## 6.2 Marine Radio

Marine radios transmit along VHF/FM frequencies and are much more reliable than Citizen's Band (CB) radios. In addition to this more advanced technology, Marine Radios have designated channels that are monitored 24/7. Channel 16 is the international channel for all distress calls.

What to Tell the Coast Guard:

How to call for Help:

- Makes sure you radio is transmitting on Channel 16
- If you are in distress:
  - Call "MAYDAY, MAYDAY, MAYDAY"
- If you are not in distress:
  - Call "Coast Guard"

What to Tell the Coast Guard:

- Your location or position
- Exact nature of the problem or emergency
- Number of people on board
- Your boat's name, registration, and description
- Safety equipment on board

When to Call Back

- A medical emergency develops
- A storm approaches
- Your boat begins to take on water
- Your last reported position changes



The following are some useful Channels to know, the most important of which is: CHANNEL 16 VHF/FM 2182 khz HF/SSB for international distress, safety and calling.

Channel Number	Ship Transmit MHz	Ship Receive MHz	Use
6	156.300	156.300	Intership Safety
07A	156.350	156.350	Commercial
9	156.450	156.450	Boater Calling. Commercial and Non-Commercial.
10	156.500	156.500	Commercial
13	156.650	156.650	Intership Navigation Safety (Bridge-to-bridge). Ships >20m length maintain a listening watch on this channel in US waters.
16	156.800	156.800	International Distress, Safety and Calling. Ships required to carry radio, USCG, and most coast stations maintain a listening watch on this channel.
21A	157.050	157.050	U.S. Coast Guard only
22A	157.100	157.100	Coast Guard Liaison and Maritime Safety Information Broadcasts. Broadcasts announced on channel 16.

### 6.3 Winter Operations

Decisions to cancel a field operation due to severe weather conditions will be based on information provided to the Field Supervisor by the Crew Chief. Crews must be prepared to work in cold temperatures, and should have the following cold weather gear available:

- Insulated under clothing (multiple layers are recommended)
- Survival coat or suit
- Hooded jacket
- Insulated socks and gloves
- Insulated boots, waders, hip boots

Frostbite and hypothermia are the two most serious safety problems during the cold weather. (Refer to HDR SH&E Procedure 29 "Cold Stress.")

Workloads for crews using boats with outboard engines and little protection from the weather should be designed with weather conditions in mind. The crew on boats will not be expected to complete the same amount of work performed under ideal conditions. The Crew Chief will have to assess the weather conditions (wind, precipitation, temperature etc.) before initiating a field survey.

The Crew Chief/Captain will make the final decision as to whether a survey (i.e., trawls, seines, larval tows, water quality, etc.) is canceled due to weather.



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## 7.0 PROVISION FOR SANITATION FACILITIES ON WATERCRAFT

OSHA health and safety regulations regarding Sanitation can be found at OSHA 29 CFR 1910.141. These regulations extend coverage to situations involving boating on navigable water and, as such, require that all employees engaged in work activities on watercraft be provided acceptable sanitation facilities (i.e., toilets and hand washing facilities), or immediately available transportation to readily accessible sanitation facilities. These facilities must be maintained in a clean, sanitary, and serviceable condition and provide privacy.

To ensure that proper sanitation facilities will be provided, the project manager and/or his/her designee is to confirm availability of the facilities on the vessel or the immediately available transportation to facilities prior to departure from shore/docking.

In addition, unless stated by contract and under proper training and use of personal protective equipment, it is not the responsibility of HDR employees to maintain the facilities, nor handle community sanitary waste.

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## 8.0 EMERGENCY PROCEDURES

### 8.1 Person Overboard

Falls overboard account for a large percentage of annual boating injuries and deaths. In most of the cases documented, had the person falling overboard been wearing a life jacket, he/she would have survived.

The following Procedures will be followed for “person overboard” rescues:

- When a person falls overboard, the boat operator should take the boat out of gear (e.g., transmission placed in neutral) and look for the person.
- After determining location of the person, approach the area against the current so the boat will not drift over the person in the water. Stop the boat when the person is within reach of a boat hook or life ring. He/she should be brought immediately into the boat.
- If the person in the water is injured or unconscious, the victim should be lifted into the boat with great care.
- No one will deliberately enter the water during person overboard rescues. If the victim is unconscious or injured, and cannot be otherwise retrieved into the boat, the Crew Chief or a volunteer from the crew may go overboard with a safety line tied to the boat in order to retrieve the victim.
- First aid should be ready for the victim as he/she may be suffering from shock, exposure or suffocation. Emergency medical aid may be obtained by placing a MAYDAY distress call on the marine radio or, if available, by calling 911 on a cellular phone.

### 8.2 Missing Person Overboard

When it is noticed that a crew member is missing, it must be assumed that he or she has fallen overboard. The following Procedures must be followed:

- The boat crew will determine when and where the missing crew member was last seen, and, with the aid of compass and charts, retrace their course to that point.



- While the initial search is being conducted, a radio call will be placed to the U.S. Coast Guard to "stand by" and then to the field supervisor to advise of the situation. If after 5 min of searching the missing person has not been found, the Coast Guard must be contacted for search and rescue aid.
- Until a formal Rescue Director from the Coast Guard or local rescue facility arrives, the Crew Chief will retain command of all rescue operations.

A person remaining in water colder than 70°F (21°C) for any length of time will be suffering from exposure and the Crew Chief should be prepared to rescue an unconscious or immobile person. Immediate emergency medical aid must be ready in case the person in the water is in an advanced stage of hypothermia.

### **8.3 Fire Aboard**

There is little that can be done to put out a boat fire unless it is detected in its very early stages. Fire extinguishers are on board all boats. Dry-powder A/B/C type extinguishers should be turned over and shaken frequently, as boat vibration tends to cake the powder. If possible, the fire department or other emergency services should be notified of any fire. If fire spreads to the vicinity of a fuel tank, the crew must abandon ship rapidly.

The person discovering the fire will yell, "FIRE ABOARD" and describe its location and intensity. The following Procedures will be implemented in the event of a boat fire:

- To control fire:
  - Cut off air supply to fire - close hatches, ports, doors, ventilators, etc.
  - Immediately spray portable fire extinguishers at the base of the flames for combustible materials, flammable liquids or electrical fires OR apply water for fires in ordinary combustible materials.
- If fire is in machinery space, shut off fuel supply and ventilation.
  - Maneuver vessel to minimize effect of wind on fire.
  - If the fire cannot be rapidly extinguished, the Crew Chief should:
    - Direct the crew to prepare to abandon ship;
    - Send a MAYDAY distress call on the marine radio;
    - On gasoline-powered outboards and inboards, the abandon ship call will be made whenever open flames are apparent;
    - On diesel-powered inboards, the crew will abandon ship, following the direction of the Crew Chief, as soon as it becomes apparent the fire cannot be contained, or reaches the vicinity of fuel lines or tanks.
- In all cases where a boat is abandoned due to fire aboard, it is the Crew Chief's responsibility to see that all crew members are off the boat before he/she leaves (see also the section on Abandon Ship below).





## 8.4 Abandon Ship

The situations that could lead to abandoning ship include collision with another vessel or fixed object, running aground, being holed by ice or floating debris, capsizing or swamping in high winds or seas, and fire aboard. Abandon ship is the most serious of all emergencies on the water.

The Procedures used in abandon ship situations vary with the condition and location of the boat and with the weather. For example, do not attempt to stay aboard a gasoline-powered outboard on fire; however, an outboard swamped by high seas will probably float if it is wood or has built-in flotation. In the latter situation, do not abandon ship.

Once the decision to abandon ship is made by the Crew Chief, his instructions must be carefully followed.

In case of collision with another vessel, fixed object, ice, or floating debris in deep water, the Crew Chief will:

- Ascertain if any of the crew has been injured.
  - If one or more crew members have been injured, direct the remaining crew members to administer first aid and ensure the victims' life jackets are secured properly.
- Determine the extent of damage to the vessel.
  - Examine hull for holes and/or leaks and, if water is entering the hull, turn on the bilge pump.
  - If water is entering the hull, estimate the length of time the boat can stay afloat and whether emergency repairs can be made.

If water is entering the hull at a slow rate and the boat is operable:

- Head for the nearest docking area after the injured have been secured.
- While heading for the docking area, instruct crew members to launch the life raft if the boat appears to be sinking before it reaches a docking area.
- Detail a crew member to act as lookout and use flares or other distress signals as required, to signal any passing vessel to act as escort.
- Place a MAYDAY distress call and inform the Coast Guard of the situation and the intended course of action.
- If the boat appears to be sinking and land is near, consider GENTLY running the boat aground to prevent sinking.

If the boat is filling rapidly:

- Initiate abandon ship Procedures immediately.
- Direct two crew members to release and launch the life raft.
- Place a MAYDAY distress call on the marine radio.
- Give the order to abandon ship, being certain that injured crew members are placed in the life raft first, and that all crew are in the life raft before leaving boat.
- Once in the life raft, direct one crew member to act as lookout and use flares or other distress signals to signal any passing vessel for aid.



- Administer or have first aid administered to any injured crew members and pick up survivors in the water.

## **8.5 Running Aground**

The Crew Chief will:

- Ascertain whether any of the crew has been injured and, if so, have first aid administered.
- Examine the boat for damage or influx of water.
- If the boat is not taking on water and does not have any holes that would be submerged when the boat is re-floated, attempt to unground.
  - If the boat is aground by the bow (facing forward) and the nearest deep water is astern, cast a light anchor as far astern as possible.
  - While the stern anchor rope is being pulled with a winch, attempt to back the boat into deep water. A close watch will be kept on the engine temperature as the cooling water intake may be blocked. Moving all equipment and crew weight to the stern may aid in ungrounding.
  - If the boat does not unground, determine whether the tide is rising or falling (in tidal areas). If the tide is rising, leave an anchor astern to prevent the boat from being driven further aground, and inform the laboratory of the situation by marine radio or cellular phone.
  - If the boat runs aground at high tide, the assistance of another vessel will probably be required to re-float it.
- If the boat is taking on water, no attempt to unground should be made unless the hole or leaks have been blocked.
  - Cast a light anchor as far off the bow as possible to prevent the boat from being ungrounded by wind, wave or tidal action.
  - If the boat will rest on the bottom with the superstructure above water after sinking, direct the crew to prepare to abandon ship, but do not execute this operation unless waves are sweeping the boat or the boat capsizes.
  - Direct two crew members to release, inflate, and launch the life raft. Direct the remaining crew members to assist in the launch if needed.
  - Make a MAYDAY distress call on the marine radio, and proceed as directed by Coast Guard authorities. However, decide whether or not to abandon ship, as conditions require. When the decision to abandon ship is made, notify the Coast Guard.
  - It is likely that, having abandoned ship, the boat crew in the life raft will quickly be washed or blown ashore. They should be prepared for a rough landing. Alternatively, consider remaining moored to the boat until help arrives.

## **8.6 Swamping or Capsizing**

If the engine or steering fails in high seas, the boat is in danger of swamping or capsizing. In such cases, the Crew Chief will:

- Immediately deploy an anchor.



- Ensure that all crew's life jackets are secured properly.
- Detail two crew members to be ready to launch the life raft when directed.
- Place a call to the U.S. Coast Guard on the marine radio. If the situation deteriorates, a MAYDAY call will be made.
- If the boat starts to take on more water than can be cleared with the bilge pumps, the life raft should be launched and a MAYDAY distress call made.
- Order, "abandon ship" when it becomes obvious the boat will sink shortly. Prior to leaving the boat, make a MAYDAY distress call.

## **8.7 Operational Breakdowns**

There are two important operational breakdowns that have been experienced by HDR field crews:

- Fouling of a boat's propeller with ropes or nets,
- Snagging of gear on obstructions on the bottom of a river or lake.

Any attempt to correct the situation must be supervised by the Crew Chief and his/her instructions must be followed. Consideration will be given to the season, location, current, and turbidity of water.

## **8.8 Storms**

Boating storm response is dependent on the gear and vessel type and size that will be utilized, the water environment and other locale factors. Updated weather forecasts must also be utilized in order to properly assess the incoming weather and related hazards, and to plan appropriate actions. The following inclement weather Procedures should be implemented as applicable:

### **8.8.1 Electric Storm**

If caught "unaware" in an electrical storm, the following precautions must be taken:

- Individuals should remain inside a closed boat as much as practicable during an electrical storm;
- Persons should avoid making contact with any items connected to a lightning protective conductor, especially in such a way as to bridge between two parts of the grounding system. For example, it is undesirable to touch either the reverse lever or spotlight control, particularly in contact with both at the same time;
- In an open boat, immediately motor to the nearest shore, secure boat and get out of it. Move away from the water. Seek safe shelter;
- No one should be in the water during a lightning storm.

### **8.8.2 Tornadoes**

In the event of tornado warnings, all boats should attempt to return to shore as soon as possible. Once on shore, if possible get inside a building. If shelter is not available or there is no time to get indoors, lie in a ditch or low-lying area or crouch near a strong building.



## **8.9 Injuries and Medical Emergencies**

By its very nature, there is a possibility of injuries or medical emergencies in field work. A small work boat cannot carry the amount of medical equipment or trained personnel needed to deal with the range of medical emergencies that may be encountered.

A well-prepared first aid kit, a marine radio, crew members with basic first aid training, and pre-arrangements with local ambulance services are provided. (An optional cellular phone could be used to contact local emergency personnel.)

Most medical emergencies will be self-evident, but some have mild symptoms. The Crew Chief or first aid provider should be on the lookout for the following:

- Shock
- Chemicals in eyes
- Advanced stages of hypothermia
- Frostbite
- Early stages of heart attack
- Heat exhaustion
- Back injuries

The Crew Chief will have personnel with the above injuries taken to a hospital immediately. An ambulance can be obtained by making a marine radio call through the local marine operator or calling 911 on a cellular telephone.

If a marine operator cannot be reached, a medical safety call should be made. The Coast Guard should be informed of the situation and asked if they can arrange to have an ambulance sent to the location where the boat will be docking.

If the boat cannot reach shore for medical aid, a MAYDAY distress call should be made on the marine radio.

The following must be adhered to:

- Every boat shall be equipped with a moisture-tight, portable first aid kit.
- Crew members must report to their Crew Chief all injuries and any first aid treatment received.

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## **9.0 CRAFT-SPECIFIC PROCEDURES**

The following subsections address operational hazards associated with specific NY Dept. watercraft.

### **9.1 Heather M II Hydraulic Systems Standard Operating Procedures**

#### **9.1.1 Introduction**

- The Heather M II is a 42' fiberglass Bruno & Stillman lobster style boat. She is rigged as an inshore trawler with a mast, steel A-frame and gantry. A hydraulic system comprised of two deck mounted winches located aft of the main mast on the forward portion of the work deck and a dual head capstan located at the base of the main mast immediately forward of the



winches provide mechanical lifting, etc. capabilities for the deployment and retrieval of various types of sampling gear.

- The winches and capstan are driven by a hydraulic pump coupled to the forward end of the vessels engine, a Detroit Diesel 671, via a power take off (PTO). A steel hydraulic fluid reservoir, holding approximately 20 gallons of hydraulic oil, is located just forward of the engine hatch, immediately aft of the dashboard. A spool valve, located below the helm, controls the flow of hydraulic fluid to the winches and capstan. The hydraulic systems are controlled and operated, after the PTO clutch is engaged, via several valves and levers which will be described under each section below.
- The following descriptions provide general operational guidelines for the hydraulic systems on the Heather M II.
- NOTE: DO NOT OPERATE THE VESSEL HYDRAULICS without first reading this document and receiving a “hands-on” demonstration and training on the equipment, controls and proper use by one of the senior Crew Chiefs.

### **9.1.2 Power Take Off (PTO):**

The PTO, engaged via a lever located below-deck (down stairs and mid-ship) at the forward end of the engine (on the port side) activates the hydraulic systems of the boat, i.e. the port & starboard winches and capstan. The PTO lever is pulled “up” to engage the system, and pushed “down” to disengage the system. The lever is coupled to an aluminum arm which extends upward to the main deck. This arm allows the PTO clutch to be engaged and disengaged from the cabin without having to go below deck. The PTO clutch must only be engaged or disengaged when engine is at idle. Failure to wait for the engine RPM to drop to idle will cause damage to the PTO clutch and/or engine. The PTO should only be engaged when using the winches or capstan, i.e. deploying or retrieving gear and should be disengaged (in the down position) when transiting between stations or running to and from port. Failure to follow this protocol can result in excessive wear and damage to the PTO and engine.

### **9.1.3 Winches**

The two winches are located on the forward portion of the work deck, aft of the main mast, with one to the port and one to the starboard side of mid-ships. Each winch drum is ~12” in diameter and ~7” wide and is loaded with approximately 600’ of ¼” diameter 7x19 wire rope (cable or tow cable). Each winch has its own hydraulic valve; located below control lever on the forward side of winch, control lever; located above hydraulic valve on the forward side of winch and a brake handle. The two winches can be operated independently of each other or simultaneously.

#### **Deployment Of Gear Requiring PTO Control:**

- This includes IP sleds, clam dredges and other gear of insufficient weight to pull cable from the winches during free-spool deployment.
- All rigging associated with the operation of the winches, i.e. cable, blocks, booms, etc. should be inspected prior to use.
- Gear to be deployed is set-up and ready for deployment.
- Check to make sure brakes are set on both winches.
- Check ALL winch and capstan control levers for “neutral” status before engaging PTO.
- Activation of the vessels hydraulic systems is done only after the captain signifies to do so.



- PTO must then be pulled up (on) to engage the hydraulic pump and activate the hydraulic system. Note: The crew member operating the winches should not leave the winch control station while the winch is “active.”
- The appropriate winch control valve is opened;
- Winch control valve should be in the “on”/“off” position as follows:
  - Port winch valve handle horizontal to deck – winch operational
  - Port winch valve handle vertical to deck – winch off with drum in free spool
  - Starboard winch handle vertical to deck – winch operational
  - Starboard winch valve handle horizontal to deck – winch off with drum in free spool
- The brake is then released by pulling the handle toward the operator (forward). Note: the brake should be released before activating the control lever to avoid stalling the vessel’s engine.
- Gear is deployed from the vessel; the winch control lever is pushed away from operator (toward the stern of the vessel) to power cable out from the drum. Speed of winch drum (deployment) is controlled by how far the control lever is pushed away from the neutral position.
- After the requisite amount of wire rope has been deployed for the specific gear type, the control lever is returned to the neutral position and the brake is applied until it locks in place.
- The PTO is then disengaged (pushed back down to the off position) for the duration of the gear deployment.

**Deployment of Gear Not Requiring PTO Control:**

- This includes Bottom Trawls, Smith-McIntyre Dredge grabs, Tucker Trawls and other gear types heavy enough to pull cable from winch drums during free spool.
- Gear to be deployed is set-up and ready for deployment.
- Check to make sure brakes are set on both winches.
- Check ALL winch and capstan control handles (levers) for “neutral” status before engaging PTO.
- Activation of the vessels hydraulic systems is done only after the captain signifies to do so. Note: The crew member operating the winch should not leave the winch control station while the winch is “active.”
- The brake is then released by pulling the handle toward the operator (forward).
- Gear is deployed, and the control lever is pushed away from operator (toward the stern of the vessel) to release cable from the drum. Note: because the PTO is not engaged, speed of cable deployment is controlled by the forward speed of the vessel and use of the brake.
- After the requisite amount of cable has been deployed, the control lever is returned to the neutral position, and the brake is applied until it locks in place.

**Winch Retrieval:**

- All gear types.



- Before engaging the PTO, check all control levers for neutral position, and make sure brake is applied on both winches.
- After the vessel has returned to idle speed, and the captain gives the OK, the PTO lever is engaged (pulled up) to activate the PTO. ).Note: The crew member operating the winch should not leave the winch control station while the winch is “active.”
- The appropriate winch control valve is opened.
- Winch control valve should be in the “on”/”off” position as follows:
  - Port winch valve handle horizontal to deck – winch operational
  - Port winch valve handle vertical to deck – winch off with drum in free spool
  - Starboard winch handle vertical to deck – winch operational
  - Starboard winch valve handle horizontal to deck – winch off with drum in free spool
- The brake is released slowly, and then the control lever is moved toward the operator (forward) to start recovery of the cable onto the winch drum (retrieval). Speed of recovery is controlled by the extent to which the control lever is pulled back or pushed forward.
- Note: It may become necessary, should wire rope begin to load unevenly onto the winch drum, to have a crew member deflect the cable to the opposite side of the drum. This is to be done ONLY by pushing/pulling against the cable (away from where cable loads onto the drum) with open hands while wearing leather/rubber coated gloves. Crew members’ hands should never be closed around the cable, nor should the cable be allowed to run across a stationary hand during deployment or retrieval of cable from a winch. If vessel traffic or space permits, the manner in which the cable loads onto the drum can be varied by having the captain turn the boat to port and/or starboard to keep the cable from overloading on one side of the drum.
- Once the gear nears the vessel, retrieval speed is slowed to ensure a safe, controlled retrieval of the gear onto the vessel.
- Once gear is secured on deck, the control lever is moved to the neutral position, the brake applied and the PTO is returned to the off position.

#### **CAPSTAN:**

- The capstan provides a superior mechanical advantage over the winches and is used to lift or manipulate heavy objects from the water or on the deck, i.e. recovery of a trawl net with a heavy catch at the stern of the vessel. It is used in conjunction with tackle, either trawl blocks or block and tackle, located on the A-frame or one of the boat’s two booms. The capstan and associated rigging should be inspected on a regular basis.
- The capstan is located on the aft of the main mast (actually attached to the mast) and immediately forward of the winches. Two “cat-head” drums, ~6” in diameter and ~6” wide, mounted horizontally on each side of the mechanism, rotate when activated by the control lever. The drums rotate clockwise or counterclockwise depending on the position of the control lever which is located on the starboard side of the mast above the capstan. The drums of the capstan can be used simultaneously or independent of each other.
- Note: The capacity of the capstan on the Heather M II is 2000 lbs.; however,



- Captains, Crew Chiefs and crew should always be aware that the entire system, including all lines, rigging, blocks, booms, A-frame and other hardware, must be considered before commencing with a lifting operation.

#### **Capstan Operation:**

- All rigging associated with the operation of the capstan, i.e. booms, blocks, lines, etc. should be inspected prior to use. Note: only fibrous rope should be used on the capstan drums.
- The working line should be attached to the load, run through a block and led to the capstan drum before the PTO is engaged. Note: the working line should be of sufficient strength to handle the load to be lifted.
- Check ALL control levers for winches and capstan for “neutral” status before engaging PTO.
- After the engine RPM has returned to idle speed, and the captain gives the OK, the PTO lever is engaged (pulled up) to activate the PTO. Note: The crew member operating the capstan should not leave the control station while the capstan is “active.”
- The capstan is activated by moving the control lever up or down to start the cat-head drum rotating. The speed of drum rotation is controlled by how far the control lever is moved from neutral; however, the capstan is designed for power and the drum does not rotate at a fast rate.
- The working line should be wrapped around the drum a minimum of three times, in the direction of drum rotation, starting from the inside portion of the drum and wrapping outward before tension is applied to the line. This allows excess line to be removed from the outside portion of the cat-head as it is retrieved.
- When the capstan’s drum rotation is stopped, the line, while still wrapped around the drum, should be secured to the cleat on the mast above the capstan until it is determined how to deal with the load at the working end of the line.
- To relieve a load on the working end of the line the capstan drum rotation can be slowly reversed or the tension on the retrieval line can be slowly eased off from the drum.
- When both drums are being used simultaneously it is possible to “float” the line on one drum (maintain without taking up or letting out line) while taking up line on the other drum. This is accomplished by very slowly reducing the tension on the line coming off the drum to the point where the drum rotates but does not retrieve additional line. This line should be secured when the capstan rotation is stopped.
- When the use of the capstan is no longer required the PTO should be disengaged.

## **9.2 Airboat Specific Protocols**

Unlike other boats, Airboat propulsion systems consist of an engine that powers a 6 foot diameter propeller mounted on the rear of the boat. In many ways, airboats are more similar to aircraft than regular boats with regard to both maintenance and safety considerations.

The following operational guidelines must always be followed:

- Prior to every run, the “Pre-Flight Checklist” must be completed. This check includes fluid checks, visual inspection of the boat and propulsion system as well as pressure checks for various systems.





- All personnel operating the airboat will go through a hands-on training period with another employee who is deemed to be a qualified trainer.
- Always make sure there are no people or obstructions near (within 15 feet) the propeller before starting the airboat. Serious damage, injury or death can result if people or materials come in contact with the propeller when it is spinning.
- The key must be OUT of the ignition unless there is someone in the driver's seat.
- The key must be OUT of the ignition if there is anyone working on or near the stern of the boat (as in an inspection, maintenance, etc.).
- Operators and passengers on airboats must comply with the Hearing Conservation Program protocols set in place, as the airboats exceed the 85dB level for an 8-hour TWA.

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## 10.0 TRAINING AND RECORDS RETENTION

Each HDR employee who is subject to water hazards will be provided awareness level training on the applicable contents of this Procedure and the use of PFDs. Training shall be provided by the SC or other designated employee who, through experience and/or past training, has the necessary water safety knowledge and skills. The training session must include a demonstration of the correct way to don a life vest, and the importance of pre-use inspection. It is the responsibility of the Project Manager to identify affected project personnel, and to verify they have received this training through coordination with their SC. The training will be documented, and record of this training will be maintained in the local office, and a copy forwarded to HDR Corporate Safety for retention.

Crew Chiefs who are responsible for operation of boats will be expected to participate in a Coast Guard or Power Squadron Safe Boating Program.

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## 11.0 FORMS

Water Safety Checklist

## WATER SAFETY CHECKLIST

Project: \_\_\_\_\_ Date: \_\_\_\_\_

Location: \_\_\_\_\_

Completed by: \_\_\_\_\_

### Life Rings or Buoys

- Life rings or ring buoys are readily available.
- Life rings have lights when used after dark.

### Safety Blocks

- Safety blocks are available for employees working on shoreline installations.

### Personal Flotation Devices (PFDs)

- All HDR employees are wearing coast guard approved life vests (PFDs).
- All PFDs have been inspected for defects prior to the start of work.
  - Original float material is present
  - Buoyant material is securely held in position
  - Webbing or straps are not ripped, torn, or separated from an attachment point on the PFD
  - No structural components fail when tugged
  - There are no rips, tears, or holes
  - All seams in fabric or coatings are sealed and securely stitched
  - Hardware, including buckles and straps, are whole, properly formed, and not corroded
  - No signs of water logging, mildew odour, or shrinkage of the buoyant materials
  - No air leaks (for kapok PFDs check by gently squeezing the bag)
- PFDs are drip-dried thoroughly before they are put away and stowed in a well-ventilated place.

### Safety Skiffs

- At least one skiff is immediately available for use in rescue.
- Personnel that are trained in launching and operating the skiff are readily available.

- Skiffs either are kept afloat or ready for instant launching.
- Skiffs are fully equipped:
  - 4 oars (2 if the skiff is motor powered)
  - Oarlocks attached to gunwales or the oars
  - 1 ball-pointed boat hook
  - 1 ring buoy with 27 metres feet of solid braid polypropylene or equivalent line attached
  - PFDs for the maximum number of personnel allowed onboard based on the skiff rating
- Navigation lights are available and used for night operations.

### **Cofferdams**

- If overtopping of the cofferdams by high water is possible, provisions for controlled flooding of the work area have been designed into the system.
- If personnel or equipment are required or permitted on cofferdams, standard railings or equivalent, protection are provided.
- At least two means of rapid exit are provided for personnel and equipment working on cofferdam walkways, bridges, or ramps.
- A plan (including warning signals) for evacuation of personnel and equipment in case of emergency and for controlled flooding has been developed and posted in the immediate project area.
- Cofferdams located close to navigable shipping channels shall be protected from vessels in transit.

### **Floating Barges**

- Ramps for access of vehicles to or between barges are well maintained and are:
  - Of adequate strength
  - Provided with sideboards
  - Properly secured
- Unless employees can step safely to or from the wharf, float, barge, or river towboat, either a ramp or a safe walkway has been provided.
- Jacob's ladders are of the double rung or flat tread type and:
  - Hang without slack (or is pulled up entirely)
  - Are securely fastened at the top
  - Rungs are well maintained with no visible cracks or defects



## SH&E Procedure #021 – Personal Protective Equipment Table of Contents

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### Revision History

Rev	Description of Change	Issue Date
0	Initial Release	07/14/2003
1	Revisions	01/01/2007
2	Revisions	09/21/2012
3	Revisions	06/14/2013
4	Re-Formatting	11/06/2013
5	Revisions	12/18/2013
6	Re-Formatting	04/29/2014
7	Re-formatting; added close proximity rule (workers within 10 feet of another worker engaged in a task requiring PPE must wear the same level of PPE); streamlined the equipment acquisition section; added project manager responsibilities for completing hazard assessments; replaced glove chart attachments with reference to glove selection resources on the SH&E portal; added section specifying minimum PPE required on construction sites; added inclusion of PPE training in project safety briefings	01/10/2017/



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## 1.0 PURPOSE

This procedure details selection and use requirements for specific types of personal protective equipment (PPE) for eye, face, head, foot, and hand protection.

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## 2.0 APPLICABILITY

This procedure applies to HDR personnel required to wear PPE for assigned tasks. Note that workers within 10 feet of another worker engaged in a task requiring PPE must wear the same level of PPE (close proximity rule).

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## 3.0 PROCEDURE IMPLEMENTATION

This procedure will be administered by the HDR Director of Safety, Health, and Environmental (SH&E), Regional SH&E Managers, supervisors, and project managers (PMs). The Director of SH&E shall periodically review, at least annually, the effectiveness of this procedure, identify any deficiencies, and ensure that they are corrected and this procedure is updated accordingly.

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## 4.0 PROCEDURE

### 4.1 Hazard Assessment

Since the nature of our project tasks is typically non-repetitive and varied, it is not possible to complete a formal, permanent hazard assessment for every task that any employee may perform. When working in an industrial setting, the PM will consult with the client on the hazards associated with the workplace, and ensure employees are aware of and comply with the client requirements for PPE. Documentation of the hazards associated with the project site and any client requirements for PPE must be included in the Site-Specific SH&E Plan, which is completed prior to work on any project.

For other project sites and assignments, supervisors and PMs are responsible for the following:

- Perform a hazard assessment of the workplace/job site to determine if hazards are present, or likely to be present, which necessitate the use of PPE.
- For all hazards identified, select the type of PPE that will protect the employee from the identified hazard(s).
- Upon issuance of the PPE, instruct the employee on the purpose and proper use of the PPE, its limitations, and ensure that the PPE fits each affected employee properly and is used.
- Document the hazard assessment and PPE selection in the project's Site-Specific SH&E Plan. [Note, in accordance with OSHA requirements, this serves as certification of the hazard assessment and includes the PM's name, signature, and date on the plan signature page.]

### 4.2 Equipment Selection

The selection of all PPE is based on the potential hazards. Once the hazards of a worksite have been identified, the project manager will determine the suitability of the PPE presently available and, if necessary, select new or additional equipment necessary to provide adequate protection. Care will be taken to



recognize the possibility of multiple and simultaneous exposure to a variety of hazards. Adequate protection against the highest level of each of the hazards will be provided or recommended for purchase.

All personal protective clothing and equipment will be of safe design and construction for the work to be performed, and shall be maintained in a sanitary and reliable condition. Only those items of protective clothing and equipment that meet NIOSH (National Institute of Occupational Safety and Health) or ANSI (American National Standards Institute) standards will be procured or accepted for use.

- **Head Protection**

- A Class E hard hat meeting ANSI Z89.1-1997 (or later) design requirements shall be worn at all times when in a construction environment and where overhead hazards exist.
- HDR issued hardhats must include the current HDR logo and have a maximum expiration date (useful life) of five years from the month of purchase (includes outer shell and inner suspension apparatus). A small adhesive sticker must be placed inside the hardhat shell to indicate the month and year of purchase.
- Bump caps/skull guards may only be worn for protection against scalp lacerations from contact with sharp objects. They will not be worn as substitutes for hardhats because they do not afford protection from high impact forces or penetration by falling objects.

- **Foot Protection**

- Mid-ankle or higher lace-up safety-toed boots meeting ANSI Z41.1-1999 (or later) or ASTM F2413-2005 (or later) design requirements shall be worn by all workers in a construction environment or on railroad property and in areas where there is a danger of foot injuries due to falling, rolling, or piercing objects or when an employee's feet are exposed to electrical hazards.
- When the top of the foot is exposed to impact from (dropped) heavy materials (foundries, etc.), an add-on device, called a metatarsal guard, may be either built into the boot by the manufacturer, or later added as a slip-on by the wearer. They feature a leather enclosed metal shield, which lays parallel with the foot top, absorbing impact and distributing the blow over a wider area. While offering additional protection to the top of the foot, ANSI does not allow for the use of these add-on metatarsal shields to substitute for protective footwear. In other words, where protective footwear is required, an approved ANSI/ASTM boot is needed, and slipping on metatarsals over non-safety boots or shoes will not meet this requirement. Metatarsals may be added to protective boots at any time.

- **Visibility**

- A minimum Class II reflective safety vest (or Class II rain jacket) with the HDR logo meeting ANSI-ISEA 107-2004 (or later) design requirements shall be worn at all times when in a construction environment and when in the vicinity of moving traffic and/or mobile equipment. (See HDR SH&E Procedure #017, Traffic Safety.)

- **Hearing Protection**

- Hearing protection shall be worn when exposures exceed 85 dBA and employees shall be enrolled in HDR's Hearing Conservation Program as applicable (see SH&E Procedure #026, Noise (Hearing Conservation)).



- **Eye and Face Protection**

- Safety glasses with rigid side shields meeting ANSI Z87.1-1989 (or later) design requirements and marked on the frame front or temple with “Z87” or safety goggles shall be worn at all times when in a construction environment and in any area where eye hazards exist.
- Face shields, in addition to safety glasses, shall be worn when grinding, chipping, jack hammering, and power sawing or when conducting other tasks that involve flying particulate and debris hazards or chemical splash hazards.
- Where the eyes or body of any person may be exposed to injurious corrosive materials, it should be confirmed prior to initiation of project activities that suitable facilities for quick drenching or flushing of the eyes and body are available within the work area for immediate emergency use. (Corrosive materials are typically labeled as such, and the corresponding SDS will state “corrosive” on it). See SH&E Procedure #030, *First Aid, CPR, AED Program*, for specific requirements.

- **Hand Protection**

- It is HDR policy that anyone using X-Acto knives must don a cut-resistant ambidextrous glove on their non-knife wielding hand while cutting. These gloves have been distributed throughout the company in a variety of sizes. It is also recommended that users of knife-arm paper cutters also wear the glove, to prevent severe lacerations or amputations.
- For other hazards such as chemicals, abrasions, burns, biological, and harmful temperature extremes, glove selection shall be based on performance characteristics of the gloves, conditions, duration of use, and hazards present. See the [SH&E portal](#) for glove selection guidance.

- **Drowning Protection**

- A US Coast Guard-approved Type III or Type V personal flotation device (PFD) with the HDR logo must be worn when working over or adjacent to water and be marked for use as a work vest, for commercial use or for use on vessels. (See HDR SH&E Procedure #018, *Water and Boating Safety*.)

- **Skin/Body Protection**

- Long pants and shirts with sleeves (no tank tops) shall be worn for all field work. (See HDR SH&E Procedure #034, *Biological Hazards*.)
- If ordinary weather gear is not sufficient to protect an HDR employee, and special equipment or extraordinary clothing is needed to protect the employee from unusually severe weather conditions, HDR will provide such equipment to the employee at no cost. For example, employees working in extreme cold for extended periods of time, which may include overnight stays in the field, shall be provided with a sleeping bag designed for such conditions at no cost to the employee. Employee reimbursement for ordinary items such as winter coats, jackets, gloves, and parkas will NOT be provided by HDR.
- Selection should be based on functionality and protection specific to the conditions and tasks anticipated. (See HDR SH&E Procedure #029, *Cold Stress*, for additional information on working in extremely cold conditions.)



### **4.3 Equipment Acquisition**

MidContinent Safety is HDR's sole provider for safety apparel with the HDR logo. Items can be selected and ordered from an online catalog accessible from the SH&E portal. Purchases are billed to Corporate for payment and then charged to the ordering department. For other all other safety equipment and supplies, with the exception of safety footwear and prescription safety glasses, MidContinent is our preferred provider and orders should be made through the online catalog accessible from the SH&E portal. HDR does not have a specific provider for safety footwear but discounts are available from various vendors and are posted on the SH&E portal.

In general, HDR departments will bear the cost of providing required PPE for their employees. Exceptions to this requirement include safety-toe footwear, prescription safety eyewear, ordinary clothing, and ordinary weather related clothing. Under certain conditions, HDR will reimburse employees to a maximum amount for safety-toe footwear and prescription safety eyewear (see Sections 4.3.1 and 4.3.2 respectively for more details). The cost of ordinary clothing and ordinary weather related clothing will be borne by the employee. If cold weather gear beyond ordinary clothing is required, the employees department will cover the cost (see Section 4.3.5 for additional details). HDR Departments will also pay for replacement PPE, except when an employee has intentionally lost or damaged the PPE.

If an employee wishes to use his or her own purchased PPE, the project manager shall be informed. Upon confirming the adequacy of the equipment for the assigned task, the project manager will ensure that the equipment is subject to the same procedures and requirements contained herein for maintenance, inspection, and sanitation.

#### **4.3.1 Safety Toe Boot Reimbursement**

Employees who are assigned to the field essentially full time and where foot protection is frequently required shall be reimbursed for the cost of one (1) pair of approved safety boots, per each two-year period, as needed. The employee shall be reimbursed for the cost of the boots, up to a maximum of \$125.00. Supervisor approval is required prior to purchasing the boots as the cost of this reimbursement is borne by the local office safety budget.

Boots purchased for reimbursement must be toe-protective, mid ankle or higher variety, and lace-up and the receipt must indicate the boots meet ANSI Z41.1-1999 (or later) or ASTM F2413-2005 (or later) design requirements.

#### **4.3.2 Prescription Safety Eyewear Reimbursement**

Employees who are exposed to eye hazards for extended periods of time and who need to wear prescription lenses shall be reimbursed for the cost of one pair of prescription safety glasses, with side shields, per each two-year period, as needed. The employee shall be reimbursed for the cost of the glasses, up to a maximum of \$170.00. All safety glasses shall either be equipped with permanently installed side shields, or rigid removable shields. All glasses shall comply with the design requirements specified in ANSI Z87-1989 (or later).

HDR will not reimburse the employee for prescription or non-prescription safety glasses for those employees who need protection for only brief or intermittent periods of time. In these cases, employees can check out safety glasses or safety goggles, to be worn over their personal eyewear.

**Note:** To be eligible for reimbursement, all personal protective equipment shall meet specifications of the American National Standards Institute (ANSI), where these standards exist. All receipts for





purchases of glasses should indicate that the item purchased meets these criteria. In addition, supervisor approval is required prior to purchase, as the cost of this reimbursement is borne by the local office safety budget.

#### **4.4 Minimum PPE Required on Construction Sites**

The following minimum PPE meeting the design specifications listed in Section 4.2 are required when performing construction-related services:

- Hard hat
- Minimum Class II reflective safety vest
- Safety glasses with rigid side shields
- Mid-ankle or higher lace-up safety-toed boots

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### **5.0 CLEANING AND MAINTENANCE**

All PPE must be kept clean and properly maintained. It is the responsibility of the user to regularly clean and maintain their issued PPE, and to clean all loaned PPE before returning it to the equipment stores. Cleaning is particularly important for eye and face protection where dirty or fogged lenses could impair vision. Personal protective equipment shall not be shared between employees until it has been properly cleaned and sanitized. PPE will be distributed for individual use whenever possible.

It is also important to ensure that contaminated PPE which cannot be decontaminated is disposed of in a manner that protects employees from exposure to hazards.

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### **6.0 TRAINING**

HDR employees requiring PPE for the performance of any task will be trained in the proper use, care, maintenance, and limitations of that PPE. This information will also be reviewed in project safety briefings.

Training shall include, but not necessarily be limited to, the following subjects:

- When PPE is necessary to be worn
- What PPE is necessary
- How to properly don, doff, adjust, and wear PPE
- The limitations of the PPE
- The proper care, maintenance, useful life and disposal of the PPE

Written records shall be kept of the names of persons trained, the type of training provided, and the dates when training occurred and submitted to Corporate SH&E for retention.

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### **7.0 CROSS REFERENCES**

#### **PPE for General Industry**



- 1910 Subpart I
- App A - References for further information (Non-mandatory)
- App B - Non-mandatory Compliance Guidelines for Hazard Assessment and Personal Protective Equipment Selection.
- 1910.132 - General requirements.
- 1910.133 - Eye and face protection.
- 1910.135 - Head protection.
- 1910.136 - Occupational foot protection.
- 1910.137 - Electrical protective devices.
- 1910.138 - Hand Protection.
- 1910.151(c) - Emergency eyewash/shower.

### **PPE for Construction**

- 1926 Subpart E
- 1926.95 - Criteria for personal protective equipment.
- 1926.96 - Occupational foot protection.
- 1926.100 - Head protection
- 1926.102 - Eye and face protection.
- 1926.104 - Safety belts, lifelines, and lanyards.
- 1926.106 - Working over or near water.



## SH&E Procedure #026 – Noise (Hearing Conservation) Table of Contents

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### Revision History

Rev	Description of Change	Issue Date
0	Initial Release	09/01/1999
1	Revisions	08/11/2004
2	Revisions	11/03/2008
3	Revisions	07/12/2011
4	Re-Formatting	07/15/2013
5	Added Contracted Aircraft Noise Reduction Program	10/06/2014



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6	Re-Formatting	11/30/2014
7	Re-Formatting	01/04/2016
8	Updated HDR exposure limits table to include comparison to PELs and TLVs; added a section describing noise reduction ratings; added a section describing specific HDR assignments with exposure to noise hazards and procedures for noise monitoring; revised requirements for hearing protection near pile driving to indicate models/brands other than 3M/Peltor™ Tactical Pro Muffs require approval from the Regional SH&E Manager; revised training section to reference training on HDR University; added a more detailed description of recordkeeping procedures.	11/15/2016

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## 1.0 PURPOSE

The purpose of this procedure is to assist HDR employees in recognizing and avoiding noise hazards encountered at project work sites, thereby preventing hearing loss due to workplace noise exposures. It is the goal of this procedure to prevent employees from being subjected to noise exposures in excess of 85 dBA, as a daily, time-weighted average.

The standards for preventing hearing loss set forth in this procedure are based on OSHA 29 CFR 1910.95, 29, OSHA 29 CFR 1926.52, and the Threshold Limit Values (TLVs) established by the American Conference of Governmental Industrial Hygienists (ACGIH).

## 2.0 APPLICABILITY

This procedure applies to all HDR personnel with occupational exposure to noise hazards.

## 3.0 PROGRAM IMPLEMENTATION

This procedure will be administered by the HDR Director of Safety, Health, and Environmental (SH&E), local Safety Coordinators (SCs), and Project Managers (PMs). The Director of SH&E shall periodically review, at least annually, the effectiveness of this procedure, identify any deficiencies, and ensure that they are corrected.

## 4.0 DEFINITIONS

Term	Definition
Action Level	A routine daily exposure to an 8-hour time-weighted average noise level in excess of 85 decibels, when measured with a dosimeter or sound-level meter on the A-scale at slow response. The action level is the criterion for instituting employee participation in the HCP, which includes annual training and audiometric testing.
Audiogram	Charts, graphs, or tables that result from an audiometric test. An audiogram shows an individual's hearing threshold level as a function of frequency (Hz). The HCP consists of a baseline, or initial audiogram, and annual audiograms thereafter. Annual audiograms detect shifts in an individual's threshold of hearing by comparison to their baseline audiogram.
Decibel (dB)	A unit of measurement of sound-pressure level. The decibel level of a sound is related to the logarithm of the ratio of sound pressure to a reference pressure. The dB has meaning only when the reference is known. The internationally accepted reference pressure is 20 micropascals.
Decibels, A-Weighted (dBA)	A sound level reading in decibels made on the A - weighted network of a sound-level meter at slow response. The "A" scale mimics the auditory response of the human ear.
Decibels, Peak (dBp)	A unit used to express peak sound-pressure level of impact noise.
Hertz (Hz)	A unit of measurement of frequency; equal to cycles per second.



Term	Definition
Impact Noise	Variations in noise levels that involve peaks of intensity that occur at intervals greater than one second. If the noise peaks occur at intervals of one second or less, the noise is considered continuous. Common project impact noises occur during drill rig auger hammering, hammer forge operations, sheet pile installation, etc.
Loudness	An individual's perception of the intensity of sound pressure level. Arbitrary and without scientific meaning.
Noise	Unwanted sound. Considered a physical contaminant.
Noise Dose	A measure of cumulative noise exposure over a stated period, which takes into account both the intensity of the sound and the duration of the exposure.
Noise Dosimeter	An electronic instrument that integrates cumulative noise exposure over time and yields a noise dose, expressed as a time-weighted average in decibels.
Noise Hazard Area	Any work area with a continuous noise level of 85 dBA or greater.
Representative Exposure	The measurements of an employee's noise dose, which is representative of the exposure of an employee in a work area or job classification.
Standard Threshold Shift (STS)	An average hearing threshold shift of 10 dB or more at 2000, 3000, and 4000 Hz in either ear. A threshold shift can be temporary or permanent. Temporary threshold shift is a change in hearing threshold, primarily due to exposure to short-term, high-intensity noise that is usually recovered in 14 to 72 hours after exposure ceases. Any loss that remains after an adequate recovery period is termed permanent threshold shift.
Sound-pressure level	The term used to identify the intensity of sound (expressed in decibels), commonly perceived as "loudness."
Sound-Level Meter (SLM)	An electronic, hand-held portable instrument used to measure sound pressure levels, conforming to the requirements for a Type II sound-level meter as specified in ANSI S1.4. Battery powered, SLMs are used for area surveys, and to determine the sound pressure levels generated by specific, point-source machines or processes.
Time-Weighted Average (TWA) Sound Level	The accumulated, average sound level over a defined period, usually 8 hours. Thus, it is normally referred to as an "8 hr TWA." OSHA standards for maximum permissible noise exposures are given in 8 hr TWA decibels. <b>OSHA requires that HDR employees exposed to an average, daily noise level of &gt; 85 dBA (8 hr TWA) wear hearing protection, and participate in our HCP.</b>

## 5.0 NOISE EXPOSURE LIMITS

### 5.1 Characteristics of Sound

Sound is generated by the reception of airborne pressure waves caused by any vibrating source. The ear receives this mechanical energy, and transforms it to electrochemical impulses that are transmitted to the brain, resulting in the perception of sound. When exposed to high pressure levels for long periods of time, the receiving transmitters in the inner ear become deadened, resulting in a permanent reduction of hearing ability. **The intensity of sound pressure levels varies inversely with distance, so moving a short distance away from a source can greatly reduce the dose.**



## 5.2 OSHA Action Level

The OSHA action level for an 8-hour, time-weighted average (TWA) exposure is 85 dB of sound pressure measured on the A-weighted scale (dBA). If an employee’s daily noise exposure level, averaged over 8 hours, exceeds 85 dBA (computed without regard to any attenuation provided by the use of hearing protective devices), they must be enrolled in HDR’s Hearing Conservation Program (HCP) and must be provided hearing protection.

## 5.3 HDR Exposure Limits for Continuous/Impact Noise

ACGIH has established exposure guidelines for occupational exposure to noise in their Threshold Limit Values (TLVs). The TLVs are based on a 3-decibel exchange rate, which means the allowed exposure time is reduced by half for every 3-decibel increase in sound pressure level. Consistent with the ACGIH TLVs, HDR has adopted a three decibel exchange rate for our exposure limits. This means the HDR exposure limits are more stringent than OSHA noise exposure limits, which are based on a 5-decibel exchange rate. HDR exposure limits are shown in Table 1. Protection against the effects of noise exposure will be provided at no cost to the employee, and must be worn, whenever sound levels exceed HDR exposure limits.

**Table 1**  
**HDR Exposure Limits for Continuous and Impact Noise**

Duration Per Day (Hours)	HDR Exposure Limit (dBA) <sup>1</sup>	ACGIH TLV (dBA)	OSHA PEL (dBA)
8	85 (OSHA Action Level)		90
4	88	88	95
2	91	91	100
1	94	94	105
0.5	97	97	110
0.25	100 <sup>2</sup>	100	115
Impact Noise	140 dB peak sound pressure level	140 dB peak sound pressure level	140 dB peak sound pressure level
<sup>1</sup> Measured on the A-scale of a standard sound-level meter set at slow response. <sup>2</sup> When sound pressure levels exceed 100 dBA on a time weighted basis, both plugs AND muffs must be worn simultaneously.			

## 5.4 Speech Interference and Annoying Noise

In some cases, noise may not exceed standards established to protect hearing, but still interferes with speech or causes annoyance, either of which can reduce productivity. Although there are no mandatory standards for nuisance noise in the occupational setting, these guidelines and recommendations should be followed to protect employees from exposure to this type of noise.

- **Speech Interference**

Most of the information conveyed through speech is in the mid-frequencies --from about 500 to 2000 Hz. Thus, noise in these frequencies often interferes with speech recognition. Mid-frequency range levels below 50 dB are desirable in a typical conference room; those above



70 dB often present a problem in such settings. Background mid-range noise levels above 60 dB make telephone conversation difficult. If elimination and/or reduction of this noise is infeasible, ear protection designed to filter some of the noise in the mid-ranges may make speech easier to understand.

- **Annoying Noise**

Noise may be annoying because of its level, frequency, or aspects of its modulation. A noise may not be very “loud”, but its frequency may be high enough to cause headaches in susceptible individuals. Alternatively, a noise may not be loud but may start and stop suddenly. This can disturb concentration or frighten exposed personnel. Annoyance caused by irregular noises can sometimes be masked by running an appliance, such as a fan, that generates a low constant “white” noise.

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## 6.0 CONTROL OF NOISE EXPOSURE

The three ways to reduce employee noise exposure are through the use of:

- Engineering controls - Best option
- Administrative controls - Good option
- Hearing protectors – Worn when other controls fail

### 6.1 Engineering Controls

Engineering controls are defined as a permanent reduction in noise through any modification, insulation, isolation or replacement of the noise source. Examples include replacing old, noisy equipment; increasing sound dampening around equipment; or improving muffler design. Engineering controls should be formally considered before other types of controls are implemented. This is the best, and only permanent, option to eliminate the hazards posed by excessive noise. Unfortunately, HDR employees do not typically control noisy operations or mechanical noise sources, so we will rarely be able to implement engineering controls.

Any reduction in employee noise exposure is beneficial. However, if engineering controls are infeasible, or fail to reduce sound levels to below HDR exposure limits, administrative controls must be implemented or hearing-protective equipment must be used.

### 6.2 Administrative Controls

Administrative controls are changes in work schedules or operations to reduce the employees total noise dose. Common administrative controls include increasing the distance between the noise source and the worker or reducing exposure time through job rotation.

**Because our workers are generally not tied to one project site location, this will be the most simple, inexpensive, and frequently implemented form of noise exposure control for HDR project personnel.**

### 6.3 Hearing Protective Devices

Hearing protection should only be used as a last resort when feasible engineering and administrative measures have been implemented, and further protection is still needed. Hearing protective devices such as ear plugs and/or ear muffs must be worn when workplace noise levels are:





- Greater than the HDR exposure limits shown in Table 1.
- When working within 120 feet of pile driving activities (see Section 8.2, Pile Driving).
- When flying on contracted aircraft (see Section 8.3, Flights on Contracted Aircraft).
- In signed areas indicating hearing protection is required at client/host facilities and sites.

HDR employees may select any ear plug or ear muff they prefer, as long as the selected hearing protective device has been evaluated for the specific work environment to confirm it will reduce employee noise exposure to a level of 85 dBA or below.

### 6.3.1 Noise Reduction Rating

Each device will state on the package a "noise-reduction rating" (NRR) number, which is the level of noise reduction (in decibels) the protector will provide if it is fitted and worn properly. The larger the NRR value, the better protection is afforded.

The amount of decibels being reduced are not equivalent to a device's NRR. There are two reasons for this. First, the NRR is designed for use with C-weighted sound measurements. So if only A-weighted data are available, the NRR must be adjusted by subtracting seven to account for the difference between A-weighting and C-weighting. Second, the data used to determine the NRR for a device are normally obtained under laboratory conditions, so devices must be "derated" to account for the significantly reduced protection provided under "real world" conditions.

As an example, if the NRR on a package of earplugs is 27, the actual noise reduction would be calculated as follows:

$$\frac{27 - 7}{2} = 10 \text{ dBA}$$

Where:

27 = NRR on package

7 = correction factor to account for the difference between A-weighting and C-weighting

2 = 50% safety factor

### 6.3.2 Dual Hearing Protection

As noted in Table 1, when noise levels exceed 100 dBA on a time weighted basis, both plugs AND muffs must be worn simultaneously. To calculate the combined protection factor when both are worn, add 5 to the adjusted NRR of the higher published NRR. As an example, if the NRR on the package of earplugs is 24 and, the NRR on the earmuffs is 20, then the actual reduction in noise decibels afforded by wearing both would be calculated as follows:

$$\frac{(27 - 7)}{2} + 5 = 15 \text{ dBA}$$

Where:

27 = NRR for the hearing protective device with a higher rating

7 = correction factor to account for the difference between A-weighting and C-weighting

2 = 50% safety factor

5 = attenuation from use of the second hearing protective device



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## 7.0 HEARING CONSERVATION PROGRAM

### 7.1 Program Enrollment

If any HDR employee is, or is expected to be, routinely occupationally exposed to continuous noise at or above the OSHA Action Level (time-weighted average of 85dBA) (regardless of any sound attenuation provided by the use of hearing protective devices), the employee shall be enrolled in the HCP, which complies with the requirements of 29 CFR 1910.95/1926.52 and includes:

- Annual education on the health effects of noise exposure and instructions on how to fit and wear hearing protectors (see Section 11.0).
- A baseline audiogram and annual follow-up audiometric testing.

To enroll in the HCP and schedule a baseline audiogram, contact your Regional SH&E Manager in Corporate SH&E. The employee will receive initial information concerning the effects of noise, the purpose of audiometric testing, and a survey of any pre-existing medical conditions that may adversely impact the audiometric test. The employee shall provide information regarding their work history to document past noise exposures, and possible non-occupational noise exposures.

The employee must have no apparent or suspected ear, nose, or throat problems that might compromise the validity of the audiogram. If an employee is determined to be suffering from an acute disease, which may compromise the validity of the test, the baseline audiogram will be delayed until the condition has abated.

When it is discovered that employees have been working where they encounter hazardous noise or incur exposures that exceed HDR exposure limits (see Table 1) and have not had a baseline audiogram, one shall be conducted within 30 days. The audiogram must follow at least 14 hours of no known exposure to sound levels in excess of 85 dBA. This “quiet time” interval will allow recovery from a noise-induced temporary threshold shift, should one have occurred.

### 7.2 Standard Threshold Shift

If any annual audiogram result indicates that a standard threshold shift has occurred, the affected employee shall be notified, in writing, within 21 days of the determination. The employee’s supervisor shall ensure that the employee is using assigned hearing protectors. A retest shall be conducted within 30 days of the first audiogram, with that result considered the annual audiogram. Unless a physician determines that the standard threshold shift is not work related or aggravated by occupational noise exposure, the employee shall either be removed from the high noise environment or the employee shall be refitted and retrained in the use of hearing protectors and provided with hearing protectors offering greater attenuation if necessary.

### 7.3 Existing Ear Disease

Personnel who suffer from acute diseases of the ear shall not be placed in hazardous noise areas until the condition has abated, particularly if such diseases preclude the wearing of hearing protectors, cause a hearing impairment or produce tinnitus.



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## 8.0 ASSIGNMENTS WITH EXPOSURE TO NOISE HAZARDS

### 8.1 Noise Monitoring

Since the functions of our project staff generally afford them the option of moving freely about the project site, there are few reasons for HDR employees to ever be exposed to excessively loud noises for extended periods of time. Exceptions are when operating boats/motorized specialty vehicles; during observation of pile driving activities where we are required to remain near the point of noise generation; and when traveling on contracted aircraft.

If a nearby process generates high noise levels, our employees should move a short distance away, until normal conversations can be understood (administrative control). This will preclude the possibility that we will receive noise doses in excess of the OSHA Action Level. On sites where this is not an option, PMs are responsible for arranging for noise monitoring with either a sound level meter or noise dosimeters to determine if HDR exposure limits could be exceeded and if employees need to be enrolled in the HCP.

Sound level meters (SLMs) measure instantaneous, integrated-average and dose/TWA sound levels. They are typically used to survey an area or operation. Dosimeters are personal sized monitors that are worn by the employee with a microphone that is clipped to an employee's shirt lapel. The dosimeter is usually worn for an entire shift or all day, providing a cumulative average noise exposure value (dose) representing the period sampled (any employee sampled must be notified of the results). Dosimeters incorporate all continuous, intermittent and impulsive sound levels from 80 to 130 dBA into the TWA dose value. These are used to determine personnel exposures, and to verify compliance with the HDR exposure limits presented in Table 1.

On construction sites, since project conditions change constantly, dosimeter personnel sampling is rarely performed. Potential noise levels are more frequently estimated by use of an SLM or by assuming overexposure, and enrolling project personnel in the HCP.

As a general guideline, if employees are unable to converse with each other, in a normal tone and volume, at a distance of 3 feet or less, ambient noise levels will generally exceed 85 decibels.

### 8.2 Pile Driving

Pile driving operations and equipment encountered at project sites produce noise levels that exceed HDR exposure limits for continuous and impact noise. Exposure to these excessive noise levels may result in a permanent loss of hearing acuity, development of tinnitus (i.e., ringing of the ears), a possible increase in blood pressure, and stress-related problems if not mitigated.

Due to the nature of the pile driving inspection activities, HDR does not have the ability to reduce the noise hazard through engineering or administrative controls, such as limiting duration of exposure or employee distance from the noise source. Therefore, HDR employees must rely on hearing protective devices to prevent exposures in excess of HDR exposure limits.

Table 2 summarizes the requirements PMs must ensure are being met for employees with project assignments in close proximity to pile driving.



**Table 2**  
**Protection Requirements for Assignments Near Pile Driving**

Distance from Pile Noise Source	Enrollment in Hearing Conservation Program	Noise Canceling Earmuffs <sup>1</sup>	Earplugs with minimum 32 dB NRR
0 – 10 feet <sup>2</sup> (0 – 3 meters)	<b>Exclusion Zone – HDR employees are not allowed this close.</b>		
10 – 25 feet <sup>3</sup> (3 – 8 meters)	<b>Required</b>	<b>Required</b>	<b>Required</b>
25 – 45 feet <sup>4</sup> (8 – 14 meters)	<b>Required</b>	<b>Required</b>	Optional
45 – 80 feet <sup>5</sup> (14 – 24 meters)	<b>Required</b>	Optional	<b>Required</b>
80 – 120 feet <sup>6</sup> (24 – 37 meters)	Not Required	Optional	<b>Required</b>
<p><sup>1</sup> 3M/Peltor™ Tactical Pro Muffs are HDR’s preferred model for electronic noise canceling ear muffs. A complete ready-to-use kit (one Peltor™ Tactical Pro Muff housed in a Pelican™ storage/shipping case, with a hygiene kit) is available through the <a href="#">HDR equipment catalog</a> with Mid-Continent Safety. Replacement parts and accessories contained in the unit can also be purchased separately through Mid-Continent Safety. A model other than the 3M/Peltor Tactical Pro will only be approved if the user can demonstrate it provides equal or better protection. Contact your Regional SH&amp;E Manager with questions.</p> <p><sup>2</sup> No HDR employee shall work within 10 feet (3 meters) of the pile.</p> <p><sup>3</sup> All HDR employees working within 25 feet (8 meters) of the pile must be enrolled in the HCP and must wear dual hearing protection consisting of both NRR32 or higher rated disposable ear plugs and 3M/Peltor™ Tactical Pro Muffs.</p> <p><sup>4</sup> All HDR employees working between 25 and 45 feet (8 and 14 meters) of the pile must be enrolled in the HCP and must wear 3M/Peltor™ Tactical Pro Muffs as a minimum level of protection.</p> <p><sup>5</sup> All HDR employees working between 45 and 80 feet (14 and 24 meters) of the pile must be enrolled in the HCP and must wear NRR32 or higher rated disposable ear plugs as a minimum level of protection.</p> <p><sup>6</sup> All employees working between 80 and 120 feet (24 and 37 meters) of the pile driving activities must wear NRR32 or higher rated disposable ear plugs as a minimum level of protection.</p>			



### 8.3 Flights on Contracted Aircraft

Travel on small contracted aircraft (non-commercial) for work assignments may expose employees to noise levels that exceed occupational exposure limits. PMs are to ensure the following employee actions are met when assignments involve travel on small contracted aircraft:

**1. Notify SC of scheduled flights.**

Employees must notify their SC of all travel plans involving contracted aircraft.

**2. Complete Flight Detail Tracking Form.**

Documentation of flight details (including flight duration and type of aircraft) must be submitted on the [SH&E portal](#) within two weeks of completed travel. This information is critical for confirming regulatory compliance and for determining the need for enrollment in the HCP.

**3. Enroll in the HCP if applicable.**

If the flight duration is long enough that HDR exposure limits could be exceeded, exposed employees will be enrolled in the HCP. Enrollment may occur prior to the employee’s first flight or could occur following the flight (OSHA allows up to 6 months from an employee’s first exposure at or above the action level for completion of a baseline audiogram). Table 3 summarizes predicted flight durations that could exceed HDR exposure limits and thus require enrollment in the HCP.

**Table 3**  
**Flight Durations for a Single Work Shift Requiring Enrollment in HDR’s HCP**

	Type of Aircraft			
	Float Planes	Fixed Wing Aircraft Other than Float Planes	Rotary (Helicopter) Aircraft	Flights in Multiple Aircraft
Predicted Flight Durations that Could Exceed an HDR Exposure Limit <sup>1,2</sup>	Greater than 1-hour	Greater than 3-hours	Greater than 4-hours	Contact Corporate SH&E to Calculate
<sup>1</sup> If aircraft-specific monitoring has been conducted and indicates exposure is below HDR exposure limits, enrollment in HDR’s HCP is not required. Contact Corporate SH&E to review and confirm the adequacy of such monitoring. <sup>2</sup> These durations were determined through noise monitoring conducted by Corporate SH&E. We will continue to measure exposures on future flights and will update and communicate any changes to these values if additional data indicate this is warranted.				

**4. Complete HDR’s Noise and Hearing Conservation training.**

This self-directed online training is available on HDR University and is required for all employees traveling on contracted aircraft. Employees enrolled in the HCP must repeat the training annually.

**5. Wear assigned hearing protection.**

Regardless of flight duration, when in contracted aircraft with the engine running, employees must wear inflight communication ear muffs provided by the carrier. In addition, on fixed wing aircraft and float planes, employees must also wear disposable ear plugs with an NRR of 25 or higher. These must be worn in combination with the inflight communication ear muffs provided by the carrier.



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## 9.0 TRAINING

Employees with potential exposure to noise hazards must complete the Noise and Hearing Conservation eLearning available on HDR University before initial assignment. For employees enrolled in the HCP, this training must be repeated on an annual basis. This training is updated as needed to be consistent with any changes in personal protective equipment and work processes and covers the following topics:

- Adverse effects of noise
- How to prevent noise-induced hearing loss
- How to recognize hazardous noise
- Symptoms of overexposure to hazardous noise
- Hearing protection devices - advantages and limitations
- Selection, fitting, use, and maintenance of hearing protective devices
- Explanation of noise measurement procedures
- Hearing Conservation Program requirements

PMs are responsible for confirming employees assigned to their projects have completed the requisite training. Employees can access the OSHA noise standards (29 CFR 1910.95 and 29 CFR 1926.52) and this procedure through the SH&E portal on the HDR intranet.

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## 10.0 RECORDKEEPING

Training records are maintained in HDR's Learning Management System and are available to employees, their designated representatives, and applicable regulatory agency representatives upon request. HDR's Medical Monitoring Program Manager in Corporate SH&E maintains employee exposure and medical records in accordance with OSHA 29 CFR 1910.1020, *Access to Employee Exposure and Medical Records* and OSHA 29 CFR 1910.95, *Occupational Noise Exposure*. Audiometric test data are maintained for the duration of the affected employee's employment. Records are provided upon request for examination and copying to the subject employee, to anyone having written consent of the subject employee, and to applicable regulatory agency representatives.

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## 11.0 CROSS REFERENCES

OSHA 29 CFR 1910.95, *Occupational Noise Exposure (General Industry)*

OSHA 29 CFR 1926.52, *Occupational Noise Exposure (Construction)*

OSHA 29 CFR 1910.1020, *Access to Employee Exposure and Medical Records*

American Conference of Governmental Industrial Hygienists (ACGIH), *Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs)*, 2016.

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## Revision History

Rev	Description of Change	Issue Date
0	Initial Release	10/26/2004
1	Revisions	12/26/2006
2	Re-Formatting	07/15/2013
3	Clarification made regarding fire extinguishers in project vehicles	09/17/2014
4	Specified minimum fire extinguisher rating for project vehicles	10/20/2014
5	Reformatting and reorganization; clarified training requirements	09/26/2016





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## 1.0 PURPOSE

This procedure describes requirements for the availability, selection, maintenance, inspection, and effective use of portable fire extinguishers in HDR offices, project sites, and vehicles. These requirements are consistent with the following:

- NFPA 10, Standard for Portable Fire Extinguishers (2013 Edition)

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## 2.0 APPLICABILITY

This procedure is applicable to portable fire extinguishers in HDR offices, at HDR project sites, and in HDR vehicles.

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## 3.0 PROCEDURE IMPLEMENTATION

This procedure will be administered by the HDR Director of Safety, Health, and Environmental (SH&E), local Safety Coordinators (SCs), and project managers (PMs).

### 3.1 Director of SH&E

The Director of SH&E shall:

- Periodically review, at least annually, the effectiveness of this procedure, identify any deficiencies, and ensure that they are corrected.
- Assist SCs and project professionals, as requested, in the implementation of this procedure and regulatory interpretations.

### 3.2 Safety Coordinators

SCs shall:

- Initially locate and identify all extinguishers in their offices, and record this information on the ***Portable Fire Extinguisher Inventory Log*** (see attached forms).
- Perform monthly inspections (unless performed by an outside source).
- Arrange annual training for individuals designated as authorized fire fighters.
- Interface with the Director of SH&E regarding any unsafe office conditions that have been discovered and need addressing or interpretation.

### 3.3 Project Managers

PMs shall:

- Identify fire extinguishing equipment that is needed to safely perform project activities.
- Confirm annual training for project team members designated as authorized fire fighters.
- Interface with the Director of SH&E regarding any unsafe project conditions that have been discovered and need addressing or interpretation.



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## 4.0 TYPES OF FIRE EXTINGUISHERS

Fire extinguishers are categorized by two factors: the class and the size of fire they are designed to suppress.

### 4.1 Classes of Extinguishers

There are four classes of fires, assigned the letters A, B, C, D. All fire extinguishers are labeled, using these letters, for the classes of fires on which they can be used. Some extinguishers are rated for two or more classes (ABC), and can be used on fires of all these classes.

- Class A – Ordinary combustibles
  - Ordinary combustibles such as wood, cloth, paper, and trash having glowing embers. These are the most common combustibles in our office settings. Tap water may also serve as a Class A extinguishing agent. It is very dangerous, however, to use water or an extinguisher labeled only for Class A fires on a cooking-grease (Class B) or electrical (Class C) fire.
- Class B – Flammable liquids
  - Flammable liquids such as solvents, gasoline, oil, and oil-based paints. Common on project sites, but rarely present in HDR offices.
- Class C – Electrical equipment
  - Electrical equipment including wiring, fuse boxes, circuit breakers, machinery, and appliances. Found in both HDR office complexes, vehicles and on project sites/trailers.
- Class D – Combustible metals
  - Combustible metals such as magnesium or sodium. It is not anticipated that these will ever be present in either our offices or on our project sites.

**The most commonly used extinguishers in HDR offices are multi-purpose ABC units, which contain a stored pressure dry chemical.**

### 4.2 Sizes of Extinguishers

Portable extinguishers are also rated for the size (“quantity”) of fire they can handle. This rating is expressed as a number from 1 to 40 for Class A fires, and from 1 to 640 for Class B fires. This rating will appear on the label – 2A:10B:C for example. The larger the numbers, the larger the fire of a specific class on which the extinguisher can be used.

No number accompanies an extinguisher’s Class C rating. The C on the label indicates only that the extinguisher is safe to use on electrical fires.

Extinguishers for Class D fires must match the type of metal that is burning. These extinguishers do not use numerical ratings. Extinguishers for Class D fires are labeled with a list detailing the metals that match the unit’s extinguishing agent.

Often, extinguishers will also be labeled as to the weight of extinguishing agent they contain – 5 pound (2.3 kilograms), 10 pound (4.5 kilograms), etc. While these weight references are helpful in discussing extinguisher needs with safety supply houses, do not confuse weight classifications with size ratings;

weights will vary with the type of agent contained; ratings are consistent for the size of fire they will suppress.

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## 5.0 EXTINGUISHER SELECTION AND PLACEMENT

### 5.1 Offices and Project Trailers

A minimum rule of thumb for fire extinguisher availability is one 10-pound (4.5 kilogram) Class ABC extinguisher for each 3,000 sq. feet (279 sq. meters) of floor space, placed such that employees have access to the extinguisher within a travel distance of 75 feet (22.86 meters).

In HDR offices, a local fire specialist company should inspect the premises and recommend specific sizes and classes. For many of our offices, this has already been performed by specialists contracted to the building owner. The specialist can also specify the number of extinguishers necessary to provide adequate coverage.

- All fire extinguishers are to be mounted vertically and identified by signs or equivalent means on walls, upright structures or in specially designed cabinets.
- Locate fire extinguishers near a door that can be used as an escape route.
- Fire extinguishers must be readily accessible and within easy reach without the need for ladders, stepstools, or other climbing aid.
- The area surrounding each mounted fire extinguisher must be kept free of obstructions.
- Fire extinguishers with a gross weight greater than 40 pounds (18 kilograms) shall be installed so that the top of the extinguisher is not more than 3.6 feet (1.1 meters) above the floor when the extinguisher is not equipped with wheels.
- Fire extinguishers having a gross weight of 40 pounds (18 kilograms) or less shall be installed so that the top of the extinguisher is not more than 5 feet (1.5 meters) above the floor.

### 5.2 Server Rooms

Class ABC fire extinguishers are designed to put out ordinary combustibles, flammable liquids, and electrical fires, but will leave a residue on electrical components which ruins the equipment. Historically, Halon was the fire extinguisher chemical used for these applications; however, Halon is a chlorofluorocarbon and is suspected to cause damage to the earth's ozone layer. Halon also poses an asphyxiation risk to humans since it will rapidly displace the oxygen within a small room. Halon extinguishers are still in use but are no longer being manufactured or sold.

Fire extinguishers charged with FE-36® are the preferred alternate to Halon fire extinguishers. CleanGuard, a portable fire extinguisher manufactured by Ansul, and other similar fire extinguishers utilize an extinguishing agent (DuPont FE-36®) that is clean (does not leave a residue on electrical components), electrically nonconductive, and environmentally friendly. Use of this agent to extinguish a fire should not damage sensitive computer components.

HDR offices which have server rooms, computer centers, electronic data storage areas, etc., shall procure a FE-36® containing fire extinguisher and place it outside of or just inside of the entrance to a server room. The size of the fire extinguisher will be dependent on the size of the server room. A local fire specialist company will provide a recommended size and class for the fire extinguisher. The following guidance is offered, based on past HDR experience in supplying server rooms:



- If the room only contains computer equipment, a 5 pound (2.3 kg) BC rated FE-36® portable fire extinguisher should be sufficient.
- If the room also contains “ordinary combustibles” including paper or cloth, a 9 pound (4 kg) ABC rated FE-36® portable fire extinguisher should be utilized.
- Large server rooms may require a 13 pound (5.9 kg)ABC rated FE-36® portable fire extinguisher, with this determination made after considering the recommendations by a local fire equipment supply firm.

Offices that currently have Halon fire extinguishers do not need to immediately replace them. These extinguishers can be phased out over time in conjunction with the annual testing of the devices. If the Halon extinguisher is scheduled for hydrostatic testing as part of the annual inspection or if the chemical has been discharged, then the extinguisher should be replaced with an FE-36® extinguisher.

### 5.3 HDR Owned and Leased Vehicles

Although there is no regulatory requirement for the presence of extinguishers in vehicles, HDR owned or leased vehicles (including specialty vehicles such as UTVs) used for off-road project activities (e.g., vehicles driven off of paved and/or otherwise maintained roads to conduct project activities) shall be equipped with a properly mounted/secured portable fire extinguisher, rated at not less than 1A:10 BC. Operators must be trained in the use of extinguishers (see Section 9.0). HDR does not require extinguishers in rental vehicles or in owned/leased vehicles that are used solely on paved/maintained roads.

### 5.4 Flammable/Combustible Liquids

Locations that contain Class B flammables (such as workshops, storage areas, laboratories, garages, and warehouses) require that all employees have access to an extinguisher as specified in Table 1.

**Table 1. Fire Extinguisher Spacing for Flammable/Combustible Liquids**

Hazard	Extinguisher	Spacing
Light (the total quantity of Class B flammables typically expected to be present is less than 1 gallon (3.8 liters) in any room or area)	5B	30' (9.14 m)
	10B	50' (15.25 m)
Ordinary (the total quantity of Class B flammables typically expected to be present is from 1 gallon (3.8 liters) to 5 gallons (18.9 liters) in any room or area)	10B	30' (9.14 m)
	20B	50' (15.25 m)
Extra (the total quantity of Class B flammables typically expected to be present is more than 5 gallons (18.9 liters) in any room or area)	40B	30' (9.14 m)
	80B	50' (15.25 m)

(Adapted from NFPA 10 (2013) Fire Extinguisher Size and Placement for Class B Hazards)

## 6.0 EXTINGUISHER USE

### 6.1 Who Can Use an Extinguisher

Using fire extinguishers or any method to suppress fires is an inherently dangerous activity, requiring an understanding of the mechanics of fire initiation and propagation, proper use and limitations of the



extinguisher, correct body placement, and escape routes. The simultaneous integration of all these factors, combined with the panic situation present, makes proper application of fire fighting techniques much more difficult than most employees assume.

Workers may use a portable fire extinguisher only if:

- They have completed portable fire extinguisher training (see Section 9.0).
- The fire is small and they have verified that someone has reported the fire to 911.
- The fire alarm has been sounded to initiate evacuation procedures.
- They know what materials are burning and are certain they have the correct class of portable fire extinguisher for the class of fire (using the wrong type of extinguisher on a fire can intensify the fire or lead to personal injury).
- They have an unobstructed escape route with an exit at their back in case of failure to extinguish the fire.

## 6.2 How to Use an Extinguisher

Tips for safe extinguisher use:

- Keeping your back to the exit at all times, stand 6 to 8 feet (2.0 to 2.4 meters) away from the fire, depending on the size of the fire. Many times people will approach to within a few feet and begin extinguisher application, and the force of the projected agent will scatter the burning material, spreading the fire. It is always better to begin application too far away and then approach, than the opposite.
- To discharge the extinguisher, follow the PASS procedure (**P**ull-**A**im-**S**queeze-**S**weep):
  1. **PULL the pin:** This unlocks the operating lever and allows you to discharge the extinguisher. The pin will be tied in place with a plastic tie which can make pulling the pin out difficult. Trick: Twist the pin, using your wrist, to break the plastic tie as you pull. This makes removal considerably easier.
  2. **AIM low:** Point the extinguisher hose (or nozzle) at the base of the fire. Hold the extinguisher canister in a vertical position during use.
  3. **SQUEEZE the handle lever:** This discharges the extinguisher agent. Squeeze the lever ALL the way down. Do not worry about “saving” your extinguishing agent - you actually want to empty the extinguisher as rapidly as possible. Fully discharge the unit. During use, releasing the lever will stop the discharge.
  4. **SWEEP from side to side:** Moving carefully toward the fire, keep the extinguisher aimed at the base of the fire and sweep back and forth until the flames appear to be out. Watch the fire area. If the fire reignites, repeat the process.
- **If the fire does not begin to go out immediately, leave the area at once! Portable fire extinguishers discharge faster than most people realize. For example, a 10 pound ABC unit will completely discharge within 15-17seconds.**
- Always have the fire department inspect the fire site, even if you think you have extinguished the fire. They will record the incident, which may prove necessary for insurance purposes.



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## 7.0 MAINTENANCE AND INSPECTION

All fire extinguishers must be maintained in a fully charged and operable condition and kept in their assigned places, except during use. The following section details inspection and maintenance procedures required to ensure that extinguishers maintain their effectiveness.

Any fire extinguisher not meeting inspection criteria shall be removed from service and replaced until the deficiencies are corrected. If the extinguishers within an HDR lease space are provided by an office building owner, the owner must be notified, and the notification details recorded on the **Portable Fire Extinguisher Inventory Log** (see attached forms).

### 7.1 Fire Extinguisher Inventory

The locations of fire extinguishers for each individual HDR office should be specified in the office's Emergency Action Plan (HDR SH&E Procedure #24). In addition, an inventory of all fire extinguishers (including extinguishers in the office, at project sites, and in HDR owned and leased vehicles) is to be maintained by the local SC in the office safety files. Each extinguisher should be recorded on the **Portable Fire Extinguisher Inventory Log** (see attached forms).

### 7.2 Annual Maintenance Check

An annual maintenance check will be conducted by an approved third party trained in fire extinguisher maintenance. This third party is typically the fire specialist company who supplied the extinguishers. A record and certification of the annual check will be attached to the neck of each extinguisher. The year printed on the tag indicates the year that the annual check was performed; that is, it is valid until the month of the following year. So a tag indicating March 2016 indicates the annual inspection must be repeated in March 2017. While the owner of the building may have a contract with the supplier to provide this service, it is still the occupant's (e.g., HDR) responsibility to ensure that these inspections have been performed, and that each extinguisher has a current certification tag attached. The SC shall check these tags to ensure annual inspections have been performed.

All fire extinguishers used in outside service or on project sites will have hard (plastic, metal, or laminated) annual inspection tags, to prevent environmental deterioration.

### 7.3 Monthly Inspections

Unless provided by the building owner or outside contract, SCs (or assigned designees) are responsible for monthly inspections of all portable fire extinguishers maintained in their office to ensure that they are in proper working condition and have not been tampered with or physically damaged. Extinguishers maintained on project sites must be inspected monthly by the PM (or assigned designee) and extinguishers in HDR vehicles must be inspected monthly by the assigned vehicle driver.

Monthly inspections are documented by initialing the applicable month on the annual inspection tag and consist of verifying the following:

- The fire extinguisher is in its assigned location
- The pin and seal are in place
- Pressure gauge (if present) indicates acceptable pressure



- Extinguisher hose or nozzle are in good condition and free from obvious cracks, deficiencies or obstructions
- Annual inspection tag is attached and indicates inspection within the past 12 months
- Access to the extinguisher is not blocked or obstructed

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## 8.0 TRAINING

### 8.1 Portable Fire Extinguisher Training on HDR University

It is the absolute policy of HDR that only employees who have completed portable fire extinguisher training within the previous 12 months are allowed to engage in incipient stage fire fighting. **If an employee has not been trained or their training is not current, evacuation is required.**

A training course to familiarize employees with the general principles of portable fire extinguisher use and the hazards involved in incipient stage fire fighting is available on HDR University. Completion of this course, or a similar course approved by Corporate SH&E, is required on an annual basis prior to an employee's use of a portable fire extinguisher in HDR offices, project sites, or vehicles.

SCs, with the assistance of PMs are responsible for assigning and confirming completion of this training by employees who are designated as emergency responders in their office and/or project Emergency Action Plan.

### 8.2 Hands-On Training

SCs are encouraged, where local conditions permit, to conduct "hands on" extinguisher training on a bi-annual basis (every two years). This training will afford the participants an opportunity to use an extinguisher to extinguish a fire. Because of local fire restrictions, this training shall not be conducted by internal staff, but shall be contracted with local resources that have the necessary equipment and burn permits.

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## 9.0 FORMS

Fire Extinguisher Inventory Log







## SH&E Procedure #028 – Heat Stress

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### Revision History

Rev	Description of Change	Issue Date
00	Initial Release	10-01-1998
01	Revisions	01/04/2007
02	Re-Formatting	07/15/2013
03	Revisions to adopt requirements of California Code of Regulations (CCR), Title 8, section 3395 Heat Illness Prevention	01/10/2017
04	Removed requirements for physiological monitoring of heat strain	06/08/2020



## 1.0 PURPOSE

The procedure describes safe work practices to prevent heat-related illness when environmental factors and/or workload present a heat hazard.

## 2.0 APPLICABILITY

This procedure applies to HDR employees with work assignments that present a reasonable potential for exposure to the risk of heat illness (such as assignments outdoors and/or in other high heat environments; assignments involving use of impermeable protective clothing; and assignments involving significant physical exertion).

## 3.0 PROGRAM IMPLEMENTATION

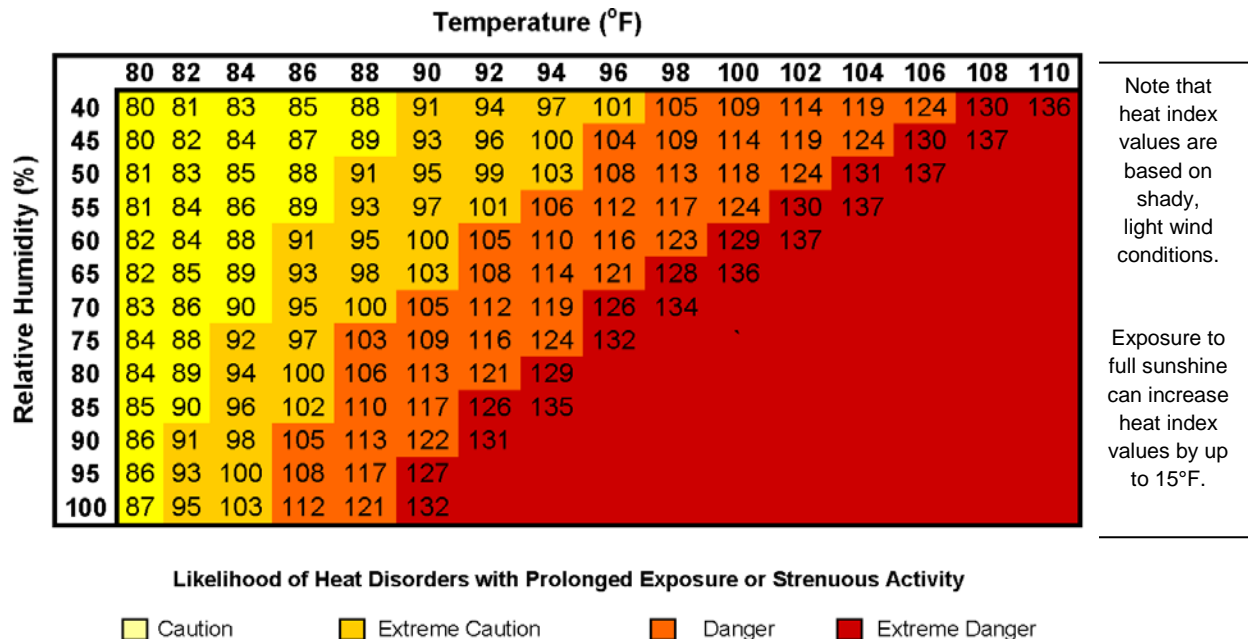
This procedure will be administered by the HDR Director of Safety, Health, and Environmental (SH&E), Regional SH&E Managers, and project managers (PMs). The Director of SH&E shall periodically review, at least annually, the effectiveness of this procedure, identify any deficiencies, and ensure that they are corrected and this procedure is updated accordingly.

## 4.0 DEFINITIONS

Term	Definition
Acclimatization	The temporary adaptation of the body to work in the heat that occurs gradually when a person is exposed to it. Acclimatization peaks in most people within four to fourteen days of regular work for at least two hours per day in the heat but can be lost rapidly if the worker is removed from the hot environment for a few days.
Aural	The external, visible ear structure (pinnae).
Environmental Risk Factors for Heat Illness	Working conditions that create the possibility that heat illness could occur, including air temperature, relative humidity, radiant heat from the sun, and other sources. Other sources include conductive heat sources such as the ground, air movement, workload severity and duration, protective clothing, and personal protective equipment worn by employees.
Heat Illness	A serious medical condition resulting from the body's inability to cope with a particular heat load. These medical conditions include heat cramps, heat exhaustion, heat syncope, and heat stroke.
Heat Index	Combines both air temperature and relative humidity into a single value that indicates the apparent temperature in degrees Fahrenheit, or how hot the weather will feel. See Figure 1.
Heat Stress	Any external environmental heat stimulus that causes your body to react outside its normal range.
Personal Risk Factors for Heat Illness	Factors such as an individual's age, degree of acclimatization, health, water consumption, alcohol consumption, caffeine consumption, and use of prescription medications that affect the body's water retention or other physiological responses to heat.

Term	Definition
Heat Wave	Defined in this procedure to mean any day in which the predicted high temperature for the day will be at least 26.7°C (80°F) and at least 5°C (10°F) higher than the average high daily temperature in the preceding five days.
Relative Humidity	A ratio of the amount of water in the air, at a specific temperature, compared to the maximum absolute amount that it could hold. The human body can only lose heat through sweat evaporation if the air can accept the water vapor. Sweat will rapidly evaporate and cool the body when a low relative humidity is present. But if the relative humidity is high, sweat will sit on the skin, and no benefit (heat loss) will be gained from sweating. The body will continue to sweat in an attempt to shed heat, and dehydration is a dangerous possibility.
Shade	Blockage of direct sunlight. One indicator that blockage is sufficient is when objects do not cast a shadow in the area of blocked sunlight. Shade is not adequate when heat in the area of shade defeats the purpose of shade, which is to allow the body to cool. For example, a car sitting in the sun does not provide acceptable shade to a person inside it, unless the car is running with air conditioning. Shade may be provided by any natural or artificial means that does not expose employees to unsafe or unhealthy conditions and that does not deter or discourage access or use.
Temperature	The dry bulb temperature in degrees Fahrenheit is determined by using a thermometer to measure the outdoor temperature in an area where there is no shade. While the temperature measurement must be taken in an area with full sunlight, the bulb or sensor of the thermometer should be shielded while taking the measurement, e.g. with the hand or some other object, from direct contact by sunlight.

**Figure 1. National Weather Service Heat Index**





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## 5.0 HEAT RELATED ILLNESSES

The following subsections describe signs, symptoms, and treatment of common heat-related illnesses. Employees experiencing signs or symptoms of a heat-related illness are to report the exposure to their supervisor and submit an incident report in IndustrySafe (<https://www.industrysafe.com/hdrinc>).

For non-emergency illness symptoms, regardless of how minor, employees are to also call WorkCare at (888) 449-7787 for medical consultation. For life threatening or other serious symptoms of a heat-related illness, employees are to seek immediate medical care.

### 5.1 Heat Rash (Prickly Heat)

Heat rash is a painful temporary condition caused by clogged sweat pores, typically from hot sleeping quarters. Commonly observed in tropical climates, heat rash is caused by the plugging of sweat ducts due to the swelling of the moist keratin layer of the skin which leads to inflammation of the sweat glands. Heat rash appears as tiny red bumps on the skin, and can impair sweating, resulting in diminished heat tolerance. Often appears on the neck, upper chest, groin, under the breast, and in elbow creases.

#### Treatment:

- Heat rash can usually be cured by providing cool sleeping quarters.
- Body powder may also help absorb moisture.
- Move to a cooler less humid environment
- Keep the affected area dry
- Do not use ointment or creams

### 5.2 Heat Cramps

Heat cramps are characterized by painful intermittent spasms of the voluntary muscles following hard physical work in a hot environment. Heat cramps usually occur after heavy sweating, and often begin at the end of the workday. The cramps are caused by a loss of electrolytes, principally salt. This results in fluids leaving the blood and collecting in muscle tissue, resulting in painful spasms usually in the abdomen, arms, &/or legs.

#### Treatment:

- Increase ingestion of commercially available electrolytic “sports” drinks (because of individual sensitivity, it is best to double the amount of water required by package directions or add water to the liquid form).
- Rest in a shady, cool area
- Drink water every 15-20 minutes
- Have a snack
- Wait a couple hours before performing strenuous work
- Seek medical attention if:
  - ✓ Worker has heart problems



- ✓ Is on a low sodium diet
- ✓ If cramps do not subside within 1 hour

### 5.3 Heat Syncope (Fainting)

Heat Syncope or fainting is a mild form of heat illness that often results from physical exertion when it is hot. It occurs when your body, in an effort to cool itself, causes the blood vessels to dilate to such an extent that blood flow to the brain is reduced. Symptoms include faintness, dizziness, headache, increased pulse rate, restlessness, nausea, vomiting and brief loss of consciousness.

**Treatment:** Have the victim lie or sit down in the shade or a cool area and elevate the feet. Have the victim drink cool fluids containing low levels of salt, such as sports drinks, and refrain from vigorous activity. **If fainting has occurred, the victim shall not return to work until authorized by a physician.**

### 5.4 Heat Exhaustion

Heat exhaustion is characterized by profuse sweating, weakness, low blood pressure, rapid pulse, dizziness, decreased urine output, and frequent nausea and/or headache. The skin is cool and clammy, and appears pale. The body core temperature is normal or depressed. Victim may faint and/or vomit.

This is the most common form of serious heat illness encountered during employment activities.

**Treatment:**

- Move victim to a cool area, loosen clothing, and provide rest and plenty of fluids.
- Remove worker from heat and provide fluids
- Remove unnecessary clothing, including shoes and socks
- Cool the victim with cool compress, or have them wash head, face, and neck with cold water
- Encourage frequent sips of water

Any worker who is a victim of heat exhaustion may not be exposed to a hot working environment for an absolute minimum of 24 hours. **If fainting has occurred, the victim is not allowed to return to work until authorized by WorkCare or another medical provider.**

### 5.5 Heat Stroke

This is the most serious heat disorder, and is life-threatening. Heat stroke is a true medical emergency. This results when the body's heat dissipating system is overwhelmed and shuts down (thermoregulatory failure). Heat stroke results in a continual rise in the victim's deep core body temperature, which is fatal if not checked. The symptoms are hot, dry, flushed skin, elevated body core temperature, convulsions, delirium, slurred speech, unconsciousness, and possibly, death.

**Treatment:** Treatment response time is critical when assisting a victim of heat stroke! Do not give coffee, tea, or alcoholic beverages. Treat for shock and obtain immediate medical assistance.

- Move the victim to a cool area, cool the body rapidly by immersion in cool (not cold) water or sponging the body with cool water



- Remove outer clothing
- Fan air around the worker
- Place cold wet towels or ice on the workers head, neck, armpits, and groin

## 5.6 Effects of Personal Protective Clothing and Equipment

Normal work clothing, which allows some passage of air and sweat from the skin to the environment, is considered permeable. The restriction of air circulation is not usually of significant health concern, unless the volume of clothing worn is great. Some personal protective equipment and clothing, such as Tyvek™ coveralls, respirators, etc. are designed to prevent air/liquid environmental contaminants from passing through the clothing and contacting the skin.

The impermeable nature of this fabric also prevents heat and sweat from passing through and escaping the suit. Additionally, the extra weight of this equipment and clothing and the restriction of body motions that it imposes causes the wearer to work harder than normal, and more heat is generated. When impermeable clothing/equipment is worn, more metabolic heat than usual is generated, and the heat cannot readily escape the clothing. Cool outside air temperatures do not help significantly, since the clothing/equipment is impermeable. Therefore, use of impermeable protective clothing can greatly increase the potential for heat-related illnesses, even in relatively benign ambient temperatures.

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## 6.0 SITE-SPECIFIC HEAT ILLNESS PREVENTION PLAN

For projects with field work involving the following, PMs are responsible for developing and documenting heat illness prevention procedures using the [Site-Specific Heat Illness Prevention Plan template](#).

- Working in environments with a temperature at or approaching 80°F (26.7°C)
- Performing extended services in the proximity of radiant heat sources (foundries, etc.)
- Wearing semi-impermeable or impermeable clothing in temperatures exceeding 69.8°F (21°C)

The completed template must be included in the project site-specific SH&E plan and/or on the project job hazard analysis (JHA) forms and must include provisions for the following:

- Environmental monitoring (see Section 6.1)
- Provision of water and/or other drinking fluids (see Section 6.2)
- Access to shade and rest areas (see Section 6.3)
- Worker monitoring (see Section 6.4)
- Emergency response procedures (see Section 6.5)
- Training and daily briefings (see Section 6.6)
- High heat procedures for temperatures at or above 35°C (95°F) (see Section 6.7)
- Acclimatization (see Section 6.8)



## **6.1 Environmental Conditions Monitoring**

The PM (or a designee such as the field team leader) shall monitor weather reports and modify work schedules and activities accordingly based on the forecast and any hot weather advisories.

Download the [OSHA-NIOSH Heat Safety Tool](#) mobile device app to calculate risk based on the Heat Index (see Figure 1).

## **6.2 Provision of Water and/or Other Drinking Fluids**

Fluids are a key preventative measure to minimize the risk of heat related illnesses. HDR employees shall have access to potable drinking water or other non-alcoholic beverages (drinking fluids). Where the supply of water is not plumbed or otherwise continuously supplied, drinking fluids shall be provided in sufficient quantity at the beginning of the work shift to provide at least one liter (L) per employee per hour for the entire shift. Employees may begin the shift with smaller quantities of drinking fluids if they are able to replenish their supply during the shift. The beverages should be cool 10°C to 15.5°C (50°F to 60°F), and readily available (as close as possible to employees). Coffee, Tea and other warm beverages should be avoided.

Employees are encouraged to maximize daily fluid intake and realize that thirst is not an adequate indicator of sweat loss. Drinking fluids should be consumed at a target rate of 0.2 L (one cup) every 15 to 20 minutes at a minimum.

If drinking fluid containers are being shared by employees disposable/single use drinking cups need to be provided, or employees may use their own cup. In addition, a supervisor or designated employee shall be assigned to monitor the quantity and condition of the drinking fluids. When drinking fluid levels within a container drop below 50%, the fluids need to be replenished.

## **6.3 Access to Shade and Rest Areas**

Access to rest and shade or other cooling measures are important preventative steps to minimize the risk of heat related illnesses.

Every worker is unique in his/her ability to handle heat. Work/rest periods should be based on the individual's capacity to safely handle the heat, not on a predetermined or inflexible time length. As such, employees shall be allowed and encouraged to take a preventative cool-down rest in the shade when they feel the need to do so to protect them from overheating. When possible, rest areas should be readily accessible and near supplies of drinking fluids. Air conditioned construction offices, trailers, and work vehicles make good rest areas.

- At or below 29°C (80°F), employees shall have timely access to a rest area with shade that is either open to the air or provided with ventilation or cooling for a period of no less than five minutes. Such access to shade shall be permitted at all times.
- For temperatures above 29°C (80°F), one or more areas with shade shall be provided at all times while employees are present. The amount of shade present shall be at least enough to accommodate the employees on recovery or rest periods, so that they can sit in a normal posture fully in the shade without having to be in physical contact with each other. The amount of shade present during meal periods shall be at least enough to accommodate the number of employees on the meal period who remain onsite.

An individual employee who takes a preventative cool-down rest:

- Shall be monitored and asked if he or she is experiencing symptoms of heat illness;



- Shall be encouraged to remain in the shade; and
- Shall not be ordered back to work until any signs or symptoms of heat illness have abated, but in no event less than 5 minutes in addition to the time needed to access the shade.

If an employee exhibits signs or reports symptoms of heat illness while taking a preventative cool-down rest or during a preventative cool-down rest period, appropriate first aid shall be provided or emergency response procedures described in Section 6.7 shall be activated.

#### **6.4 Worker Monitoring**

The PM (or a designee such as the field team leader) shall consider risk factors that may lead to heat-related illnesses (see Table 1) and closely observe employees for signs/symptoms of heat-related illness. In addition to monitoring by the PM (or a designee such as the field team leader), the buddy system may also be used for monitoring in high-heat and/or a heat wave conditions, particularly for newly assigned employees (see also Section 6.7).

**Table 1. Heat-Related Illness Risk Factors**

<b>Environmental</b>
<ul style="list-style-type: none"> <li>• Work in high temperature and humidity</li> </ul>
<ul style="list-style-type: none"> <li>• Direct sun exposure (with no shade) in extreme heat</li> </ul>
<ul style="list-style-type: none"> <li>• Conditions with limited air movement (no breeze or wind)</li> </ul>
<b>Job-Specific</b>
<ul style="list-style-type: none"> <li>• Performing physically demanding work (excessive lifting, climbing, digging, etc.)</li> </ul>
<ul style="list-style-type: none"> <li>• Use of bulky protective clothing and semi-impermeable and impermeable equipment (use of impermeable protective clothing can greatly increase the potential for heat-related illnesses, even in relatively benign ambient temperature)</li> </ul>
<b>Personal</b>
<ul style="list-style-type: none"> <li>• Dehydration</li> </ul>
<ul style="list-style-type: none"> <li>• Poor physical condition, obesity or ongoing health problems</li> </ul>
<ul style="list-style-type: none"> <li>• Some medications</li> </ul>
<ul style="list-style-type: none"> <li>• Pregnancy (female workers should be aware of the possible adverse consequences of hot work while pregnant due to elevated core body temperatures)</li> </ul>
<ul style="list-style-type: none"> <li>• Lack of previous exposure to hot workplaces</li> </ul>
<ul style="list-style-type: none"> <li>• History of heat-related illness (a victim of a heat-related disorder is permanently predisposed to suffering a recurrence)</li> </ul>
<ul style="list-style-type: none"> <li>• Alcoholism (alcohol reduces heat tolerance and has been commonly associated with the occurrence of heat-related illnesses)</li> </ul>





## 6.5 Emergency Response Procedures

Employees are directed to immediately report to their supervisor or PM, symptoms or signs of heat illness in themselves or in co-workers. Employees should not delay in reporting these observations.

To help ensure proper medical care is provided with minimal delay, supervisors shall take the following steps:

- **Provide First Aid:** As with all HDR field work, at least one certified first aid/CPR responder must be on site at all times. Should an HDR employee exhibit signs or symptoms of possible heat illness, the treatment procedures described in Section 5.0 shall be implemented. An employee exhibiting signs or symptoms of heat illness shall be monitored and shall not be left alone or sent home without being offered assistance. If the signs or symptoms are indicators of severe heat illness (such as, but not limited to, decreased level of consciousness, staggering, vomiting, disorientation, irrational behavior or convulsions), the employer must implement emergency response procedures.
- **Contact EMS:** If Emergency Medical Service (EMS) is required, the HDR field supervisor (or a designee) shall contact EMS. Once contact is established, stay on the phone with EMS to provide clear and precise directions to the work site. If a land line and cell phone coverage are not available, prior to initiating field work, arrangements (satellite phone, two way radio, etc.) shall be made to contact EMS with minimal delay.
- **Determining Directions to the Site:** Prior to beginning field work, the directions from the nearest medical facility to the site shall be documented in the site-specific SH&E Plan and/or JHA forms and shall be kept immediately available at the job site.
- **Plan for Remote Locations:** If potential heat stress victims will be working at remote locations where EMS cannot physically reach, provisions shall be made for transporting the victims to a point where they can be reached by an EMS provider.

## 6.6 Training

### 6.6.1 Employee Training

Prior to being assigned work that has a reasonable potential for exposure to the risk of heat illness, HDR personnel must complete the following training or an equivalent substitute.

- HDR University eLearning – *Heat Stress*
- Review and confirm understanding and access to HDR SH&E Procedure #028, Heat Stress

In addition, for project-specific assignments, the PM shall include review of the following in the project safety orientation and/or onsite daily safety briefing:

- Environmental and personal risk factors for heat illness, as well as the added burden of heat load on the body caused by exertion, clothing and personal protective equipment.
- Heat stress prevention procedures for employee monitoring; fluid intake (including recognition of the importance of frequent consumption of up to 1 liter (4 cups) of water per hour when the work environment is hot and employees are likely to be sweating more than usual); access to shade and cool-down/rest areas; acclimatization; etc.



- Types of heat illness, the progression of common signs and symptoms of exposure from mild to serious and life threatening, and procedures for providing and summoning first aid and/or emergency response.
- Importance of immediately reporting to a supervisor or designee symptoms or signs of heat illness in themselves or in co-workers.
- Site-specific procedures for responding to signs or symptoms of possible heat illness, contacting emergency medical services, and (if necessary) transporting employees to a point where they can be reached by an emergency medical service provider.

### **6.6.2 Supervisor/Project Manager Training**

Prior to managing employees who could be given assignments with a reasonable potential for exposure to the risk of heat illness, supervisors and PMs will be trained on the following:

- Procedures for preventing heat disorders.
- Procedures to follow in the event an employee exhibits signs or reports symptoms consistent with possible heat illness, including first aid and emergency response procedures.
- How to monitor weather reports and how to respond to hot weather advisories.

### **6.7 High-Heat Procedures for Temperatures at or above 35°C (95°F)**

Because of extreme environmental conditions during high heat, employees' physical and mental condition can change even more rapidly into a serious medical condition. The onset of heat illness may be confused with other problems and may not always be obvious before it becomes life-threatening. Therefore, extra measures may be required to prevent and/or respond to heat illness during high heat.

These extra measures include the following to the extent practicable:

- Ensuring that effective communication by voice, observation, or electronic means is maintained so that employees at the work site can contact a supervisor when necessary. An electronic device, such as a cell phone or text messaging device, may be used for this purpose only if reception in the area is reliable.
- Observing employees for alertness and signs or symptoms of heat illness. When feasible, HDR will use the buddy system to meet this requirement. However, regular communication between a sole employee and a supervisor can also be used.
- Reminding employees throughout the work shift to drink plenty of water.
- Closely supervising new employees (by a supervisor or designee) for the first 14 days of the employee's employment, unless the employee indicates at the time of hire that he or she has been doing similar outdoor work for at least 10 of the past 30 days for 4 or more hours per day.
- Closely observing (by a supervisor or designee) all employees during a heat wave. For purposes of this section only, "heat wave" means any day in which the predicted high temperature for the day will be at least 26.7°C (80°F) and at least 5°C (10°F) higher than the average high daily temperature in the preceding five days.



## **6.8 Acclimatization**

Individual susceptibility to heat-related illness can vary widely between workers. Workers become gradually acclimatized when exposed to hot conditions for several weeks. Physical changes in blood vessels and in sweating occur to dissipate heat more effectively.

PMs are responsible for developing a site-specific plan for heat acclimatization when the heat index is high (at or above 39.5°C or 103°F) to protect workers while they adjust, particularly on the first few days of the job.

Full acclimatization may take up to 14 days or longer depending on factors relating to the individual, such as increased risk of heat illness due to certain medications or medical conditions, or the environment.

- All workers should begin on the first day of work in excessive heat with 50% of the normal workload and time spent in the hot environment, 60% on the second day, 80% on the third day, and 100% on the fourth day.
- New workers and those returning from a prolonged absence should begin with 20% of the workload on the first day, increasing by no more than 20% each subsequent day.

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## **7.0 CROSS REFERENCES**

N/A

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## **8.0 FORMS**

*Site-Specific Heat Illness Prevention Plan Template*



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### Revision History

Rev	Description of Change	Issue Date
0	Initial Release	10/01/1998
1	Revisions	09/24/2007
2	Revisions	11/03/2008
3	Revisions	05/06/2009
4	Re-Formatting	06/07/2013
5	Revisions	12/17/2013
6	Re-formatting; added section for safe work practices; added section for training requirements	01/01/2017
7	Program Editorial Changes	07/01/2019
8	Updated training frequency and winter weather vehicle kit	03/28/2019



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## **1.0 PURPOSE**

This procedure presents information regarding the hazards and physiological effects of exposure to low temperatures, wind, and water, and the practices that should be implemented to prevent cold-related injuries and illnesses.

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## **2.0 APPLICABILITY**

The procedure is applicable to all HDR employees who work in cold environments.

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## **3.0 PROCEDURE IMPLEMENTATION**

This procedure will be administered by the HDR Director of Safety, Health, and Environmental (SH&E) and project managers.

### **3.1 Director of SH&E**

The Director of SH&E shall:

- Periodically review, at least annually, the effectiveness of this procedure, identify any deficiencies, and ensure that they are corrected.
- Assist project professionals, as requested, in the implementation of this procedure and regulatory interpretations.

### **3.2 Project Managers**

Project Managers shall:

- Identify projects with a potential risk of cold stress.
- Develop and maintain written job-specific safe work procedures.
- Inform workers and their supervisors where their work involves potential risk of cold stress.
- Verify that training on this procedure has been received by their applicable project staff.
- Interface with the SC and/or Director of SH&E regarding any cold stress project site conditions that need addressing or interpretation.

### **3.3 Workers**

Workers shall:

- Be familiar with cold stress hazards, predisposing factors and preventative measures.
- Follow safe work procedures established to prevent cold-stress related injuries.
- Follow recommended schedule of rest breaks, as advised by supervisors, to prevent frostbite or hypothermia.
- Understand and be able to recognize frostbite, frostnip and hypothermia.



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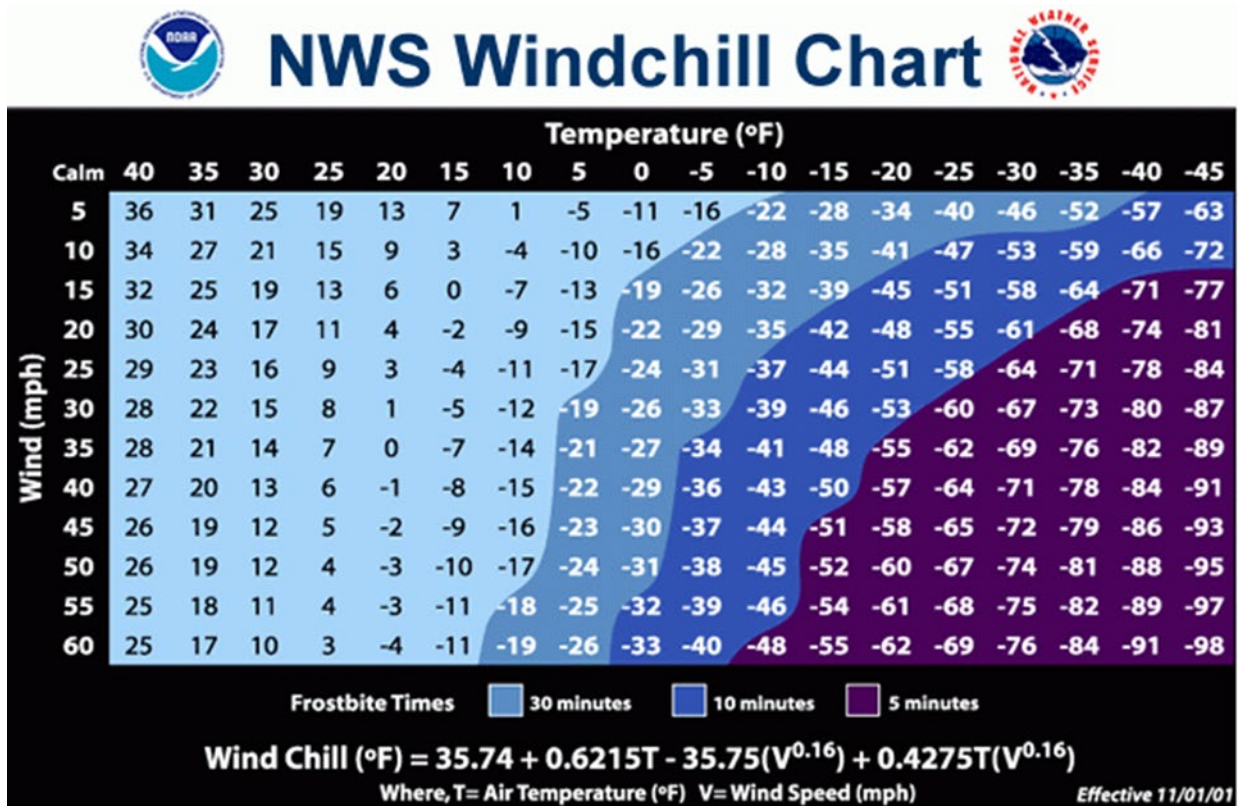
## 4.0 SAFE WORK PRACTICES

The following prevention practices for working in cold environments apply to healthy employees in fair to good physical condition. Older employees or those with circulatory problems may need to avoid extremely cold environments or wear extra clothing. Workers who are suffering from diseases or taking medication that interferes with normal body temperature regulation, or which reduces tolerance to cold environments, should be excluded from prolonged work in cold below 30° F (–1° C).

- **Know the weather conditions.**
  - Wind chill is the term used to describe the rate of heat loss from the human body, resulting from the combined effect of low air temperature and wind speed. The Wind Chill Temperature is a single value that takes both air temperature and wind speed into account. It is essentially the air temperature that would feel the same on exposed human flesh as the given combination of air temperature and wind speed.
  - It is important for field teams to know the wind chill temperature so they can gauge exposure risk and plan how to safely do the work. Check weather reports and preplan so that work is performed during the warmest periods of the day.
  - Limit the use of rotating or vibrating tools in cold environments.
  - Accurate weather conditions in real time can be found at the following website:  
<https://www.weather.gov/forecasts.php>
- **Wear appropriate clothing.**
  - Wear at least three layers of loose fitting clothing. Layering provides better insulation. Trapped air between the layers is the best insulation and layers can be removed to avoid sweating and subsequent chill.
    - An inner layer of wool, silk or synthetic to keep moisture away from the body. (Cotton loses its insulation value when it becomes wet. Wool, silk and most synthetics, on the other hand, retain their insulation even when wet.)
    - A middle layer of wool or synthetic to provide insulation even when wet.
    - An outer wind and rain protection layer that allows some ventilation to prevent overheating.
  - Wear a hat or hood to help keep your whole body warmer. Hats reduce the amount of body heat that escapes from your head.
  - Wear a knit facemask, scarf, or other covering to cover the face and mouth and protect the lungs from cold air.
  - Use insulated gloves to protect the hands (water resistant if necessary).
    - If the task precludes the wearing of mittens or gloves, establish special provisions to allow the workers to frequently warm their hands (e.g., provide battery-operated hand warmers, contact warm plates, or radiant heaters).
  - Wear insulated and waterproof boots (or other footwear).

- Use of steel-toed safety shoes may become uncomfortable, as low ground temperatures are transmitted to the user's feet. It may become necessary to substitute alternative protective footwear, such as high impact plastic/rubber-composition footwear, during cold periods.
- Cover all exposed skin by referencing table 1.
- Wear safety glasses/goggles possessing ultraviolet/glare protection when there is an expanse of snow coverage causing a potential eye hazard from blowing ice crystals or reflective radiation.
- To prevent contact frostbite, avoid bare skin to metal contact at absolute temperatures below freezing, 32° F (0° C). Metal tool handles should be covered by insulation. Or, alternately, where fine manual dexterity is not required, insulating gloves may be worn.
- When cold surfaces below -7°C are within reach, a warning should be given to prevent inadvertent contact with bare hands.

**Table 1 Wind-chill Chart**



- **Stay dry.**
  - Provide extra insulating clothing on site so wet or damp clothing can be changed as soon as possible.
  - If the work involved presents the possibility of becoming wet through splashing, wear an outer layer of impermeable clothing.



- At air temperatures of 35.6°F (2°C) or less, if a worker becomes immersed in water or their clothing becomes wet (from external sources, not incidental sweat) immediately provide a change of clothing and observe for symptoms of hypothermia.
  
- **Pace the work and take breaks.**
  - Pace the work to avoid excessive sweating. If such work is necessary, establish a schedule for rest breaks in a warm area and have employees change into dry clothes. See attached work/warm up schedule and work restrictions based on wind chill.
  - Provide new employees time to get acclimated to the cold and the use of protective clothing before they assume a full work load.
  - For continuous work in temperatures below the freezing point, provide a heated warming shelter (car, rest room, tent, office, etc.). When entering the shelter, remove the outer layer of clothing and loosen the remainder of clothing to permit the evaporation of sweat.
  
- **Use the buddy system.**
  - For work in cold environments, use the buddy system to ensure constant protective observation.
  - Monitor one another's physical condition during tasks, especially new workers who may not be used to working in the cold and workers returning after spending time away from work.
  
- **Take precautions when working with evaporative liquids.**
  - Take extra care when handling evaporative liquids (gasoline, alcohol, cleaning fluids, etc.) at air temperatures below 39.2° F (4° C). If these liquids are soaked into clothing or gloves, the subsequent rapid evaporative cooling can result in frostbite.
  
- **Maintain proper eating and drinking.**
  - Provide warm sweet drinks and soups to replenish caloric intake and fluid volume. Food provides fuel to be burned and warm fluids directly provide heat and prevent dehydration.
  - Limit the intake of coffee because of the diuretic and circulatory effects. The same applies to alcohol consumption, which increases blood circulation to the skin, and interferes with mental acuity, which can lead to risk taking.
  
- **Be cognizant of the signs and symptoms of cold-related injuries/illnesses.**
  - Immediately terminate exposure to cold and return to the shelter if experiencing observable shivering, pain in extremities, excessive fatigue, or drowsiness (see Section 5.0).





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## 5.0 COLD-RELATED INJURIES/ILLNESSES

Cold related injuries require immediate removal from the cold environment and proper medical treatment. The supportive first aid measures included here are to be used only until proper medical treatment by a qualified physician can begin.

### 5.1 Hypothermia

Hypothermia results when the body core temperature falls below 95° F (35° C). If the body core temperature drops below this critical level, the victim cannot produce enough body heat to recover. Prolonged exposure to cold air or to immersion in cold water at temperatures well above freezing can lead to hypothermia. Hypothermia is a medical emergency. Untreated, it can lead to ventricular fibrillation (heart attack) and death.

Signs and symptoms of hypothermia:

- Uncontrollable shivering
- Dizziness
- Weakness
- Slurred speech
- Impaired judgment, disorientation, or incoherence
- Apathy, listlessness, or sleepiness
- Decreased pulse and breathing rates
- Loss of consciousness

Hypothermia first aid:

- Call for emergency medical services (EMS).
- Remove the victim to a warm area out of any wind.
- Remove all cold and/or wet clothing.
- Wrap in warm blankets.
- If conscious and able to converse, give the victim warm (non-caffeinated, non-alcoholic) liquids to drink.
- Keep the victim awake until medical assistance arrives.

### 5.2 FrostNip

Frostnip is a superficial nonfreezing cold injury due to vasoconstriction. The skin will be pale and may have paresthesia or numbness. It is common on exposed skin including cheeks, ears, and nose. The skin is still pliable. This is a major difference between frostnip and frostbite. If rewarmed at this point, there is no permanent tissue damage. If you identify a body part with frostnip, warm it immediately.



Frostnip is a precursor to frostbite and once recognized, appropriate precautions should be taken to treat it and prevent progression and recurrence.

### **5.3 Frostbite**

Pain in the extremities is commonly the first early warning sign of the onset of cold stress. While frostbite (the actual freezing of body tissue) will occur only at absolute temperatures below freezing (32° F (0° C)) (regardless of wind speed), unpleasant cold sensations in extremities may be felt at higher temperatures and heat loss in extremities can assist in the onset of hypothermia. Extremities most commonly affected are your toes, fingers, nose, and ears.

Frostbite can also occur when bare skin comes into contact with objects whose surface temperature is below freezing (despite warm ambient temperatures) or when skin is exposed to either an escaping gas with a high vapor pressure or a liquid with a very low boiling point. Examples include liquid ammonia, gasoline, and other alcohols. All liquids must have heat added to them in order to evaporate. The liquid acquires the necessary heat from its immediate surroundings. If the liquid is on human skin, the heat will be drawn from the warm skin surface, resulting in very rapid cooling of the skin surface.

Frostbite damage may be reversible if properly treated in the first 12 to 24 hours. Sometimes the area is particularly sensitive to cold for months or years afterward. If not treated, frostbitten areas may become gangrenous.

Signs and symptoms of frostbite:

- Sharp prickling sensation in affected area
- Area feels cold and numb
- Incipient frostbite (frostnip) - skin is blanched or whitened (because of a lack of oxygen) and feels hard on the surface
- Moderate frostbite - large blisters
- Deep frostbite - tissues are cold, pale, and hard

Frostbite first aid:

- For minor frostbite:
  - Gradually warm the affected body parts by placing them next to warm skin (such as the abdomen and the armpit).
  - Contact WorkCare (888-449-7787) for further guidance.
- For more serious frostbite:
  - When EMS is available, or there is any chance that the part may refreeze (for example, you are in a remote site and warming up in a shelter but must return to the cold to get back to your vehicle/permanent shelter), do not try to rewarm the frostbitten area. If a frostbitten area is rewarmed and gets frozen again, more tissue damage will occur. It is safer for the frostbitten area to be rewarmed by medical professionals.
  - If EMS is not readily available, and there is no chance refreezing will occur, rewarm the affected body part by immersing it in warm water for 20 to 30 minutes. The water should be just above normal body temperature (not too hot).



- Loosely cover and protect the area from contact.
- Do not rub the frostbitten part, and do not break any blisters.
- Provide warm drinks (non-caffeinated, non-alcoholic), and do not let the victim smoke.
- Be aware that the tissue may itch and/or hurt intensely as it thaws.
- The victim should not use the affected limb or area until cleared by a physician.

#### **5.4 Raynaud's Phenomenon**

Raynaud's Phenomenon, also called "white fingers," is a vascular abnormality characterized by a loss of circulation in the fingers and/or toes associated with exposure to cold and/or vibration. The onset of Raynaud's Phenomenon is gradual, and is characterized by several stages. The initial stage is manifested by occasional pain, and a slight loss of hand sensitivity. If removed from cold and vibration, it is usually reversible at this stage. As the condition worsens, pain and numbness increases, and finger sensitivity decreases. As the blood vessels are damaged, blood flow slows and the skin temperature decreases. In the pronounced stages, fingers become white and the hands feel cold and moist. At this point, the condition is irreversible. Employees who routinely work in cold environments should limit the duration that they use rotating or vibrating tools.

Signs and symptoms of Raynaud's Phenomenon:

- Cold fingers or toes
- Color changes in your skin in response to cold
- Numb, prickly feeling or stinging pain upon warming
- Loss of sensitivity in fingers or toes

Raynaud's Phenomenon first aid:

- Remove worker from cold and vibration
- Treat similar to frostbite

#### **5.5 Immersion Foot**

Immersion foot, also known as trench foot, is an injury of the feet resulting from prolonged exposure to wet and cold conditions. The condition may be aggravated by tight footwear. Immersion foot can occur at temperatures as high as 60 °F if the feet are constantly wet. Injury occurs because wet feet lose heat 25-times faster than dry feet. Therefore, to prevent heat loss, the body constricts blood vessels to shut down circulation in the feet. Skin tissue begins to die because of lack of oxygen and nutrients and due to the buildup of toxic products.

Signs and symptoms of immersion foot:

- Reddening or discoloration of the foot
- Numbness
- Swelling
- Tingling pain



- Blisters or ulcers
- Bleeding under the skin

Immersion foot prevention:

- Put on clean, dry socks daily.
- Thoroughly clean and dry the feet after exposure.
- When sleeping or resting, do not wear socks.

Immersion foot first aid:

- Remove shoes/boots and wet socks
- Treat similar to frostbite

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## 6.0 INCIDENT REPORTING AND INVESTIGATION

Report all cold stress incidents to your supervisor and project manager and complete an Incident Report in IndustrySafe (<https://www.industrysafe.com/hdrinc>). For non-emergency injury/illness symptoms, call WorkCare (888-449-7787). For emergencies, call for emergency medical services.

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## 7.0 TRAINING

Prior to field work in cold environments, HDR personnel must complete the following training or an equivalent substitute.

- Review and confirm understanding of HDR SHE& Procedure #029, Cold Stress
- HDR University eLearning – *Cold Stress*

Project orientations and Job Hazard Analysis for assignments involving work in cold environments will include review of the following (minimum annually) as applicable to site conditions: health effects of cold exposure, proper rewarming procedures, recognition and first aid for frostbite and hypothermia, required protective clothing, proper use of warming shelters, the buddy system, assignment-specific vehicle breakdown procedures, and proper eating and drinking habits for working in the cold.





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## 8.0 ATTACHMENTS

Attachment 1 - Work/Warm Up Schedule Based on Wind Chill



### Work/Warm-up Schedule for a 4-Hour Shift

Air Temperature--Sunny Sky		No Noticeable Wind		5 mph Wind		10 mph Wind		15 mph Wind		20 mph Wind	
<sup>°F</sup> (approximate)	<sup>°C</sup> (approximate)	Maximum Work Period	Number of Breaks	Maximum Work Period	Number of Breaks	Maximum Work Period	Number of Breaks	Maximum Work Period	Number of Breaks	Maximum Work Period	Number of Breaks
-26 to -28	-15 to -19	(Normal Breaks ) 1		(Normal Breaks ) 1		75 min	2	55 min	3	40 min	4
-29 to -31	-20 to -24	(Normal Breaks ) 1		75 min	2	55 min	3	40 min	4	30 min	5
-32 to -34	-25 to -29	75 min	2	55 min	3	40 min	4	30 min	5	Non-emergency work should cease 	
-35 to -37	-30 to -34	55 min	3	40 min	4	30 min	5	Non-emergency work should cease 			
-38 to -39	-35 to -39	40 min	4	30 min	5	Non-emergency work should cease 					
-40 to -42	-40 to -44	30 min	5	Non-emergency work should cease 							
-43 & below	-45 & below	Non-emergency work should cease									

Schedule applies to any 4-hour work period with moderate to heavy work activity; with warm-up periods of ten (10) minutes in a warm location and with an extended break (e.g. lunch) at the end of the 4-hour work period in a warm location.

*Adapted from ACGIH 2012 TLVs*

## SH&E Procedure #030 – First Aid, CPR, and AED Program Table of Contents

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### Revision History

Rev	Description of Change	Issue Date
0	Initial Release	02/01/1999
1	Revisions	07/16/2003
2	Revisions	01/22/2004
3	Revisions	11/21/2008
4	Revisions	02/28/2010



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5	Reformatting	07/16/2013
6	Revisions	11/20/2013
7	Reformatting; added WorkCare information; revised first aid supplies section for consistency with ANSI/ISEA Z308.1-2015; added requirements for emergency eyewashes/showers.	01/10/2017

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## 1.0 PURPOSE

This procedure establishes provisions for first aid care in the workplace. The information and requirements presented in this procedure are in compliance with *OSHA 29 CFR 1910.151 and 29 CFR 1926.50 – Medical Services and First Aid*.

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## 2.0 APPLICABILITY

This procedure is applicable to all HDR personnel.

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## 3.0 PROCEDURE IMPLEMENTATION

This procedure will be administered by the HDR Director of Safety, Health, and Environmental (SH&E), local Safety Coordinators (SCs), project managers (PMs), and Automated External Defibrillator (AED) Site Coordinators.

### 3.1 Director of SH&E

The Director of SH&E shall:

- Review, at least annually, the effectiveness of this procedure, identify any deficiencies, and ensure that they are corrected.
- Provide guidance to SCs and PMs concerning implementation of these procedures.
- Assist SCs and PMs in locating appropriate training instructors.

### 3.2 Safety Coordinators

SCs shall:

- Determine medical and first aid requirements for their respective office location and work with management to designate first aid responders as necessary.
- Ensure designated first aid responders are provided certification in first aid/CPR.
- Ensure the availability of adequate first aid supplies in the office and replace expended items and supplies at least monthly.

### 3.3 Project Managers

PMs shall:

- Determine medical and first aid requirements for project sites and designate first aid responders as necessary.



- Ensure designated first aid responders are provided certification in first aid/CPR.
- Confirm the contents of project first aid kits at the start of field operations to ensure the availability of adequate first aid supplies at project sites and replace expended items and supplies at least weekly.

### **3.4 AED Site Coordinators**

AED Site Coordinators shall:

- Notify Corporate SH&E of the purchase of any new AED units.
- Conduct and record monthly AED status checks.

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## **4.0 PROCEDURES**

### **4.1 Emergency Injury/Illness Notification and Transportation**

For emergency injuries/illnesses, SCs and PMs are responsible for developing a communication system at each office and project site for contacting ambulance services to transport injured persons to a physician or hospital. This system must be included in the office or job site emergency action plan, as applicable (see *HDR SH&E Procedure #024, Emergency Action Plan Template*).

In areas where 911 is not available, SCs and PMs are responsible for ensuring telephone numbers for contacting emergency services are conspicuously posted.

### **4.2 WorkCare for Non-Emergency Injuries/Illness**

For non-emergency injuries/illnesses, employees are to contact their supervisor and then call WorkCare's Incident Intervention hotline at 888-449-7787 for consultation (WorkCare provides 24/7 telephonic access to occupational nurses and physicians).

### **4.3 First Aid Providers**

OSHA requires that employers ensure prompt first aid treatment for injured employees, either by providing for the availability of a trained first aid provider at the worksite or by ensuring that emergency treatment services are within "near proximity" of the worksite. OSHA guidance on the definition of "near proximity" is as follows:

- 3-4 minutes (from notification until initiation of first aid) at work sites where serious accidents such as those involving falls, suffocation, electrocution, or amputation are possible.
- 15 minutes at work sites, such as offices, where the possibility of serious work-related injuries is remote.

If an HDR office or project site is located such that the near proximity response times cannot be met, at least one on-site first-aid provider with current certification must be designated for the site. At remote sites, at least two first-aid providers must be present at the job site. A site is "remote" if it is isolated from normal human activities or if travel over unmarked roads or off-road is required. Note that some clients/contracts require designation of a minimum of two certified first-aid providers at project sites.

Factors for SCs and PMs to consider in determining the number of first aid providers to designate for a building/job site include the following:

- Types of work performed and the nature of hazards associated with those types of work





- Typical number of occupants/staff present
- Typical operating hours of the building/site
- Coverage for periods when the designated provider is absent/away from the building/site
- Physical size and layout of the building/site
- Proximity to emergency service response

#### 4.4 First Aid Supplies

SCs and PMs must evaluate their office and project sites to ensure first aid supplies are easily accessible (including in job site trailers and project vehicles) and are adequate for the environments in which they are used based on the number of employees, physical layout, and the remoteness to emergency services.

##### 4.4.1 First Aid Kits

ANSI/ISEA Z308.1-2015 establishes minimum performance requirements for first aid kits. There are two classes of first aid kits (based on the assortment and quantity of first aid supplies), and four types of first aid kit containers (based on the work environment) (see Table 1).

**Table 1**  
**First Aid Kit Classes and Types**

Classes of First Aid Kits			
Class A		Class B	
Designed to deal with the most common types of workplace injuries such as minor cuts, abrasions and sprains.		Designed with a broader range and quantity of supplies to deal with injuries in more complex or high-risk environments.	
Types of First Aid Containers			
Type I (Indoor)	Type II (Indoor)	Type III (Indoor/Outdoor)	Type IV (Indoor/Outdoor)
Stationary, indoor applications where kit contents have minimal potential for damage due to environmental factors and rough handling.	Portable indoor applications where the potential for damage due to environmental factors and rough handling is minimal.	Portable use in mobile indoor and/or outdoor settings where the potential for damage due to environmental factors is not probable.	Portable use in mobile industries and/or outdoor applications where the potential for damage due to environmental factors and rough handling is significant.

HDR offices must be equipped with one or more Class A Type I or Type II kits. Field operations require one or more Class A Type III or Type IV kits. For construction operations, items must be stored in a weather proof container (Type III or IV first aid kit) with individually sealed packages of each type of item. Minimum kit contents per ANSI/ISEA Z308.1-2015 are summarized in Table 2.

When deciding the type of kit, SCs and PMs must consider the risks that are present and the potential severity and likelihood of an incident. If unsure in what to select, contact Corporate SH&E for assistance.



**Table 2**  
**ANSI Minimum Fill Requirements<sup>1</sup>**

<b>Class A – Type I, II, III, or IV First Aid Kit Contents</b>			
16	Adhesive Bandage, 1 x 3 in.	1	Eye/Skin Wash, 1 fl oz.
1	Adhesive Tape, 2.5 yd.	1	First Aid Guide
10	Antibiotic Application, 1/57 oz.	6	Hand Sanitizer, 1/32 oz.
10	Antiseptic, 1/57 oz.	2 pair	Medical Exam Gloves
1	Breathing Barrier (CPR barrier mask)	2	Roller Bandage, 2 in. x 4 yd.
1	Burn Dressing (Gel Soaked), 4 x 4 in.	2	Scissors
10	Burn Treatment, 1/32 oz.	2	Sterile Pad, 3 x 3 in.
1	Cold Pack, 4 x 5 in.	2	Trauma Pad, 5 x 9 in.
2	Eye Covering (with means of attachment) 2.9 in <sup>2</sup> .	1	Triangular Bandage, 40x40x56 in.
<b>Class B - Type I, II, III, or IV First Aid Kit Contents</b>			
50	Adhesive Bandage, 1 x 3 in.	10	Hand Sanitizer, 1/32 oz.
2	Adhesive Tape, 2.5 yd.	4 pair	Medical Exam Gloves
25	Antibiotic Application, 1/57 oz.	2	Roller Bandage, 2 in. x 4 yd.
50	Antiseptic, 1/57 oz.	1	Roller Bandage, 4 in. x 4 yd.
1	Breathing Barrier (CPR barrier mask)	1	Splint
2	Burn Dressing (Gel Soaked), 4 x 4 in.	1	Scissors
25	Burn Treatment, 1/32 oz.	4	Sterile Pad, 3 x 3 in.
2	Cold Pack, 4 x 5 in.	1	Tourniquet
2	Eye Covering with Means of Attachment, 2.9 in <sup>2</sup> .	4	Trauma Pad, 5 x 9 in.
1	Eye/Skin Wash, 4 fl oz.	2	Triangular Bandage, 40x40x56 in.
1	First Aid Guide		
<sup>1</sup> If over-the-counter medicine is put in first aid kits, it must be packaged in single-dose, tamper-evident packaging and labeled as required by Food and Drug Administration (FDA) regulations. Over-the-counter drug products should not contain ingredients known to cause drowsiness.			

**4.4.2 Maintenance and Inspection**

SCs and PMs must regularly inspect all first aid kits to ensure they are full, in good condition, and that contents that have expiration dates have not expired. First aid kits for specific projects shall be checked by the PM before being sent out on the project and at least weekly. First aid kits for office locations shall be checked at least monthly by the responsible SC.



## 4.5 Emergency Eyewash/Shower for Corrosives

Where the eyes or body of any person may be exposed to injurious corrosive materials, it should be confirmed prior to initiation of project activities that suitable facilities for quick drenching or flushing of the eyes and body are available within the work area for immediate emergency use. (Corrosive materials are typically labeled as such, and the corresponding SDS will state “corrosive” on it).

### 4.5.1 Placement and Location

American National Standards Institute (ANSI) Standard Z358.1-2004, “Emergency Eyewash and Shower Equipment” recommends the following regarding placement and location:

- Eyewash units shall be in accessible locations that require no more than 10 seconds to reach from the point of exposure and should be within a travel distance no greater than 100 feet (30.5 meters) from the hazard.
- The unit should be located as close to the hazard as possible, and on the same level.
- The maximum time required to reach the eyewash should be determined by the potential effect of the chemical. For a strong acid or strong caustic, the eyewash should be immediately adjacent to or within 10 feet (3 meters) of the hazard.

Other recommendations include that the emergency shower or eyewash station should:

- Not be separated by a partition from the hazardous work area.
- Be on an unobstructed path between the workstation and the hazard. (Workers should not have to pass through doorways or weave through machinery or other obstacles to reach them.)
- Be located where workers can easily see them - preferably in a normal traffic pattern.
- Be on the same floor as the hazard (no stairs to travel between the workstation and the emergency equipment)
- Be located near an emergency exit where possible so that any responding emergency response personnel can reach the victim easily.
- Be located in an area where further contamination will not occur
- Provide a drainage system for the excess water (remember that the water may be considered a hazardous waste and special regulations may apply).
- Not come into contact with any electrical equipment that may become a hazard when wet.
- Be protected from freezing when installing emergency equipment outdoors.

### 4.5.2 Design

Emergency eyewashes should not be confused with portable squeeze rinse bottles. By definition, an eyewash must be so designed as to deliver 0.4 gallons per minute, for 15 minutes minimum, of potable water in a steady stream (therefore, a minimum capacity of 6 gallons). These units may be plumbed (fixed facilities), or portable (construction sites). Commonly used portable units have a poly tank holding 6 gallons and is set up near the hazardous operation, then filled with water. The eyewash flow should flush both eyes simultaneously, with a velocity low enough not to be injurious to the user. Also,



the activating control valves on all units must be designed so that the water flow remains on without the use of the operator's hands.

#### **4.5.3 Sanitation**

Users of eyewashes have injured eyes-this means the protective surface of the eye has been compromised in some way, and a pathway for infection may now exist. If any eyewash unit is unused for extended periods, pathogenic bacteria may grow in the dead-water pipe, and infect the eye(s) of the user. Plumbed units are required to be flushed weekly, to prevent the proliferation of bacteria in the dead-water zone, but this issue is more complicated for portable units. There are only two options for portables-either change out the water weekly (which is usually not feasible, due to the weight of these units, and the difficulty of transportation), or use a commercially prepared anti-bacterial additive.

All eyewash nozzles must be protected from worksite contamination by keeping the nozzle caps on the nozzles when not in use. Contaminated nozzles can introduce microbial agents into the injured eye, resulting in serious eye infections.

#### **4.5.4 Freeze Protection**

When portable units are used in cold weather, they may freeze. There are two classes of cold-weather eyewash/shower portable units available: freeze-resistant and freeze-protected. Neither type is necessarily water tempering-that is, the water being dispensed will be at ambient temperature.

Freeze-resistant systems are designed to withstand sub-freezing temperatures for brief periods only, are plumbed units, and are not generally recommended. Freeze-protected units are electrically heat-traced, and therefore can be used throughout extreme, long-duration, cold periods. Freeze protection for portable units can be accomplished by installing a heating core into the reservoir tank, which electrically heats the water to above freezing.

### **4.6 Automated External Defibrillators (AEDs)**

Many HDR offices have a Zoll Plus AED (HDR's preferred model) or other brand/model AED available for use in resuscitating a victim experiencing sudden cardiac arrest. SCs are responsible for ensuring AED units include a CPR barrier mask in the AED case (this should be a single-use device with a one-way valve, filter medium, or other equivalent method for providing protection from direct contact with bodily fluids).

If an office purchases an AED, Corporate SH&E must be notified with the serial number, brand/model and office location so the unit can be registered with En-Pro. HDR has a partnership with En-Pro to manage our AED program. En-Pro operates PlusTrac, an interactive, web-based AED management system that is available globally ([www.plustrac.com](http://www.plustrac.com)). En-Pro ensures HDR is compliant with all local, state, national and global registrations and, since AEDs are considered medical devices, serves as the HDR program medical director overseeing all of our AEDs (all brands and models).

Each HDR office with an AED must identify two AED Site Coordinators and provide these names to Corporate SH&E. The AED Site Coordinators are responsible for conducting monthly AED status checks and logging onto the PlusTrac site ([www.plustrac.com](http://www.plustrac.com)) to confirm completion of the check. The status check is conducted to confirm the unit is functioning properly and is done by looking at the visual indicator on the front of the AED. On Zoll units, it is located on the bottom left. The visual indicator displays whether the AED is functioning correctly or not (e.g., depending on brand, it may indicate a green check or "OK" for good, or a red "X" or other obvious sign for trouble).



Status checks must be completed by the 28<sup>th</sup> of each month. The only way we can verify that our AEDs are in a shock-ready state is through regular status checks, so these monthly checks are an essential part of our program. En-Pro provides alerts to both the local AED Site Coordinators and Corporate SH&E whenever:

- Monthly status checks are not being timely performed,
- A recall has been issued for that AED, or
- The AED consumables (pads and batteries) are nearing the end of their service life.

#### **4.7 Incident Reporting**

All incidents involving (near miss, injury/illness, damage, security, environmental) must be reported and investigated as per *HDR SH&E Management System – 007, Incident Reporting and Investigation*.

First aid incidents involving the presence of blood or other potentially infectious materials must be reported before the end of the work shift during which the incident occurred. The report must include the names of all first aid providers who rendered assistance, regardless of whether personal protective equipment was used and must describe the first aid incident, including time and date. Corporate SH&E will make a determination as to whether post-exposure evaluation, prophylaxis<sup>1</sup>, and follow-up procedures are necessary (see *HDR SH&E Procedure #008, Bloodborne Pathogens Exposure Control Plan*).

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## **5.0 TRAINING**

Designated first aid responders will be provided first aid and CPR certification training from the American Heart Association, the American Red Cross, the National Safety Council, or equivalent training that can be verified by documentary evidence (such as Amerencia Safety and Health Institute). Designated first aid responders shall also be provided training on *HDR SH&E Procedure #008, Bloodborne Pathogens Exposure Control Plan*.

Training on the use of AEDs is available on HDR University and is encouraged for all employees.

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## **6.0 CROSS REFERENCES**

*29 CFR 1910.151 and 29 CFR 1926.50 – Medical Services and First Aid*

*ANSI/ISEA Z308.1-2015 – Minimum Requirements for Workplace First Aid Kits and Supplies*

En-Pro PlusTrac site ([www.plustrac.com](http://www.plustrac.com))

*HDR SH&E Procedure #024, Emergency Action Plan Template*

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<sup>1</sup> Note that HDR first aid providers whose only exposure to blood is from potentially responding to workplace incidents are not offered the hepatitis B vaccination series at the time of assignment. Provision for the full hepatitis B vaccination series will be made available as soon as possible (no later than 24 hours) to any employee who has rendered assistance in a situation involving the presence of blood or other potentially infectious materials (see *HDR SH&E Procedure #008, Bloodborne Pathogens Exposure Control Plan*).

*HDR SH&E Management System – 007, Incident Reporting and Investigation*

*HDR SH&E Procedure #008, Bloodborne Pathogens Exposure Control Plan*

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## **7.0 LIST OF ATTACHMENTS**

None



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**Revision History**

Rev	Description of Change	Issue Date
0	Initial Release	10/01/1998
1	Revisions	09/24/2007
2	Revisions	11/03/2008
3	Revisions	05/06/2009
4	Re-Formatting	06/07/2013
5	Revisions	11/20/2013
6	Re-Formatting	12/13/2014
7	Procedure reorganized to include recommended controls and prevention and Incident response and reporting subsections for each hazard. Section added addressing training requirements.	06/01/2016
8	Additional content added regarding ticks and Valley Fever.	07/21/2020





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## 1.0 PURPOSE

This procedure provides safe work practices for employees who may encounter biological hazards when conducting field work. Sources of such hazards include wildlife and organisms that have the ability to injure, bite, sting, or cause some form of allergic reaction or infection to those exposed (such as plants, insects, arachnids, snakes, alligators, mammals, and disease causing pathogens).

Biological hazards associated with the contact of human blood and bodily fluids are addressed in SH&E Procedure #008, *Bloodborne Pathogens Exposure Control Plan*.

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## 2.0 APPLICABILITY

This procedure is applicable to all HDR employees with potential for exposure to biological hazards.

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## 3.0 PROCEDURE IMPLEMENTATION

This procedure will be administered by the HDR Director of SH&E, Regional/Area SH&E Managers, local Safety Coordinators (SCs), and project managers (PMs).

### 3.1 Director of SH&E

The Director of SH&E shall:

- Review, at least annually, the effectiveness of this procedure, identify any deficiencies and ensure that they are corrected.

### 3.2 Regional/Area SH&E Managers

Regional/Area SH&E Managers shall:

- Following any near miss or injury/illness incident involving biological hazards, review and revise this procedure as necessary.
- Assist SCs and project professionals in the implementation of this procedure.

### 3.3 Safety Coordinators

SCs shall:

- Arrange initial training and periodic retraining (if required) on this procedure to respective staff.

### 3.4 Project Managers

PMs shall:

- Assure that this procedure is followed by project employees and verify assigned employees exposed to biological hazards are properly trained and equipped to perform their duties safely.
- Interface with the SC and/or Director of SH&E regarding any unsafe project site situations that have been discovered and need addressing or interpretation.
- Designate an adequate number of first aid/CPR trained providers for all project sites and ensure field teams have adequate first aid supplies (see SH&E Procedure #030, *First Aid, CPR, AED Program*).



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## 4.0 DEFINITIONS

Term	Definition
Pathogen	A microbial agent capable of causing disease in humans.

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## 5.0 SAFE WORK PRACTICES

### 5.1 Plants

#### 5.1.1 Description

##### 5.1.1.1 Poison Ivy, Poison Oak, Poison Sumac, Poisonwood

Any person working outdoors is at risk of exposure to poisonous plants, such as poison ivy, poison oak, and poison sumac. These plants are found among trees, shrubs, vegetables, and vines. When in contact with skin, the sap oil of these plants (urushiol) can cause an allergic reaction. All parts of the plant contain this oil including the leaves, vines, and berries.

Exposure can occur from direct contact as well as from touching clothing, shoes, tools, equipment, and other objects that have come in contact with the urushiol. Exposure can also occur through inhalation of smoke produced from burning these plants.

**Poison Ivy** can be found in every region of the United States except the Southwest, Alaska and Hawaii. It grows in the form of a vine (and shrub in its early growth) along riverbanks, rocky fields, pastures, thickets, woods, and waste places and often climbs trees, fences, and dwellings. The plant is identified by having shiny green leaves grouped in threes and its woody vine which generates a proliferation of aerial rootlets resembling a reddish beard. The leaves turn red in fall. Another feature used to identify poison ivy is its small waxy globe-shaped, white, berry-like fruits.

**Poison Oak** is found on the west coast (CA, OR, WA). Poison oak is a perennial shrub with slender stems, which are erect and woody, with one or a few erect branches. It does not climb nor does it have aerial roots. The leaves are similar in number (three), arrangement and coloration to poison ivy. The leaves are oblong (resembling oak leaves) and are hairy on the top surface and velvety beneath. The fruit is a small pale green to whitish-tan berry. Poison oak grows in dry barrens, sandy wastes, pinewoods, and sandy woods.

**Poison Sumac** grows abundantly along the Mississippi River and swamps of eastern North America, but is far less common in other regions. It grows as a shrub to approximately 25 feet in height. Each stem contains seven to thirteen leaves arranged in pairs. The leaf and leaflet stalks are reddish with clustered whitish fruits, which resemble those of poison ivy.

**Poisonwood** grows abundantly in the Florida Keys and can also be found in various ecosystems in Southern Florida and the Bahamas, south through the Caribbean. Poisonwood has loose clusters of small green and yellow flowers that appear from late winter through late summer, and produce an abundance of small, orange, oblong fruits. All parts of the tree contain urushiol.

##### 5.1.1.2 Wild Parsnip

Wild Parsnip is a noxious plant that grows more than 5 feet tall and has a yellow, umbrella-shaped cluster of flowers. Common in the North Central US, the plant sap contains photosensitive chemicals that when smeared on human skin and activated by the presence of natural sunlight, causes nasty chemical burns ("phyto-photo-dermatitis") about 24-48 hours after exposure.



Wild Parsnip grows in clusters, and aggressively invades soils found in roadside ditches and other areas of recent disturbance where the natural vegetation is sparse or missing. Unlike poison ivy, just brushing against the plant doesn't produce the symptoms – you must get the crushed leaf or stem sap on your skin, and then it must receive direct ultra violet radiation found in sunlight. Cases may be misdiagnosed as poison ivy.

The sap is lipid-soluble, meaning it is rapidly absorbed into the skin so washing is effective only if done immediately after contact. However, the potency of the sap seems to diminish over time, so the exposed skin's sensitivity to UV light appears to peak 30-120 minutes post contact. In mild cases, the skin reddens and appears sunburned for a day or so. In severe cases, blisters form and eventually erupt. In some cases, may leave a brownish pigmentation that can persist for years.

### **5.1.1.3 Stinging Nettle**

Stinging nettle is an erect, herbaceous perennial that is widely known for its unpleasant stinging hairs on the stems and lower leaf surface. It reproduces by wind-dispersed seeds and creeping rhizomes (horizontal underground stems), and grows in dense clumps, often forming large colonies. It is widespread throughout the eastern U.S. and thrives in damp, nutrient-rich soil and does not grow well where soil nutrients, especially phosphorus, are low. It can be found in pastures, nurseries, orchards, neglected yards, waste places, roadsides, flood plains, stream banks and ditches, as well as along the edges of fields and woodlots where it tolerates partial shade. This species does not tolerate saline conditions.

Stinging hairs on the stem and leaves of stinging nettle cause irritation upon contact with skin. The toxins are located at the base of each stinging hair. When skin brushes against the stinging hairs, the bulbous tip of each hair readily breaks off, forming a sharp shaft that acts like a hypodermic needle to inject the toxins into the skin, causing localized pain, reddish swelling, itching and numbness. Even though the pain can be intense, avoid touching or rubbing the affected area for 10 minutes to prevent the chemicals from being pushed into the skin. Symptoms will last for a few minutes to a few hours, and then resolve on their own. Airborne pollen, which is shed in large amounts when stinging nettle is in flower, is an important contributor to hay fever.

### **5.1.2 Recommended Controls and Prevention**

- Complete the HDR University eLearning – *Biological Hazards: Poisonous Plants*.
- Include applicable hazards and controls in task-specific Job Hazard Analysis (JHA) forms prepared for field work and review with the field team.
- Learn how to identify and recognize poisonous plants so you can avoid them.
- Wear long pants, long-sleeves, socks, and fully-enclosed footwear.
- Wear gloves when direct contact is necessary. If wearing cotton gloves, wear plastic gloves over them because urushiol can eventually soak through cotton).
- Be careful not to touch your face, eyes, or other exposed skin with the gloves! A common exposure occurs when incidentally touching your face to adjust your glasses, especially in hot weather.
- Apply a barrier cream to exposed skin, such as IvyX, to slow the absorption of urushiol (see HDR equipment catalog).
- When work is completed for the day, ensure that clothes that may have come into contact with urushiol contaminated materials are washed thoroughly with detergents and are done so in a



manner in which they cannot come into contact with skin (PPE may be required while handling these soiled clothes).

### **5.1.3 Incident Response and Reporting**

Not everyone is allergic to urushiol but, immunity seems to be transitory – individuals may seem to be immune for years and then suddenly develop the rash upon the next exposure. Symptoms usually appear within several hours to three days of exposure, but may appear as long as three weeks later and include:

- Redness and extreme itching are the first signs.
- Rash erupts on areas that were exposed, often in the pattern of streaks or patches consistent with where the plant touched the skin.
- Rash is in the form of red pimples and may form large, weeping blisters.
- The worst stage of the rash is experienced four to seven days after exposure.
- The rash may last for one to two weeks.
- Reactions can vary from very mild to very severe in highly sensitive individuals.

For all incidents involving contact with poisonous plants or items contaminated with urushiol:

- Use a cleanser such as Tecnu (see HDR equipment catalog) to wash the oil from skin, clothes, tools, and equipment as soon as possible following exposure. Use rubbing alcohol or dish soap and lots of cool water if a special cleanser is not available.
- Scrub under the fingernails with a brush to prevent spreading the oils to other parts of the body by touching or scratching.
- After removing the oil, even if you have no symptoms, immediately notify your supervisor and call WorkCare at (888) 449-7787 to report the exposure.
- Report the incident in IndustrySafe (<https://www.industrysafe.com/hdrinc>).
- In the event that an employee identifies that he or she may be severely allergic to any of the above mentioned irritants, it shall be planned to keep that individual as far away from contact with these organisms as possible.
- If you have a serious reaction involving swelling of the throat or any of the following symptoms, seek immediate medical care.
  - Abnormal breathing
  - Tightness in throat or chest
  - Dizziness
  - Fainting

## **5.2 Insects and Arachnids**

### **5.2.1 Description**

#### **5.2.1.1 Biting/Stinging Insects**

Insects will be encountered in a variety of outdoor project settings. Table 1 presents descriptions and habitat information for various types of stinging and biting insects.



**Table 1. Stinging and Biting Insects**

Organism	Description	Habitat	Problem	Severity	Protection
<b>Bed Bugs</b>	Small, oval, brownish insects. Adult bedbugs have flat bodies about the size of an apple seed. After feeding, however, their bodies swell and are a reddish color.	Enter homes/hotels on luggage, clothing, used beds and couches, etc. Live in groups in mattresses, box springs, bed frames, and headboards where they have easy access to people to bite in the night.	<b>Bites.</b> Lives on the blood of animals and humans.	Most bedbug bites are painless at first but later turn into itchy welts. They do not transmit diseases.	Inspect bed and upholstered furniture and alert hotel staff if you spot signs of bed bugs.  Keep bags closed and zipped.  Never lay luggage, backpacks or clothes on bed or on the floor.
<b>Bees</b>	Variable in size and color, many species ranging in size from microscopic to Bumblebee. European Honey Bee most familiar. Has two pair of wings.	Hollow logs, underground nest, and old buildings.	<b>Stings</b> when annoyed. Honey Bee leaves venom sac in victim. The ripping away of the venom sac kills the individual bee.	If person is allergic, nausea, shock, and constriction of the airway can result. Death may result.	Cover exposed skin. Avoid areas where bees are swarming. Avoid wearing sweet fragrances and bright clothing. Move slowly or stand still when swarming about you.
<b>Fire Ants</b>	Small reddish to brown ant. Large visible colony mounds appear after heavy rains overnight in areas where presence was not suspected.	Rural or residential, prefers sandy soils, limited to southern U.S. (VA, TN southward). Cold weather intolerant.	<b>Stings.</b> Highly aggressive, attacks en masse. Multiple stings almost always occur.	Severe pain, allergic reactions possible similar to bees. Can be fatal.	Avoid disturbing mounds; wear boots when in sandy, coastal plain habitats.
<b>Flies</b>	One pair of wings; variable in size and color; some species microscopic (biting Midges), others (Horse flies) bumblebee size.	Variable, may range far from wetland breeding areas. Common around rural farmlands, swamps.	<b>Bites.</b> <b>Bloodsucking.</b> Black Flies, Horse flies and Yellow Flies, in particular, can be vicious biters.	Very painful bites. Often more inhibiting during daytime lowland work than mosquitoes.	Wear thick protective clothing. Use plenty of insect repellent.



Organism	Description	Habitat	Problem	Severity	Protection
<b>Hornets</b>	One inch long with some body hair. Abdomen is mostly black.	Round, paper like nest hanging from trees, shrubs, or under eaves of buildings.	<b>Stings.</b> One nest may contain up to 100,000 hornets, which may attack in force at the slightest provocation.	Severe pain, allergic reactions similar to bees. Can be fatal.	Do not come near or disturb nest. If a hornet investigates you, do not move.
<b>Mosquitos</b>	Small, dark, fragile body with transparent wings.	Wherever water is available for breeding.	<b>Bites. Bloodsucking.</b> Itching and swelling result.	Can transmit diseases ( <b>see Table 2</b> ).	Use insect repellent and wear gloves. Stay in windy areas.
<b>Wasps</b>	Very thin waist. Color can be black, yellow or orange with stripes.	Underground nest; also paper-like honeycomb nest in abandoned buildings, hollow trees, etc.	<b>Stings.</b> Some species will attack en masse if you disturb or even closely approach the nest.	Severe pain, allergic reactions similar to bees. Can be fatal.	Avoid nests. Do not swat at them.

**Table 2. Mosquito-Borne Diseases**

Disease	Symptoms	Geographic Distribution
Zika virus	<p>Common symptoms of Zika virus begin 2-7 days after transmission and include fever, rash, joint pain, and red eyes. Other symptoms include myalgia (muscle pain) and headache.</p> <p>Note besides transmission from the bite of a mosquito, Zika virus can also be transmitted through direct contact with a Zika infected person's blood or other body fluids or from a pregnant woman to her fetus.</p> <p>Zika virus has been linked to a serious birth defect of the brain called microcephaly in babies of mothers who had Zika virus while pregnant.</p>	<a href="http://www.cdc.gov/zika/geo/index.html">http://www.cdc.gov/zika/geo/index.html</a>
West Nile virus	Most people infected with West Nile virus will not have any symptoms. About 1 in 5 people who are infected will develop a fever and other symptoms. Less than 1% of those infected develop a serious, sometimes fatal, neurologic illness.	<a href="http://www.cdc.gov/westnile/stats/maps/index.html">http://www.cdc.gov/westnile/stats/maps/index.html</a>
Chikungunya virus	The most common symptoms of chikungunya virus infection are fever and joint pain. Other symptoms may include headache, muscle pain, joint swelling, or rash. Outbreaks have occurred in countries in Africa, Asia,	<a href="http://www.cdc.gov/chikungunya/geo/index.html">http://www.cdc.gov/chikungunya/geo/index.html</a>

Disease	Symptoms	Geographic Distribution
	Europe, and the Indian and Pacific Oceans. In late 2013, chikungunya virus was found for the first time in the Americas on islands in the Caribbean.	
Dengue	<p>Dengue virus is a leading cause of illness and death in the tropics and subtropics. The principal symptoms are high fever and at least two of the following: °</p> <ul style="list-style-type: none"> <li>• Severe headache</li> <li>• Severe eye pain (behind eyes)</li> <li>• Joint pain</li> <li>• Muscle and/or bone pain</li> <li>• Rash</li> <li>• Mild bleeding manifestation (e.g., nose or gum bleed or easy bruising)</li> <li>• Low white cell count°</li> </ul>	<a href="http://www.healthmap.org/dengue/en">http://www.healthmap.org/dengue/en</a>
Malaria	People with malaria often experience fever, chills, and flu-like illness. Left untreated, they may develop severe complications which could be fatal.	<a href="http://www.cdc.gov/malaria/about/distribution.html">http://www.cdc.gov/malaria/about/distribution.html</a>

**5.2.1.2 Arachnids**

*Chiggers*

Chiggers are a microscopic parasitic mite larvae (not an insect). They are found in fields with high weeds throughout the U.S. and are very common in Southeastern U.S. Chiggers inject anti-clot fluid into tissue to feed (typically around the top of ankles, the waistline, and under arms), causing redness, swelling and intense itching. Chigger bites are not serious or fatal but are temporarily irritating due to the itching sensation from an allergenic response to the injected saliva.

*Scorpions*

Scorpions are a brown arachnid found in deserts and semi-arid regions including Southern and Southwestern U.S. They range in size from 1 to 8 inches long with eight legs and a front pair of prominent lobster-like claws. Scorpions inject a neurotoxic which attacks the nervous system, resulting in localized swelling and discoloration; may sometimes cause serious allergic reactions.

*Black Widow Spiders*

Black widow spiders are found throughout North America, but are most common in the southern and western areas of the United States. The black widow is a moderately large, glossy black spider with very fine hairs over its body that give it a silky appearance. The abdomen is a characteristic red, crimson, or yellow marking in the form of an hourglass. Only the female is poisonous; the male, which is smaller, is harmless.

They are usually found in damp and dark places such as woodpiles, tree stumps, under eaves, fences, under rocks, and trash piles and other areas where debris has accumulated. They may also be found living in outdoor toilets where flies are plentiful.

Black widow spiders build webs between objects, and bites usually occur when humans come into direct contact with these webs. A bite from a black widow can be distinguished from other insect bites by the two puncture marks it makes in the skin. The venom is a neurotoxin that produces pain at the bite area and then spreads to the chest, abdomen, or the entire body.

### *Brown Recluse Spiders*

The brown recluse spider, also known as the violin spider, is most commonly found in the Midwestern and southern states of the United States. It is brown in color with a characteristic dark violin-shaped (or fiddle-shaped) marking on its head and has six equal-sized eyes (most spiders have eight eyes). Brown recluse spiders are usually found in workplaces with secluded, dry, sheltered areas such as underneath structures logs, or in piles of rocks or leaves. If a brown recluse spider wanders indoors, they may be found in dark closets, shoes, or attics.

The brown recluse spider cannot bite humans without some form of counter pressure, for example, through unintentional contact that traps the spider against the skin. Bites may cause a stinging sensation with localized pain. A small white blister usually develops at the site of the bite. The venom of a brown recluse can cause a severe lesion by destroying skin tissue (skin necrosis).

### *Ticks*

A tick is a tiny brown mite that attaches itself to the skin of a mammal, bird or reptile and sucks blood. Ticks range in size from one to four millimeters but may greatly enlarge as they consume blood. There are hundreds of species of ticks and they can be found almost everywhere in woods or grasslands. Ticks are generally most active April through October and peak in the months of June through August.

Lacking wings, ticks climb onto small bushes or tall grass usually close to the ground, and wait for an animal or person to pass near them. They are attracted by carbon dioxide, which is generated during respiratory exhalation. As a host animal or human passes by, they latch on to the skin with their legs, use their "nose" to secure themselves, and cut a hole into the skin by means of a pair of sharp mandibles that saw back and forth. Blood is then sucked into their abdomen until fully engorged, at which time they drop off.

Ticks infected with bacteria, viruses, or parasites can pass diseases (see Table 3) to humans and animals when they attach to the skin to feed. In most cases, an infected tick must be attached for at least 12 hours to transmit pathogens. Symptoms for all tick-borne diseases can include headache, fatigue, muscle aches, and fever. With Lyme disease you may also experience joint pain. Rash symptoms unique to each disease are summarized in Table 3.



**Table 3. Tick-Borne Diseases**

<b>Disease</b>	<b>Rash Symptoms</b>	<b>U.S. Geographic Distribution</b>
Lyme disease	Circular (“bullseye” appearance) rash may appear within 3-30 days, typically before the onset of fever. Rash occurs in approximately 70-80% of infected persons and begins at the site of a tick bite. It may be warm, but is not usually painful.	Northeast, North Central, Pacific Coast
Ehrlichiosis	In about 30% of adults, a rash appears after the onset of fever.	East, Southeast, Central
Rocky Mountain Spotted Fever	Varies greatly from person to person in appearance, location, and time of onset. Rash occurs in approximately 90% of people. Most often, the rash begins 2-5 days after the onset of fever as small, flat, pink, non-itchy spots on the wrists, forearms, and ankles and spreads to the trunk. It sometimes involves the palms and soles. In some patients, a red to purple, spotted rash is occurs the sixth day or later after onset of symptoms with the infection.	Southeast, Atlantic Coast
Southern Tick-Associated Rash Illness	Nearly identical to that of Lyme disease, with a red, expanding "bulls eye" lesion that develops around the site of a lone star tick bite.	Southeast, Atlantic Coast
Tularemia	A skin ulcer appears at the site where the organism entered the body. The ulcer is accompanied by swelling of regional lymph glands, usually in the armpit or groin.	All States except Hawaii
Babesiosis	Rash is not typical.	Northeast, Midwest, Northwest
Anaplasmosis	Rash is not typical.	Northeast, North Central, Pacific Coast
Colorado Tick Fever	Rash is not typical.	Northwest, Rocky Mountains
Powassan Encephalitis	Rash is not typical.	Northeast
Q fever	Rash is not typical.	Throughout the U.S.
Tick-Borne Relapsing Fever	Rash is not typical.	Rocky Mountains, Pacific Coast

### 5.2.2 Recommended Controls and Prevention

In addition to the protection measures listed in Table 1, the following actions are recommended to prevent insect and arachnid bites and stings:

#### 5.2.2.1 General

- Complete the HDR University eLearnings - *Biological Hazards: Insects* and *Biological Hazards: Arachnids*.



- Include applicable hazards and controls in task-specific Job Hazard Analysis (JHA) forms prepared for field work and review with the field team.
- Do not wear perfumes or colognes when performing field activities as they often attract stinging insects.
- Workers with a history of severe allergic reactions to insect bites or stings should carry an epinephrine auto injector (EpiPen) and should wear a medical identification bracelet or necklace stating their allergy.

#### **5.2.2.2 Mosquitos/Ticks/Chiggers**

- Check the Center for Disease Control and Prevention website for travel notices and updated maps of areas with mosquito and tick-borne disease transmission.
  - <http://www.cdc.gov/niosh/topics/outdoor/mosquito-borne/other.html>
  - <http://www.cdc.gov/ticks/index.html>
- Use insect/mosquito repellents containing 20 -30% DEET on exposed skin in accordance with product label instructions and reapply as directed.
- If DEET cannot be used for some reason (such as a personal sensitivity or the potential for cross-contamination when conducting environmental sampling), select an alternative EPA-registered product.
  - <https://www.epa.gov/insect-repellents/regulation-skin-applied-repellents>
- Apply sunscreen prior to applying insect repellent.
- Treat clothing and gear with permethrin (see HDR catalog) or purchase permethrin-treated items.
- Wear light-colored long-sleeved shirts and long pants so you can easily see ticks on your clothing; tuck your pants into your socks to form a barrier.
- For additional protection, tape clothing joints, (i.e. wrists, waist, and boots/ankles).
- Wear hats with mosquito netting to protect the face and neck. (Note: Although dryer sheets have not been scientifically tested as a mosquito repellent, anecdotal evidence indicates some dryer sheets contain a chemical that may be marginally effective as a repellent. Placing a dryer sheet above the hard hat liner has shown positive results in reducing mosquito activity around the user.)
- Avoid non-essential outdoor activities at sunrise, sunset, and early evening when mosquitoes are most active.
- Avoid high grass if possible and walk in the center of trails to avoid ticks in overhanging grass and brush and chiggers in grass and weeds.
- Check your body, gear, and clothing for ticks, paying close attention to the head, armpits, and groin area. A daily total-body skin inspection greatly reduces the risk of infection since ticks may take several hours to two days to attach to the skin and feed.
- Put your clothes in a dryer on high heat for an hour to kill any remaining ticks.
- Carry a lint roller to roll over clothing to pull off non-imbedded ticks that may not be easily visible.

- Shower promptly after exposure.

### 5.2.2.3 Spiders

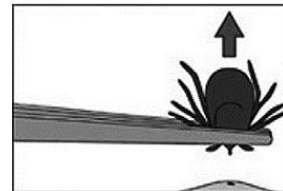
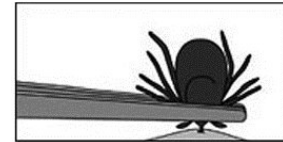
- Wear protective clothing such as a long-sleeved shirt and long pants, hat, gloves, and boots when handling stacked or undisturbed piles of materials.
- Store apparel and outdoor equipment in tightly closed plastic bags.
- Inspect or shake out any clothing, shoes, towels, or equipment before use to remove spiders.
- Keep your tetanus boosters up-to-date (every 10 years). Spider bites can become infected with tetanus spores.
- Minimize the empty spaces between stacked materials.
- Remove and reduce debris and rubble from around outdoor work areas.
- Trim or eliminate tall grasses from around outdoor work areas.

## 5.2.3 Incident Response and Reporting

### 5.2.3.1 Tick Removal

If you find a tick embedded in your skin:

- Remove the tick as soon as you discover it.
- Use fine-tipped tweezers and firmly grasp the tick close to the skin.
- Pull straight up until the tick releases - do not jerk, twist, or squeeze the tick.
- After removing the tick, wash your hands, the bite area, and the tweezers with soap and water or use an alcohol-based hand sanitizer or antiseptic.
- Immediately notify your supervisor and call WorkCare at (888) 449-7787.
- Report the incident in IndustrySafe (<https://www.industrysafe.com/hdrinc>).



### 5.2.3.2 All Bites and Stings

Risks from bites and stings include allergic reaction, infection, and transfer of disease-causing agents such as parasites, bacteria, and viruses. General guidelines are as follows:

- Wash the area around the bite/sting with soap and water.
- For bee stings, remove the stinger by gently scraping it out with a blunt-edged object, such as a credit card or dull knife. Don't try to pull it out as this may release more venom.
- If you have any symptoms of an allergic reaction, infection, or illness following a bite or sting occurring at work, regardless of how minor, immediately notify your supervisor and call WorkCare at (888) 449-7787.
- If you have a serious reaction involving any of the following symptoms, seek immediate medical care:



- Swelling of the throat
- Abnormal breathing
- Tightness in throat or chest
- Fainting
- Report all incidents in IndustrySafe (<https://www.industrysafe.com/hdrinc>).

## 5.3 Snakes

### 5.3.1 Description

Only two families of snakes in the United States are poisonous: *pit vipers* (rattlesnakes, copperheads, and water moccasins) and *coral snakes*.

#### 5.3.1.1 Pit Vipers

Pit vipers have triangular, flat head, wider than the neck; vertical elliptical pupils (cat's eye); and a heat-sensitive "pit" located between the eye and nostril.

##### *Rattlesnakes*

There are many species of rattlesnakes across the United States. They can be found in the mountains, prairies, deserts, and beaches and many times sun themselves near logs, boulders, and open areas. They can accurately strike at up to one-third their body length. Rattlesnakes use their rattles or tails as a warning when they feel threatened. Rattle snakes often sun themselves along hiking trails for body heat due to their cold blooded nature. Always look over objects before stepping to decrease the likely hood of surprising one of these venomous snakes.

##### *Copperheads*

Copperheads are often found in forests, rocky areas, swamps, or near sources of water like rivers in eastern states, extending as far west as Texas. Copperheads vary in color from reddish to golden tan. The colored bands on their body are typically hourglass-shaped. Most adults are 18–36 inches long. They are not usually aggressive, but will often freeze when frightened. Workers are more likely to be bitten when they unknowingly step on or near a copperhead.

##### *Cottonmouths/Water Moccasins*

Cottonmouth snakes are found in wetland areas, rivers, lakes, etc., in the southeastern states. Cottonmouth snakes average 50–55 inches long. The adult snake's skin is dark tan, brown, or nearly black, with vague black or dark brown crossbands. Juveniles have a bold crossbanded pattern of brown or orange with a yellow tail. Cottonmouths are frequently found in or around water. They do not scare easily and will defend themselves when threatened.

#### 5.3.1.2 Coral Snakes

Coral snakes inhabit the coastal plain regions of the southern U.S., from North Carolina through central Texas and are found in wooded, sandy, or marshy areas. Coral snakes tend to hide in leaf piles or burrow into the ground. Coral snakes have an extremely potent venom and staying away from these brightly colored snakes is advisable.



The coral snake is small and very colorful, with a series of bright red, yellow, and black bands that go all the way around its body. Every alternate band is yellow and the snout is black. The color banding is similar to that of the non-venomous king snake. These snakes are often confused with nonvenomous king snakes, which have similar colored bands although in a different arrangement.

- Venomous coral snakes – Black snout with touching red and yellow body rings
- Non-venomous king snakes – Red snout with touching red and black rings

### **5.3.2 Recommended Controls and Prevention**

- Complete the HDR University eLearning – *Dangerous Desert Snakes and Lizards*.
- Include applicable hazards and controls in task-specific Job Hazard Analysis (JHA) forms prepared for field work and review with the field team.
- Know how to identify venomous snakes and understand the risk of exposure to snake bites.
- Wear thick leather boots and long pants. Consider leather chaps or sturdy leg coverings in areas with a heavy population of venomous snakes.
- Wear leather gloves when handling brush and debris.
- Avoid tall grass and piles of leaves.
- If you encounter a snake when working, leave it alone. Many people are bitten because they try to kill a snake or get a closer look at it. Do not try to handle any snake.
- Keep hands and feet out of areas you can't see.
- Don't pick up rocks or firewood unless you are out of a snake's striking distance. (A snake can strike half its length.) When turning over rocks or logs, always lift them towards your body, thus shielding yourself from any snake hiding beneath.
- Avoid climbing on rocks or piles of wood where a snake may be hiding, especially during early spring and fall.
- Be aware that snakes tend to be most active at night and in warm weather.

### **5.3.3 Incident Response and Reporting**

Signs or symptoms of a snake bite vary depending on the type of snake but may include:

- A pair of puncture marks at the wound
- Redness and swelling around the bite
- Severe pain at the site of the bite
- Nausea and vomiting
- Labored breathing (in extreme cases, breathing may stop altogether)
- Disturbed vision
- Increased salivation and sweating
- Numbness or tingling around your face and/or limbs

If you know or suspect you have been bitten by a venomous snake:



- Seek immediate medical attention (dial 911 or call local Emergency Medical Services).
- Try to remember the color and shape of the snake to aid in treatment of the snake bite. Take a picture of the snake at distance if possible.
- Keep still and calm. Immobilize the bitten area and keep it lower than the heart to help slow down the spread of venom.
- Notify your supervisor and, when possible, report the incident in IndustrySafe (<https://www.industrysafe.com/hdrinc>).

The bites of venomous snakes can be effectively treated with antivenin. But other factors, such as part of body bitten, time elapsed prior to treatment, and care taken before arriving at the hospital are also critical. Do NOT do any of the following:

- Do not pick up the snake or try to trap it.
- Do not touch the head of an apparently dead snake; it may be able to bite reflexively for as long as an hour after death.
- Do not wait for symptoms to appear if bitten, seek immediate medical attention.
- Do not apply a tourniquet.
- Do not slash the wound with a knife.
- Do not suck out the venom.
- Do not apply ice or immerse the wound in water.
- Do not drink alcohol as a painkiller.
- Do not drink caffeinated beverages.

## **5.4 Alligators**

### **5.4.1 Description**

The American Alligator is a common large reptile across the Southeast U.S., ranging from Georgia to Texas, and especially Florida. It inhabits fresh water of any size and kind, from ditches and ponds to sloughs, marshes, rivers, and reservoirs. In suburban areas they wander onto golf courses and into family swimming pools or conveyance canals.

This reptile grows to lengths in excess of 12 feet, and feeds on a wide variety of animals, including fish, turtles, ducks and any mammal that it can grasp, subdue and drag under the water and drown.

### **5.4.2 Recommended Controls and Prevention**

Although humans are not normally viewed as prey by alligators, attacks do occur. Employees working in and around gator habitat should take the following precautions:

- Include applicable hazards and controls in task-specific Job Hazard Analysis (JHA) forms prepared for field work and review with the field team.
- Keep 30 feet away from alligators at all times. If you get too close, back away slowly. Do not assume that alligators are slow and sluggish. They are extremely quick and agile and will defend themselves when cornered. They rarely chase people, but they can outrun or out swim the fastest person for the first 30 feet.



- Never encourage the approach of alligators. Never feed alligators. It is illegal and also, once fed, they will return for more handouts and quickly lose their fear of humans. Once this fear has subsided, they will begin to charge humans due to the association with food.
- Alligators spend a lot of time sunning on the banks of open water and appear lazy but are aware of intruders and can run very fast for short distances.
- Don't approach to look or yell, taunt, or throw anything in their direction.
- Female alligators make large nest mounds out of plant materials – don't knowingly walk on or around these. Avoid piles of twigs, grasses and/or soil near the side of the gator habitats.

### **5.4.3 Incident Response and Reporting**

If an aggressive alligator is sighted, try to get GPS coordinates or photos to document its location and call the local Fish and Wildlife Commission for handling or relocation.

Report all incidents in IndustrySafe (<https://www.industrysafe.com/hdrinc>). For non-emergency injury incidents, immediately notify your supervisor and call WorkCare at (888) 449-7787.

## **5.5 Mammals**

### **5.5.1 Description**

Encounters with mammals are potentially dangerous either from traumatic injury due to direct contact or from infectious diseases that are carried by them or their parasites (see Section 5.6 for details on rabies, hantavirus, and histoplasmosis). Animal species that could be encountered depend on geography and will vary in size and ferocity. Mammals most likely to attack humans in North America are feral animals, bears, mountain lions, and moose.

### **5.5.2 Recommended Controls and Prevention**

#### **5.5.2.1 General**

General precautions are as follows:

- Complete the HDR University eLearning – *Biological Hazards: Mammals*
- Include applicable hazards and controls in task-specific Job Hazard Analysis (JHA) forms prepared for field work and review with the field team.
- Be aware of the appearance and habitat of animals you are likely to encounter and plan accordingly based on the danger these animals pose.
- Do not setup near obvious animal nests or burrows.
- Keep food and garbage stored in sealed containers.
- Wear clothes made of tightly woven materials and tuck pants into boots.
- Minimize the amount of time you use lights after dark because light may attract animals.
- Don't touch rodents or other mammals, dead or alive.
- Do not attempt to feed animals.



### **5.5.2.2 Feral Animals**

Employees conducting work at landfills, abandoned buildings, or urban project locations may encounter feral animals. A feral animal is any formerly domesticated animal that is now living as a wild animal. They are particularly dangerous because their appearance as a familiar pet causes people to assume they will act like one and, former association with people often causes feral animals to act without fear of humans. Feral dogs can become pack oriented, very aggressive, and represent serious risk of harm to unprotected workers.

- Do not feed, chase, act threatening or call to these animals or try to pet them.
- If the animal acts in a threatening manner, back away while facing the animal.

### **5.5.2.3 Bears**

All species of bears are dangerous and should be avoided if possible. Brown (including Grizzlies) and black bears are the two species of bears expected to be encountered most often by HDR employees while working in Alaska, Canada, and northern and western regions of the United States. Employees required to work in these regions must be trained to work safely in bear country and be positively protected against a bear attack by either (a) the presence of a third party bear guard or (b) carrying an industry accepted chemical bear deterrent (such as bear spray). Under no circumstances, should an HDR employee work alone in bear prone areas.

The method of positive protection selected for each project will vary depending on the project location, type of work, bear population and risk of attacks, project logistics, and client requirements. The method of protection must be chosen prior to the project start and all associated requirements communicated to team members and the client to ensure awareness and concurrence by affected employees.

#### *Bear Guards*

A bear guard (an independent third party or the client) should be assigned to accompany a group of workers for any field work performed in medium to high density bear areas where the number of workers and/or the worker experience is not adequate to provide the positive protection needed. The designation of bear guard is assigned only to trained individuals whose sole responsibility is to provide positive protection against bears for the group of workers they are accompanying.

The project manager or team leader is responsible for verifying that the assigned bear guard is competent to perform the job duties through completion of a required firearm safety course and any additional training course completion, past experience or certification by an independent third party.

Bear guards carrying firearms shall provide the project manager documentation of the following:

- Completion record of a formal training class (and refresher training, as required) on firearm safety sponsored by the National Safety Council, National Rifle Association or other nationally recognized safety organization.
- Completion record of a formal training class on bear awareness and response sponsored by a recognized organization in the field of bear safety. Note: participants completing the LTR Training Systems Learn to Return Wilderness Safety Leader (Bear Guard) course must receive a minimum rating of 3 to serve as bear guard for HDR.





- Record of a passing pre-employment drug and alcohol test and enrollment in their employer's random drug and alcohol testing program.

### *Bear Spray*

HDR encourages each individual to carry a bear deterrent such as pepper spray when working in bear prone areas. The spray canister should be carried in a holster on a belt, shoulder strap or pack to allow quick response if needed.

Caution must be used when discharging the spray to make sure that the individual is upwind from the spray to avoid exposure to the irritating and possibly disabling effects of the deterrent. Training for the use of bear spray should be obtained through bear safety classes or live training presented by experienced HDR employees.

Bear spray products are considered hazardous materials for ground and air common carrier transport. Each product should be handled according to applicable regulations and transportation providers should be alerted about its presence. Prior to shipping, contact Corporate SH&E for manifest preparation. Privately commissioned air transport does not fall under the air common carrier regulations and therefore does not require a formal manifest.

### *Personal Protective Equipment*

Employees are to wear orange or orange/yellow vests when working alongside a bear guard carrying a firearm and during any hunting seasons that are occurring near the project area.

### *Bear Safety Training*

Standard industry bear safety training should be provided for any employee required to work in bear country, especially in areas where bears are present in medium to high densities. The training should include an introduction to bear behavior, biology and body language, bear avoidance, use of deterrents, and bear encounter scenarios including how to react in case of an attack.

An awareness level video titled "Staying Safe in Bear County" presented by the Safety in Bear Country Society (in co-operation with the International Association for Bear Research and Management) is available through the HDR Anchorage office.

Many live instructor courses are also available in Alaska, Western Canada, and in the lower 48 United States. Courses may be found in listings on the Internet or by contacting local agencies, such as the U.S. Forest Service.

#### **5.5.2.4 Mountain Lions**

Mountain lions are native to much of the Americas all the way down to Argentina with high concentration along the west coast and parts of Canada. Small populations are found sporadically along the east coast. Their habitat includes mountains, forests, deserts and wetlands. Avoidance is the best protection:

- Avoid outdoor activities at, dawn, dusk, and at night when mountain lions are most active.
- Avoid walking near dense growth, rock outcroppings, and ledges.
- Always look up and behind you.
- Carry pepper spray.



Typically, mountain lions kill their prey with a bite to the back of the neck, aiming to position its canine teeth between the vertebrae and into the spinal cord. This is the same method these big cats have employed when attacking humans. If confronted by a mountain lion:

- Do not run, back away slowly, do not corner it.
- Do not play dead, look it in the eyes.
- Make yourself look larger (arms overhead), do not bend down.
- Use a loud voice.
- Throw sticks or rocks.
- Fight back.
- Protect your neck and head.

### **5.5.2.5 Moose**

In North America, the moose range includes almost all of Canada (excluding the arctic and Vancouver Island), most of Alaska, northern New England and upstate New York, the upper Rocky Mountains, northern Minnesota, Michigan's Upper Peninsula, and Isle Royale in Lake Superior.

If you encounter a moose:

- If it hasn't detected you, move away from it. Give the moose plenty of space.
- If it knows you're there, talk to it softly and move away slowly.
- Don't be aggressive - you want to convince the moose that you aren't a threat.
- If you think the moose is going to charge you, take cover or run away.
- Try to get behind a tree or a car if a moose charges.
- Never get between a mother moose and her calves.

### **5.5.3 Incident Response and Reporting**

Immediately notify your supervisor and call WorkCare at (888) 449-7787 for all non-emergency injuries. Report all incidents in IndustrySafe (<https://www.industrysafe.com/hdrinc>).

## **5.6 Pathogens and Disease**

Disease-causing pathogens can be carried or transmitted by animals or be encountered in soil, air, or water. The following subsections describe diseases that could potentially be encountered during field work.

### **5.6.1 Rabies**

#### **5.6.1.1 Description**

Rabies is a fatal viral infection of the brain that may follow the bite of a rabid animal. The disease only affects warm-blooded animals. Animals that can be infected with rabies include all mammals, but in particular:

- Wild animals--primarily bats, foxes, skunks, and raccoons
- Livestock--mostly cattle but occasionally horses, sheep, goats, and pigs



- Domestic cats and dogs
- Wolves, coyotes, and other meat-eating mammals

#### **5.6.1.2 Recommended Controls and Prevention**

Include applicable hazards and controls in task-specific Job Hazard Analysis (JHA) forms prepared for field work and review with the field team.

If you will be working with species with a high risk of rabies, obtain the rabies vaccine (see SH&E Procedure #035, *Medical Monitoring*). Pre-exposure vaccination greatly reduces, but does not eliminate, the need for post-exposure treatment.

Avoidance and protection protocols include watching for animal dens, using good housekeeping to discourage foraging, and using repellents (visual-wear bright clothing, audio-announce your approach or presence with loud whistling, talking, radios, etc., and chemical such as pepper spray, etc.).

Be aware that all animals do not behave in the same manner when they have rabies.

- Foxes and skunks may lose their shyness and fear of people, pets, or livestock. Back away from any wild mammal that is acting unafraid.
- Cattle usually become restless and aggressive, bellow loudly, drool, may show weakness in the hind legs, and appear to be choking.
- Cats can often become extremely vicious.
- Dogs usually become excitable, wander aimlessly, and may be vicious and bite for no reason.

If an animal is threatening and dangerous and cannot be scared away, or is suspected of having rabies, withdraw, call 911, request the services of local police or animal control personnel, and continue to observe its movements (if possible).

If an animal must be killed, try to avoid damaging its head. An undamaged brain is important for a rapid, accurate laboratory diagnosis. Do not handle the animal or carcass (but if necessary, for any reason, wear protective gloves, masks, and goggles).

#### **5.6.1.3 Incident Response and Reporting**

Workers who may have been exposed to rabies must never wait until they develop symptoms of the disease. **Once the symptoms appear, the disease is almost inevitably fatal.**

If you have been scratched or bit or have otherwise come into contact with saliva, body fluids, or tissue of animals suspected of having rabies, take the following steps without delay:

- Immediately clean the wound with soap and flush with water for several minutes. Washing the wound is probably the most effective procedure in the prevention of rabies. While this is being done, shield the eyes, nose, and mouth from spray from the wound.
- Remove any clothing that may be contaminated, place it in a plastic bag properly labeled and wash it promptly and separately from other clothing.
- Notify your supervisor and call WorkCare at (888) 449-7787.
- Enter report into IndustrySafe
- Contact the police or local humane society to request help finding and identifying the offending animal.



## 5.6.2 Hantavirus

### 5.6.2.1 Description

Hantavirus is a virus present in the urine, saliva, or droppings of infected deer mice and other wild rodents. Hantavirus causes a rare but serious lung disease called Hantavirus Pulmonary Syndrome (HPS). The disease begins as a flu-like illness. In the early stage, a worker may experience fever, chills, muscle aches, headaches, nausea, vomiting, and shortness of breath. However, the disease progresses rapidly and infected people experience an abnormal decrease in blood pressure and their lungs will fill with fluid.

People can contract the Hantavirus infection through inhalation of respirable droplets of saliva or urine, or through the dust of feces from infected wild rodents. Transmission can also occur when contaminated material gets into broken skin, or possibly, ingested in contaminated food or water.

### 5.6.2.2 Recommended Controls and Prevention

When working in areas where the disease has been reported, take the following precautions to reduce the likelihood of exposure to potentially infectious materials:

- Complete the HDR University eLearning – *Hantavirus*
- Include applicable hazards and controls in task-specific Job Hazard Analysis (JHA) forms prepared for field work and review with the field team.
- Avoid coming into contact with rodents and rodent burrows or disturbing dens (such as rat nests).
- When performing project work that requires entry into confined spaces, where obvious signs of rodent infestation are present, wear disposable gloves and a NIOSH-approved respirator with a high efficiency particulate air (HEPA) filter to prevent inhalation of fecal dust (requirements that must be met to wear a respirator include medical clearance, annual training, and annual fit testing; see HDR SH&E Procedure #009, *Respiratory Protection*).
- Do not dwell in areas that are in proximity to rodent droppings or burrows or near areas that may shelter rodents or provide food for them (e.g., woodpiles, large supplies of birdseed).
- Keep food, birdseed, etc. in rodent-proof containers.

### 5.6.2.3 Incident Response and Reporting

Immediately notify your supervisor and call WorkCare at (888) 449-7787 if potentially exposed to material containing hantavirus. Report all incidents in IndustrySafe (<https://www.industrysafe.com/hdrinc>).

## 5.6.3 Histoplasmosis

### 5.6.3.1 Description

Histoplasmosis is an infectious disease of the lungs caused by inhalation of a fungus, *Histoplasma capsulatum*. The infection sometimes can spread to other parts of the body. *Histoplasma c.* thrives in moderate temperatures and moist environments. Droppings from chickens, pigeons, starlings, blackbirds, and bats support its growth.



Birds are not infected with it because of their high body temperatures, but they can carry it on their feathers. Bats can be infected and can excrete the organism in their droppings. The symptoms of the infection appear within 5 to 18 days after exposure, most commonly in ten days.

### **5.6.3.2 Recommended Controls and Prevention**

HDR employees at potential risk for exposure are those whose job duties involve contact with soil enriched with bird and bat droppings. Prevention of histoplasmosis relies on avoiding exposure to soil/dust in a contaminated environment.

- Include applicable hazards and controls in task-specific Job Hazard Analysis (JHA) forms prepared for field work and review with the field team.
- Persons working in known contaminated areas should wear disposable coveralls, gloves, boots, hats, and a NIOSH-approved full face respirator with a HEPA filter or a supplied air respirator with full face piece (requirements that must be met to wear a respirator include medical clearance, annual training, and annual fit testing; see HDR SH&E Procedure #009, *Respiratory Protection*).
- Seal the glove/sleeve and boot/leg interfaces with duct tape before entering the worksite.
- Water sprays or other dust suppression techniques should be used to reduce the amount of dust aerosolized during construction, excavation, or demolition in regions where *Histoplasma capsulatum* is endemic.
- During windy periods or other times when typical dust suppression techniques are ineffective, earthmoving activities should be interrupted.
- Before leaving the site, vacuum the protective coveralls, boots, and gloves using a HEPA vacuum, then walk to an excrement free area, remove the protective clothing, and place it in plastic bags prior to removing respiratory protection. Treat disposable clothing believed to be contaminated with disease agents as infectious waste.
- Non-disposable work clothing and respirators should be removed, placed in a plastic bag, and sealed. These items must be disinfected in the bag before final cleaning and reuse.
- If the disposable coveralls or other protective clothing are torn, workers must shower prior to putting on their street clothes. It is recommended that workers shower and thoroughly wash their hair at the end of their shift.

### **5.6.3.3 Incident Response and Reporting**

Immediately notify your supervisor and call WorkCare at (888) 449-7787 if potentially exposed to bird and bat droppings. Report all incidents in IndustrySafe (<https://www.industrysafe.com/hdrinc>).

Most patients who develop histoplasmosis do not require treatment. Some may only require supportive treatment that relieves the symptoms of the disease. Severe symptoms with a large involvement of the lungs require treatment with specific antifungal drugs. There are five different forms of infection, as follows:

- Asymptomatic is when the victim does not show any symptoms and is unaware of the infection.
- Acute disseminated involves short-term affects to organs other than the lungs. It is usually confined to young children and is marked by fever, cough, exhaustion and enlargement of the liver and spleen.



- Acute benign respiratory is produced by a heavy exposure and marked by weakness, fever, chest pains, and cough. The severity of the symptoms depends upon the magnitude of the exposure.
- Chronic disseminated is of long duration (chronic) and it involves other organs outside of the lungs. It occurs in people with a reduced capacity to fight disease, such as patients with leukemia and persons being treated with drugs that suppress the body's immune system. The chronic disseminated form is marked by fever, anemia, hepatitis, pneumonia, inflammation of the lining of the heart cavity, meningitis, and ulcers of the mouth, tongue, nose and larynx.
- Chronic pulmonary occurs in persons with pre-existing lung diseases such as emphysema. It resembles tuberculosis and is more common in males over 40 years of age.

#### **5.6.4 Legionnaires' disease**

Legionnaires' disease is contracted by breathing in aerosolized water and/or soil contaminated with the Legionella bacteria. The bacterium is found naturally in fresh water. It can contaminate ornamental fountains, hot water tanks, hot tubs, and cooling towers of large air conditioners. The disease is particularly associated with hotels, fountains, cruise ships, and hospitals with complex potable water systems and cooling systems. Outdoor job assignments where soil is disturbed by bulldozing, and areas where surface or aerosolized water discharge occurs may also be at risk.

##### **5.6.4.1 Recommended Controls and Prevention**

The prevention of Legionella infection is best achieved by good engineering practices in the operation and maintenance of air and water handling systems.

##### **5.6.4.2 Incident Response and Reporting**

Legionnaires' disease usually begins with a headache, pain in the muscles and a general feeling of illness. These symptoms are followed by high fever (up to 40°-40.5°C or about 104°-105°F) and shaking chills. Nausea, vomiting, and diarrhea may occur. On the second or third day, dry coughing begins and chest pain might occur.

Immediately notify your supervisor and call WorkCare at (888) 449-7787 if you are exposed to a known source of Legionella or if you develop symptoms of Legionnaire's disease following exposure to hot water tanks, cooling towers, etc. Report all incidents in IndustrySafe (<https://www.industrysafe.com/hdrinc>).

#### **5.6.5 Valley Fever**

Valley Fever is primarily a disease of the lungs that is common in the southwestern United States and northwestern Mexico. It is prevalent in the San Joaquin and Central Valleys of California, and in the hot, desert regions of southern Arizona (especially in the Phoenix and Tucson areas), southern Nevada, southern Utah, southern New Mexico, western Texas (especially around El Paso), Mexico (in the states of Sonora and Chihuahua), and in semiarid and arid areas in Central and South America.

It is caused by the fungus *Coccidioides immitis*, which grows in soils in areas of low rainfall, high summer temperatures, and moderate winter temperatures. Resistant spores, produced by this fungus, become airborne when the soil is disturbed by winds, construction, farming and other activities. These spores are the infective agent.

Employees with potential risk of exposure are those assigned duties involving disturbed desert soils (construction, excavations, agricultural work, archeological digging, driving ATV/UTVs), particularly



around rodent burrows, Indian ruins and burial grounds. Earthquakes can also increase cases of Valley Fever.

In these settings, infections are more likely to be severe because of intensive exposure to a large number of spores. Exposure to windstorms or recently disrupted soils may increase the chances of infection. Various domestic animals such as dogs, cats, and horses as well as wild animals are also susceptible. Valley Fever is not contagious. Valley Fever infections are more prevalent during certain seasons. In Arizona, the highest incidence of infection occurs during June and July, and October through November. In California, the risk of infection is highest from June through November, without the late summer break.

Individuals with an increased risk of contracting Valley Fever include:

- Older adults (60 years and older), pregnant women, and people with diabetes
- Certain racial/ethnic groups: African Americans and Filipinos
- People with health conditions that weaken their immune system such as cancer, HIV, autoimmune illnesses, chemotherapy or steroids treatment, and organ transplants

#### **5.6.5.1 Recommended Controls and Prevention**

- Determine if the worksite is in an area where Valley Fever is endemic. Check with the local health department to determine whether cases have been known to occur in the proximity of your work area.
  - [\*Arizona Department of Health Services – Valley Fever\*](#)
  - [\*California Department of Public Health – Valley Fever\*](#)
- Complete the HDR University eLearning – *Valley Fever Awareness*.
  - Note: Per [\*CA legislation AB 203 Occupational Safety and Health Valley Fever\*](#), this training is required for construction employers with employees working at worksites in California counties where Valley Fever is highly endemic where work activities disturb the soil, including, but not limited to, digging, grading, or other earth moving operations, or vehicle operation on dirt roads, or high winds. Highly endemic means that the annual incidence rate of Valley Fever is greater than 20 cases per 100,000 persons per year. As of November 2019, this includes but not limited to the following counties: Fresno, Kern, Kings, Madera, Merced, Monterey, San Joaquin, San Luis Obispo, Santa Barbara, Tulare, and Ventura,
- Include applicable hazards and controls in task-specific Job Hazard Analysis (JHA) forms prepared for field work and review with the field team.
- When soil will be disturbed by heavy equipment or vehicles, wet the soil before disturbing it and continuously wet it while digging to keep dust levels down.
- Position workers upwind when possible.
- Suspend work during heavy wind or dust storms and minimize amount of soil disturbed.
- Change into clean clothes and shoes before leaving a dusty job site. Store dusty clothes and shoes in a plastic bag until washed.
- Shower and wash your hair at work or as soon as you get home.
- Bandanas and simple dust masks are not protective against Valley Fever.



- Persons working in known contaminated areas should wear disposable coveralls, gloves, boots, hats, and a NIOSH-approved respirator with a HEPA filter (requirements that must be met to wear a respirator include medical clearance, annual training, and annual fit testing; see HDR SH&E Procedure #009, *Respiratory Protection*).

### **5.6.5.2 Incident Response and Reporting**

Valley Fever symptoms generally occur within three weeks of exposure. The duration and severity of symptoms varies. Most cases are very mild. It is thought that over 60% of infected people have either no symptoms or experience flu-like symptoms and never seek medical attention. Of those patients seeking medical care, the most common symptoms are fatigue, cough, chest pain, fever, rash, headache, and joint aches. Some victims develop painful red bumps on their shins or elsewhere that gradually turn brown.

In rare cases, Valley fever can cause severe infections in the lungs or in other parts of the body. This more severe form of Valley fever can cause infections in the skin, bones, joints, or brain. Severe forms will likely need medical care for several months or even a year and can be fatal in very rare cases

Following work in endemic areas, if you experience any of these symptoms within the next month, immediately notify your supervisor and call WorkCare at (888) 449-7787. Inform the WorkCare occupational health professional that you were in an area where Valley fever has been reported and indicate if you were exposed to dirt or dust in that area.

## **5.6.6 Tetanus**

### **5.6.6.1 Description**

Tetanus is a serious illness that can occur after an injury with a contaminated object. The bacteria that cause tetanus are commonly found in soil, dust and manure and enter the body through breaks in the skin - usually cuts or puncture wounds caused by contaminated objects.

### **5.6.6.2 Recommended Controls and Prevention**

Immunization is the best way to prevent tetanus. Immunization is generally given in childhood and should be repeated every 10 years throughout adulthood. Immediate and proper wound care can also help prevent infection.

### **5.6.6.3 Incident Response and Reporting**

Report all incidents in IndustrySafe (<https://www.industrysafe.com/hdrinc>). For non-emergency injury incidents, immediately notify your supervisor and call WorkCare at (888) 449-7787.

## **5.6.7 Waterborne Pathogens**

### **5.6.7.1 Description**

Waterborne pathogens are found in nearly all surface water systems and many groundwater systems and can cause various diseases (including Leptospirosis, Cryptosporidiosis, and Giardiasis). For a comprehensive list of water-related diseases and contaminants, visit the CDC website (<http://www.cdc.gov/healthywater/disease/type.html>).

Most pathogens originate from body fluids and feces of animals and humans, although some are normal environmental inhabitants.





- Pathogens can enter surface water through sewage discharge and spills, animal feedlot operations, landfills, storm and agricultural runoff, and direct contact.
- Pathogens can also be transported on small particles such as dust or aerosols.
- Pathogens can enter groundwater through infiltration from septic tank effluent, leachate from fields and ponds, and from faulty well seals and casings.

The most common means of contracting these pathogens is by drinking contaminated water and through accidental ingestion from direct contact or splashing (particularly when performing sewer inspection services).

#### **5.6.7.2 Recommended Controls and Prevention**

- Never drink untreated water from streams, lakes, rivers, ponds, etc., no matter how pristine the environment appears.
- If contact or immersion in water is required:
  - Receive vaccinations as appropriate (typhoid, tetanus, hepatitis, polio).
  - Protect open cuts or wounds.
  - Avoid hand-to-mouth contact (never eat, drink or put items in your mouth).
  - Wear waders or rubber boots, gloves, and coveralls to prevent skin contact and goggles/face shields to prevent contact with spray and splashes.
  - Evaluate the need for use of a respirator.
  - Wash your hands and scrub under nails with antibacterial soap and clean, running water immediately following exposure and shower as soon as possible.

#### **5.6.7.3 Incident Response and Reporting**

If you have come in contact with water suspected or known to be contaminated:

- Immediately notify your supervisor and call WorkCare at (888) 449-7787.
- Report the incident in IndustrySafe (<https://www.industrysafe.com/hdrinc>).

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## **6.0 TRAINING**

The following eLearning courses are available on HDR University and are required for field staff with assignments in outdoor settings.

- *Biological Hazards: Poisonous Plants*
- *Biological Hazards: Insects*
- *Biological Hazards: Arachnids*

The following eLearning courses are available on HDR University and are required for field staff as applicable to assigned tasks and exposure settings.

- *Dangerous Desert Snakes and Lizards*
- *Hantavirus*



- *Valley Fever Awareness* (see Section 5.6.5.1, per CA legislation AB 203, this training is required annually for those who perform field work in highly endemic counties in California)

Project Managers are responsible for identifying additional training needs based on anticipated hazards and exposures (such as bear safety training for employees with field assignments in bear country (see Section 5.5.2.3)). Contact your *Regional SH&E Manager* with questions.

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## **7.0 CROSS REFERENCES**

HDR SH&E Procedure #008, *Bloodborne Pathogens Exposure Control Plan*

HDR SH&E Procedure #030, *First Aid, CPR, AED Program*

HDR SH&E Procedure #009, *Respiratory Protection*

IndustrySafe (<https://www.industrysafe.com/hdrinc>)



## 1.0 INTRODUCTION

This document describes scenarios for which HDR employees may be required or may voluntarily choose to wear a face covering, face mask, or respirator for protection from COVID-19 hazards. Note that assignments involving potential inhalation hazards besides COVID-19 exposure must still be assessed and proper respiratory controls selected in accordance with HDR SH&E Procedure #009, Respiratory Protection.

## 2.0 DEFINITIONS

Term	Definition
Air Purifying Respirator (APR)	A respirator with an air-purifying filter, cartridge or canister that removes specific air contaminants by passing ambient air through the air-purifying element.
Face Covering	Covering such as a scarf, balaclava, neck gaiter, or other cloth covering that covers both the nose and mouth without restricting breathing.
Face Mask	Loose-fitting, disposable device that creates a physical barrier between the mouth and nose of the wearer and potential contaminants in the immediate environment.
Filtering Facepiece Respirator (FFR)	<p>A negative-pressure particulate respirator with a filter as an integral part of the facepiece or with the entire facepiece composed of the filtering medium.</p> <p>There are nine classes of particulate filters (three levels of filter efficiency, with three categories of resistance to filter degradation by oil mist): N95, N99, N100, R95, R99, R100, P95, P99, and P100. The N95 FFR is the most commonly-used type of respirator, especially in healthcare environments.</p> <p>The “N” label is for Not resistant to oil, “R” if somewhat Resistant to oil, and “P” if strongly resistant (oil Proof)). The levels of filter efficiency indicate minimum filter efficiency in removing particles of approximately 0.3 microns in diameter. Those that filter out at least 95% are given a 95 rating. Those that filter out at least 99% receive a “99” rating, and those that filter out at least 99.97% (essentially 100%) receive a “100” rating (considered High Efficiency Particulate Air (HEPA)).</p>

## 3.0 DIRECTIVES OR ORDERS

If an agency or government directive or order is issued requiring use of a face covering or respirator, Regional SH&E Managers will work with Area Managers, Managing Principals, and Managing Directors to determine requirements of the directive or order and actions needed for HDR compliance.



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## 4.0 CLIENT REQUIREMENTS

### 4.1 Face Covering or Face Masks

If a client requires use of a face covering or a non-NIOSH<sup>1</sup> approved face mask (e.g., surgical mask) at a job site, employees can fashion their own covering following [CDC guidelines](#) or use a surgical mask, if available. If an employee needs assistance finding a suitable face covering or surgical mask, they should contact their Project Manager. Project Managers can contact Corporate SH&E for assistance with personal protective equipment (PPE) requests.

### 4.2 Filtering Facepiece Respirators

Due to limited supplies of FFRs, it is critical to review with the client the engineering controls, work practices, and administrative controls that could be implemented to decrease the need for FFRs. Under recent CDC recommendations for cloth masks, the agency emphasized that N95 FFRs are “critical supplies” that must “be reserved for healthcare workers and other medical first responders.”

#### 4.2.1 N95 FFR Required and Available

If a client requires an N95 FFR (or an OSHA-approved alternative<sup>2</sup>) and your office has an inventory of these items available, or the client is able to provide them, our employees are subject to OSHA’s Respiratory Protection Standard. Contact your Regional SH&E Manager regarding the regulatory requirements that must be met for medical clearance, fit testing, and training when use of an N95 FFR is required.

#### 4.2.2 N95 FFR Required but Not Available

If a client requires an N95 FFR (or an OSHA-approved alternative<sup>1</sup>) but SH&E does not have any in stock or the client cannot provide this respirator, project managers may want to consider the use of alternative classes of respirators that provide equal or greater protection. These alternatives may include a NIOSH-approved, non-disposable, air-purifying respirators (APRs). Contact your Regional SH&E Manager regarding the use and regulatory requirements that must be met for medical clearance, fit testing, and training if this upgraded respiratory equipment is required.

#### 4.2.3 N95 FFR Recommended and Available

If a client recommends but does not require use of an N95 FFRs (or an OSHA-approved alternative<sup>1</sup>) and your office has an inventory of these items or the client is able to provide the

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<sup>1</sup> NIOSH (National Institute of Occupational Safety and Health). NIOSH provides technical assistance to OSHA (Occupational Safety and Health Administration) and recommends standards for OSHA’s adoption, including those for respirator certification and use.

<sup>2</sup> OSHA Enforcement Guidance for Respiratory Protection and the N95 Shortage Due to the Coronavirus Disease 2019 (COVID-19) Pandemic. April 3, 2020. “Other filtering facepiece respirators, such as N99, N100, R95, R99, R100, P95, P99, and P100, are also permissible alternatives for those who are unable to obtain N95 FFRs. When these alternatives are not available, or where their use creates additional safety or health hazards, employers may consider the extended use or reuse of N95 FFRs or use of N95 FFRs that were NIOSH-approved but have since passed the manufacturer’s recommended shelf life.



respirator, employees who elect to use this protection must complete the voluntary use requirements outlined in Section 5.2.

#### **4.2.4 N95 FFR Recommended but not Available**

If a client recommends an N95 FFR (or an OSHA-approved alternative<sup>1</sup>) but SH&E does not have in stock or the client cannot provide this respirator, employees can voluntarily use an alternative class of respirators that provides equal or greater protection. These alternatives may include a NIOSH-approved, non-disposable, air-purifying respirators (APRs). Employees who elect to use this protection must complete the voluntary use requirements outlined in Section 5.2.

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## **5.0 HDR HAZARD ASSESSMENT**

### **5.1 Requirements for Face Covering**

If you are working in the field or in any environment near others where social distancing cannot be maintained (situations where six feet of separation from others at all times is not possible), a face covering or non-NIOSH approved mask (e.g., surgical mask) is required. Employees can fashion their own covering following [CDC guidelines](#) or use a surgical mask if available.

Use of face coverings or masks can be considered a requirement in the job hazard analysis (JHA) as an additional control to minimize face-to-face contact. The use of a face covering is not a substitute for other safety measures, including social distancing, hand washing and proper hygiene, etc.

Face coverings with holes or a one-way valve and N95 FFRs with an exhalation valve are not acceptable for use as face coverings as they allow unfiltered exhaled air and droplets to be released, which could put others nearby at risk.

### **5.2 Voluntary Use of Respirators**

HDR does not require use of N95 FFRs or APRs for tasks involving potential exposure to COVID-19 unless there is a regulatory<sup>3</sup> or client requirement for use. Employees may consider voluntarily wearing this level of protection for tasks such as the following:

- Working in areas where social distancing for a prolonged period of time (10 minutes or more) is not possible and/or where workers must or could potentially make physical contact with another.
- Working in a confined or enclosed area occupied by others where there is limited ventilation or airflow.
- Working near a medical environment where you may be exposed to potentially infected patients.

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<sup>3</sup> Current OSHA workplace guidance for use of respirators for COVID-19 protection includes work within 6 feet of patients known to be, or suspected of being, infected with SARS-CoV-2 including those in healthcare, medical transport, and mortuary fields. If a respirator is required, it must be used in accordance with HDR SH&E Procedure #009, Respiratory Protection, that includes fit-testing, training, and medical clearance.



- Riding on public transportation.

We will not provide N95 FFRs for voluntary use until supply has met the demand in support of healthcare workers and other medical first responders. If an employee needs assistance finding a suitable face covering, surgical mask, or respirator for field work, they should contact their Project Manager. Project Managers can contact Corporate SH&E for assistance with PPE requests.

If an FFR (such as an N95) or APR will be worn voluntarily, the following requirements must be met.

- Medical clearance (not applicable to FFRs, applies to APRs only).
- Review of Appendix D of the OSHA Respiratory Protection standard (29 CFR 1910.134), “Information for Employees Using Respirators When Not Required under the Standard”
- Completion of the Respirator Voluntary Use Signature Form included in HDR SH&E Procedure #009, Respiratory Protection (see attached)
- Completion of the Respiratory Protection eLearning on HDR University.

When FFRs used voluntarily are stored properly, they may be reused by the original wearer provided they have not become damaged or soiled and the user’s breathing when wearing the FFR has not become difficult. If any of these conditions have occurred, the FFR must be discarded.

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## **6.0 COVID-19 TRAINING AND EDUCATION**

Employees providing field services at client sites and facilities must complete the COVID-19 Awareness and Typical Project Site Required-Practices eLearning on HDR University. This training provides instruction on the use, care, and limitations of face coverings and face masks.

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## **REVISION HISTORY**

<b>Rev</b>	<b>Description of Change</b>	<b>Issue Date</b>
0	Initial Release	04/10/2020
1	Added footnote explaining role of NIOSH	04/15/2020
2	Clarified the requirement for face coverings when social distancing can't be maintained	05/08/2020
3	Added that face coverings with holes or a one-way valve and N95 FFRs with an exhalation valve are not acceptable for use as face coverings	06/08/2020



## RESPIRATOR VOLUNTARY USE ACKNOWLEDGEMENT FORM

HDR employees may choose to use filtering facepiece respirators, also referred to as N95 or N99 disposable dust masks, on a voluntary basis during activities that involve exposures to low-level, non-hazardous nuisance dust or other similar particulates. According to the HDR Respiratory Protection Program and Occupational Safety and Health Administration (OSHA) regulations, HDR must provide you with the following information if you wear a filtering facepiece respirator voluntarily.

The following information is copied from the OSHA Respiratory Protection Standard and pertains to the voluntary use of respirators. After reading the information below, please complete the section at the end of this form.

### 29 CFR 1910.134, Appendix D - (Mandatory) Information for Employees Using Respirators When Not Required Under the Standard

Respirators are an effective method of protection against designated hazards when properly selected and worn. Respirator use is encouraged, even when exposures are below occupational exposure limits, to provide an additional level of comfort and protection for workers. However, if a respirator is used improperly or not kept clean, the respirator itself can become a hazard to the worker.

Sometimes, workers may wear respirators to avoid exposures to hazards, even if the amount of hazardous substance does not exceed an occupational exposure limit. If your employer provides respirators for your voluntary use, or if you provide your own respirator, you need to take certain precautions to be sure that the respirator itself does not present a hazard.

#### You should do the following:

1. Read and heed all instructions provided by the manufacturer on use, maintenance, cleaning and care, and warnings regarding the respirators limitations.
2. Choose respirators certified for use to protect against the contaminant of concern. NIOSH, the National Institute for Occupational Safety and Health of the U.S. Department of Health and Human Services, certifies respirators. A label or statement of certification should appear on the respirator or respirator packaging. It will tell you what the respirator is designed for and how much it will protect you.
3. Do not wear your respirator into atmospheres containing contaminants for which your respirator is not designed to protect against. For example, a respirator designed to filter dust particles will not protect you against gases, vapors, or very small solid particles of fumes or smoke.
4. Keep track of your respirator so that you do not mistakenly use someone else's respirator.

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Employee Signature

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Date

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Please Print Name

**Send original to Corporate SH&E, Attention Olivia Pooley**