GREEN RIVER ENERGY RESOURCES, INC.

Health, Safety and Environmental Standards of Operation

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1 General

1.1 Personal Protective Equipment (PPE)

Purpose

The purpose of these Personal Protective Equipment Policies is to help protect the employees of Green River Energy Resources from work place hazards and the potential injuries associated with the improper use of personal protective equipment (PPE). PPE is not a substitute for safe work practices. It will be used in conjunction with existing hazard controls and proper training of standard operating procedures.

Personal protective equipment will be provided to all GRER employees. This equipment must be available and properly maintained at all times. PPE will be used when it has been determined that its use is required to ensure the safety and health of our employees and that such use will lessen the likelihood of occupational injury and/or illness.

This section addresses general PPE requirements, including: eye, face, head, foot, leg, hand, arm, body (torso), and protection from drowning. Separate programs exist for respiratory protection and hearing protection as the need for participation in these programs is established through industrial hygiene monitoring.

Responsibilities

HSE Manager

The HSE manager is responsible for the development, implementation, and administration of GRER PPE policies. These include:

1. Conducting workplace hazard assessments to determine the presence of hazards which necessitate the use of PPE.
2. Selecting PPE.
3. Reviewing, updating, and conducting PPE hazard assessments whenever a job changes, new equipment is used, there has been an accident, a supervisor or employee requests it, or at least every year
4. Maintaining records on hazard assessments.
5. Maintaining records on PPE assignments and training.
6. Providing training, guidance, and assistance to supervisors and employees on the proper use, care, and cleaning of approved PPE.
7. Periodically re-evaluating the suitability of previously selected PPE.
8. Reviewing, updating, and evaluating the overall effectiveness of PPE use, training, and policies.

Supervisors

Supervisors have the primary responsibility for implementing and enforcing PPE use and policies in their work area. These include:

1. Providing appropriate PPE and making it available to employees.
2. Ensuring that employees are trained on the proper use, care, and cleaning of PPE, per GRER PPE training videos.
3. Ensuring that PPE training is documented in the competency based training matrix for GRER.
4. Ensuring that employees properly use and maintain their PPE, and follow all PPE policies and rules.
5. Notifying management and the HSE Manager when new hazards are introduced or when processes are added or changed.
6. Ensuring that defective or damaged PPE is immediately disposed of and replaced.

Employees

The PPE user is responsible for following the requirements of the PPE policies. These include:

1. Properly wearing PPE as required.
2. Attending required training sessions.
3. Properly caring for, cleaning, maintaining, and inspecting PPE as required.
4. Following all PPE policies and rules.
5. Informing the supervisor of the need to repair or replace PPE.
6. Employees who repeatedly disregard and do not follow PPE policies and rules will be subject to disciplinary action.

Procedures

Hazard Assessment for PPE

- Supervisors will conduct a site specific hazard assessment that will determine the PPE required for the project site. The assessment must state whether hazards are present or if they are likely to become present at any time.
- HSE manager will conduct, review, and update the hazard assessment for PPE whenever a job changes, new equipment or process is installed, there has been an accident, whenever a supervisor or employee requests it, or at least every year
- All hazard assessments must be certified and signed by the project manager or HSE manager. Documentation must include name and signature of certifier and the date.
- Any new PPE requirements that are developed will be added into GRER's written PPE policy.

Selection of PPE

Once the hazards of a workplace have been identified, the HSE manager or responsible party will determine if the hazards can first be eliminated or reduced by methods other than PPE, i.e.,

methods that do not rely on employee behavior, such as engineering controls. If such methods are not adequate or feasible, then the HSE manager or responsible party will determine the suitability of the PPE presently available; and as necessary, will select new or additional equipment which ensures a level of protection greater than the minimum required to protect our employees from the hazards. 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 recommended for purchase.

All personal protective clothing and equipment will be of safe design and construction for the work to be performed and will be maintained in a sanitary and reliable condition. Only those items of protective clothing and equipment that meet NIOSH (National Institute for Occupational Safety and Health) or ANSI (American National Standards Institute) standards will be procured or accepted for use. Newly purchased PPE must conform to the updated ANSI standards which have been incorporated into the PPE regulations, as follows:

- Eye and Face Protection ANSI Z87.1-2010
- Head Protection ANSI Z89.1-2014
- Foot Protection (varies based on job requirements and hazard assessment as per ASTM testing regulations)
- Hand Protection (There are no ANSI standards for gloves, however, selection must be based on the performance characteristics of the glove in relation to the tasks to be performed.)
- Affected employees whose jobs require the use of PPE will be informed of the PPE selection and will be provided PPE by GRER at no charge. Careful consideration will be given to the comfort and proper fit of PPE in order to ensure that the right size is selected and that it will be used.

Training

Any worker required to wear PPE will receive training in the proper use and care of PPE before being allowed to perform work requiring the use of PPE. Periodic retraining will be offered to PPE users as needed. The training will include, but not necessarily be limited to, the following subjects:

- When PPE is necessary to be worn
- What PPE is necessary
- How to properly put on, remove, adjust, and wear PPE
- The limitations of the PPE
- The proper care, maintenance, useful life, and disposal of the PPE
- After the training, the employees will demonstrate that they understand how to use PPE properly, or they will be retrained.

Training of each employee will be documented using the TRAINING MATRIX and kept on file. The document certifies that the employee has received and understood the required training on the specific PPE he/she will be using.

Retraining

The need for retraining will be indicated when an employee's work habits or knowledge indicates a lack of the necessary understanding, motivation, and skills required to use the PPE (i.e., uses PPE improperly), new equipment is installed, changes in the work place make previous training out-of-date, or changes in the types of PPE to be used make previous training out-of-date

Cleaning and Maintenance of PPE

It is important that all PPE be kept clean and properly maintained. Cleaning is particularly important for eye and face protection where dirty or fogged lenses could impair vision. Employees must inspect, clean, and maintain their PPE according to the manufacturers' instructions before and after each use. Supervisors are responsible for ensuring that users properly maintain their PPE.

Personal protective equipment must not be shared between employees until it has been properly cleaned and sanitized. PPE will be distributed for individual use whenever possible.
If employees provide their own PPE, supervisors will make sure that it is adequate for the work place hazards, and that it has been properly maintained.

Defective or damaged PPE will not be used and will be immediately discarded and replaced.
NOTE: Defective equipment can be worse than no PPE at all. Employees would avoid a hazardous situation if they knew they were not protected; but they would get closer to the hazard if they erroneously believed they were protected, and therefore would be at greater risk.
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.

Protective Clothing and Equipment

It is the direct responsibility of every employee to wear and use the protective clothing and equipment provided. Each employee is responsible for ensuring such equipment is kept in a good state of repair.

1. Appropriate clothing for the area should be worn.
2. Do not wear loose clothing around moving machinery such as engines, vibrators, or drills. Tuck shirttails in, fasten cuffs and tuck long hair under appropriate headgear. Overalls are the most appropriate clothing to wear. Shorts, cutoffs, swimsuits, and sleeveless shirts are not acceptable.
3. Gloves should be worn for specified jobs.
4. Hard hats and protective footwear should be worn as required by company policy, crew procedures or by posted instructions.
5. When selecting eye and combined eye and face protectors, careful consideration should be given to the kind and degree of the hazard and the degree of protection and comfort afforded. The main causes of eye injuries are:

a. Infrared rays (e.g., from gas welding).
b. Ultraviolet rays (e.g., from electric welding).
c. Exposure to chemicals (e.g., from battery acid).
d. Exposure to particles and foreign bodies (e.g., from helicopters, wind)
e. Strong sunlight or snow blindness.
f. Battery explosions or splashes.

6. Ordinary prescription glasses do not afford protection. Eye protection is available in a wide variety of styles and applications. Prescription eye protection is also available.

Hearing Protection

All personnel exposed to high levels of noise (greater than 85 dB) are encouraged to wear hearing protection suitable for the particular circumstances. If you must raise your voice to be heard, you are probably in an area requiring hearing protection. Long-term exposure to high noise levels may cause long-term hearing loss. A noise survey should be made of any questionable area.

Training on the sources of high levels of noise in the workplace will be provided to all employees. This will be done to ensure proper understanding of the risks involved with working around various equipment.

Respiratory Protection

While OSHA does not currently have any regulations for basic respiratory protection, GRER does highly recommend its use when working around moderate to high dust volumes. Respiratory protection will be provided to any employee wishing to use it. We offer light paper dust masks and plastic dust masks with removable filters.

Drowning Protection

If work takes place in or around water, training will be provided to employees on protecting against drowning. Flotation devices will also be provided when it is deemed necessary.

Personal Flotation Devices (PFDs) will be required for all personnel regardless of swimming ability, if their use is deemed necessary. They must be worn correctly and adjusted securely. Consideration will be given to comfort and vision obstruction.

1.2 Stop Work Authority (SWA)

Purpose

Stop Work Authority establishes the ***'authority and obligation'*** of any individual to suspend a single work task or group operation when the control of HSE risk is not clearly established or understood. In general terms, the SWA process involves a stop, notify, correct and resume

approach for the resolution of a perceived unsafe condition, act, error, omission, or lack of understanding that could result in an undesirable event.

Green River Energy Resources' SWA standard establishes the authority and obligation of any individual to 'stop work' without the threat of reprisal.

Roles and Responsibilities

- **Senior Leadership**: Establish clear expectations and accountability, and create the culture necessary to promote SWA. Model SWA behavior and ensure that there is support, not reprisal, for using Stop Work Authority.
- **Field Supervisors:** Create a culture where SWA is exercised freely, honor SWA requests, resolve issues before operations resume and recognize proactive participation.
- **Company employees/contractors:** Initiate Stop Work and support interventions of others.
- **HSE**: Training, documentation, compliance and support of the Stop Work Authority program

Procedure

1. If an employee feels that a situation is unsafe or may become unsafe at some point, they have the right and responsibility to call for a "stop work".
2. The employee and any other employees involved in the same task must go into a work stand down and ensure that all machinery is powered off.
3. If the unsafe condition may affect other personnel at a different location or participating in a different activity, the stand down will apply to them as well.
4. The group of personnel in stand down will discuss the hazardous situation and means of mitigating the unsafe conditions. This will be recorded in a JSA (Job Safety Analysis).
5. Work will only resume when all participants are comfortable with the new procedures and safety conditions.

Training

All GRER personnel will receive training for Stop Work Authority procedures prior to beginning work for the first time and also at the start of every project. Employees will be trained as to when SWA can and should be used and the procedures for mitigating hazards and returning to work. Procedures for performing a proper JSA will also be addressed. All training will be documented.

Follow-Up

The results of any SWA incident or safety stand down will be discussed with all employees at the next safety meeting. Suggestions for additional mitigation options should be brought up during this group discussion. All JSA and procedure changes will be reviewed by GRER management.

1.3 Short Service Employee (SSE) Program

Purpose

GRER employees and their sub-contractor personnel with less than six (6) months experience in the same job type or with no previous work time under any current GRER project manager shall be considered a Short Service Employee (SSE).

Responsibilities of GRER Management:

- Ensure appropriate roster/crew notifications are submitted to field Representative or HSE manager prior to SSE's arrival at the worksite. Approve SSE roster before deploying to location
- Ensure all GRER employees and sub-contractors adhere to GRER's SSE program policies and roster requirements.
- Ensure each SSE can be identified by visible means (hard hat decal or high visibility orange colored hard hat.)
- SSE's will be monitored for HSE compliance by an experienced mentor at all times.

The following table shows the maximum allowable number of SSE crew members at any given time:

Crew Members	SSE's in Crew	Required Approvals and Notifications
1	0	Single-person crew shall not be an SSE
≤ 4	1	None
≥ 5	≤ 20% of crew	None
≥ 5	20–30% of crew	Project Manager concurrence
≥ 5	≥ 30% of crew	Written variance approval by the Senior Management

Informal evaluation of the SSE employees will continue throughout the mentoring period. The mentor or project manager will have the right to remove the SSE employee from the work site at any time.

Removal of SSE status

For an employee to be no longer considered an SSE, the following criteria should be met:

- If the employee has more than 6 months of previous work experience in the same job, the project manager or direct supervisor and the assigned mentor will conduct a formal evaluation of the employee after a minimum of 1 month.
- If the employee has no previous work experience in the same job, the project manager or direct supervisor and the assigned mentor will conduct a formal evaluation of the employee after 6 months.
- If the employee lacks the physical capabilities or mental aptitude for their required tasks or refuses to operate in a safe manor, the assigned mentor has the right to remove the employee from the work area at any time.

Mentorship

All GRER SSE's are required to be monitored for HSE compliance by an experienced mentor at all times. Mentors are selected prior to the SSE employee being allowed in the field. Mentorship status is by volunteer only and must be approved by the Project Manager or direct supervisor. Mentors are responsible for their mentee while traveling to and from the job site and while on the job site. They must teach the mentees safe operating procedures and ensure that they comply with all rules and regulations. If an SSE employee's assigned mentor leaves the project area, a second mentor will be assigned to the SSE.

All mentors must have at least one year experience at GRER. Mentors are limited to a maximum of 4 mentees at any given time. An SSE employee may have more than one mentor if the job location or task dictates additional training. All mentors must approve the SSE employee's removal from SSE status.

Mentors must participate in special training before taking responsibility for their mentee. Training will include a review of HSE standards and procedures, review of local rules and regulations and review of site specific emergency response plans.

1.4 Communications

Radios

Communications between all field crews are essential at all times, especially in the event of an injury or medical emergency. Procedures should be in place for emergency first aid treatment and evacuation. The Emergency Response Plan (ERP) including telephone numbers of paramedic or HSE Advisor, doctors, hospitals, etc., should be displayed in all field office locations and with all drivers and field management personnel. Radio communications between working groups are important in promoting crew safety. Knowledge of the movement of working groups (i.e., direction of travel and length of absence) could save time if an emergency situation should arise. More than one person within each working group should be

familiar with communications equipment and procedures. Each operating unit should have a working radio, and a base radio should be manned at all times while personnel are in the field.

Global Positioning Systems (GPS) and HSE

Global Positioning Systems (GPS) have provided a useful tool to assist in Medivac, Search and Rescue, Civil Unrest and Evacuation as well as Environmental emergencies. If you know where you are, where you want to go, and if you can communicate those positions, HSE response is significantly faster. These procedures are applicable to most exploration areas.

The GPS is commonly used in hazard assessment and hazard avoidance for obstacles such as oil field infrastructure, environmentally sensitive areas, artifact and cultural resources and anything that requires a location.

All personnel who are assigned to a crew that may have an emergency evacuation or who may have to use a unit should be trained in the use of the GPS.

1. Remember the system requires a line of sight to function. The receiver must be able to see the satellites (normally 10° or more above the horizon) in order to receive the signals. Clouds and mist will not block the signals, light foliage, heavy rain or the occasional intermittent blockages of one or two satellites may start to degrade the position accuracy. Sheltering under a bridge, in a room, vehicle or under a heavy canopy will cause the loss of signals, and reduced accuracy.
2. Regularly discuss the use of GPS at safety meetings. Be sure everyone understands the measurement units used or listed for reporting locations. Surveyors like the DD.MM.SS display of Latitude and Longitude. Pilots like DD.MM.mmm. Precious time can be lost converting display formats or resolving other confusion about parameters. Time saved can mean a life saved.
3. Ensure ALL senior crewmembers are comfortable with GPS terminology and can adequately utilize a GPS receiver to acquire and report position. Latitude comes before Longitude! Be sure all crewmembers understand how the GPS receivers work and units are operating with the same internal geodetic parameters. A correct datum setting can put the Life Flight helicopter a mile or more closer to you at a critical time.
4. In the Emergency Response Plan, provide coordinates for all major helipads or airfields, docks and boat ramps, hospitals, ambulance and fire stations that may be used in the event of an emergency. Be sure copies are available for local emergency response units. Make sure everyone knows how to plot their position on the diagram and use their GPS to navigate to the nearest evacuation point.
5. Practice evacuations. Practice navigating from one Way Point to another using the GPS. All drivers should have this training. Can evacuation routes be followed at night as well as by day? Are people and equipment prepared?
6. GPS can be used for restricted areas on the project sites. Alarms can be set if vehicles or personnel encroach into these areas.

Cell Phones

Subject to local laws and driving regulations, cell phone use is permitted in “hands free” mode when operating in areas free of heavy traffic, bad weather, or marginal road conditions. Texting or dialing while driving is not allowed. If your phone rings in an area where marginal conditions exist, do not answer it. Instead pull to the side and return the call or wait until conditions exist such that your conversation will not distract you from the primary task of controlling the vehicle.

Client policies pertaining to cell phone usage shall take precedent for individual projects based on specific written client instructions.

If you are driving with explosives you are not permitted to use a cell phone under any circumstances. If an emergency occurs or if cellular communications are absolutely necessary, pull off the road, exit the vehicle and move a safe distance from the hazardous material before making the call.

It is recommended that all field personnel carry their cell phones while in the field. While cell phone coverage is not always available, in an emergency situation, having it as an option may save a life. If you are seeking cell phone coverage, climb to a high point. This may also help to gain radio signal as well.

1.5 Safety Disciplinary Policy

Purpose

Green River Energy Resources (GRER) believes that to be enforceable, a safety and health Accident Prevention Program must be supported by some type of disciplinary policy. Our company believes that in order to maintain a safe and healthful workplace, the employees must be aware of and adherent to all company, State, and Federal safety and health regulations as these apply to their specific job duties. The following disciplinary policy is in effect and will be applied to all safety and health violations. Enforcement of the disciplinary procedures is the responsibility of the supervisor and Project Manager.

For a safety rule or policy to be deemed violated it must be documented in the GRER HSE Standards, or Employee Handbook in which each employee has been given training prior to entering the work area, or must be a documented client zero tolerance effort in which all affected GRER employees have been exposed to prior to work beginning.

All consequence management issues will be investigated by the General Manager with the assistance of the assigned project manager. A physical inspection of the work area by the project manager may be required to determine that a safety rule or policy has been violated. If it is determined that a possible documented violation has indeed occurred the project manager must immediately notify the general manager in-order to begin the investigation process and to

determine the current employee status. The project manager will meet with the affected employee and explain the violation and inform of the rule or policy violated. Periodic physical inspection of the work area by the project manager may be required to determine when a safety rule or policy has been violated

Procedure

The following three step process will be followed unless the seriousness of the violation would dictate the managerial discretion of going directly to Step 2 or Step 3.

1. A first time violation will be discussed orally between company supervision and the employee. This will be done as soon as possible following the policy violation. Details of the oral discussion will be summarized by the company supervisor, dated and entered into the employee's personnel folder

2. A second time offense will be followed up in written form and a copy of this written documentation will be entered into the employee's personnel folder. A copy of the Step 1 summary will be attached to this form and must be signed by the project manager and the employee prior to the employee returning to work.

3. A third time violation will result in mandatory suspension from work or possible termination, depending on the seriousness of the violation.

1.6 Notifications & Record Keeping

Purpose

Green River Energy Resources (GRER) maintains documentation of all work related injuries, illnesses and fatalities, changes to safety policies and procedures, and changes to company policies. This information is available to all employees for review. Records of all safety statistics is filed at the base administrative office.

HSE Notifications

Bulletin boards will be established at all work sites so employees can review safety or any new company information. The Project Manager is designated as the individual responsible to ensure the notification boards are maintained and contain pertinent information.

Record Keeping

All project files, DOT, BATFE, HSE statistics and employee training will be sent to the Base Administration office monthly or at the end of the project depending on the duration of the project for recordkeeping. All hardcopy and permanent files will be archived in the Base Administration office.

OSHA Reporting Guidelines

GRER is required to keep records of occupational deaths, injuries and illnesses, and to make certain it reports to OSHA and the Bureau of Labor Statistics.

Required regulatory forms:

- OSHA 300 Log of Work-Related Injuries and Illnesses,
- Annual OSHA 300A Summary of Work-Related Injuries and Illnesses
- OSHA 301 Injury and Illness Incident Report.

Each Log must include injuries and illnesses to employees on GRER's payroll as well as injuries and illnesses of other employees the employer supervises on a day-to-day basis, such as temporary workers or contractor employees who are subject to daily supervision by GRER and be posted on the OSHA 300 log within 7 calendar days from the time the incident is reported.

General Recording Criteria.

GRER must record work-related injuries and illnesses that meet one or more of the general recording criteria or meet the recording criteria for specific types of conditions.

Recordable work-related injuries and illnesses are those that result in one or more of the following:

- Death
- Days away from work
- Restricted work
- Transfer to another job
- Medical treatment beyond first aid
- Loss of consciousness
- Diagnosis of a significant injury or illness.

Certification, Summarization and Posting.

At the end of the year the OSHA 300 summary will be reviewed for accuracy, the OSHA 300 summary form will be completed and signed by the GRER President. This information must then be posted for three months, from February 1 to April 30 in a place visible to employees.

Green River Energy Resources must maintain these records in the administrative office for a minimum of five years.

1.7 Management of Change (MOC)

Purpose

The Management of Change (MOC) policy helps ensure that changes to a process do not inadvertently introduce new hazards or unknowingly increase risk of existing hazards. The MOC

element includes a review and authorization process for evaluating proposed adjustments to operations, organization, or activities prior to implementation to make certain that no unforeseen new hazards are introduced and that the risk of existing hazards to employees, the public, or the environment is not unknowingly increased.

Responsibilities

1. Be knowledgeable of the MOC process as necessary.
2. Ensure that employees follow the MOC process by reviewing the current MOCs.
3. Provide comment on every change when identified as a reviewer of assigned MOC tasks.
4. Verify that employees execute the MOC and close out according to MOC conditions.
5. Do not allow changes that require a MOC to be made without adherence to the appropriate process.

Types of change that may require an MOC:

1. **Physical Change** – All changes that are not "replacement in kind" should go through an MOC process regardless of whether the change is temporary or permanent.
2. **Procedural Change** – Emergency Response, or Medical Emergency Response changes, managed pressure, etc.
3. **Personnel Change** – All changes to a worksite staffing plan and or personnel roles and responsibilities, including sub-contract personnel. Routine personnel vacancies and replacements, rotations, and shift or tour changes are exempt.
4. **Software Change** – This includes all modifications to the programming or settings of any computerized systems in Control and Automation Domain.

Approval

All MOC's must be signed and dated by senior management, GRER president, GRER Vice President or a general manager before being implemented. See the MOC form in the Appendix.

1.8 Subcontractor Management Plan

Overview

Green River Energy Resources (GRER) has established procedures to review and require that subcontractor safety programs, training, procedures and initiatives coordinate with GRER's own standards of safety. The process is intended to help ensure that, in the event subcontractors are utilized by GRER as part of a work project, each subcontractor's safety programs, OSHA compliance, training, confirmations, documentations and statistical results of previous safety performance are in accordance with requirements of both GRER and general contractor. Under this program and its associated processes, any subcontractor will be reviewed and qualified by

GRER prior to performing work as part of a GRER project.

Subcontractor safety and health requirements

Pre-qualification by GRER will include review of the subcontractor's:

- OSHA 300 log for the last five years, or from the date the subcontractor began doing business if this time is less than five years
- OSHA experience regarding any previous inspections or citations
- Written safety and health programs as required by GRER and/or the respective host employer or general contractor
- Written subcontractor procedures for at-work incident, injury, illness and emergency response, reporting and investigation requirements
- Workers' compensation insurance EMR (Experience Modification Rating) information
- Proof of insurance documented by a current certificate of insurance from the subcontractor's insurance agent(s)
- Documentation of required safety training of subcontractor employees that will be assigned to the respective project, including supervisor, competent person training and site safety representative training
- Documentation of required Operator Qualification (OQ) and other individual qualifications or certifications as may be required by the project
- Documentation as may be available to explain the subcontractor's previous safety performance using a statistical method.

Review and evaluation will be performed by senior management, or a qualified third party as designated by the Safety Manager or designated person.

Written materials, submissions, results and documentations of subcontractor pre-qualification reviews will be maintained by the Base Office Administrator in a file for a period to be determined in coordination with GRER's designated legal counsel.

Measurements of workplace safety and health results

To manage a process or system, you must be able to measure it. This is why GRER measures safety performance and results as a tool toward identifying and eliminating hazards, mitigating risks and protecting employees and other individuals from workplace injuries and illnesses.

For purposes of this program, a safety metric will be considered as any such measurement of safety performance and injury/illness/incident prevention results. Specific safety metrics to be considered during subcontractor pre-qualification will include, but are not limited to, those items above.

Safety metrics will be utilized to help evaluate when, where and how safety programs and initiatives have been successful, and also to identify areas that require additional attention.

Subcontractor safety performance will be reviewed and evaluated in part through comparisons of the subcontractor's safety metrics with levels of accomplishment as identified by GRER.

Subcontractors who cannot provide sufficient documented safety metrics evidence which are not in accordance with project requirements will not be utilized for that specific project; or they will be utilized in roles and assignments that have lower levels of risk and are acceptable to GRER and the host employer.

All determinations of acceptability of a subcontractor's safety metrics, as requested and reviewed in accordance with this program, will be made by GRER and/or the host employer for the respective project.

Inclusion and participation of subcontractors in project safety initiatives

Subcontractors assigned by GRER to a project will attend initial safety and planning meetings; project safety orientations; incident, injury and illness response planning and coordination meetings. Subcontractor personnel will participate in these and other such activities as required in preparation for working safely at the project location.

Subcontractor personnel will utilize, cooperate with, attend and support all pertinent components of safety programs and procedures; safety orientation, training, tailgate and daily meetings; qualification and/or certification requirements; periodic safety meetings and awareness activities; safety inspections; incident reporting and investigation procedures; and other such safety, health and incident prevention initiatives as may be established for all workers at a project location. Subcontractor personnel will also participate in and cooperate with all Job Safety Analysis (JSA) as established for the project workplace.

Requirements for reporting hazards, incidents, injuries and illnesses

Subcontractor employees are responsible for reporting any observed near-miss, hazard or unsafe behavior of another person when there is a potential for causing an undesirable incident, injury or illness in the project workplace.

First report will be made to the subcontractor's on-site supervisor or to the GRER contact person if the supervisor is not readily available. Reporting should be made without delay to help facilitate intervention and preventive measures.

Subcontractor supervisors and/or management will forward any such report to their GRER contact person so that additional communication can be made and/or actions taken if GRER deems this necessary.

Any on-the-job injury or illness that requires medical attention by a physician or professional medical provider will be reported immediately to the GRER contact person after the individual(s) requiring treatment are in route to medical care.

Subcontractors will investigate near-misses, first aid injuries, and incidents, injuries or illnesses in the project workplace in accordance with requirements established for the project.

Post-project review of subcontractor safety performance and results

On conclusion of a project, GRER will make a timely review of each subcontractor's safety performance, incident and injury experience, and other factors that will be helpful in evaluating the subcontractor's suitability for future projects.

In the event that a subcontractor exits or is terminated from a project that remains in progress, a similar timely review as explained above will be performed.

Post-project evaluations will be performed in coordination with GRER managers and supervisors who worked with the subcontractor during the specific project under review.

2 Safety Practices

2.1 Safety Meetings & Orientations

Safety Meetings:

Short tailgate meetings of 5-10 minute durations must be conducted daily, to discuss accidents, near accidents, as well as unsafe acts or conditions noted by the crew. The tailgate meetings should be recorded to highlight gaps in subjects reviewed, against incident reports. Pre-work safety meetings and monthly safety meetings will also be conducted by Green River Energy Resources (GRER) employees and management.

Regularly scheduled, well-organized and properly conducted safety meetings should be held to discuss new material and subjects not adequately covered at the shorter meetings. Documentation of these meetings, with attendance records and signed employee confirmation of information shared is mandatory. It is common practice to organize these meetings along the lines of the crew structure, i.e., drillers, drivers, etc.; crews usually meet separately to discuss subjects specific to their work.

Safety Orientations:

The project manager should give each person who visits a crew a documented safety orientation prior to individual visiting the field operations.

Immediately upon joining a crew or moving into a new area, all personnel should be made aware of local factors that may affect their personal safety. Such factors would normally include:

- Emergency response procedures.
- firefighting equipment and evacuation plan.
- Site specific hazard communication.
- Job and associated hazards.
- Company HSE policies.
- Job Descriptions

2.2 Job Safety Analysis (JSA)

Purpose

Green River Energy Recourses (GRER) is committed to teaching all of its employees HSE awareness while performing their daily activities through different methods including the Job Safety Analysis (JSA) program. GRER has implemented the JSA program to train employees on how to recognize hazards, hazardous conditions and how to mitigate such conditions in order to perform their job in the safest manner possible. It is a tool made available to each employee to ensure they are concentrating on the activities they are performing and are able to perform them safely. This tool will allow an employee to analyze the job thoroughly and ensure that the proper PPE and procedures are being used and followed.

Job Safety Analysis Basics

A JSA consists of four major components. First, each crewmember's duties are listed along with all key or significant steps required to perform that job. Experienced personnel must assist new hires or inexperienced employees with the steps followed while performing duties in their respective positions.

Second, all hazards that may be encountered in each step are identified and listed. Hazards are identified as equipment, personnel, wildlife, environmental, etc. Employees must identify such hazards and also events that may occur when such hazards are encountered. These events could include injuries, illnesses, damages, etc.

Third, recommended actions or procedures to eliminate or mitigate these potential hazards are outlined. Experienced personnel must assist new hires or inexperienced employees with the procedures that must be followed or required PPE that should be worn while performing duties in the respective positions.

The fourth and perhaps the most important step is the development, implementation and review of an on-going JSA program. By having crewmembers participate in developing the JSA's for their particular duties, it encourages them to be proactive in their thinking. They must anticipate what hazards they may encounter, and they must think of how to avoid or overcome

these on-the-job challenges. This is one of the most effective methods of education crewmembers about the hazards of the respective jobs. A JSA program assists the crews in increasing their overall safety awareness.

Stepback

There are many situations in which a worker or group of workers will find a written JSA is not necessary and instead may perform a Stepback. A Stepback is a process that identifies hazards before a task is started. It is based on "engaging the mind before the hands". The sequences of steps that shall be followed are:

1. Physically Stepback from the job
2. Invest time to step through (visualize) the job in your mind

If the process is performed by a group of employees, the following sequence of steps shall be followed:

1. Share learning from previous events with the work groups and others where appropriate
2. Share information to determine any conflicting work
3. Identify hazards that may be encountered during the work
4. Discuss previous experience doing the same work

The Stepback process shall be performed while conduction daily duties. This will enable each worker to remain focused on the task at hand while working. Supervisors shall give positive reinforcement for using the Stepback process. Management expects that Stepback be done for all tasks and JSA's when required or necessary.

When to Implement a JSA

Most work place injuries, incidents, and/or losses occur because hazards are not identified during routing work activities. However, these losses can be greatly reduced or eliminated by investing time in stepping through the task and identifying hazards. Both of the processes mentioned provide a simple method to reduce the likelihood of losses.

All workers shall be aware that the following categories usually lead to a loss and steps shall be taken to prevent losses.

1. Hazards not recognized
2. Incomplete planning
3. Awkwardness of the task
4. Communication breakdown

JSA is a useful tool which will improve employees' HSE awareness. It is used to take a proactive approach while performing their daily tasks in order to prevent incidents. It allows them to think about the job at hand and to determine the safest way to perform each task.

The employee shall perform a JSA whenever the job task meets any of the following criteria:

- Training
- Hazardous materials used
- Non-routine activity
- Group activity
- New activity
- High risk activity
- Change in procedures
- Critical procedures used
- Retraining
- Hazardous area

JSA Review and Mitigation

All JSA's will be review by the HSE Manager and Project Manager. All identified hazards must be reviewed and assessed for severity. If the mitigation technique identified in the JSA does not reduce the identified hazard to a satisfactory level, a new mitigation technique must be discussed. Any changes to established procedures or policies must be reviewed and authorized by senior management before being implemented.

Hazard Severity Classification

The following chart is used to classify the severity of the hazards identified in a JSA.

CONSEQUENCES					INCREASING LIKELIHOOD				
SEVERITY	PEOPLE	ASSEETS	ENVIRONMENT	REPUTATION	A	B	C	D	E
					Never heard of in the industry	Heard of in the industry	Has happened in the Organization or more than once per year in the industry	Has happened at the Location or more than once per year in the Organization	Has happened more than once per year at the location
0	No injury or health effect	No damage	No effect	No impact	PAER				
1	Slight injury or health effect	Slight damage	Slight effect	Slight impact					
2	Minor injury or health effect	Minor damage	Minor effect	Minor impact					
3	Major injury or health effect	Moderate damage	Moderate effect	Moderate impact					
4	PTD or up to 3 fatalities	Major damage	Major effect	Major impact					
5	More than 3 fatalities	Massive damage	Massive effect	Massive impact					

2.3 Hazard Communication

Purpose

The following Hazard Communication Program (HAZCOM) has been established to ensure compliance with all directives pertinent to Code of Federal Regulations (29 CFR 1910.1200). It is the intent of this program to provide all Green River Energy Resources (GRER) personnel with a reference guide to working with hazardous chemicals.

The written Hazard Communication Plan will be updated for each project and will be available for review by all GRER employees at all field location sites and main office sites. Copies of the plan may be obtained at the request of any supervisory personnel.

Policies set forth in this Hazard Communication Plan must be adhered to by all employees and contractors. Employees found to be knowingly violating the policies set forth will be subject to disciplinary actions, up to and including immediate termination.

Roles and Responsibilities

The following personnel have been designated as responsible for updating and maintaining the hazard communication program, employee training, labeling, and ensuring the MSDS forms are obtained and maintained.

HSE Manager

The HSE Manager is the overall Hazard Communication Program Coordinator. Training of all GRER personnel will be conducted by the HSE Manager. After completion of initial training, it will be the responsibility of individual supervisors to provide on the job safety training to all newly hired personnel. When new chemical products are introduced, additional training by supervisory personnel will be required. A central file of MSDS will be provided to all field sites and office locations by the HSE Manager. At least once per year, the HSE Manager will review and update the program. The update will consist of each of the following elements of the HAZCOM program:

- Hazard assessment
- Assessment of applicable regulations
- Update of Written plans & Policies
- Training
- Inspection audits

Field Supervisors

Inventories of hazardous chemicals will be maintained at each field location. It will be the responsibility of the supervisor of the area to ensure proper labeling of containers. This is to be consistent with the information contained in the appropriate SDS. Note: Common nomenclature must be stated on the label. Chemical symbols may be added, but common nomenclatures are mandated by OSHA. Field Supervisors will maintain SDS for their area and

inform HSE Manager when new materials are added to the work area so the appropriate MSDS sheets can be provided.

Project Managers

It will be the responsibility of project supervisor to inform contractors of the hazards in the work area to which they are assigned. This is critical wherever chemicals or compressed gas are in use or are stored. Contractors are to be informed of any restrictions involving use of compressed gasses, flame, or chemicals to be utilized by the contractor as part of the job.

Container Labeling

Container labels will be in accordance with current and accepted OSHA and NFPA Standards. All containers received for use are to be properly and clearly marked with the following:

- Contents of the container
- Potential Hazards
- Name and Address of the Manufacturer

Any missing, defaced or illegal labels will be replaced immediately with clean, properly marked ones.

Portable Containers

Portable containers used for hazardous chemicals that are transferred from labeled containers for the immediate use of the employee who performs the transfer are not required to be labeled. If any hazardous chemical remains when the employee leaves the immediate area, then the container in which the hazardous chemical is stored must be labeled, or the material transferred back (if allowable) into a labeled container. All other portable containers are to be labeled with the content and hazard to the potentially affected body parts.

Safety Data Sheets (SDS)

An SDS for each hazardous chemical in the facility is to be maintained at the local field office. This will be available for review by all employees at all times.

A master file of all SDS will be kept at the administrative office. SDS obtained from chemical manufacturers or distributors will also be kept on file. A work area specific SDS binder will be kept within the intended work area.

All SDS must have complete information in each of the following categories:

- Identities used on label
- Chemical and common names
- Physical and chemical characteristics
- Physical hazards
- Health hazards
- Primary routes of entry
- Air exposure limits (PEL's, TIV's)

- Carcinogenicity
- Precautions for safe handling
- Control Measures
- Emergency and first aid procedures
- Date of preparation of SDS
- Name, address and phone number of SDS preparer or distributor

The project supervisor will contact suppliers for any missing SDS or missing SDS category information.

Training

Prior to beginning work with hazardous chemicals, all affected employees are required to attend a hazard communications training class. Supervisors will ensure that new employees are trained and that the training is documented.

Additional training will be conducted by supervisors when new chemicals are introduced to the work area. Retraining is not required if the new chemical contains hazards similar to previously existing chemicals for which training has already been conducted but documentation of the similarities should be noted.

Each employee attending the safety course will receive information of the following:

- The location and availability of the written Hazard Communication Program and SDS
- Training on the physical and health hazards of the chemicals in the work area
- How to reduce or prevent exposure to these hazardous chemicals through proper work practices, engineering procedures, emergency procedures, and personal protective equipment to be used.
- Actions taken and protocols implemented to reduce or prevent the workers' exposure to hazardous chemicals
- Procedures to follow if they are exposed to hazardous chemicals
- Methods and observations used to verify the presence or release of a hazardous chemical
- Explanation of the details of the program, labeling the SDS, and how employees can obtain and use appropriate information.

Hazardous Non-Routine Tasks

It is GRER policy that no employee will begin work or any non-routine task without first notifying the appropriate supervisor.

Specific Training

Any non-routine task will require specific training concerning the hazards associated with the task. This training will include information on:

- Specific chemical hazard

- Protective/safety measures that the employee can take
- Measures that GRER has taken to reduce the hazards, including administrative controls, engineering controls, and personal protective equipment (PPE) required.

Multi-Employer Work Sites

It is the responsibility of the project manager to provide contractors and their employees with the information listed below. This information will be given to the contractor's employees prior to entering the work site.

- Hazardous chemicals onsite
- Measures the employee may take to reduce the possible exposure
- Steps taken to reduce the risks
- SDS for all hazardous chemicals on file
- Procedures to follow if they are exposed
- Location of the written Hazard Communication Plan

2.4 Incident Reporting

Purpose

All incidents (accidents and near misses), hazardous situations, unsafe acts and conditions will be reported as per the Company procedures, client or regulatory requirements. All incident reports and high potential events will be investigated, reviewed, and actioned in an effort to prevent future occurrence of a similar event.

Incident Investigation and Reporting

Incidents (accidents and near-misses) will be reported to the Base Administration office and the client as soon as possible not to exceed 24 hours according. This includes all incidents involving GRER employees and events where GRER employees were at risk. An initial assessment of the incident will be communicated by the on-site supervisor to senior management and the client. The on-site supervisor will gather and secure any initial evidence or initial assessment information and ensure it is preserved for the investigation team as deemed necessary. The incident will then be investigated according to the degree of potential loss and chance of reoccurrence by the GRER Management team. The investigation will begin within 24 hours of the occurrence or as soon as possible. At least one member of Senior Management is required to participate in at-the-scene investigation of all fatalities, major fires or explosions, major property damage, serious injuries and major releases of hazardous chemicals. His or her responsibilities will include collection, preservation and security of any evidence deemed appropriate and essential to the investigation.

The onsite supervisor will be responsible for taking and maintaining copies of any witness statements, interviews and the collection of necessary photographs which are relevant to the incident and its investigation, the initial identification of evidence (might include a listing of

people, equipment, and materials involved and a recording of environmental factors such as weather, illumination, temperature, noise, ventilation, and physical factors such as fatigue, age, and medical conditions.). A Management review meeting will be held within 48 hours to review initial response information and ensure effective follow through for establishing action items an ensuring any special equipment or tools needed to conduct an effective investigation are provided in a timely manner.

Follow up action items will be identified to control or mitigate the possibility of future losses and these items will be documented on the accident investigation forms or as part of the follow up system and distributed to all locations for review with crews to prevent a potential re-occurrence and to ensure lessons learned are communicated to the field. Follow up actions should be addressed within an established time frame and individuals involved in the investigation will be assigned specific follow up responsibilities.

For reporting major and high potential incidents and near-misses the definitions shall be consistent with the definitions established under the Incident reporting policy.

Incident Training

The Management and Safety Manager shall receive adequate training in incident investigation techniques. This training will be updated annually and documented.

Notification

All fatalities, serious injuries and illnesses (lost time cases), property damage, vehicle accidents and process losses, all fires and explosions, all reportable chemical spills (exceeding the reportable quantity) and all potentially catastrophic near-miss incidents occurring must be reported by phone to the contact persons as listed on the project specific ERP, immediately upon occurrence or as soon as the accident situation allows. The Safety Manager will ensure that appropriate governmental agencies are advised about the accidents according to regulations and company policy.

The OSHA regulation for reporting major and catastrophic accidents that occur is that reporting is done within 8 hours. It is important that the Project Manager understand the definition for accidents that are reportable. The Project Manager will be responsible for all major and catastrophic accident reporting to GRER senior management, who will advise the proper regulatory body requiring notification. All incidents will be recorded on the GRER accident form. Also all recordable illnesses and injuries will be recorded on the OSHA 300 log within seven calendar days of receiving notification of the occurrence. The OSHA 300A log will be signed by a company official and posted from February 1st through April first. All illness and accident report forms and OSHA logs must be maintained in the administrative office for a period of five years.

Incident Statistics

GRER shall ensure that incident statistics are reviewed on a quarterly basis. The statistics will include number of incident types reported (including LTIs, disabling injuries or illnesses, property damage (fire, vehicle), reportable environmental releases, citations/violations, process losses and near misses). Factors, immediate and basic causes, and lack of control for the following types of incidents are reviewed. Types of incidents Site/Location involved Work operations (activity at time of incident) The Safety Manager and/Base Administrator will ensure that copies of all incidents are on file, and organized to be readily accessible for reference for the current and previous five years.

3 Employee Health

3.1 Health and Hygiene

Good health depends on a balance of work, rest, sensible and regular meals, adequate sleep and an avoidance of rich food, alcohol, tobacco and drugs. Hazards to your health can also come from outside sources such as injuries, foreign substances and harsh weather conditions.

Injuries

1. Simple as well as serious infections can easily be spread from one person to another. Preventive measures, as well as effective treatment, are essential.
2. Cuts and abrasions should be cleansed at once and given first aid treatment.
3. Many serious infections can be guarded against by inoculation and vaccination. These inoculations and vaccinations should be kept up to date as necessary to meet the requirements of the location or circumstances.

Foreign Substances

1. Prolonged exposure to oils may cause dermatitis and skin conditions. All traces of oil should be thoroughly washed from the skin and hydrocarbon solvents should be avoided. Work clothes should be laundered frequently. Oil-soaked rags should not be placed in pockets.
2. Exposure to or contact with toxic chemicals or other harmful substances should be reported immediately and the appropriate remedial action taken.
3. Some domestic substances, such as caustic soda and bleaching powders or liquids, can burn the skin. They may react dangerously with other substances and should not be mixed indiscriminately.

Weather

1. High humidity and heat can lead to heat exhaustion and heat stroke, which may be fatal. When working in these conditions, it is advisable to drink at least 4.5 liters (8 pints) of cool (but not iced) water daily, it is best to take small quantities at frequent intervals.
2. When it is necessary to work in excessive sunlight, appropriate clothing offering protection to both head and body should be worn. Use a sun block or sunscreen cream to protect part of the body exposed to sun or drying winds.

3.2 Fitness to Work (FTW)

Purpose

The purpose of the Fitness to Work Standard is to promote the enhancement of employee health and safety by ensuring that the state of workers' fitness does not pose a threat to themselves, others, the environment, and assets.

Employees must be able to perform tasks that may require a higher level of physical fitness. These job tasks include heavy lifting, repetitive lifting, being on feet all day, hiking long distances, working outdoors in high heat or extreme cold.

Mandatory Requirements for GRER Management / Onsite Representative:

1. Ensure worker fitness for duty and notify the project manager of situations that indicate an employee is not fit for work (e.g. impaired, sleep deprived, etc.).
2. Ensure that workers with regulatory-driven fitness requirements and/or those participating in tasks that require medical evaluation of Fitness to Work adhere to required testing (e.g. substance abuse screening, H_2S, respiratory fit test, etc.).
3. Ensure that no one is scheduled to work for more than the maximum allowable limits and seek approvals as required for extended work periods.
    - 14 consecutive hours which can be extended to 17 hours, 2 days in a row at the Representative (Focal Point/Champion) discretion
    - 42 consecutive days or where regulatory limits are stricter (mgmt. approval)
4. Ensure that the driving duty hour's requirements are met for drivers leaving the worksite.
5. Ensure that injured or ill workers returning to duty have appropriate medical clearance.

3.3 Alcohol & Drug Policy

Purpose

Green River Energy Resources, Inc. (GRER) is committed to maintaining a safe and productive workplace, promoting an environment that is free from substance abuse and ensuring compliance with any government laws or regulations. Substance abuse may consist of alcohol abuse, illicit or illegal drugs or the inappropriate use of prescription medicines, which may result in impairment to health, behavior, and judgment or job performance.

The use of alcohol and drugs increases the risk of accidents and injuries. Employees must be aware of regulatory, client and contractor policies on drugs and alcohol. Illegal drugs and unauthorized consumption of alcohol are not allowed on any crew, and their use is cause for dismissal.

Most facilities and companies do not allow alcohol under any circumstances, such as on crews with 24-hour operations or on board seismic vessels. It is the responsibility of the employee to abide by the policy of the client, contractor and crew by whom they are employed.

Prescription and over-the-counter drugs may also impair performance. Consult your physician and/or label instructions as to any work-related risk. Advise your immediate supervisor of any drugs being used so proper safety precautions can be taken. The employee has the responsibility to report the use of all prescription or non-prescription drugs or medications prior to reporting to work.

GRER prohibits any use of Drugs or Alcohol during the workday. As a condition of employment with GRER all employees are subject to drug and alcohol testing as follows:

- Pre-employment
- Random
- Suspicion
- Post - Accident

GRER uses Pipeline Testing Consortium's drug and alcohol policy adapted for GRER for testing regulations and needs. Please reference the enclosed Drug and Alcohol polices for GRER.

3.4 Bloodborne Pathogens

Purpose

Bloodborne pathogens are pathogenic microorganisms that are present in human blood and can infect and cause disease in humans. These pathogens include but are not limited to, Hepatitis B Virus (HBV) and Hepatitis C Virus (HCV), serious liver diseases, and Human Immune Deficiency Virus (HIV) which causes Acquired Immunodeficiency Syndrome (AIDS).

To minimize or eliminate the risk of occupational exposure to bloodborne pathogens, Green River Energy Resources (GRER) supports the following procedures. These actions include: employee training, personal protective equipment, and emergency procedures.

Training

All GRER employees will receive training on prevention of bloodborne pathogens in the work place. This training will be given before a new employee will be allowed in the field and updated annually and documented. Training records will be kept on file for a minimum of 3 years.

Training will include modes of transmission, personal protective equipment, proper clean up techniques, personal hygiene, and emergency procedures.

Modes of Transmission

Bloodborne pathogens such as HBV and HIV can be transmitted through contact with infected human blood and other potentially infectious body fluids such as:

- Semen (the viscid, whitish fluid from the male)
- Vaginal secretions (fluid from the female cervix).
- Cerebrospinal fluid (colorless liquid that surrounds the brain and spinal cord).
- Synovial fluid (fluid that lubricates and cushions the joint).
- Pleural fluid (fluid between the pleural membranes of the lung and the inner chest wall).
- Peritoneal fluid (fluid in the gastrointestinal organs).
- Amniotic fluid (fluid which surrounds the fetus).
- Saliva (in dental procedures).
- Any body fluid that is visibly contaminated with blood.

It is important to know the ways exposure and transmission are most likely to occur in your particular situation. GRER personnel will most likely be exposed to bloodborne pathogens during emergency situations or will providing first aid to a fellow employee.

HBV and HIV are most commonly transmitted through:

- Sexual Contact
- Sharing of hypodermic needles
- From mothers to their babies at/before birth
- Accidental puncture from contaminated needles, broken glass, or other sharps
- Contact between broken or damaged skin and infected body fluids
- Contact between mucous membranes and infected body fluids

Anytime there is blood-to-blood contact with infected blood or body fluids, there is a slight potential for transmission. Unbroken skin forms an impervious barrier against bloodborne pathogens. However, infected blood can enter your system through:

- Open sores
- Cuts

- Abrasions
- Acne
- Any sort of damaged or broken skin such as sunburn or blisters

Bloodborne pathogens may also be transmitted through the mucous membranes of the

- Eyes
- Nose
- Mouth

For example, a splash of contaminated blood to your eye, nose, or mouth could result in transmission.

Personal Protective Equipment

It is extremely important to use personal protective equipment and work practice controls to protect yourself from bloodborne pathogens. PPE will be provided for all GRER employees and will be easily accessible to all work locations.

"**Universal Precautions**" is the name used to describe a prevention strategy in which all blood and potentially infectious materials are treated as if they are, in fact, infectious, regardless of the perceived status of the source individual. In other words, whether or not you think the blood/body fluid is infected with bloodborne pathogens, *you treat it as if it is*. This approach is used in all situations where exposure to blood or potentially infectious materials is possible. This also means that certain engineering and work practice controls shall **always** be utilized in situations where exposure may occur.

The first thing to do in any situation where you may be exposed to bloodborne pathogens is to ensure you are wearing the appropriate personal protective equipment (PPE). This is a simple precaution they take in order to prevent blood or potentially infectious body fluids from coming in contact with their skin. **To protect yourself, it is essential to have a barrier between you and the potentially infectious material.**

Rules to follow:

- Always wear personal protective equipment in exposure situations.
- Remove PPE that is torn or punctured, or has lost its ability to function as a barrier to bloodborne pathogens.
- Replace PPE that is torn or punctured.
- Remove PPE before leaving the work area.

GRER does not operate in areas where exposure to blood or potentially infectious materials is likely. However, the necessary PPE should be readily accessible. Contaminated gloves, clothing, PPE, or other materials should be placed in appropriately labeled bags or containers until it is disposed of, decontaminated, or laundered. It is important to find out where emergency PPE and disposal bags or containers are located in your area before beginning your work.

Gloves should be made of latex, nitril, rubber, or other water impervious materials. If glove

material is thin or flimsy, double gloving can provide an additional layer of protection. Also, if you know you have cuts or sores on your hands, you should cover these with a bandage or similar protection as an additional precaution before donning your gloves. You should always inspect your gloves for tears or punctures before putting them on. **If a glove is damaged, don't use it!** When taking contaminated gloves off, do so carefully. Make sure you don't touch the outside of the gloves with any bare skin, and be sure to dispose of them in a proper container so that no one else will come in contact with them, either.

Normal clothing that becomes contaminated with blood should be removed as soon as possible because fluids can seep through the cloth to come into contact with skin. Contaminated laundry should be handled as little as possible, and it should be placed in an appropriately labeled bag or container until it is decontaminated, disposed of, or laundered.

Remember to use universal precautions and treat all blood or potentially infectious body fluids as if they are contaminated. Avoid contact whenever possible, and whenever it's not, wear personal protective equipment. If you find yourself in a situation where you have to come in contact with blood or other body fluids and you don't have any standard personal protective equipment handy, you can improvise. Use a towel, plastic bag, or some other barrier to help avoid direct contact.

Hygiene Practices

Hand washing is one of the most important (and easiest) practices used to prevent transmission of bloodborne pathogens. Hands or other exposed skin should be thoroughly washed as soon as possible following an exposure incident. Use soft, antibacterial soap, if possible. Avoid harsh, abrasive soaps, as these may open fragile scabs or other sores

Hands should also be washed immediately (or as soon as feasible) after removal of gloves or other personal protective equipment.

If you are working in an area without access to such facilities, you may use an antiseptic cleanser in conjunction with clean cloth/paper towels or antiseptic towelettes. If these alternative methods are used, hands should be washed with soap and running water as soon as possible.

Antiseptic towelettes and latex gloves will be provided for all employees and will be readily available at all times. These products can be found in all first aid kits and first responder kits.

If you are working in an area where there is reasonable likelihood of exposure, **you should never:**

- **Eat**
- **Drink**
- **Smoke**
- **Apply cosmetics or lip balm**
- **Handle contact lenses**

Decontamination and Sterilization

All surfaces, tools, equipment and other objects that come in contact with blood or potentially infectious materials must be decontaminated and sterilized as soon as possible. **Equipment and tools must be cleaned and decontaminated before servicing or being put back to use.**

Decontamination should be accomplished by using

- A solution of 5.25% sodium hypochlorite (household bleach / Clorox) diluted between 1:10 and 1:100 with water. The standard recommendation is to use at least a quarter cup of bleach per one gallon of water.
- Lysol or some other EPA-registered tuberculocidal disinfectant. Check the label of all disinfectants to make sure they meet this requirement.

If you are cleaning up a spill of blood, you can carefully cover the spill with paper towels or rags, then gently pour the 10% solution of bleach over the towels or rags, and leave it for *at least 10 minutes*. This will help ensure that any bloodborne pathogens are killed before you actually begin cleaning or wiping the material up. By covering the spill with paper towels or rags, you decrease the chances of causing a splash when you pour the bleach on it.

If you are decontaminating equipment or other objects (be it scalpels, microscope slides, broken glass, saw blades, tweezers, mechanical equipment upon which someone has been cut, first aid boxes, or whatever) you should leave the disinfectant in place for *at least 10 minutes* before continuing the cleaning process.

Of course, any materials you use to clean up a spill of blood or potentially infectious materials must be decontaminated immediately, as well. This would include mops, sponges, re-usable gloves, buckets, pails, etc.

Emergency Procedures

In an emergency situation involving blood or potentially infectious materials, you should always try to minimize your exposure by wearing gloves, splash goggles, pocket mouth-to-mouth resuscitation masks, and other barrier devices.

If you are exposed, however, you should:

1. Wash the exposed area thoroughly with soap and running water. Use non-abrasive, antibacterial soap if possible.
2. If blood is splashed in the eye or mucous membrane, flush the affected area with running water for at least 15 minutes.
3. Report the exposure to your supervisor as soon as possible.
4. All exposure incidents will be documented and kept in the exposed person's file. This documentation will be kept for a minimum of the employment duration plus 30 years.
5. You may also request blood testing or the Hepatitis B vaccination if you have not already received it. This will be provided to any employee exposed to bloodborne pathogens at no cost to the employee.

An updated Emergency Control Plan (ECP) for bloodborne pathogens will be provided to all employees for each GRER project and included in the project's Emergency Response Plan (ERP).

3.5 Emergency Preparedness & Response

Purpose

First aid and emergency preparedness are an important part of Green River Energy Resources (GRER) company's Health and Safety Program. The purposes of the services and training provided to employees are to ensure prompt and effective emergency response, promote speedy recovery and to minimize the effects of injuries or exposure, and to provide workers with assistance when required.

The success of first aid and emergency preparedness depends on the employee's knowledge of what to do in minor and major emergency situations. Supervisors are required to communicate emergency contact information and procedures to workers during orientation training and to regularly bring up this information during safety meetings. In addition, risks associated with the projects work process and their control measures must also be communicated and understood. Annual emergency and evacuation drills are practiced to ensure awareness and effectiveness of emergency routes and procedures. All training, meetings and drills shall be documented to meet due diligence requirements and to identify and mitigate any areas of improvement. Employers will provide all tools and resources required for these programs to be effective.

Training

All GRER employees will receive training on basic first aid and CPR that's meets the requirements of the US Bureau of Mines, the American Red Cross, or equivalent training. This training will be updated as needed and fully documented in all employees' personnel files.

Since each project that GRER operates on has unique requirements and safety precautions, a project specific Emergency Response Plan will be created by GRER management prior to project start up. GRER management will review the project specific ERP will all other employees as part of the standard orientation process.

First Aid Kits and Eyewash Stations

Basic first aid kits will be accessible to all employees at all times. First aid kits will meet minimum OSHA requirements. Supplementary first aid supplies will be provided when necessary and based on the hazard assessment of each project. Hazard assessments will be conducted according to the **GRER HSE Standard: Hazard Assessment** policy. Contents of all first aid kits will be inventoried monthly to ensure adequate quantity and condition of all materials.

Eye wash bottles will be provided to all employees and accessible at all times. Eye flushing kits will be placed on all heliportable and buggy drills and in all trailers where contact with hazardous or corrosive chemicals could occur. These eyewash kits will be inspected monthly to ensure constant good working condition, In the event, that an eyewash kit is needed to treat an injury, procedures learned during standard first aid training will be followed. In addition to eye flushing, immediate evacuation procedures will be initiated.

Emergency Response

Due to the remote nature of normal drilling and survey operations, all GRER personnel will be trained in first aid and CPR. This will be done to ensure adequate first aid assistance in most emergency situations. Additionally, no GRER employee will be allowed to operate alone.

All GRER personnel will be familiar with the project specific ERP. A sample ERP can be found in the Appendix of the **GRER HSE Standards**.

4 Hazardous Materials

4.1 Hazardous Materials (HAZMAT)

Purpose

Crews may carry products known as Hazardous Material or HAZMAT, ranging from paints and solvents to explosive agents. Each HAZMAT product is generally safe to use if the manufacturer's instructions are carefully followed. Mixing or combining products or chemicals can often result in dangerous situations, which may cause combustion, harmful vapors, explosion, or serious eye and skin injuries.

All HAZMAT products must be supported by a Material Safety Data Sheet (MSDS) which lists critical information on a specific product or chemical, such as content, explosion/flammability rates, safe handling procedures, spill/clean-up information, Personal Protective Equipment (PPE) required and first aid measures. HAZMAT training for employees who handle hazardous materials will be administered and documented.

Correct Hazmat labels must be in full view of personnel using or coming near the hazardous materials. All waste materials must be disposed of correctly as per the MSDS sheets. MSDS information sheets should be posted near the chemical storage space for review prior to using the product and kept on file in the crew office for quick access in case of emergency.

Batteries

Batteries can be extremely hazardous if not cared for properly. Different types of batteries require different procedures for handling, charging, connecting and disposing of used or spent units.

1. Battery storage areas, boxes and charging spaces should be well ventilated and kept free of flammable products, explosive gases, open flames, electrical spark hazards, metal objects and portable power tools or lamps.
2. Proper PPE should worn at all times when handling or transporting batteries. An eye wash station should be located near any area where batteries are being charged for immediate use in the event of an accident. No smoking signs must be posted in the battery charging area.
3. Jewelry, watches, rings, etc., should be removed when working on batteries. A short circuit through any of these items will heat the metal object rapidly and cause severe burns. If rings cannot be removed, they should be taped with insulating material.
4. All battery connections should be kept clean and tight to avoid sparking and overheating. Insulation and/or guarding of all battery terminals and cables should be maintained in good condition. Never short circuit a battery.
5. All circuits fed by the battery should be switched off when the leads are being connected or disconnected. If a battery is in sections, it may be possible to reduce the voltage between cells in the work area and hence, the severity of an accidental short circuit or electric shock by removing the jumper leads between sections before the work is begun.

Lead-acid Batteries

1. Acid electrolytes are highly corrosive. Immediate remedial action should be taken to wash off any accidental splashes on the person or on the equipment. Hands and clothes should always be washed as soon as the work is complete.
2. To neutralize acid on skin or clothes, ample quantities of water should be used.
3. Goggles, rubber gloves and a protective apron should be worn when acid is handled.

Lithium Batteries

1. Never attempt to charge a lithium battery, unless designed to be charged, such as the batteries in Laptops.
2. Never short-circuit a lithium battery.
3. Lithium batteries are transported and stored under regulated and usually restricted conditions. Consult the battery manufacturer or original shipping containers for exact storage and use/care instructions.
4. Special lithium fire extinguishers (Lith-X) should always be on hand to be used in the event of a lithium fire.
5. Do not expose lithium batteries to moisture and protect individual batteries from contacting any metal source (including other lithium batteries) during storage.
6. Correct disposal must be done. NEVER PUT IN A FIRE.

4.2 Hydrogen Sulfide (H_2S) Awareness

Purpose

The purpose of this procedure is to ensure Green River Energy Resources (GRER) employees are aware of the potential hazards associated with H_2S gas and means of mitigating these hazards.

Hazards and Characteristics

GRER does not operate in areas where known H_2S hazards exist. However, all personnel should be aware of the potential danger and ways of recognizing it. All personnel will receive appropriate H_2S training before working in areas where an H_2S hazard may exist. This training must be documented.

H_2S is most likely to be encountered where there is oil and gas production, pipelines and sewage plants. The principal hazard of H_2S is death by inhalation. When the amount of gas absorbed into the blood stream exceeds that which is readily oxidized, it acts negatively on the nervous system and results in systemic poisoning. Labored respiration quickly occurs and respiratory paralysis immediately follows at higher concentrations. Minute amounts of H_2S are lethal.

Exposure may cause the following symptoms to occur individually or in combinations: headache, dizziness, excitement, nausea, coughing and drowsiness.

H_2S cannot be detected solely by smell since the gas rapidly paralyzes the sense of smell. H_2S has the following characteristics:

1. Extremely toxic, ranking second to hydrogen cyanide and five to six times more toxic than carbon monoxide.
2. Colorless and transparent.
3. An offensive odor, which seems like rotten eggs. Though in high concentrates, it is odorless.
4. Heavier than air. Vapors tend to accumulate in low places.
5. Flammable and forms an explosive mixture with air.
6. Has an auto-ignition point of 260°C (500°F) Note: cigarettes burn at 760°C (1400°F).
7. Burns with blue flame and produces sulfur dioxide (SO_2), which is less hazardous than H_2S, but irritating to the eyes and lungs and can cause serious injury. Chemical pneumonia can develop in a few hours.
8. Soluble in both water and liquid hydrocarbons and may be expelled from the produced fluids.
9. Produces irritation to the eyes, throat and respiratory system.
10. The Threshold Limit Value (TLV) is a maximum of 8-hour exposure at 10 parts per million (ppm) without respiratory equipment.

The following table lists the physical effects of H2S

Concentration **Physical Effects**

PPM	
0.02	Odor Thresholds
10	Safe for 8-hr exposure; Obvious and unpleasant
100	Kills smell in three to 15 minutes May sting eyes and throat
200	Kills smell shortly; stings eyes and throat
500	Dizziness; breathing ceases in a few minutes; Need prompt artificial respiration
700	Quickly becomes unconscious; Death will result if not rescued promptly (30 min.)
1000	Unconscious at once; death follows in a few minutes

Detection

Knowing the limitations and capabilities of your detection devices can save your life. When testing, always be prepared for a high concentration of gas. Do not attempt to rescue someone yourself without wearing an emergency breathing apparatus.

Action Plan in H_2S Areas:

1. Prior to entering a H_2S area, all personnel working in posted areas should attend hydrogen sulfide safety training conducted by certified instructors.
2. Absolutely no smoking or open flames are permitted while in posted areas or where H_2S exists.
3. A fully detailed and documented field crew evacuation (and head count) procedure should be established prior to entering the posted area.
4. Detectors and escape packs should be available to all persons working in an H_2S area. Detection monitors may be fixed or portable and must be calibrated to alert the wearer at the appropriate permissible exposure limits of 20ppm for 1910 or 10 ppm for 1926.

5 Fire Prevention and Emergency Response

5.1 Fire Prevention

Fire Danger Awareness

GRER employees should be made aware of the potential fire danger for all areas of work. During dry weather, grass or brush fires can be caused by various means. These can include; inadequate methods of cigarette disposal, catalytic converters on vehicles, hot machinery parts coming in contact with vegetation, lightening, or spontaneous combustion.

Flammable Fluid Containment

Fire and explosion dangers are always present when petroleum products are being used. Gasoline, especially, is to be used only as a fuel for internal combustion engines. Never use gasoline as a cleaning agent. Use only approved containers to carry gasoline, diesel fuel, solvents and other flammable liquids. Plastic containers manufactured for food products and other non-petroleum products are not suitable containers for petroleum-based products. Petroleum-based products may cause rapid deterioration of this type of plastic container.

Portable fuel containers should be non-corroding, impact resistant and made of metal or polyethylene. An automatic vent should be built into the handle, which reacts to changes in pressure and releases instantly when pouring. The vent should seal tight when the container is tipped over. A retractable pour spout that has a filter and a flame arrester should be fitted to the container.

Label all containers as to their contents. Provide Material Safety Data Sheets (MSDS) for each hazardous product and have them available near product storage areas. Areas used for storage of fuels, solvents and other flammable liquid should be clearly marked as non-smoking and hazardous.

Vehicles and other Engines

When entering areas with tall or dried grass and/or wooded areas, check the undercarriage of your vehicle often for any trash, twigs, leaves, limbs or grass. Turn the vehicle off, set the emergency brake and remove any of these items that are near the exhaust systems, especially around the manifold or catalytic converter. Wear gloves to prevent injury to the hands when removing these items. Park the vehicle in the clearest area available and try not to park in high grass or over large ground foliage accumulations. Keep a close watch on the vehicle when parked and/or when driving through these areas. Be prepared to extinguish a fire as quickly as possible, should the need arise.

Smoking

Careless smoking habits are a major cause of fires. Areas where smoking is prohibited should be clearly marked and well defined. Permanent non-smoking areas include; flammable fluid storage areas, battery storage areas and areas with an abundance of dry grass or vegetation.

Place discarded matches, cigarette butts and other smoking materials in ashtrays or suitable containers only after ensuring they are completely extinguished. Smoking is not permitted when a suitable disposal container is unavailable.

Fire Practice Drills

Fire drills should be conducted regularly to test the efficiently of emergency procedures and communication systems. Upon completion of these drills a written evaluation of the events and the responses will be completed by the project manager or HSE representative.

5.2 Fire Extinguishers

Fire extinguishers compatible with the hazard and volume of material should be made available. Extinguishers carry ABC ratings and these should be used to determine the adequacy of the extinguisher and its intended service. Different class fires require different class extinguishers.

Types of Fire Extinguishers

Type A – These extinguishers are for ordinary combustible materials such as paper, wood, cardboard, and most plastics. The numerical rating on these types of extinguishers indicates the amount of water it holds and the amount of fire it can extinguish.

Type B – These fires involve flammable or combustible liquids such as gasoline, kerosene, grease and oil. The numerical rating for class B extinguishers indicates the approximate number of square feet of fire it can extinguish.

Type C - These fires involve electrical equipment, such as appliances, wiring, circuit breakers and outlets. Never use water to extinguish class C fires - the risk of electrical shock is far too great! Class C extinguishers do not have a numerical rating. The C classification means the extinguishing agent is non-conductive.

Type D – These fire extinguishers are commonly found in a chemical laboratory. They are for fires that involve combustible metals, such as magnesium, titanium, potassium and sodium. These types of extinguishers also have no numerical rating, nor are they given a multi-purpose rating - they are designed for class D fires only.

Type K – These fire extinguishers are for fires that involve cooking oils, trans-fats, or fats in cooking appliances and are typically found in restaurant and cafeteria kitchens.

Maintenance

Fire extinguisher maintenance is crucial to office and operations safety. Keep fire-fighting equipment in good condition by following these guidelines:

1. Visually inspect extinguishers monthly. Each unit should meet the following requirements:
    a. Mounted vertically where possible, in a designated place and at least 6 inches from the floor.
    b. Properly tagger with ID number and service record.
    c. Sealed
    d. No visible physical damage
    e. No external corrosion
2. Be readily accessible and not obstructed.
3. Replace any extinguisher removed for maintenance.

4. Thoroughly service all portable fire extinguishers yearly.

Locations

Fire extinguishers should be located in positions and locations so they are readily available. At least one extinguisher, of a suitable type, should be positioned near the access door to the area it is designed to protect.

Install a fully charged and inspected fire extinguisher in every vehicle in service (company-owned or personal). The driver of the vehicle is responsible for inspecting the extinguisher before the vehicle is used. Replace any damaged or stolen fire extinguishers immediately.

Use

A typical fire extinguisher contains 10 seconds of extinguishing power. This could be less if it has already been partially discharged. Always read the instructions that come with the fire extinguisher beforehand and become familiarized with its parts. When activating a fire extinguisher, never stand directly above it. Always tilt away from your body to prevent injury in case of failure or explosion.

Use this acronym as a quick reference:

Pull the Pin at the top of the extinguisher. The pin releases a locking mechanism and will allow you to discharge the extinguisher.

Aim at the base of the fire, not the flames. This is important - in order to put out the fire, you must extinguish the fuel.

Squeeze the lever slowly. This will release the extinguishing agent in the extinguisher. If the handle is released, the discharge will stop.

Sweep from side to side. Using a sweeping motion, move the fire extinguisher back and forth until the fire is completely out. Operate the extinguisher from a safe distance, several feet away, and then move towards the fire once it starts to diminish. Be sure to read the instructions on your fire extinguisher - different fire extinguishers recommend operating them from different distances. Remember: Aim at the base of the fire, not at the flames!!!! Once the fire is out, don't walk away! Watch the area for a few minutes in case it re-ignites. Recharge the extinguisher immediately after use.

5.3 Fire Emergencies

Reporting

At the first sign of fire, no matter how small, all field operations will cease and field personnel will contact their immediate supervisor and/or the project manager.

First Stage – Small or manageable fires

Extinguish the fire immediately using available personnel and equipment. Secure the area from bystanders and non-essential personnel. Make routine notification to the immediate supervisor and project manager

Second Stage – Major fire & dangerous conditions

1. Investigate and check the scene. Be sure the scene is safe
2. Gather information:
3. Account for all personnel and move to a safe area
4. Exact location of the fire
5. Equipment involved in the fire
6. Note prevailing wind direction
7. Is the fire manageable?
8. Manpower and equipment on site
9. Manpower and equipment needed

Call for help quickly. Contact the field supervisor and the project manager immediately. Begin Emergency Radio Procedures.

If a helicopter is available, call them to assist immediately. A bambi bucket will be available to all times on projects that involve a helicopter.

Explosive Fires

DO NOT fight any fires involving explosives. Move all personnel away to a safe distance and notify the field supervisor and the project manager immediately. If a fire starts in the vicinity of explosives, contain it from reaching the explosives or any flammable fluids only if you are able to do so without risking your own safety.

Clothing or Body Fires

If a person's clothing catches on fire, wrap him or her in a blanket, rug, woolen coat, or any other natural fiver. Wrap about the head and neck first, then have the victim drop to the floor or ground and roll over slowly. If water is available, douse and have them roll in the spilled water.

6 Weather

6.1 Extreme Heat

Purpose

Green River Energy Resources (GRER) frequently works in areas where exposure to extreme heat conditions is possible. The following policy addresses types of potential heat illnesses and their symptoms along with prevention measures.

Heat Illnesses

Exposure to heat can cause illness and death. The most serious heat illness is heat stroke. Other heat illnesses, such as heat exhaustion, heat cramps and heat rash, should also be avoided. There are precautions your employer should take any time temperatures are high and the job involves physical work. Age, weight, degree of physical fitness, degree of acclimatization, metabolism, use of alcohol or drugs and a variety of medical conditions such as hypertension all affect a person's sensitivity to heat. However, even the type of clothing worn should be considered. Prior heat stress predisposes an individual to additional stress.

It is difficult to predict just who will be affected and when, because individual susceptibility varies. In addition, environmental factors include more than the ambient air temperature. Radiant heat, air movement, conduction and relative humidity all affect an individual's response to heat.

Workers should not be permitted to work when their deep body temperature exceeds 38°C (100.4°F).

Risk Factors for Heat Illness

- High temperature and humidity, direct sun exposure, no breeze or wind
- Low liquid intake
- Heavy physical labor
- Waterproof clothing
- No recent exposure to hot workplaces

Heat Rashes

Heat rashes are the most common problem in hot work environments. Prickly heat is manifested as red papules and usually appears in areas where the clothing is restrictive. As sweating increases, these papules give rise to a prickly sensation. Prickly heat occurs in skin that is persistently wetted by un-evaporated sweat and heat rash papules may become infected if they are not treated. In most cases, heat rashes will disappear when the affected individual returns to a cool environment.

Heat Cramps

Performing hard physical labor in a hot environment usually causes heat cramps. These cramps have been attributed to an electrolyte imbalance caused by sweating. It is important to understand that cramps can be caused by either too much or too little salt.

Heat Fatigue

The signs and symptoms of heat fatigue include impaired performance of skilled sensor motor, mental, or vigilance jobs. There is no treatment for heat fatigue except to remove the heat stress before a more serious heat-related condition develops.

Heat Collapse (Fainting)

In heat collapse, the brain does not receive enough oxygen because blood pools in the extremities. As a result, the exposed individual may lose consciousness. This reaction is similar to that of heat exhaustion but does not affect the body's heat balance. However, the onset of heat collapse is rapid and unpredictable. To prevent heat collapse, the worker should gradually become acclimatized to the hot environment.

Heat Exhaustion

The signs and symptoms of heat exhaustion are cool, moist, pale, or flushed skin, headache, dizziness, fainting, nausea, vertigo, weakness, thirst, vomiting, irritability or giddiness. Fortunately, this condition responds readily to prompt treatment.

Heat Stroke

Heat stroke occurs when the body's system of temperature regulation fails and body temperature rises to critical levels. This condition is caused by a combination of highly variable factors and its occurrence is difficult to predict. The signals of heat stroke include red, hot and dry skin; changes in consciousness; rapid or weak pulse; or rapid or shallow breathing. Heat stroke if untreated can result in death.

Treatment of Heat Illness

When you recognize heat-related illness in its early stages, you can usually reverse it. Get the victim out of the heat. Loosen any tight clothing. Apply cool, wet cloths, such as towels or sheets to the individuals face, neck area and under arm areas.

If the victim is conscious, give cool water to drink. Refusing water, vomiting and changes in consciousness mean that the victim's condition is getting worse. Initiate the crew's Emergency Response Plan (ERP) immediately.

If the victim vomits, stop giving fluids and position the victim on the side. Watch for signals of breathing problems. Keep the victim lying down and continue to cool the body any way you can. If you have ice packs or cold packs, place them on each of the victim's wrists and ankles, on the groin, in each armpit and on the neck to cool the large blood vessels. Do not apply rubbing (isopropyl) alcohol.

Prevention of Heat Illness

Ventilation, air cooling, fans, shielding and insulation are the five major types of engineering controls used to reduce heat stress in hot work environments. However, as GRER operates in outdoor sites, these controls are not always possible.

The following administrative controls can be used to reduce heat stress:

1. Reduce the physical demands of work, e.g., excessive lifting or digging with heavy objects.
2. Use only workers who are acclimatized to the conditions.
3. Provide recovery areas, e.g., a shaded, cooler area. In some areas it may be possible to provide air-conditioned enclosures and rooms.
4. Use shifts, e.g., early morning, cool part of the day. Use intermittent rest periods with water breaks.
5. Limit the number of workers present, especially in confined or enclosed spaces.

Fluid Replacement

Cool, 50-60°F (10-16°C), water or any cool liquid (except alcoholic drinks) will be made available to workers at all times. Employees will be encouraged to drink small amounts frequently, e.g., one cup every 20 minutes. Ample supplies of fluids will be placed close to the work area. Although some commercial replacement drinks contain salt, this is not necessary for acclimatized individuals because most people add enough salt to their diets.

Training

All GRER employees will be trained on recognizing the symptoms of all heat related illnesses and treatment methods. This training will be updated annually and documented. All employees and supervisors will also be trained on prevention methods including but not limited to proper diet, acclimatization, proper clothing, and using the buddy system. Training on the emergency response plan will also be included. All training will be completed prior to the employee or supervisor entering the field.

6.2 Extreme Cold

General

One of the most important lessons to be learned is that, in all cases, extreme cold dictates that additional time is required to complete a job assignment. Such time should always be allowed for in the planning phase.

All environmental problems in arctic or cold regions are important and none can be ignored. The most persistent and most dangerous is that of extremely low temperatures accompanied by wind-chill.

Maximum wind speed occurs during periods of seasonal transition and changing temperatures. The adverse effect of cold on man is to produce a condition called hypothermia, which is the lowering of body temperature due to loss of heat at a rate faster than the body can produce it. Normal, body temperature is 37°C (98.6°F). When the body temperature falls below 34°C, (94°F), the patient may become disoriented and lapse into a coma. Heart failure and death can result if body temperature falls below 31 to 32°C (88 to 90°F).

Hypothermia can occur from exposure to temperatures above freezing in instances such as immersion in cold water, exposure to wind (wind chill), physical exhaustion and insufficient food.

The use of alcohol in a cold environment is extremely dangerous. It causes dilation of the blood vessels, permitting a rapid loss of body heat and thus, increasing the risk of hypothermia.

Related cold injuries include trench foot,), immersion foot and the effect of total immersion in near freezing water. Trench Foot is a thermal injury resulting from exposure to cold, short of freezing, in a damp or wet environment. Immersion foot is an injury resembling trench foot and caused by prolonged immersion of the extremities in water. In thecase of total immersion in near freezing water, immersion for only a few minutes will cause total body cooling with a marked drop in inner body temperatures. Exposure to severe dry cold while inadequately dressed will produce the same effect.

In general, the length of time that a person may be exposed to cold, without danger of injury, varies directly with the temperature, wind velocity and protective clothing. The lower the temperature and the stronger the wind, the sooner injury will occur.

Personal Protection

A person can be protected from cold by the following means:

1. The knowledgeable use of specialized cold weather clothing.
2. The regular and frequent consumption of essential foods and liquids.
3. Provision for adequate shelter.

4. Auxiliary body heating and cooling devices should be considered for inclusion in prevention and first aid kits.

The principles governing clothing are:

1. Use only clothing designed for arctic or extreme cold conditions. Consider new fabrics designed for extreme weather/cold conditions. Several layers, instead of very thick garments, are preferable.
2. Take maximum advantage of the protection this clothing affords.
3. Dress consistent with the weather. Remember: it is easier to remove excess clothing than not have sufficient clothing.
4. Have available all of the items needed in the event a severe change in weather occurs. Clothing for both cold-wet (moderately cold weather ± 10°C (14°F) and cold-dry (temperatures below 14°F) should be at hand.
5. The efficient use of clothing requires observation of the following:
    a. Keep clothing **C**lean
    b. Avoid **O**verheating.
    c. Wear clothing **loose** and in layers.
    d. Keep clothing **D**ry

    Remember **C-O-L-D** to keep warm in winter.
6. Clean clothes not only provide for sanitation and comfort but, more importantly, they provide more efficient insulation.
7. When the temperature rises:
    a. If indoors, wear a minimum of clothing and don't overheat the shelter.
    b. If outdoors or when hard work is being performed, adjust clothing accordingly
8. It is better to be a little cold than too warm in order to promote maximum effectiveness of body heat production.
9. During severe wind-chill conditions, wear a cold-weather mask or wool scarf. Remove face protectors at intervals in order to check for frostbite.
10. C-O-L-D applies to hand and footwear, just as it does to clothes.
11. Insulated footwear with wool, not cotton, socks are preferred to prevent frostbite.
12. Never touch cold metal with bare hands.

Foods and Liquids

Balanced meals and adequate liquid intake are essential to body heat production and the prevention of dehydration.

1. Eat a nutritional, balanced diet for essential body heat production.
2. While working in cold weather conditions, eat regular balanced meals particularly in the morning and evening before and after a hard day's work. A complex carbohydrate diet is preferable to a high protein, high sugar, or high fat diet.
3. Maintain normal liquid intake.
4. Dehydration (loss or deprivation of water) is as prevalent in cold regions as it is in hot-dry areas.

a. Dehydration can be avoided at all costs by consuming sufficient additional liquids to offset losses caused by additional exertion in order to perform all tasks in cold weather.
b. Warm liquids (hot soup or tea) are preferable since they do not have to be warmed by the body after consumption.

5. Eat cold food only as a matter of necessity. Avoid eating snow if at all possible. It will deplete body heat.

Frostbite

Frostbite, a cold injury caused by freezing of the body tissues or body part, can occur without hypothermia when extremities do not receive sufficient heat from the central body due to restricted blood circulation or inadequate insulation. Both conditions,frostbite and hypothermia, may occur at the same time if the body is exposed to subfreezing temperatures. Whenever a patient is treated to thaw any portion of the body, care must be exercised to prevent the possibility of refreezing.

Frostbite is characterized by:

1. Sensation of coldness followed by numbness.
2. Tingling, stinging, aching, or a cramping pain.
3. Initial redness followed by pale gray or waxy skin appearance.

To review preventative measures:

1. Wear sufficient clothing, including face, ear, eye, head, nose, hand, and foot protection.
2. Avoid tight clothing and tight hand footwear that could interfere with blood circulation.
3. Exercise face, fingers and toes. Massage the ears to keep them warm and to detect any numb or hard areas.
4. Use the buddy system to detect signs of frostbite.
5. Frostbite may be either superficial (involving only the skin) or deep (extending below the skin). If exposure time was very short, the frostbite is probably superficial. Otherwise, assume that the injury is deep and, therefore, serious. If freezing is believed to be deep, do not attempt to treat it in the field. Get the patient to a hospital or aid station by the fastest means possible.

Treatment for superficial frostbite in the field:

1. Cover cheeks with warm hands until pain returns.
2. Place uncovered frostbitten fingers under the opposing armpit next to the skin.
3. Never re-warm by massage, exposure to open fire, cold water soaks, or rubbing with snow.
4. Be prepared for pain when thawing occurs.
5. Notify competent medical authority.

Treatment for deep frostbite:

1. Do not treat deep frostbite in the field. Get the patient to a hospital or aid station by the fastest means possible.
2. Protect the frozen part from additional cold injury but do not try to thaw.

Trench Foot

This is an injury resulting from exposure to cold, short of freezing, in a damp or wet environment. Arbitrarily, it is said to occur in the temperature range between 0 and 10°C (32 and 50°F). It is almost identical to gradual frostbite since the primary causes are the same except for differences in the degree of cold.

Causes include:

1. Immobility of the limbs (legs and feet down as in sitting or standing).
2. Insufficient clothing.
3. Lack of blood circulation to the body by boots, socks and other garments being too tight.

To prevent:

1. Keep feet dry by wearing waterproof footwear including wool socks. Exercise the feet to keep them warm.
2. Change into clean, dry socks and boots at every opportunity, or at least daily.
3. Dry the feet as soon as possible after getting them wet. They may be warmed with the hands. Foot powder should be applied and dry socks put on.
4. If wearing wet boots and socks is unavoidable, the feet should be exercised continually by wiggling the toes and bending the ankles.
5. Never wear tight boots.

Treatment:

1. Feet should be handled gently. They must not be rubbed or massaged.
2. Clean feet carefully with plain white soap and water, dry, elevate and expose to the air.
3. While it is desirable to warm the patient, the feet should be kept at room temperature 20°C (70°F).

After first aid, treatment by qualified medical personnel is essential. The patient must be carried and not permitted to walk on damaged feet.

6.3 Inclement

Overview

Inclement usually refers to severe or harsh weather that is cold and wet. However, it also refers to harsh and unmerciful weather. Types of inclement weather that may be encountered while working on a Green River Energy Resources (GRER) project can include but are not limited to flash floods, lightning, high winds, dust storms, and hail.

Lightning Protection

Lightning is one of nature's most dangerous and devastating phenomena. It is responsible for many deaths, injuries, equipment damage and forest fires. Lightning usually strikes the highest point or object in any area because it is seeking the shortest path to the ground Since lightning may strike almost anywhere, take the following precautions when an electrical storm approaches:

1. Suspend all explosives operations; this includes moving away from powder magazines, caps and powder. If you are carrying explosives, lay them down and move at least 30 m (100 ft.) away. Do not make up charges during an electrical storm nor while it is approaching. Wait 30 minutes after the storm has passed over. Do not load holes or go near the charges, or loaded holes until the storm has passed.
2. When you see an electrical storm approaching:
    a. lower the mast of the drill.
    b. move the drills away from overhead power lines.
    c. move all personnel away from drill or equipment units.
3. If you are carrying hand-held, two-way radios, stop transmitting.
4. Stay away from all flammable and explosive materials.
5. Drop all metal tools, loading and survey range poles, pipe, or drill stems.
6. Stay away from trees, power lines, cables (coiled or out on the ground) and fences. The lightning current can travel long distances along wire fence.
7. Suspend grounded equipment operations, such as drills and move clear of the unit.
8. Suspend small boat operations; get out of the water.

You are safer inside a rubber-tired vehicle but park it in a low open area rather than under trees.

Lightning conductors are recommended for metal structures that are not grounded. Explosive magazines made of metal should be grounded with a ground cable and metal stake or grounding rod.

An approaching electrical storm will create static on AM radio stations. This can be used as an indicator of potential lightning in the area.

Heavy Rain & Flash Floods

Flash floods are the number one cause of weather related deaths in the United States. They are primarily caused by slow moving thunderstorms and heavy rain. During rainstorms, water is absorbed into the ground. When the water accumulates faster than it is being absorbed, flooding occurs. Flash floods can occur or travel many miles from the location of the rainfall. So even if you are experiencing blue skies and sunshine, you still might be in an area with flash flood risk.

Many areas that GRER operates in have heavy rain seasons. When working in low areas where flash flooding can occur, be aware of your surroundings. Know where to find shelter or a quick escape route to high ground. Be aware of dry wash outs or creek beds as they can fill up quickly and unexpectedly.

Dust Storms

A dust storm or sand storm is a meteorological phenomenon common in arid and semi-arid regions. Dust storms arise when a gust front or other strong wind blows loose sand and dirt from a dry surface. Particles are transported by saltation and suspension, a process that moves soil from one place and deposits it in another.

Dust Storm Safety

If you find yourself in the midst of a dust storm, the following safety recommendations should be observed:

- If you have a respirator or mask designed to filter out small particulates, put it on immediately. If you don't have a mask, wrap a bandanna or some other piece of cloth around your nose and mouth. Moisten it a bit if you have enough water. Apply a small amount of petroleum jelly to the inside of your nostrils to prevent drying of your mucous membranes.
- Eyeglasses offer minimal protection from blowing dust or sand, but airtight goggles are better. If you don't have goggles, shield your face with your arm as you move, then wrap a piece of cloth tightly around your head to protect your eyes and ears.
- Get to high ground. The densest concentration of sand or dust bounces close to the ground, so the storm will be less forceful at the top of a hill. Seek high ground if you can find a safe, solid, high point, but only if the storm is not accompanied by lightning and there is no danger of being struck by heavier flying debris.
- Do not lie in a ditch, as flash flooding may occur even if no rain is falling where you are. In the actual dust cloud, rain generally dries up before it reaches the ground, but it may be raining nearby, and ditches, arroyos, and other low-lying areas can quickly flood.
- If you're in sand dunes, do not seek shelter right on the leeward side of the dune. The high winds can pick up huge amounts of sand very quickly, and you could find yourself being buried in sand.
- Shield yourself from flying objects. Seek out a large rock or other landform to protect you at least partially. Cover as much of your body as possible to protect yourself from flying sand. Wind-propelled sand can hurt, a dust storm's high winds can also carry heavier (and hence more dangerous) objects. If you find yourself without shelter, try to stay low to the ground and protect your head with your arms, a backpack or a pillow.
- Wait out the storm. Don't try to move through the storm; it's much too dangerous. Stay where you are and wait for it to pass before you attempt to move to a different location.

- If you can quickly reach such shelter before a dust storm reaches you, get there as quickly as possible and stay inside. Close all windows and doors, and wait out the storm.
- If you're with other people, stick together so no one gets lost.

Hail

Hail is a form of solid precipitation. It is distinct from sleet, though the two are often confused for one another. It consists of balls or irregular lumps of ice, each of which is called a hailstone. Hailstones consist mostly of water ice and measure between 5 millimeters (0.2 in) and 15 centimeters (6 in) in diameter..

Hail is possible within most thunderstorms. Its formation requires environments of strong, upward motion of air with the parent thunderstorm (similar to tornadoes) and lowered heights of the freezing level.

If you find yourself in a hail storm, evacuate the area or seek shelter immediately. If shelter is unattainable, cover you head and neck as best as possible.

7 Transportation

7.1 Journey Management

Journey management is essential to coordinate and monitor the movement of both vehicles and helicopters. Without journey management, company employees can be exposed to unnecessary dangers and hazards.

The following applies to both vehicles and helicopters when operating outside the project area:

1. Before a vehicle or helicopter can be used for work, the driver or pilot will use a checklist to ensure that the vehicles or helicopter is mechanically sound and that the necessary safety equipment is in place.
2. Before the journey begins, the supervisor will inform the driver or pilot of the destination.
3. The supervisor and driver or pilot will establish an estimated time of arrival. In the event that the estimated time of arrival will not be met, the driver or pilot will notify the supervisor immediately.
4. The crew management will approve all journeys and routes.
5. Each base or camp site will designate who is responsible for recording vehicle/helicopter movements.
6. On reaching the destination, the driver will report any hazards encountered to the supervisor, who will pass the information to the Project Manager.
7. If the vehicle or helicopter is overdue by fifteen minutes, the supervisor will inform the Project Manager immediately and search procedures will begin.
8. The following will be recorded:

a. Destination
b. Name of Driver or Pilot
c. Unit number of vehicle or helicopter
d. Time of departure
e. Estimated time of arrival
f. Actual time of arrival
g. Number of personnel on board

7.2 Vehicle Operation

Purpose

Green River Energy Resources (GRER) provides vehicles to support the services of the company. These vehicles are to be used only by qualified and authorized employees. They are not considered a part of an employee's compensation. In all cases, these vehicles are to be operated in strict compliance with motor vehicle laws of the jurisdiction in which they are driven and with the utmost regard for their care and cost-efficient usage. Any employee found to have abused the privilege of operating a company vehicle will be subject to disciplinary measures, including possible termination.

Approved Driver Qualifications:

An approved driver for GRER has been given certain privileges. The approved driver assumes the duty of obeying all motor vehicle laws, maintaining the vehicle properly at all times and otherwise following the policies and procedures as follows:

Driver Licensing and Qualifications

- The employee must have a valid driver's license for their state of residence. License class must be valid for the vehicle he or she will be required to drive.
- The employee will provide GRER authorization to access their MVR (Motor Vehicle Record).

Driver Conditions for Disqualification

- Any GRER employee who has had any of the following experiences during the 36 months prior to employment will not qualify to drive a GRER vehicle:
    - Conviction of a driving while impaired offense
    - Conviction resulting in having a driver's license suspended or revoked
    - Conviction of failure to stop or report an accident
    - Conviction of reckless driving
    - Conviction of homicide, manslaughter or assault arising from the use of a vehicle
    - Convicted of driving while license is suspended or revoked.
    - Conviction of more than three speeding violations

- Conviction of more than two serious violations as classified by state law

Review of Motor Vehicle Record

- MVRs will be used as the source to verify driver history. GRER management will review the MVRs of prospective drivers prior to employment. MVRs will also be reviewed prior to the approval of any currently employed individual to drive a GRER vehicle. Employees who do not meet the requirements above will not be authorized for employment as drivers with GRER and will not be authorized to operate company vehicles under any circumstances.
- MVRs will be reviewed annually. Employees who do not meet the above requirements shall not be authorized to operate GRER vehicles.

Requirements for Insurance

- Employees compensated for the use of their personal vehicles on behalf of GRER shall maintain liability insurance as part of their vehicle compensation agreement with GRER. ***Minimum liability insurance requirement shall be $500,000.*** Insurance must be kept current, with a certificate on file with the GRER administrative office.
- An employee involved in an accident in their personal vehicle while on GRER business will be required to report the accident directly to their designated insurance agent as indicated on the insurance certificate. Additionally, the accident must be reported to GRER management on the accident/incident report form.

Personal Use

- GRER vehicles are provided for business purposes to support the services of the company and the client. Incidental personal use is permitted for authorized drivers only and for the sole purpose of business-related transportation during the time that the employee is working away from their home location. Transportation outside of company-required use must be approved with the direct project supervisor. Personal use is designated as follows:
    - Transportation for incidental trips in the vicinity of the project base during the time in which the vehicle is assigned to the authorized employee

Violations of Personal Use

- The following are direct violations of personal use and will result in disciplinary action up to and including termination:
    - A non-approved driver operating a GRER vehicle
    - Driving under the influence of alcohol or a controlled substance
    - Reckless driving of a GRER vehicle
    - Unauthorized use of vehicle or unauthorized transportation of passengers not employed by GRER.
    - Unauthorized transportation of personal trailers, including boats and recreational vehicles

Traffic Violations and Accidents Involving Company Vehicles

- Fines for parking or moving violations are the personal responsibility of the assigned operator. Each driver is required to report all license revocations and all convictions for moving violations to their direct supervisor within 24 hours. Failure to report violations will result in disciplinary action up to and including termination.
- In the event of an accident, theft or vehicle vandalism, employees shall contact their direct supervisors and local authorities immediately and an accident/incident report must be filed.

Driver Responsibilities:

Drivers are responsible for the care, maintenance and use of the GRER vehicles in their possession. Therefore, a driver's responsibilities include, but are not limited to:

1. Always have and carry a valid driver's license for the type of vehicle you are operating.
2. If transporting hazardous materials, have the appropriate operator's license and training according to local and federal regulatory requirements.
3. Ensure that your vehicle is equipped with current registration and permit plates and they are available for all official inspections.
4. Operate the vehicle in a manner consistent with reasonable practices that avoid abuse, theft, neglect or disrespect of the equipment.
5. Comply with all traffic laws and regulations.
6. It is the policy of GRER that **all** personnel wear seat belts while they are in a moving vehicle, whether owned by or contracted by GRER. Any driver and/or passenger not wearing a seat belt will be subject to disciplinary action, including possible termination.
7. Adhere to the manufacturer's recommendations regarding service, maintenance and inspection. Vehicles should not be operated with any defect or mechanical problem that would prevent safe operations. All vehicle problems are to be reported immediately to the employee's direct supervisor and documented on the daily vehicle inspection log.
8. Pay Attention to and practice safe driving techniques and adhere to all GRER safety requirements.
9. Accurately report all accidents by a driver of a company vehicle to the appropriate supervisor and authorities in a timely manner.
10. Drivers hired for DOT/Hazmat hauling are required to operate by the Federal Motor Carrier Association rules and regulations as defined in Section 4, DOT/Hazmat Requirements # 4.3
11. The vehicle operator should ensure that a daily visual inspection of the vehicle has been made. Before the vehicle is moved; brakes, steering, horn, lights and tires should be in operating condition and all lights, windows and reflectors should be clean. Left and right rear view mirrors and windshield wipers should be in good condition.
12. Walk around your vehicle prior to driving. The driver should check that no equipment or people are in the path or under the vehicle before starting or moving.
13. Keep yourself physically fit and mentally alert. Do not drive while fatigued or tired. Drowsy driving is as dangerous as alcohol impaired driving.

14. Do not drive while under the influence of alcohol, drugs, or narcotics.
15. Do not throw litter or cigarettes out of the vehicle
16. Vehicles must be kept clean of trash, debris, dirt and un-necessary equipment. The outside of the vehicle must also be kept clean and windows and mirrors clear to maintain good visibility.

Failure to comply with any of these responsibilities will result in disciplinary action up to and including termination.

General Vehicle Requirements:

1. All vehicles should be fitted with the following:
    a. Fire extinguisher.
    b. First aid kit.
    c. Communications; radio or telephone
    d. Emergency contingency plan where appropriate.
    e. Seat belts on all seats for all occupants in front and back.
    f. Serviceable spare wheel.
    g. Tool kit including jack and wheel nut spanner (lug wrench).
    h. Survival kit if climate dictates.
    i. Reverse warning/ backup alarm device if appropriate.
    j. Maps.
2. The use of headlights on all vehicles while in operation is mandatory.
3. If flags, triangles or cones are required on your vehicle, be sure you have the sufficient number at all times. The vehicle must be of the proper size and design for its intended use.

Fueling Operations

Do not smoke during fueling operations. Each fuel tank should be clearly marked NO SMOKING, and the type of fuel should be clearly identified near the fueling spout. Shut the engine off when refueling.

Portable Fuel Containers:

1. MSDSs (Material Safety Data Sheets) for diesel and gasoline product must be readily available and current.
2. Gasoline tanks and portable or stationary engines shall be fueled by use of safety nozzles or safety containers only.
3. Gasoline shall not be pumped or transferred, moved, stored, poured, or received by use of open, glass, or unapproved plastic containers.
4. All gasoline powered vehicles and equipment shall be fueled outdoors.
5. All portable fuel containers will be marked with the name of the contents such as “gasoline”.

6. Personnel dispensing liquids shall not leave nozzles or valves unattended when they are in use.

Filling Stations:

1. Smoking, open flames of all types or other sources of ignition shall not be permitted within 50 feet of gasoline dispensing pumps.
2. No gasoline shall be dispensed to a vehicle while the engine is running.
3. All vehicles being fueled shall have proper gas caps installed.
4. If a gasoline spill occurs near a vehicle while refueling, no vehicle shall be started within 50 feet of the spilled gasoline until the spill has been properly taken care of.
5. Gasoline nozzles shall be kept in direct contact with the vehicle when refueling to prevent static electricity.
6. Personnel engaged in dispensing gasoline must be familiar with:
    a. Telephone number of the Fire Department.
    b. Proper operation of firefighting equipment provided.
7. Ignition switches of the vehicle being fueled shall be turned to the "OFF" position prior to fueling.

Fuel Trucks:

1. "No Smoking" signs must be displayed inside the cab of all bulk fuel carrying vehicles.
2. Bulk fuel carrying vehicles shall not be parked inside of or within 50 feet of any structures, empty or not.
3. Every effort shall be made to park bulk fuel carrying vehicles at least 50 feet away from one another.
4. Fuel tank trucks shall be attended by qualified and authorized personnel at all times during loading and unloading operations.
5. Fuel tank trucks shall be properly grounded during refueling.
6. ALL tank trucks, trailers, or semi-trailer vehicles used for the transportation of Class I or II Flammable liquids will be posted with "FLAMMABLE" and "NO SMOKING WITHIN 50 FEET" signs or stickers.
7. ALL tank trucks, trailers, or semi-trailer vehicles used for the transportation of Class I or II Flammable liquids will be equipped with a minimum of two Class B fire extinguishers of at least 10lbs each. ALL tank trucks, trailers, or semi-trailer vehicles used for the transportation of Class I or II Flammable liquids will restrict their travel to and from fuel dumps and/or to dispatching operations.
8. Bulk Fuel Trucks operating under field conditions shall be lined and bermed to contain accidental releases.
9. Spill kits must be within 100 feet of all bulk fuel trucks, fuel tank trucks or fueling locations at all times.
10. A minimum of two fire extinguishers with a combined weight of 100 lbs. must be within 100 feet of all bulk fuel trucks, fuel tank trucks or fueling locations at all times.
11. All bulk Fuel Trucks will be inspected weekly for container stability and leaks.

Defensive Driving

Defensive drivers make allowances for the other person's lack of skill and knowledge and recognize that they have no control over the weather, the conditions of the road, or the unpredictable actions of other drivers or pedestrians. Therefore, they think ahead and make concessions to avoid collision. They are careful to commit no driving errors themselves and are defensively alert to avoid the accident created by weather, roads, pedestrians and other drivers.

It is easy to make safe driving a habit. A safe and careful driver is also a courteous driver. Your attitude on the road and the way you drive is a reflection of you and your company.

Maintain Proper Speed

- Drive at a speed consistent with the condition of the road surface, the traffic density, the degree of visibility and within the posted speed limit. Maintain a safe distance when following another vehicle. The condition of the road, speed, visibility, the weight of the load and the braking ability of your vehicle determine this distance. Never operate a vehicle at speeds that will not permit you to stop within a safe distance. Use the two-second rule for cars and the four-second rule for trucks to maintain a safe following distance.
- Use skill and judgment in selecting the speed for all vehicles.
- All vehicles must respect the established speed limits and those set by the client in their areas of operations.

Maintain Safe Following Distance

- When following another vehicle on dusty roads slow down and maintain a safe distance between you and the vehicle in front of you. Any time you are driving in conditions of limited visibility, such as blowing snow, sand, dust, rain, or fog, use extreme caution. Do not forget to have on your headlights on low beam and stay alert! Be aware of those vehicles following too close behind you.

Maintain Proper Vehicle Position

- Maintain the proper position in the line of traffic when going straight ahead or making a right or left turns. In making right turns, keep as close as possible to the right side of the road. For left turns on a two-way street, keep to the center lane but on your side. Corresponding rules should be followed in jurisdictions where traffic maintains a left-hand drive or the left of the center line. Signal your intentions at least 60 m (200 ft.) in advance of what you intend to do in order to give following traffic an opportunity to adjust accordingly.
- Properly positioning your vehicle on the highway and using proper signals will reduce the possibility of accidents. Driving rules that contribute both to safety and goodwill are based on common sense and courtesy.

- Do not weave from one lane to another

Signal Your Intentions

- Give proper hand or mechanical signals before making right or left turns, slowing down, or stopping. Do not drive with your horn. The horn is emergency equipment to be used only as a warning device and not as a means of demanding attention. In many foreign countries, the horn is integrated into normal driving procedures. Driver's should be aware of local driving customs and adapt to those customs.

Mirror Use

- Do not depend entirely upon your rear view and side mirrors. Use them as an aid, but also look backward and forward on both sides.
- Be cognizant of blind spots and merging traffic in front, behind and next to your vehicle at all times.

Brake Use

- If your vehicle is equipped with anti-lock brakes. NEVER PUMP YOUR BRAKES. This will disable the antilock system.
- After driving in water, brakes may become wet and are not effective. Apply the foot brake lightly for a short period to dry the vehicle brakes.
- Never apply your brakes suddenly when you have a flat tire or blowout. Take your foot off the accelerator and apply the brakes cautiously.

Intersections & Traffic

- Enter and cross intersections cautiously and do not cross until you can do so safely.
- To avoid intersection accidents, never assume you have the right-of-way.
- Take your turn in traffic. Do not crowd other vehicles. Do not demand the right of way.

Approaching Curves

- Approach all curves cautiously. Slow down before entering a curve and accelerate gradually as you round it. Do not attempt to pass another vehicle on a curve.

Passing

- When other drivers signal that they wish to pass, permit them to do so.
- Pass vehicles only when there is ample room to get back safely into your own lane.

Boarding Vehicle

- Employees boarding or exiting from vehicles should do so from the right side of the vehicle when applicable.
- Jumping on or off moving vehicles is prohibited.
- When boarding or exiting non-moving vehicles, truck beds, or trailers, proper climbing techniques should be used.

Maintain Control

- If you run off the road, slow your speed before attempting to return to the road.
- Do not coast with gears in neutral or drive with the clutch pedal pushed down except when shifting gears. When going down steep grades use a lower gear.
- If your vehicle is equipped with auto steering lock, NEVER TURN OFF THE IGNITION OF YOUR VEHICLE WHEN IT IS STILL IN MOTION. This could cause the steering to lock and you would lose control of your vehicle.

Pedestrians & Cyclists

- Watch carefully for persons riding bicycles, especially children.
- Allow pedestrians to cross ahead of your vehicle.
- Approach children and pass through pedestrian traffic cautiously. Be particularly careful to give elderly persons and children the right-of-way.
- Never pass a school bus from either direction while the bus is stopped for loading or unloading passengers
- Do not pick up hitchhikers. Only GRER employees and authorized personnel are permitted aboard company vehicles.

Parking

1. When parking, do not block pedestrian cross walks, private drives, emergency exits, or other entrances. Do not obstruct fire hydrants.
2. Avoid backing when possible. When parking, look for a space where you can drive straight out. When you must back up, have someone direct you or walk around your vehicle to make sure nothing is in your way.
3. When parallel parking, facing uphill, back the front wheel into the curb. Set the parking brake securely.

Winter Driving:

Winter driving requires special care since snow, ice, sleet, rain, mist or fog decreases traction and visibility. The following are precautions to take:

1. On slippery ice or snow, start in one of the higher gears and engage the clutch slowly when operating a manual control vehicle.
2. Chains or winter tread tires should be used when snow or ice causes hazardous driving conditions.
3. Do not rely on chains or other skid control devices.
4. Keep defrosting equipment in good working order. All windows should be free of ice and frost.
5. To avoid the dangers of carbon monoxide, see that the cab is well ventilated at all times.
6. Winter driving conditions call for reduced speed.

Night Driving:

1. When driving at night, you should assume certain responsibilities to attain maximum safety:
2. Check all lights regularly, ensuring they are properly adjusted, clean lenses and ensure all lights operate.
3. Drive your vehicle at a speed consistent with its braking ability and the degree of visibility.
4. Reduce speed when bright lights hamper vision.
5. Pass oncoming vehicles with your low-beam headlights on. This is the courteous and the safe thing to do. Use low beams when following other vehicles or driving in foggy conditions.
6. At dusk, make sure your headlights are on and on low-beam. More automobile accidents occur during the time from sunset to total darkness than any other time of the day. Most of these accidents are caused by drivers who fail to turn on their lights as daylight fades.
7. Switch to low-beams when driving through a city or town.
8. If you have to stop a truck on a highway at night, use emergency warning signals immediately. Cones and other reflective material may be placed approximately 100 ft (30m) behind and in front of your vehicle.

Passenger Protection in Vehicles

Geophysical operations involve a considerable amount of passenger transportation. The standard of protection provided for passengers varies with different vehicle manufacturers and in different countries and may not be adequate for the intended use of the vehicle. It is recommended, therefore, that the following measures be taken for the protection of passengers in vehicles:

1. All seating should be securely fixed. Passengers must be seated and wearing a seat belt while traveling.
2. There should be means for the driver to observe passengers carried in the rear of the vehicle.
3. Passengers and freight should be carried in separate compartments or there should be a means of securing freight.
4. No one is permitted to rest, sleep or otherwise recline under a vehicle at any time

Load Transportation

Guard against road mishaps by making routine checks of the distribution of your load. If your vehicle carries a high load, check all clearances of underpasses. Give attention also to tailgate, tarpaulins, chains, ropes, etc. Red flags in daytime and red lights at night should be attached to any object extending one meter (three feet) or more beyond the rear tailgate. Loads will be secured at all times and must be within the manufacturers legal limits for the vehicle being used. Strict adherence to GRER's Load Securement HSE Standard is required.

Vehicle Maintenance

1. All vehicles must be inspected weekly. This inspection must be documented. Any vehicle operating under DOT regulations must be inspected daily.
2. Damaged vehicles or parts of vehicles must be repaired or replaced immediately.
    a. Notify your supervisor of all maintenance.
3. Do not leave or store equipment under a parked vehicle.
4. No one is permitted to work in or under a vehicle with the keys in the ignition unless under the direct supervision of the mechanic and proper lock out tag out procedures are followed

Cell Phone Use

Subject to local laws and driving regulations, cell phone use is permitted in "hands free" mode when operating in areas free of heavy traffic, bad weather, or marginal road conditions. Texting or dialing while driving is not allowed. If your phone rings in an area where marginal conditions exist, do not answer it. Instead pull to the side and return the call or wait until conditions exist such that your conversation will not distract you from the primary task of controlling the vehicle.

Client policies pertaining to cell phone usage shall take precedent for individual projects based on specific written client instructions.

If you are driving with explosives you are not permitted to use a cell phone under any circumstances. If an emergency occurs or if cellular communications are absolutely necessary, pull off the road, exit the vehicle and move a safe distance from the hazardous material before making the call.

Accident Reporting

In the event of a vehicle incident, contact the project manager or field supervisor immediately. Also, call 911 if necessary and give the dispatcher your location and the status of you and the other passengers. The project manager will contact other local authorities, shut down other field operations if needed, send additional aid, notify the field office, and activate the Emergency Response Plan (ERP).

1. Assess your scene; check all passengers including any occupants of other vehicles involved.
2. Activate emergency flashers or beacon lights. Place emergency, cones, triangles, or use a flagman.
3. Move vehicles off the road if possible.
4. Contact the project manager again and give additional information, such as number of injuries, type of injuries, etc.

5. Give first aid if necessary and possible.
6. Secure the incident site until local authorities or the project manager arrives.
7. Do not leave the scene.

7.3 Aircrafts

Helicopter Operations

Helicopters have enabled us to work in normally inaccessible areas. Since safety depends on communication and education, safety meetings should be held frequently with all crew members. Each new crew member and visitor must receive a complete safety briefing and training from the onsite pilot before beginning any operational work with or around helicopters. It is essential to have a good understanding of possible hazards and to follow safe, consistent practices when using helicopters. The following guidelines incorporate the International Association of Geophysical Contractors (IAGC) and Green River's standards.

Maintenance of Helicopters

1. The owners and operators of the helicopters must comply with all manufacturers and government regulations covering repairs and maintenance of the helicopters.
2. Maintenance records must be available for inspection prior to start-up of all helicopter operations. A pre-work audit by a qualified independent rotor-wing inspector is mandatory at least once each year for each contracted Helicopter Company and each individual helicopter.
3. A basic area audit will also be completed by an HSE field advisor or a field supervisor to inspect general area housekeeping.

Fueling Operations

1. Helicopters Fuel pumps, hoses, nozzles, motors and fuel pump filters should be of the type manufactured for fuel operations. In case of a leak in the hose, it must be repaired with material manufactured for this purpose.
2. Electrical systems are to be grounded as fueling occurs.
3. Fuel hoses and nozzles should meet regulations.
4. Nozzles and fittings must be of non-sparking material.
5. Fuel storage must be at least 15 m (50 ft.) from any power source (electrical power supplies, switch boxes and transformers).
6. The area around fuel storage is to be kept free and clear of all dried grass and weeds for at least 8 m (25 feet).
7. All -fuel storage areas must be surrounded by secondary containment systems or earth berms. Containment must be lined with seamless, impervious material and be of sufficient volume to fully contain the fuels stored plus a freeboard excess of 10-50%, depending on local requirements.

8. No smoking is allowed within 15 m (50 feet) of fuel storage and while refueling is in progress. The area should be marked with “No Smoking” signs.
9. An approved fuel filtering system with effective water and contamination separation must be used in conjunction with the fuel storage and refueling facilities.
10. Fire extinguishers totaling 100 pounds must be within 25 m (75 feet) of the fuel pump or dispenser. Fire extinguishers should be either foam, dry chemical or CO2 and have a rating of at least 20-B or C.
11. Dispose of fuel tank samples in an environmentally acceptable procedure

Landing Zones (LZ) - Helicopters

Contractors, clients and helicopter pilots should define the parameters for landing areas in order to allow for efficiency of operations and safety.

1. The pilot’s judgment as to suitability for flight is final.
2. Landing areas must be kept clean and clear of all obstructions to allow for maneuvering of helicopters.
3. All wires, ropes, antennas, etc., are to be well-marked and never erected near the landing area or approaches to the landing area.
4. Fly camps or “man-camps” must be built at sufficient distance from the landing zone. Loose objects like tents or bags should be secured to ensure that the helicopter’s down draft does not affect them.
5. Keep the approach and departure paths into a Landing Zone (LZ) clear of people and vehicles and allow for possible changes in paths as the wind changes.
6. Wind direction indicators must be set up at all frequently used LZs.
7. Pilots should be able to approach or depart the LZ with external loads without flying over people, equipment, vehicles, or houses.
8. When selecting a new LZ, choose one that is as flat as possible and has adequate clearance in all directions. Never pick an LZ in a hollow or depression. When calling a helicopter into a new LZ, give a detailed description of the area and all hazards around it, as well as the wind direction.

Pilots and Ground Crew

1. All pilots must be currently licensed and have a current physical examination certificate.
2. Ground crew members must be physically fit to perform their required duties and trained accordingly.
3. Ground crew personnel will be specifically designated. Any person not designated as ground crew/flight crew and/or given approval by project managers to assist with helicopter operation will not be permitted in the helicopter area and should stay clear at all times.
4. Pilots and ground crew must observe rest rules and not operate aircraft unless they are properly rested to be alert while on duty.

5. No pilot or ground crew member may report for duty under the influence of alcohol, after taking any drug - legal or illegal - that impairs their judgment and coordination.

Passengers

Transporting passengers in a helicopter can be the most dangerous part of such operations. Especially when crew members are not familiar with boarding and disembarking procedures. No one is to ride in a helicopter without a briefing from qualified personnel.

Passenger Guidelines and Information

When approaching and boarding a helicopter, take the following precautions:

1. All ground crew personnel must remain stationary and grouped while the helicopter is landing. Personnel may approach the helicopter after the pilot signals to and only from the front in the pilot's field of vision, never from the rear.
2. Hold your hard hat in your hand, unless you are using a chin strap or peltors, and securely hold any small or loose articles. Never carry loads above your shoulder.
3. Do not walk uphill when leaving the helicopter or downhill when approaching the helicopter. Walk under helicopter blades in a crouched position. Blade tips may droop and come within 1.5 m (5 ft.) of ground level.
4. If the only way to board the helicopter is from the uphill side, the helicopter must be shut down and the rotor blades stopped.
5. Open and close the helicopter doors gently. Never let swinging the doors swing freely. They should always be hand-held while open.
6. When all passengers are buckled in and all doors closed properly, signal the pilot that all is secured.
7. Any crew members near the Landing Zone (LZ), but not boarding the helicopter, should ensure that all doors and panels are fastened with no loose gear hanging from the helicopter.
8. Long lines or any other external lines must not be attached to a helicopter while it is carrying passengers.
9. Smoking is not allowed in or around the aircraft.
10. Seat belts must remain fastened at all times and passengers may not change seats at any time.
11. Crew members must inform the pilot of any hazards in flight, such as other aircraft, something caught on the skids, etc.
12. Hearing protection is required for all passengers. If headsets are not available use some form of hearing protection (ie. ear plugs, peltors)
13. When the helicopter is approaching for landing, remain seated and do not unfasten seat belts until told to do so by the pilot.
14. When exiting the helicopter, refasten the seat belts and close the doors properly. Disembark only upon signal by the pilot.
15. Stay together and depart in the pilot's field of vision. If on uneven terrain, exit to the downhill side or as instructed by the pilot.

16. The last crew member to depart the helicopter should ensure that all doors are closed properly and that no loose tie downs or equipment are hanging from the helicopter. Signal the pilot that all personnel are clear.
17. Each passenger must have a flotation device or life vest if flying over water that spans a distance greater than 10 miles.
18. Passengers should be shown the location of first-aid kits and fire extinguisher on the aircraft prior to flight.
19. No person shall ride the sling, long line stretcher or basket for any reason other than a life or limb emergency situation.
20. Caution: Let the hook touch the ground to discharge static electricity built up during flight. All tag lines should be short enough that they will not be drawn up into the rotor blades.

Pilot Briefing Guide

Use the following topics as useful headings for a pilot briefing guide for first time and inexperienced workers.

General Helicopter Safety

1. Helicopters and Hazards.
2. Terrain and Landing Zone (LZ) Preparation.
3. Passenger and Equipment Loading.
4. Enroute - Rules and regulations while in the air.
5. Unloading.
6. External Operations.
7. Hazardous Materials.
8. Rescue/Emergency Operations.
9. Fuel shutoff in case of uncontrolled landing (crash).
10. Management of doors when loading and unloading.
11. Location of all first aid kits, fire extinguishers and crash kits
12. Location of Emergency Locating Transmitter (ELT)

Equipment Loading

Loading equipment takes planning and caution. It must be directed by the pilot and designated load master according to the following rules:

1. Any equipment carried in the cabin must be tied down or, if small enough, securely held by crew members.
2. Poles or tall objects must be carried horizontally and close to the ground when approaching or disembarking from the aircraft.
3. If equipment is loaded into a cargo compartment, it must be secured so that it will not move around in flight. (When working around cargo compartments, be very careful of engine exhaust and the close proximity of the tail rotor.)

4. Never load any hazardous materials (flammables, explosives, toxins, corrosives) without the pilot's knowledge and permission.
5. After unloading equipment, ensure that all tie-downs are properly secured.

Long line and Sling Load Operations

Long lines require competent people who thoroughly know the equipment used and have a working understanding of procedures employed.

1. Each time the helicopter lands and/or shuts down with the long line, it must be disconnected or use a lock out tag out procedure to the cyclic as a reminder for the pilot. The long line and hook / lifting device should be placed in front of the cockpit on the ground in a manner so it is visible to the pilot and he has a clear view of it for takeoff as a reminder the line is connected.
2. Never use more than the absolute minimum number of people to hook lines and loads to the helicopter. All other people are to be clear of the area in use to allow room for the helicopter to land in case of an emergency.
3. One person at each site must be designated as signal person and must be familiar with universal helicopter hand signals and/or have a radio.
4. People working under the helicopter should wear gloves, a hard hat with chin strap or peltors, and goggles or safety glasses for protecting the eyes from blowing sand, rocks, etc. The persons handling the hook are to inform the pilot of the type of load and any special conditions.
5. After hooking a load to a long line, do not turn your back or take your eyes off the load. As the load is being carried away, do not walk underneath it. Be sure to inform the pilot of any difficulty you may see, such as catching on limbs or loads coming loose. Always watch your footing.
6. If assistance is needed in order to unhook a load, always let the load touch the ground first. If you are required to assist in unhooking a load notify the pilot before approaching. Do not approach the load if it is swinging excessively and never get under it. Avoid becoming trapped between a swinging load and a fixed object on the ground.
7. Static electricity is always present with helicopters and the amount of charge carried depends on the size of the helicopter and the atmospheric conditions (snow, blowing sand, etc.). Always let the hook, load, or tag line touch the ground first to dissipate the charge and stabilize the load. Never use long lines within 100 m (300 ft.) of high voltage lines and never when thunderstorm activity is in the immediate area.
8. Passengers must not be carried during long line or sling load operations.

Fire Prevention and Fire Fighting Equipment

- Each main base helipad should have a combination of at least two of the following: foam, dry chemical or CO2 extinguishers. These should add up to a total capacity of 45 kg (100 lb.).
- Crew members must receive training in the use of all fire-fighting equipment.

- The helipad must be kept free of fire hazards. Clean up fuel spills immediately. Repair or replace all leaky fuel hoses. Post “No Smoking” signs in appropriate languages where they can be seen by all personnel approaching the helipad.
- Hot fueling should only be carried out by a qualified person such as the helicopter mechanic and the pilot should remain at the controls. No passengers are allowed on board and the main fire extinguisher should be manned and ready.

Transporting Explosives by Helicopter

Government regulations and company requirements must be reviewed with the aircraft operator in a pre-planning meeting. The pilot is the person in command and must be the person to give approval to transport explosives and explosive material. All members of the crew should be briefed and documented. There should be no deviation from the agreed procedure. All explosive materials need to be transported externally and never inside the helicopter. Detonators may only be transported together with the other explosive materials in a designated magazine box. It is extremely important that the pilot be notified before explosive materials or detonators are placed aboard the external container and transported.

Transporting Other Hazardous Materials

- Batteries and power sources shall be carried in a container or protected so as not to allow terminals to contact the aircraft body or any metal object that could cause sparking. Batteries must be secured to prevent accidental spillage of battery acids.
- Any object with sharp points, such as loading poles, must not be carried in a position where the points could cause injury to crew, passengers, or damage to the helicopter.
- Fuel of any kind may not be carried in any leaking container. All containers must be approved for the type of fuel and have properly fitting lids or caps.
- All hazardous materials must be identified by name and the hazards well marked, (e.g., flammable, explosive, corrosive, toxic, etc.).

Air Travel

A minimum survival pack shall be on all aircraft flying over uninhabited country. A radio beacon Electronic Location Transmitter (ELT) or equivalent must be available on the aircraft.

As a minimum, the survival pack should consist of the following items:

- Sufficient food to sustain life for a period of 24 hours per passenger.
- One axe or hatchet.
- Fishing gear.
- A knife.
- Two boxes of waterproof matches.
- A mosquito net for each occupant.
- Signal devices (mirror).

Crash Kit

Suitable crash equipment should be available in the base camp or staging areas, in addition to firefighting equipment. This equipment should be kept in a crash box, suitable for rapid deployment in the vicinity of the base camp / staging area (carted). Where more than one helicopter is in operation, this same crash equipment should be available for rapid loading into one of the helicopters, for transport to a remote crash site. Crash equipment can include:

- Fireman type axe
- Large axe
- Heavy duty hacksaw with 4 spare blades
- Grab hook with long handle or 30 meters of 10mm non plastic rope
- Heavy duty crowbar of 1 meter length
- 24 inch (61 cm) bolt cutters
- 2 Pairs flameproof gloves
- 2 Torches (flashlights) with spare batteries
- Inch adjustable spanner/wrench
- 2 Fire blankets
- Wire cutting pliers
- 1 Set assorted screwdrivers
- Straight metal ladder (8 ft minimum)
- Harness knife with sheath

The crash kits should be audited by a GRER employee prior to project start up and regularly throughout to ensure the contents are in working condition at all times and fully stocked.

7.4 All Utility Terrain Vehicles (ATV & UTV)

Purpose

ATV's and UTVs can be dangerous to operate. Severe injury or death can occur from accidents on UTVs and ATVs. They should only be used when absolutely necessary and all personnel using UTVs or ATVs must be trained.

Definition

Utility Terrain Vehicles (UTV's) are defined as a single or multi seat vehicle with four or more wheels, which has a seat and has a steering wheel. Multi seat UTVs are required to have seatbelts and roll-over protection.

All-Terrain Vehicle (ATV) is defined as being a single seat vehicle with four or more wheels, which has a seat that must be straddled and is equipped with handlebars for steering.

Procedure

The handling of single seat UTVs or ATVs is said to be rider active. The position of the operator and/or the cargo loaded on the UTV or ATV can drastically alter its handling characteristics and maneuverability.

UTVs and ATVs are designed for off-road use. Handling characteristics change drastically on pavement. **Stay off paved roads**. In many places, it is unlawful to operate an UTV or ATV on or near public roads. When operating an UTV or ATV, drive defensively. Other traffic cannot always see you so yield to other traffic. UTVs or ATVs with one seat are designed to carry only ONE person; the operator.

1. Operators should be properly trained and certified in UTV or ATV use.
2. Personal Protective Equipment (PPE):
    a. Approved head protection **(¾ shell or full shell motorcycle helmets)** is required. ½ shell helmets are not designed for off-road use. Hard hats are unacceptable.
    b. Face shield, goggles or safety glasses when applicable.
    c. Jacket or long sleeved shirt.
    d. Gloves.
    e. Long pants.
    f. Boots.
    g. High visibility clothing. (I.e. safety vest, reflective tape strips, etc.)
3. Always perform a pre-ride inspection to minimize the chance of injury or being stranded because of mechanical problems. Bear in mind you can ride further in an hour than you can walk in a day.
    a. Tires and wheels.
    b. Controls and cables
    c. Lights and electrics.
    d. Oil and fuel.
    e. Drive shaft chassis.
    f. Emergency brake.
    g. Whip flag or slow moving triangle.
    h. First Aid kits and fire extinguishers.
4. Ride within your skills.
5. Scan the environment for hidden obstacles and hazards such as large rocks, stumps, holes, washouts and fences.
6. Set the parking brake when getting off the UTV or ATV. You will not always be on level ground.
7. Do not use excessive speed.
8. See and be seen, and do not rely on sound to make people or animals aware of your presence.
9. Follow local laws and regulations.
10. Plan ahead. Carry a radio, small tool kit, small first aid kit and snacks.

11. When carrying cargo, evenly distribute the weight and make sure it is securely fastened down.
12. Ride in an environmentally friendly fashion not breaking traction, turning “donuts” or creating ruts. Leave as little evidence of vehicle passing as possible.
13. Adding a whip flag to the UTV or ATV makes it more visible.

7.5 Load Securement

Purpose

Green River Energy Resources (GRER) has established a best practice for load securement and protection against shifting or falling cargo during road transport. This standard applies to all GRER employees, contractors and sub-contractors.

General Loading and Unloading Requirements

Cargo Securement

- Cargo must be completely immobilized and secured on or within the transport vehicle using chains, straps, dunnage or a combination of these.
- Chocks, wedges, a cradle, or equivalent must be used to restrain cargo capable of rolling.
- Cargo securement devices must not unfasten or come loose in transit.
- Articles of cargo placed beside each other and secured by transverse tie-downs must either be:
    - Place in direct contact with each other or
    - Prevented from shifting towards each other while in transit.
- If straps used to secure cargo are subject to abrasion, edge protection resistant to abrasion, cutting, and crushing must be used (edge protection compose of paper is prohibited).
- Hoses used by carriers must be securely stowed in their hose racks and/or hose troughs before moving. This includes while operating within the project area or while transporting any GRER property.

Exceptional Loads

Any load may be designated as an exceptional load if

- The equipment requires special handling due to:
    - The load not likely being tied down adequately
    - Size
    - Weight
    - Awkward or bulky shape
- Loss or damage would result in
    - Substantial economic loss or

- Major time delays to the project

Loading Height

The highest point of the load/trailer/vehicle must have sufficient overhead clearance along the entire route, including pickup and drop off locations.

Safety Zone

No personnel shall be within 20’ of the truck or forklift while all cargo is being loaded or unloaded whenever practical

Restraint Requirements

Working Load Limit

The working load limit (WLL) or safe working limit (SWL) is the maximum load that may be placed on any component of a cargo securement system during normal service. The total WLL of a cargo securement system must be at least 100% of the weight of the article being secures. The total WLL is the sum of the WLL for each chain and/or strap used to secure the load. For example, a 20,000 lb cargo load must be secured using chains and/or straps with a combined working load limit of 20,000 lbs or more.

The WLL of any restraining device used to secure cargo must not be exceeded. Any restraining device not marked by the manufacturer with its working load limit will be considered to have a WLL of the lowest grade or classification for the type and size of the component being used.

Default Working Load Limits

The working load limits of tied owns used for cargo securement on commercial motor vehicles may be determined by using either the tie down manufacturer’s markings or by using the tables shown below.
Under U.S. federal regulations, the working load limits listed in the tables are to be used when the tie down material is not marked by the manufacturer with the working load limit. Tie down materials which are marked by the manufacturer with working load limits that differ from the tables will be considered to have a working load limit equal to the value for which they are marked.

Tables to §393.108 [Working load limits (WLL), chain]					
Size mm (inches)	WLL in kg (pounds)				
	Grade 30 proof coil	Grade 43 high test	Grade 70 transport	Grade 80 alloy	Grade 100 alloy
1. 7 (1/4)	580 (1,300)	1,180 (2,600)	1,430 (3,150)	1,570 (3,500)	1,950 (4,300)
2. 8 (5/16)	860 (1,900)	1,770 (3,900)	2,130 (4,700)	2,000 (4,500)	2,600 (5,700)
3. 10 (3/8)	1,200 (2,650)	2,450 (5,400)	2,990 (6,600)	3,200 (7,100)	4,000 (8,800)
4. 11 (7/16)	1,680 (3,700)	3,270 (7,200)	3,970 (8,750)		
5. 13 (1/2)	2,030 (4,500)	4,170 (9,200)	5,130 (11,300)	5,400 (12,000)	6,800 (15,000)
6. 16 (5/8)	3,130 (6,900)	5,910 (13,000)	7,170 (15,800)	8,200 (18,100)	10,300 (22,600)
Chain Mark Examples					
Example 1	3	4	7	8	10
Example 2	30	43	70	80	100
Example 3	300	430	700	800	1000

Polyester Fiber Rope WLL (3-Strand and 8-Strand Constructions)	
Width mm (inches)	WLL kg (pounds)
10 (3/8)	250 (555)
11 (7/16)	340 (750)
13 (1/2)	440 (960)
16 (5/8)	680 (1,500)
20 (3/4)	850 (1,880)
25 (1)	1,500 (3,300)

Nylon Rope	
Width mm (inches)	WLL kg (pounds)
10 (3/8)	130 (278)
11 (7/16)	190 (410)
13 (1/2)	240 (525)
16 (5/8)	420 (935)
20 (3/4)	640 (1,420)
25 (1)	1,140 (2,520)

Double Braided Nylon Rope	
Width mm (inches)	WLL kg (pounds)
10 (3/8)	150 (336)
11 (7/16)	230 (502)
13 (1/2)	300 (655)
16 (5/8)	510 (1,130)
20 (3/4)	830 (1,840)
25 (1)	1,470 (3,250)

Steel Strapping	
Width mm (inches)	WLL kg (pounds)
31.7 x .74 (1 ¼ x 0.029)	540 (1,190)
31.7 x .79 (1 ¼ x 0.031)	540 (1,190)
31.7 x .89 (1 ¼ x 0.035)	540 (1,190)
31.7 x 1.12 (1 ¼ x 0.044)	770 (1,690)
31.7 x 1.27 (1 ¼ x 0.05)	770 (1,690)
31.7 x 1.5 (1 ¼ x 0.057)	870 (1,925)
50.8 x 1.12 (2 x 0.044)	1,200 (2,650)
50.8 x 1.27 (2 x 0.05)	1,200 (2,650)

Synthetic Webbing	
Width mm (inches)	**WLL kg (pounds)**
45 (1 ¾)	790 (1,750)
50 (2)	910 (2,000)
75 (3)	1,360 (3,000)
100 (4)	1,810 (4,000)

Wire Rope (6 x 37, Fiber Core)	
Width mm (inches)	**WLL kg (pounds)**
7 (1/4)	640 (1,400)
8 (5/16)	950 (2,100)
10 (3/8)	1,360 (3,000)
11 (7/16)	1,860 (4,100)
13 (1/2)	2,400 (5,300)
16 (5/8)	3,770 (8,300)
20 (3/4)	4,940 (10,900)
22 (7/8)	7,300 (16,100)
25 (1)	9,480 (20,900)

Manila Rope	
Width mm (inches)	**WLL kg (pounds)**
10 (3/8)	90 (205)
11 (7/16)	120 (265)
13 (1/2)	150 (315)
16 (5/8)	210 (465)
20 (3/4)	290 (640)
25 (1)	480 (1,050)

Polypropylene Fiber Rope WLL (3-Strand and 8-Strand Constructions)	
Width mm (inches)	**WLL kg (pounds)**
10 (3/8)	180 (400)
11 (7/16)	240 (525)
13 (1/2)	280 (625)
16 (5/8)	420 (925)
20 (3/4)	580 (1,275)
25 (1)	950 (2,100)

Chains and Devices

Chains must at a minimum be 5/16", Grade 70 transport chain meeting NACM specifications. If securing with chains, use at least 4 chains in a cross bind pattern. This pattern restrains movement in any direction. Additional restraining devices must be used if necessary.

Chains must be applied to a load such that the angle is more than 45 degrees from horizontal or vertical. The full WLL of a chain is achieved only when the chain is in a straight pull or straight line. Attaching chains to a load with less than a 45 degrees angle greatly reduces their WLL. Cross binding a load on the front and rear offers restraint from movement in all directions.

The ratchet-style load binder is the approved securement device when chain configurations are used to secure cargo. The use of lever-style load binders to secure cargo is prohibited. The stored energy of these devices introduces the potential for serious injury to the driver when breaking or releasing the handle of the lever binder.

Nylon Straps

Straps must be nylon at least 4" wide to secure items on trailer decks. The driver may use 2" straps to secure items inside of baskets, containers, motor vehicle beds and moving parts of equipment. Nylon straps used to secure the load must be placed in the immediate proximity of each support point. Whenever possible, straps should be run between the rub rail and the trailer for added protection. A minimum of 2 straps must be used.

Truck Driver Responsibilities

The truck driver is the party accountable for ensure that all loads are properly and legally secured prior to road transportation. The truck driver shall refuse transport of any load that is not properly secured. Truck drivers are responsible for ensuring that the following requirements are met before equipment or material is transported for GRER:

- The provisions of the GRER Load Securement HSE Standard as well as any and all local, state and federal regulations are met.
- Complete a Job Safety Analysis (JSA) prior to commencing any loading/unloading activities.
- Truck drivers have Stop Work Authority at all times
- Ensure the vehicle's tailgate, tailboard, doors, tarpaulins, spare tire and other equipment used in its operation are secured.
- The cargo or any other object does not do any of the following:
    - Obscure the truck drivers view ahead or to the right or left sides
    - Prevent his/her free and ready access to accessories required for emergencies
    - Prevent the free and ready exit of any person from the cab or truck driver's compartment

Personal Protective Equipment

The required safety equipment must be worn at all times while:

- Loading
- Unloading
- Securing any type of load

All personnel involved in loading or unloading activities shall have the following equipment:

- Hard hat meeting or exceeding the ANSI standards
- Impact-resistant safety glasses with side shields that meet or exceed ANSI standards
- Work Boots
- Work Gloves
- Fluorescent colored safety vest or other high-visibility outer wear.

Non-compliant Trucks/Drivers

Trucks or divers arriving at the work location to load or unload without the proper safety equipment or materials will not be loaded and will be asked to leave the work location immediately. They may leave, obtain the required equipment and return to loading.

Any truck driver acting in an unsafe manner will be requested and required to leave the work location immediately.

7.6 Winches & Cables

Chains and cables (wire rope, synthetic rope) are useful tools, but proper care and maintenance are frequently ignored by tow operators. Both chains and cables should receive a quick inspection before each use and thorough inspections should be scheduled every week or month depending on the severity or frequency of use. Any rope (synthetic or wire) should be certified in writing as to its breaking strength and safe workload and it should be purchased with factory-installed attachments to ensure high quality.

Cables bear great stress during winching and can break and fly through the air to cause severe injury or death. When a cable breaks, it becomes a flying object that can cause hooks or snatch blocks to fly in unpredictable paths. No person not engaged in the actual winch-out should be allowed anywhere near the tow truck, the vehicle to be recovered, or the rope or chains being used.

1. Winches should only be operated by trained personnel.
2. The winch cable should be unspooled and inspected regularly. If more than 5% of the wires can be seen to be broken in a 30 cm (1 ft.) length or there are kinks, the cable should be replaced.
3. The winch cable should be maintained by keeping clean and oiling with a light preservative. When re-spooling, avoid kinking the cable.

4. Always wear leather gloves when handling cable. Always run cable hand over hand when re-spooling.
5. Apply moderate pressure to the end of winch cable when re-spooling.
6. Never stand near, step over, or go underneath a cable. It may suddenly go under tension or it may break with a whipping action and fly through the air.
7. Stand clear of objects being lifted or pulled. If the cable breaks, the objects may fall or roll back.
8. Do not stretch a cable across a road or street. Do not hook cables on telephone poles. Do not use man-made objects as an anchor unless prior approval has been obtained from the owner.

8 Seismic Drilling Operations

8.1 Drilling Operations

There are numerous types of drill rigs which can be used in seismic drilling including conventional truck mounted, buggy drills, portable drills, airboat drills, marsh buggy drills, and mini hole drills. These drills can remove cuttings from the hole by means of water jet/injection, mud circulation, air, or by the use of augured pipe stems. The type(s) of drill(s) selected for use will depend on site-specific conditions encountered on each job. Also refer to driller and drill helper job duties and responsibilities sections of the HSE Standards.

General guidelines, which apply for ALL types of drills, are as follows.

Planning & Set Up

1. Subcontractors should check their client's safety standards and specifications before project start-up.
2. The driller and assistant are the only members of the party designated to operate the drill equipment. No employee should operate the drill unit in training or practice unless under direct supervision.
3. The driller should plan ahead for the job. Problems should be discussed and a safe system agreed upon.
4. Drills and support vehicles, including boats should be equipped with the correct fire extinguishers and fully stocked first aid kits.
5. There should always be a second crew member (helper, etc.) at the drill unit in case of an emergency.
6. Always check for overhead obstructions such as power lines before raising the mast.
7. Drilling (re-entering a hole) must not be carried out on any shot point that has been previously shot or contains explosives.
8. The shot hole must not be drilled closer than two times the hole depth from any power line, unless special precautions have been taken for hole blow out. Consider offsets in order to meet this requirement.

Maintenance Checks:

1. Daily maintenance checks should be performed and any repairs carried out.
2. Pre start-up check should include guards, fuel lines, fuel tanks and lids, spark plug wires, switches (for proper installation), hoses, safety chains, couplings, oil levels, air filters, fire extinguishers, first aid kit, brakes and steering. The engine stop switch operation should also be checked at the start of each day's operation.
3. Post start-up check should include throttle operation, gauges and hoses for hydraulic and air leaks.
4. Make sure your supervisor or mechanic is advised immediately if a drill unit is not operating properly.
5. Do not attempt repairs, maintenance or service while the machinery is running. If adjustments must be made while the machinery is running, do so only when an assistant is at the controls that can take emergency measures in the event of malfunction.
6. All shafts, sprockets, pulleys, gears and other moving parts must be guarded. If guards must be removed, replace them before the machinery is placed back into operation. Do not risk losing a finger or foot by using unguarded machinery.
7. Drills should be kept leak free. Steps should be taken to keep motor oil and hydraulic fluids from getting to the ground or into the water. Oil spots on the ground should be removed and disposed of properly. Never attempt to stop a hydraulic leak by covering it with your hand.
8. Inspect winch lines, chains and hoists frequently.
9. A daily visual inspection to identify fractures in welding seams, loose nuts, bolts and screws should be performed.

Personal Safety, Safety Equipment:

1. Do not wear loose clothing, rings or jewelry around moving machinery or drills. Tuck long hair under head gear.
2. Drill crew members should wear appropriate and properly fitted Personal Protective Equipment (PPE), including but not limited to, sturdy work boots, gloves, hard hats, hearing protection and eye protection.
3. Drilling units must have an emergency shut down or kill switch fitted in such a way that either the driller or the helper has access to it.
4. Drilling units should be fitted with gauges to monitor hydraulic pressure.
5. When the mast is being raised, often the lower end of the mast will swing down into contact with the base or skid. This area should be clear of personnel and equipment when raising the mast.
6. Once drilling/begins, keep all non-essential people away from the rig.

Drilling Safety Equipment

- Where applicable a regulation detonator and explosive magazine must be permanently mounted and provided with locks.
- Each piece of equipment will carry an adequate dry chemical fire extinguisher. (ABC)
- Radio communications
- First Aid Kit
- Wheel cocks – **Buggy drill units**
- Safety signs as required
- Functioning seat belt (for all self-propelled drill units).
- Emergency cutoff/kill switch
- Safety Cones to be placed front & rear of rig prior to drilling (for all self-propelled drill units). Reverse alarm applicable to only buggy driven units.

During Drilling:

1. Be sure that all holes are being drilled in compli**an**ce with the projects offset distance table or contract specifications for structures and pipelines, etc.
2. Never drill into explosive materials or into a shot hole that has contained explosive materials. Do not re-enter holes that have been previously loaded.
3. Drill personnel should not allow visitors at the drill site who are not equipped with proper Personal Protective Equipment (PPE).
4. Never hold or grab a drill bit by the blade.
5. Never use the fingers to align the bit and the stem.
6. Keep hands and feet away from rotating drill stems. Rotating pipe can cause serious injury to hands, feet and fingers.
7. In the event of an approaching electrical storm, stop all operations. Lower the rig mast and move all personnel to a safe distance from the explosives magazines.

General Hole Plugging

The procedure for plugging shot holes may vary from project to project due to State Regulations, permit stipulations and/or specific Client requirements. The following is the GRER standard hole plugging procedure.

- The operator shall adequately plug the hole by filling it from total depth to a depth of no more than 3 feet below the surface with drill cuttings and/or bentonite. A plastic cap shall be set above no less than three feet below the surface. The remainder of the hole shall be filled with drill cuttings or native soil. All precautions should be taken to prevent cuttings from bridging over.
- Magnets if required will be placed just below surface, 12” to 6”
- Check detonator with cap tester and log reading of cap on drill logs

Shot Point Completion and Clean Up

1. Refer to the Hole Loading HSE Standard for proper procedures and requirements.
2. Do not leave any refuse at the drill location. Do not burn trash at the location. Remove it for proper disposal.
3. Do not drill shot holes charges deeper than the limit set by the regulations or the permit.
4. Before moving, always visually inspect the machine for dragging items, loose articles, proper equipment, etc. Be sure spare equipment, pipe and tools are secure.
5. If a drill is backed from a shot hole onto a road, a helper should act as a guide and, if necessary, stop traffic to ensure that the maneuver is carried out safely.
6. Before moving a drill to a new location, always shut the engine off if it is separate from the vehicle engine.
7. Do not move a drill with the mast raised.
8. With pattern drilling the rig can be moved short distances without lowering the mast but only if the shot points are on level ground and there are no overhead obstructions.

Instructions for Specific Rig Types

Truck Drills and Buggy Drills

1. There should be a support vehicle at or in contact with the drill location to be used in case of emergency.
2. The mud pit, return ditch and sump hole should be filled in immediately after a shot hole has been drilled.

Heli Portable Drills

1. Before starting drilling, discuss all aspects of the project and helicopter loading and transporting safety.
2. Make sure the area around the drill location is level and clear of obstructions. A landing zone may need to be cleared before the drill is placed. .
3. Only approved containers for fuel can be used and must be properly marked as to their contents. These containers must be kept away from portable magazines carrying explosives and caps.
4. Fuel tanks must be mounted away from hot parts of the engine or other ignition sources. Where this is not possible, only metal fuel cans with explosion preventers fitted into the spout should be used.
5. Where fuel tanks are mounted to the drill, engines should be switched off before refueling. Care must be taken to avoid spills.
6. When an air drill is being used, the air pressure must be completely released before breaking any line or connection. Check the gauge. Do not use your hands to check an air stream.

Marsh Buggy Drills

1. Personnel will board and exit only in areas which have been equipped with handrails and steps, climb and descend backwards facing the marsh buggy. Use caution walking on buggy tracks, they become slippery.
2. Be sure the tracks are clear of personnel and other equipment before putting the buggy into motion.
3. Be sure equipment is secure before crossing levees and canals. If possible, unload passengers first.
4. Follow all field safety procedures and line sketch information when operating the buggy. Do not drive buggy off line without permission.
5. Personnel riding on the buggy should use extreme caution. Sit only in designated areas and not on the engine cover, fuel cans, back hoe, etc. Remain seated at all times when the buggy is underway. Obey the instructions of the operator.
6. Always wear Personal Flotation Devices (PFDs) when the buggy is in the water.
7. Keep deck and drill area clean of greases and other slippery substances.
8. Keep fuel in proper containers in a safe designated area.
9. Never jump from the buggy to the ground.
10. Back up alarms should be operational.

Airboat Drills

1. Check props on a daily basis for stress cracks, chips or nicks.
2. Drill boat should be kept free of unnecessary debris, which could go into the prop(s).
3. The front deck and work area should be kept clean and orderly.
4. Never enter the cage without disconnecting the battery cables, removing the keys and fouling the prop.
5. Shut off engines before refueling.
6. When working or traveling over water, personnel should wear proper Personal Flotation Devices (PFDs).

8.2 Job Descriptions & Responsibilities

General Drilling Responsibilities

- The Project Manager is responsible for making sure that all Green River & subcontract drill personnel understand and abide by the company's **and client's** HSE standards and policies.
- The Project Manager will ensure that HSE checks and audits are performed as per policy/standard.
- The Drill Supervisor is in charge of over-seeing all drilling activities.
- The Drill Supervisor will organize the line movements of all drills with the drill coordinator daily.

- The Drill Supervisor will ensure that all the shot holes have been drilled to the proper depths and that all of the explosives are loaded in a safe manner.
- The Drill Supervisor will ensure that all drills are in “safe operating condition” and decide what is required to put a drill requiring repair back into a “safe operating condition”. All repairs must be documented on the scheduled maintenance form, all parts and inventory used on project site will be document by drill coordinator or crew mechanic on site for both buggy and heliportable operations.
- The Drill Supervisor will review access maps and ensure that the access for the equipment is adequate and that all shot-point locations are safe for drill set-ups.
- The Driller is responsible for all HSE aspects for his or her drilling operations.
- All GRER Employee’s hired to perform drilling duties must pass BATFE employee possessor status and any state blasting permits required to handle explosives for GRER.

The Buggy Driller will

- Abide by all of GRER safety standards and procedures.
- Conduct work in a safe way as to protect himself and the helper.
- Understand the mechanics of the drill unit and be able to perform or assist in routine maintenance and repairs to the equipment.
- Use and handle explosives with proper safety methods.
- Follow all rules and regulations of hole plugging procedures.
- Be responsible for the drill helper and the surroundings for a radius of 50 ft around the drill rig during operations.
- Ensure that no one encroaches in the drilling area without his approval and until the hole is completely drilled and safely loaded.
- When approaching the shot hole, check the area for hazards such as overhead power cables, pipelines, trip hazards and sloping ground.
- Inspect the area around the shot-hole to verify that the location is safe for drilling
- Park drill ensuring that all braking systems are applied.
- Ensure that hard hats, safety glasses, hearing protection and gloves are worn.
- Raise and lock mast
- Drill hole to depth as required
- Communicate to drill coordinator (by radio) that the drill hole is drilled and being prepared for charge – turn off radio communications during loading procedure.
- Ensure that the correct charge size and the correct number of detonators are loaded in the hole following the approved hole loading procedure.
- Lower mast. Secure equipment
- Inspect surrounding is cleaned per permit and job specifications i.e.: cuttings, stake, pin flag, trash debris.
- Verify the location of the helper and any other personnel present.
- Once shot hole is complete, driller needs to make contact via radio communication to drill coordinator that the hole is loaded and the area has been secured, and the drill is moving to the next location.

The Heli Driller will

- Abide with all of GRER and GRED's safety policies and procedures.
- Conduct work in a safe way as to protect himself and the helper.
- Understand the mechanics of the drill and compressor unit, able to perform or assist in routine maintenance and repairs to the equipment.
- Use and handle explosives with proper safety methods.
- Follow all rules and regulations of hole plugging procedures.
- Be responsible for the drill, helper and the surroundings for a radius of 50 ft around the drill rig during operations.
- Use correct hand signals and radio communication with the helicopter pilot with and without equipment on the helicopter long line.
- Will practice safe hooking and unhooking of equipment load to and from helicopter long line.
- Ensure that no one encroaches in the drilling area without his approval and until the hole is completely drilled and safely loaded.
- When approaching the shot hole, check the area for hazards such as pipelines, trip hazards, sloping ground and overhead hazards such as dead fall, hanging branches and power lines.
- Inspect the area around the shot-hole to verify that the location is safe for drilling
- Driller needs to recheck drill and compressor unit placement after catcher has placed equipment to ensure safe setup prior to shot hole drilling.
- Ensure that leveling legs and foot pads are firmly planted and drill is in correct position for slope of grade.
- Ensure that the air hose and the whip check cable are properly connected.
- Ensure that air compressor unit is at safe distance from drill unit during drill operations and placed on slope or grade properly.
- Ensure that hard hats, safety glasses, hearing protection and gloves are worn.
- Re-count explosive each time rig is moved.
- Drill hole to depth as required
- Communicate via radio contact to the drill coordinator that the drill hole is drilled and being prepared for charge – turn off radio communications during hole loading procedure.
- Ensure that the correct charge size and the correct number of detonators are loaded in the hole following the approved hole loading procedure.
- Lower mast. Secure equipment and supplies on drill and compressor for heli flight to next location
- Inspect surrounding is cleaned per permit and job specifications i.e.: cuttings, stake, pin flag, trash debris.
- Verify the location of the helper and any other personnel present.

- Once shot hole is complete, driller needs to make contact via radio communication to drill coordinator that the hole is loaded and the area has been secured, and equipment is ready for transport.
- Walk to next drill location while equipment is being transported.

The Drill Coordinator / Catcher will

- Abide with all of GRER and GRED's safety policies and procedures.
- Conduct work in a safe way as to protect himself, the heliportable equipment, driller and drill helper.
- Use and handle explosives with proper safety methods.
- Follow all rules and regulations of hole plugging procedures.
- Use correct hand signals and radio communication with the helicopter pilot with and without equipment on the helicopter long line.
- Will practice safe hooking and unhooking of equipment load to and from helicopter long line.
- Be responsible for securing safe and level equipment landing areas
- Ensure that no one encroaches the landing area without catchers approval until the equipment is secure and the helicopter has left the area.
- When approaching the shot hole, check the area for hazards such as pipelines, trip hazards, sloping ground and overhead hazards such as dead fall, hanging branches and power lines.
- Inspect the area around the shot-hole to verify that the location and numbering are correct for placement of the drilling equipment.
- Recheck drill and compressor unit for any damage during equipment transport.
- Ensure that leveling legs and foot pads are firmly planted and drill is in correct position for slope of grade.
- Ensure that air compressor unit is at safe distance from drill unit during drill operations and placed on slope or grade properly.
- Ensure that hard hats, safety glasses, hearing protection and gloves are worn.
- Catcher will maintain accurate coordinators daily log.
- Catcher is responsible for communicating via radio to the driller the next shot location their equipment is being transported to.
- Move to next shot point location.

The Buggy Drill and Heliportable Coordinator/Mechanic will:

- Abide by all rules and regulations of GRER and GRED
- Use and handle explosives with proper safety methods.
- Will assist Drill Supervisor and GRER management with all field required needs
- Will maintain and service all required equipment
- Keep required Journey management sheet on personnel in field.

- Will notify supervisors if any equipment is not safe to operate.
- Will keep documented reports of service and repairs
- Will maintain documented delivery and usage of parts in trailers.
- Monitor radio
- Monitor drill production and assist in moving equipment
- Will assist powder person with daily duties if needed.

The Buggy Drill Helper will:

- Abide by all rules and regulations of GRER and GRED
- Use and handle explosives with proper safety methods.
- Follow all rules and regulations of hole plugging procedures.
- Perform all duties required by the Driller, within reason.
- Assist on the drill with anything needed.
- Rake cuttings while the hole is being drilled and keep the hole clean.
- Safely add and remove drill stem as needed.
- Check drill and surrounding areas for safety cautions when not busy.
- Walk to and locate the next hole and scout best routes for Driller, when possible.
- Walk from hole to hole and not ride on the drill in rough terrain.

The Heliportable Drill Helper will:

- Abide by all rules and regulations of GRER and GRED
- Use and handle explosives with proper safety methods.
- Follow all rules and regulations of hole plugging procedures.
- Perform all duties required by the Driller, within reason.
- Assist on the drill with anything needed.
- Rake cuttings while the hole is being drilled and keep the hole clean.
- Safely add and remove drill stem as needed.
- Check drill and surrounding areas for safety cautions when not busy.
- Recheck and secure items on drill and compressor unit prior to equipment transport to next location.
- Radio communicate to driller that equipment is in transport and that helper is walking to the next drill point location.

The Powder Man will:

- Abide by all federal DOT compliances set forth by the FMCSR (Federal Motor Carrier Safety Regulations).
- Abide by all of GRER's safety policies and procedures.

- Keep an accurate count of powder and detonators in magazine as required by the BATFE and GRER which includes daily distribution sheets and monthly magazine counts with accurate counts daily.
- Keep all Daily Drivers Log books accurate with hours worked.
- Maintain documented daily inspections of the vehicle he/she uses for the duties above.
- Abide by all of GRER;s drug and alcohol policies and procedures which will include random drug testing.
- Handle and deliver explosives with proper handling methods.
- Not deliver explosives to non-employee possessor applicants.
- Help coordinate everyday activities of drills while they use the delivered explosives.
- Assist the Project Manager in keeping DOT compliances and driving records while on the job.
- Not let GRER or any of its employees engage in any dangerous acts while working in the field. Any unsafe acts or practices will be reported immediately to GRER Management at 406-892-8964.

8.3 Drilling on Sloping Ground

Parking the Buggy Drill or Water Buggy on Sloping Ground

Every effort must be made to ensure that buggies are not parked in a position where one can roll into another.

Only when there is **absolutely no alternative** should the support buggy be parked in a position where in could roll into the drill buggy.

If the support buggy must be parked on a down slope toward the Drill Unit do the following.
The Driller and the helper(s) must discuss the situation and be aware of the possible hazards.

- Apply the braking system.
- Point the wheels in a direction whereby, if the buggy rolls it will roll away from the Drill Unit
- Chock the wheels
- If required secure the support buggy by means of chain or cable.
- If the grade or slope is considered to be too steep to operate safely, inform the Project Manager and/or drill coordinator before attempting to set up on the hole.

Setting the Heliportable Drill & Compressor on Sloping Ground

Every effort must be made to ensure that the drill and compressor are not set in a position where one can roll into another or down a steep slope.

If the compressor unit must be set on a down slope toward the Drill Unit do the following.

- The Driller and the helper(s) must discuss the situation and be aware of the possible hazards.
- If the grade or slope is considered to be too steep to operate safely, inform the drill coordinator /or drill supervisor and either move the hole location or drop the point.

8.4 Refueling a Heliportable Drill or Compressor using a Heliportable Fuel Skid

Purpose

The purpose of this procedure is to ensure Green River Energy Resources employees are aware of the potential hazards associated with fueling heliportable drill rigs and heliportable compressors and to ensure their safety while performing these daily tasks.

Actions

1. Ensure the equipment being fueled is stationed securely and is as level as possible, with plenty of room around the rig to safely move personnel and other equipment.
2. Ensure the fuel skid is stationed securely and is as level as possible, with plenty of room around to safely move personnel and other equipment. Should the fuel skid be placed on uneven terrain, place the pump side downhill to ensure maximum pressure to the nozzle.
3. Ensure that the equipment being fueled is shut down and powered off.
4. Before fueling begins, place absorbent drip pads beneath the fuel intake spout of the equipment being filled.
5. While covering the nozzle with an absorbent pad, carry the nozzle to the equipment that needs to be refueled.
6. Securely place the nozzle in the fuel hole of the compressor or drill.
7. Attach the power cable to the battery of the fuel skid and ensure that the polarity of the cables is correct prior to turning on the electric pump switch.
8. Ensure that the fuel nozzle is properly engaged at all times.
9. Activate the electric pump and monitor the fueling process until desired amount of fuel is added.
10. Turn the pump off and unhook the power clips from the battery.
11. Remove the fuel nozzle from the hole and replace the fuel cap properly.
12. Cover the nozzle with an absorbent pad.
13. Return the fuel nozzle to the fuel skid and properly secure it.
14. Complete a walk around inspection to check for leaked fuel and re-assure the pump is switched off.
15. Properly secure and contain all fuel skid materials before hooking the fuel skid to the helicopter long line.

Additional Operations:

1. Spill kits and fire extinguishers must be readily available.

2. Contaminated fuel drip pads must be properly secured in approved containers before being sent to the staging area for proper disposal.
3. Smoking is not permitted during the fueling process.
4. Ensure no spills occur, if a spill should occur, report the spill immediately and clean accordingly.

9 Energy Source

9.1 Explosives

General

To establish and maintain the highest safety standards in the handling of explosive materials, all phases concerned - transportation, storage and use - should be accorded the same degree of consideration. Everyone involved with any aspect of explosive handling must receive adequate training.

During any operation where explosive materials are handled, a qualified person must be responsible for establishing and enforcing procedures to ensure that all safety precautions and regulatory requirements are being followed.

Personnel involved in explosive handling (magazine keeper and magazine crews, truck drivers and helpers, blasters and loading crews) must be familiar with the characteristics and hazards of the explosive products they are handling and trained in the proper handling procedures.

Transportation of Explosive Material (Not Including Aircraft)

For this subsection transportation means only the transportation of explosives between the user is storage facility and the work location and between work locations.

1. Do not smoke, carry matches, fuel, flame-producing devices, firearms, or loaded cartridges while in or near a motor vehicle carrying explosives. This prohibition against firearms does not apply when they are required to protect the health and life of employees or the security of the explosives.
2. Motor vehicles or conveyances transporting explosives shall only be driven by, and be in the charge of, a licensed driver who is DOT and Hazmat approved. The driver must be familiar with regulations governing the transportation of explosives in the area of operations.
3. Do not carry or transport explosives in or upon a public conveyance or vehicle carrying passengers for hire.
4. Vehicles used for transporting explosives must be strong enough to carry the load without difficulty, be in good mechanical condition and contain the proper storage magazines approved by the BATFE

5. Electric blasting caps may be transported on the same vehicle with other explosives, provided they are segregated and carried in an approved cap container.
6. Explosives may be transported on vehicles carrying equipment (i.e., drills) or materials (i.e., water), provided that the explosives are carried only in approved magazines securely mounted on the vehicle and that while on public roads, the magazine and separate cap box are closed and locked. Any local regulations must be followed.
7. Explosives may be transferred from one vehicle to another within the project area without notifying authorities, provided that the transfer is made under qualified supervision and not in a congested area or near a public road, inhabited building, operating equipment, or any kind of loading or shooting operation.
8. Every motor vehicle or conveyance used for transporting explosives must be marked or have placards on all four sides. The placard must signify the class of explosives being transported, unless local government regulations require alternative identification procedures.
9. Each vehicle used for transporting explosives must be equipped with two fully charged fire extinguishers in good condition. The driver must be trained in the use of the extinguishers on the vehicle. The vehicle must also include a first-aid kit, tool kit, and radio communications.
10. In the event of breakdown or collision, the local fire and police departments must be promptly notified. Explosives must be transferred from the disabled vehicle to another only when qualified supervision is provided.
11. Motor vehicles or conveyances containing explosives, blasting agents, or blasting supplies must not be taken inside a garage or shop for repairs or servicing. The vehicle must be free of all explosives material before any work is preformed.
12. Vehicles transporting explosives shall avoid congested areas and heavy traffic.
13. Do not leave any vehicle transporting explosives unattended at any time.
14. Detonators and other explosives must be carried in separate marked containers when they are transported.
15. Do not transport explosives manually, or any time there is a high static electricity conditions.

Storage of Explosive Material

For this subsection storage means storing explosives and blasting agents in storage facilities under the control of the user. Consult local authority for safe distances to explosive storage, lightning protection and grounding requirements.

1. Store explosive materials in approved facilities and authorized container units as defined by the BATFE and the local authorities.
2. Do not store damaged explosives with other explosives, or store explosives with a cap inserted. Contact the supplier to dispose of damaged explosives. Damaged explosives must be safely destroyed according to the manufacturers' recommendations.
3. Primers and boosters can be stored with other explosives, but must not be stored with caps.

4. Magazines and the use of explosives must be in charge of a competent person who should enforce all safety precautions. This same person must be in charge of inventory. The inventory must be up to date at all times.
5. Use non-mass detonating caps where available.
6. Keep the area around a magazine clear of any combustible material for at least 15 m (50 ft).

Use and Handling of Explosive Material

All explosives are dangerous and must be carefully handled and used following approved safety procedures either by or under the direction of competent, experienced persons in accordance with all applicable federal, state and local laws, regulations and ordinances. If you have any questions or doubts about how to use any explosive product, do not use it before consulting your supervisor, or the manufacturer. In the event that there are variations between local, state and federal laws, the more stringent obligation or restraint must be exercised. The prevention of accidents depends on careful planning and the use of proper procedures.

The use of charge anchors and hole plugs should be reviewed at the planning stage.

1. Only qualified personnel who have received proper training may handle or use explosives. Never use explosive materials unless completely familiar with safe procedures or under the direction of a qualified supervisor.
2. No person may handle or use explosives when such handling or use constitutes an undue hazard to life and/or property.
3. All persons handling explosives must wear the proper protective devices, such as hard hats, eye protection, ear protection, and fly rock protection where necessary.
4. No equipment, persons, or activity other than that required for loading shot holes with explosive materials are to be near the shot hole at the time of loading.
5. Any knowledge of theft or loss of explosive materials must be reported to the supervisor who, in turn, must promptly notify the proper local and federal authorities.
6. Never fight fires involving explosive materials. Remove yourself and all other persons to a safe location and guard the area from intruders.
7. Always follow the manufacturer's recommendations for the use of an explosive material.
8. All tools, machines, equipment, or devices used with explosive material must be designed for use with explosive materials and be checked or tested periodically to ensure that they function properly and in accordance with the manufacturer's recommendations.
9. Do not detonate explosive materials in congested areas or in close proximity to any structure, railroad, highway, power line, communication line, pier, dock, vessel, or other installation that may be damaged.
10. All persons in the vicinity of the shot hole must be able to hear, see, or otherwise be aware of any order, warning, or hazardous situation during loading or shooting operations.

11. When loading shot holes with more than one loading crew, the crews must be separated by enough distance to ensure safe operations.
12. Never drill into explosive materials or into a shot hole that has contained explosive materials.
13. The loader must check the shot hole before loading to ensure that it is open to a safe depth.
14. Never tamp explosive materials with metallic devices, except jointed non-sparking poles with non-ferrous metal connectors.
15. Always insert detonator completely into the receptacle incorporated in the charge as furnished by the manufacturer.
16. Be prepared with procedures that must be followed and who should be contacted in case of flowing shot holes.
17. Be sure that all the holes are being drilled in compliance with the crew's offset distance table for structures and pipelines as per regulations and client guidelines.

9.2 Seismic Drilling - Explosives

Explosive Handling, Use And Security

Explosive Handling

General:

- Make sure hand held radio's cell phones are off before receiving explosives from powder man.
- Always lift and carry explosives with the correct lifting procedures
- Never drag or throw explosive containers.
- Never strike or hammer explosives
- Always treat explosives with respect
- Always keep explosives away from sparking or flammable materials.
- Never place explosives near or on the exhaust of a vehicle.
- Never leave explosives unattended.

THE THREE-SHUNT SYSTEM.

Detonator shunting should be checked when,

- Taken from the magazine
- Before loading the hole
- After loading the hole

Storage

- Never store explosives and detonators together.
- Explosives and detonators should be stored in separate approved day boxes or magazines

- Detonators must not be stored in the same magazines with other explosives.
- Where possible the ground around magazines must slope away for drainage. The land surrounding magazines must be kept clear of brush, dried grass, leaves, and other combustible materials for a distance of 25 feet in each direction.
- Magazines must be located in accordance with the American Table of Distances for Storage of Explosives.
- No smoking, matches, flame producing devices or fire of any kind shall at any time be permitted inside of or within 50 feet of a magazine.
- Magazine floors must be regularly swept, kept clean, dry, and free of grit, paper, empty used packages and garbage.
- An accurate inventory of the stock explosives and caps in magazines must be maintained at each magazine. The inventory must reflect the date, date/shift-code, quantity on hand, quantity received, quantity issued, quantity returned, and balance on hand at all times of each brand and grade.
- Each magazine will have two x 15lb ABC fire extinguishers
- Each magazine will have warning signs and emergency contact number signs

Objects In Shot Hole

The following procedure is designed to minimize the risk of lost pipe or any other objects inadvertently placed in the shot hole from being discharged from the hole in a hazardous manner upon detonation.

- Every safe effort should be made to recover the pipe casing or any other foreign object that should not be in the shot hole. In the event that drill pipe or any other object (loading poles, hole loader weight or any other material not intended for hole loading purposes) is lost in the shot hole, the shot hole should be considered a hazard if shot
- It must be noted on the drill log as *SHOOTER BEWARE*. The Project Manager will inform the client.

Radios, Cell Phones And Other Devises

Radios, cell phones and other electronic devices can detonate explosives

- Always turn off radios cell phones and other devices when approaching a drill unit.
- Drillers and helpers should not have cell phones and other devices in or near the drilling and support units.
- Always ensure that the drill / crew radio does not transmit when explosives are taken out of the day boxes for loading into the hole.

The Issuing And Receiving Of Explosives In The Field

The following are procedures that must be followed to ensure that all explosives are stored and issued in a manner that enables all quantities of explosives to be tracked, thereby ensuring that no explosives are unaccounted for.

Receiving Explosives At The Magazine / Storage Area

The individual receiving explosives at the magazine will be licensed and authorized, and will also ensure that all explosives are counted and correctly inventoried.

All boxes of explosives and detonators received will be opened and each individual stick of explosive and detonator will be counted before delivery is accepted. **This MUST be done in the presence of the person delivering the explosives from the distributor**

The drill supervisor will ensure that the individual receiving the explosives has all the necessary assistance to expedite the inventory. Once all explosives have been accounted for the magazine inventory must be updated to include all the explosives received from that delivery.

From The Magazine To The Drill Rigs – Buggy Drilling Operations

- The powder person will take the required amount of explosives and detonators from the storage area.
- The powder person will ensure that he or she has the exact amount of explosives on the powder truck that relates to the inventory sheet in the magazine.
- The powder person will follow GRER radio/cell phone procedure
- On arrival at the drill unit the powder person will physically count each charge and detonator that is being handed to the Driller.
- The driller and helper will check that no hand held radio or cell phone is near the drills day box prior to receiving daily shipment of explosives.
- Driller and Powder person must make sure that explosives are not delivered to drill that is parked near power lines.
- The Driller and the helper will physically count each charge and detonator before receiving the explosives.
- If both counts agree the Driller will sign the daily explosive inventory report in the presence of the powder person.
- The Driller is fully responsible for accounting for all the explosives and detonators issued to him or her for that day.
- Each unopened box or container of explosives or detonators MUST be opened in the presence of two company employees
- If there is a shortage the Project Manager/Drill Supervisor MUST be notified immediately

From The Magazine To The Drill Rigs – Heliportable Drilling Operations

- The powder person will take the required amount of explosives and detonators from the storage area.
- The powder person will ensure that he or she has the exact amount of explosives on the powder truck that relates to the inventory sheet in the magazine.
- The powder person will follow GRER radio/cell phone procedure
- On arrival at the Heliportable Fly Mag, the powder person will physically count each charge and detonator that is being loaded into the Fly Mag.
- The Fly Mag will be loaded with the required amount of explosive and Detonators for each Heliportable Drill Unit.
- The Fly Mag will then be physically monitored by an authorized employee possessor until it is flown for delivery to the heliportable drill units.
- The driller and helper will check that no hand held radio or cell phone is near the drills day box prior to receiving daily shipment of explosives.
- The Driller and the helper will physically count each charge and detonator before receiving the explosives.
- If both counts agree the Driller will contact the drill coordinator and radio that his count is correct.
- The Coordinator will radio the powder person and report that all drills have received the correct amount and production will start.
- The Powder person will document this and continue with his day.
- The Driller is then fully responsible for accounting for all the explosives and detonators issued to him or her for that day.
- Each unopened box or container of explosives or detonators MUST be opened in the presence of two company employees
- If there is a shortage the Project Manager/Drill Supervisor MUST be notified immediately

From The Drill Rigs To The Magazine – Buggy Drill Operations

- At the close of the workday the Driller will return unused explosives to the powder person.
- Driller and powder person must ensure that the drill has not moved near power lines at end of day before returning un-used explosives.
- The Driller and the powder person will physically count every charge and detonator to ensure that the used and returned totals match.
- The Driller will sign the daily explosive inventory report in the presence of the powder person to show that he or she has returned explosives as per the daily explosive inventory report
- If the totals do not agree, the Project Manager/Drill Supervisor MUST be informed immediately.

- On arrival at the magazine the powder person will calculate the correct total used against issued totals and physically count each charge and detonator that is being returned to the magazine.
- The close of day inventory sheet total must match exactly with the amount of explosives being secured.

From The Drill Rigs To The Magazine – Heliportable Drill Operations

- At the close of the workday the Driller will return unused explosives to the Heliportable Fly Mag.
- He will notify the Drill Coordinator/Catcher and report his return.
- The Drill Coordinator/Catcher will then notify the Powder person of the returns.
- The powder person will physically count each and every charge and detonator to ensure that the used and returned totals match.
- The Driller will sign the daily drill report to show that he or she has returned explosives as per the daily explosive inventory report.
- On arrival at the magazine the powder person will calculate the correct used against issued totals and physically count each charge and detonator that is being returned to the magazine.
- The close of day inventory sheet total must match exactly with the amount of explosives being secured.
- If the totals do not agree, the Project Manager/Drill Supervisor MUST be informed immediately.

Inventory Taking

The Project Manager will ensure that an inventory of explosives is taken:

- Daily by the powder person
- Once a week by the drill supervisor or designated powder person.
- On the last day of the month
- When new product is delivered
- When a project begins and ends
- The Project Manager must approve all these inventories

All office based Supervisors and Managers are expected to conduct an inventory check whenever they visit a worksite.

Security Of Explosives

- All day boxes will be secured with a padlock
- The Powder person will take explosives from the main magazine as required and store them for transport in the powder truck magazines.

- On arrival at a drill or distribution area the powder person will ensure that the person receiving the explosives has the correct day boxes for safe storage and transport before removing the explosives from the powder truck.
- Once safe storage has been established the powder person will issue the explosives to the person receiving them.
- The person receiving the explosives will count the explosives and then sign the daily explosive inventory report.
- The explosives will then be IMMEDIATELY placed in the day boxes and the explosives secured.
- Detonators and explosives should not be carried together when transferring them from the powder truck to the day boxes.
- Only the person using the explosives will sign for them.
- If the above procedure cannot be followed the powder person will not issue the explosives until the appropriate corrective action is taken.
- **NEVER** leave explosives unattended.
- Never set down explosives outside of the day boxes or powder truck magazines.

Static Electricity

Static occurs naturally in many ways and can set off explosives
Always do the following:

- Always ground yourself before handling explosives.
- Always wear natural fiber clothing
- Always ensure that detonators are shunted and that the shunt remains secure until the hole is loaded.
- Stop work during dust storms and electrical storms.

During severe weather or thunderstorms

- Secure the explosives in the day boxes
- Lower the drill mast when applicable
- Head for a safe area
- Do not drill near or under power or telephone lines

9.3 Hole Loading Procedures

1. Follow all safety procedures as recommended by the manufacturers of the explosives and detonators.
2. All employees working with explosives must be trained in proper handling and use of the explosive.
3. Both explosive and detonator day boxes must be made to BATFE regulatory standards and kept secured. Drills will display the proper explosives placards at all times when transporting explosives.
4. Make sure the detonator is properly shunted before loading operations begin.

5. Some soils cave in easily and make it difficult to keep the hole open. Where the hole must be loaded quickly, do not rush or forget the basic safety rules.
6. Never prime or make up a charge prior to completion of the hole. A charge is considered primed when it has been fitted with a detonator. ALWAYS wait until you are ready to load the charge before inserting the detonator into the seismic charge.
7. Never place/hang the detonator spool on the drill rig while loading the hole. This practice may cause static build up and the premature detonation. Always hold the spool by hand.
8. Never prime a charge and leave it lying around the drill site, work area or work deck.
9. ALWAYS use a blasting galvanometer to check a detonator. Do not use a Volt-Ohmmeter or other device not designed to check electric blasting caps.
10. Before testing a detonator, ensure that the detonator is in a safe place before removing the shunt to test.
11. ALWAYS re-shunt the detonator after checking the circuit.
12. Never use a radio or any kind of radio transmitter when handling explosives. This includes, but is not limited to, cellular phones, Global Positioning System (GPS) stations, FM (Frequency Modulation) or CB (Citizen Band) radios.
13. Loading poles must be tipped with non-sparking material (brass or rubber).
14. After drilling and loading the shot hole, backfill it with cuttings or another authorized material. Avoid adding the backfill too quickly as this can cause bridging (blockage). Place a shot hole plug near the surface as per local regulations to avoid wash in.
15. Tamping or back filling personnel must never leave the area until the hole(s) have been tamped sufficiently such that the charges cannot be removed from the hole.
16. Do not attempt to load a flowing hole. Attempt to plug it and immediately notify the Project Manager and or Drilling Supervisor.

Once Explosives are loaded into the hole, it must never be removed under any circumstances!

10 Other Operations

10.1 Survey Operations

Overview

Surveyors are frequently the first members of the operations to enter a location. They should warn other crew members of dangers, such as dangerous animals, insects (bees), underground pipelines or electric lines, electric fences, hunters in the area, old cisterns, wells, mines or partially concealed holes or pits, posted poison gas areas and natural obstacles.

The surveyor should prepare a hazard map for distribution to all crew members showing the location of all points of danger, including but not limited to:

- Power, oil, gas, water and telephone lines.
- Radio, television and radar transmitters.

- Weak bridges.
- Holes or pits.
- Fences.
- Animals and insects (such as bees).
- Access to survey areas.

When surveying a project, be alert to the location of radio and television transmitters. Advise drilling and explosives crews of their locations. Identify the type of transmitter, power and frequency and then refer IAGC Standards for recommended offset distances for shot holes. .

Do not stake a shot point closer than twice the depth of the shot hole from any overhead power line. This is to keep the length of the cap wire, plus firing line, from accidentally blowing over the power line.

Use extreme caution when working near bulldozers, woodgators, or chain saws when clearing the line.

Surveyors should attempt to utilize existing trails and access routes to reach survey lines wherever possible.

Survey Positions and Responsibilities

Survey Coordinator

The survey operations representative in the field

- Responsible for the safe operation, conduct, and productivity of all survey crews on the job
- Conducts safety meetings and ensures that all employees understand safety procedures
- Make sure that all members go thru orientation of the ERP before working.
- Ensure that “One Call” has been established in the field before operation has commenced.
- Will have a list of all permits and restrictions.

Surveyor

May use conventional (optical) survey equipment or GPS technology

- Uses existing survey evidence to place the seismic line in the correct position or establish a new control with OPUS or similar technology.
- Instructs the line cutters where to clear the seismic line of brush and debris
- Decides where to deflect the seismic lines to avoid major obstacles
- Works closely with Cat Operators and Line Cutting Management to construct the line, as well as detours around obstacles for drill rigs and trucks
- In heli-portable operations, chooses locations for heli-pads
- Uses information and maps from oil companies, as well as field evidence to determine the location of buried pipelines, cables, and other utilities

- Responsible for finding and documenting all pipelines and other utilities in the area of the proposed construction, and will insure that “One Call” notices have been made.
- Responsible for the cleanliness and safety of the line
- Will have a list of permits and conditions with him at all times.
- Each crew team leaders will have copy of the ERP with them.
- To manage and control the daily production
- Reports to Survey Coordinator

Surveyor - GPS

Uses specialized GPS equipment to position the seismic line and place flags at designated intervals

- First line of responsibility for keeping shot points legal distances from houses, water wells, pipelines, etc
- May work alone or with an assistant
- Responsible for survey data
- Responsible for all GPS equipment
- Responsible for actions of surveyor's helper, if provided
- Creates chaining notes and line sketches
- Reports to Survey Coordinator

Arch view map manager

- Uses GPS or conventional equipment, as well as specialized computer equipment to create a detailed topographical map of the seismic lines and surrounding areas
- Responsible for including all relevant information on maps
- Reports to Survey Coordinator
- Collect data on daily basis and delivers updated progress maps to crew and management.

PPE and Work Clothing Requirements

The standard PPE for personnel on worksites is; Hard-hat, ankle support hiking work boots, gloves, safety glasses, hearing protection & visible safety shirt. Personnel without all the proper PPE will not be allowed on the worksite. No cell phone use allowed while driving.

- Good quality work boots that support the ankle.
- Hard hats – required when working under or around helicopter operations
- Safety Glasses
- First aid kit will be with each team.
- Each team will have radio with them at all times
- ERP copy with supervisor and each team leader.

10.2 Chain Saw Operations

Before any cutting is considered check the Permit to ensure that cutting is allowed and is allowed, permit stipulations are followed.

Chainsaw operations should be avoided when possible. If chain saw use is required, it should be done under close supervision and all safeguards in place. Chain saw cutting operations should be carried out with extreme caution and a high level of safety awareness. All operators should be skill-tested before any chain saw operations commence in order to ensure that the employee is knowledgeable and qualified. Only approved operators who perform their duties while complying with all the safety standards should be authorized to operate chain saws on the crew. Each operator should be issued a Daily Safety Checklist for the chain saw. Operators should be familiar with this checklist and follow all of the standards listed. Only chain saws with an automatic chain break should be used.

Limit the people that can do the cutting. All employees are required to have chain saw training by a competent trainer before cutting

All operators will have and use the following Personal Protective Equipment (PPE):

1. Lumberjack helmet (a hard hat with eye and ear protection).
2. Gloves.
3. Safety (steel-toed) shoes.
4. Chain saw chaps.
5. Whistle
6. Fire Extinguisher

Other safety equipment that should be issued:

1. Proper fuel and an oil container with funnel.
2. First aid kit. (one per work group)
3. Cutter bar guard for saw.
4. Chain saw safety sleeve guard for chain.
5. Spare spark plug.
6. Chain file.
7. Screwdriver.
8. Plug wrench.
9. Radio communications

Note: Major repairs should be completed by a mechanic

The following safety standards should be emphasized to all chain saw operators:

1. No operator should operate the chain saw without wearing Personal Protective Equipment.
2. Radio communications should be available between the operating site and a unit capable of medivac.

3. Never cut above shoulder height or operate the chain saw with one hand. Always keep the cutting direction away from you. Always use the bottom of the blade for cutting; never use the top or the tip.
4. Clear the area of all personnel before the operator uses the chain saw. When falling a tree, all crew members should be grouped a distance that is at least twice the tree height away. The chain saw operator should have a planned escape route before cutting any tree.
5. Make sure the chain is properly tightened. Make sure a mechanic regularly maintains the saw and updates the log book. A sharp chain is safer.
6. Always allow the chain saw engine to cool before refueling. The chain saw should not be restarted at the location where refueling took place as fuel spillage can catch fire.
7. Mix fuel with two-stroke oil. Use the proper chain bar oil on the chain. Use a funnel when refueling if the fuel container does not have a spout funnel. Never smoke or have open flame near fuel.
8. Never transport a chain saw while it is operating. Always turn the engine off and place the guard on the cutter bar before moving. Carry the saw with the bar facing behind.
9. Never carry the chain saw on your head
10. Start the chain saw only when it is placed firmly on the ground.
11. Operate the chain saw only when stable footing is available. Do not stand downhill while falling trees large than three (3) inches in diameter.
12. Use the chain saw only when necessary.
13. Chain saws should be fitted with a working chain brake, kill switch and kickback safety stops.
14. Minimize the amount of vegetation disturbed, (e.g., no wider than 2 m or 6 feet).
15. Helipads and drop zones may require the cutting of large trees. Local environmental restrictions need to be considered.
16. Clearing a seismic line can normally be accomplished without removing trees greater than four (4) inches in diameter.
17. Leave in place smaller vegetation, low shrubs and grasses consistent with a safe walking surface.
18. Remove leaners and hung up trees to prevent them falling unexpectedly later on.
19. Do not build fires when the vegetation is dry.
20. Do not fall trees across pipelines, right of ways, trails or water courses.
21. Try to cut and scatter limbs such that tree trunks fall flat on the ground. Good ground contact speeds up decay.
22. Where needed back-sighting is blocked by a branch, remove it rather than the whole tree.

10.3Lockout & Tag Out

Purpose

Lockout is the process of blocking the flow of energy from a power source to a piece of equipment and keeping it blocked out. A lockout device is a lock, block, or chain that keeps a switch, valve, or lever in the off position.

Tag out is accomplished by placing a tag on the source. The tag acts as a warning not to restore energy to or restart the piece of equipment under lockout. Tags should clearly state: DO NOT OPERATE and should be applied by hand.

Training

Supervisors, persons in charge and employees working for them must receive lockout/tag out training before working on any equipment. Training will be updated annually and documented to ensure all personnel understand and follow GRER's Lockout/Tag Out policies and procedures. Training will be given on hazard identification, types of energy sources, energy control procedures, emergency shut down procedures, and isolation techniques. Additional training will be done when personnel are introduced to a new piece of equipment or energy source.

Procedure

When maintenance is needed on any electrical powered line, motor, equipment, or fuel-powered engines, you should protect yourself and others from accidental start-ups. Accidents can occur when the proper procedures are not followed.

The following rules should be observed:

1. The person in charge should identify all parts that are to be shut down and which switches, equipment and people should be involved in maintenance, repairs, or installation. At this same time, the restarting procedures should be planned with details including who starts it, when it will be started and how it is carried out.
2. Inform all personnel involved that a lockout/tag out procedure will take place. The procedure for the equipment under repair must be established and documented in advance and agreed upon by all personnel involved. If tags will be used to mark the equipment, this must be clearly noted in the established procedure.
3. Identify all power sources for the project. What makes it work? This includes identifying all hydraulic and pneumatic systems, spring, compressed air, gravity systems and all electrical circuits.
4. Every power source has its own procedure for lockout, which may be accomplished by pulling a plug, opening a disconnect switch, removing a fuse, closing a valve, bleeding the line, or placing a block in the equipment. Always use proper shut down procedures

as addressed by the manufacturer. Completely isolate power sources (ie. Batteries, plugs, air compressors) from the machine before beginning maintenance.

5. In situations where multiple personnel must work on the same piece of equipment, one person will be in charge of the lockout/tag out device and work on the equipment will only be allowed under the direct supervision of the person in charge. Each worker involved should verify the correct lock out or tag out procedure is followed to ensure all energy has been removed. The lockout or tag out devices may only be placed and removed by the person in charge. Group lockout or tag out devices are not permitted on any GRER equipment. This is done to ensure the same level of protection of all personnel regardless of the number of personnel working on the same piece of equipment.
6. Tag out all the power sources and machines. Tags should indicate that the machine or circuit is out of order, the reasons for the lockout, time of and date of lockout, your name, the date, the phone number where you can be reached and the time of tagging. Tagging should be done by the person in charge and removed only after all personnel involved are satisfied that equipment maintenance is complete, the system has been tested and restart has been approved.
7. The person in charge should clear the area of all workers to a safe distance. When the equipment is ready; remove the "out of order" tab before turning the power on. Remove locks, turn on power sources, and operate any valves in preparation to test the system.
8. Any power source or machine undergoing long term maintenance will be inspected for proper Lockout/Tag Out periodically. Annual inspections must be performed and documented.

Items that are subject to Lockout/Tag Out:

- Vehicles
- Trailers
- Drills
- Electrical or motorized equipment

Six Steps of Lockout/Tag Out:

1. Prepare for shutdown
    a. Know the type and magnitude of the energy, hazards involved, and means of control
2. Shut down the equipment
    a. Follow manufacturer's recommended procedures
    b. Do so in a safe and orderly manner
3. Operate all energy isolating devices
    a. These include valves or switches
    b. De-energize the equipment
4. Attach all LOTO devices
5. Release all stored energy
    a. Electric charge, pressure, charged springs

6. Verify that equipment energy isolation has been accomplished

10.4 Ladder Safety

Purpose

Green River Energy Resources has established the following procedures in accordance with the requirements of OSHA 29 CFR 1910.21, 1910.25, and 1910.26 to reduce the risk of incident or injury to our staff, and when employees are working on or around portable metal or wood ladders. This program outlines the proper procedures to be taken when inspecting, maintaining, storing and using portable aluminum, fiberglass, metal, and wood ladders on the job.

Ladder Ratings / Types

Ladders are categorized by size and weight limits. These limits are posted or otherwise attached to the ladder to let the user know its limitations.
Only the following ladders shall be used :

- Type I (Industrial) rated for 225 – 300 lbs.
- Type II (Commercial) rated for 200 – 225 lbs.

Ladder Selection

Ladders should be chosen carefully using the following criteria:

- Portable ladders must be of proper construction, size, and type for the specified work task.
- Metal ladders cannot be used around electrical equipment (i.e. panels, transformers, power lines etc.).
    - Use fiberglass or wood ladders around electrically energized equipment and lines
- Ladders must be of sufficient height to perform the necessary work. Standing on the top two steps of a stepladder or the top three steps of a straight ladder is prohibited.
- Step ladders cannot be used as straight ladders
- Smooth rungs should not be used where there is ice, rain, snow, or other wet conditions
- When attempting to gain access to a platform, roof, or other elevated area a straight ladder shall be used.
- The straight ladder must extend at least 5 rungs above the surface to be accessed.
- If the ladder is to be used at a height of 8’ or more, it shall be tied off, held in place by a spotter, or otherwise prevented from movement at all times.

Ladder Inspection

Ladders must be thoroughly inspected…

- if damaged
- after subjected to overloading
- after subjected to impact
- after exposure to elevated temperatures

- after repair
- every 6 months for damage and deficiencies

Before each use, it should be assured that the ladder is:

- free of loose locks, rungs or steps
- free of loose nails, screws or bolts
- free of broken, cracked or split braces, rails, rungs or steps
- free of burrs, jagged edges and slivers
- free of corrosion, grease, non-compliant paint, oil or rust
- free of any recognized damage that could cause injury
- Any ladder found to be damaged beyond repair should be disposed of after complete dismantling or breakage. This will insure that the ladder cannot be used after disposal.

General Notes

- Personnel shall always face the ladder when ascending or descending.
- Both hands should be in contact with the ladder when ascending or descending.
- Tools should be carried on a tool belt
- Personnel using a ladder should never overreach.
- The belt buckle should not extend beyond the beam or uprights of the ladder.
- Ladders shall never be placed in front of a doorway that opens toward the ladder unless:
    - the doors have been locked to prohibit use (Locking of exit doors is not permissible.)
    - the doors have been posted with barrier tape or a sign that warns of the person on ladder
    - a person has been posted on the other side of the door to prohibit entry when ladder is being used
- Ladders 8 feet in height or larger shall be held in place with any or all of the following:
    - a rope tied to a secure part of the building or fixture
    - a person whose responsibility is to stabilize the ladder for the user, or
    - any other method to prevent accidental movement
- Employees using ladders on the job must feel comfortable using the ladder.
    - if an employee is apprehensive about using the ladder for any reason they should contact their supervisor.
    - if an employee is using medication that may cause drowsiness, reasonable accommodation must be made to prevent injury
- Ladders must be placed on level, solid surfaces.
    - Never place a ladder on concrete blocks or any other object that might move
    - Slippery conditions such as ice and snow may also pose a problem. Always secure the ladder in place.
- Only one person at a time is permitted on a ladder.
- The ladder should not be overloaded beyond its rated capacity.
- Do not leave ladders unattended where unauthorized personnel or children may use them.

- Do not use ladders during strong winds except in emergencies and after tying or securing.

Step Ladders

- Step ladders must be opened completely with spreaders locked in place.
- Step ladders cannot be used as straight ladders.
    - if a straight ladder will not fit, a step ladder can be used, provided it is tied off at the top to prevent falling.
- Step ladders must be tall enough to perform the necessary work.
- Stepping on the top two steps of a step ladder greater than 3' in height is prohibited.

Extension or Straight Ladders

- Straight or extension ladders must extend at least 5 rungs above the platform, roof, or other area of dismounting.
- Straight or extension ladders must be long enough to perform the necessary work.
- Stepping on the top 3 rungs of a straight ladder is prohibited.
- Straight or extension ladders must be placed so that the proper ladder angle is met - for every 4 feet in height the ladder must be raised, the base should be 1 foot away from the wall or object that the ladder is set against.

Ladder Storage

- Ladders should not be stored where excessive heat or dampness is present.
- Straight ladders should be stored horizontally either on the floor or hung on the wall where they will be supported at 4 to 5 foot intervals.

Ladder Maintenance

- Aluminum ladders should be cleaned with soap and water as needed.
- Fiberglass ladders should be cleaned with soap and water as needed and sealed with a clear or pigmented lacquer or paste wax when necessary.
- Metal ladders can be cleaned with a mild soap and water as needed.
- Wood ladders should be cleaned with a mild soap and water, then dried. The wood ladders should be protected with a clear shellac, varnish, or wood preservative application at least annually. Wood ladders that have been painted shall be removed from service.

10.5 Proper Lifting Technique

Most back injuries are caused by negligence or non-compliance with basic safe lifting rules. You can prevent a painful back injury if you first assume a squatting position. Keep the object close to your body and raise the object by straightening your legs. Get help when needed.

1. Be sure your footing is secure and level.

2. Keep your body erect. **Always lift with your legs** and not your back.
3. Assess the weight before lifting. If the object is too heavy, get help. To avoid the load on one person, pick up or lay down the object on a given signal.
4. Take advantage of skids, hoist, bars, jacks, blocking, rollers or hand trucks when moving heavy material.
5. Never pick up or put down an object while in a twisted position.
6. Never place yourself under a heavy object when it is being lifted.
7. Use the same lifting procedures for lightweight objects as you would for heavy weight.

Failure to follow these basic standards may result in needless injury.

10.6 Fall Protection

Purpose

Green River Energy Resources is committed to providing its employees with a safe, hazard free, work environment. It is the responsibility of every GRER employee to contribute to the overall safety of each project and communicate potential hazards as they arise. The purpose of this HSE standard is to ensure all GRER personnel are equipped with the knowledge and skills required to identify and safely operate in conditions where fall protection may be necessary. While typical operations for GRER are not conducted with equipment, or in areas, where fall protection is required; we believe that it is important to educate our employees on these procedures to ensure they are prepared for any situation they may encounter.

Training

Training will be provided to all employees on recognizing and eliminating fall hazards. In the event that fall protection equipment is required, additional training on the proper use and maintenance of equipment will also be provided. Training will consist of both classroom and hands on content. This training we be updated annually and documented.

Types of Fall Hazards

During normal drill or survey operations work tasks involving climbing or stepping off the ground rarely occur. However, when operating in areas near cliffs and canyons, all personnel must be made aware of steep slopes or drop offs. Never place a drill or other equipment within 50 feet of a cliff edge.

In the event that maintenance is needed on or near the top of the drill mast, use the three point contact method when climbing and have a helper spot you. Do not climb higher than 4 feet above the ground. If a greater height is needed, use a ladder that meets ANSI standards and follow the Ladder Safety HSE Standard.

If it is deemed necessary for an employee to work at a height greater than 6 feet above ground for any reason, fall protection equipment will be provided at no expense to the employee. Fall protection equipment will meet ANSI, ASTM or OSHA standards as applicable. A site specific plan or JSA must be complete before any work at height can begin. The plan must be reviewed and approved by the site supervisor or other qualified person.

Accident Investigation

In the event of a fall, near miss or other serious incident, a full accident investigation must be performed. Special attention will be given to causes of the fall and prevention of future incidents. If lack of training or insufficient training methods were a contributing factor in the incident, all work requiring fall protection will be suspended and all personnel will be retrained. Equipment quality and condition must also be addressed if fall protection equipment was used.

Fall Emergency

Any employee involved in a fall incident will be immediately evacuated from the field and assessed for injuries. If the fall takes place on or near a cliff or canyon edge, prompt rescue efforts will begin as per the project Emergency Response Plan. All other work activities within the project boundary will be suspended until rescue personnel are clear of the area and remaining field personnel can safely resume normal operations.

10.7Welding, Burning & Cutting

Purpose

Welding, burning, cutting, hot tapping and other types of hot work are strictly prohibited by unauthorized persons. The following sections discuss Welding, Burning, Cutting and Hot Tapping Practices and Procedures. Employees working in this area will be adequately trained before they are authorized to perform any of these duties. Training will also include proper fire extinguisher use. Strict adherence to GRER's Fire Safety HSE Standard must be observed. A hot work permit must be reviewed and approved by senior management before any hot work activity can be performed.

General Safe Practices

Welding and cutting should be kept to a minimum and extra safety precautions should be taken when welding or cutting on any tank, pump, or line containing a flammable substance. In addition, a specific area should be designated as the welding area. A supervisor should approve this area and all welding and cutting should be restricted to this area. Fire extinguishers shall be readily available at all times.

Before welding or burning, equipment should be inspected for the following:

1. Welding leads should be completely insulated and in good condition.
2. Cutting tool hoses should be leak-free and equipped with proper fittings, gauges, regulators and flashback devices.
3. Oxygen and acetylene bottles should be secured in a safe place.

When welding or cutting do the following:

1. When welding or cutting is necessary in areas where fire hazards exist, one person should stand as a fire watch with a fire extinguisher. This person must be properly trained on fire extinguisher use and fire watch must continue for a minimum of 30 minutes after the hot work activity is complete.
2. Move welding and cutting to the safest practical area. If the object being welded or cut cannot easily be moved, the area must be cleared of all potential fire hazards.
3. Warn people in the area before striking an arc so they may avert their eyes to prevent flash burns.
4. Welding and cutting areas should be checked periodically for a combustible atmosphere.
5. All employees should wear eye and face protection. Depending on the nature of the work and the proximity of other welders, employees may also need to wear the following as appropriate: fire retardant clothing, hard hat, ear protection and respiratory protection. Special respiratory protection may be required when working on equipment that may result in expulsion of hazardous fumes, gas or dust. In this event, special procedures for the preparation of the work area may also be necessary.
6. Care should be taken to prevent sparks from starting fires. Guards may be used when necessary to contain heat, sparks and slag within the hot work area.
7. Gas cylinders require careful treatment. Unused gas cylinders should be removed from the welding and cutting area.
8. Acetylene regulators should be equipped with flame or flashback arrestors. Only authorized factory personnel can service or repair regulators.
9. Hoses should be kept out of doorways and away from other workers. If the hose is flattened, a flashback may occur.
10. If flammable gas is detected, welding or cutting operations should be shut down.
11. All welding operations should be performed according to authorized procedures. If hot work cannot be safely performed, activity will be suspended until conditions can be improved and hazards mitigated.
12. Hot metal should be marked with a sign or some other warning when welding is complete. This can be done verbally if there are only a few employees in the area.
13. Any damaged or defective equipment must be reported immediately and use of that equipment must be suspended until it can be repaired or replaced.

Acetylene (Gas) Welding and Cutting Tools

The following precautions should be taken with gas welding and cutting equipment:

1. Only qualified employees may use welding equipment.

2. Close cylinder valves when work is finished, the cylinder is moved, or the cylinder is empty.
3. Repair, replace, or clean, dirty or defective hoses. Do NOT repair or tamper with cylinders, valves, or regulators.
4. Do not interchange regulator or pressure gauges with other gas cylinders.
5. Keep cylinders in an upright position when in use.
6. Never try to transfer acetylene from one cylinder to another.
7. Never use cylinders as rollers or supports.
8. Never use a match to ignite a welding torch. Always use an approved igniter.
9. Never heat a cylinder to raise the pressure.
10. Acetylene cylinders should be stored in an upright and secure position, with the discharge valve closed and the protective valve cover screwed on.

Controlling Sparks and Heat

Control heat, sparks and slag when performing hot work:

1. Cover cracks, holes and openings with fire retardant material. Take precautions to protect people and equipment in the work site.
2. Check both sides of a partition before welding on it. Remove any combustibles.
3. When working in confined spaces, place all cylinders and welding machines outside.
4. Do not open equipment, piping, or containers with flammable materials adjacent to a welding area.
5. Weld upwind of potential vapor releases.

Electric Welding and Cutting Tools

The following precautions should be taken with electric welding and cutting equipment:

1. Store arc welding tools in areas free from combustible vapors.
2. Hood or screen arcs.
3. Wear eye protection.
4. Ground the frames or cases of arc welding equipment.
5. Keep welding cables away from passageways to prevent trips and falls.
6. Replace welding cable with damaged insulation or exposed conductors.
7. Avoid contact with grounded circuits when changing electrodes.