Task 1.3.2. Environmental, Safety and Health Plan

The Utah FORGE Project will take into consideration environmental, safety and health (ES&H) issues during all aspects of our work. We consider protecting the environment, identifying risks and hazards, preventing accidents and exposures to all individuals at our work sites, and protecting the atmosphere, lands, and groundwater from contamination to be of paramount importance. To facilitate this protection, we have developed the following ES&H plans.

- Accident Reporting and Investigation Plan with accompanying Industrial Accident Investigation Report form.
- Bloodborne Pathogens Plan.
- Confined Spade Entry Permit Required Plan.
- Emergency Action Plan.
- First Aid Program Plan.
- Gases, Vapors, Fumes, Dust, and Mists (H2S) Plan.
- Hazard Assessment Plan.
- Hazard Communication Plan.
- Hazardous Waste Contingency Plan.
- Personal Protective Equipment Plan.
- Respiratory Protection Plan.
- Signs and Tags Compliance Program Plan.
- Visitor Safety Plan.

These ES&H plans (see below) are designed to provide clear and actionable protocols to ensure the maximum safety and environmental compliance for all stakeholders (employees, team members, and visitors) at all Utah FORGE Project sites. These ES&H plans are also designed to provide the Utah FORGE Project team leadership with the tools to anticipate and identify risks and hazards and provide for clear and detailed communication of the hazards and mitigation plans to all stakeholders. Other ES&H plans may be developed in the future as the Utah FORGE Project moves forward and facilities are sited and constructed.

The above listed ES&H plans were developed using guidelines from the following agencies and/or reference material.

- American National Standards Institute (ANSI)
- Bureau of Land Management (BLM)
- 2012 Emergency Response Guidebook (ERG)
- Environmental Protection Act (EPA) regulation
- J. J. Keller Online Service
- National EMS Education & Practice Blueprint
- National Institute for Occupational Safety and Health (NIOSH)
- Occupation Safety and Health Act (OSHA) 29 CFR 1910 and 1926
- Utah Administrative Rules R614, R655 and R307
- Utah Division of Environmental Quality
- Utah Occupational Safety and Health (UOSH) regulation
- Utah State Engineer

The Utah FORGE Project will continually strive for compliance to regulation and internal policy by inculcating our highest regard for personal safety and health protection as well as environmental compliance and stewardship. This philosophy will be an integral part of all operations including planning, procurement, contracting, site development, research, administration, site tours, and transportation. All components of the FORGE Project will center around the need for commitment, compliance, engagement, involvement, and communication as outlined below.

- **Commitment**

The Utah FORGE Project will, at all times and at every level of management, make every attempt to provide and maintain a safe and healthful working environment for all employees, team members, visitors, and researchers while establishing and maintaining the highest regard for environmental awareness and protection. All ES&H protection programs are aimed at protecting the environment, and preventing accidents and exposures to harmful atmospheric contaminants.

- **Compliance**

The Utah FORGE Project will continually strive to inculcate our highest regard for personal safety and health protection as well as environmental compliance and stewardship. This philosophy will be an integral part of all operations including planning, procurement, contracting, site development, research, administration, site tours, and transportation.

- **Engagement**

Each level of management at all companies and entities involved in this project must reflect a strong interest in ES&H compliance. They and must set a good example by complying with their company rules for ES&H protection as well as all rules set forth by the Utah FORGE project. Management interest must be vocal, visible, and continuous from top management to departmental supervisors to employees, team members, and visitors. Management must be proactive in identifying and mitigation hazards.

- **Involvement**

All employees, team members, researchers, and visitors are expected to take active interest in the ES&H program, participate in program activities, and abide by the rules and regulations set forth by the federal government, State of Utah, their respective employers, and those established by the Utah FORGE Project.

- **Communication**

The Utah FORGE Project will communicate its policies and expectations to those companies, employees, team members, and expected visitors that they may have a complete understanding of our environmental policy, safety rules, and hazards. Through our dedication to training, it is our intent that all individuals may have a clear vision of our intent

to hold environmental respect and compliance, and the restless pursuit of safety, health, and welfare as first priority for all stakeholders, governmental entities, private companies, and individuals.

Each level of management at all companies and entities involved in this project must reflect a strong engagement with ES&H compliance. They and must set a good example by complying with their company rules for EH&S protection as well as all rules set forth by the Utah FORGE project. Management engagement must be vocal, visible, and continuous from top management to departmental supervisors to employees, team members, and visitors. The training requirements set forth and necessitated by the individual plans will be administered by competent trainers as part of employee orientation, visitor awareness, and contract awards. This very important element, training, can be best optimized by the continual engagement of all management to see that ES&H compliance is the most important part of our operation. It is also incumbent upon management to be vigilant in identifying risks and hazards and communicating those risks and hazards, along with the mitigation efforts, to all entities involved in the project. This can be accomplished by a sound hazard assessment and hazard communication programs as well as effective posting of signs and tags.

All employees, team members, researchers, and visitors are expected to be involved in, and dedicated to, the ES&H programs, participate in program activities, and abide by the rules and regulations set forth by the federal government, State of Utah, their respective organization/company, and those established by the Utah FORGE Project. This involvement required by all, is that of taking the safety training and orientation seriously and providing feedback to allow for continual improvement of the programs. The success of the EH&S program will require buy-in and cooperation of all individuals regardless of affiliation.

The Utah FORGE Project will communicate its policies and expectations to those companies, employees, team members, and expected visitors that they may have a complete understanding of our environmental policy, safety rules, and hazards. Through our dedication to training and communication, it is our intent that all individuals may have a clear vision of our intent to hold environmental respect and compliance, the restless pursuit of safety, health and welfare as first priority for all stakeholders, governmental entities, private companies, and individuals. It is our intent that all contract (and sub-contract) awards will be contingent upon the successful companies' ability to provide evidence of a safe work history (OSHA 300 log), strong development and adherence to their internal EH&S plans, and a unwavering commitment to abide by all safety regulations and polices found in the Utah Forge Project EH&S plans as well as OSHA, EPA, BLM, DOT, Utah Occupational Safety and Health (UOSH), and Utah State Engineer's statutes and orders.

In summary, the EH&S plans at the Utah FORGE project will be our standard for excellence in safety and accident prevention and environmental respect and compliance. It is contingent upon the leadership the Utah FORGE Project to recognize this as our most important responsibility.

APPENDIX 1.3.2

Accident Reporting and Investigation Plan

University of Utah - Energy & Geoscience Institute

Utah FORGE Project – Milford, Utah

Completed by: Garth Larsen
Completed Date: 11/02/2015

Accident Reporting and Investigation Plan

Purpose

This Accident Reporting and Investigation Plan prescribes methods and practices for reporting and investigating accidents. No matter how conscientious the safety effort at a company, accidents happen occasionally due to human or system error. Therefore, this written plan is intended to provide a means to deal with all workplace accidents in a standardized way and demonstrate our company's compliance with the reporting requirements of 29 CFR 1904. In addition, it is the policy of the company to comply with all workers' compensation laws and regulations.

Administrative Duties

Garth Larsen, Safety Manager, is responsible for developing and maintaining this written Accident Reporting and Investigation Plan. This person is solely responsible for all facets of the plan and has full authority to make necessary decisions to ensure the success of this plan. Garth Larsen, Safety Manager, is also qualified, by appropriate training and experience that is commensurate with the complexity of the plan, to administer or oversee our Accident Reporting and Investigation Plan and conduct investigations.

This written Accident Reporting and Investigation Plan is kept at the following location: Energy & Geoscience Institute (EGI) Bldg. at the University of Utah. The location is in the EGI bldg. at 423 Wakara Way Suite #300, Salt Lake City, UT 84108. Employees, team members and visitors can obtain the plan by EGI bldg. at 423 Wakara Way Suite #300, Salt Lake City, UT 84108.

Accident Reporting Procedures

Our accident reporting procedures include the following:

All accidents and near misses are to be reported to Garth Larsen, Safety Manager, immediately (if possible). The attached Industrial Accident Investigation Report form will be completed by the Safety Manager and/or Supervisor of the injured/near miss employee.

Accident Investigation Procedures

A thorough accident investigation will help the FORGE Project team determine why accidents occur, where they happen, and any accident trends that might be developing. Such identification is critical to preventing and controlling hazards and potential accidents. For all accident investigations, Garth Larsen, Safety Manager, will perform the following duties:

- collect all pertinent data, interview all witnesses, ensure the accident report is filled out correctly, and notify the FORGE Project PI, Joe Moore.
- complete and submit OSHA form 301 will completed for any work related fatalities, disabling or serious injuries and any occupational disease incident and submitted within seven days, and
- notify the Utah Labor Commission must be notified within eight hours of a fatal or serious injury at phone contact number (801) 530-6901.

Recordkeeping

Garth Larsen, Safety Manager, is responsible for maintaining the following accident record keeping:

- report all accidents and near misses to the Safety Manager and FORGE Project team members, and
- store all related files at the Energy & Geoscience Institute Bldg. at the University of Utah at 423 Wakara Way Suite #300, Salt Lake City, UT 84108.

Annual Summary Posting

At the end of each calendar year, Garth Larsen performs the following steps:

- review, sign and post the OSHA 300 log, and
- prepare Recordable Incident log and summary complete with employment calculations.

Employee and Team member Involvement and Training

This plan is an internal document guiding the action and behaviors of employees. Annually Garth Larsen, Safety Manager, will explain the Accident Reporting and Investigation Plan to all employees. Employees and Team members will be instructed in how to report an injury or illness.

Employees and Team members and their representatives, will be provided limited access to our injury and illness records. Copies of relevant OSHA form 301 and Utah Industrial Accidents form 122 are provided to all employees, team members and representatives that request them.

The FORGE Project does not discriminate against employees for:

- reporting a work-related fatality, injury, or illness;
- filing a safety and health complaint;
- asking for access to occupational injury and illness records; or
- exercising any rights afforded by the Occupational Safety and Health Act.

Bloodborne Pathogens Plan

University of Utah - Energy & Geoscience Institute

Utah FORGE Project – Milford, Utah

Completed by: Garth Larsen
Completed Date: 11/02/2015

Exposure Control Plan (ECP) for Bloodborne Pathogens

Purpose

The University of Utah - Energy & Geoscience Institute (EGI) is committed to providing a safe and healthful work environment for our entire staff and team members. In pursuit of this endeavor, the following exposure control plan (ECP) is provided to eliminate or minimize occupational exposure to bloodborne pathogens in accordance with OSHA standard 29 CFR 1910.1030, "Occupational Exposure to Bloodborne Pathogens."

This ECP assists the FORGE project team in implementing and ensuring compliance with the OSHA standard, thereby protecting our employees and team members. This ECP includes:

- determination of employee exposure,
- implementation of various methods of exposure control, including:
    - universal precautions,
    - engineering and work practice controls,
    - personal protective equipment, and
    - housekeeping
- hepatitis B vaccination,
- post-exposure evaluation and follow-up,
- communication of hazards to employees and training,
- recordkeeping, and
- procedures for evaluating circumstances surrounding an exposure incident.

The methods of implementation of the standard are discussed in the subsequent pages of this ECP.

Administrative Duties

Garth Larsen, Safety Manager, is responsible for the implementation of the ECP. Garth Larsen, Safety Manager, will maintain, review, and update the ECP at least annually, and whenever necessary to include new or modified tasks and procedures. Contact location/phone number: Garth Larsen, Safety Manager, located at the Utah FORGE Project Office Bldg. Phone contact number 435-749-4015.

Those employees who are determined to have occupational exposure to blood or other potentially infectious materials (OPIM) must comply with the procedures and work practices outlined in this ECP.

Garth Larsen, Safety Manager, will maintain and provide all necessary personal protective equipment (PPE), engineering controls (e.g., sharps containers), labels, and red bags as required by the standard. Garth Larsen, Safety Manager, will ensure that adequate supplies of the aforementioned equipment are available in the appropriate sizes. Contact location/phone number: Garth Larsen, Safety Manager, located at the Utah FORGE Project Office Bldg., phone contact number is 435-749-4015.

Garth Larsen, Safety Manager, will be responsible for ensuring that all medical actions required are performed and that appropriate employee health and OSHA records are maintained. Contact location/phone number: Garth Larsen, Safety Manager, located at the Utah FORGE Project Office Bldg., phone contact number is 435-749-4015.

Garth Larsen, Safety Manager, will be responsible for training, documentation of training, and making the written ECP available to employees, OSHA, and NIOSH representatives. Contact location/phone number: Garth Larsen, Safety Manager, located at the Utah FORGE Project Office Bldg. Phone contact number 435-749-4015.

Employee Exposure Determination

The following is a list of all job classifications at our establishment in which all employees have occupational exposure, including employees, researchers, team members, and visitors. Part-time, temporary, contract, and per diem employees are covered by the standard. How the provisions of the standard will be met for these employees is described in this ECP, if applicable.

Methods of Implementation and Control

Universal Precautions

All employees will utilize universal precautions.

Exposure Control Plan

Employees and team members covered by the bloodborne pathogens standard will receive an explanation of this ECP during their initial training session. It will also be reviewed in their annual refresher training. All employees and team members may review this plan at any time during their work shifts by contacting Garth Larsen, Safety Manager. If requested, we will provide an employee with a copy of the ECP.

Garth Larsen, Safety Manager, is responsible for reviewing and updating the ECP annually or more frequently if necessary to reflect any new or modified tasks and procedures that affect occupational exposure and to reflect new or revised employee positions with occupational exposure.

The review and update of such plans must also:

- reflect changes in technology that eliminate or reduce exposure to bloodborne pathogens, and

- annually document consideration and implementation of appropriate commercially available and effective safer medical devices designed to eliminate or minimize occupational exposure.

Engineering and work practice controls will be used to prevent or minimize exposure to bloodborne pathogens. Sharps disposal containers are inspected and maintained or replaced by Garth Larsen, Safety Manager. The sharps containers will be inspected every week or whenever necessary to prevent overfilling.

Personal Protective Equipment (PPE)

PPE is provided to each of our employees at no cost. Training is provided by Garth Larsen, Safety Manager, in the use of the appropriate PPE for the tasks or procedures employees will perform.

The types of PPE available to employees are as follows: Nitrile gloves, eye protection, and face shields.

PPE is located at the Utah FORGE Project Office Bldg. and may be obtained through Garth Larsen, Safety Manager.

Each employee using PPE must check PPE for proper working condition, cleanliness and proper fit. all used PPE items will be doubled bagged and labeled with the contents, date, and disposal method.

Housekeeping

Regulated waste will be placed in containers that are closable, constructed to contain all contents and prevent leakage, appropriately labeled or color-coded (see Labels section), and closed prior to removal to prevent spillage or protrusion of contents during handling.

Contaminated sharps are discarded immediately or as soon as possible in containers that are closable, puncture-resistant, leak-proof on sides and bottoms, and labeled or color-coded appropriately. Sharps disposal containers are available at the Utah FORGE Project Office Bldg. and may be obtained from Garth Larsen, Safety Manager.

Bins and pails (e.g., wash or emesis basins) are cleaned and decontaminated as soon as feasible after visible contamination.

Broken glassware that may be contaminated is picked up using mechanical means, such as a brush and dust pan.

Laundry

Laundering will not be performed for contaminated articles as they will be disposed of as contaminated and potentially infectious material.

Labels

The following labeling method(s) is used in this facility:

Garth Larsen, Safety Manager, will ensure warning labels are affixed or red bags are used as required if regulated waste or contaminated equipment is brought into the facility. Employees are to notify Garth Larsen, Safety Manager, located at the Utah FORGE Project Office Bldg., phone contact number 435-749-4015, if they discover regulated waste containers, refrigerators containing blood or OPIM, contaminated equipment, etc., without proper labels.

Hepatitis B Vaccination

Garth Larsen, Safety Manager, will provide training to employees on hepatitis B vaccinations, addressing the safety, benefits, efficacy, methods of administration, and availability.

The hepatitis B vaccination series is available at no cost after training and within 10 days of initial assignment to employees identified in the exposure determination section of this plan. Vaccination is encouraged unless:

- documentation exists that the employee has previously received the vaccination,
- antibody testing reveals that the employee is immune, or
- medical evaluation shows that vaccination is contraindicated.

However, if an employee chooses to decline vaccination, the employee must sign a declination form. Employees who decline may request and obtain the vaccination at a later date at no cost. Documentation of refusal of the vaccination is kept at the Utah FORGE Project Office Bldg.

Vaccination will be provided by the Milford Memorial Hospital, 850 N. Main, Milford, Utah 84751 at the Milford Memorial Hospital.

Following hepatitis B vaccinations, the health care professional's Written Opinion will be limited to whether the employee requires the hepatitis vaccine, and whether the vaccine was administered.

Post-exposure Evaluation and Follow-Up

Should an exposure incident occur, contact Garth Larsen, Safety Manager, located at the Utah FORGE Project Office Bldg., phone contact number 435-749-4015.

A medical evaluation and follow-up will be conducted immediately by the Milford Memorial Hospital, 850 N. Main Milford, Utah. Following the initial first aid, cleaning the wound and flushing eyes or other mucous membranes will be performed.

Administration of Post-Exposure Evaluation and Follow-up

If it is determined that revisions need to be made, Garth Larsen, Safety Manager, will ensure that appropriate changes are made to this ECP.

Employee Training

Each employee who has occupational exposure to bloodborne pathogens receives training conducted by Garth Larsen, Safety Manager, located at the Utah FORGE Project Office Bldg., phone contact number 435-749-4015.

Each employee who has occupational exposure to bloodborne pathogens will receive training on the epidemiology, symptoms, and transmission of bloodborne pathogen diseases.

Training materials for this facility are available at the Utah FORGE Project Office Bldg.

Recordkeeping

Training Records

Training records are completed for each employee upon completion of training. These documents will be kept for at least three years at the Utah FORGE Project Office Bldg.

The training records include: training materials and documentation, attendance roll, and tests.

Employee training records are provided upon request to the employee or the employee's authorized representative within 15 working days. Such requests should be addressed to Garth Larsen, Safety Manager, located at the Utah FORGE Project Office Bldg. Phone contact number 435-749-4015..

Medical Records

Medical records are maintained for each employee with occupational exposure in accordance with 29 CFR 1910.1020, "Access to Employee Exposure and Medical Records."

Garth Larsen, Safety Manager, is responsible for maintenance of the required medical records. These confidential records are kept at for at least the duration of employment plus 30 years.

Employee medical records are provided upon request of the employee or to anyone having written consent of the employee within 15 working days. Such requests should be sent to Garth Larsen, Safety Manager, located at the Utah FORGE Project Office Bldg., phone contact number 435-749-4015.

OSHA Recordkeeping

An exposure incident is evaluated to determine if the case meets OSHA's Recordkeeping Requirements (29 CFR 1904). This determination and the recording activities are done by Garth Larsen, Safety Manager.

Hepatitis B Vaccine Declination (Mandatory)

I understand that due to my occupational exposure to blood or other potentially infectious materials I may be at risk of acquiring hepatitis B virus (HBV) infection. I have been given the opportunity to be vaccinated with hepatitis B vaccine, at no charge to myself. However, I decline hepatitis B vaccination at this time. I understand that by declining this vaccine, I continue to be at risk of acquiring hepatitis B, a serious disease. If in the future I continue to have occupational exposure to blood or other potentially infectious materials and I want to be vaccinated with hepatitis B vaccine, I can receive the vaccination series at no charge to me.

Signed: _____ *(employee/team member signature)*

Date: _____

Confined Space Entry (Permit-Required) Plan

University of Utah - Energy & Geoscience Institute

Utah FORGE Project – Milford, Utah

Completed by: Garth Larsen
Completed Date: 11/03/2015

Permit-Required Confined Space Entry Program

General Policy

The purpose of this program is to inform interested persons, including employees, team members, and visitors that the University of Utah - Energy & Geoscience Institute is complying with the OSHA Confined Space Standard, Title 29 Code of Federal Regulations 1910.146. If permit-required confined spaces are identified, we have developed and will implement a permit-required confined space entry program. This program applies to all work and research conducted by the University of Utah - Energy & Geoscience Institute (EGI) at the Utah FORGE Project where employees, team members, and visitors will be conducting work and research and may have need to enter a permit-required confined space as part of their job duties.

Garth Larsen has overall responsibility for coordinating safety and health programs in this company. Joe Moore, the Utah FORGE Project PI, is the person having overall responsibility for the Permit-Required Confined Space Program. Joe Moore will review and update the program, as necessary.

Copies of the written program may be obtained from Joe Moore, Utah FORGE Project PI at the EGI bldg. at the University of Utah on 423 Wakara Way Suite #300, Salt Lake City, UT 84108.

Under this program, we will identify permit-required spaces at the Utah FORGE Project and provide training for our employees and team members regarding to their responsibilities in the permit space. These employees and team members will receive instructions for safe entry into our specific types of confined spaces, including testing and monitoring, appropriate personal protective equipment, rescue procedures, and attendant responsibilities.

This program is designed to ensure that safe work practices are utilized during all activities regarding the permit space to prevent personal injuries and illnesses that could occur.

Confined space means a space that:

- is large enough and so configured that an employee can bodily enter and perform assigned work, and
- has limited or restricted means for entry or exit (for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits.), and
- is not designed for continuous employee occupancy.

Hazard Evaluation for Permit Spaces

To determine if there are permit-required confined spaces at the Utah FORGE Project, Joe Moore and Garth Larsen, will conduct a hazard evaluation of the site. This evaluation will provide employees and team members with the information necessary to identify the existence and location of permit-required confined spaces at the Utah FORGE Project site that must be covered by the Permit-Required Confined Space Entry Program. This written hazard evaluation is kept in EGI bldg. at the University of Utah on 423 Wakara Way Suite #300, Salt Lake City, UT 84108.

Preventing Unauthorized Entry

To provide a safe work environment and to prevent employees and team members from accidentally entering a permit space, we will implement the following procedures to inform all employees of the existence, location, and danger posed by permit spaces at the Utah FORGE Project. To inform employees, team members, and visitors of the existence of a permit space, we will use signs reading "Caution-Confined Space-Do not enter" to ensure that unauthorized employee, team members and visitors do not enter and work in permit spaces.

Safe Permit Space Entry Procedures

Garth Larsen, Safety Manager, is the Entry Supervisor responsible for authorizing entry and issuing entry permits for work in our permit spaces. The file of permits and related documents are kept in files located at the Utah FORGE Project Office Bldg. The procedures we follow for preparing, issuing, and canceling entry permits includes the following elements.

(1) Identify the confined space and its boundaries.
(2) Identify and record all real and potential hazards.
(3) Identify and list entrance supervisor.
(4) Identify and list authorized entrants.
(5) Complete Confined Space entry permit.
(6) Review the Confined Space permit contents with all entrants.
(7) Conduct pre-job safety tailboard meeting and collect signatures.
(8) Test any and all issues regarding safe atmosphere and perform work.
(9) Conduct de-brief meeting with entrant team.
(10) Cancel the entry permit and initiate the post-operations procedure.

Pre-Entry Evaluation

To ensure the safety and health of our employees, team members, and visitors before allowing authorized workers to enter a permit space, we evaluate conditions in that space to determine if the conditions are safe for entry. Any employee, team member, or visitor who enters the space, has the opportunity to observe the pre-entry evaluation and any subsequent testing. The authorized entrant also has the option of requesting a reevaluation of the space if they feel that the evaluation was not adequate.

Alternate Entry Evaluation

The Utah FORGE Project will follow the procedures to evaluate each permit space before entry according to 1910.146(c)(5)(ii)(C). This includes testing the internal atmosphere with a calibrated direct-reading instrument for oxygen content, flammable gases and vapors, and potential toxic air contaminants. We will also periodically test the atmosphere of the space to ensure that the continuous ventilation is preventing the accumulation of a hazardous atmosphere.

Certification

Alternate Entry Procedure Certification

According to 1910.146(c)(5)(ii)(H), the Utah FORGE Project will verify that the space is safe for entry and that the pre-entry measures required by 1910.146(c)(5)(ii) have been taken, through a written certification that contains the date, location of the space, and signature of the person providing the certification. At the Utah FORGE Project, Garth Larsen, Safety Manager, is responsible for verifying these procedures. The certification is made before entry by any employee, team member, and/or visitor.

Reclassification as Non-permit Space Certification

According to 1910.146(c)(7)(iii), the Utah FORGE Project will document the basis for determining that all hazards in a permit space have been eliminated, through a certification that contains the date, location of the space, and signature of the person making the determination. Garth Larsen, Safety Manager, is responsible for documenting this information. The certification is available to each employee, team member, and visitors entering the space.

Equipment

To ensure the safety and health of our employees, team member, and visitors the Utah FORGE Project will provide the appropriate equipment to all employees, team members, and visitors who work in or near our permit spaces. According to 1910.146(k)(3)(i), each authorized entrant will use a chest or full body harness, with a retrieval line attached at the center of the entrant's back near shoulder level, above the entrant's head, or at another point which the Utah FORGE Project can establish as adequate. Wristlets may be used instead of the chest or full body harness if the Utah FORGE Project can demonstrate that the use of a chest or full body harness is infeasible or creates a greater hazard and that the use of wristlets is the safest and most effective alternative.

The Utah FORGE Project will provide the following additional equipment to all employees who work in or near our permit spaces: air monitors, respirators, tag lines, coveralls, harness, wristlets and gloves.

The Utah FORGE Project will maintain all equipment in excellent working condition, train the entrants in the correct usage of this equipment, and ensure that all equipment, including that used for personal protection, is used properly.

The Utah FORGE Project will follow these procedures to ensure that the appropriate equipment is being used by entrants. All equipment used will be compared to the list of identified hazards.

Duties: Authorized Entrants

Those persons who have completed the training and are authorized to enter our permit spaces (authorized entrants) are assigned specific duties and responsibilities that they must perform when they work in the permit space. Their duties and responsibilities include: The authorized entrant is an employee, or team member who is authorized by the Utah FORGE Project to enter a permit space. 29 CFR 1910.146(h) contains the following minimum duties of authorized entrants.

The employer shall ensure that all authorized entrants:

(1) know the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of exposure,

(2) properly use equipment as required by paragraph (d)(4) of this section,

(3) communicate with the attendant as necessary to enable the attendant to monitor entrant status and to enable the attendant to alert entrants of the need to evacuate the space as required by paragraph (i)(6) of this section,

(4) alert the attendant whenever:

(i) the entrant recognizes any warning sign or symptom of exposure to a dangerous situation, or

(ii) the entrant detects a prohibited condition, and

(5) exit from the permit space as quickly as possible whenever:

(i) an order to evacuate is given by the attendant or the entry supervisor,

(ii) the entrant recognizes any warning sign or symptom of exposure to a dangerous situation,

(iii) the entrant detects a prohibited condition, or

(iv) an evacuation alarm is activated.

Training: Authorized Entrants

The elements covered in the training program for authorized entrants include: according to 29 CFR 1910.146(g)(1), the Utah FORGE Project must provide training so that all employees and team members whose work is regulated by this rule acquire the understanding, knowledge, and skills necessary for the safe performance of the duties assigned under this rule. In other words you must train authorized entrants so that they have an understanding, knowledge, and the skills necessary to safely perform their duties including:

(1) knowing the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of exposure,

(2) properly using equipment as required by paragraph (d)(4) of this section,

(3) communicating with the attendant as necessary to enable the attendant to monitor entrant status and to enable the attendant to alert entrants of the need to evacuate the space as required by paragraph (i)(6) of this section,

(4) alerting the attendant whenever:

(i) the entrant recognizes any warning sign or symptom of exposure to a dangerous situation, or

(ii) the entrant detects a prohibited condition, and

(5) exiting from the permit space as quickly as possible whenever:

(i) an order to evacuate is given by the attendant or the entry supervisor,

(ii) the entrant recognizes any warning sign or symptom of exposure to a dangerous situation,

(iii) the entrant detects a prohibited condition, or

(iv) an evacuation alarm is activated.

Duties: Attendants

Those persons who have completed the training and have been designated as permit space attendants are assigned specific duties and responsibilities that they must perform in permit space job duties.

Their duties and responsibilities include: the attendant is an individual stationed outside one or more permit spaces who monitors the authorized entrants and who performs all attendant's assigned duties. 29 CFR 1910.146(i) contains the minimum duties of attendants. Here are the contents of that regulation.

The employer shall ensure that each attendant:

(1) knows the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure,

(2) is aware of possible behavioral effects of hazard exposure in authorized entrants,

(3) continuously maintains an accurate count of authorized entrants in the permit space and ensures that the means used to identify authorized entrants under paragraph (f)(4) of this section accurately identifies who is in the permit space,

(4) remains outside the permit space during entry operations until relieved by another attendant (NOTE: When the employer's permit entry program allows attendant entry for rescue, attendants may enter a permit space to attempt a rescue if they have been trained and equipped for rescue operations as required by paragraph (k)(1) of this section and if they have been relieved as required by paragraph (i)(4) of this section.),

(5) communicates with authorized entrants as necessary to monitor entrant status and to alert entrants of the need to evacuate the space under paragraph (i)(6) of this section,

(6) monitors activities inside and outside the space to determine if it is safe for entrants to remain in the space and orders the authorized entrants to evacuate the permit space immediately under any of the following conditions:

(i) if the attendant detects a prohibited condition,

(ii) if the attendant detects the behavioral effects of hazard exposure in an authorized entrant;

(iii) If the attendant detects a situation outside the space that could endanger the authorized entrants, or

(iv) if the attendant cannot effectively and safely perform all the duties required under paragraph (i) of this section,

(7) summon rescue and other emergency services as soon as the attendant determines that authorized entrants may need assistance to escape from permit space hazards,

(8) takes the following actions when unauthorized persons approach or enter a permit space while entry is underway:

(i) warn the unauthorized persons that they must stay away from the permit space,

(ii) advise the unauthorized persons that they must exit immediately if they have entered the permit space, and

(iii) inform the authorized entrants and the entry supervisor if unauthorized persons have entered the permit space,

(9) performs non-entry rescues as specified by the employer's rescue procedure, and

(10) performs no duties that might interfere with the attendant's primary duty to monitor and protect the authorized entrants.

The elements covered in the training program for permit space attendants include: according to 29 CFR 1910.146(g)(1), your company must provide training so that all employees whose work is regulated by this rule acquire the understanding, knowledge, and skills necessary for the safe performance of the duties assigned under this rule. You must train attendants so that they have an understanding, knowledge, and the skills necessary to safely perform their duties including:

(1) knowing the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure,

(2) being aware of possible behavioral effects of hazard exposure in authorized entrants,

(3) continuously maintaining an accurate count of authorized entrants in the permit space and ensuring that the means used to identify authorized entrants under paragraph (f)(4) of this section accurately identifies who is in the permit space,

(4) remaining outside the permit space during entry operations until relieved by another attendant (NOTE: When the employer's permit entry program allows attendant entry for rescue, attendants may enter a permit space to attempt a rescue if they have been trained and equipped for rescue operations as required by paragraph (k)(1) of this section and if they have been relieved as required by paragraph (i)(4) of this section.),

(5) communicating with authorized entrants as necessary to monitor entrant status and to alert entrants of the need to evacuate the space under paragraph (i)(6) of this section,

(6) monitoring activities inside and outside the space to determine if it is safe for entrants to remain in the space and orders the authorized entrants to evacuate the permit space immediately under any of the following conditions,

> (i) if the attendant detects a prohibited condition,
>
> (ii) if the attendant detects the behavioral effects of hazard exposure in an authorized entrant,
>
> (iii) if the attendant detects a situation outside the space that could endanger the authorized entrants, or
>
> (iv) if the attendant cannot effectively and safely perform all the duties required under paragraph (i) of this section,

(7) summoning rescue and other emergency services as soon as the attendant determines that authorized entrants may need assistance to escape from permit space hazards,

(8) taking the following actions when unauthorized persons approach or enter a permit space while entry is underway:

> (i) warn the unauthorized persons that they must stay away from the permit space,
>
> (ii) advise the unauthorized persons that they must exit immediately if they have entered the permit space, and
>
> (iii) inform the authorized entrants and the entry supervisor if unauthorized persons have entered the permit space,

(9) performing non-entry rescues as specified by the employer's rescue procedure, and

(10) performing no duties that might interfere with the attendant's primary duty to monitor and protect the authorized entrants.

Duties: Entry Supervisors

Those persons who have completed the training and have been designated as permit space entry supervisors are assigned specific duties and responsibilities that they must perform in permit space job duties. Their duties and responsibilities include: an entry supervisor is the person (such as the employer, team member, foreman, or crew chief) responsible for determining if acceptable entry conditions are present at a permit space where entry is planned, for authorizing entry and overseeing entry operations, and for terminating entry as required by 29 CFR 1910.146. 29 CFR 1910.146(j) contains the minimum duties of entry supervisors. Here are the contents of that regulation.

The employer shall ensure that each entry supervisor:

(1) knows the hazards that may be faced during entry, including information on the mode, signs or symptoms, and consequences of the exposure,

(2) verifies, by checking that the appropriate entries have been made on the permit, that all tests specified by the permit have been conducted and that all procedures and equipment specified by the permit are in place before endorsing the permit and allowing entry to begin,

(3) terminates the entry and cancels the permit as required by paragraph (e)(5) of this section,

(4) verifies that rescue services are available and that the means for summoning them are operable,

(5) removes unauthorized individuals who enter or who attempt to enter the permit space during entry operations, and

(6) determines, whenever responsibility for a permit space entry operation is transferred and at intervals dictated by the hazards and operations performed within the space, that entry operations remain consistent with terms of the entry permit and that acceptable entry conditions are maintained.

Training: Entry Supervisors

The elements covered in the training program for permit space entry supervisors include: an entry supervisor is the person (such as the employer, foreman, or crew chief) responsible for determining if acceptable entry conditions are present at a permit space where entry is planned, for authorizing entry and overseeing entry operations, and for terminating entry as required by 29 CFR 1910.146. 29 CFR 1910.146(j) contains the minimum duties of entry supervisors. Here are the contents of that regulation.

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(4) verifies that rescue services are available and that the means for summoning them are operable,

(5) removes unauthorized individuals who enter or who attempt to enter the permit space during entry operations, and

(6) determines, whenever responsibility for a permit space entry operation is transferred and at intervals dictated by the hazards and operations performed within the space, that entry operations remain consistent with terms of the entry permit and that acceptable entry conditions are maintained.

Training Program

Every employee and team member at the Utah FORGE Project who faces the risk of confined space entry will be provided with training so that each designated employee acquires the understanding, knowledge, and skills necessary for the safe performance of the duties assigned to them. Garth Larsen, Safety Manager, will conduct permit-required confined space training. All training related materials, documents, and signed certificates are kept in files located at the Utah FORGE Project Office Bldg.

Upon successful completion of the Utah FORGE Project permit-required confined space training program, each participant receives a certificate which they will sign verifying that they understand the material presented, and that they will follow all company policies and procedures regarding permit space entry. Refresher training will be completed for all employees and team members on an annual basis.

Rescue and Emergency Services

University of Utah - Energy & Geoscience Institute utilizes Smokin' Fire Productions, 5244 W Shaggy Peak Drive, Riverton, Utah. The contact person is Mike White, telephone number 801-647-0851 to perform rescue and emergency services in the event of a permit space incident. To familiarize this service with our facility and emergency needs, we will provide Smokin' Fire Productions access to all permit spaces from which rescue may be necessary so the rescue team can develop appropriate rescue plans and practice rescue operations. We will also inform the rescue team of the hazards they may confront when called on to perform rescue at the site.

Multiple Employer Entry Procedures

When outside employers/contractors enter the Utah FORGE Project site to perform work in permit spaces, we will coordinate entry and work operations. We will also coordinate entry operations when employees of more than one employer are working simultaneously as authorized entrants in a permit space. This will ensure that employees of one employer do not endanger the employees of any other employer. According to 29 CFR 1910.146(c)(8), when an employer (host employer) arranges to have employees of another employer (contractor) perform work that involves permit space entry, the host employer shall:

- inform the contractor that the workplace contains permit spaces and that permit space entry is allowed only through compliance with a permit space program meeting the requirements of this section,
- apprise the contractor of the elements, including the hazards identified and the host employer's experience with the space, that make the space in question a permit space,

- apprise the contractor of any precautions or procedures that the host employer has implemented for the protection of employees in or near permit spaces where contractor personnel will be working,
- coordinate entry operations with the contractor, when both host employer personnel and contractor personnel will be working in or near permit spaces, as required by paragraph (d)(11) of this section, and
- debrief the contractor at the conclusion of the entry operations regarding the permit space program followed and regarding any hazards confronted or created in permit spaces during entry operations.

In addition to complying with the permit space requirements that apply to all employers, each contractor who is retained to perform permit space entry operations shall:

- obtain any available information regarding permit space hazards and entry operations from the host employer,
- coordinate entry operations with the host employer, when both host employer personnel and contractor personnel will be working in or near permit spaces, as required by paragraph (d)(11) of this section, and
- inform the host employer of the permit space program that the contractor will follow and of any hazards confronted or created in permit spaces, either through a debriefing or during the entry operation.

In order to coordinate operations before the contractor's and/or FORGE employees begin work involving permit space entry a pre-entrance meeting will be held with the entry supervisors of all involved employers as well as with the Utah FORGE Project Safety Manager. In this meeting, all entry procedures and issues will be agreed upon and written into the permit.

Post-operations Procedures

Upon completion of work in a permit space, we follow these procedures to close off the space and cancel the permit: According to 29 CFR 1910.146(d)(12), the Utah FORGE Project willdevelop and implement procedures (such as closing off a permit space and canceling the permit) necessary for concluding the entry after entry operations have been completed. The duration of the permit may not exceed the time required to complete the assigned task or job identified on the permit in accordance with 29 CFR 1910.146(f)(2). Paragraph (f)(2) requires the employer to identify the purpose of the entry. In summary, the duration of the permit can only be for the time required to accomplish the task for which the permit was issued. A combination inspection/repair permit could be issued IF AND ONLY when all the potential hazards of ALL the anticipated repair activities are evaluated and addressed on the permit and during the entry procedures.

Review-Procedures

To ensure that all employees, team members, and visitors participating in entry operations are protected from permit space hazards, the Utah FORGE Project reviews the Permit-Required Confined Space Entry Program on a regular basis. We use the retained canceled permits from the past 12 months and revise the program as necessary. The Utah FORGE Project will perform a single annual review covering all entries performed during a 12-month period. If no entry is performed during a 12-month period, no review will be performed.

Emergency Action Plan

University of Utah - Energy & Geoscience Institute

Utah FORGE Project – Milford, Utah

Completed by: Garth Larsen
Completed Date: 11/06/2015

Emergency Action Plan

Purpose

The University of Utah - Energy & Geoscience Institute (EGI) is dedicated to the protection of its employees, team members, and visitors. This Emergency Action Plan (EAP) is in place to ensure employees, team members, and visitors' safety from emergencies during regular hours and after hours. It provides a written document detailing and organizing the actions and procedures to be followed by employees, team members, and visitors in case of a workplace emergency.

OSHA's Emergency Action Plan requirement, found at 29 CFR 1926.35, encourages the University of Utah - Energy & Geoscience Institute to have a written Emergency Action Plan (EAP). This EAP addresses emergencies that our company expects may reasonably occur at any of our project sites.

The EAP communicates to employees, team members, and visitors' policies and procedures to follow in emergencies. This written plan is available, upon request, to employees, their designated representatives, and any OSHA officials.

Administrative Duties

Joe Moore, Utah FORGE Project PI, (or designee) is the EAP administrator, who has overall responsibility for the plan. This responsibility includes the following:

- developing and maintaining a written Emergency Action Plan for regular and after hours work conditions,
- notifying the proper rescue and law enforcement authorities, land owners, and superintendent in the event of an emergency affecting the facility,
- taking security measures to protect employees, team members, and visitors,
- integrating the Emergency Action Plan with any existing general emergency plan covering the building or work area occupied,
- distributing procedures for reporting emergencies, the location of safe exits, and evacuation routes to each employee, team member, and visitor,
- conducting drills to acquaint employees, team members, and visitors with emergency procedures and to judge the effectiveness of the plan,
- training designated employees and team members in emergency response such as the use of fire extinguishers and the application of first aid,
- deciding which emergency response to initiate (for example, evacuate or not),
- ensuring that equipment is placed and locked in storage rooms or desks for protection,
- maintaining records and property as necessary, and
- ensuring the FORGE facility meets all local fire codes, building codes, and regulations.

Garth Larsen, Safety Manager, is responsible for reviewing and updating the plan as necessary. Copies of this plan may be obtained from Energy & Geoscience Institute (EGI) bldg. at the University of Utah on 423 Wakara Way Suite #300, Salt Lake City, Utah, and in the Utah FORGE Project Office bldg. Milford, Utah.

Joe Moore, Utah FORGE Project PI, has full authority to implement the EAP if he believes an emergency might threaten human health. The following potential emergencies might reasonably be expected at this facility and thus call for the implementation of this EAP:

- fires and explosions; hazardous releases (chemical or biological);
- radiological accidents,

- natural disasters such as flood, wild fire, earthquake, or blizzard,
- power outage; civil disturbance, or
- criminal/terrorist threats such as bomb threats, arson, robbery, shootings, or other violence.

External emergencies that may affect the FORGE project site includes train derailment, oil truck overturns, chemical truck overturns, fire and explosions at nearby facilities.

The following personnel can be contacted forfurther information about the written Emergency Action Plan and/or an explanation of duties under this plan:

Garth Larsen, Safety Manager

Key management personnel home telephone numbers are kept in a safe place at the Utah FORGE Project Office Bldg. Milford, Utah and the EGI bldg. at the University of Utah on 423 Wakara Way Suite #300, Salt Lake City, UT 84108, for immediate use in the event of an emergency. These telephone numbers include:

Key management member:	**Telephone number:**
Joe Moore	801-231-0393
Rick Allis	801-455-0600
Garth Larsen	435-749-4015

These telephone numbers of key management personnel will be distributed to the following persons to be retained in their homes for use in communicating an emergency occurring during non-work hours:

Name:	**Title:**
Joe Moore	Utah FORGE Project Managing PI
Rick Allis	Utah FORGE Project PI
Garth Larsen	Utah FORGE Project Safety Manager/Site Supervisor
Les Whitney	Beaver County Emergency Response Coordinator
Mike White	Smokin Fire Productions Owner

Alarms

Different emergencies call for different alarms to indicate what actions employees should take. The University of Utah - Energy & Geoscience Institute FORGE Project has established an employee alarm system. We have 10 or fewer employees, therefore we use direct two-way radio voice communication as our primary means for alarming employees, team members, and visitors of an emergency.

Because we use a communication system as an alarm system, all emergency messages have priority over all non-emergency messages.

We have posted the following emergency telephone numbers near telephones, or emergency notice boards, and other conspicuous locations for use when telephones serve as a means of reporting emergencies:

Emergency responder:	**Telephone number:**
911 -All emergencies	911

Les Whitney-Beaver County Emergency Response	435-691-2381

Emergency Reporting and Weather Monitoring Procedures

In the Event of an Emergency Requiring Evacuation

When employees detect an emergency that requires an evacuation, such as a fire or hazardous release, they should make an announcement on the site radio communication alarm system and call 911. The person making the radio announcement will make the 911 call immediately afterwards.

Our backup method for reporting emergencies that require evacuation includes cell phone contact and direct face-to-face communication.

Evacuation Procedures

Some emergencies require evacuation or escape procedures, while some require employees to stay indoors or in a safe area. Our emergency escape procedures are designed to respond to many potential emergencies, depending on the degree of seriousness. Nothing in these procedures precludes the Plan Administrator's authority in determining whether employees should remain inside or evacuate.

At the Utah FORGE site, the following types of emergency evacuations exist:

- in some cases where the emergency is grave, "total and immediate evacuation" of all employees is necessary,
- in other emergencies, a "partial evacuation" of nonessential employees with a delayed evacuation of others may be necessary for continued site operation or shut-down, and
- in still other cases, only those in the immediate area of an emergency may be expected to evacuate or move to a safe area such as when a localized fire breaks out but is extinguished before spreading.

Our emergency evacuation procedures and assignments are designed to respond to many potential emergencies that require them, including wild fires, earthquakes, chemical release and/or explosion, and fire from a train or truck, terrorist attack, or bomb threat.

Employees need to know what to do if they are alerted to a specific emergency. After an alarm is sounded to evacuate, employees should take the following steps: stabilize (if possible) the work site, cease work, and then proceed to the nearest available safe exit to leave the facility. Once evacuated to a safe area, the head-count must be communicated to the site supervisor at the primary evacuation site.

Once evacuated, employees are to head toward their designated exterior or safe area, where an additional head count will be performed, and further instructions given. Following is a list of exterior refuges/safe zones:

Departmental group:	Designated safe area:
Well site activities	Utah FORGE Project bldg. Milford, UT
Utah FORGE Project bldg.	West side of railroad tracks on Thermal Road.

Procedures to Account for Employees

Trained evacuation personnel will assist in safe and orderly evacuation for all types of emergencies that require evacuation. Once evacuation is complete, they will conduct head counts. The employees selected are trained in the complete workplace layout and the various alternative escape routes from the workplace. Before leaving, these employees will check rooms and other enclosed spaces in the workplace for employees who may be trapped or otherwise unable to evacuate the area. A list of trained personnel appears below:

Name/title:	Department:	Shift:
Garth Larsen, Safety Manager	Utah FORGE Project Milford, UT	Day

Others will be named and trained as the project moves to Phase II.

This list indicates a sufficient number of employees who have been designated by the company and trained to:

- direct and assist in safe and orderly emergency evacuation,
- provide guidance and instruction for all types of emergency situations,
- be aware of employees with special needs who may require extra assistance, and
- avoid hazardous areas during an emergency evacuation.

Every trained evacuation person is responsible for seeing to approximately 0-15 evacuated employees. The trained personnel also serve as a resource of information about emergency procedures and conduct head counts once evacuation is complete.

Frontline supervisors must be aware of the locations of those employees working on a particular day when an emergency occurs, as well as suppliers, customers, and other non-employees on the premises, and be aware of who is absent or otherwise away from the premises. Accounting for employees and non-employees will aid local responding fire/rescue departments in determining whether rescue efforts are necessary.

Once each evacuated group has reached their evacuation destinations, each trained evacuation employee:

- takes roll of his or her group,
- makes sure all persons are accounted for,
- reports in to a central checkpoint managed by Joe Moore, Utah FORGE Project PI, and
- assumes role of department contact to answer questions.

Other duties provided by the trained personnel during an emergency evacuation include the following: account for all on-site employees, team members and visitors, and issue a follow-up call to Les Whitney, Beaver County Emergency Response, and Joe Moore, Utah FORGE Project PI.

No employees are to return to the buildings until advised by Joe Moore, Utah FORGE Project PI or designee (after determination has been made that such re-entry is safe). If anyone is injured or contaminated, the Plan Administrator will activate rescue and first aid actions. If an emergency incident expands, the EAP Administrator may send employees home by normal means or provide them with transportation to an offsite location.

Plan Administrator Duties

During an emergency, Joe Moore, Utah FORGE Project PI, will do the following: collect information regarding head count, injuries and site conditions, and communicate with the site Safety Manager and/or Beaver County Emergency Response.

Rescue and First Aid

Professional emergency services responding in an emergency will help with and direct all rescue and medical duty assignments upon their arrival on site.

Training

Our Plan Administrator or Site Supervisor will review the Emergency Action Plan at the following times with each employee and team member covered by the plan:

- initially, when the plan is developed,
- when a new employee us hired,
- whenever the employee is assigned initially to a new job or position,
- whenever an employee's responsibilities or designated actions under the plan change,
- whenever new equipment, materials, or processes are introduced into the workplace,
- whenever the layout or design or the facility changes, and
- whenever the plan is changed.

We will communicate the contents of this plan through a briefing delivered by supervisors followed by a demonstration.

Emergency Equipment and Support

Our company provides the following equipment and support for use by our trained personnel during emergencies: two-way radios and fire extinguishers.

First Aid Program Plan

Utah FORGE Project – Milford, Utah

Completed by: Garth Larsen
Completed Date: 12/16/201

First Aid Program Plan

Purpose

The Utah FORGE Project is dedicated to the protection of its employees and team members from on-the-job injuries and illnesses. When injuries or illnesses do occur, we are prepared to immediately respond to the needs of the injured or ill.

This First Aid Program Plan (FAPP) is intended to ensure that the Utah FORGE Project meets the requirements of 29 CFR 1926.23, First Aid and Medical Attention, and 29 CFR 1926.50, Medical Services and First Aid.

Administrative Duties

Joe Moore, Utah FORGE Project Managing PI, is responsible for establishing and implementing the FAPP. Joe Moore has full authority to make necessary decisions to ensure the success of this FAPP. Copies of this FAPP may be obtained from the Energy and Geoscience Institute at the University of Utah, 423 Wakara Way, Salt Lake City Utah and in Utah FORGE Project Office bldg. located near Milford, Utah.

First Aid Personnel

Gath Larsen, Safety Manager, will be available for advice and consultation on project safety and health issues and concerns.

The *National EMS Education and Practice Blueprint* lists the following first aid designations.

- **First aid provider**. Occupationally required to be trained in first aid even though they may not be specifically obligated by law to perform first aid. Responds as a "Good Samaritan." Uses a limited amount of equipment to perform initial assessment and provide immediate life support and care while awaiting arrival of emergency medical services (EMS).
- **First responder**. Uses a limited amount of equipment to perform initial assessment and intervention and is trained to assist other EMS.
- **Emergency Medical Technician (EMT)-Basic**. The 2nd level of professional emergency medical care provider. Qualified to function as the minimum staff for an ambulance.
- **EMT-Intermediate**. The 3rd level of professional emergency medical care provider. Can perform essential advanced techniques and administer a limited number of medications.
- **Paramedic**. The 4th level of professional emergency medical care provider. Can administer additional interventions and medications.

The following person(s) are trained to render first aid at Utah FORGE Projects:

Garth Larsen, Safety Manager	**435-749-4015**

Hazard and Medical Services Assessment

Joe Moore, Utah FORGE Project PI, and Garth Larsen will assess the FORGE site for hazards to determine whether any pose the risk of a life-threatening or permanently disabling injury or illness. Refer to the Utah FORGE Project Hazardous Assessment Plan.

The nearest hospital, clinic, or infirmary, Milford Memorial Hospital, is located 850 N. Main, Milford Utah approximately 6 miles from the Utah FORGE Project Office bldg.

Milford Memorial Hospital is not considered in near proximity because it is over four minutes away. For this reason, the Utah FORGE Project is required to train an on-site employee in first aid.

When hazards or locations change, Joe Moore or Garth Larsen will reassess the risk and determine whether or not we are required to train an on-site employee in first aid.

First Aid Supplies and Equipment

Garth Larsen will ensure that adequate first aid supplies will be readily available. Below is a summary of the optional first aid supplies called for in the American National Standard (ANSI) Z308.1-1998, Minimum Requirements for Workplace First Aid Kits.

- Gauze roller bandages
- Compress
- Eye dressing
- Eyewash solution
- Instant cold packs

Other items we will put in the first aid kits include.

- Metal splints
- Tourniquet
- Forceps
- Scissors
- Ammonia inhalants
- Antibiotic cream
- Resuscitation equipment, such as a resuscitation bag, airway, or pocket mask
- Blanket
- Instructions for giving first aid

The contents of the Utah FORGE Project first aid kits, which will be placed in a weatherproof container with individual sealed packages for each type of item, located at the Utah FORGE Project Office bldg. and at each well site.

Using an inventory supply list, Garth Larsen will check the first aid kits for missing or un-wrapped every week. Supplies will be replaced promptly when expended.

Because it is reasonably anticipated that employees and/or team members may be exposed to blood or other potentially infectious materials while rendering first aid, we will provide personal protective equipment (PPE) in compliance with the provisions of the Occupational Exposure to Bloodborne Pathogens standard, Sec. 1910.1030(d)(3) (56 FR 64175). This standard lists appropriate PPE for this type of exposure, such as gloves, gowns, face shields, masks, and eye protection. See the Utah FORGE Project's Bloodborne Pathogens Plan for further details

Posting

The Utah FORGE Project will post the appropriate signage to make everyone aware of the location of First Aid kits.

Reporting

If an injury occurs, the injured party or bystanders are to immediately notify Garth Larsen, who is trained to administer first aid and will notify the Beaver County Emergency Response via 911 call. If no one on site is available, the injured party or bystanders are to dial 911 to report the injury.

After the immediate needs of an injury or illness emergency have been met, Utah FORGE Project employees and team members are required to report the event to their supervisor. Extremely minor injuries, like a small bruise, do not need to be reported. Those injuries and illnesses involving professional treatment, time away from work, or a near miss of a more serious accident, must be reported to an employee's supervisor. Even injuries that do not become immediately apparent after an incident must be reported immediately after they are recognized. For example, back pain that develops over a period of time must be reported.

Recordkeeping

Garth Larsen, Safety Manager, is responsible for maintaining records and documentation relating to first aid, injuries, illnesses, and accidents.

Joe Moore will annually evaluate the workplace or worksite and, as necessary, revise this FAPP to ensure the FAPP's effectiveness and prevent or eliminate any problems.

Gases, Vapors, and Fumes Plan

(Hydrogen Sulfide)

University of Utah - Energy & Geoscience Institute

Utah FORGE Project – Milford, Utah

Completed by: Garth Larsen
Completed Date: 12/18/2015

Gases, Vapors, and Fumes Plan

This Gases, Vapors, and Fumes Plan (GVFP) will ensure that no employee, team member, or visitor at the Utah FORGE Project site is exposed to inhalation, ingestion, skin absorption, or contact with any material or substance at a concentration above those specified in the "Threshold Limit Values of Airborne Contaminants for 1970" of the American Conference of Governmental Industrial Hygienists found in Appendix A of OSHA's Gases, Vapors, Fumes, Dusts, and Mists standard, Title 29 Code of Federal Regulations 1926.55.

To comply with this and other OSHA rules we will implement all feasible administrative and engineering controls. When such controls are not feasible we will use protective equipment or other protective measures to keep the exposure of employees to air contaminants within the limits prescribed in Appendix A of 29 CFR 1926.55. All equipment and technical measures used to achieve compliance will first be approved for each particular use by a competent industrial hygienist or other technically qualified person.

The GVFP applies to all construction and drilling work (including alteration, repair, painting, and decorating) where employees, team members, or visitors may be occupationally exposed to gases, vapors, fumes, dusts, and mists, and especially hydrogen sulfide that is sometimes emitted to the atmosphere during geothermal drilling and associated activities.

Administrative Duties

This GVFP is for all well sites located on the Utah FORGE Project site located near Milford, Utah. Joe Moore, Utah FORGE Project Managing PI, is the program coordinator/manager and is responsible for its implementation. Copies of the written plan may be obtained at Energy and Geoscience Institute at the University of Utah, 423 Wakara Way Suite # 300, Salt Lake City, Utah and at Utah FORGE Project Office bldg., near Milford, Utah.

Exposure Assessment and Monitoring

We will conduct personal or area sampling for gases, vapors, fumes, dusts, and mists to measure worker exposures. Air sampling is needed to measure worker exposures and select appropriate engineering controls and respiratory protection. Where data is collected it must be retained to support negative exposure assessments.

We will perform hydrogen sulfide gas monitoring as needed to measure the potential for exposure. The OSHA legal limit of hydrogen sulfide airborne exposure (PEL) is 20 ppm as an acceptable ceiling concentration and 50 ppm as a maximum peak, not to be exceeded during any 10-minute work period.

Levels between 0 ppm and 10 ppm are acceptable for routine work activities at the site. Levels greater than 10 ppm will require personal respiratory protection or evacuation from the immediate area. Wind socks will be installed at all sites to identify local site wind direction and thus evacuation should proceed up-wind.

Recordkeeping

Recordkeeping is critical for our gases, vapors, fumes, dusts, and mists operations. Our recordkeeping tasks, at a minimum, include hydrogen sulfide levels measured and recorded in parts per million (ppm) on a daily basis at each well site.

Training and Information

We will provide our employees and team members with training that includes:

- use of hydrogen sulfide detection and the associated gas monitoring detectors, as well as the response and action required upon detection near a well site,
- how to detect hydrogen sulfide by smell,
- how to egress or evacuate based on the wind direction,
- how to effectively barricade the affected area,
- use of the 2016 Emergency Response Guidebook (ERG) and the use of guide 117 and table 1 ID# 1053, and
- proper use, maintenance, and cleaning techniques for self-contained breathing apparatus/repirators.

All employees will also be trained and become familiar with other Utah FORGE Project Health and Safety Plans, such as Hazardous Communication Plan, Hazard Assessment Plan, Emergency Action Plan, and Visitor Safety Plan.

Methods of Compliance

Administrative procedures, engineering controls, and good work practices

Exposures to gases, vapors, fumes, dusts, and mists can be controlled through the use of engineering controls and work practices. Engineering controls are hazard controls designed into equipment and workplaces. Work practices are procedures followed by employers and workers to control hazards.

Routine work activities are permitted at well sites determined to be no or low hazard areas. The Safety Supervisor will provide for daily gas monitoring to determine if the hazard is of significant quantity to require action. Hydrogen sulfide levels between 0 ppm and 10 ppm are acceptable for routine work activities. Levels greater than 10 ppm will require personal respiratory protection or evacuation from the immediate area. Wind socks will be installed at all sites to identify local site wind direction, and evacuation, when necessary, will progress up-wind.

Well Site Practices

All employees and team members will receive training on hydrogen sulfide gas detection, monitoring techniques, and use of PPE and respirator, including NISOH approved gas cartridges. All employees and team members will receive training of how to take action when hydrogen sulfide gas is present and how to instruct and lead visitors away from the hazard.

All well sites will be equipped with wind socks to identify wind direction and evacuation direction at the site. All well sites as well as the office will have Material Data Sheets posted and available to all employees, team members, and visitors. All sites will have warning signs posted in and around the site to make everyone aware of the potential danger.

Respirators and the Respiratory Protection Program

OSHA regulations require implemention of a respirator program when engineering, administrative, and good work practices are not enough to keep gases, vapors, and fumes below their permissible exposure limit (PEL) as found in 29 CFR 1926.55. We will not use respirators as the primary means of preventing or minimizing exposures to airborne contaminants. Instead, we will use effective source controls such as:

- detection,
- gas monitoring,
- wind socks,
- local exhaust ventilation, and

- signs and barricades.

Such measures will be the primary means of protecting our workers. When source controls cannot keep exposures below the PEL, controls will be supplemented with the use of respirators. NIOSH recommended gas cartridges will be selected for use.

Communication of Hazards

We will post warning signs to mark the boundaries of work areas contaminated with gases, vapors, and fumes at or above their PELs with special focus being placed on hydrogen sulfide.

Our Communication of Hazards plan is supplemented by the requirements of 29 CFR 1926.59-Hazard Communication and is implimented as part of the training used in this GFVP.

Hazard Assessment Plan

University of Utah - Energy and Geoscience Institute

Utah FORGE Project – Milford, Utah

Completed by: Garth Larsen
Completed Date: 11/10/2015

This plan contains detailed hazard information that is part of several different regulatory compliance programs.

Administrative Duties

Joe Moore, Utah FORGE Project PI, is responsible for developing and maintaining our facility's hazard assessment plan. The plan is available for review and is kept at the Energy and Geoscience Institute (EGI) at the University of Utah, 423 Wakara Way Suite #300, Salt Lake City, Utah.

The Utah FORGE Project performs regular hazard assessments to review the hazards in the workplace, and protect employees, team members, and visitors from those hazards. Hazards can change with every process change or the next project phase. Therefore, we will perform a hazard assessment of our facility at the beginning of a new Phase of the project or as new equipment is added to the site. Joe Moore, Project PI, and Garth Larsen, Safety Manager, will conduct the hazard assessment based on an actual physical site walk-through, followed-up by a table top review, and recording the assessment in a written report.

When safety deficiencies are discovered, the process for getting the deficiencies corrected will depend on their significance. If the deficiencies are minor, they will be handled at or near the time of discovery. If the deficiency is significant and requires project changes or additional budget dollars, the Project PI will be contacted and a method to address the deficiency will be discussed and implemented.

General Condition expectations at the Worksite

The floors will be clean, dry, and clear of obstacles.

There will be no materials on the floor that could trip a worker.

The lighting will be adequate for the work being performed.

There will be excessive noise in the work area, hindering worker communication. This can be corrected or mitigated with proper hearing protection.

Fire protection equipment will be readily accessible and employees will have been trained in its use.

Emergency exits will be clearly marked.

Trucks and/or motorized vehicles will be properly equipped with brakes, overhead guards, backup signals, horns, and identification as deemed necessary.

All employees operating vehicles and equipment will be properly trained and authorized.

All employees will be wearing proper personal protective equipment for the jobs they are performing.

Employee Exposures to Chemicals

Our hazard assessment looks at the workers' exposures to the chemicals they handle or may be exposed to during drilling and testing of geothermal wells.

Areas and conditions requiring Personal Protective Equipment

The sources of motion; i.e., machinery or processes where any movement of tools, machine elements, or particles could exist are drill sites and pump stations.

The areas where movement of personnel could result in collision with stationary objects include drill rigs and associated drilling equipment.

The sources of high temperatures that could result in burns, eye injury, or ignition of protective equipment, etc.include well sites and geothermal fluid pipelines.

The types of potential chemical exposures include hydrogen sulfide.

The sources of harmful dust most likely come from disturbed well sites and road ways.

The sources of hazardous light radiation include welding, cutting, and brazing activities.

The sources of falling objects or potential for dropping objects include drilling rigs and drilling equipment.

The sources of sharp objects which might pierce the feet or cut the hands include drilling rigs and drilling equipment.

The sources of rolling or pinching objects which could crush the feet include drilling rigs and associated equipment.

The electrical hazards including drilling equipment and other electrical equipment.

Ventilation in confined spaces is required especially where hydrogen sulfide may be present.

Conclusion

For safety, it is important , to perform a complete hazard assessment of the facility and well sites. We will utilize this information to correct problems or potential problems to ensure a safe environment for our employees, team members, visitors, and the surrounding community.

Hazard Communication Plan

University of Utah - Energy & Geoscience Institute

Utah FORGE Project – Milford, Utah

Completed by: Garth Larsen
Completed Date: 11/18/2015

Hazard Communication Program

The Utah FORGE Project is complying with the requirements of OSHA's Hazard Communication Standard for construction by compiling a list of hazardous chemicals, using safety data sheets (SDSs), ensuring that containers are labeled and/or provided other forms of warning, and training our worksite employees and team members. In addition, we share information with other employers involved in the Utah FORGE Project so that they may keep their employees informed.

This program applies to all work operations at the University of Utah - Energy & Geoscience Institute (EGI) Utah FORGE Project site where employees, team members, and visitors may be exposed to hazardous chemicals under normal working conditions or during an emergency situation. Utah FORGE Project employees, team members, and visitors will be informed of the contents of the Hazard Communication Standard, the hazards of chemicals with which they work, safe handling procedures, and measures to take to protect themselves from these chemicals.

Joe Moore, Utah FORGE Project Managing PI, has overall responsibility for the program, including reviewing and updating the program, as necessary. Copies of this written program may be obtained from Joe Moore at the University of Utah EGI, 423 Wakara Way Suite #300, Salt Lake City, Utah. All employees, or their designated representatives, contractors, researchers, visitors and team members may obtain further information about this program, the Hazard Communication Standard, applicable SDSs, and our chemical list from Joe Moore or Garth Larsen, Safety Manager, at the Utah FORGE Project Office bldg. located near Milford Utah.

List of Hazardous Chemicals

Our "chemical inventory" is a list of product identifiers of hazardous chemicals known to be present at our workplace. Anyone who comes in contact with the hazardous chemicals on the list needs to know what those chemicals are and how to protect themselves. The hazardous chemicals on the chemical inventory can cover a variety of physical forms including liquids, solids, gases, vapors, fumes, and mists. Sometimes hazardous chemicals can be identified using purchase orders. Identification of other chemicals may require an actual survey of the workplace.

Garth Larsen, Safety Manager, will update the hazardous chemical inventory as necessary and will maintain a written document at the site that lists chemicals as found, shipped, and/or supplied by contractors.

Safety Data Sheets (SDSs)

SDSs are fact sheets for chemicals that pose a physical or health hazard in the workplace. These sheets provide our employees, team members, contractors, and visitors with specific information on the chemicals in their work areas.

Garth Larsen, Safety Manager, is responsible for obtaining and maintaining the SDSs at our workplace and will contact the chemical manufacturer or vendor if additional chemical information is needed.

SDSs are kept readily accessible to all employees during each work shift at the Utah FORGE Project Office bldg., near Milford, Utah. Employees, team members, and visitors may obtain them at the Utah FORGE Project Office bldg., near Milford, Utah.

If the SDS is not received with the first shipment of a chemical, we will contact the supplier and request an electronic and hard copy of the SDS. If not received, an SDS will be located via internet sources such as JJKeller.com.

Labels and Other Forms of Warning

Hazardous chemical containers at the work site will be clearly labeled, tagged, or marked in accordance with the Hazard Communication Standard, either with:

- the product identifier, signal word, hazard statement(s), pictogram(s), and precautionary statement(s), or
- the product identifier and words, pictures, symbols, or combination thereof, which provide at least "general" information regarding the hazards of the chemicals, and which, in conjunction with the other information immediately available to employees under the Hazard Communication Program, will provide employees with the "specific" information regarding the physical and health hazards of the hazardous chemical.

Garth Larsen, Safety Manager, is responsible for ensuring that all hazardous chemicals in containers at the Utah FORGE work site have proper labels or other forms of warning that are legible, in English, and displayed clearly on the container or readily available in the work area throughout each work shift. Garth Larsen will update labels, as necessaryand ensure that newly purchased chemicals are checked for labels.

Garth Larsen, Safety Manager, is responsible for ensuring the proper labeling, tagging, or marking of any shipped containers leaving the workplace. These labels, tags, or marks must provide not only the product identifier, signal word, hazard statement(s), pictogram(s), and precautionary statement(s), but also the name, address, and telephone number of the chemical manufacturer, importer, or other responsible party.

A JJ Keller poster will be displayed to inform employees about the Hazard Communication Standard. I

If employees transfer chemicals from a labeled container to a portable, secondary container that is intended only for their IMMEDIATE use, no labels, tags, or markings are required on the portable container. Otherwise portable containers must be labeled, tagged, or marked in accordance with our in-house labeling system for workplace containers.

Finally, the following procedures are used to review and update label information when necessary, to ensure that labels that fall off or become unreadable are immediately replaced, following §1910.1200(f) for labeling provisions. The following are examples of procedures to review, update, and replace labels, as necessary.

- We will check all incoming hazardous chemical containers for proper labeling and product identifiers, signal word, hazard statement(s), pictogram(s), and precautionary statement(s).

- If an incoming container is not labeled properly or is missing a label, we will determine whether or not a label is required based on 29 CFR 1910.1200, Hazard Communication. If a label is required, we either send the shipment back with the transporter to the distributor, importer, or manufacturer or store the chemical until it can be labeled.

- When a chemical container is discovered with a label that is soiled, unreadable, or missing, we instruct employees not to move, touch, or use the chemical.

- If a label is required, we attempt to identify the chemical. If the chemical can be identified, we relabel the container with an extra label already provided by the chemical distributor or manufacturer, relabel the container or store the chemical until it can be labeled with a label ordered from the manufacturer, importer, or distributor.

- If the label cannot be obtained from the chemical manufacturer, importer, or distributor, and no other labeling options are available, we will dispose of the chemical according to the chemical's safety data sheet and other proper federal, state, and local disposal requirements.

- An employee, team member or visitor who transfers hazardous chemicals from a labeled container to a portable container, is required to contact Garth Larsen if more than one employee will be using the chemical, if the chemical will be used for more than one shift, if the employee who transferred the chemical will not be in control of the chemical the entire time.

- Once notified, Garth Larsen will clearly label the portable container with the product identifier.

Training

Everyone who works with or is potentially "exposed" to hazardous chemicals on the Utah FORGE work site will receive initial training on the Hazard Communication Standard and the safe use of those hazardous chemicals before starting work. "Exposure" means that "an employee is subjected in the course of employment to a chemical that is a physical or health hazard, and includes potential (e.g., accidental or possible) exposure." Whenever a new chemical hazard is introduced or an old hazard changes, additional training is provided. All training is conducted by Garth Larsen, Safety Manager.

Effective information and training is a critical part of the Hazard Communication Program. We train our employees to read and understand the information on labels and SDSs, determine how the information can be obtained and used in their own work areas, and understand the risks of exposure to the chemicals in their work areas, as well as ways to protect them. Our goal is to ensure employees know that they are exposed to hazardous chemicals, have the skills to read and use labels and SDSs, and understand how to appropriately follow the protective measures we have established.

All employees and team members will receive training for hazard communication.

Training Content

Employees and team members will receive training on all chemicals/chemical hazards present at the site. According to §1910.1200(h)(1), "(h)(1) Employers shall provide employees with effective information and training on hazardous chemicals in their work area at the time of their initial assignment, and whenever a new chemical hazard the employees have not previously been trained about is introduced into their work area. Information and training may be designed to cover categories of hazards (e.g., flammability, carcinogenicity) or specific chemicals. Chemical-specific information must always be available through labels and safety data sheets." The format of the training program used is According to §1910.1200(h)(1).

The training program emphasizes these elements.

- Summary of the Hazard Communication Standard.
- Identification of hazardous chemicals present in operations and in employee work areas.

- Chemical and physical properties of hazardous chemicals (e.g., flash point, reactivity, etc.) and how to detect the presence or release of these chemicals (including chemicals in unlabeled pipes).
- Physical hazards of chemicals (e.g., potential for fire, explosion, etc.).
- Health hazards, including signs and symptoms of overexposure, associated with exposure to chemicals and any medical condition known to be aggravated by exposure to them.
- Any simple asphyxiation, combustible dust, and pyrophoric hazards, as well as hazards not otherwise classified, of chemicals in work areas.
- Any steps the Utah FORGE project has taken to reduce or prevent exposure to hazardous chemicals, such as engineering controls.
- Procedures to protect against hazards and exposure (e.g., work practices or methods to assure proper use and handling of chemicals and any required personal protective equipment and its proper use and maintenance).
- Procedures for reporting and responding to chemical emergencies.
- How to read and use both the workplace labeling system and labels received on shipped containers.
- The order of information found on SDSs and how to read the information and what it means.
- How to access SDSs and the written Hazard Communication Program, including the chemical inventory.

The procedure to train new employees at the time of their initial assignment is, according to §1910.1200(h)(1), "(h)(1) Employers shall provide employees with effective information and training on hazardous chemicals in their work area at the time of their initial assignment, and whenever a new chemical hazard the employees have not previously been trained about is introduced into their work area."

We will document all hazard communication training and retraining using a standard training attendance roll form and keep this documentation at the Utah FORGE Project Office bldg.

Multi-Employer Facility

When contractors, sub-contractors or any other employers' workers will be working at the Utah FORGE Project work site, the Safety Manager, Garth Larsen, will:

- provide the other employer(s) as follows with SDSs for any of our hazardous chemicals to which their employees may be exposed: According to §1910.1200(e)(2), "(e)(2) 'Multi-employer workplaces.' Employers who produce, use, or store hazardous chemicals at a workplace in such a way that the employees of other employer(s) may be exposed (for example, employees of a construction contractor working on-site) shall additionally ensure that the hazard communication programs developed and implemented under this paragraph (e) include the following:... (ii) The methods the employer will use to inform the other employer(s) of any precautionary measures that need to be taken to protect employees during the workplace's normal operating conditions and in foreseeable emergencies; and, (iii) the methods the employer will use to inform the other employer(s) of the labeling system used in the workplace," and
- relay to other employer(s) all necessary in-house labeling system and precautionary information for normal operations and foreseeable emergencies.

Moreover, it is the responsibility of Garth Larsen to obtain from each contractor, sub-contractor, or other employer the appropriate hazard information on chemicals they bring onsite, including SDSs, the labeling system used, and the precautionary measures to be taken in working with or near these chemicals. This information will be added to the chemical inventory and given to all others workers, team members, and visitors on site that have the potential to come in contact with these additional hazardous chemicals

Hazardous Waste Contingency Plan

University of Utah - Energy & Geoscience Institute

Utah FORGE Project, Milford, Utah

Completed by: Garth Larsen
Completed Date: 10/23/2015

Hazardous Waste Contingency Plan

General Company Policy

The purpose of this program is to inform interested persons, including employees, that our company is complying with EPA requirements for preparing and maintaining a Hazardous Waste Contingency Plan under the hazardous waste regulations, Title 40, Code of Federal Regulations 265.50-.56, by providing a written plan describing the equipment, manpower, and procedures for responding to a discharge of hazardous waste.

THE University of Utah - Energy & Geoscience Institute (EGI) has developed this program to handle hazardous wastes at Utah FORGE drilling and operation sites, because they can pose significant safety and health risks to our workers and those of our subcontractors, when not handled properly.

This program applies to all work operations in our company where employees and visitors may be exposed to potential discharge or spill situations involving hazardous waste under normal working conditions or during an emergency situation.

Our contingency plan is designed to minimize hazards to human health or the environment from fires, explosions, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to air, soil or surface water. The provisions of our plan are to be carried out immediately whenever there is a fire, explosion, or release of hazardous waste or hazardous waste constituents that could threaten human health or the environment.

The Utah FORGE Project falls under the Conditionally Exempt Small Quantity Generators (CESQGs) that generate 100 kilograms (220 lbs.) or less per month of hazardous waste, or 1 kilogram (2.2 lbs.) or less per month of acutely hazardous waste, or less than 100 kilograms (220 lbs.) per month of acute spill residue or soil.

The Utah FORGE Project does not store hazardous waste.

The Utah FORGE Project is not a permitted transportation, storage and disposal facility.

The Utah FORGE Project encourages any suggestions that our team members, contractors, and visitors have for improving our Hazardous Waste Written Contingency Plan, as we are committed to developing and maintaining an effective plan. We strive for clear understanding, safe behavior and involvement in the plan from every level of the company.

Administrative Duties

Joe Moore, the Utah FORGE PI, is responsible for our hazardous waste written contingency plan. Copies of our written plan may be obtained from EGI Bldg. at 423 Wakara Way Suite #300, Salt Lake City, UT 84108.

Garth Larsen is our emergency coordinator, who must be familiar with:

- all aspects of the facility's contingency plan,
- all operations and activities at the facility,
- the location and characteristics of waste handled,
- the location of all records within the facility, and
- the facility layout.

The University of Utah - Energy & Geoscience Institute is the owner or operator of our facility. Garth Larsen is responsible for ensuring that our written plan is complete, kept up to date, and made available to applicable or

required authorities. Our plan will be submitted to the Beaver County Sheriff Office, Milford Utah phone 435-387-5486, Beaver County Fire District #2, Mil ford Utah phone 435-387-2620, Beaver County Emergency Response Coordinator, Milford Utah phone 435-691-2381, and Milford Memorial Hospital 850 N. Main, Milford Utah phone 435-387-2411.

Our plan will be submitted to the local emergency response team.

Our plan will be submitted to the state emergency response team.

Location of Plan

Our hazardous waste written contingency plan may be obtained from EGI bldg. at 423 Wakara Way Suite #300, Salt Lake City, UT 84108. Employees, team members and visitors can obtain the plan by EGI bldg. at 423 Wakara Way Suite #300, Salt Lake City, UT 84108.

Emergency Equipment and Procedures

It is our policy to operate our facility in a safe and responsible manner. We continually review our operations to minimize the possibility of a fire, explosion, or an accidental release of a hazardous waste.

Because of the nature of the hazardous waste we generate, our facility is not equipped with an alarm system; however radio communication is capable of providing immediate emergency instruction to facility personnel. The FORGE site is not equipped with fire detection at the site.

Our facility is equipped with a two-way hand held radio system.

Our facility's fire control equipment is located at the FORGE office site, well sites, and drilling mobile and mounted equipment. All are equipped with fires extinguishers and smoke alarms (where appropriate). Our facility's spill control equipment consists of satellite spill kits located at the FORGE office bldg., and all well sites and off-loading areas near the FORGE Office bldg. Our facility's decontamination control equipment consists of spill kits consisting of a protocol instruction card, PPE, absorbent material, and barricade tape, and disposable absorbent pigs. At our facility, we have established monthly examination and annual pressure test of all fire extinguishers.

We also regularly test and maintain as necessary our alarm system, fire control equipment, spill control equipment and decontamination equipment to ensure that it will function properly in an emergency

At our facility, we ensure that at all times our emergency equipment is readily accessible to our employees during operations involving hazardous waste. All emergency equipment and reporting protocols will be located in the main office as well as placards located at the satellite locations and individual well sites.

We have established procedures at our facility to ensure that adequate aisle space is maintained to allow for the unobstructed movement of personnel and the transporting of equipment during an emergency. A minimum of 36-inch aisle space will be maintained at all times.

The following are the responsibilities of the emergency coordinator in the event of an emergency caused by a hazardous waste spill or discharge: the emergency response team leader is responsible to protect all employees and the public, isolate the spill if possible, identify the type of chemical or substance spilled, and contact the appropriate county, state, and federal agencies. (The 2016 Emergency Response Guidebook will be utilized.)

In addition, the emergency coordinator has the following responsibilities after determining that the facility has had a release, fire or explosion that threatens human health or the environment outside the facility: the emergency response team leader is responsible to protect employees and the public, isolate and barricade the perimeter if possible, identify the type of chemicals and/or hazards, and contact the appropriate county, state, and federal agencies. (The 2016 Emergency Response Guidebook will be utilized.)

The following are the responsibilities of the emergency coordinator immediately after an emergency: secure the area to protect employees, personnel, visitors and the public from further exposure and/or contamination and establish incident command post. Contact the appropriate county, state, and federal agencies (The 2016 Emergency Response Guidebook will be utilized.)

The owner or operator has the following responsibilities in the event of an emergency caused by a hazardous waste spill or discharge: set-up incident command and control protect all personnel and visitors, notify Beaver County Emergency Response. Provide for clean-up response and restoration through emergency response protocol. (The 2016 Emergency Response Guidebook will be utilized.)

INDUSTRIAL ACCIDENT INVESTIGATION REPORT – UTAH FORGE PROJECT

ACCIDENT REPORT NO.____
ACCIDENT DATE _____

ACCIDENT TIME _____ ☐ AM ☐ PM

I. COMPANY INFORMATION

Name ____ Telephone No. ____ Fax ____
Address ____
Accident Address (if different than above) ____
Investigator ____ Telephone No. ____ Fax ____

II. EMPLOYEE INFORMATION

Name ____ Social Security No. ____ Sex ____ Age ____
Home Address ____
Department ____ Job Title ____
Employment Status ☐ Full Time ☐ Part Time ☐ Temporary ☐ Other ____
Length of Employment ☐ Less than 1 mo. ☐ 1 - 5 mos. ☐ 6 mos. to 5 yrs. ☐ More than 5 yrs.
Time in Occupation at Time of Accident ☐Less than 1 mo. ☐1 - 5 mos. ☐ 6 mos. to 5 yrs. ☐ More than 5 yrs.

III. INJURY INFORMATION

Person Reported To ____ Date Reported ____
Nature of Injury and Part of Body ____
Employee's Specific Task and Activity at Time of Accident ____

☐ Working Alone ☐ Working with assigned group ☐ Supervised ☐ Not Supervised

SEVERITY OF INJURY

☐ Fatality
☐Lost work days - days away from work
☐ Days of restricted activity or job transfer
☐ Medical treatment
☐ First aid
☐ Other, specify _____

ACCIDENT REPORT NUMBERS AND NAMES OF OTHERS INJURED

1. _____ _____
2. _____ _____
3. _____ _____
4. _____ _____
5. _____ _____
6. _____ _____

NAME OF PHYSICIAN

_____
_____
_____

NAME AND ADDRESS OF HOSPITAL / CLINIC

_____
_____
_____

IV. WITNESSES

Name _____ Telephone Number _____

Name _____ Telephone Number _____

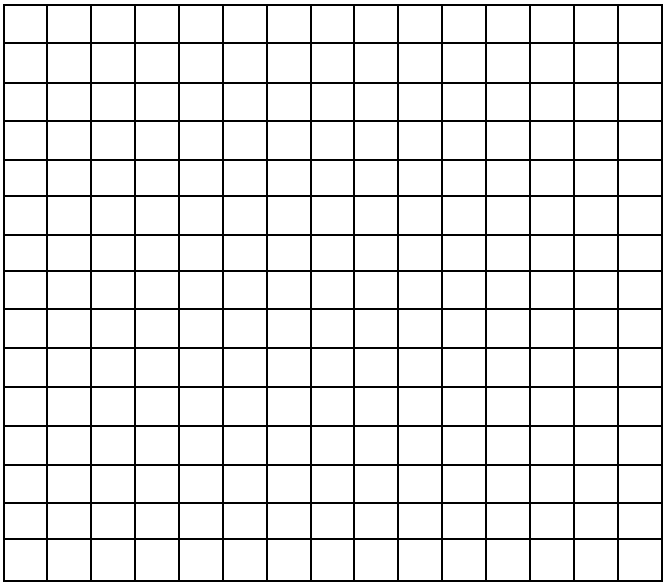
Name _____ Telephone Number _____

Name _____ Telephone Number _____

V. SCENE OF ACCIDENT INFORMATION

Specific Location _____

Describe How the Accident Occurred _____
Diagram any Specific Location Factors That Contributed to the Accident



Type of Equipment / Machinery Involved _____
Equipment / Machinery Placed (if involved) 1. ☐ Out of Service ☐ Repaired ☐ _____
2. ☐ Out of Service ☐ Repaired ☐ _____
3. ☐ Out of Service ☐ Repaired ☐ _____

V I . ACCIDENT SEQUENCE. Describe in order of occurrence the events leading to the accident and/or injury. Reconstruct the sequence of events that led to the accident.

A. Event #1 _____

B. A. Event #2 _____

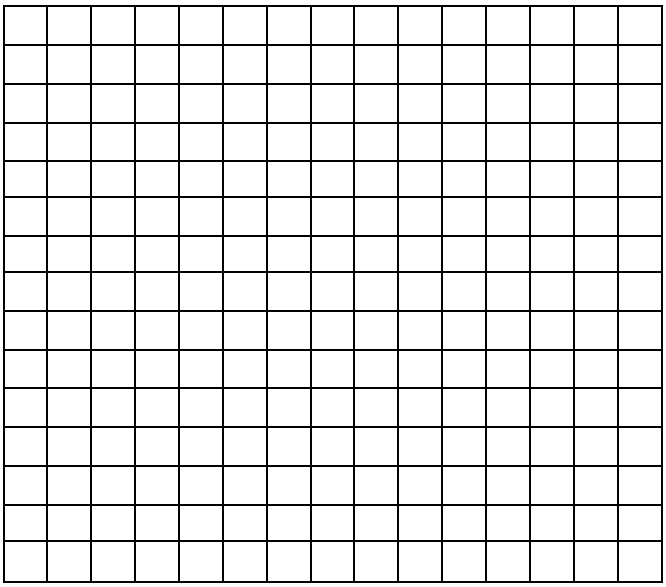
C. Accident Event _____

D. Injury Event _____

VII. CAUSAL FACTORS. Describe events and conditions that contributed to the accident. Include information on worker, machinery and equipment, environment and management.

VIII. CORRECTIVE ACTIONS. Identify the factors listed above that can be corrected to prevent a reoccurrence of this type of accident. Indicate the person responsible for making the change and project a target date for completion of the task. Use the diagram grid below to illustrate layout changes.

	CAUSAL FACTOR	ASSIGNMENT RESPONSIBILITIES	TARGET DATE FOR COMPLETION
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			



IX. SUMMARY. Include comments that would promote a safe workplace environment and reduce an accidents potential in the future based on review of the Causal Factors and implementation of Corrective Actions.

This Industrial Accident Investigation Report was prepared by:

Signature _____ Date _____

Title _____ Department _____

If corrective action is required:

Approved by _____ _____

Signature Date

_____

Title

Personal Protective Equipment Plan

University of Utah - Energy & Geoscience Institute

Utah FORGE Project – Milford, Utah

Completed by: Garth Larsen

Completed Date: 12/15/2015

Personal Protective Equipment (PPE) Program

The Utah FORGE Project minimizes injury resulting from various occupational hazards present at our construction sites by protecting each employee, contractor, team member, or visitor through the use of PPE when the hazards cannot be eliminated.

The Safety Manager, Garth Larsen, is the program coordinator, acting as the representative of the plant manager, who has overall responsibility for the program. The Safety Manager will designate appropriate plant supervisors to assist in training each employee and monitoring his/her use of PPE. This written plan is kept in Energy and Geoscience Institute at the University of Utah, 423 Wakara Way Suite # 300, Salt Lake City, Utah 84108. Joe Moore, Utah FORGE Project Managing PI, will review and update the program as necessary. Copies of this program may be obtained from Joe Moore or Garth Larsen at the Utah FORGE Project Office bldg., near Milford, Utah.

We at Utah FORGE Project believe it is our obligation to provide a hazard free environment to our employees, team members, and visitors. The purpose of protective clothing and equipment (PPE) is to shield or isolate individuals from chemical, physical, biological, or other hazards that may be present in the workplace.

Establishing an overall written PPE program detailing how employees, team members, and visitors use PPE makes it easier to ensure that they use PPE properly in the workplace and document our PPE efforts in the event of an OSHA inspection. The Utah FORGE Project PPE program covers:

- Purpose
- Hazard assessment
- PPE selection
- Employee training
- Cleaning and maintenance of PPE
- PPE specific information

Purpose of Program

The basic element of any PPE program is an in depth evaluation of the equipment needed to protect against the hazards at the workplace. The PPE program should be to protect the wearer from incorrect use and/or malfunction of PPE. The PPE Program documents the hazard assessment, protective measures in place, and PPE in use on this project. PPE devices are not to be relied on as the only means to provide protection against hazards, but are used in conjunction with guards, engineering controls, operational best practices, and sound manufacturing practices. If possible, hazards will be abated first through engineering controls. PPE will provide protection against hazards that cannot reasonably be abated otherwise.

Hazard Assessment

In order to assess the need for PPE the following steps are taken.

1. The Safety Manager, Garth Larsen as well as Joe Moore, Utah FORGE Project PI, will identify job classifications where exposures occur or could occur. The Safety Manager or designee will examine the following records to identify and rank jobs according to exposure hazards: injury/illness records and first aid logs.

2. The Safety Manager and PI will conduct a walk through survey of workplace areas where hazards exist or may exist to identify sources of hazards to employees, team members and visitors. They consider these basic hazard categories: impact, heat or extreme cold, penetration, harmful dust, light (optical) radiation, chemical, and electrical.

During the walk through survey the Safety Manager will observe and record the following hazards along with PPE currently in use.

• Sources of motion; i.e., machinery or processes where any movement of tools, machine elements or particles could exist, or movement of personnel that could result in collision with stationary objects, such as well sites where drilling equipment will be in operation and pumping stations where pipe and pumps could be utilized.

• Sources of high temperatures that could result in burns, eye injury, or ignition of protective equipment, such as geothermal fluids, and steam and associated piping systems.

• Types of chemical exposure, such as hydrogen sulfide, which could be present where geothermal fluids and steam vent to the atmosphere.

• Sources of harmful dust, which could be present during wind storms and near drilling sites.

• Sources of light radiation, such as welding, brazing, cutting, furnaces, heat treating, high intensity lights, which may be found in and around well site construction and drilling operation areas.

• Sources of falling objects or potential for dropping objects; well sites have the potential for falling objects due to the height and nature of work involved during drilling operation and construction.

• Sources of sharp objects that might pierce the feet or cut the hands, such as well sites and pumping stations.

• Sources of rolling or pinching objects that could crush the feet, such as well sites and pumping stations.

• Certain electrical hazards, such as electric shock or burns from electric arcs, blasts, or heat.

3. Following the walk through survey, the Safety Manager will assessthe hazards data to enable proper selection of protective equipment.

4. The Safety manager will then estimate the potential for injuries. Each of the basic hazards will be reviewed and a determination will be made as to the frequency, type, level of risk, and seriousness of potential injury from each of the hazards found. The existence of any situations where multiple exposures occur or could occur will also be considered.

5. Finally, the Safety Manager will document the hazard assessment via a written certification that identifies the workplace evaluated, the person certifying that the evaluation has been performed, the date(s) of the hazard assessment, and that the resulting written document is a certification of hazard assessment.

Selection Guidelines

Once hazards have been identified and evaluated through hazard assessment, the general procedure for selecting protective equipment is as follows.

1. Become familiar with the potential hazards and the type of protective equipment (PPE) that are available, and what they can do.

2. Compare types of equipment to the hazards associated with the environment.

3. Select the PPE that meets selection requirements found in the OSHA regulations and ensures a level of protection equal to or greater than the minimum required to protect employees from the hazards.

4. Fit the user with proper, comfortable protection and instruct each employee on care and use of the PPE. It is very important that the users are aware of all warning labels for and limitations of their PPE. (See the Employee Training guidelines outlined in the next section of this program for a more detailed description of training procedures.)

Reassessment

It is the responsibility of the Safety Manager to reassess the workplace hazard situation as necessary, to identify and evaluate new equipment and processes, to review accident records, and reevaluate the suitability of previously selected PPE. This reassessment will take place as needed, but at least annually, and anytime there is a significant change to the operational plan or equipment.

Elements that should be considered in the reassessment include:

• adequacy of PPE program,

• accidents and illness experience,

• levels of exposure,

• adequacy of equipment selection,

• number of person hours that workers wear various PPE,

• adequacy of training/fitting of PPE,

• program costs,

• the adequacy of program records,

• recommendation for program improvement and modification, and

• coordination with overall safety and health program.

Employee Training

The Safety Manager will provide training for each employee who is required to use PPE. Training will include:

• when PPE is necessary,

• what PPE is necessary,

• how to wear assigned PPE,

• limitations of PPE, and

• the proper care, maintenance, useful life, and disposal of assigned PPE.

Each employee must demonstrate an understanding of the training and the ability to use the PPE properly before he/she is allowed to perform work requiring the use of the equipment.

Employees are prohibited from performing work without appropriate PPE.

If the Safety Manager has reason to believe an employee does not have the understanding or skill required, the employee will be retrained. Since an employee's supervisor is in the best position to observe any problems with PPE use by individual employees, the Safety Manager will seek this person's input when making this determination. Circumstances where retraining may be required include changes in the workplace or changes in the types of PPE to be used. Any inadequacies in an employee's knowledge or use of the assigned PPE, which indicates that the employee has not retained the necessary understanding or skills, would require retraining.

Cleaning and Maintenance

It is important that all PPE be kept clean and properly maintained by the employee to whom it is assigned. Cleaning is particularly important for eye and face protection where dirty or fogged lenses could impair vision. PPE is to be inspected, cleaned, and maintained by employees at regular intervals as part of their normal job duties so that the PPE provides the requisite protection. Supervisors are responsible for ensuring compliance with cleaning responsibilities by employees. If PPE is for general use, the Safety Manager has responsibility for cleaning and maintenance. If a piece of PPE is in need of repair or replacement it is the responsibility of the employee to bring it to the immediate attention of his or her supervisor or the Safety Manager. It is against work rules to use PPE that is in disrepair or not able to perform its intended function. Contaminated PPE that cannot be decontaminated is disposed of in a manner that protects employees from exposure to hazards.

PPE Specific Information

Eye and face protection

To help prevent eye and face injuries, (including those resulting from flying particles, molten metal, liquid chemicals, acids or caustic liquids, chemical gases or vapors, or light radiation, for example) it is the policy of the company that, as a condition of employment, all regular full time, part time, and temporary employees working in designated work areas and/or job assignments are required to wear protective eye and face protection devices that comply with 1989, 1989 (R-1998), or 2003 editions of ANSI Z87.1, "American National Standard Practice for Occupational and Educational Eye and Face Protection," or devices our company can demonstrate to be just as effective. Employees are required to wear goggles/face shields any time an individual is in or near the drill site area and when severe winds have the potential for airborne debris. The type of eye/face protection will be safety glasses that include side shields and face shields where appropriate. Employees from temporary work agencies and contractors are required to wear eye/face protection if assigned to work in these work areas. All supervisors and managers are responsible for ensuring employees under their charge are in compliance with this policy. All employees required to wear eye/face protection must routinely inspect and properly care for their eye/face protection.

Foot Protection

To help prevent foot injuries, ankle injuries, slips, and falls, it is the policy of the company that, as a condition of employment, all regular full time, part time, and temporary employees working in designated work areas and/or job assignments are required to wear foot protection.

Employees in or near the drill site area are required to wear foot protection that complies with the 1991 or 1999 editions of ANSI Z41, "American National Standard for Personal Protection — Protective Footwear," or both ASTM F2412-2005, "Standard Test Methods for Foot Protection" and ASTM F2413-2005, "Standard Specification for Performance Requirements for Protective Footwear," or footwear our company can demonstrate to be just as effective.

Standard foot protection will be hard toe shoes or boots. Employees from temporary work agencies and contractors are required to wear foot protection if assigned to work in or near the drill site area. It is the responsibility of the agency and/or contractor to ensure the employee reports to his or her temporary assignment at this company wearing approved foot protection.

Those employees who do not work in or near hazardous areas and vendors and visitors will be allowed to walk through the designated work areas without foot protection as long as they remain outside hazardous areas.

All employees who work in in or near the drill site area are responsible for purchasing and wearing foot protection to comply with this policy.

The Safety Manager is responsible for the selection and implementation of an onsite shoe vendor once each fiscal year. He or she also coordinates and addresses any shoe complaints, returns, or replacements for employees.

The Safety Manager is responsible for informing new employees who are assigned in or near the drill site area of the foot protection policy and the procedures for obtaining them. The new employee is responsible for reporting to his or her first day of work wearing approved foot protection.

Hand Protection -- Gloves

It is the policy of the company that as a condition of employment, all regular full time, part time, and temporary employees working in designated work areas and/or job assignments are required to wear gloves to help prevent hand injuries, including cuts, burns, and chemical exposure.

All employees required to wear protective gloves must routinely inspect and properly care for their assigned gloves.

Head protection

To help prevent head injuries, including those resulting from falling objects, bumping the head against a fixed object, or electrical shock, it is the policy of the company that as a condition of employment, all regular full time, part time, and temporary employees working in designated work areas and/or job assignments are required to wear either:

- head protection that complies with the 1997 edition of ANSI Z89.1, "American National Standard for Personnel Protection — Protective Headwear for Industrial Workers — Requirements," or the 2003 or 2009 editions of ANSI Z89.1, "American National Standard for Industrial Head Protection," or
- head protection devices our company can demonstrate to be just as effective.

Employees in well sites and pumping stations are required to wear head protection. Well sites have the potential for falling objects due to the height and nature of work involved during drilling operation and constriction.

The type of head protection required will be hard hat helmets.

Employees from temporary work agencies and contractors are required to wear head protection if assigned to work in well sites or pumping stations.

All supervisors and managers are responsible for ensuring employees under their charge are in compliance with this policy.

All employees required to wear head protection must routinely inspect and properly care for their head protection.

Respiratory Protection Plan

University of Utah - Energy & Geoscience Institute

Utah FORGE Project – Milford, Utah

Completed by: Garth Larsen
Completed Date: 12/11/2015

Respiratory Protection Plan

This Respiratory Protection Plan (RPP) specifies standard operating procedures to protect each Utah FORGE Project employee from respiratory hazards (as according to the requirements of 29 CFR 1926.103, which refers to 29 CFR 1910.134). Respirators will be used only where engineering control of respiratory hazards is not feasible, while engineering controls are being installed, or in emergencies.

Administrative Duties

University of Utah - Energy & Geoscience Institute Utah FORGE Project Managing PI, Joe Moore, is RPP Administrator. The RPP Administrator is responsible for all facets of this plan, and has full authority to make necessary decisions to ensure its success, including hiring personnel and purchasing equipment. The RPP Administrator will develop written detailed instructions covering each of the basic elements in this plan, and is the sole person authorized to amend these instructions.

Garth Larsen, Safety Manager, will assist the RPP Administer in overseeing respiratory protection efforts and conduct the required evaluations of plan effectiveness.

Employees may review a copy of our Respiratory Protection Plan, which will be located at the Energy and Geoscience Institute at the University of Utah, 423 Wakara Way Suite # 300, Salt Lake City, Utah. RPP Administrator, Joe Moore, Utah FORGE Project Managing PI, reviews this plan periodically to ensure its effectiveness.

Respirator Selection

Respirators will be selected on the basis of respiratory hazards the worker is exposed to, and workplace and user factors that affect respirator performance and reliability. All selections are made by the Program Administrator, Joe Moore, Utah FORGE Project Managing PI, or Garth Larsen, Safety Manager. The Utah FORGE Project's selection procedures follow OSHA requirements.

Selection Procedure Checklist

Follow these guidelines when selecting general use respirators.

- Select and provide respirators based on respiratory hazard(s) to which a worker is exposed and workplace and user factors that affect respirator performance and reliability.
- Select a NIOSH-certified respirator. NIOSH stands for the National Institute for Occupational Safety and Health.
- Identify and evaluate the respiratory hazard(s) in the workplace, including a reasonable estimate of employee exposures to respiratory hazard(s) and an identification of the contaminant's chemical state and physical form. Consider the atmosphere to be immediately dangerous to life or health (IDLH) if you cannot identify or reasonably estimate employee exposure.
- Select respirators that are acceptable to and correctly fit the user.

Follow these guidelines when selecting respirators for IDLH atmospheres.

- Provide selected respirators:
    - a full facepiece pressure demand self-contained breathing apparatus (SCBA) certified by NIOSH for a minimum service life of thirty minutes, or
    - a combination full facepiece pressure demand supplied-air respirator self-contained breathing apparatus (SAR) with auxiliary self-contained air supply.

- Select NIOSH-certified respirators for escape from the atmosphere in which they will be used when they are used only for escape from IDLH atmospheres.
- Consider all oxygen-deficient atmospheres to be IDLH. An exception to this requirement can be made if it can be demonstrated that, under all foreseeable conditions, the oxygen concentration can be maintained within the ranges specified in Table II of 29 CFR 1910.134 (i.e., for the altitudes set out in the table).

Follow these guidelines when selecting respirators for atmospheres that are not IDLH.

- Select a respirator that is adequate to protect the health of the employee and ensure compliance with all other OSHA statutory and regulatory requirements, under routine and reasonably foreseeable emergency situations.
- Select a respirator that meets or exceeds the required level of employee protection by using the assigned protection factors (APFs) listed in §1910.134 Table 1. [Effective Nov. 22, 2006].
- For combination respirators (e.g., airline respirators with an air-purifying filter), ensure that the APF is appropriate to the mode of operation in which the respirator is being used. [Effective Nov. 22, 2006].
- Select a respirator for employee use that maintains the employee's exposure to the hazardous substance at or below the maximum use concentration (MUC), when measured outside the respirator. [Effective Nov. 22, 2006].
- Do not apply MUCs to conditions that are immediately dangerous to life or health (IDLH); instead use respirators listed for IDLH conditions in §1910.134(d)(2). [Effective Nov. 22, 2006].
- Set the MUC at the lower limit when the calculated MUC exceeds the IDLH level for a hazardous substance or the performance limits of the cartridge or canister. [Effective Nov. 22, 2006].
- Select respirators appropriate for the chemical state and physical form of the contaminant.
    - For protection against gases and vapors, select: an atmosphere-supplying respirator, or
    - an air-purifying respirator, provided that: (1) The respirator is equipped with an end-of-service-life indicator (ESLI) certified by NIOSH for the contaminant; or (2) If there is no ESLI appropriate for conditions in our workplace, implement a change schedule for canisters and cartridges that is based on objective information or data that will ensure that canisters and cartridges are changed before the end of their service life. Describe in the respirator program the information and data relied upon and the basis for the canister and cartridge change schedule and the basis for reliance on the data.
    - For protection against particulates, select: an atmosphere-supplying respirator, or
    - an air-purifying respirator equipped with a filter certified by NIOSH under 30 CFR part 11 as a high efficiency particulate air (HEPA) filter, or an air-purifying respirator equipped with a filter certified for particulates by NIOSH under 42 CFR 84, or
    - for contaminants consisting primarily of particles with mass median aerodynamic diameters (MMAD) of at least 2 micrometers, an air-purifying respirator equipped with any filter certified for particulates by NIOSH.

Respirator Types and Uses

Only NIOSH-certified respirators will be selected and used. Where practicable, the respirators will be assigned to individual workers for their exclusive use.

Fit Testing Procedures

Respirators must fit properly to provide protection. If a tight seal is not maintained between the facepiece and the employee's face, contaminated air will be drawn into the facepiece and inhaled by the employee. Fit testing seeks to protect the employee against breathing contaminated ambient air and is one of the core provisions of our respirator program.

In general, fit testing may be either qualitative or quantitative. Qualitative fit testing (QLFT) involves the introduction of a gas, vapor, or aerosol test agent into an area around the head of the respirator user. If that user can detect the presence of the test agent through subjective means, such as odor, taste, or irritation, the respirator fit is inadequate.

In a quantitative respirator fit test (QNFT), the adequacy of respirator fit is assessed by measuring the amount of leakage into the respirator, either by generating a test aerosol as a test atmosphere, using ambient aerosol as a test agent, or using controlled negative pressure to measure the volumetric leak rate. Appropriate instrumentation is required to quantify respirator fit in QNFT.

The Utah FORGE Project will fit test employees and team members at the following times with the same make, model, style, and size of respirator that will be available for their protection:

- before any of our employees or team members are required to use any respirator with a negative or positive pressure tight-fitting facepiece,
- whenever a different respirator facepiece (size, style, model, or make) is used,
- at least annually,
- whenever the employee or team member reports, Safety Manager or RPP Administrator makes visual observations of changes in the employee's physical condition that could affect respirator fit. Such conditions include, but are not limited to, facial scarring, dental changes, cosmetic surgery, or an obvious change in body weight, and
- when the employee, subsequently after passing a QLFT or QNFT, notifies the company, RPP Administrator, supervisor, or PLHCP that the fit of the respirator is unacceptable.

Employees and selected team members must pass one of the following fit test types that follow the protocols and procedures contained in 29 CFR 1910.134 Appendix A:

- QLFT (Only used to fit test negative pressure air-purifying respirators that must achieve a fit factor of 100 or less. May be used to test tight-fitting atmosphere-supplying respirators and tight-fitting powered air-purifying respirators if tested in the negative pressure mode), or
  QNFT (May be used to fit test a tight-fitting half facepiece respirator that must achieve a fit factor of 100 or greater OR a tight-fitting full facepiece respirator that must achieve a fit factor of 500 or greater OR tight-fitting atmosphere-supplying respirators and tight-fitting powered air-purifying respirators if tested in the negative pressure mode).

Proper Use Procedures

Once the respirator has been properly selected and fitted, its protection efficiency must be maintained by proper use in accordance with 29 CFR 1910.134(g). The Utah FORGE Project uses the following checklist to ensure that proper use procedures include coverage of OSHA requirements.

Facepiece Seal Protection

- Do not permit respirators with tight-fitting facepieces to be worn by employees who have:
  - Facial hair that comes between the sealing surface of the facepiece and the face or that interferes with valve function; or
  - Any condition that interferes with the face-to-facepiece seal or valve function.
- If an employee wears corrective glasses or goggles or other personal protective equipment, ensure that such equipment is worn in a manner that does not interfere with the seal of the facepiece to the face of the user.

- For all tight-fitting respirators, ensure that employees perform a user seal check each time they put on the respirator using the procedures in 29 CFR 1910.134 Appendix B-1 (User Seal Check Procedures) or procedures recommended by the respirator manufacturer that you can demonstrate are as effective as those in Appendix B-1.

Continuing Respirator Effectiveness

- Appropriate surveillance will be maintained of work area conditions and degree of employee exposure or stress. When there is a change in work area conditions or degree of employee exposure or stress that may affect respirator effectiveness, reevaluate the continued effectiveness of the respirator.
- Ensure that employees leave the respirator use area:
    - to wash their faces and respirator facepieces as necessary to prevent eye or skin irritation associated with respirator use, or
    - if they detect vapor or gas breakthrough, changes in breathing resistance, or leakage of the facepiece, or
    - to replace the respirator or the filter, cartridge, or canister elements.
- If the employee detects vapor or gas breakthrough, changes in breathing resistance, or leakage of the facepiece, replace or repair the respirator before allowing the employee to return to the work area.

Procedures for IDLH Atmospheres

Ensure that:

- one employee or, when needed, more than one employee is located outside the IDLH atmosphere,
- visual, voice, or signal line communication is maintained between the employee(s) in the IDLH atmosphere and the employee(s) located outside the IDLH atmosphere,
- the employee(s) located outside the IDLH atmosphere are trained and equipped to provide effective emergency rescue,
- the employer or designee is notified before the employee(s) located outside the IDLH atmosphere enter the IDLH atmosphere to provide emergency rescue,
- the employer or designee authorized to do so by the the Utah FORGE Project, once notified, provides necessary assistance appropriate to the situation,
- employee(s) located outside the IDLH atmospheres are equipped with:
    - pressure demand or other positive pressure self-contained breathing apparatuses (SCBAs), or a pressure demand or other positive pressure supplied-air respirator with auxiliary SCBA, and either
    - appropriate retrieval equipment for removing the employee(s) who enter(s) these hazardous atmospheres where retrieval equipment would contribute to the rescue of the employee(s) and would not increase the overall risk resulting from entry, or
    - equivalent means for rescue where retrieval equipment is not required under the bullet item above this one.

Procedures for Interior Structural Firefighting

In addition to the requirements in the Procedures for IDLH Atmospheres, in interior structural fires, ensure that:

- at least two employees enter the IDLH atmosphere and remain in visual or voice contact with one another at all times,
- at least two employees are located outside the IDLH atmosphere, and
- all employees engaged in interior structural firefighting use SCBAs.

- One of the two individuals located outside the IDLH atmosphere may be assigned to an additional role, such as incident commander in charge of the emergency or safety officer, so long as this individual is able to perform assistance or rescue activities without jeopardizing the safety or health of any firefighter working at the incident.
- Nothing in this Proper Use Procedures section is meant to preclude firefighters from performing emergency rescue activities before an entire team has assembled.

Maintenance and Care Procedures

To ensure continuing protection from respiratory protective devices, it is necessary to establish and implement proper maintenance and care procedures and schedules. *Cleaning & Disinfecting*

The Utah FORGE Project will provide each respirator user with a respirator that is clean, sanitary, and in good working order. We ensure that respirators are cleaned and disinfected using the procedures in Appendix B-2 of 29 CFR 1910.134, or the procedures recommended by the respirator manufacturer that are equivalent to those in Appendix B-2 of 29 CFR 1910.134.

The respirators will be cleaned and disinfected at the following intervals.

Respirator type:	**Are cleaned and disinfected at the following interval:**
Issued for the exclusive use of an employee	As often as necessary to be maintained in a sanitary condition
Issued to more than one employee	Before being worn by different individuals
Maintained for emergency use	After each use
Used in fit testing and training	After each use

Storage

Respirators must be properly stored to ensure that the equipment is protected and not subject to environmental conditions that may cause deterioration. Respirators will be stored to protect them from damage, contamination, dust, sunlight, extreme temperatures, excessive moisture, and damaging chemicals, and they are packed or stored in locking cabinets to prevent deformation of the facepiece and exhalation valve. In addition, emergency respirators are kept accessible to the work area, in lockers that are clearly marked as containing emergency respirators, and stored in accordance with any applicable manufacturer instructions.

Inspection

In order to assure the continued reliability of respirator equipment, it must be inspected on a regular basis. The frequency of inspection is related to the frequency of use. The respirators will be inspected at the following frequencies.

Respirator type:	**Inspected at the following frequencies:**

All types used in routine situations	Before each use and during cleaning
Maintained for use in emergency situations	At least monthly and in accordance with the manufacturer's recommendations, and checked for proper function before and after each use
Emergency escape-only respirators	Before being carried into the workplace for use

We have created the following schedule(s) to be used for each respirator. To assure the continued reliability of respirator equipment, respirators must be inspected on a regular basis. The frequency of inspection is related to the frequency of use. All types of respirators used in routine situations must be inspected before each use and during cleaning. Respirators maintained for use in emergency situations must be inspected at least monthly and in accordance with the manufacturer's recommendations, and checked for proper function before and after each use. Emergency escape-only respirators must be inspected before being carried into the workplace for use.

All respirator inspections will include the following checks for respirator function, tightness of connections, and the condition of the various parts including, but not limited to, the facepiece, head straps, valves, connecting tube, and cartridges, canisters or filters; and of elastomeric parts for pliability and signs of deterioration.

For self-contained breathing apparatus, in addition to the above, monthly, we maintain air and oxygen cylinders in a fully charged state and recharge when the pressure falls to 90% of the manufacturer's recommended pressure level and determine that the regulator and warning devices function properly.

For respirators maintained for emergency use, we will certify the respirator by documenting the date the inspection was performed, the name (or signature) of the person who made the inspection, the findings, required remedial action, and a serial number or other means of identifying the inspected respirator (see attached documentation). This information shall be maintained until replaced following a subsequent certification.

Repairs

Respirators that fail an inspection or are otherwise found to be defective will be removed from service, and will be discarded or repaired or adjusted in accordance with the following procedures.

- Repairs or adjustments to respirators will be made only by persons appropriately trained to perform such operations and only with the respirator manufacturer's NIOSH-approved parts designed for the respirator.
- Repairs will be made according to the manufacturer's recommendations and specifications for the type and extent of repairs to be performed.
- Reducing and admission valves, regulators, and alarms will be adjusted or repaired only by the manufacturer or a technician trained by the manufacturer.

Discarding of respirators

Respirators that fail an inspection or are otherwise not fit for use and cannot be repaired will be discarded.

Air Quality Procedures

When atmosphere-supplying respirators are being used to protect employees it is essential that the air being breathed is of sufficiently high quality. The Utah FORGE Project's procedures to ensure adequate air quality, quantity, and flow of breathing air for atmosphere-supplying respirators include coverage of the following OSHA requirements.

Compressed Air, Compressed Oxygen, Liquid Air, and Liquid Oxygen Used for Respirators

- Compressed and liquid oxygen must meet the United States Pharmacopoeia requirements for medical or breathing oxygen.
- Compressed breathing air must meet at least the requirements for Grade D breathing air described in ANSI/Compressed Gas Association Commodity Specification for Air, G-7.1-1989, to include:
    - oxygen content (v/v) of 19.5-23.5%,
    - hydrocarbon (condensed) content of 5 milligrams per cubic meter of air or less,
    - carbon monoxide (CO) content of 10 parts per million (ppm) or less,
    - carbon dioxide content of 1,000 ppm or less, and
    - lack of a noticeable odor.
- Ensure that compressed oxygen is not used in atmosphere-supplying respirators that have previously used compressed air.
- Ensure that oxygen concentrations greater than 23.5% are used only in equipment designed for oxygen service or distribution.

Cylinders Used to Supply Breathing Air to Respirators

- Cylinders must be tested and maintained as prescribed in the Shipping Container Specification Regulations of the Department of Transportation (49 CFR 180).
- Cylinders of purchased breathing air must have a certificate of analysis from the supplier that the breathing air meets the requirements for Grade D breathing air.
- The moisture content in the cylinder must not exceed a dew point of -50 deg. F (-45.6 deg. C) at 1 atmosphere pressure.

Breathing Gas Containers

Use NIOSH-approved breathing-gas containers, marked and maintained in accordance with the Quality Assurance provisions of the NIOSH approval for the SCBA as issued in accordance with 42 CFR 84.

Filters, Cartridges, and Canisters:

Ensure that all filters, cartridges and canisters used in the workplace are labeled and color-coded with the NIOSH approval label and that the label is not removed and remains legible.

Training

The most thorough respiratory protection program will not be effective if employees do not wear respirators, or do not wear them properly. Utah FORGE Project employees and team members will be trained in proper respirator use.

The Utah FORGE Project's RPP training program provided by Garth Larsen covers both the respiratory hazards to which our employees are potentially exposed during routine and emergency situations, and the proper use of respirators, including putting on and removing them, any limitations on their use, and their maintenance.

The Utah FORGE Project requires all of our employees to be retrained annually and when any of the following situations occur:

- changes in the workplace or the type of respirator render previous training obsolete,
- inadequacies in the employee's knowledge or use of the respirator indicate that the employee has not retained the requisite understanding or skill, or
- any other situation in which retraining appears necessary to ensure safe respirator use.

General Requirements

The general requirements of 29 CFR 1910.134 are: develop a written program, properly select respirators, evaluate respirator use, correct deficiencies in respirator use, conduct medical evaluations, provide for the maintenance, storage, and cleaning of respirators, and retain and provide access to specific records.

Information for employees using respirators when not required under the standard

Respirators are an effective method of protection against designated hazards when properly selected and worn. Respirator use is encouraged, even when exposures are below the exposure limit, to provide an additional level of comfort and protection for workers. However, if a respirator is used improperly or not kept clean, the respirator itself can become a hazard to the worker. Sometimes, workers may wear respirators to avoid exposures to hazards, even if the amount of hazardous substance does not exceed the limits set by OSHA standards. If your employer provides respirators for your voluntary use, or if you provide your own respirator, you need to take certain precautions to be sure that the respirator itself does not present a hazard.

Each employee should do the following.

- Read and heed all instructions provided by the manufacturer on use, maintenance, cleaning and care, and warnings regarding the respirators limitations.
- Choose NIOSH respirators certified for use to protect against the contaminant of concern. A label or statement of certification should appear on the respirator or respirator packaging. It will tell you what the respirator is designed for and how much it will protect you.
- Do not wear your respirator into atmospheres containing contaminants for which your respirator is not designed to protect against. For example, a respirator designed to filter dust particles will not protect you against gases, vapors, or very small solid particles of fumes or smoke.
- Keep track of your respirator so that you do not mistakenly use someone else’s respirator.

Program Evaluation

It is inherent in respirator use that problems with protection, irritation, breathing resistance, comfort, and other respirator-related factors may arise in most respirator protection programs. The Utah FORGE Project will try to eliminate as many potential respirator problems as possible to improve respiratory protection and encourage employee acceptance and safe use of respirators. Our RPP Administrator, Joe Moore, Utah FORGE Project Managing PI, will evaluate and, as necessary, revise our RPP, to eliminate problems. Evaluations of the workplace will be conducted to ensure that the provisions of the current written program are being effectively implemented and that it continues to be effective. Employees required to use respirators will be consulted regularly to assess their views on program effectiveness and to identify any problems. Any problems that are identified during this assessment must be corrected. Factors to assess include, but are not limited to: respirator fit (including the ability to use the respirator without interfering with effective workplace performance), appropriate respirator selection for the hazards to which the employee is exposed, proper respirator use under the workplace conditions the employee encounters, and proper respirator maintenance

Signs and Tags Compliance Program Plan

University of Utah - Energy & Geoscience Institute

Utah FORGE Project - Milford, Utah

Completed by: Garth Larsen
Completed Date: 12/14/2015

Signs and Tags Compliance Program

Purpose

Many operations by their nature involve a certain amount of risk that cannot be controlled through engineering measures. These situations require careful planning and prevention measures. Safety markings, such as signs, labels, tags, barricades, signals, and other markings, have been developed as one means of preventing work accidents and subsequent injury. These markings tell employees, team members, and visitors about hazards and warn them to be careful.

Throughout the regulations, there are many different types of marking requirements, including:

29 CFR 1910.144, Safety Color Code for Marking Physical Hazards;

29 CFR 1910.145, Specifications for Accident Prevention Signs and Tags; and

29 CFR 1926.200 to.203, Signs, Signals, and Barricades.

The Utah FORGE Project intends to comply with the marking regulations and also take a proactive approach to injury prevention that focuses on our hazards and on the markings that can help protect our employees, team members, and visitors from those hazards.

Administrative Duties

Joe Moore, Utah FORGE Project Managing PI, is responsible for developing and maintaining the written Signs and Tags Compliance Program. This program is kept at the Energy and Geoscience Institute at the University of Utah, 423 Wakara Way Suite #300, Salt Lake City, Utah. Contact Joe Moore or Garth Larsen, Safety Manager, for a copy of our program.

Hazard Evaluation

Joe Moore, Utah FORGE Project PI, and Garth Larsen, Safety Manager, are responsible for the Utah FORGE Project's hazard evaluation. They:

- evaluate hazards as part of the process of changing, designing, or purchasing equipment, chemicals, or processes,
- review existing safety and health records and reports,
- identify and review all safety data sheets and labels of hazardous chemicals,
- observe employees to determine if the way they approach their job increases a hazard for themselves or others, and
- perform a work area hazard inspection by interviewing employees, observing employees, videotaping or photographing conditions, evaluating risk factors, or using an inspection checklist.

Once a hazard is identified, Joe Moore, Utah FORGE Project PI, and/or Garth Larsen, Safety Manager, determines whether or not:

- the hazard is required to be marked according to regulations, or

- failure to identify hazards may lead to property damage and/or to accidental injury to workers and/or the public.

Joe Moore, Utah FORGE Project PI, and Garth Larsen, Safety Manager, will perform hazard evaluations annually and whenever new equipment is installed.

Once Joe Moore, Utah FORGE Project PI, and Garth Larsen, Safety Manager, determine a marking to be necessary, they will ensure that the proper marking is placed at the hazard as soon as possible.

Safety Colors

In order to have uniform marking colors, the Utah FORGE Project will use the following color scheme:

- Safety red identifies FIRE, DANGER, or STOP. It is most commonly used in flammable liquid identification, emergency stop switches, and fire protection equipment. Danger indicates an immediately hazardous situation that could cause death or serious injury.
- Safety orange indicates WARNING. Orange identifies hazardous equipment or situations. Common uses include marking machine hazards which pose cut, crush, or pinch injuries, and for marking insides of movable guards which allow access to gears, chains, and the like. Warning indicates a potentially hazardous situation that could result in death or serious injury.
- Safety yellow denotes CAUTION. Used with black lettering, yellow identifies hazards that might result in tripping or falling, flammable material storage, or containers for corrosive or unstable materials. Caution indicates a potentially hazardous situation that may result in moderate injury.
- Safety green denotes SAFETY INSTRUCTION. Green identifies the locations of safety equipment (like eye washes), exits, and first-aid equipment.
- Safety blue indicates NOTICE. It is the color that identifies safety information signs such as personal protective equipment requirements.

Tags

Tags are cards, papers, pasteboard, plastic, or other material that identify a hazardous condition. Tags are used as a means to prevent accidental injury or illness to employees who are exposed to hazardous or potentially hazardous conditions, chemicals, equipment, or operations which are out of the ordinary, unexpected, or not readily apparent. Tags must be used until such time as the identified hazard is eliminated or the hazardous operation is completed. Tags need not be used where signs, guarding, or other positive means of protection are being used.

Utah FORGE Project tags contain a signal word and a major message, according to the regulations. They are affixed as close as safely possible to their respective hazards by a positive means such as string, wire, or adhesive that prevents their loss or unintentional removal. The Safety Manager will consider the environment where the tag will be placed in order to select one that can withstand its environment throughout its expected use.

Joe Moore and Garth Larsen are responsible for authorizing, applying, and removing all tags. Garth Larsen will inspect our Utah FORGE Project weekly to ensure that soiled, unreadable, or missing tags are replaced.

Visitor Safety Plan

University of Utah - Energy & Geoscience Institute

Utah FORGE Project – Milford, Utah

Completed by: Garth Larsen
Completed Date: 12/16/2015

Visitor Safety Plan

Purpose

This Visitor Safety Plan establishes uniform requirements designed to safeguard the health and safety of visitors and minimize the possibility of injury or harm to visitors while visitors are present at our facility. This plan ensures that visitors and employees are aware of, understand, and follow the visitor safety rules and restrictions.

Under this plan, visitors are defined as any individual who is not part of the Utah FORGE Project team, an employee of the Energy and Geoscience Institute, or an employee of a company specifically contracted to work at the Utah FORGE Project. Visitors may include, but are not limited to, researchers, DOE employees, political and governmental leaders, and students. However, visitors do not include employees of contractors and sub-contractors working on site (under contract) on the Utah FORGE Project.

The Utah FORGE Project is committed to the safety and protection of employees and visitors. The project will establish an environment of safety and welfare that will afford the utmost protection for all visitors and employees. The project will ensure all visitors and employees have adequate training and hazard awareness to ensure compliance and strict adherence to safety and environmental policy. This policy covers all visitors when visitors are present at our facility.

Administrative Duties

Joe Moore, Utah FORGE Project Managing PI, the project's Visitor Safety Plan Administrator, is responsible for developing and maintaining the Visitor Safety Plan, is solely responsible for all facets of the plan, and has full authority to make necessary decisions to ensure the success of this plan. Our Plan Administrator is also qualified by appropriate training and experience that is commensurate with the complexity of the plan to administer or oversee our Visitor Safety Plan.

The Visitor Safety Plan is kept at the following location: Energy and Geoscience Institute at the University of Utah, 423 Wakara Way Suite # 300, Salt Lake City, Utah and Utah FORGE Project office bldg., located near Milford, Utah. Copies of the plan may be obtained by contacting Joe Moore, Utah FORGE Project Managing PI, or Garth Larsen, Safety Manager.

Company Rules and Restrictions

To protect visitors, employees, and the company itself, the following rules and restrictions will be adhered to.

All visitors will be required to report to the site supervisor located at the Utah FORGE Project Office bldg. located near Milford, Utah, prior to any activity or site tours. All visitors will be required to attend a Safety Rules and Facility Restrictions for Visitors orientation after which they will be required to sign and date a log that signifies he or she has received and understands the Safety Rules and Facility Restrictions for Visitors. This orientation will include, but is not limited to, all pertinent health and safety rules, hazards and warning signs, as well as restricted areas and required personal protective equipment (PPE) necessary for visitor protection.

Protective Equipment

Garth Larsen, Safety Manager, is responsible for ensuring the provisions of this Protective Equipment section are met. Hard hats, safety glasses, and ear protection (disposable ear plugs) used by visitors at this facility will be provided without cost to visitors; visitors will need to provide their own hard-toe boots. Protective equipment will be chosen based on anticipated hazards and will be provided to visitors based on the job safety analysis as well as the PPE assessment for work site areas. The following protective equipment will be required:

Work area:	Protective equipment required:
Well sites	hard hat, safety glasses, and hard-toe shoes
Drill rig sites	hard hat, safety glasses, and hard-toe shoes
Pump stations	hard hat and hard-toe shoes

In order to assure the continued reliability of protective equipment, it must be inspected and cleaned on a regular basis. The frequency of inspection is related to the frequency of use.

Protective equipment that fails an inspection or is otherwise found to be defective will be discarded and replaced immediately.

Recordkeeping

Garth Larsen will maintain all records and logs related to visitors and orientation. These records will be located at the Utah FORGE Project Office bldg. located near Milford, Utah.