



Health & Safety Plan

Mobile Flowback Water Treatment System



Iron Eagle Treatment System Health and Safety Program

RFI Project Number: 097882000

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Table of Contents

1.0 - Introduction	3
2.0 - Responsibilities	4
3.0 - Site Description	4
4.0 - Treatment/Process Description	5
5.0 - Planned Field Activities	7
6.0 - Hazard Evaluation	7
6.1 - Hazard and Control Overview	7
6.2 - Potential for Hydrocarbon Release	9
6.3 - 911 Address	9
7.0 - Site Control	9
8.0 - Required PPE	9
9.0 - Safe Work Practices	10
9.1 - General Work	10
10.0 - Emergency Plan	10
10.1 - Communications	11
10.2 - Injuries/Illnesses	11
10.3 - Fire/Explosion	12
10.4 - Hazardous Weather	12
11.0 - Reference	13
APPENDIX - Material Safety Data Sheet (MSDS)	14

1.0 Introduction

RETTEW Flowback Inc. (RFI) has been authorized by Iron Eagle Enterprises (IE) to mobilize and operate a mobile flowback treatment system at the Sherrodsville, OH processing site. This Project Specific Health and Safety Plan (PSHASP) has been developed for RFI personnel to address any environmental health and safety issues that may arise during routine operational activities. The objective of the PSHASP is to establish procedures to ensure that safe working conditions are maintained and that adequate personnel protection measures are taken during field activities.

This PSHASP has been prepared in accordance with the regulations set forth by the Occupational Safety and Health Administration (OSHA), OSHA Regulations (Standards - 29 CFR), Part No. 1910 Occupational Safety and Health Standards' Standard No. 1910.120' "Hazardous Waste Operations and Emergency Response" (29 CFR 1910.120). Policies and procedures outlined in this manual have been taken from applicable information outlined in RFI's "Policy and Procedures Manual".

A copy of the PSHASP will be kept on-site at all times during field operations. All reasonable precautions will be taken by RFI to ensure the safety and health of workers. Any subcontractors used will be required to supply their own plan containing appropriate requirements

2.0 Responsibilities

The following RFI project personnel have been designated:

Title	Name	Affiliation	Telephone No.
Site Manager	Ryan Mastowski	RFI	(724) 366-2160
Field Supervisor	Jeff Yocum	RFI	(717) 327-6009
Health and Safety Coordinator	Curtis Yeager	RETTEW	(570) 380-9414
Safety Technician	Matt Pollart	RETTEW	(717) 319-7728
RFI Director	Chris Foreman	RFI	(717) 496-3223
Safety Director	Luke Lazar	RETTEW	(717) 645-0268
Vice President	Yves Pollart	RFI	(717) 475-0397

3.0 Site Description

RFI will mobilize its treatment systems for Phase 1 at 298 S. Church Sreet, Sheerodsville, OH 44675. This site has been defined by the following characteristics:

- Graded location with stone substrate topped with secondary containment.
- Location is generally free of trees and overhead wires.
- Phase 1 of this location houses numerous frac tanks containing both treated and untreated production water.
- All tanks, transfer lines, manifolds, and pumps will be within primary and secondary containment.
- Location is subject to truck traffic and associated activities.
- Location is manned with 24/7 Site Security personnel provided by RFI.

4.0 Treatment/Process Description

The primary objective of the treatment process is the chemical precipitation and filtration of all influent process waters for the purpose of reuse during the fracing process. This objective is achieved by chemical precipitation followed by coagulation and flocculation of the precipitated particles which can be effectively removed from the process water by clarification and filtration.

The subsequent sludge side stream as well as any water based muds delivered to the facility will be processed through a plate and frame press. All filtrate from this operation will be processed back through the chemical precipitation process described above. All sludge generated by the press will be stored in covered sludge boxes provided by Waste Management (or similar disposal company) until full screening of each sludge box is performed. Once the screening is provided, the sludge box will be transported by Waste Management (or similar firm) to America LF, Waynesburg, OH 44688 for final disposal.

The RFI System is currently comprised of the following components:

Main Treatment System

- Electric-driven influent pumps to convey influent process water to the treatment process from on-site storage tanks.
- Oil/Water separation (as needed).
- pH adjustment using a sodium hydroxide solution.
- Coagulation using an inorganic coagulant solution (e.g. poly aluminum chloride solution).
- Flocculation using an anionic polymer solution.
- Clarification/Settling.
- Filtration.
- Treated Effluent Storage.
- Disinfection.

Sludge Handling System

- Electric and air-driven pumps to supply process sludges and water based muds to the sludge handling system from on-site sludge storage tanks.
- Plate and frame press utilizing lime to stabilize pH and provide initial coagulation.
- Flocculation using a cationic polymer solution.
- Final sludge storage.
- Electric-driven filtrate pump.

Current Treatment Process Chemicals

- 50% Sodium Hydroxide solution (maximum of 500 gallons distributed and stored in 50 gallon drums).
- Poly Aluminum Chloride solution (maximum of 250 gallons distributed and stored in 50 gallon drums).
- Anionic Polymer mixed into a dilute solution in water for feed to the treatment process (maximum of 50 gallons distributed and stored in 50 gallon drum).
- 15% Sodium Hypochlorite (when needed for oxidation of metals – stored in 50 gallon drum).
- Biocide (maximum of 100 pounds distributed and stored in ½ pound individual bags).
- Lime (maximum of 500 pounds distributed and stored in 25 pound bags).
- Cationic Polymer mixed into a dilute solution in water for feed to the sludge handling system (maximum of 50 gallons distributed and stored in 50 gallon drum).

Please note: All chemicals are to be stored on-site in the main production facilities. These two facilities are climate controlled and provide separate storage allocations for each chemical classification. A separate chemical handling facility will be provided by RFI. All applicable Material Safety Data Sheets (MSDS) will be maintained onsite and electronically.

5.0 Planned Field Activities

The planned field activities will include all tasks associated with the mobilization, demobilization, and operation of the RFI treatment facility. For activities where field employees do not come into contact with hazardous material, RFI is not required to follow procedures outlined in 29 CFR 1910.120 and will utilize general site safety guidelines during these procedures. This PSHASP has been compiled to serve as guidance for safety procedures only during field activities where field employees come into contact with hazardous materials/situations.

General Description of Current Field Activities for a Given Work Day or Shift:

- Mobilize to pad and check in with site security.
- Fill out and discuss Daily Safety Form.
- Ensure the proper onloading and offloading off all materials.
- Check all equipment.
- Movement of pumps and hose.
- Operation of pumps.
- Operation of chemical feed systems.
- Changing of chemical feed drums.
- Operation of all equipment.
- Collection of influent and effluent samples.
- Refueling of equipment.
- Breakdown of pumps, hoses and equipment.
- Policing of Site.
- Demobilization.
- Sign out with site security.

6.0 Hazard Evaluation

6.1 Hazard and Control Overview

The potential hazards, both chemical and physical, that the workers may face during the planned field activities include the following:

- Physical/Chemical hazards associated with potential hydrocarbons received in untreated influent waters.
- Physical hazards associated with working in the vicinity of heavy machinery and truck traffic.
- Physical hazards associated with being splashed by potentially contaminated fluids, exposure to hot weather, slipping and falling due to wet or uneven surfaces, and fire or explosion.
- Physical hazards associated with inhalation of unknown contaminants that may or may not be present in the untreated production water.

- Chemical hazards associated include the potential exposure to chemicals, such as sodium hydroxide used for water treatment. The exposure pathways include inhalation, skin absorption, direct skin/eye contact and accidental ingestion. All MSDS for chemicals used for the treatment process are attached.
- Physical Hazards associated with lifting hose, moving pumps, sludge press operation and changing bag filters.

Potential Hazards on location:

Potential Hazard	Source(s)	Controls/Required PPE
Hydrocarbons	<ul style="list-style-type: none"> • Flow back operations outside of RFI control 	<ul style="list-style-type: none"> • Initial air monitoring using multi gas meter and periodic monitoring during the workday. • All RFI personnel will be tasked with maintaining a multi gas meter on their person throughout the work day while onsite.
Pinch Points	<ul style="list-style-type: none"> • Operation of sludge press 	<ul style="list-style-type: none"> • Ensure hands are free of moving parts prior to activation of unit.
Fire	<ul style="list-style-type: none"> • General operations 	<ul style="list-style-type: none"> • Fire resistant clothing.
Heavy Machinery/Traffic	<ul style="list-style-type: none"> • Transportation of Process and treated water 	<ul style="list-style-type: none"> • Awareness. • Constant contact via buddy system. • Usage of truck grounding systems.
Lifting Injuries	<ul style="list-style-type: none"> • Moving/Lifting hose • Moving/Lifting pumps 	<ul style="list-style-type: none"> • Use proper lifting techniques at all times. • Use of buddy system when applicable.
Pressurized Line Hazards	<ul style="list-style-type: none"> • Untreated and treated water line • Chemical feed lines • Sludge press feed lines 	<ul style="list-style-type: none"> • Daily inspections of lines and connections. • Consistent monitoring of lines. • Replacement of worn or damaged components.
Slips, Trips and Falls	<ul style="list-style-type: none"> • General worksite 	<ul style="list-style-type: none"> • Maintain clean/orderly work area. • Be aware of surroundings.
Hazards Associated with Splashing Fluids/Chemicals	<ul style="list-style-type: none"> • Moving/Lifting drums 	<ul style="list-style-type: none"> • Ensure all fittings are secure prior to system startup and monitor system pressures. • Wear proper PPE - Safety glasses/nitrile gloves/ etc.

6.2 Potential for Hydrocarbon Release

During normal treatment operations, there is the potential for release of small volumes of methane gas and other hydrocarbons. Due to this potential, continuous monitoring for the presence of methane is required. Should the multi gas meter indicate a concentration of 500 PPM, 10% of the LEL for methane, operations are to immediately cease. All pumps, equipment and generators are to be immediately shutdown.

Should evacuation be required, staff should immediately evacuate to the designated muster point at the site office.

6.3 911 Address

All 911 and emergency contact information will be posted on the safety boards located in main treatment facility and in the mobile chemical trailer.

7.0 Site Control

Access to active areas of the site is restricted. Only approved personnel will be admitted by Site Security. The pad is generally manned 24 hours per day, 7 days per week by RFI personnel.

8.0 Required PPE

Based on a hazard evaluation and review of existing site information, Level D is anticipated to be adequate for personnel involved in most field activities. The levels of personal protection, specific to this project, are defined as follows:

Level D

- Hard hat.
- Fire Resistant Clothing (coveralls or jacket/pants).
- Tyvek™ coveralls (optional and/or job specific).
- Chemical-resistant gloves (optional and/or job specific).
- Safety glasses, goggles, or face shield.
- Steel-toe boots.
- Disposable ear plugs or ear muffs with a noise reduction rating (NRR) of 35 decibels (optional). Not optional when noise level is above 85 decibels.
- Dust mask (optional).

Please note, when transferring chemicals, the full list of Level D equipment is required with the exception of Tyvek coverall, hearing protection and dust mask.

9.0 Safe Work Practices

9.1 General Work

A copy of this Project Specific Health and Safety Plan will be available for reference at the site during the planned field activities.

A 'tailgate' safety meeting will be conducted daily. Attendees will be recorded on the 'tailgate' safety meeting form.

Only those vehicles and equipment required to complete work tasks will be permitted within the work zone (such as excavators, support trucks, etc.). All non-essential vehicles will remain outside of the work zone.

Containers (such as drums) will be moved only with the proper equipment and will be secured to prevent dropping or loss of control during transport. Employ the buddy system when performing any activity within the work zone.

Field personnel must observe each other for signs of toxic exposure and heat/cold stress. Field personnel are advised to inform each other of non-visual effects of illness such as:

- Headaches
- Dizziness
- Nausea
- Blurred Vision
- Cramps
- Irritation of eyes, skin, or respiratory tract

If any indications of explosiveness or unusual conditions are observed, exit the site immediately and report to the RFI field supervisor.

Use proper personal lifting techniques; use of legs, not back.

10.0 Emergency Plan

A step-wise approach for dealing with emergency situations has been developed to address the immediate needs of on-site emergency activities. This plan describes the action that shall be implemented in the event of an emergency and includes a list of emergency telephone numbers to assist during the event. Pre-emergency planning will be discussed during the daily safety meetings to make personnel aware of the hazards and minimize the potential for health and safety accidents.

In the event of an emergency, a member of the field team will immediately call 911 or local emergency personnel and provide the appropriate information including the 911 Address and contact Site Security. Should evacuation be required, staff will immediately evacuate to the designated muster point.

At the conclusion of an emergency situation, the Field Supervisor will critique the emergency response effectiveness and record the event in accordance to OSHA Regulations (Standards — 29 CFR) Part No. 1904 Recording and Reporting Occupational Injuries and Illness Standard No. 1904.4 "Recordkeeping Forms and Recording Criteria" (29 CFR 1904.4). The required OSHA 300s forms as per attachment II will be fill-out in accordance OSHA Regulations (Standards — 29 CFR) Part No. 1904 Recording and Reporting Occupational Injuries and Illness Standard No. 1904.29 "Forms" (29 CFR 1904.29). The Field Supervisor will also interview all personnel involved to collect information on problems observed and suggestions for improvement.

10.1 Communications

On-site verbal communications should not be a problem since all tasks are anticipated to be performed in Level D protection. If the action level is exceeded and personnel are upgraded to Level C or Level B PPE, verbal communications may become difficult. A universal set of hand signals will then be used.

10.2 Injuries/Illnesses

In the event of an injury or chemical exposure where medical service is required, the Field Supervisor or the designee will call for emergency services immediately (via verbal communication to the Eyes on Eyes Representative/ or Site Security or via the on-site telephone or personal mobile phone). The Field Supervisor will evacuate the work area immediately. All workers will assemble in the muster area and wait for additional instruction. If the worker cannot be moved, then the Field Supervisor will wait for the arrival of the emergency medical services. The emergency medical service team will be provided with the chemical and physical hazards associated with the task by the Field Supervisor so that proper procedures for isolation can be taken before the injured worker can be transported. A first aid kit for use on minor cuts, abrasions, etc. will be kept on-site.

The Field Supervisor will then investigate the injury or chemical exposure prior to any resumption of work. Work will not resume until the cause of the incident has been identified and the hazards have been eliminated. The Field Supervisor will then complete an OSHA Injury and Illness Reporting Form (OSHA 300s Forms) and forward this to the office health and safety manager. The office health and safety manager will review all incidents and provide critique, when applicable, to the Field Supervisor and the project team.

10.3 Fire/Explosion

In the event of a fire/explosion, the Field Supervisor will evacuate the work area immediately. All workers will proceed to the Security Booth for further instruction. Dependent upon the type and magnitude of the emergency, the appropriate emergency response organizations will be notified by Field Supervisor or Site Security.

To prevent potential fire hazards, all vehicle or equipment refueling will take place with the vehicle shut off, and in a safe area without sources of ignition. Fuel for equipment will be stored and transported in metal containers, which will be properly secured during transit. Dry chemical fire extinguishers (A, B, and C type) will be kept aboard equipment and posted in well-marked, strategic areas throughout the work site.

10.4 Hazardous Weather

If hazardous weather conditions (e.g., thunderstorms) occur during operations, the Field Supervisor will stop work immediately. Field staff should maintain safe cover inside the main treatment building or within company vehicles. Once the immediate danger has passed, the Field Supervisor will signal for work to be restarted.

11.0 Reference

American Conference of Governmental Industrial Hygienists. 1994. 1994-1995 Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indexes.

National Institute of Occupational Safety and Health. 1994. Pocket Guide to Chemical Hazards. June 1994.

Occupational Safety and Health Administration (OSHA). OSHA Regulations (Standards - 29 CFR), Part No. 1910 Occupational Safety and Health Standards: Standard No. 1910.120. "Hazardous Waste Operations and Emergency Response",
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_i_d=9765, (2005).

Occupational Safety and Health Administration (OSHA). OSHA Regulations (Standards -29 CFR), Part No. 1904 Recording and Reporting Occupational Injuries and Illness, Standard No. 1904.4

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Occupational Safety and Health Administration (OSHA). OSHA Regulations (Standards -29 CFR), Part No. 1904 Recording and Reporting Occupational Injuries and Illness, Standard No. 1904.29 "Forms",
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_i_d=12805, (2005).

Occupational Safety and Health Administration (OSHA). OSHA Regulations (Standards -29 CFR), Part No. 1926 Safety and Health Regulations for Construction, Subpart F — "Fire Protection and Prevention",
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_i_d=10910, (2005).

APPENDIX

Material Safety Data Sheet (MSDS)

- 50% Sodium Hydroxide (Caustic Soda).
- 31% Hydrochloric Acid (pH adjustment when necessary).
- KlarAid IC1172 Polyaluminum Chloride Solution.
- PolyFloc AE1138 Anionic Liquid Polymer.
- Tetrakis (hydroxymethyl) Phosphonium Sulfate (THPS) – Biocide.
- Spectrus NX1113 – Biocide.
- Diesel Fuel.