



FLUID LEAK DETECTION PLAN

FOR

Bigfoot 11

Prepared For:



1120 Lincoln Street, Suite 801
Denver, CO 80203
www.cogcc.state.co.us

Prepared By:



600 17th Street, Suite 2800 Denver, CO
80202
www.rpgres.com

Date Prepared: October 29, 2021

Table of Contents

1. PLAN PURPOSE.....	3
2. INTRODUCTION & SITE DESCRIPTION	3
3. DRILLING OPERATIONS LEAK DETECTION MEASURES	3
4. COMPLETION OPERATIONS LEAK DETECTION MEASURES	4
5. DISCHARGE PREVENTION & PROCEDURES	4
5.1. Discharge Prevention Measures	4
5.2. Discharge and Draining Controls.....	4
5.3. Countermeasures for Discharge Discovery & Response.....	5
5.4. Disposal Methods in Accordance with Regulations.....	5
6. INSPECTIONS, TESTS, & RECORDS.....	5
6.1. Flow-Through Process Vessels and Produced Water Container Inspections	5
6.2. Facility Transfer Equipment Inspections.....	6
7. PERSONNEL & TRAINING	6
7.1. Training	6
7.2. Contact List / Designation of Accountable Personnel.....	6
7.3. Discharge Briefings for Personnel.....	6
8. PRECIPITATION ACCUMULATION MANAGEMENT.....	6
9. BULK STORAGE CONTAINERS & FLOW-THROUGH PROCESS VESSELS.....	7
9.1. Material Requirements	7
9.2. Secondary Containment.....	7
9.3. Good Engineering Practice.....	7
9.4. Flow-Through Process Vessels	7
10. SITE-SPECIFIC FLUID LEAK DETECTION BMPS	8
LITERATURE CITED	9

APPENDIX A – Site-Specific BMP List for Fluid Leak Detection

1. PLAN PURPOSE

The purpose and intent of this plan is to provide field wide and site-specific guidance and recommended best management practices that demonstrate one or more methods of meeting the requirements of Rule 304.c.(13) as an attachment to the Form 2A submittal of the titled project location. Confluence DJ, LLC (Confluence), as the operator, is submitting this site-specific Fluid Leak Detection Plan to satisfy all requirements of Rule 304.c.(13).

2. INTRODUCTION & SITE DESCRIPTION

Site operations at Confluence’s production facilities include extraction and separation of oil and gas and storage of oil and produced water. Typical equipment at these facilities includes wellhead(s), separators, heater treaters, storage tanks, and vapor recovery systems. Processes at these facilities additionally include initial treatment of wet gas streams. Products separated from the gas stream include crude oil and produced water which is stored in tanks for sale and transport to an oil processing facility for further stabilization and refinement. Natural gas generated at Confluence facilities is sold and piped downstream for further treatment.

All tanks and equipment are provided with general containment or sized-secondary containment. All aboveground piping containing oil is installed within secondary containment berms except for load lines which may or may not be installed within the containment. General containment is provided for any aboveground piping and flow-through process equipment not constructed or installed within tank berms.

Confluence’s proposed Bigfoot 11 pad is located in Township 4 North, Range 63 West, Section 11 in Weld County, CO. The proposed location is fee surface with a total pad disturbance of 17.67 acres with a working pad surface area of 11.2 acres and a production pad area of 6.9 acres after interim reclamation. The graded site elevation is expected to be approximately 4617 feet. Construction is anticipated to begin no sooner than March 2022.

3. DRILLING OPERATIONS LEAK DETECTION MEASURES

During drilling operations, Confluence keeps an accurate account of volume levels on all tanks, in particular the mud volumes in the active pits / tanks. This is done with PVT alarms to assist with monitoring overall active tank levels and ensure spills don’t occur, via surges or a severe downhole loss.

When completing transfers between the tank farm to the active system or the solids control equipment, Confluence will always use two people: one person will be at each end with a radio so they can communicate and don’t overfill or leave a pump running.

For containment, Confluence uses a liner under all drilling equipment holding OBM, distillate or diesel so leaks cannot touch the ground and are easier to identify.

Any time valves or fittings are damaged or broken, they are immediately replaced and retested to ensure proper function.

Crews perform multiple inspections per day around the backyard and rig to ensure there are no spills or minor leaks on any hose, connection, or other equipment.

4. COMPLETION OPERATIONS LEAK DETECTION MEASURES

During completion operations, Confluence keeps an accurate account of volume levels on all tanks, and transports. Automation and alarms are used for fuel.

When completing transfers between the transports, there are always two people on the transfer: one person at each end with a radio so they can communicate and don't overfill or leave a pump running. All transfers are done on containment.

For containment, Confluence uses an approved and inspected liner under all completions equipment holding any type of fluid, chemical or diesel so leaks cannot touch the ground and are easier to identify.

Any time there needs to be a connection, fluid is pumped to frac tanks. Then they are pressure tested to ensure there are no leaks when reconnected.

Crews/consultants perform multiple inspections per day around the equipment the pad to ensure there are no spills or minor leaks on any hose, connection, or other equipment.

5. DISCHARGE PREVENTION & PROCEDURES

5.1. Discharge Prevention Measures

The facilities rely on a number of measures to aide in the prevention of a discharge. Descriptions of these measures are provided below.

- Adequate containment volume to store process fluids in order to avoid overfill during normal operations;
- Routine equipment maintenance;
- Sized secondary containment for the tank batteries;
- Written loading and unloading procedures for tank trucks;
- High level alarms and automatic shut-offs;
- Regularly scheduled site inspections conducted by facility personnel; and
- Stored oil is compatible with the material which the storage containers are constructed.

5.2. Discharge and Draining Controls

The containment structures at each facility are designed to provide adequate protection against the discharge of oil. Secondary containment is provided for all bulk oil storage tanks and separators. General secondary containment is provided for all other oil-filled equipment and flow-through vessels.

In the rare case where oil or other material is released from a containment structure, the spill will be cleaned up immediately in order to prevent offsite discharge.

5.3. Countermeasures for Discharge Discovery & Response

As part of routine facility operational procedures, visual exterior inspections of the oil storage containers and equipment are conducted daily. Deficiencies noted from these examinations are corrected in a timely manner. In addition to the regular checks, the oil storage equipment is inspected on a regular basis, typically monthly according to written procedures.

Any discharge occurring at any of the facilities would be discovered by operational personnel during daily inspections. Upon discovery, the proper response procedures will be initiated immediately.

In the event of a release, each facility has trained personnel and equipment available to contain and clean up minor volumes of discharged oil. On-site response equipment and materials include spill kits, shovels, and sorbent materials (booms, sorbent pads, etc.) that may be used to dike, contain, and remove minor releases.

In the event of a larger discharge, specific response procedures have been developed. As part of these procedures, external contractors and their resources have been identified to assist facility personnel. To ensure the commitment of these external resources, Confluence maintains a service agreement with each selected contractor. A list of approved contractors is kept at the Confluence office. At a minimum, contractors identified to assist in a spill response will have the capabilities to provide emergency response, industrial power vacuuming, tank and pipeline cleaning, equipment decontamination, excavation/earthmoving and waste transportation and disposal services.

5.4. Disposal Methods in Accordance with Regulations

Materials recovered during a spill event will be appropriately containerized or will be remediated on site in accordance with Colorado Department of Public Health and Environment (CDPHE) stipulations. Soils and other solids will be placed in 55-gallon drums, roll-off containers, lined berms, or in other approved containers as warranted. Liquids will be placed in 55-gallon drums or will be collected in a tank truck using industrial power vacuuming. Materials removed from a facility where a spill occurred will be labeled, characterized and disposed/recycled in accordance with applicable federal, state and local regulations.

6. INSPECTIONS, TESTS, & RECORDS

Oil storage containers, oil-filled equipment and related containment structures at the facilities are visually examined on a daily basis. These inspections are conducted as part of normal facility operations. Deficiencies noted from these examinations are corrected in a timely manner. The equipment is also inspected and documented on a regular basis, monthly according to written procedures.

Signed and dated records of all monthly inspections and other pertinent information, such as spills, removal and disposal of spill contaminated materials, replacement or repair of equipment, and training are maintained for a minimum of 3 years at the Confluence office.

6.1. Flow-Through Process Vessels and Produced Water Container Inspections

Flow-through process vessels, produced water containers, and any associated piping and appurtenances downstream from the container will be periodically and upon a regular schedule visually inspected at

each container of oil for deterioration and maintenance needs, including the foundation and support of each container that is on or above the surface of the ground.

6.2. Facility Transfer Equipment Inspections

Periodically and upon a regular schedule all aboveground valves and piping associated with transfer operations for the general condition of flange joints, valve glands and bodies, drip pans, pipe supports, pumping unit polish rod stuffing boxes, bleeder and gauge valves, and other such items will be inspected.

7. PERSONNEL & TRAINING

Oil-handling personnel operating the facilities are trained in the operation and maintenance of equipment to prevent the discharge of oil; discharge procedure protocols; applicable pollution control laws, rules, and regulations; general facility operations; and the contents of the SPCC plan.

7.1. Training

At a minimum, training is conducted annually and whenever new spill regulations are promulgated, existing operating systems are modified, personnel responsibilities change or new personnel come onboard, or this SPCC plan is amended. In addition, regular safety meetings will be used as a forum to reinforce understanding of SPCC procedures as necessary. Attendance rosters and other training records will be maintained at the Confluence main office for a period of no less than three years.

7.2. Contact List / Designation of Accountable Personnel

The Contact List for oil spill response activities is provided as part of the Oil Spill Response Procedures developed for the facility. This list includes a facility response coordinator, National Response Center, cleanup contractors with whom Confluence has an agreement for response services, and all appropriate Federal, State, and local agencies who must be contacted in case of a discharge.

7.3. Discharge Briefings for Personnel

Discharge prevention briefings for oil-handling personnel are conducted along with the annual training described above. The training is conducted at least once a year to assure adequate understanding of this facility SPCC Plan. The briefing highlights and describes known discharges or failures, malfunctioning components, and any recently developed precautionary measures.

8. PRECIPITATION ACCUMULATION MANAGEMENT

Confluence procedure for managing precipitation that accumulates within bermed areas includes evaporation and off-site disposal. In all cases, Confluence personnel visually inspect accumulated precipitation for a sheen. If no sheen is present and the amount of water is small, the water will be allowed to evaporate. If a sheen is evident, absorbent mats will be used to recover the oil, and then the water will be re-inspected. If there is a considerable amount of oil or water within the containment, the fluid will be removed using a vacuum truck. Removed water will be disposed of offsite at a disposal facility in accordance with applicable local, state, and federal regulations.

9. BULK STORAGE CONTAINERS & FLOW-THROUGH PROCESS VESSELS

9.1. Material Requirements

All tanks are constructed with materials which are compatible with the materials stored in them.

9.2. Secondary Containment

A secondary means of containment is provided for all tank batteries, separation units, and treating equipment. Secondary containment structures for aboveground storage tanks are sized such that each will be able to contain the volume of the largest storage container and enough freeboard to contain precipitation from a 25-year 24-hour storm event. The undiked areas of each facility with the potential for a discharge include sections of aboveground piping.

9.3. Good Engineering Practice

Engineer or update new and old tank battery installations in accordance with good engineering practice to prevent discharges providing at least one of the following:

- **Container Capacity:** Container capacity adequate to assure that a container will not overflow if a pumper/gauger is delayed in making regularly scheduled rounds.
- **Retained Rainwater/Discharge Inspection:** Retained rainwater will be discharged as necessary only after ensuring it is free of contaminant and erosion will not occur as a result of the discharge.
- **Vacuum Protection:** Vacuum protection adequate to prevent container collapse during a pipeline run or other transfer of oil from the container.
- **High-Level Sensors:** High-level sensors to generate and transmit an alarm signal to the computer where each facility is subject to a computer production control system.

9.4. Flow-Through Process Vessels

The following alternate requirements may be implemented for flow-through process vessels in lieu of sized secondary containment:

- **Visual Inspection:** Periodically and on a regular schedule visually inspect and/or test flow-through process vessels and associated components (such as dump valves) for leaks, corrosion, or other conditions that could lead to a discharge.
- **Corrective Action and Repairs:** Take corrective action or make repairs to flow-through process vessels and any associated components as indicated by regularly scheduled visual inspections, tests, or evidence of an oil discharge.
- **Accumulation of Oil Discharges:** Promptly remove or initiate actions to stabilize and remediate any accumulations of oil discharges associated with flow-through process vessels.
- **Oil Discharges:** These facilities have not discharged more than 1,000 gallons of oil in a single discharge, or discharges more than 42 gallons of oil in each of two discharges within any 12-

month period, from flow-through process vessels (excluding discharges that are the result of natural disasters, acts of war, or terrorism).

10. SITE-SPECIFIC FLUID LEAK DETECTION BMPS

The site-specific BMP list for fluid leak detection on the Bigfoot 11 pad is included in Appendix A.

LITERATURE CITED

Colorado Oil and Gas Conservation Commission. 2021. Permitting Process 300 Series. Colorado Department of Natural Resources.

Confluence DJ, LLC. 2019. Spill Prevention Control and Countermeasure Plan. Prepared by Olsson.

APPENDIX A

Site-Specific BMP List for Fluid Leak Detection



FLUID LEAK DETECTION PLAN



Project Name:	Bigfoot 11	Region:	DJ Basin
Report Date:	8/9/2021	Field Name:	Wattenberg
County, State:	Weld County, CO	Proposed Start Date:	3/15/2022
Location (Township, Range, Section):	T4N, R63W, S11	Project Lat - Long:	40.32600,-104.41336

Site Specific Best Management Practices

Proposed BMP	Description
AVO Inspections	Operator will perform daily AVO inspection methods during all phases of activity. Operator will employ trained personnel and document all inspection findings, if any.
Inspection of Production Equipment	Operator will adhere to the inspection procedures for all production equipment as outlined and detailed in this Fluid Leak Detection Plan.
Approved Instrument Monitoring Method (AIMM) Inspections	As needed for drilling, completion, flowback and production operations, operator will implement AIMM for inspections on this location.
Spill Prevention	Operator will provide site specific training to all field employees on an annual basis. Training will include a review of past spills or failures. Training attendance logs and records of training sessions will be maintained by Operator for a minimum of 3 years.
Flowline Integrity Testing	Aboveground flowlines will be visually inspected on a weekly basis and tested triennially for leaks. Underground lines will be pressure tested every 3 years. Pressure testing records will be maintained by operator for a minimum of 10 years.
Spill Response	Spills are reported immediately to the Person Responsible and clean-up personnel upon discovery. Oil and impacted media are removed or remediated as soon as possible.
Drilling & Workover Procedures	PVT alarms, automation and other sensory monitoring devices will be utilized to monitor active tank levels at all times. During any transfer operations, visual inspections from inlet and outlet vessels with radio communication will be implemented. Daily visual inspections will be performed on all equipment, hoses and valving to ensure integrity of fluid containment at all times.
Completions Procedures	PVT alarms, automation and other sensory monitoring devices will be utilized to monitor active tank levels at all times. During any transfer operations, visual inspections from inlet and outlet vessels with radio communication will be implemented. Daily visual inspections will be performed on all equipment, hoses and valving to ensure integrity of fluid containment at all times.

Reviewed By: Joe Schultz
Signature:

Title: Project Manager
Date: 9/21/2021