



Caerus Piceance LLC
1001 Seventeenth Street
Suite 1600
Denver, CO 80202

Fluid Leak Detection Plan

Introduction

This document provides a summary of the Fluid Leak Detection Plan for the proposed ELU A18 495 Well Pad (A18). The location is in Section 18, Township 4 South, Range 95 West. Total disturbance of the A18 Well Pad Site is approximately 8.320 acres, with total disturbance of the A18 pad itself measuring in at roughly 26.806 acres including access roads, stormwater, stockpiles, and pipelines. The ELU G13-296 (G13) will serve as a remote completion support location and ultimately the production pad for the A18, as discussed in other documents within in this OGDG submission. The CDP site surface use during the production phase of operations will be approximately 7.785 acres of disturbance, Total acreage measures at 10.545 acres for the G13 pad location.

The location is located on Fee service, but Federal minerals at an elevation of 8,029 ft. This is in non-crop rangeland within the Piceance Creek Basin. Estimated timing for this pad activity is Fall of 2023 (possibly September) and D&C activities could be between 1 year and 2 years.

Overarching Operational Considerations

As a large operator in Western Colorado, with most field personnel living and playing in the same areas that they work, Caerus takes its potential impacts on public safety, health, welfare, environment, and wildlife seriously. Protection of the environment and safety of the public and personnel are firmly entrenched in the minds and daily routine of Caerus employees. Each location will have its own site-specific approach to Fluid Leak Detection, with several overarching considerations during location planning.

Planning Stages

There are many aspects in place for fluid leak detection in Caerus operations for on-location activities, which will apply to all new locations filed for under Oil and Gas Development Plans (OGDP). During the site selection and planning process, appropriate equipment is specified by engineering for each unique location, which will include in scope the type of material that is determined to be most compatible with pressures, temperatures, volumes, and process fluids. Subsequent protection for the physical equipment is covered through automation and instrumentation. Set points are specified by engineering with utmost importance to consider the protection of public health, safety, and the environment. Alarms can be set to cover a wide variety of scenarios but the most used are both high-pressure and low-pressure. However, additional strategies of utilizing low/zero flow indication, high/low fluid levels, or a combination of multiple instruments can be used as indication of a fluid leak and trigger appropriate action that is appropriate to each specific situation.

At the wellhead and on location, the work starts with site planning and installation prior to operation. The Caerus team designs pad locations to maximize efficiency and to operate within rules and regulations with spill control and prevention in mind. Where possible, facilities are designed to minimize the potential for erosion and corrosion, frequently using chemicals for transferring fluids off-location as a part of three-phase gathering systems, to minimize potential for spills. Upon installation, qualified individuals verify that all work is completed properly. Details associated with each installation is documented in the project job book. Appropriate standards are referenced for the construction of new pipelines. The system is hydrotested prior to use in production operations.

Drilling & Completions Stages

During the drilling program, closed loop systems are used to minimize the potential for any leaks. In



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In addition, there are several best management practices in place to monitor operations and minimize risk:

- Drilling fluid tanks have pit volume sensors and are monitored through the electric drilling recorder
- Equipment, tanks, and lines are regularly checked and monitored as personnel are on-site walking equipment 24/7.
- BOPE is pressure tested every 30 days or when a seal is broken.
- Pressure relief valves are designed with discharge into tanks.

During completions operations, the on-site equipment used will be above ground and any potential leaks will be identified in short order. Several best management practices are in place to prevent leaks or spills:

- Equipment is monitored and tracked on-site with Electric Diagnose Controls. These controls have built-in shutdown parameters to catch & prevent failures. Including Vibration Control Monitoring sensors on Frac Pumps / Iron.
- All equipment/tanks are occupied & operated and monitored by personnel to prevent and respond and shutdown due to any failures/leaks/abnormalities not caught by above mention controls
- Checking of all temperatures / fluid levels / Packing and normal equipment wear & tear)
- Pumps and Equipment are placed inside of spill containments and Catch pans / berms are in place, where appropriate
- Pressure Testing of all equipment / iron is conducted before each stage, at pressures above anticipated operating pressure
- Use of Safety Systems to prevent over-pressuring of Iron.
- Safety Iron Restraints are installed on all High-Pressure Iron.

Production Stage

Once wells are turned on, they enter the flowback stage. During this period, there are personnel on-site 24 hours per day. Additionally, wells are connected through a Supervisory Control and Data Acquisition ("SCADA") monitoring technology which allows for real-time monitoring remotely.

Beyond the initial flowback stage, Caerus employees are trained to look for signs of leaks and releases through AVO; including looking at equipment conditions on-site or along pipeline rights-of-way, regardless if such a location is within their tier of responsibility. All teams work together to identify concerns. In addition, route operators, facility operators and gas control operators are trained and required to monitor Cygnet daily during their shifts to look for concerning pressure or volume variations to ensure that wells are functioning properly and there are no leaks, releases or noted safety concerns. Facility operators have checklists built to assess daily and weekly the appearance and condition of the facility in which they operate. Further, pressure testing is completed at least annually on active pipelines within the system.

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To prevent any major uncontrolled leaks caused from overpressure of piping around the new well pad meter skids, pressure safety valves ("PSVs") will be installed, both on the upstream high-pressure side between the well and meter skid, as well as the downstream lower-pressure side of the meter. If the meter is blocked and pressure is increasing in the piping from the producing well, the upstream PSV,



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along with other pressure alarms and controls, will protect the piping and prevent serious leaks. The downstream PSV is being installed to protect the lower pressure rated piping for the corresponding pipelines from overpressure when a blocked flow also occurs. Overall, the installation of these PSVs will greatly reduce uncontrolled leaks as well as potential personnel harm and exposure.

After the well is turned to production, it becomes part of our regular monitoring protocol, which includes a SCADA system which is monitored with a manned control center 24-hours per day, 7 days per week. Pipelines generally have low and or high pressure set point alarms, which will be checked when received. There are also emergency shut down (ESD) set points to shut down equipment before an overpressure event can even occur. Data from wells are also analyzed by operators looking for variations from the norm in pressures or, where applicable, volume – when there is a variation, it warrants a site visit.

The on-location flowlines and dumplines become part of a regular pressure testing program, as addressed in the 1100 Series Rules. In addition, there are well operators, field coordinators and others in the field that are trained to look for concerns during regular site visits and audio/visual observations if they are in the area or on-location.

For larger facilities, with extensive containment, Caerus frequently has installed level switches, that will signal an alarm if fluid is identified within the containment. Facilities such as Divide Road have leak detection in their containment. Any changes to process or process equipment will be captured and analyzed by Caerus' Change Management procedure.

As a Colorado operator, Caerus is subject to numerous different rules that regulate leak detection and real-time monitoring at new production facilities. CDPHE now requires all new well facilities to monitor continuously for VOC (or methane) beginning from the drilling and completion phase through the first 6 months of production which incorporate alarm levels that require the Operator to act when a threshold concentration is exceeded. Caerus is required to complete facility inspections using an infrared camera ("FLIR") to document compliance with leak detection and repair ("LDAR") requirements on a schedule mandated by CDPHE's Regulation 7. Caerus also has numerous facilities subject to LDAR requirements mandated by the EPA's NSPS OOOOa that require semi-annual "FLIR" camera inspections. Furthermore, Caerus voluntarily inspects all locations bi-annually, even those which are exempt from periodic inspections required by CDPHE's Regulation 7 such as Caerus' participation in One Future and Environmental Partnership programs. These programs require annual reporting such that our LDAR records are clearly tracked, transparent and documented. Further, all new well pad facilities are required to have no-bleed pneumatics as a part of CDPHE's Regulation 7, leading to a significant decrease in emissions.

Each Caerus location is a part of the company Spill Prevention, Countermeasure and Control (SPCC) plan. There are site specific plans for large compressor stations and water facilities. Each specific well pad is covered within the field wide SPCC plans that are in place. Each new location is reviewed, and a Professional Engineer certifies that the designed secondary containment measurements meet all regulatory requirements. Upon completion of pad built, there is confirmation of tank capacity and containment. A formal SPCC inspection is performed annually at each location. Location updates are incorporated and certified as required and all SPCC plans maintained and stored in Caerus' field offices.