COLORADO
Oil & Gas Conservation Commission
Department of Natural Resources

COGCC Operator Guidance

Rule 911.a.(4) - Oil and Gas Facility Closure

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911. CLOSURE OF OIL AND GAS FACILITIES

a. Operators will close all Oil and Gas Facilities, including Drilling Pits and Cuttings Trenches, in accordance with an approved Form 27.

(1) Operators will obtain the Director's approval of the Form 27 prior to conducting any investigation or closure operations.

(2) The Form 27 will include a description of the proposed investigation and Remediation activities pursuant to Rule 913.

(3) Operators will close and remediate Emergency Pits as soon as the initial phase of emergency response operations is complete or any process Upset Conditions are controlled.

(4) Oil and Gas Facility closure pursuant to this Rule 911.a will be at the time of final site closure, Plugging and Abandonment, or decommissioning, unless the Director determines that a substantive change to the site requires a Form 27, or a reportable Spill or an historic impact is discovered during facility operation or removal.

Purpose of Rule

Rule 911.a ensures that Operator performs environmental characterization during abandonment or any substantive change to a facility or vessel to verify that no residual contamination is left at a Location after closure. Through this rule Operator will fully investigate the footprint of the Oil and Gas Facility, which is defined as equipment or improvements used or installed at an oil and gas location for the exploration, production, withdrawal, treatment, or processing of crude oil, condensate, Exploration and Production Waste ("E&P Waste"), or gas.

Oil and Gas Facilities include wellheads, Flowlines, Pits, Cuttings Trenches, buried or partially buried vessels, tank batteries, Centralized E&P Waste Management Facilities,

Gas Facilities including compressor stations and gas processing plants, gas storage facilities, enhanced recovery facilities, E&P Waste treatment facilities, beneficial reuse areas, or other ancillary facilities. The rule is intended to prevent undocumented impacts from being left at a Location after the abandonment process and ensures that historical releases are properly reported and remediated.

An important benefit of this rule is that through thorough and well-documented site and facility closure, Operators can be assured that latent environmental liability will not crop up or come to the surface months or years after they have plugged a well and closed the facilities.

Rule 911.a.(4) Guidance

The following guidance assumes no anticipated or discovered impacts associated with abandonment activities. If impacts are present Operator will report such Spills or Releases pursuant to Rule 912.b. Remediation of the Spill or Release should be performed in compliance with Rules 913 and 915.

Additional information can be found in the following COGCC Guidance documents:

- 911.c - Pit Closure
- 912.b. - Spill/Release Reporting
- 913.b.(5)B i-v - Remediation Standards
- 915 - Concentrations and Sampling for Soil and Groundwater
- 915.e.(2) - Soil Sampling and Analysis

FORM 27 REQUIREMENTS

Operator will prepare, submit, and obtain the Director's approval of a Form 27, Initial Site Investigation and Remediation Workplan (Form 27 - Initial) *prior to* commencing investigation or Remediation addressed by the Form 27. COGCC will review and process properly completed Form 27s within 30 days.

Operator may submit a single Form 27, Site Investigation and Remediation Workplan (Form 27) for multiple activities on the same Location. For example, if Operator removes a wellhead and the associated Flowline on the same oil and gas pad, Operator can submit one Form 27 to document the removal of both Facilities. However, if Off-Location Flowlines join into a gathering system, or the wellhead is located on a separate Oil and Gas Location, Operator will submit separate Form 27 for the wellhead

and for the flowline/gathering system. COGCC Staff recognizes the many legacy Locations constructed prior to 2008 do not have a Location ID assigned in COGIS. In these cases Operator is encouraged to discuss the Form 27 requirement with the COGCC Area Environmental Protection Specialist ("EPS") prior to submitting one or more Form 27s.

Operator will include the following information on the Form 27 - Initial:

a. The correct Latitude and Longitude for the work area (e.g. buried vessel, corner of Pit, end of Flowlines, southeastern tank battery berm);
b. A desktop review of any Sensitive Areas within a quarter mile (surface water, water wells, wetlands, High Priority Habitat, residences, businesses, etc);
c. A site map showing the proposed work area;
d. Initial action summary, including the scope of work to be done;
e. Planned waste disposal pursuant to Rules 905 and 906;
f. Proposed soil sampling plan including planned sample analysis and sample locations. Operator will provide a facility diagram or aerial photograph depicting site equipment and proposed sample locations.;
g. A proposed Groundwater sampling plan if applicable;
h. Date of Surface Owner notification/consultation;
i. Anticipated start date and duration;
j. Timeline for followup reporting, typically 45 days after work is completed (work is considered completed when final laboratory reports are received or field work is completed whichever occurs later).

ACTIVITIES REQUIRING A FORM 27

Operator will obtain Director approval of a Form 27 - Initial prior to the removal, decommissioning, or closure of any of the following Oil and Gas Facilities pursuant to Rule 911.a.(4) and Rule 913.c.:

a. Pit or Cuttings Trench;
b. Buried or partially buried vessel, regardless of construction material (note - buried or partially buried vessels cannot be closed in place);
c. Tank battery/Production Facility;
d. Substantive changes to Production Facility;
e. Flowlines (including Produced Water Transfer Systems);
f. Wellhead;

g. Centralized Waste Management Facilities;
h. Gas Facilities (including compressor stations and gas processing plants);
i. Gas Storage Facilities;
j. Enhanced recovery facilities;
k. E&P Waste treatment facilities;
l. Beneficial reuse areas;
m. Other ancillary facilities.

After closure activities are complete, surface reclamation is required in compliance with the 1000 Series Rules.

The following subsections provide a summary of the basic information Operator will submit on a Form 27 - Initial for the most common closure or decommissioning activities. Pits and cuttings trench closure are addressed in a separate Operator Guidance for Rule 911.c. If Operator has a question regarding the applicability of Rule 911.a.(4) to a specific type of Facility or Location, they should contact the area EPS prior to beginning work. Operator will report results of all field inspections and laboratory analysis on a Form 27, Supplemental Site Investigation and Remediation Workplan (Form 27 - Supplemental). Example field forms are included in the Appendices of this document. These forms are meant to guide operators during site investigation and provide clear documentation of site conditions and work completed. Each form may be used alone or as an attachment to other field forms. Operators can use these forms in conjunction with photo logs during closure activities or develop their own version of field forms.

In general, the goal of facility closure is to demonstrate that no residual impacts remain at the location. When surface equipment is removed, the Operator will document the conditions under the equipment through observation, field screening, and sampling and analysis to determine if produced fluids or E&P Waste were released. Specific areas of concern are where subsurface piping connects to surface equipment, where Above Ground Storage Tanks (“ASTs”), valves, pumps, compressors, or other process equipment were used on a location and at joints, hammer unions, or previous repairs in above ground or subsurface pipe. Operator will keep field documentation and provide with the Form 27 observations of hydrocarbon or salt staining or odor included on field screening logs and photo logs collected during the removal of equipment from

a Location and during any required subsurface investigation. Operator will collect and submit discrete grab samples for final confirmation purposes.

Site specific conditions may require Operator to deviate from this guidance. Operator will coordinate with the Area EPS prior to beginning work.

PARTIALLY BURIED VESSEL REMOVAL

Operator will submit a Form 27 - Initial for Director approval prior to the removal of any buried or partially buried vessel, regardless of its construction (fiberglass, concrete, or steel). Operator may submit a single Form 27 - Initial for multiple partially buried vessels on the same Location. COGCC Staff has prepared a field form, Appendix A, that Operator may use to guide investigations.

Upon removing the buried or partially buried vessel, Operator will field screen a minimum four sidewall samples and one base sample in the excavation. Operator will collect the base sample from the center of the partially buried vessel footprint or areas of observed impact based on visual and olfactory inspection. Operator will collect samples and provide photographs from the following locations:

a. Below the dump line or beneath other ancillary piping;
b. Areas of observed impact based on visual and olfactory inspection;
c. Within the root zone (less than three feet from ground surface).

Additionally, Operator will provide the following photographs:

a. Bottom of the tank;
b. Area where the dump line or other ancillary piping connects to the tank.

At a minimum, Operator will submit a floor sample and the sidewall sample exhibiting the highest degree of impact for laboratory analysis pursuant to Rule 915.

At Locations where multiple buried and partially buried vessels are removed resulting in one large excavation, Operator may refer to the Rule 915e.(2) Soil Sample Collection Guidance Document for aid in determining the appropriate number of samples to characterize the excavation.

PRODUCTION FACILITY/TANK BATTERY FINAL SITE CLOSURE/DECOMMISSIONING OR SUBSTANTIVE CHANGE

Operator will inspect the entire footprint of the Location. COGCC Staff has prepared a field form, Appendix B, that Operator may use to guide investigations.

a. Operator will inspect and document the conditions of site surface material, subsurface material, and if present, Groundwater and surface water.
b. Operator will make and record observations of visual and olfactory evidence of hydrocarbon impacts, such as hydrocarbon stained material.
c. Operator will perform appropriate field screening methods such as headspace screening using a photo-ionization detector ("PID") for volatile organic constituents or other field screening methods as appropriate to the E&P Waste characteristics.
d. Operator will submit samples exhibiting the highest degree of impact for laboratory analysis based on a combination of visual, olfactory and field screening results.
e. After all road base or other material is removed for reclamation Operator will submit samples for laboratory analysis for soil suitability in compliance with Rule 915.b if impacts from inorganic constituents are indicated.
f. If hydrocarbon or inorganic impacted media is removed, Operator will submit confirmation samples of remaining material to delineate the lateral and vertical extent of material removed and demonstrate that all remaining material complies with Table 915-1.

Above Ground Storage Tanks (AST): Upon removing any AST, Operator will conduct a visual inspection of the soil within the former berm footprint underlying the AST. At a minimum, Operator will submit one sample per tank for laboratory analysis pursuant to Rule 915. Operator will submit a sample from an area exhibiting the highest degree of impact, or in the absence of apparent impacts from the area directly below the service hatch, where a load out valve was connected to an AST, or where subsurface piping connected to the AST at the surface. Operator will provide photographs of the bottom of the AST and the footprint after removal.

Separator(s): Operator will visually inspect the footprint of the separator after removal. Operator will submit a minimum of one sample per separator for laboratory analysis pursuant to Rule 915. Operator will submit a sample from an area exhibiting the highest degree of impact, or in the absence of apparent impacts samples will be collected from below the inlet line(s) to the separator and from below the dump lines exiting the separator. Operator will provide photographs of the footprint of the separator.

Flare or combustors: Operator will visually inspect and field screen the area around the combustor or flare for impacted media. Operator will submit a sample from an area exhibiting the highest degree of impact, or in the absence of apparent impacts, Operator may submit field screening results and photo documentation only.

Third Party Meter Sheds: Connections will be cut from meter sheds and the equipment will be removed in compliance with the 1000 series rules. A sample will be taken from the area adjacent to the connection. If impacts are discovered Operator will determine if impacts were caused by equipment upstream or downstream of the meter shed in order to determine responsible party, regulatory jurisdiction, and reporting/cleanup requirements. If impacts are not present, Operator may submit field screening and photo documentation only.

Other process equipment: Operator will visually inspect and field screen the area around the equipment for impacted media. Operator will submit a sample from an area exhibiting the highest degree of impact, or in the absence of apparent impacts, Operator may submit field screening results and photo documentation only.

Other potential waste: Operator will identify and handle all potential E&P Waste, non-E&P Waste, and hazardous waste according to all applicable federal, state, and safety regulations as well as their waste management plan pursuant to Rule 905. This includes but is not limited to: tank bottoms, Technologically Enhanced Naturally Occurring Radioactive Material ("TENORM"), Asbestos Containing Materials ("ACM"), unused chemicals, or any other waste generated or discovered during decommissioning.

ANY OTHER SUBSTANTIVE CHANGE TO A SITE

Substantive changes require a Form 27 when there are significant changes to the equipment at an Oil and Gas Facility. For example, if several pieces of equipment are being removed from a large Production Facility, a Form 27 would be appropriate. In cases where a facility is being upgraded with removal of old equipment and installation of new on the same footprint of the existing facility, a Form 27 would be appropriate. In cases where an Operator was removing a single tank or other piece of equipment from a facility, a Form 27 would not be necessary. If the Operator discovered a reportable Spill or Release during that removal, then they would report the Spill or Release in compliance with Rule 912. In cases where the Operator is unsure if a Form 27 is required or has a specific question, they will contact the area EPS prior to beginning work.

FLOWLINE REMOVAL OR REPLACEMENT

The removal of both on Location and Off-Location Flowlines requires the submission of a Form 27. Flowline repairs or sleeving does not require a Form 27. If a reportable Spill was involved or discovered with these operations, a Form 19, Spill/Release Report (Form 19) is required, and Operator will conduct investigation and remediation pursuant to Rules 912 and 913. COGCC Staff has prepared a field form, Appendix C, that Operator may use to guide investigations.

Operator will visually inspect and field screen the area surrounding the Flowline that is removed. The amount of field sampling will vary depending on the size of the area disturbed and if the Flowline is being removed or closed in place. All Flowline abandonment will be performed in compliance with Rule 1105. Operator will refer to Rule 915.e.(2) and the Impact Characterization Guidance Document for further information. If indications of impacts to soil or Groundwater are present, Operator will submit samples for laboratory analysis from the areas most likely to be impacted to demonstrate compliance with Table 915-1, per Rule 913.h.(1).

During Flowline abandonment any liquids evacuated from the Flowline will be properly contained and disposed in compliance with Rule 905. Allowing produced liquids or E&P Waste to flow into unlined excavations used to access the line will be considered a reportable Spill if reporting thresholds of Rule 912.b are exceeded. The Operator will plan for recovering or containing fluids evacuated from a Flowline prior to abandonment to prevent impact to soil or Groundwater. Liner, sumps, tanks, vacuum pumps, or other methods should be utilized to prevent Spills. If Groundwater is encountered in a flowline excavation, Operator will notify COGCC EPS, collect and analyze a Groundwater sample for Table 915-1, and soil investigation will proceed using the Table 915-1 Protection of Groundwater Soil Screening Level Concentrations.

It is not the intent of COGCC to require sampling along the entire path of a Flowline if integrity is demonstrated at the time of abandonment and there were no Spills or Releases associated with the Flowline. However, in order to meet the requirements of Rule 913.h, Operators will still collect and submit for laboratory analysis a soil sample collected from the areas most likely to have been impacted during the operational life of the flowline. These areas include, but are not limited to: where Flowlines connect to the wellhead, surface equipment, risers, valves, or manifolds; where Flowlines were repaired in the past and at joints and hammer unions; where Flowlines connect to Flowlines or equipment of different material; and where Flowlines crossed drainages or surface water or are in contact with shallow groundwater.

If a Flowline is being abandoned due to lack of integrity, the Operator will be required to perform adequate investigation to document where the line(s) failed integrity and the extent of any associated impacts. If a line is being removed by excavation, the Operator will perform field screening and photo documentation at reasonable distance intervals along the entire excavation of the Flowline.

Operator will submit results of field screening, photo documentation, and laboratory analytical results on a Form 27 - Supplemental with a detailed sample and photo location diagram.

PLUGGING AND ABANDONMENT OF A WELL

Operator may submit one Form 27 - Initial for multiple wellheads on the same Location. If multiple wellheads at geographically separated locations flow to a single Location, Operator will submit a separate Form 27 - Initial for each wellhead as well as the central Location. COGCC Staff has prepared a field form, Appendix D, that Operator may use to guide investigations.

Operator will visually inspect and field screen the area around the Well in all four directions as well as the associated pumping equipment area, if present. Operator will inspect both surface and subsurface soil near the Well. If petroleum impacted soils are encountered during cut and cap operations, the impacted soil will be segregated for proper off site disposal and the lateral and vertical extent of impact determined with appropriate confirmation soil sampling. Operator will submit a sample from an area exhibiting the highest degree of impact, or in the absence of apparent impacts, Operator will submit a sample from the base of the excavation adjacent to the Well along with photo logs of the excavation and surface areas. If impacts from inorganic constituents, including metals, are suspected, Operators will collect soil samples from such areas for laboratory analysis. Operator will submit field observations and screening results along with laboratory analytical reports on a Form 27 - Supplemental. All imported fill material such as road base will be removed from the wellhead location and the grade restored to pre disturbance condition with suitable material in preparation for final reclamation activities pursuant to the COGCC 1000 Series Rules.

SAMPLE COLLECTION, IMPACT CHARACTERIZATION, AND REPORTING

Operator will collect and analyze samples pursuant to Rule 915, following the general sample collection guidance in Rule 915.e.(2) and Rule 915.e.(3). Operator will collect discrete soil samples for site characterization and confirmation sampling. COGCC Staff will not accept composite samples for site characterization purposes. If Operator discovers impacts exceed the reporting thresholds, Operator will report the Spill or Release pursuant to Rule 912.b. The Form 19 will reference the COGCC Remediation Project Number. Operator will investigate and remediate impacts pursuant to Rule 913. Operator may refer to the Rule 913 Site Investigation and Remediation Workplan Guidance document for additional information.

If discrete impacts are found at separate areas at the Location, Operator may treat each area as its own separate Spill and spill reporting thresholds assessed accordingly. If each discrete area of impact does not meet spill reporting thresholds in compliance with 912.b., a Form 19 is not required. However, the vertical and lateral extent of impacts, volume of impacted media, and disposal information will still be noted on the Form 27 - Supplemental and areas presented in the site figure. For example, if during a tank battery dismantlement Operator discovers 5 cubic yard (cu yd) of impacted soil at the wellhead, 4 cu yd of soil at the partially buried vessel, and 3 cu yd of soil at the separator, a Form 19 is not required. If impacts are from distinct sources but impacts are commingled, reporting thresholds should be assessed as a single spill.

Attachment Docs

Appendix A: Partially Buried Vault Site Closure Checklist
Appendix B: Tank Battery Site Closure Checklist
Appendix C: Flowline Site Closure Checklist
Appendix D: Wellhead Site Closure Checklist

Document Change Log

January 4, 2021	Document Finalized
September 20, 2021	Modified guidance for Flowine closure; expanded purpose; other minor edits