DJ-BASIN WASTE MANAGEMENT PLAN

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REGULATORY REVIEW

COLORADO OIL & GAS CONSERVATION COMMISSION '900' RULES: The rules and regulations of this series establish permitting, construction, operating, and closure requirements for pits, exploration and production (E&P) waste management, procedures for spill/release response reporting, sampling, and analysis for remediation activities. The 900 series rules apply to E&P waste, as defined in §34-60-103, C.R.S., or other solid waste where the Colorado Department of Public Health And Environment (CDPHE) has allowed remediation and oversight by the Colorado Oil and Gas Conservation Commission (COGCC).

WASTE IDENTIFICATION AND DISPOSAL

Production Water: Produced water is generated as a by-product in the production of oil and gas. Produced water is separated from oil and gas during production operations.

Disposal of produced water is regulated under *COGCC rule No. 907.c.2.* Produced water is either disposed of at a Class II UIC facility for down-hole injection or treated and reused during operations. Produced water is transported under "trip ticket" which is submitted to the disposal facility when the produced water is off loaded at the disposal facility. The disposal facility maintains a record of each load delivered and forwards a copy of the disposal transaction to Encana for tracking purposes.

Oil stained Soils: Accidental release of E&P waste can cause oil stained soils. The removal of these oil stained soils is required by Encana environmental management guidelines, COGCC 900 rules, and in the event waters of the State are impacted, CDPHE water quality control regulations.

Disposal of oil stained soils is regulated under *COGC rule No. 907 e.* Oil stained soils are sampled under guidelines described in *COGCC Rule No. 910.b.(3) entitled "Soil sampling & analysis"*. Oil stained soils are transported and disposed of at a Class II land fill facility under a pre-determined waste profile characterization. Once a waste characterization is completed, a "*Waste Manifest Profile*" number is assigned and waste manifest are provided to Encana. Under this disposal manifest system, contract waste disposal transporters haul "*oil stained soils*' to the disposal facility using the assigned waste disposal documentation.

Drilling Mud/Cuttings: Drilling mud/cuttings are generated during drilling operations. Drilling mud/cuttings typically involve fresh water, bentonite, and a blend of bio-degradable polymers. Soda Ash or caustic soda is added in small concentrations to

control fluid pH to a range of 9.0 – 10.0. Drilling mud/cuttings are considered E&P waste and therefore exempt from RCRA.

Disposal of drilling mud/cuttings may be reclaimed as a soil amendment to surface soils under *COGCC Rule No. 907.d(3).B.* The drilling mud/cuttings are transported to an approved site and are applied to the surface in accordance with the COGCC rule. Prior to application of drilling mud/cuttings, the surface owner must sign a "*Letter of Agreement" w*ith Encana authorizing application of drilling mud/cuttings. A copy of this letter of agreement is retained by Encana.

Drilling Waste: Drilling waste is regulated under *COGCC rule No. 907.d(2)* and is disposed of at a Class II land fill facility if it meet the waste profile standards for E&P exempt wastes under RCRA Subtitle C.

Non-E&P Waste: Non-E&P waste is regulated under *COGCC rule 907A.* – Wastes that are non-exempt under RCRA subtitle C must be managed as follows:

a. Certain wastes generated by oil and gas-related activities are not E&P wastes and are properly identified and disposed of in accordance with state and federal regulations.

b. The hazardous waste regulations require that a hazardous waste determination be made for any non-E&P solid waste. Hazardous wastes require storage, treatment, and disposal practices in accordance with 6 C.C.R. 1007-3. All non-hazardous/non-E&P wastes are considered solid waste, which require storage, treatment, and disposal in accordance with 6 C.C.R. 1007-2. The most common example of a "Non E&P Waste" is hydraulic oil. Hydraulic oil does not meet any of the RCRA threshold standards and is not listed as a hazardous product or waste by the EPA.

Universal Wastes: Specific universal wastes that may be generated at all levels of Encana operations and activities may include batteries, florescent light bulbs, printer cartridges, and used electronics.

Hazardous Wastes: Materials that have specific characteristics or are generated by specific processes may be hazardous waste. The specific characteristics can include:

- **Ignitability** (D001):
  - Liquids with a flash point < 140 ° F
  - Solids that readily ignite and burn vigorously
- **Reactive** (D002):

- Normally unstable and readily undergoes violent changes without detonation
- Violent reaction to water
- Explosive mixture with water
- Generates toxic gases, vapors, or forms with water

• **Corrosive** (D003):
- Aqueous liquids with a pH ≤ 2 or ≥12

• **Toxic** (D004-D043):
- Harmful or fatal when ingested, or adsorbed
- When land disposed contamination may leach out of the waste and pollute ground water
- Exhibits concentration of the RCRA 8 heavy metals in excess of threshold limits

When necessary, the appropriate personnel will dispose of hazardous waste in a timely manner such that any unforeseen circumstances (e.g., rejection by the treatment, storage, and disposal facility) do not cause the extension of storage times to exceed regulatory limits.

Figure 1.0 provided at the end of this document describes the process flow Encana uses to properly categorize and manage waste.

STORAGE OF WASTE

Hazardous Waste: Hazardous waste can be stored on location in 55 gallon approved drums that are:

- Properly labeled with DOT and CAS numbers and placards
- Well maintained to prevent leaks
- Sealed when not filling

Universal Waste: Universal waste is stored in a manner to prevent contamination. Universal waste is stored in an approved container that is:

- Properly labeled with DOT and CAS numbers and placards
- Labeled as “Universal Waste (enter waste type)” (e.g., “Universal Waste Pesticides”)
- Well maintained to prevent leaks
- Sealed when not filling

Universal waste is only held on site for up to one year. In order to track the amount of time that Universal Waste is held on site, Encana staff will complete one of the following:

- Marking the container holding the waste with the date the material was initially accumulated
- Using an inventory tracking system

Generator status for Universal Waste is determined solely by the total amount (in kilograms) held on site at any given point in time. Encana will track and record waste and comply with applicable federal rules.

Used Oil: When storing used oil, Encana does the following:

- Used oil must be stored in tanks or containers with appropriate secondary containment
- Containers must be in good condition and not leaking
- Used oil storage units must clearly be labeled with the words "Used Oil."

Used oil should not be mixed with hazardous waste, however, some mixtures of used oil and hazardous waste can be treated as used oil.

Exploration and Production Waste: Exploration and production waste (E&P waste) is exempt from RCRA regulations, but is regulated under COGCC 900 series rules. Encana waste management practices are consistent with COGCC requirements, including the following:

- Store E&P waste in a manner to prevent contamination
- Do not mix E&P waste with hazardous or other waste
- Track the disposal of E&P waste

Non-Hazardous Solid Waste: Non-hazardous solid wastes are stored in a manner that prevents contamination and releases by ensuring containers are:

- Undamaged
- Sealed or leak proof covers, if appropriate
- Labeled as "Trash" or "Recycle"
- Wildlife proof where necessary

HANDLING & TRANSPORTATION OF WASTE

Safety Data Sheets for waste and associated materials should be referenced when handling and transporting wastes.

Transportation of waste is recorded and tracked utilizing Waste Manifests. Properly trained and designated personnel will prepare a manifest for waste and material shipments, to ensure proper tracking and reporting. Hazardous Waste Manifests must have an original signature of an authorized representative of Encana. A copy of each manifest is given to the Encana environmental employee responsible for waste for tracking purposes.

REUSE, REDUCE, RECYCLE, RECOVER

The Encana EH&S Management System specifies the 4 R's must be at the forefront of any process that generates waste. Comprehensive industrial ecology analyses may be completed annually by Waste Specialists on materials used and wastes generated by Encana. Industrial ecology includes the study of finding reuses for generated "waste" streams. Encana strives to find new environmentally and economically sound methods to reuse, reduce, recycle and/or recover waste.

SEGREGATION OF WASTE

Waste streams should be kept separate and only combine when doing so in accordance with an SOP reviewed and approved by Encana environmental personnel.

The following provides a few examples of recommended waste segregation guidelines:

- Do not mix methanol with used oil
- Do not mix triethylene glycol (TEG) with used oil
- Do not mix unknown chemicals

Encana facilities generating very small quantities of hazardous waste may be able to accumulate all hazardous waste in a single drum, as long as the waste streams are compatible and will not react violently. This procedure will help eliminate the hazards associated with maintaining several partial drums for several years. Records should be kept of the type and quantity of each waste that is put into the drum.

Attachments:
FIGURE 1, Encana's Process Flow to Properly Categorize and Manage Waste

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