

April 18, 2017

Subject: Boring & Sampling Plan

EF C27 595 – Pit Closure and Remediation System (Rem:8255)

COGCC Location ID: 335828

COGCC Facility ID: 278619

NENW, Sec. 27, T5S, R95W, 6th PM

39.58901 / -108.04395 (WGS 84)

Garfield County, Colorado

Attn: Carlos Lujan

Background

During pit reclamation activities and prior to installation of the bio-vent wells the sidewalls and base of the pit were excavated and broken up to create pore space and decrease bulk density of the soils. These soils were blended and layered at the base of the pit to facilitate remediation activities. This approach will not allow for the sampling of the pit sidewalls to replicate the initial below liner sampling event that occurred in October 2014, prior to backfilling the pit.

Approach

Based on the 2014 and 2016 sampling data, it has been determined that in 2017, nine (9) additional soil borings via hollow stem auger will be advanced to depths ranging from 5 to 35 feet below ground surface. Grab samples will be collected from specific depths where organic concentrations were at the highest levels in 2014. The 2017 locations will be drilled within a three-foot radius of the bio-vent wells that were previously installed or in areas that indicated elevated hydrocarbon levels. The additional samples near bio-vent wells will be used to compare TPH data from the prior sampling events to demonstrate effectiveness of the current remediation approach. A summary report will be submitted to the COGCC detailing the changes in TPH that have occurred since the prior soil analyses and bio-vent well installations. Based on these sample analyses, Encana will be able to provide details on the effectiveness of the bio-vent wells and provide information on the expected number of years to achieve compliance with COGCC table 910-1. If the bio-vent wells prove to be an ineffective means of

remediation on this location, an alternative remediation approach will be evaluated and proposed to the COGCC for approval.

SVE pilot trailer data

In 2016, Encana has incorporated the use of an SVE pilot trailer to determine air flow in cubic feet per second, and vacuum pressures at which the air flow occurs. PID readings are collected to observe available hydrocarbon changes over time to help determine when additional drilling needs to occur to obtain site closure. This analysis demonstrates air movement occurring within the subsoils at the screened interval allowing for subsurface air exchange to occur. The continuous air exchange via the bio-vent wells allows for naturally occurring bacteria to consume the TPH (GRO/DRO ranges). Encana will continue to utilize the SVE pilot trailer into 2017 to further study these exchanges. The following table demonstrates data obtained with the use of the SVE pilot trailer in 2016:

C27 Pit	2016 3rd Quarter	Well	Start Time	SCFM	Vacuum (inches of Hg)	Temp (F°)	PID (ppm)
		SBW01	11:50	124	8	62	1.9
		SBW02	12:00	116	8	62	3.5
		SBN02	12:20	120	8	62	2.1
		SBS01	12:30	125	8	62	0.8
		SBS02	12:40	130	8	70	0.8
		SBMID	12:50	124	8	68	1.2

Attachments

- Site diagram

Regards,
Matt Kasten
Environmental Consultant
On behalf of Encana Oil & Gas

