

Spring 2010 Environmental Geology

Coffin Butte Field Trip

Stop #1: Location 7 (Page 46)

Orient yourself: We are at the South end of the Luckiamute Watershed, between Coffin Butte and Poison Oak Hill (beware). Note: Newer construction on the map is unaccounted for (page 48). Tour guide is Aleshia and sports an Allied Waste neon green safety vest.

Stop #2: PNGC Power Station

The PNGC Power station purchases methane from the Coffin Butte disposal facility. Introduce Pete (Bioengineer) and Bill (Well Monitoring). Input is about 2,000scfm of methane. Output is about 6 megawatts of electricity, enough to power greater Corvallis. The 3 older CAT engines, 16 cylinder, twin turbo will burn about 400-500scfm (standard cubic foot per minute) and produce 800kwatts each. The 2 newer CAT engines, 20 cylinder, twin turbo will burn about 500-550scfm and produce 1600kwatts each. These engines produce what is considered open market. The flare out front burns off the excess gas. It usually burns about 300scfm, but has been pushed as high as 2000scfm when the power grid gets cut off as the engines require an electrical start. This Cooperative is contracted with 15 other companies, receives carbon credits and sells power produced back to the grid. The CAT Engine pistons are 6.5 inches in diameter and the top end of each machine has to be rebuilt every month or so due to the corrosive contaminants in the methane gas most likely H₂S produced by anaerobic bacteria. The filtering technique removes or knocks out the water and the remaining 30% ends up in the leachate ponds.

Stop #2: Leachate Ponds.

Max capacity is about 5 million gallons while others are about 4 million. The pH of the leachate is about 7.5 to 7.3. Two feet of "free board" is marked on the side of the line, and to remain in accordance with their contract with the Dept. of Environmental Quality, they must ship all excess to Corvallis for disposal when rainfall input months are high. August will produce about 50,000 gallons a day and the middle of winter will produce nearly 250,000 gallons a day. In the high input seasons trucks haul the contaminated water depending on monitoring levels of the Willamette River, plant flow and Zinc levels. Portland cares more about Total dissolved solute levels while Corvallis is more concerned about zinc levels.

One of the more detrimental materials deposited in the landfill is sludge, or solid feces. Last October to January a business in Sweethome made a major deposit and monitoring was thrown for a loop. The majority of monitoring appears to be addressed to the leachate as groundwater is a major concern to neighbors of Coffin Butte, along with smells emitted from the landfill. A way of managing the leachate is geosynthetic membranes (see packet diagram page 22 for details)

The environment here could be referred to as a "reducing environment" and any oxygen introduced, combined with anaerobic environments will create a flammable mess. Mattresses

are a great hazard as one corner will stick out and the oxygen will travel down the gradient and create an underground inferno.

Stop #3: Top of the fill hill.

This is a cut into Siletz River Volcanics and used as a rock quarry. The dump gets what the quarry company considers trash fill and uses it build the surface for the machinery. The top of the hill is littered with plastic bags blowing in the breeze and barriers have been set up to control for the wind direction. The entirety of the landfill is about 25% full at this point, and an estimate was given at about 45 years until full capacity when final closure will occur (see packet for details). At this point the facility will require an additional 30 years of biomonitoring.

The 72 acres of garbage fill has 370 gas wells. This high number of well per area is dependent on annual rainfall amounts and facilities in more arid regions will usually require fewer wells as their gas and moisture output is less. The landfill started in 1944 as the military Camp Adair needed a disposal facility. In the 1960's and 1970's the facility was maintained by open burn techniques and enclosed in cell 1 of the disposal site. Wah-Chang out of Albany has dumped some questionable waste and seepage was observed as little bubbles rose out of the ground right in front of the tour group. It was explained as a mystery that is still baffling most of the employees.

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