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State of Utah
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

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February 2, 1994

TO: File

TO: J. Randell Harden, SCA Permit Coordinator

FROM: Henry Sauer, Senior Reclamation Soils Specialist 

RE: Refuse and Slurry Acid-and/or-Toxic Forming Potential
Sampling Plan, Sunnyside Cogeneration Associates,
Refuse and Slurry, ACT/007/035, Folder #2, Carbon
County, Utah

SYNOPSIS

The sampling and analysis plan presented below is this writers response to the Sunnyside Cogeneration Associates (SCA) proposal to fulfill Permit Condition # 18 (refer to Sunnyside Cogeneration Associates Mining and Reclamation Permit, ACT/007/035, Appendix 6-5). SCA's condition response is insufficient to ascertain the acid-and/or-toxic forming potential of the slurry and the coarse refuse material within the Coarse Refuse Pile and the West Slurry Cell. Therefore, the Division has independently formulated an alternative sample and analysis plan.

The forthcoming proposal was submitted to Eckoff, Watson and Preator Engineering, environmental consultant for the permittee, during a meeting held at the Division's office on February 2, 1994.

ANALYSIS

COARSE REFUSE/EAST AND WEST SLURRY MATERIAL SAMPLE COLLECTION AND ANALYSIS PLAN

Sample Depth Increment: 10 ft.

Drilling Depth: Into and through the PRECIPITATE LAYER (see below)



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Sample Size/Increment: at least 1500 to 2000 g (4 to 5 pounds).

Sample Location: As indicated in Sunnyside Cogeneration Associates Mining And Reclamation Permit, ACT/007/035, Appendix 6-5, Figure 2, plus addition sample sites within the Coarse Refuse Pile and adjacent to the East Slurry Cell. To be determined in the February 2, 1994 meeting.

Field Analyses and Documentation: Color - Hue/Value/Chroma Report by Munsell Notation, Sampler, Sample Time and Date, Climatic Condition, Air Temperature.

Field Preparation: Immediately place samples into sealed container, expel air, store in a cool dry environment, do not freeze or expose to heat or direct sunlight.

SAMPLE LABORATORY ANALYSIS MUST BE COMPLETED WITHIN 30 DAYS OF SAMPLE COLLECTION

Laboratory Preparation: 1) Air dry samples, 2) Mechanically grind sample to pass a 2 mm (10-mesh) stainless steel sieve.

Preparation of Saturation Extract: American Society of Agronomy Monograph No.9, Methods of Soil Analyses, Part 2, Second Addition 1982 (Referenced here to for as ASA Mono. No. 9) Method 10-2.3, page 169. **Note:** 1) Deionized Water must have an electrical conductivity (EC) no greater than 2 uS cm⁻¹.

2) Upon obtaining a proper consistency (i.e. saturation), the sample must be covered with an air-tight lid. Allow the sample to set for 24 hours to establish equilibrium between the soil/spoil minerals and the water.

COAL REFUSE/SLURRY SAMPLE LABORATORY ANALYSIS

Analyze samples in accordance with the Division of Oil, Gas and Mining Guidelines for the Management of Topsoil and Overburden, Table 6. **Note:** 1) In reference to the Maximum Acid Potential, report the following: Percent Sulfate-Sulfur; Percent Pyritic-Sulfur; Percent Total-Sulfur.

2) If laboratory methods vary from that suggested in DOGM Guidelines, Table 6, report method and literature reference(s).

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**PRECIPITATE LAYER AND/OR REFUSE/LITHOLOGIC CONTACT SAMPLE
LABORATORY ANALYSIS**

Sample Depth Increment: Sample at 2 foot intervals through the entire depth of the precipitate layer and temporarily store. Determine variability in color, texture structure, fizz (10% HCl solution), etc. Composite no more than 5 feet of profile based on variability of material.

The following constituents shall be analyzed in accordance with the methods located in DOGM Guidelines, Table 6: pH; Electrical Conductivity; Saturation %; Sodium Adsorption Ration (Note; report soluble Na, Mg, Ca); Texture; Acid Potential; Neutralization Potential.

Prepare saturation extract as indicated above and perform the following analyses on the aqueous extract or as indicated by the method reference below.

Water Soluble Metals by Furnace Atomic Absorption Spectrometry: Se; As; Cr; Ni; Cu; Cd; Zn; Pb; Mo.

Water Soluble Metals by Inductively Coupled Plasma Optical Emission Spectrometry: Al; Fe; Co; Mn; B.

Alkalinity: Standard Methods for the Examination of Water and Waste Water (16 ed), 1985 Method 403. **Note:** Report CO_3^{2-} and HCO_3^- .

Exchangeable Acidity: ASA Mono. No. 9, Method 9-4.1, page 163.

Chloride: ASA Mono. No. 9, Method 10-3.5, page 174-175.

Nitrate: ASA Mono. No. 9, Method 10-3.6, page 175.

Sulfate: ASA Mono. No. 9, Method 10-3.7.1, page 175-176.

Ten percent of the precipitate layer samples shall be analyzed utilizing the Toxic Characteristic Leaching Procedure (TCLP) as incorporated in 40 CFR Chapter 1 (7-1-92 Ed.), Part 261, Appendix II, Method 1311.

RECOMMENDATION

The SCA's proposal to fulfill the requirements of Permit Condition # 18 is inadequate. The permittee must redesign the

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sample and analysis plan for ascertaining the acid-and/or-toxic forming potential of the coarse refuse and slurry material within the Coarse Refuse Pile and the West Slurry Cell based on the Division's proposal and discussions held on February 2, 1994.

CC: Ken Wyatt