

0007



Norman H. Bangert
Governor
Dee C. Hansen
Executive Director
Dianne R. Nielson, Ph.D.
Division Director

State of Utah

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203
801-538-5340

November 24, 1992

TO: Pamela Grubaugh-Littig, Permit Supervisor

FROM: Henry Sauer, Senior Reclamation Soils Specialist *HS*

RE: Technical Deficiencies, Sunnyside Cogeneration Associates, Sunnyside Refuse Pile, PRO/007/035, Folder #2, Carbon County, Utah

SYNOPSIS

The forthcoming technical deficiency review is an attempt to enumerate the most obvious technical deficiencies found in the permit application package and the applicant's response to the Division's Initial Completeness Review.

ANALYSIS

R645-301-528.320. Coal Mine Waste

The proximate analysis of the core samples provided (Appendix 6-1, pages 16 and 17) indicate a substantial quantity of ash (55% by weight) production subsequent to combustion of the refuse and slurry material. While this does not indicate the precise quantity of waste rock (i.e., noncombustible reject material) no other reliable estimate has been provided which accurately represents the amount of noncombustible waste material likely to be encountered during mining operations. The applicant contends that approximately 5% (by weight) or 475,000 cubic yards (October 27, 1992 ICR Response, R645-301-240) of the refuse will require disposal within the permit area and reclamation. The basis for this estimate has not been presented. Therefore, the applicant must describe the logic and methods employed to arrive at this volume estimate. Unless the applicant can precisely quantify the volume of waste rock produced utilizing scientifically sound methodologies, the applicant must separately design the waste rock disposal facility to incorporate various waste rock volume scenarios. The designs must include contingency plans for the excavation and disposal of the hardpan layer encountered at the refuse/soils interface (see discussions below).

In addition, the present proposal for waste disposal is completely inadequate. The applicant has not provide designs or cross-sections of the proposed configuration and reclamation of the waste rock pile, surface area drainage, maximum slopes, etc. The proposed location of the waste rock disposal facility (Plate 5-15) lies in the middle of the Coarse Refuse Pile (CRP). Without specific mining plans, the feasibility of placing waste in this area is questionable. Essentially, how will the applicant dispose of the said material in the middle of the refuse pile without first moving the refuse material.

R645-301-553.250. Refuse Piles

The CRP and the East and West Slurry Cell, in accordance with the regulation cited, must be covered with four feet of suitable material unless the permittee can prove that alternative topsoil depths are adequate to fulfill the R645 Rules. The applicant has not proven that alternative topsoil depths are adequate to meet the R645 Rules nor has the applicant committed to cover the refuse material with four feet of non-combustible, non-acid and non-toxic forming materials or bonded for the currant conditions that define the point in the planned mining operation that presents the greatest estimated reclamation costs for the permit term. Therefore, the applicant must commit to and submit designs for covering the refuse with four feet of suitable topsoil material. The reclamation bond must reflex the aforementioned reclamation commitments.

731.300. Acid- and Toxic-Forming Materials

The applicant has not submitted plans to determine the Acid- and/or Toxic-Forming Potential (ATFP) of the waste rock material (noncombustible reject material) during operations or at the time of final reclamation. The plans must include at a minimum sample frequency, sample density, field sampling methods, constituents analyzed, and laboratory methods employed.

The applicant has not provided adequate physicochemical analysis of the coarse refuse and slurry material for the purposes of determining the acid- and/or toxic- and alkalinity-producing potential of the material. The applicant, in response to the Division's Initial Completeness Review, contends that refuse analyses (Appendix 7-17) and roof and floor analyses (Appendix 7-18) demonstrates the non-acid and non-toxic nature of the material. The February, 1981 report does provide some physicochemical analyses of the refuse material (four samples) but omits analysis of the Acid-Base Potential, Selenium and Boron. The roof and floor data provided actually indicates acid

pH values, net acid potentials, unacceptable sodium adsorption ratios, electrical conductivity and boron concentrations. Therefore, it is difficult to understand the applicant's statements regarding this matter. The existing refuse material has been processed, undergone size reduction, been exposed to weathering processes, changes in moisture content and reduction-oxidation potentials, been exposed to the effects of the migration and concentration of soluble constituents, etc. Therefore, the applicant must submit specific plans, to be implemented prior to mining activities, for the collection and analysis of refuse material within the Coarse Refuse Pile and the East and West Slurry Cells to determine the ATFP of the waste material. The plan must include a discussion of the potential for, and mitigation of, water quality impacts and/or revegetation problems attendant to the above-mentioned materials.

The Coal Refuse Borehole Logs (Appendix 6-1, A-1 through A-17) depict a yellow, orange-red staining of the alluvial material and Mancos Shale at the bottom of the refuse/slurry fill in the following drill holes: 91-2; 91-3; 91-6; 91-7; 91-10 and 91-11. The staining is most likely the result of pyrite (FeS_2) oxidation and the subsequent migration of iron, manganese and other metals to the refuse-Mancos Shale/alluvium interface. Once the metals contact the natural material, a precipitant is formed. A precipitant similar to that described in the drill logs was observed, by this writer, after a headcut formed below the Old Coarse Refuse Road. The roadbed is composed of refuse material from the Sunnyside Mine and is underlain by Mancos Shale. The precipitant was indurate and has formed a 2-3 cm thick hardpan below the roadbed. The hardpan, potentially several feet thick underneath the refuse material (see borehole logs), has likely impeded the vertical movement of water resulting from slurry dewatering and precipitation. The seep at the bottom of the CRP is most likely the result of water movement, in a near horizontal manner, along the refuse induced hardpan aquitard. As percolation of water occurs, various metal constituents dissolved and are subsequently transported. This theory is even more substantiated by the fact that water quality analysis of the seep water indicate unusually high Iron, Manganese and Total Dissolved Solid concentrations when compared to the quality of the water emanating from adjacent springs, in mine water quality (JBR Consultants Inc. Spring and Seep Survey {1986} and Bookcliffs Commercial Laboratories Water Analysis Report {1983}) and receiving waters.

The applicant states that the water from the seep at the bottom of the coarse refuse pile (CRP) meets all standards for Type 4, Agricultural Uses and for Type 3C, Aquatic Wildlife Uses. This statement is completely false. The standard for Total Dissolved Solids (1200 mg/L) has been exceeded every month for which water quality data is available during 1986-1988 and 1990-1992. The minimum Dissolved

Oxygen content (i.e., 5 mg/L) was not attained during Aug.-Oct./1988, June-Aug./1990, Dec./1991 and Jan./1992. The standard for Iron (i.e., 1 mg/L) has been exceeded during the following months: Feb./1986, Aug./1986, Nov./1986, March/1987, Aug.-Nov./1987, Jan./1988, Feb./1988, April-June/1988, Aug./1988, Sept.-Dec./1990, Feb./1991, Dec./1991, Jan./1992, Feb./1992, Sept./1992 and Oct./1992. A preponderance of information exists within the ACT/007/007 mine file which proves that the seep at the bottom of the CRP is the result of slurry dewatering activities and water quality does not meet state and federal water quality effluent limitation standards. Therefore, the applicant must obtain a UPDES permit and meet the applicable water quality standards for the water emanating from the bottom of the CRP.

R645-301-230 Soils: Operation Plan

The following are general comments which must be addressed:

The sequential revegetation procedure outlined in the applicant's ICR response must be discussed in greater detail. Many refinements are necessary and should be discussed with Division staff.

The scarification of the "subgrade" material to a depth of two inches is not adequate to promote root penetration or prevent soil slippage. Minimum scarification must account for the depth of wheel compaction of standard earth moving equipment (approximately two feet). Please make necessary revisions.

The compaction of topsoil as state in the applicant's ICR response (R645-301-230) directly contradicts the soil redistribution regulations which are intended to prevent compaction. The applicant must revise this statement.

The permittee must submit as-built drawings of the topsoil stockpiles. Adequate cross-sectional representations of each topsoil stockpile must be provided to determine the volume of topsoil within each stockpile.

The applicant's proposal to apply 435 lbs./acre of fertilizer (10-10-10) to the regrade soil is not an optimal type or rate of fertilization. In addition, fertilization recommendations should be formulated subsequent to soil sampling and analysis.

The applicant must describe the methods by which the topsoil stockpiles will be protected from wind and water erosion. This must include a commitment to revegetate (seed mixture?) the piles for long term protection and construction of a berm

Page 5
Technical Deficiencies
PRO/007/035
November 24, 1992

at the base of the stockpiles as interim containment of soil that may be displaced while vegetation becomes established.

In accordance with the Division's Guidelines for the Management Of Topsoil and Overburden, an Order I soil survey is required for all areas to be disturbed. Please make necessary revisions.

The applicant must depict, on an appropriate map or plate, the sample site locations within each borrow area.

RECOMMENDATION

The applicant must adequately address the aforementioned technical deficiencies.

jbe
SCA.HEN