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OK

February 22, 2006

Michael Blakey, Plant Manager
Sunnyside Cogeneration Association
P. O. Box 159
Sunnyside, Utah 84539

Subject: Bond Renewal, Sunnyside Cogeneration Associates, Sunnyside Refuse/Slurry, C/007/0035, Task ID #2389, Outgoing File

Dear Mr. Blakey:

The above-referenced amendment is conditionally approved upon receipt of three clean copies prepared for incorporation. Please submit these copies by March 22, 2006. Once we receive these copies, final approval will be granted, at which time you may proceed with your plans.

A stamped incorporated copy of the approved plans will also be returned to you at that time, for insertion into your copy of the Mining and Reclamation Plan. A CD of our Technical Analysis is enclosed.

If you have any questions, please call me at (801) 538-5268 or Wayne Western at (801) 538-5263.

Sincerely,

Pamela Grubaugh-Littig
Permit Supervisor

an
Enclosure
cc: Price Field Office
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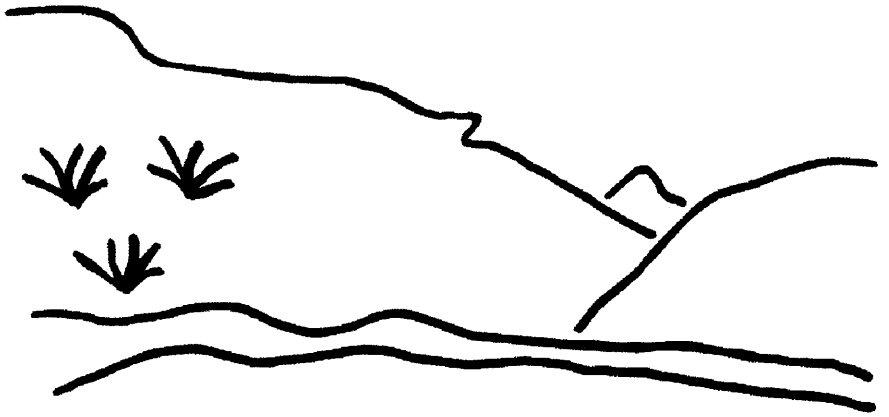
State of Utah



Utah Oil Gas and Mining

Coal Regulatory Program

Sunnyside Refuse/Slurry
Sunnyside Cogeneration Associates
Technical Analysis
February 21, 2006

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TECHNICAL ANALYSIS DESCRIPTION

The Division ensures that coal mining and reclamation operations in the State of Utah are consistent with the Coal Mining Reclamation Act of 1979 (Utah Code Annotated 40-10) and the Surface Mining Control and Reclamation Act of 1977 (Public Law 95-87). The Utah R645 Coal Mining Rules are the procedures to implement the Act. The Division reviews each permit or application for permit change, renewal, transfer, assignment, or sale of permit right for conformance to the R645-Coal Mining Rules. The Applicant/Permittee must comply with all the minimum regulatory requirements as established by the R645 Coal Mining Rules.

The regulatory requirements for obtaining a Utah Coal Mining Permit are included in the section headings of the Technical Analysis (TA) for reference. A complete and current copy of the coal rules can be found at http://ogm.utah.gov

The Division writes a TA as part of the review process. The TA is organized into section headings following the organization of the R645-Coal Mining Rules. The Division analyzes each section and writes findings to indicate whether or not the application is in compliance with the requirements of that section of the R645-Coal Mining Rules.

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Regulatory Reference: 30 CFR 778.16; 30 CFR 779.12(a); 30 CFR 779.24(a)(b)(c); R645-300-121.120; R645-301-112.800; R645-300-141; R645-301-115.

Analysis:

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Regulatory Reference: Pub. L 95-87 Sections 507(b), 508(a), and 516(b); 30 CFR 783., et. al.

GENERAL

Regulatory Reference: 30 CFR 783.12; R645-301-411, -301-521, -301-721.

Analysis:

Most of the resource information required for approval of the plan was provided prior to approval of the plan or in the submittal of information required by the Permit Conditions. In general, resource information for archaeologic, soils, land use, geologic, and vegetation information is considered adequate.

Resource information with regard to determining the location and the extent of acid- and/or toxic-forming was accomplished in the fall of 1995. Adequate baseline resource information regarding the nature of the refuse materials, the quality of the water discharging from the refuse facilities and materials contaminated or otherwise affected by the refuse material have been compiled and presented in the plan as the basis for evaluating the effectiveness of the proposed reclamation plan.

Baseline surface water data required as part of the resource information has been collected by the permittee. These data are consolidated as part of the PHC information in a report describing and summarizing those findings.

Findings:

Refer to analysis and findings under specific resource information requirements below.

PERMIT AREA

Regulatory Requirements: 30 CFR 783.12; R645-301-521.

Analysis:

A map showing a legal description of the permit area is found in the plan as Plate 1-1. The map clearly delineates the permittee's permit area. The map and meets-and-bounds survey

information provided on the drawing describes the permit area, the lease area which Sunnyside Cogeneration Associates has acquired for its power plant and facilities site, and surface ownership with an adjacent to the permit area. The permit area as described on the map results in a permit area of approximately 305 acres. As provided on Plate 3-1, the total area to be affected over the life of operations includes pre-law and post-law (SMCRA) disturbances and is delineated for the purpose of specific performance standards that may apply to these areas. The total area affected, including future disturbances, is approximately 235 acres.

Findings:

The permittee has met the minimum requirements of this section.

HISTORIC AND ARCHEOLOGICAL RESOURCE INFORMATION

Regulatory Reference: 30 CFR 783.12; R645-301-411.

Analysis:

Chapter 4 of the permit provides a description of the archeological resource information. Two sites are described as being eligible for nomination to the National Register of Historic Places. These are the coke ovens located within the SCA permit area and a cemetery located approximately 300 feet away from the permit area boundary. Page 400-3 of the permit states that a cultural resource survey of the SCA Permit Area was completed by the Utah Historical Society Preservation Office Survey and Planning staff in the fall of 1993 and is found in Appendix 4-3. Appendix 4-3 contains a letter from SHPO (State Historic Preservation Officer) stating that the permit application had been reviewed and that only the coke ovens had the potential to be affected; no site visit was conducted.

A copy of "A Stratified Archeological Sample Survey of Kaiser Steel Corporation Sunnyside Mine Lease, Carbon County, East Central Utah," is found in Appendix 4-5. This survey was conducted in the early 1980's as part of the Kaiser permit by the Consulting Services Branch, Antiquities Section of the Utah Division of State History. The SCA permit area is included in the survey area since the SCA permit area was a portion of the Kaiser permit area.

Appendix 4-1, Site Descriptions, contain several historic and prehistoric sites that were not included in the 1981 study. This survey appears to have been conducted in August 1986 by La Plate Archeological Consultants, Inc. The extent of the survey is unknown. This survey describes the cemetery that is adjacent to the permit area. The cemetery is given site no 42CV338 and is rated in poor condition.

Findings:

Information provided in the plan meets the minimum requirements of this section.

CLIMATOLOGICAL RESOURCE INFORMATION

Regulatory Reference: 30 CFR 783.18; R645-301-724.

Analysis:

The permittee has incorporated climatological information based on information from the Utah Climate Center at Utah State University. This information is summarized on pages 700-7 and 700-8 in the plan and addresses the climatological requirements. Raw data is presented in Appendix 7-2.

Findings:

The permittee has met the minimum requirements for this section.

VEGETATION RESOURCE INFORMATION

Regulatory Reference: 30 CFR 783.19; R645-301-320.

Analysis:

Plate 3-3 is a vegetation resource map which adequately details the vegetative communities within the permit area and adjacent to the permit area. Plate 3-1 delineates pre and post law disturbance areas and those areas that may be exempt from certain specific design and performance standards in the Act for final reclamation.

The plan states that mining has disturbed three vegetation types: Pinyon-Juniper/Grass, Atriplex/Grass, and Sagebrush/Grass. The seep area containing riparian/wetland species is also considered disturbed. A very brief description of the vegetative communities is given on page 300-3 and a detailed description of the Hydrophytic community is given in Appendix 3-1. The permittee claims that the seep area is not disturbed with the exception of the three weir locations. They do not anticipate removing soils from the area in an attempt to recreate a new wetland.

The communities proposed as a success standard, Pinyon-Juniper/Sagebrush and Atriplex/Grass are described in detail according to the Division's Vegetation Information Guidelines in Appendix 3-3.

The Pinyon-Juniper/Sagebrush community had 37 percent vegetative cover. The dominant vegetation consisted of Big sagebrush, Pinyon pine, and Indian ricegrass. Shrub and tree densities were 2,923 individuals per acre. The Atriplex/Grass community had 30 percent vegetative cover. Dominant species in this community are Shadscale and Salina wildrye. Shrub density in this Shadscale community was 1319 plants per acre.

Findings:

Information provided in the plan meets the minimum requirements of this section.

FISH AND WILDLIFE RESOURCE INFORMATION

Regulatory Reference: 30 CFR 784.21; R645-301-322.

Analysis:

Fish and wildlife resource information is given on page 300-4 through 300-13, Figure 3-4, and Appendix 3-6. The plan contains a general discussion of wildlife and habitat located within the region.

An assessment associated with the Sunnyside Cogeneration Project and biological considerations for the bald eagle and other sensitive species was prepared by Pioneer Environmental Services, Inc. under contract with Eckhoff, Watson and Preator Engineering in January 1993 and is provided in the plan as Figure 3-4. This assessment indicates that power lines associated with the site utilized raptor protection in their construction. No new poles, towers or lines are planned for construction that could possibly present an increased hazard for bald eagles. Other raptors within the permit area seasonally or as year-round residents include the golden eagle, ferruginous hawk, red-tailed hawk, and American kestrel. A single inactive nest located northeast of the site is indicated on Plate 3-2 of the plan at an elevation of approximately 7,600 feet and one mile from the permit boundary. Pioneer Environmental Consulting performed an on-site survey and analyzed existing information and interviewed local biologists concerning the Bald eagle, other raptors and the Canyon Sweet-vetch (Figure 3-4). Pioneer concluded that the SCA project would have no effect on migrant wintering bald eagles.

Pioneer also mentions canyon Sweet-vetch in the assessment. Canyon Sweet-vetch is a Category 2 species, which has no legal protection. The majority of plant population occurs in washes associated with B and C canyons as identified in the Sunnyside Mine permit area. There exists only a moderate potential for this plant to occur within the permit area. The operations are located upon the old Sunnyside refuse disposal site which has been in existence for a number of years and no impacts to the Canyon Sweet-vetch are expected.

The assessment provided in the plan presents technical information required for the Division to provide a Biological Assessment (BA) for the Bald eagle but not for the Colorado River fish, to be submitted by OSM to the USFWS for formal consultation. The requirement to complete a BA is being investigated with the USFWS by the Division.

The permittee has contacted the U.S. Fish and Wildlife Service and provided as Figure 3-2, a memo dated November 12, 1992 from the State Supervisor, Fish and Wildlife Enhancement of the USFWS. The memo lists the following endangered species that may occur in the area of influence of the project site: Bald eagle, Humpback chub, Bonytail chub, Colorado squawfish, and, Razorback sucker. Additionally, Canyon Sweet-vetch was noted as a candidate species for official listing on either the threatened or endangered species list. While this species has no legal protection under the Endangered Species Act, the USFWS has requested that care be taken to avoid them if they are found in the project area.

To meet DOGM and the Division of Wildlife Resources requirements, a fish inventory of Icelander Creek was required. The purpose of the inventory was to gather general information on Icelander Creek and to determine the presence of two Category 2 candidates for federal listing, (Roundtail chub and Flannelmouth sucker) as well as any other sensitive fish listed by the State of Utah. A survey was conducted in the fall of 1993 and in the spring of 1994. Appendix 3-6 reports on a fish inventory conducted in September of 1993 in Icelander Creek. Speckled dace were found close to the permit area boundary. Further downstream the less common Flannelmouth sucker was included in the inventory. In May 1994, a second fish survey was conducted to assess potential breeding species. The final report is found in Appendix 3-4. The Roundtail chub was not found in the survey. The presence of the young (0+) Flannelmouth suckers in both seasonal surveys confirm the consistency of the spawning activities.

Findings:

General information found in the text of the plan regarding wildlife resource information was found to meet the requirements of this section.

SOILS RESOURCE INFORMATION

Regulatory Reference: 30 CFR 783.21; 30 CFR 817.22; 30 CFR 817.200(c); 30 CFR 823; R645-301-220; R645-301-411.

Analysis:

Order III soil survey information for the permit area is found in Appendix 2-1, 2-2, and Map 2-1. This information is from the USDA/SCS Survey of Carbon Area, Utah (Jensen and Borchert June, 1988).

Soil map units are delineated on Map 2-1. All areas covered by coal mine waste and/or coal mine waste that is covered by topsoil have been delineated on the drawing. Map units presented on the drawing are classified according to USDA/SCS National Cooperative Soil Survey as incorporated in this section and referenced by R645-302-314.100.

An Order II soil survey for the Reclamation Borrow Area 1 is found in Appendix 2-4. The survey report and soil sample data was compiled by Ms. Susan Hasenjager representing Kaiser Coal Company in November of 1985. Approximately one-half of the data submitted in Appendix 2-4 represents soil samples outside Reclamation Borrow Area 1 (see Map 2-1 for sample site locations). Field and laboratory methods and technical soil profile descriptions are not provided. The information provided does not meet the requirements of the USDA/SCS National Cooperative Soil Survey as incorporated in this section and referenced by R645-302-314.100 but does provide useful physicochemical data and a non-technical profile description.

Soil sample data provided in Appendix 2-5 is located on Map 2-1. These data were taken from the Sunnyside Coal MRP. Appendix 2-7 also presents data from the Sunnyside Mine plan regarding the two topsoil stockpiles located near the slurry ponds.

Soils survey information for Industrial Topsoil Borrow Areas No. 1-3 and the access road to the cogeneration facility are found in Appendix 2-8. Mr. Leland Sasser of the USDA/SCS conducted the intensive Order II (personal communication with Mr. Leland Sasser) soil survey at the request of the permittee's environmental consultant.

Field profile descriptions, non-technical soils descriptions and sample site locations are provided. No physicochemical data are provided. The Order II soil survey meets the requirements of the USDA/SCS National Cooperative Soil Survey as incorporated in this section and referenced by R645-302-314.100.

Order I soils survey information is found in Appendix 2-9 and provides the identification and characterization of potential topsoil borrow areas. The survey, conducted by ACZ Inc. of Steamboat Springs, Colorado, encompasses the Reclamation Borrow Area, Industrial Borrow Areas 1 & 3, soil cover on the third and fourth lifts of the Coarse Refuse Pile (CRP-3) and Sub-Area 3 (SA-3) {see Map 1, Appendix 2-9}. Subsequent to pit excavations in SA-3 an illuviation of iron was observed at the refuse/soil interface (See ACZ Soil Survey Appendix 2-9, page 5; Appendix D, page B-12 & 13). The horizon is likely the result of upward migration, concentration, and cementation of hydrous metal oxides produced by the weathering of the coal refuse which lies below the soil material. Similar degradation of the soil material covering the CRP-3 is likely to occur over time. Therefore, these areas were not considered as potential sources of salvageable topsoil.

The Order I soil survey of the Reclamation Borrow Area meets the requirements of the USDA/SCS National Cooperative Soil Survey as incorporated in this section and referenced by R645-302-314.100.

The present and potential productivity survey for the Atriplex/grassland and Pinyon-juniper/sagebrush reference areas are located on Figure 3-5.

Findings:

Information presented in the plan meets the minimum requirements of this section.

LAND-USE RESOURCE INFORMATION

Regulatory Reference: 30 CFR 783.22; R645-301-411.

Analysis:

Land use resource information is given in Chapter 4 of the plan. Land was used primarily for wildlife habitat prior to mining (page 400-2). Currently, land use within the permit area is dominated by a refuse pile (page 400-3).

Statements are made that the area is generally too steep for livestock or farming use, although surrounding areas are used for those purposes. The SCS (now called Natural Resource Conservation Service or NRCS) (Figure 3-5) made an assessment of the vegetation reference areas that should represent the site prior to disturbance. Vegetation productivity was 900 pounds per acre for the Pinyon/Juniper/Grass and 500 pounds per acre for the Atriplex/Grass site. The SCS stated that, "the overall view of the area that has been disturbed is good." Range conditions are considered good or high.

Previous mining activity was confined to operations related to coal mine waste disposal. The plan refers to the current use as operations related to coal mine waste disposal and excavation.

Appendix 4-4 provides the Interim Zoning Ordinance for Sunnyside City. The Permit Area is within the jurisdiction of East Carbon City, Sunnyside City and Carbon County. The general area of the SCA permit is classified as industrial and the county classifies the use as M&G-1, Mining and Grazing Zone. The legislative intent of establishing the Mining and Grazing Zone is to foster agriculture, mining and industry within the state.

Findings:

Information regarding land use classification meets the minimum regulatory requirements of this section.

ALLUVIAL VALLEY FLOORS

Regulatory Reference: 30 CFR 785.19; 30 CFR 822; R645-302-320.

Analysis:

Alluvial Valley Floor Determination

Information regarding Alluvial Valley Floors was found within the text of the plan under section 724.700 on page 700-8. SCA has also provided, as Appendix 7-9, a copy of findings accomplished by the Division in regard to Alluvial Valley Floors for Permit ACT/007/007 (Sunnyside Coal Mine), as last revised on December 2, 1985.

SCA has stated that the permit area consists primarily of alluvial valley fans and pediment deposits, at the base of the Book Cliffs, in the lower Price River Drainage. In the steeper and western portions of the permit area the bed rock Mancos Shale layer is very nearly the ground surface covered with a thin veneer of sheet and rill wash. Further to the south and west is an area classified as additional alluvial fan deposits.

Icelander Creek tributaries flow through the areas to the south and northwest of the SCA permit area, however, it is a small creek and has carved only a shallow channel in the alluvial fan deposits. All surface discharge from the permit area flows into the Icelander drainage. The Utah Division of Water Quality has classified Icelander Creek as 3C (protected for non-game fish and other aquatic life, including the necessary organisms in their food chain), and 4 (protected for agricultural uses including irrigation of crops and stock watering).

Portions of the Kaiser Coal Permit (now Sunnyside Coal Company) area were found to be within the confine of an AVF that was delineated along Grassy Trail Creek from approximately five miles east of East Carbon City to the confluence of Grassy Trail Creek with Slaughter Canyon. Although SCA's permit area is encompassed by the Kaiser Coal permit area, the alluvial valley floor as delineated in Kaiser's plan, SCA has indicated that this area as identified as an AVF is not part of the SCA permit area. The AVF is located to the northeast and at a higher elevation from the SCA permit area.

SCA has requested that the Division wave the requirements that deal with additional information, findings, and performance standard required of operations affecting designated AVF's.

While the Division concurs with SCA's request, the Division requested delineation of the AVF described in the plan. Figure 1, as provided in Appendix 7-9 has been provided to delineate the alluvial valley floors as they were described and approved under Kaiser Steel Company's permit (Plate III-29 of that plan). This map shows the extent of current and historical farming as was described in the 1985 Kaiser Plan.

Applicability of Statutory Exclusions

Findings:

Information regarding this section is considered adequate. The Division waives the requirements of R645-302-320 that deal with providing additional technical information, findings, and performance standards for operations affecting designated alluvial valley floors (AVF's).

PRIME FARMLAND

Regulatory Reference: 30 CFR 785.16, 823; R645-301-221, -302-270.

Analysis:

The results of the Prime Farmland determination conducted by the U.S.D.A./Soil Conservation Service (SCS) may be located in Chapter 2, Figure 2-1.

The determination encompassed the Sunnyside Cogeneration Associates permit area. The area surveyed by the SCS is as follows: parts of Section 6 & 7, Township 15 South, Range 14 East, Salt Lake Base and Meridian.

The conclusion of the Prime Farmland determination states that the soils in the area do not meet the criteria of either Prime or Important Farmlands.

Findings:

The plan adequately addresses the minimum regulatory requirements of this section. Since the Prime Farmland Determination indicates that soils in the area do not meet either Prime or Important Farmlands, no additional information as required under R645-302-220 is necessary.

GEOLOGIC RESOURCE INFORMATION

Regulatory Reference: 30 CFR 784.22; R645-301-623, -301-724.

Analysis:

Two refuse pile-drilling programs (Appendix 6-1) were conducted in 1991 and 1992 (Appendix 6-5 & 9-3). The intent of these programs was to ascertain the quantity and quality of coal refuse available as a fuel source for an electric power generator. Analytical data from this drilling program (Appendix 6-1 & 9-3, Table 2), report the following data: percent moisture; percent ash; BTU/LB; percent sulfur; percent dry ash; percent dry ash; dry BTU/LB; MAF BTU/LB; percent dry sulfur; LBS SO_2/MM BTU. Borehole log descriptions are located in Sub-appendix A.

Appendix 6-3 provides some physicochemical analyses of the refuse material but omits analysis of the Acid-Base Potential, Selenium and Boron. Data provided indicates slightly acidic pH values, unacceptable sodium adsorption ratios and boron concentrations.

Physicochemical data of four surface refuse samples collected in August of 1993 are presented in Appendix 6.6. The information provided does not accurately report the method detection limit for selenium. The detection limit reported is two orders of magnitude greater than the correct detection limit of 0.02 mg/Kg. In addition, the pyritic-sulfur percent, organic-sulfur percent and sulfate-sulfur percent must be reported on all refuse analyses.

The general nature and extent of the refuse material and its effect upon the underlying strata has been physically described (Coal Refuse Borehole Logs). The Coal Refuse Borehole Logs (Appendix 6-1 & 9-3, Sub-appendix A) describe a yellow, orange-red staining at the refuse/soil interface in the following drill holes: 91-2; 91-3; 91-6; 91-7; 91-10, 91-11, 92-1, 92-5, 92-7, 92-8, 92-11, 92-13, and 92-17. A precipitant similar to that described in the drill logs has been observed in area SA-3 (See ACZ Soil Survey Appendix 2-9, page 5; Appendix D, page B-12 & 13), and the Old Coarse Refuse Haul Road (See Inspection and Enforcement File #ACT/007/007, NOV 93-32-5-2, part 1 of 2 and September 15-17, 1993 Complete State Inspection of the Sunnyside Coal Mine). Because the borehole material was not analyzed, additional drilling was accomplished in 1995 to determine the characteristics of the material at the base of the refuse pile. This analysis concluded that the material was not a precipitate layer but were found to be alluvium from pediment deposits that were overlying the Mancos shale.

To supplement the resource information currently provided in the plan, the permittee proposed a refuse drilling plan as a means of determining the acid- and/or toxic-forming potential of the refuse material (Appendix 6-5), the quantity and quality of water underneath the refuse and the extent and physiochemistry of the underlying precipitate layer. Monitoring wells were proposed as part of the sample-drilling program.

Appendix 6-7, Technical Report of Drilling and Sample Collection, West Slurry Cell and Coarse Refuse Pile, has been incorporated into the text of the plan. This report presents the results of the drilling and sample plan required by the Division to supplement information

previously presented in the plan. The drilling plan for which this information was derived is located in Appendix 6-5.

Six boreholes were drilled and sampled. The drilling was completed on August 11, 1995. Locations of the boreholes are found on plate 2-1. Logs of the borings and laboratory results of the samples taken for various intervals are presented as part of Appendix 6-7.

In conjunction with the drilling plan, borehole B-6 was completed as a monitoring well. Although the borehole was found to be dry, borehole B-6 was designated to become a semi-permanent monitoring site. Changes in the site conditions or use of the refuse facilities may increase the amount of water in the refuse disposal facility and the borehole would remain to monitor any potential result of that change. A commitment to inspect and monitor the well on a quarterly basis is recommended by the Division and the well is included as a sample location for water monitoring.

The objective of the drilling plan was to determine whether materials with acid- and/or toxic-forming potential exist within the refuse pile, and whether or not the underlying strata had become contaminated by water peculating through the pile.

As summarized in the report, some samples of the refuse materials were found to have acid generation potential. Utilization of all of the refuse materials for the cogeneration operations would eliminate such materials having acid potential. In the event that not all of the refuse material is used for fuel, the permittee has stated that all coal mine waste that is not utilized in the power plan will be placed in the excess spoils disposal area and covered with four feet of cover material and revegetated during reclamation.

As indicated in the report, samples collected of the underlying stratum showed that all of the samples tested were below the TCLA-MCL standards. No precipitate was found in the borehole tests throughout the soil profile. These results indicated that acidic water was not leaching heavy metals and depositing them at the base of the refuse pile, at least, in the areas where the boreholes were taken. The underlying soils beneath the coal refuse had not been adversely affected and relocation of these materials to the excess spoils disposal area would not be necessary.

Due to the limited number of samples taken and the inherent inconsistencies of the materials found within the refuse pile, no correlation between the physical properties of the refuse pile and location of any potentially acid- and/or toxic-forming materials could be made.

Primarily, concerns regarding the existence of a widespread precipitate layer forming beneath the refuse pile have been alleviated as a result of the drilling program and the analysis of the materials beneath the refuse pile. Based on information previously presented in the plan, this determination could not be made. The yellow/brown material identified in the drilling logs as

described in the John T. Boyd report were found to be alluvium consisting of remnants from pediment deposits overlying the Mancos shale rather than altered Mancos shale resulting from the formation of a precipitate layer from AMD.

The report does indicate that materials with acid- and/or toxic-forming potential do exist within the refuse materials. In the event that not all of the refuse material is utilized as fuel for power generation, these materials will have to be disposed of in the excess spoil pile facilities. Depending on the timing and the extent to which reprocessing of the refuse material has been accomplished, the final location and disposition of all refuse materials cannot be determined throughout the life of the operations. To alleviate multiple plans for the reclamation of these materials during such interim periods, the Division has determined that a worse case scenario for reclamation would be developed to determine and provide adequate bond for the life of the operations. Refer to comments made under the Bonding and Insurance Requirements section of this Technical Analysis.

The exposure of coal refuse and slurry material to oxygen and water can result in the formation of acid mine drainage. The oxidation of pyrite has the potential to produce acidic conditions within the refuse pile. Consequently, designs for the final refuse disposal facilities prevent the flow of surface and groundwater through the refuse material so that acidic leachate will not percolate through the refuse pile and increased the solubility of iron, manganese and other constituents contained within the refuse material.

The potential for acid mine drainage is supported by the precipitation of jarosite, limonite, and other iron-sulfate hydrate minerals at the refuse/lithologic interface and the water chemistry of the South Embankment of the East Slurry Cell Seep (SEESCS). Utilization of the refuse material in the cogeneration plan and relocation of any unused material to newly design refuse disposal facilities will minimized the potential for acid mine drainage.

Iron-sulfate hydrate minerals are both sinks and sources of acid mine drainage by storing acid, Fe, and SO_4^{2-} in a solid phase during dry periods and by releasing the solutes when dissolved during wet periods. The propensity for the solid precipitate to form and dissolve is important in understanding future mine drainage quality and mine waste disposal practices. The physiochemical characterization of the precipitate layer is essential for the formulation of disposal designs and the identification of water quality impacts associated with the SCA- Refuse Pile.

Prior to cessation of operation in the East Slurry Cell a small (less than 1 gallon/minute) discharge existed on the South Embankment of the East Slurry Cell. The physiochemical characteristics of the aqueous discharge were evaluated and are believed to represent the quality of water that had percolated through the refuse pile. Analytical results (Laboratory analyses performed by the Utah State Health Lab) from the South Embankment of the East Slurry Cell Seep (SEESCS) sample were collected on 9/16/93.

The characteristics of the samples taken from the South Embankment of the East Slurry Cell clearly indicate that (given the right conditions and the presence of water flowing through the refuse material) the potential for acid mine drainage, solute transport of metals and the formation of precipitates can occur.

Findings:

Information in this section was found to meet the minimum regulatory requirements. The information provided by the permittee is adequate to determine the acid- and/or toxic-forming potential of the refuse material and the underlying stratum.

HYDROLOGIC RESOURCE INFORMATION

Regulatory Reference: 30 CFR Sec. 701.5, 784.14; R645-100-200, -301-724.

Analysis:

Sampling and Analysis

On page 700-4 of the plan, the permittee commits to collecting water samples in accordance with Standard Methods for the Examination of Water and Wastewater or 40 CFR parts 136 and 434. Sampling methods are considered to be adequate and should continue to be used in all water quality collection and analyses.

Baseline Information

Appendix 7-4 contains the same water quality information from the Sunnyside mine that was submitted with the original SCA permit. The permittee has been collecting additional baseline water quality information. The Utah Division of Water Quality and the Division of Oil, Gas & Mining have been working with SCA in an effort to more fully characterize the water quality of the seep at the toe of the refuse pile.

Data specific to the coarse refuse seep is presented in Appendix 7-6. Appendix 7-8 does indicate that baseline sites will continue to be monitored for the operational parameters. A suite of parameters required for operational monitoring may allow for fewer parameters than those required for baseline information. The plan reflects the sites used for both baseline and operational monitoring, and, a parameter list for operational water monitoring is provided in the plan.

Operational surface water monitoring plans are adequate. UPDES permitted sites will need to be monitored in accordance with the UPDES permit. The sites currently being monitored for baseline parameters will continue into and through mining as operational monitoring sites after adequate baseline information is collected.

At a meeting with the permittee's consultant on August 8, 1995, a brief summary of the baseline data was presented with draft copies of graphs. On August 16, 1995 the permittee submitted a revised Appendix 7-4 that was incorporated into the permit on October 5, 1995.

On pages 700-6 and 700-7 the results of the water quality monitoring are discussed. In this discussion, they state that the water associated with the seep has high TDS due to its interaction with the Mancos Shale. The Whitmore spring also emanates from and has contact with the Mancos shale but does not exhibit the same water quality characteristics. Water from the slurry operations ceased in 1994. Since that time the seep has experienced a significant reduction in flow. Currently no flow is found directly at the base of the refuse pile. No significant changes in the Icelander Creek water quality are realized. This supports the concept that slurry water was seeping through the refuse material down to the original stream channel below the pile. High temperatures of the seep water and the reduced flow rate corresponding to loss of slurry water also support this.

The permittee states on page 700-6 that, "It is generally accepted that the increased flows near the boundary are not related to the refuse pile. Therefore, since those increased flows have similar water qualities, it is likely that the earlier increases in flows are also not related to the refuse pile. The inability to find water during the exploratory drilling of the refuse pile in August 1995, supports the theory that water is not flowing through the refuse pile and causing the refuse seep." No definitive results were obtained from the water monitoring well installed on the refuse pile nor was additional information provided that defines the origin of the water as alluvial water from Grassy Trail Creek. The water quality of the seep has historically been affected by the refuse pile and associated fires as evidenced by the warm temperatures of the seep.

The resistivity survey conducted in 1994 by the DOGM provided an anomaly that was interpreted to be the natural drainage channel. When this channel was plotted on a surface map the line width alone was about 50 feet wide on the ground. This line was used by EWP in locating the water monitoring well. Merely locating a well within this line would give a 50-foot width where the natural channel may be less than 10 feet wide. The likelihood of hitting the channel with one hole would be slim. The data supplied to date does not definitively support this concept but will be accepted in the permit, especially in light of the significant reduction in the seep water quantity. If SCA completes the removal of the refuse and slurry material as described in their plan, then the seep area will be exposed and this problem will be resolved.

Baseline Cumulative Impact Area Information

The permit area described in the plan includes the sediment ponds, Icelander Creek, the Columbia Dugway Spring and Grassy Trail Creek. These are the only water bodies within and in adjacent areas. The Columbia Dugway Spring is a significant source of water in Icelander Creek. The coarse refuse seep also adds water to Icelander Creek. Any discharges from the facilities sediment ponds will discharge into Icelander Creek. The plan on page 700-4 indicates that no discharges from the SCA facility enter Grassy Trail Creek.

The permittee continued to collect baseline water quality information as described in Appendix 7-8. Refer to comments made under Operation Plan, Ground-water Monitoring and Surface-water Monitoring. These data were concluded in 1995 and are found tabulated in Appendix 7-4 of the plan.

Modeling

No modeling or statistical analysis were provided or used in the permit application.

Probable Hydrologic Consequences Determination

The Probable Hydrologic Consequences section is located on pages 700-9 through 700-11 and describes the use of water for fugitive dust control. According to the applicant's Air Quality permit, the permittee must spray water for dust control on all unpaved roads. The permittee calculates that 29.5-acre-feet of water will be used annually for dust control. According to the Air Quality permit, spraying is to occur every two hours at a rate of 0.25 gallons per square yard.

Using the permittee's figure of 1.2 miles of road at 30 feet wide.

1.2 miles X 5,280 ft per mile X 30 ft wide = 190,080 sq. ft. = 21,120 sq. yds.

21,180 sq. yds. X 0.25 gallons per sq. yd. = 5,280 gallons per trip.

Assuming 180 days of spraying per year at 10 trips per day = 1,800 trips per year.

1,800 trips X 5,280 gallons per trip = 9,504,000 gallons per year = 29.2 acre-feet of water per year.

This value is very close to the permittee's proposed 29.5 acre-feet. The permittee states on page 700-10 that, "Adequate underground water rights from the Dragerton well are available to SCA to meet the needs of dust control. This water right holder for this well is East Carbon

City. The permittee has provided the water rights transfer for this source adequate to meet these requirements.

When present, water emanating from the base of the refuse pile has had acidic tendencies. The chemical nature of this water is potentially toxic to aquatic life. Additionally, the seep located on the south embankment of the East Slurry cell had previously shown a pH of less than 3. This indicates that acid-producing material is present within the slurry and refuse material. Cessation of the Sunnyside Coal slurry operations should eliminate reoccurring problems in these areas. Removal and relocation of the refuse materials from their existing location will also serve to mitigate and eliminate any further potential for acid/toxic discharges from the permit area.

The permittee drilled six holes in the refuse pile and West slurry cell in August 1995, in an effort to better understand the acid/toxic conditions of the refuse pile and the subsurface hydrology. This report is included as Appendix 6-7. No conclusion the quantity or location of acid- and/or toxic-forming materials was reached based on this limited drilling. The permittee has indicated that acid- and/or toxic-forming materials do exist within the refuse pile.

Groundwater Monitoring Plan

The permittee has begun collecting baseline ground-water quality information. The discussion of this information is located on page 700-5. Only one well was located within one-mile radius of the permit area. This well is the East Carbon City well. One water quality sample analysis was included in the plan. Data provided in the 1993 annual report included samples collected in June and October 1993. Monthly field parameters taken for this site are provided in Appendix 7-4 of the plan.

Surface-Water Monitoring Plan

The permittee installed weirs in the stream channel emanating from the coarse refuse seep in 1994. These weirs allow for the collection of reliable flow data from the seep. The design of the weirs is found on Plate 7-19.

The Department of Environmental Quality, Division of Water Quality, the Division, and SCA agreed upon a revised comprehensive monitoring schedule for the seep to provide adequate baseline information and accurate flow data to assess the chemical nature and potential impacts of this seep.

Based on this data the seep is being affected by the refuse pile. Conductivity is high and the temperature averages ten degrees warmer than surrounding waters. The fires within the refuse pile heat this water. The fires were put out late in 1994 and the water temperature has dropped slightly, recent 1994 data indicates. The pH is lower than adjacent waters.

Data collected for surface water monitoring is also found in Appendix 7-4 of the plan.

Complete chemical analyses of the coarse refuse pile seep water were submitted for samples collected in June and October 1993. These data sets show elevated levels of Iron, Manganese, Boron, Aluminum, Total Dissolved Solids, Sulfates and Ammonia. Adjacent water from the F-2 spring was lower in Conductivity and Total Dissolved Solids. This indicates that the two water sources do not have the same origin or that waters flowing through the refuse pile were affected.

The discharge from the CRS is most likely the result of the general physiography of the area prior to refuse disposal and water movement along and through the refuse/strata interface. The source(s) of water contributing to the discharge from the CRS cannot be quantitatively established. However, it can be established that contribution of flow to the CRS discharge conceivably comes from natural precipitation; slurry dewatering in the East and West Slurry Cell and/or natural springs underlying the refuse pile.

Water quality analysis of the Coarse Refuse Seep drainage monitored from May/1994 through January/1995 by Echkoff, Watson, and Preator exhibited unusually high temperature, iron, manganese, boron, total dissolved solid, specific conductance and sulfate concentrations when compared to the quality of the water emanating from adjacent springs (Monitoring Location: F-2 Springs), in mine water quality (See JBR Consultants Inc. Spring and Seep Survey {1986} and Bookcliffs Commercial Laboratories Water Analysis Report {1983}). In addition, an iron hydroxide-oxyhydroxide deposit exists in the bottom of the Coarse Refuse Seep Drainage channel and is most likely the result of the Fe^{+2} <-> Fe^{+3} oxidation and the subsequent hydrolysis and precipitation of Fe^{+3}. These data can be found in Appendix 7-4 of the plan.

No underground mining will occur within the SCA permit area. No drinking water supplies exist within the permit area.

Icelander Creek is the only surface water source located adjacent to the mining permit area. No other surface water sources are located in the permit area that could be impacted from this mining activity.

Findings:

Information regarding hydrologic resource information was found to meet the minimum regulatory requirements of this section.

MAPS, PLANS, AND CROSS SECTIONS OF RESOURCE INFORMATION

Regulatory Reference: 30 CFR 783.24, 783.25; R645-301-323, -301-411, -301-521, -301-622, -301-722, -301-731.

Analysis:

Affected Area Boundary Maps

Plates 3-1 through 3-1E show the boundaries of all the areas currently or proposed to be affected over the life of the mining and reclamation operations. Plate 9-7 delineates the mining areas and also shows the location of the future borrow area. As provided on Plate 3-1, the total area to be affected over the life of operations includes pre-law and post-law (SMCRA) disturbances and is delineated for the purpose of specific performance standards that may apply to these areas. The total area affected, including future disturbances, is approximately 235 acres.

Archeological Site Maps

Plate 4-2 provides the survey areas and site locations as part of the archeological survey.

Coal Resource and Geologic Information Maps

Coal resource and geologic information maps are found in Chapter 6 of the plan. Plates 6-3 through 6-6 provide geologic cross sectional information. A topographic map showing borehole sample locations within the refuse area is provided as Plate 6-1. Figures 6-1 through 6-3 provide a generalized lithologic section, stratigraphic relationship to the Sunnyside Mining district and a typical section of the Sunnyside Coal Property. Appendix 9-1 further delineates coal resource information.

Cultural Resource Maps

Chapter 4 provides plates showing the existing land use, survey areas and site locations and sensitivity zones as part of the cultural resource information. These plates are listed as Plates 4-1 through 4-4 in the plan.

Existing Structures and Facilities Maps

Plate 5-1 has been provided by the permittee to show the general location of existing surface facilities. Ponds and diversion structures are found in chapter 7 of the plan. Road details and designs are found in Chapter 5 of the plan. Details of the crushing and conveying facilities as well as the adjacent power plant operations are also found in Chapter 5 of the plan.

Additionally, contour maps have been submitted for the sediment ponds within the permit area.

Existing Surface Configuration Maps

The permittee has submitted contour maps of the permit area. A general configuration of the existing surface operations is found as Plate 5-1 in the plan.

Mine Workings Maps

There are no active, inactive, or abandoned underground mines within the permit area. Surface mining is occurring by reprocessing the refuse materials resultant from previous and current underground mining operations adjacent to the permit area. The location and extent of the existing refuse piles and slurry cells that are to be surface mined are shown on Plate 5-6 in the plan.

Monitoring and Sampling Location Maps

The permittee has submitted maps showing surface and groundwater monitoring locations. Water monitoring stations are depicted on plates 7-2 and 7-3. The water quality sites are shown on Plate 7-2. Plate 7-3 shows locations of the UPDES permitted discharge locations. The monitoring sites are described in Appendix 7-8.

Permit Area Boundary Maps

Plate 1-1 represents the permit area boundary. This map delineates the location and the extent of the permit area and relates the permit boundary to known points of reference, i.e., the southeast corner of Section 6 and the northwest corner of Section 7, Township 15 South, Range 14 East, Salt Lake Base & Meridian.

Subsurface Water Resource Maps

Ground water resource information indicates that ground water sources do not exist within the SCA permit area. The base of the refuse pile and slurry ponds is predominantly Mancos Shale. Groundwater sources in these shales are typically very high in Total Dissolved Solids and include elevated levels of sodium and sulfates that render them undesirable for domestic or agricultural uses. TDS of waters from these shales can be well over 10,000 mg/l. Accordingly, no map showing piezometric water surface elevations has been provided.

Surface and Subsurface Ownership Maps

Plate 1-1 shows surface and subsurface ownership within and contiguous to the permit area.

Surface Water Resource Maps

Surface waters located in and adjacent to the SCA property include Icelander Creek, the F2 spring which is one source for Icelander Creek, and the sediment ponds associated with the SCA permit. These are depicted on Plates 7-1 and 7-6.

Vegetation Reference Area Maps

Plate 3-1 is a vegetation map which adequately details the vegetation within and adjacent to the permit area.

Well Maps

The permittee located one water well that was within one-mile radius of the permit area. This well is identified as the East Carbon City well and is included as a water-monitoring site. The location of this well is shown on Plate 7-2 in the plan.

Findings:

Information regarding maps, plans and cross sections of resource information was found to meet the minimum regulatory requirements.

OPERATION PLAN

MINING OPERATIONS AND FACILITIES

Regulatory Reference: 30 CFR 784.2, 784.11; R645-301-231, -301-526, -301-528.

Analysis:

Mining operations for Sunnyside Cogeneration Associates involve the reprocessing of refuse materials associated with previous mining operations. The refuse and coal processing waste materials that are utilized by SCA primarily come from current and previous underground coal mining operations. The permit area included as part of SCA's permit area was previously and most recently permitted by Sunnyside Coal Company (SCC). The mining operations conducted within the permit area are shared between Sunnyside Coal Company and Sunnyside Cogeneration Associates. Changes in the mining operations resultant from chapter 11 bankruptcy by Sunnyside Coal Company will most likely change the status of the shared permit area, and influence mining operations for both SCA and SCC. Once such changes become known, SCA should revise their operation and reclamation plan accordingly.

Waste materials derived from previous underground coal mining activities are now being reprocessed by Sunnyside Cogeneration Associates. The waste materials serve as a source of fuel for the waste-to-energy facility also owned by SCA adjacent to the permit area. Over the life of the power generation facilities, it is anticipated that a significant amount of the refuse, coal waste and coal processing waste will be burned to generate electricity.

Final reclamation of the refuse pile will be accomplished after all of the coal mine waste is either disposed of by burning in the power plant, or relocated for final disposal as waste material within the permit area. That material which is not reprocessed and used as fuel for the power plant will ultimately be placed in a permanent waste disposal facility. This area has been designated by the applicant as the "Excess Spoil Disposal Area." Portions of the plan and studies included in the appendices of the plan may refer to this same area as the "Noncombustible Waste Disposal Area" which subsequently has been renamed to the Excess Spoil Disposal Area.

In light of all previous and ongoing mining activities that have occurred on the site, several waste handling and disposal structures have been designated and described in the plan which may lead to confusion regarding specific terms and definitions of those structures in the coal rules. Those structures were initially planned for final disposal of waste material but are now being reprocessed which now makes them part of the active mining area. Eventually, these

old waste disposal structures will be eliminated by reprocessing as fuel material or will be relocated to the Excess Spoil Disposal Area for final and permanent disposal.

A general discussion of the mining methods to be used within the permit area has been provided on page 500-8 of the plan. Additional information regarding a general description of the mining operations to be conducted during the life of the mine within the permit area is found in Chapter 9 of the plan. The permittee has indicated that mining will be accomplished by excavating coal mine waste in the form of coal slurry materials and coarse coal refuse materials. Excavation of the coal materials will be considerate of material quality, pile and embankment stability, and mine operation. The permittee will excavate material from the refuse disposal area based on an evaluation of the material's suitability. The evaluation will in turn be based on detailed sampling and analysis of the material.

The permittee has presented as Appendix 9-1, a draft conceptual plan prepared by John T. Boyd Company as the mine plan for SCA. Information from that proposal is summarized in section 9.1 of the plan. The plan provides recommendations and suggested equipment to be used to accomplish mining of the refuse facility.

The permittee has indicated that approximately 57% of the permit area is disturbed. These disturbances have been caused from coal mine waste disposal, roads and sediment ponds and ditches. The majority of the area was disturbed prior to SMCRA. Future activities of the SCA cogeneration facilities are expected to cause little or no new disturbances to vegetated areas since the majority of the permit activities will be within the areas currently disturbed by mining activities.

Mining activities will include the excavation and handling of coal waste materials within the permit area. The permittee has attempted to characterize the materials as being either combustible and suitable for mining for the generation of power within the Sunnyside Power Generation facilities or as non-combustible materials within the permit area that will have to be disposed of within the permit area.

The permittee has indicated in section 9.6 of the plan that the existing refuse pile consists of recoverable coarse and fine coal refuse and non-combustible material in the following proportions:

Type of Material	Tons (1000's)	Percent
Coarse Refuse	6,816	73.5
Fine Refuse	1,998	21.5
Non-combustible	460	5.0
TOTAL	9,274	100.0

The above figures were adjusted by the permittee to include anticipated materials produced by Sunnyside Coal Company's underground coal mining operation, which currently utilizes the facility for refuse disposal. Additionally, based on SCC mine production, approximately 264,000 tons of refuse material is anticipated to be added to the refuse facilities over the remaining life of the mine. Because mining operations at SCC have currently ceased, realization of the additional material may not occur. The amount of this material is not significant in relation to the amount of material currently on site.

Mining of the refuse material will be accomplished by front-end loaders and tandem haul trucks that will convey the refuse materials to the crushing and screening facilities adjacent to the refuse pile that feed directly to the cogeneration power plant.

Annual production of mined refuse materials is estimated at approximately 410,000 tons. Life of mine operations is estimated at 20 years.

The permittee has provided a general description of the mining operations proposed to be conducted during the life of the mine within the proposed permit area. This information is found on Page 500-9 of the plan. More specific information regarding these structures and facilities is located throughout the plan in specific regard to applicable design and performance standards.

The following outlines the major facilities found within the permit area.

Slurry Ditch:

The Slurry Ditch was constructed in the 1950's. Its location is shown on Plate 5-1 and its design details and a demonstration of its adequacy for the 10-year/6-hour storm are found in Appendix 7-3.

The Slurry Ditch comes from the SCC coal preparation plant, enters the SCA permit area at its northeast corner, flows adjacent to Slurry Ponds #1 and #2, enters a culvert which goes beneath Road A, and empties into the northern end of the East Slurry Cell. It can be routed into either or both of the slurry ponds or exclusively into the East Slurry Cell. The Slurry Ditch has 2 purposes: 1) to carry water laden with coal fines from the SCC coal preparation plant, and 2) to provide runoff control for the hillside to the northeast of the SCA permit area and for the area between the railroad tracks.

Slurry Ponds #1 & #2 and Clear Water Pond:

All 3 ponds were constructed in the 1970's. Their locations are shown on Plate 5-1 and the details of their design and construction are found in Appendix 7-3.

These 3 ponds are located next to each other in a triangular group at the northern edge of the permit area. A filter dike separates Slurry Ponds #1 and #2 from the Clear Water Pond. The ponds operate together as a single system to accumulate and dewater the coal fines and treat the water that come from the SCC coal preparation plant via the Slurry Ditch. While one of the Slurry Ponds is receiving slurry, the other is either drying or being cleaned. Water from the Slurry Ponds passes through the filter dike, leaving behind most of its load of coal fines, and then flows to the Clear Water Pond through an 8-inch pipe. After further settling, the water is discharged from the Clear Water Pond into Icelander Wash.

None of these ponds comes under the criteria of 30 CFR 77.216(a) but are governed by the operational and design criteria of R645-301-514.300 and R645-301-533. Since the ponds are all of incised, and not raised, construction, no demonstration of static stability is required or necessary. The permittee has included a table that details the configuration of the pond spillways. The cross sections dimensions and the slopes are provided in each pond's diversion description.

Pasture Sediment Pond:

The Pasture Sediment Pond was built in the 1970's. Its location is shown on Plate 5-1 and the details of its design and construction are found in Appendix 7-3 and shown on Plates 7-1, 7-1A, and 7-9.

The Pasture Sediment Pond is located immediately southwest of the truck dump at the north side of the permit area. The pond is partially of incised and partially of raised construction and has a total capacity of 0.98 acre-feet. Its purpose is to treat runoff from a 17.0-acre area that includes Temporary Storage Area #1 and the area to the west of the Slurry Ponds. The pond itself will contain or treat the 10-year/24-hour storm, while its principal and emergency spillways will handle the 25-year/6-hour storm.

The Pasture Sediment Pond does not come under the criteria of 30 CFR 77.216(a) and it is, therefore, governed by the operational and design criteria of R645-301-514.300 and R645-301-533. Since the pond is partially of raised construction, a demonstration of static stability is required, and this demonstration is found in Appendix 5-1. The static stability analysis found there demonstrates a static stability safety factor for the pond of 11.1, far above the minimum required value of 1.3.

Coal Pile Sediment Pond:

The plan does not indicate when the Coal Pile Sediment Pond was built. Its location is shown on Plate 5-1 and the details of its construction are shown on Plates 7-1, 7-1A, and 7-18, and Appendix 7-3 contains design details of the sediment ponds and slurry cells.

The Coal Pile Sediment Pond is located immediately to the west of the truck dump at the north side of the permit area. The pond is partially of incised and partially of raised construction. Its purpose is to treat runoff from the 0.6-acre area that includes Temporary Storage Area #4 and the truck dump.

The Coal Pile Sediment Pond does not come under the criteria of 30 CFR 77.216(a) and it is, therefore, governed by the operational and design criteria of R645-301-514.300 and R645-301-533. Since the pond is partially of raised construction, a demonstration of static stability is required. Appendix 5-1 provides the assumptions and calculations used to determine that the factor of safety for the pond embankment is 1.5.

Coarse Refuse Toe Sediment Pond:

The Coarse Refuse Toe Sediment Pond was built in the 1970's. Its location is shown on Plate 5-1 and the details of its design and construction are found in Appendix 7-3 and shown on Plates 7-1, 7-1C, and 7-7.

The Coarse Refuse Toe Sediment Pond is located at the west end of the permit area, below the west embankment of the West Slurry Cell, and adjacent to an abandoned railroad grade. The pond is partially of incised and partially of raised construction and has a total capacity of 1.63 acre-feet. Its purpose is to treat runoff from a 6.08-acre area that includes the lower lifts of the West Embankment of the West Slurry Cell and the canyon below it. The pond itself will contain the 10-year/24-hour storm, while its open channel spillway will handle the 25-year/6-hour storm.

The Coarse Refuse Toe Sediment Pond does not come under the criteria of 30 CFR 77.216(a) and it is, therefore, governed by the operational and design criteria of R645-301-514.300 and R645-301-533. Since the pond is partially of raised construction, a demonstration of static stability is required, and this demonstration is found in Appendix 5-4. The static stability analysis found there demonstrates a static stability safety factor for the pond of 1.5, well above the minimum required value of 1.3.

Rail Cut Sediment Pond:

The Rail Cut Sediment Pond was built in the 1970's. Its location is shown on Plate 5-1 and the details of its design and construction are found in Appendix 7-3 and shown on Plates 7-1, 7-1D, and 7-8.

The Rail Cut Sediment Pond is located near the southwest corner of the permit area, adjacent to an abandoned railroad grade. The pond is partially of incised and partially of raised construction, and has a total capacity of 4.8 acre-feet. Its purpose is to treat runoff from a 70.4-acre area that includes the upper lifts of the West Embankment of the West Slurry Cell, the West

Slurry Cell, and Industrial Borrow Area #1. The pond itself will contain the 10-year/24-hour storm, and its spillway will handle the 25-year/6-hour storm.

The Rail Cut Sediment Pond does not come under the criteria of 30 CFR 77.216(a) and it is, therefore, governed by the operational and design criteria of R645-301-514.300 and R645-301-533. Since the pond is partially of raised construction, a demonstration of static stability is required, and this demonstration is found in Appendix 5-1. The static stability analysis found there demonstrates a static stability safety factor for the pond of 2.1, well above the minimum required value of 1.3.

Old Coarse Refuse Road Sediment Pond:

The Old Coarse Refuse Road Sediment Pond was built in the 1970's. Its location is shown on Plate 5-1 and the details of its design and construction are found in Appendix 7-3 and shown on Plates 7-1, 7-1B, and 7-10.

The Old Coarse Refuse Road Sediment Pond is located near the southeast corner of the permit area. The pond is partially of incised and partially of raised construction and has a total capacity of 0.84 acre-feet. Its purpose is to treat runoff from a 13.88-acre area which includes the south and east embankments of the East Slurry Cell. The pond itself will contain or treat the 10-year/24-hour storm, and its 18-inch pipe spillway will handle the 25-year/6-hour storm.

The Old Coarse Refuse Road Sediment Pond does not come under the criteria of 30 CFR 77.216(a) and it is, therefore, governed by the operational and design criteria of R645-301-514.300 and R645-301-533. Since the pond is partially of raised construction, a demonstration of static stability is required, and this demonstration is found in Appendix 5-4. The static stability analysis found there demonstrates a static stability safety factor for the pond of 1.44, which is above the minimum required value of 1.3.

Borrow Area Pond:

The Borrow Area Pond was built in the 1970's. Its location is shown on Plate 5-1 and the details of its design and construction are found in Appendix 7-3 and shown on Plates 7-1, 7-11, and 7-11B.

The Borrow Area Pond is located near the southeast corner of the permit area. The pond is partially of incised and partially of raised construction, and has a total capacity of 8.3 acre-feet. Its purpose is to treat runoff from the 260-acre area that comprises Industrial Borrow Area #3. The pond itself will contain the 10-year/24-hour storm, and its spillway will handle the 25-year/6-hour storm.

The Borrow Area Pond does not come under the criteria of 30 CFR 77.216(a) and it is, therefore, governed by the operational and design criteria of R645-301-514.300 and R645-301-533. Since the pond is partially of raised construction, a demonstration of static stability is required, and this demonstration is found in Appendix 5-1. The static stability analysis found there demonstrates a static stability safety factor for the pond of 1.54, well above the minimum required value of 1.3.

East Slurry Cell:

The East Slurry Cell was built in 1974, prior to the deactivation of the West Slurry Cell. Its location is shown on Plate 5-1 and the details of its design and construction are found in Appendix 7-3 and shown on Plates 7-12 and 7-16.

The East Slurry Cell is located immediately to the east of the West Slurry Cell at the center of the permit area. It is partially of incised and partially of raised construction, and has a total capacity of 184 acre-feet. Its original purpose was to receive coal slurry from the SCC coal preparation plant. Now, however, this occurs only occasionally when Slurry Ponds #1 and #2 are both inactive. Its main function now is to receive and treat runoff from a 166-acre area that includes the cell itself and a large area to its north. The East Slurry Cell itself will contain the 100-year/6-hour storm.

The East Slurry Cell comes under the criteria of 30 CFR 77.216(a). Since it is partially of raised construction, a demonstration of static stability is required, and this demonstration is found in Appendix 5-3. The static stability analysis found there demonstrates a static stability safety factor of 1.5, which is the minimum required value.

West Slurry Cell:

The West Slurry Cell was built in the 1950's. Its location is shown on Plate 5-1 and the details of its design and construction are found in Appendix 7-3 and shown on Plates 7-12 and 7-16.

The West Slurry Cell is the dominant feature of this site and covers about 38 acres in the center of the permit area. It started out as a dike across an ephemeral drainage to collect slurry from the SCC coal preparation plant and is thus composed mostly of coal fines. It was deactivated in 1975 when the East Slurry Cell was built. No slurry or runoffs are now diverted into it and it receives only the precipitation that falls on its surface. Coarse refuse is also stored temporarily within its western embankment. It will be mined actively during the first few years of this operation.

Though inactive, the West Slurry Cell comes under the criteria of 30 CFR 77.216(a). Since it is a raised accumulation of coal and other material, and since its west embankment has

been raised by the addition of coarse refuse material, a demonstration of static stability is required, and this demonstration is found in Appendix 5-3. The static stability analysis found there demonstrates a static stability safety factor of about 2.3, well above the minimum required value of 1.5.

Temporary Storage Area #1:

Temporary Storage Area #1 was constructed in 1993. Its location is shown on Plate 5-1 and the details of its design are set forth in Chapter 9 and shown on Plate 9-2. Approval of the construction of Temporary Storage Area #1 was made after issuance of the permit and is not considered as an existing structure as defined under the coal rules.

Temporary Storage Area #1 is located immediately to the east of the truck dump and covers about 2.9 acres. The area slopes to the southwest at about a 3% grade and drains into the Pasture Sediment Pond. The topsoil from the area was removed and stockpiled at its northeast corner.

Temporary Storage Area #1 is used for the temporary storage of coarse refuse, both from this operation and also from the SCC operation. It is operated in conjunction with Temporary Storage Area #2, which is located just across the road to the south, so that one area is being filled and graded while the other is being emptied. The coarse refuse material is placed and lightly compacted in the area in 4-foot lifts, each of which has a capacity of about 20,000 tons.

Temporary Storage Area #2:

Temporary Storage Area #2 was constructed in 1993. Its location is shown on Plate 5-1 and the details of its design are set forth in Chapter 9 and shown on Plate 9-2. Approval of the construction of Temporary Storage Area #2 was made after issuance of the permit and is technically not considered as an existing structure as defined under the coal rules.

Temporary Storage Area #2 is located immediately to the south of Temporary Storage Area #1, at the northeastern tip of the West Slurry Cell, and covers about 3.1 acres. It was originally a noncoal waste (trash) dump, but the noncoal waste was leveled and covered with 18 inches of compacted soil in preparation for the area being used for storage of coarse refuse. The area slopes to the east at about a 2% grade and drains into the Pasture Sediment Pond. Since the area was used as a dump prior to SMCRA, no topsoil was removed or stockpiled.

Temporary Storage Area #2 is used for the temporary storage of coarse refuse, both from this operation and also from the SCC operation. It is operated in conjunction with Temporary Storage Area #1, which is located just across the road to the north, so that one area is being filled and graded while the other is being emptied. The coarse refuse material is placed and lightly compacted in the area in 4-foot lifts.

Temporary Storage Area #3:

Temporary Storage Area #3 was designated as such in 1993, though it had been used for the storage of slurry pond material since the construction of the slurry ponds in the 1970's. Its location is shown on Plate 5-1 and the details of its design are set forth in Chapter 9 and shown on Plate 9-2. Approval of the construction of Temporary Storage Area #3 was made after issuance of the permit.

Temporary Storage Area #3 is located immediately to the east of Slurry Pond #2, in the northeastern part of the permit area, and covers about 5.8 acres. The area slopes to the west at about a 6% grade and drains into the East Slurry Cell. Since the area was used for storage of slurry pond material prior to SMCRA, no topsoil was removed or stockpiled.

Temporary Storage Area #3 is now used for the temporary storage of slurry pond material. Its intended use, however, is as an overflow storage area for coarse refuse, both from this operation and from the SCC operation, in the event that Temporary Storage Areas #1 and #2 are full. If this occurs, the coarse refuse material will be placed and lightly compacted in the area in 4-foot lifts, each of which will have a capacity of about 44,000 tons.

Temporary Storage Area #4:

Temporary Storage Area #4 was built in 1993. Its location is shown on Plate 5-1 and the details of its design are set forth in Chapter 9. Approval of the construction of Temporary Storage Area #4 was made after issuance of the permit.

Temporary Storage Area #4 is located inside the loop of the New Access Road adjacent to the truck dump and covers about 1.5 acres. The area drains to the Pasture Sediment Pond. The topsoil from the area was removed and stockpiled in the Access Road Topsoil Stockpile just to the south.

Temporary Storage Area #4 is used for the temporary storage of coarse refuse material prior to its being placed on the main power plant conveyor. The temporary storage of materials in this area does not require that the pile be placed and compacted in lifts.

Excess Spoil Disposal Area:

Construction of the Excess Spoil Disposal Area began in 1993. Its location is shown on Plate 5-1. The details of its design are set forth in Appendices 9-2, 9-4, and 9-5 and shown on Plates 9-1A, 9-1B, 9-1C, and 9-1D. Construction of Excess Spoil Disposal Area was made after issuance of the permit.

Noncoal Waste Temporary Storage Area:

The Noncoal Waste Temporary Storage Area was designated in 1993. Its location is shown on Plate 5-1 and the details of its operation are set forth in Chapter 9. Approval of the construction of Noncoal Waste Temporary Storage Area was made after issuance of the permit.

The Noncoal Waste Temporary Storage Area is located just south of the Coal Pile Sediment Pond, at the northern border of the permit area, and covers about 1.1 acres. This area is used for the temporary storage of trash, prior to its final disposal in a separate, state-approved, commercial landfill.

Findings:

Information regarding this section of the regulations was found to meet the minimum regulatory requirements. A general description of the facilities and structures used in conjunction with mining and reclamation operations has been described and presented in the plan.

EXISTING STRUCTURES:

Regulatory Reference: 30 CFR 784.12; R645-301-526.

Analysis:

Plate 5-8 is provided in the plan to show the location of existing surface and subsurface facilities and features within the permit area that existed prior to January 21, 1981. A general description of these structures can be found in this Technical Analysis under Mining Operations, Facilities and Structures, indicating the approximate dates in which facilities and structures were constructed within the permit area.

The permit area is shared by SCA and Sunnyside Coal Company (SCC). Prior to permit application, SCC maintained and operated the site as a permanent waste disposal facility. Kaiser Coal Company, the predecessor to SCC, applied for a permanent program permit during the implementation of SMCRA. Many of the structures associated with the refuse and slurry operations were modified at that time to meet the permanent program design and performance standards. Since permit application, SCA has modified and revised the plan to incorporate these existing structures into its operation plan.

Detailed plans and description of the modifications or changes which were made to these existing structures to comply with applicable design and performance standards is addressed in the plan and discussed in this technical analysis where applicable design and performance standards apply to those facilities.

Findings:

Information regarding the general requirements of this section is considered adequate. Refer to other sections of this analysis for design or other information as may apply to existing structures.

PROTECTION OF PUBLIC PARKS AND HISTORIC PLACES

Regulatory Reference: 30 CFR784.17; R645-301-411.

Analysis:

Site 42Cb325, the coke ovens, have potential to be nominated to the National Register of Historic Places. Approximately 26 coke ovens remain on site from the original 800 (page 400-4). The coke ovens are located on the east side of the refuse pile. Avoidance is the planned protection for these ovens. The site has been staked and flagged to avoid activity within the marked area. At this time no ground disturbance activities are planned that will impact this site (page 400-5).

Plate 4-2 is provided to show the location of the coke ovens. The permittee states that Plate 3-1 has been provided to show the location of the markers used for the coke ovens. The cemetery has been enclosed in a chain link fence primarily to protect the site from vandalism. Neither the coke ovens nor the cemetery site will be included in any of the planned construction or reclamation activities within the permit area.

Plate 3-1 and the accompanying detailed series of maps labeled Plates 3-1A through 3-1E provide the location or extent of the cemetery or coke ovens. This information has been incorporated into the disturbed area boundary maps to ensure that the sites are adequately located and marked in the plan as well as on site.

Findings:

The description of the historic sites and places within the plan meets the minimum regulatory requirements of this section.

RELOCATION OR USE OF PUBLIC ROADS

Regulatory Reference: 30 CFR 784.18; R645-301-521, -301-526.

Analysis:

Nowhere on this site will mining or mining-related activities be conducted within 100 feet of the outside right of way of a public road. This is shown on Plate 5-1, which shows the permit boundary, the surface facilities, and the area contiguous to the permit boundary.

Findings:

Information provided in the plan fulfills the minimum requirements of this section.

AIR POLLUTION CONTROL PLAN

Regulatory Reference: 30 CFR 784.26, 817.95; R645-301-244, -301-420.

Analysis:

On page 500-10 of the plan, the permittee indicates that SCA will continue to comply with the requirements of the Clean Air Act and other applicable air quality laws and regulations, as well as health and safety standards. A copy of the Air Quality Permit is included in the plan as Appendix 4-2.

Haul roads used within the permit area are unpaved. To control fugitive dust, roads around the main complex will be treated with calcium chloride, potassium chloride or sprayed with water as required during dry periods as required by SCA's Air Quality Permit.

Findings:

Information regarding this section was found to meet the minimum regulatory requirements.

COAL RECOVERY

Regulatory Reference: 30 CFR 817.59; R645-301-522.

Analysis:

On page 500-8 of the plan, the permittee indicates that they will maximize the use and conservation of the coal resource by gleaning the most heat possible from combustion of the coal mine waste materials. The coal materials will be burned in a fluidized bed reactor at the Sunnyside Cogeneration Power Plant, which has been approved as the best available technology for maintaining environmental integrity at this site.

The permittee further states that abandoned coal refuse piles are often times re-activated, and reprocessed to recover a marketable coal product. On some occasions, piles are reworked several times, using various processing approaches. SCA's activities will assure that no reworking of this pile occurs in the future since the material remaining after mining will be deemed non-combustible. SCA indicates that their use of coal mine waste to generate electricity is consistent with the national energy policy to conserve domestic energy resources.

Findings:

Information provided in the plan was found to meet the minimum regulatory requirements of this section.

SUBSIDENCE CONTROL PLAN

Regulatory Reference: 30 CFR 784.20, 817.121, 817.122; R645-301-521, -301-525, -301-724.

Analysis:

Renewable Resources Survey

On page 500-10, the plan states that, since there are no underground coal resources and, therefore, no underground mining in the permit area. There will not be any material damage to or diminution of any resource or feature due to subsidence.

Subsidence Control Plan

No subsidence control plan is needed for the permitted activities.

Performance Standards For Subsidence Control

The performance standards for subsidence control are not considered to be applicable for SCA's permitted activities.

Notification

Findings:

Information provided in the plan meets the regulatory requirements of this section.

SLIDES AND OTHER DAMAGE

Regulatory Reference: 30 CFR Sec. 817.99; R645-301-515.

Analysis:

On page 500-6 of the plan, the permittee has stated that at any time a slide occurs which may have an adverse effect on public property, health, safety, or the environment, the permittee will notify the Division by the fastest available means and comply with any remedial measures required by the Division.

Similarly, the permittee has stated that any time there is a potential impoundment hazard, SCA will notify DOGM by the best available means. DOGM will be informed of the emergency procedures formulated for public protection and remediation.

Findings:

Information provided in the plan was found to meet the minimum regulatory requirements of this section.

FISH AND WILDLIFE INFORMATION

Regulatory Reference: 30 CFR Sec. 784.21, 817.97; R645-301-322, -301-333, -301-342, -301-358.

Analysis:

Protection and Enhancement Plan

The plan states that the project site and associated fish and wildlife species have been impacted for over 80 years since mining began in the Sunnyside area. Once reclamation is achieved, the displaced wildlife should return. SCA has committed to interim revegetation and contemporaneous revegetation.

SCA stated that they will make significant efforts to develop a wildlife education program for all employees associated with the surface mining activities (page 300-15).

Endangered and Threatened Species

Figure 3-4, Biological Assessment for the Bald Eagle Associated with the Sunnyside Cogeneration Project Environmental Impact Statement PA93-1 and Biological Consideration for

Other Sensitive Species, discusses the potential impact of the mining project on threatened and endangered species. The plan commits to notification if threatened or endangered species are sighted on the SCA permit area (page 300-14).

Bald and Golden Eagles

Plate 5-1 through 5-1E show the ownership and control of power lines within the permit area. These power lines are owned/controlled by PacifiCorp/Utah Power and Light. SCA has shown that they are not aware of any specific power lines within their permit boundary designated as unsafe for raptors.

Wetlands and Habitats of Unusually High Value for Fish and Wildlife

The seep area is considered a high value habitat. Appendix 3-2, Iron and TDS Report, discusses the high concentration of iron and TDS in the seep water that was potentially toxic to fish. The source of high iron and TDS water was assumed to be from the slurry ponds. Since the closure of the Sunnyside Mines and subsequent non-use of the slurry ponds, the source has dried. Removal of the refuse material and other acid- and/or toxic-forming materials that are or potentially influencing natural seep waters should improve water quality even if the overall quantity of water is diminished when the slurry ponds are no longer used. SCA has committed to a water-sampling program for the seep waters. Recent water monitoring reports for the third and forth quarters of 1995 show no samples were taken due to inadequate flows at the seep. However, no information was provided on the flow at the culvert that may also be considered a part of this seep.

Findings:

Information regarding this section was found to meet minimum regulatory requirements.

TOPSOIL AND SUBSOIL

Regulatory Reference: 30 CFR Sec. 817.22; R645-301-230.

Analysis:

Topsoil Removal and Storage

Most of the surface disturbance within the Sunnyside Coarse Refuse and Slurry permit area was affected before the enactment of Public Law 95-87 (Plate 3-1). Consequently topsoil

was not segregated or stockpiled before most mining activities. Topsoil was segregated during certain construction activities. The topsoil material segregated during these mining activities is currently stockpiled. Stockpile locations and volume estimates may be found in the table below.

Topsoil Stockpile Location (Map 2-1)	**Estimated Quantity (yds.^{3}) (Plate 5-5A through 5-5D)**
Borrow Area	651
Slurry Pond	677
New (Lower) Haul Road	2202
Rail Cut Pond	378
Coarse Refuse Toe	197
Hoist House	152
Access Road	221
Clearwater Pond	2916
Storage Area #1	534
Total Estimated Quantity	**7928**

Topsoil stored in the Hoist House Topsoil Stockpile will not be used for the reclamation of SCA's disturbed area (page 200-7). It is assumed that this material will be used for the reclamation of the Hoist House that lies within SCC's disturbed area.

Prior to all mining related disturbance in previously undisturbed areas or reclaimed areas, topsoil will be segregated and stockpiled (page 200-5). Before topsoil salvage operations vegetation that would interfere with topsoil excavation will be removed (page 200-5).

Stockpiled topsoil will be seeded with the interim seed mixture (Figure 9-1). Wood fiber (hydro-mulch) surface mulch will be applied at a rate of 1 Ton/acre. A containment berm will be constructed around the perimeter of the stockpile.

Page 200-5 indicates that fertilizer will not be applied on the topsoil stockpiles. The interim revegetation plan in Section 9.9.2, recommended 150 lbs./acre of 16-16-8 fertilizer.

Regulatory Requirements: R645-301-233. Topsoil Substitutes and Supplements.

According to Plate 8-4 Worst Case Scenario Borrow Material Plan and commitments made in Appendix 9-5 the permittee proposes in-place material as topsoil substitute.

The permittee may use the noncombustible material within the West Slurry Cell Dike as topsoil substitute. If the dike material appears suitable and is proposed as substitute topsoil, its integrity should be maintained prior to Division approval for placement in the Borrow Material Storage Area.

Appendix 2-11 was added by the permittee to describe suitability of soils used as interim cover over coal mine waste. These analyses conclude that the existing materials meet suitability requirements for cover as described in the Division's Guideline for Management of Topsoil and Overburden for Underground and Surface Coal Mining. Based on availability of suitable cover/soil materials from designated borrow areas within the permit area, re-use of the materials placed over refuse material during interim reclamation is not essential for reclamation and the reclamation plan does not depend on the re-use of these materials for final reclamation.

Findings:

Information regarding this section meets the minimum regulatory requirements.

VEGETATION

Regulatory Reference: R645-301-330, -301-331, -301-332.

Analysis:

The plan commits to interim revegetation stabilization as necessary or as required by the Division as found on page 900-18. Specifically, the plan states that berms or new disturbances associated with the sediment ponds, new topsoil piles, and other areas judged to require interim stabilization will be seeded. Areas of interim revegetation will not receive topsoil. Seedbed preparation will occur only if it is determined that it will not compromise stability. The interim seed mixture as shown in Figure 9-1 is compromised primarily of quick growing wheatgrasses, with two forbs augmenting the mixture.

The plan states on page 200-4 that the only additional areas to be disturbed during the life of mining and reclamation operations are the access road and the borrow areas.

Interim vegetation practices should not be confused with contemporaneous reclamation. In areas that will require re-disturbance during mining or reclamation, prior to final reclamation, interim vegetation practices are to be used. Contemporaneous reclamation is carrying out final reclamation treatments as contemporaneously as possible.

Findings:

Information found in the plan was found to meet the minimum requirements of this section.

ROAD SYSTEMS AND OTHER TRANSPORTATION FACILITIES

Regulatory Reference: 30 CFR Sec. 784.24, 817.150, 817.151; R645-301-521, -301-527, -301-534, -301-732.

Analysis:

Road Classification System

The plan identifies 18 roads: Road A--Upper Haul Road, Road B--Old Coarse Refuse Road, Road C--East Slurry Cell Access Road, Road D--South Haul Road, Road E--Lower Haul Road, Road F--Railroad Access Road, Road G--Slurry Pond Access Road No. 1, Road H--Slurry Pond Access Road No. 2, Road I--Clear Water Pond Access Road, Road J--New Haul Access Road, Road K--Borrow Area Pond South Access Road, Road L--East Slurry Cell South Access Road, Road M--Coarse Refuse Seep Access Road, Road N--Old Coarse Refuse Toe Pond Access Road, Road P--Railcut Pond West Access Road, and, Road Q--Old Coarse Refuse Sediment Pond Access Road. All these roads are classified as primary roads except portions of Road D--the South Haul Road, and the access into Storage Area 2, both of which are within the mining area. The regulatory definition of the word "road" may exclude both roads within the immediate mining-pit area and public roads, to be determined on a site-specific basis. Accordingly, the roads that are within the refuse facilities need not be classified as either primary or ancillary roads, per se. These roads are within the mining area and are subject to sediment controls and other performance requirements as part of the disturbed mining area.

General road information is found in Chapter 5. Plate 5-2 shows the location and designation of each road with a table that shows the maximum grade, average width, and approximate length of each road. Plates 5-2A and 5-2B show a typical cross section of each road and Plates 5-2C through 5-2J, excluding 5-2I, show a plan view and a profile, or longitudinal cross section, of each road. Appendix 5-7 contains a detailed description of each road, designates each road as either primary or ancillary, and contains a stability analysis of each road embankment. All road designs have been certified by a registered professional engineer.

Plates 7-1 and 7-1A also show Road J, the New Haul Access Road, within the permit area.

The stability analysis in Appendix 5-7 is a standard, circular failure analysis done using the procedure set forth in *Rock Slope Engineering* by Hoek & Bray. Analyses were done at 30

locations on the various roads and the results are shown in Table 2 of Appendix 5-7. The demonstrated safety factors range from 1.3 to as high as 9.3, with most falling between 1.3 and 2.0; none are below the minimum required value of 1.3.

As a road base, SCA is using oversized coarse refuse material rejected by the crushing unit and cannot be adequately sized and is rejected due to a high rock content and a low coal content. The use of the reject material will be dependent on the fuel potential of the material and/or suitability for other acceptable uses. All material determined to have an acceptable fuel content (greater that approximately 2,500 Btu/lb and less than approximately 75% ash) will be back blended with the material that is being mined then. If the material cannot be used as fuel, it will be used for either road base or placed in the Excess Spoil Disposal Area. Reject material to be used for road base will only be placed on roads within the permitted disturbed area whose drainage flows into approved sediment pond facilities.

If the reject material has low fuel potential and is not suitable for use as road base, it will be disposed of in the Excess Spoil Disposal Area. Reject material that is designated for use as road base will be stored in one of the approved temporary storage areas (separate from fuel materials) until needed.

By definition, rock reject from the crushing facility is coal-processing waste and must be handled as coal mine waste. The rock reject material must meet the Division standards for being nonacid or nontoxic forming materials as required under R645-301-534.120 for road surfaces. The Division has determined that the Operator may use the rock reject material for road base if the material is only used on roads within the refuse facilities that report to approved sediment ponds, and the material is nonacid or nontoxic forming. Upon reclamation, the road surfaces and road base materials constructed of refuse material must be disposed of within Excess Spoil Disposal Area or other permitted area for refuse disposal.

Plans and Drawings

Performance Standards

Primary Road Certification

Other Transportation Facilities

Appendix 5-7 indicates that, if a new transportation facility is required by SCA to maintain the efficiency of the operations and/or improve the conditions of the site, all designs

will be approved prior to construction. The location and construction of the facility will be such that water quality hazards, pollution, erosion, and damage to public and/or private property is minimized. Plate 4-5 show the location of and incorporates crushing, conveying and storage areas into the permit area.

Additional information regarding transportation facilities is found in Chapter 5 of the plan. This information provides the regulatory commitment to maintain and remove transportation structures and roads according to the regulatory requirements. This information has been incorporated into Chapter 5 of the plan and information of that section has been modified to incorporate conveying storage and crushing facilities into the permit area.

Findings:

Information regarding roads and other transportation facilities as required under this section of the regulations was found to meet the minimum regulatory requirements.

SPOIL AND WASTE MATERIALS

Regulatory Reference: 30 CFR Sec. 701.5, 784.19, 784.25, 817.71, 817.72, 817.73, 817.74, 817.81, 817.83, 817.84, 817.87, 817.89; R645-100-200, -301-210, -301-211, -301-212, -301-412, -301-512, -301-513, -301-514, -301-521, -301-526, -301-528, -301-535, -301-536, -301-542, -301-553, -301-745, -301-746, -301-747.

Analysis:

Disposal Of Noncoal Mine Wastes

The Noncoal Waste Temporary Storage Area is found just south of the Coal Pile Sediment Pond, and covers about 1.1 acres. Details of its operation are set forth in Chapter 9.

Noncoal waste, including, but not limited to, grease, lubricants, paints, flammable liquids, garbage, abandoned mining machinery, lumber, and other combustible materials, will be stored temporarily in the Noncoal Waste Temporary Storage Area. This material, the quantity of which is expected to be small, will then be permanently disposed of in a separate, state-approved, and commercial landfill. At no time will such materials be buried in a refuse pile or impounding structure. The permittee has indicated that this area will be operated in a way that prevents the degradation of surface or groundwater by leachate or contaminated runoff.

Coal Mine Waste

Coal mine waste will be placed in the Excess Spoil Disposal Area. The disposal of coal mine waste in excess spoil fills is allowed under R645-301-536.300. Also refer to the excess

spoil section below for clarification as to what materials are considered coal mine waste by the applicant.

Refuse Piles

The refuse pile was constructed prior to enactment of the mining regulations. During operations, this existing refuse pile will be excavated and reprocessed by SCA for the combustible material that it contains.

Fires continue periodically to burn within this pile. The permittee has developed a plan for controlling and extinguishing these fires and this plan is found on page 500-18. The plan consists both of covering the burning material in situ with noncombustible material and of excavating the burning material and placing it in the Excess Spoil Disposal Area after the fire has been extinguished.

Impounding Structures

The refuse pile was constructed prior to enactment of the mining regulations. During operations, this existing refuse pile will be excavated and reprocessed by SCA for the combustible material that it contains.

Fires continue periodically to burn within this pile. The permittee has developed a plan for controlling and extinguishing these fires and this plan is found on page 500-18. The plan consists both of covering the burning material in situ with noncombustible material and of excavating the burning material and placing it in the Excess Spoil Disposal Area after the fire has been extinguished.

Burning And Burned Waste Utilization

There currently are fires within the coarse refuse pile. Previous attempts at extinguishing these fires included covering the site with inert soil material to suffocate the fires. This treatment has not been completely effective. The permittee has developed a plan for controlling and extinguishing these fires and this plan is found on page 500-18. The plan consists both of covering the burning material in situ with noncombustible material and of excavating the burning material and placing it in the Excess Spoil Disposal Area after the fire has been extinguished.

Return of Coal Processing Waste to Abandoned Underground Workings

Excess Spoil:

All materials not mined and used for fuel will be disposed of as excess spoil within the Excess Spoil Disposal Facility. Disposal of materials within this area will not include non-coal waste material. Information and quantities of materials to be disposed of in the Excess Spoil Disposal Area have been categorized as defined in Appendix 9-5 of the plan as follows:

COAL MINE WASTE

- Breaker reject from the Bradford Breaker located at the Sunnyside Mine
- Material from outside sources
- Low fuel potential high ash reject from the crushing and screening operations

SPOIL MATERIAL

- West Slurry Cell dike material
- Reclamation material uncovered from the existing coarse refuse pile
- Fire Control Materials, Burned waste within the existing refuse pile, inert materials
- Sediment cleaned out of the sediment ponds

This operation will consist of excavation and handling of accumulated coal mine and coal processing waste, storage and handling of coarse refuse, and redisposal of noncombustible waste in the Excess Spoil Disposal Area adjacent to the west tip of the west slurry cell. The total estimated amount of material to be recovered/reprocessed over the life of the operations is approximately 9.27 million tons. The operation will process approximately 410,000 tons of material per year for approximately 30 years.

The Excess Spoil Disposal Area is located on a natural promontory at the west end of the West Slurry Cell. The facility covers an area of approximately 14 acres. Reject and other waste material, designated for disposal to the Excess Spoil Disposal Area can accommodate approximately 467,800 cubic yards of material as presently designed and proposed in the plan. The capacity of the Excess Spoil Disposal Area is sufficient to hold about 5% of the total volume of material that is projected to be reprocessed.

Based on current projections in the plan, it is expected that approximately 636,075 tons (413,622 cubic yards) of noncombustible material will be produced over the life of the facility. This material will come from the following sources:

Sunnyside Mine Breaker Reject--6,000 tons
Outside Sources (purchased coal)--30,000 tons
High Ash Fuel Reject--30,000 tons

Reclamation Cover from Sub-Area One--96,030 tons
Reclamation Cover from Sub-Area Two--33,970 tons
Reclamation Cover from Sub-Area Three--92,880 tons
Reclamation Cover from Sub-Area Four--23,670 tons
West Slurry Cell Dike Material--116,450 tons
Fire Control, Burned Sections, Hardpan, etc.--124,000 tons
Sediment Pond Cleanout Material--25,250 tons
10% Contingency--57,825 tons

The plan estimates, from a study done in 1992 by the John T. Boyd Company of Pittsburgh, Pennsylvania, that a total volume of 413,622 cubic yards of this material will be placed in the Excess Spoil Disposal Area. This estimate includes a contingency of 10% to cover unknown and unpredictable conditions and a copy of the Boyd report is included in the plan as Appendix 9-1.

The firm of SHB AGRA, Inc. did a study of the Excess Spoil Disposal Area site in 1992 in order to 1) determine its suitability for such a disposal facility, and 2) determine the proper design parameters for such a facility. The results of this study are included in Appendix 9-2. For the study, SHB AGRA's personnel dug 15 test pits to depths of up to 28 feet. They analyzed the material to learn its permeability, moisture content, grain size distribution, compaction, and Atterberg limits. They then used these data to do geologic mapping of the site and to perform a stability analysis of the foundation material. In summary, SHB AGRA made the following findings and recommendations.

1) The toe of the fill should be set back at least 25 feet from the edge of the natural foundation slope.
2) The fill outslope should not exceed a slope of 2.5H:1V.
3) Precautions should be taken to prevent the discharge of surface water on the outslopes of the fill and foundation.
4) In order to avoid creating potential failure surfaces within the fill, material with uncertain engineering properties should be placed no closer than 10 feet to the surface of the fill.
5) Surface water should be diverted away from the fill.
6) Wet material or material of low permeability should be dispersed throughout the fill to avoid creating saturated or impermeable lenses.
7) The relatively high permeability of the fill material should prevent the buildup of pore pressure that might jeopardize the stability of the fill.
8) There is no evidence of groundwater or springs on or within the natural underlying material.
9) If the above recommendations are followed, the fill will have a static stability safety factor of at least the required 1.5.

The permittee has incorporated the SHB AGRA recommendations listed above into the design of the Excess Spoil Disposal Area and commitments made in the plan. The maximum height of the fill will be 70 feet. The maximum slope of the top of the fill will be 2%. The toe of the outslope will be set back at least 25 feet from the edge of the natural ridge and the foundation slope will not exceed 2.8H:1V. The fill will be placed and compacted in lifts 4 feet or less in thickness and the outslopes will be approximately 2.5H:1V. 14-foot-wide, contour terraces, sloping into the fill at 2-4%, will be constructed every 25-35 vertical feet on the face of the fill to dissipate water energy and thus control erosion.

Page 900-13 indicates that the fill material will be sampled and analyzed for acid- and/or toxic-forming potential, at the rate of one sample per acre per 4-foot lift, and any acid- and/or toxic-forming material will be covered with at least 4 feet of suitable material. Page 600-10 of the plan commits to sample one grab sample per acre/4-foot lift of the noncombustible waste material. Sampling must be based on a verifiable procedure that would require sampling immediately after completion of each four-foot lift. The permittee has committed to include sampling information with the quarterly engineering inspection reports.

A series of diversions are designed for the 100-year/6-hour storm to divert runoff off of the Excess Spoil Disposal Area. The final configuration of the Excess Spoil Disposal Area includes terraces that are approximately 14 feet wide and are at vertical intervals of 25 to 35 feet. Plate 9-1B shows the general configuration of the terraces and a typical terrace detail.

In Appendix 9-5, page 4 (revised September 15, 1993) and 900-15 (revised December 30, 1993) the permittee commits to covering the noncombustible waste site with four feet of "suitable material."

Additional materials that may result in a significant change in the capacity and requirements for the Excess Spoil Disposal Area involve the potential requirements for removal of acid- and/or toxic-forming materials, including but not limited to the precipitate layer, exposed during mining operations. As approved by the Division during the reclamation of the Old Coarse Refuse Road reclamation, the unsuitable materials were either removed from the surface before scarifying and topsoil preparation or covered with four feet of suitable material. Until an adequate analysis of the precipitate material can be accomplished as noted elsewhere in these analyses, it should be anticipated that removal or cover requirements will exist for the precipitate materials, where encountered. Disposal of unrecovered on unusable refuse material may affect the capacity and configuration of the Excess Spoil Disposal Area, especially at the time of final reclamation.

The plan states that the toe of the outslope of the Excess Spoil Disposal Area will be set back at least 25 feet from the edge of the natural ridge and the foundation slope will not exceed 2.8H:1V. Refer to Plate 9-1B, Excess Spoil Disposal Area Design - Final Surface Configuration.

The Excess-Spoil Disposal Area Design is found in Appendix 9-5. Additionally, the foundation investigation is included in Appendix 9-2. The plan indicates that material will be placed in the fill by end or belly dumping and then spread into compactable lifts, not to exceed 4 feet. Compaction is to be accomplished by wheel rolling from hauling and loading equipment.

Stability analysis was done by SHB AGRA, Inc. based on a general characterization of the materials sampled from various locations as shown in their consulting report in Appendix 9-2. Calculations to determine the factor of safety for the slopes of the Excess Spoil Disposal Area were accomplished using PC-STABL5M. Verification of the stability analysis, using the engineering properties found in the report was done by the Division using SB-SLOPE. Factors of safety as described in the generalized analysis shown in Figure 3 of that report were similar to the results presented on that figure. Soil properties used included a density of 125 pcf and an internal friction angle of 37°. Additional analysis was done by the Division using SB-SLOPE using Section M of the Excess Spoil Disposal Area are found on Plate 9-1C. These analyses were within the factor of safety parameters as required under the performance standards.

The material in the refuse pile and the underlying foundations material were considered cohesionless. Deep-seated failures were well within the factors of safety allowed under the performance standards, however, because the materials were characterized as cohesionless, the factor of safety at or near the surface of the slopes can be significantly less due to the characteristics of the modeling software. The angle of repose for these materials is approximately equal to the internal angle of friction. The outslopes of the foundation materials below the spoil pile are at slopes of 1.4:1 or about 35.5° which is at or near the angle of repose that is often the case for the natural slopes in the area.

Setting the material back, a minimum of 25 feet from the outslopes of the foundation materials is critical to maintain stability for the spoil pile. Caution must also be used to prevent over-steepening of the foundation materials located to the north of the Excess Spoil Disposal Area where refuse currently exists and not to over-steepen the slopes below the spoil pile, especially to slopes greater than the angle of repose while removing precipitate materials or regrading slopes for final reclamation.

Sampling and analysis of the refuse material placed in the excess refuse disposal area will be accomplished at a rate of one grab sample per acre per four foot lift. This equates to about one sample per 6,500 cubic yards (8,750 tons) of material placed in the refuse disposal facility. Analysis parameters include: pH; Electrical Conductivity; Particle Size Analysis; Sodium Adsorption Ration; Soluble Ca, Mg, and Na; Total N; Nitrate-N; Boron; Maximum Acid Potential; Neutralization Potential; Organic Carbon; and, Total Sulfur.

The design capacity of the excess spoil refuse disposal facility is approximately 467,800 cubic yards (719,000 tons) of refuse materials. The configuration of the Excess Spoil Refuse Disposal Area limits the capacity of the permanent disposal facilities to that material projected in

the preliminary design information that accompanies the permit application. Although the capacity of the refuse pile will allow for disposal of operational waste materials for several years, it may not have sufficient capacity for the life of mining and reclamation operations. Additional permanent waste disposal facilities may have to be located and designed to achieve final reclamation of the site. Cessation of mining operations before the complete reprocessing of the refuse materials would most likely result in a shortage of adequate permanent waste storage.

Page 6 in Appendix 9-5 shows that certified reports of inspections will be accomplished at least quarterly and will include the results of samples taken to determine acid- and/or toxic-forming potential. Reports will be maintained at the mine site and a copy of the report will be promptly mailed to the Division following each inspection.

Coal mine waste fires which may occur in the refuse or excess spoil refuse disposal facility will be controlled according to the plan approved by the Division and the Mine Safety and Health Administration (MSHA). No burning or unburned coal mine waste will be removed from a permitted area without a removal plan approved by the Division.

Findings:

Information regarding spoil and waste materials was found to meet the minimum regulatory requirements of this section of the regulations.

HYDROLOGIC INFORMATION

Regulatory Reference: 30 CFR Sec. 773.17, 774.13, 784.14, 784.16, 784.29, 817.41, 817.42, 817.43, 817.45, 817.49, 817.56, 817.57; R645-300-140, -300-141, -300-142, -300-143, -300-144, -300-145, -300-146, -300-147, -300-147, -300-148, -301-512, -301-514, -301-521, -301-531, -301-532, -301-533, -301-536, -301-542, -301-720, -301-731, -301-732, -301-733, -301-742, -301-743, -301-750, -301-761, -301-764.

Analysis:

General

Groundwater Monitoring

The permittee proposes to sample the East Carbon City well as a source of groundwater for baseline monitoring. As discussed in previous sections, the baseline monitoring sites will continue to be monitored for operational parameters after the baseline data is collected as indicated in Appendix 7-8.

The groundwater-monitoring plan includes collecting water quality samples from the East Carbon City well and the F2 spring. Each of these sites will be added to the operational monitoring sites after adequate baseline information is collected. The text portion of Appendix 7-8 shows that the baseline monitoring sites will continue to be monitored for operational parameters after the baseline data collection is complete.

In conjunction with the 1995 drilling plan, borehole B-6 was completed as a monitoring well. Although the borehole was found dry, borehole B-6 was designated to become a semi-permanent monitoring site. Changes in the site conditions or use of the refuse facilities may increase the amount of water in the refuse disposal facility and the borehole would remain to monitor any potential result of that change. A commitment to inspect and monitor the well quarterly is recommended by the Division and the well must be included as a sample location for water monitoring.

Surface Water Monitoring

The permittee proposes to sample the F2 spring, Icelander Creek, below the fly ash disposal site (ICE-1), the seep at the source (CRS) and at the boundary (CRB). Baseline monitoring sites will continue to be monitored for operational parameters after the baseline data is collected as shown in Appendix 7-8.

The permittee has revised Appendix 7-8 to include water quality monitoring schedules to move from baseline parameters to operational parameters. Table 7-2D Post Mining Water Quality Monitoring Requirements was included in Appendix 7-8.

Surface water monitoring will continue for all UPDES permitted sites and the three surface water-monitoring sites: CRS, CRB, Ice-1. Each of these sites will be added to the operational monitoring sites after adequate baseline information has been collected.

Acid- and Toxic-Forming Materials and Underground Development Waste

The permittee references section R645-301-624.220 for the acid- and/or toxic-forming analysis. The permittee identifies additional studies conducted in the 1980's. These studies did not address all of the concerns regarding acid- and/or toxic-forming materials. Appendix 6-5 is a drilling program that provided additional chemical analysis of the drill cores for acid- and/or toxic-forming potential.

Previous studies and drilling suggested that a precipitate layer might exist at the bottom of the refuse pile at the contact between the refuse pile and the Mancos Shale. Acid production from within the pile and the slurry ponds is buffered by the Mancos Shales that could produce

this precipitate layer if sufficient water flowing through the refuse material is present. The drilling program identified in Appendix 6-5 examined the chemical nature of this material and found that the material was a pediment alluvium found above the mancos shale. The results also indicated that an acid- and/or toxic-forming potential does exist within the refuse material.

The seep at the base of the coarse refuse pile and additional seeps on the south embankment of the east slurry cell were also studied to determine the source and the chemical nature of this water.

The refuse pile seep will continue to be monitored to determine how processes within the refuse pile are affecting water quality. This study along with the drilling program was used to determine the acid- and/or toxic-forming potential of the refuse material.

In summary, refuse within the permit was found to be potentially acid- and/or toxic-forming. Measures taken in the plan during reclamation will prevent surface and groundwater from infiltrating these refuse materials.

Transfer of Wells

No water wells exist within the SCA permit area. Should wells arise which require transfer, the permittee commits to these transfers in accordance with the State Engineer's office.

Discharges Into An Underground Mine

No underground mine openings are associated with this operation.

Gravity Discharges From Underground Mines

No underground mine openings are associated with this operation.

Water-Quality Standards And Effluent Limitations

The permittee has acquired a UPDES permit #UT0024759 for the SCA facility. A copy of the UPDES permit is included in Appendix 7-1. This permit includes discharges from the six sediment ponds within the SCA property plus the three ponds outside the permit boundary but associated with the cogeneration plant operations. This permit identifies the requirements for monitoring discharges and reporting requirements. The current permit expires on July 31, 1997.

The seep area adjacent to the Coarse Refuse Pile has not been identified as a point source discharge. As indicated on page 700-5 of the plan, the Coarse Refuse Seep emerges near the toe of the existing Coarse Refuse Pile. This seep is the subject of a special study being conducted (1994-1995) by SCA in coordination with the Division of Water Quality (DWQ).

The flow of the water through the refuse materials has, at a minimum, the potential for adversely affecting water quality as described under the requirements of R645-301-724.500. Adverse impacts on or off the proposed permit area may occur to the hydrologic balance, or acid- and/or toxic-forming material present may result in the contamination of ground-water or surface-water supplies. Reclamation designs, including the removal of the refuse material from the permit area for use as fuel in the cogeneration facilities and the relocation of any unused refuse to disposal facilities designed to prevent the infiltration of water through the refuse material, should eliminate the potential for surface and groundwater contamination.

Information required under R645-301-724.100 and R645-301-724.200 was provided to evaluate the probable hydrologic consequences and to plan remedial and reclamation activities. Monitoring plans and work necessary during mining operations, and mitigation plans for final reclamation commit to disposal of any acid- and/or toxic-forming material in the Excess Spoils Disposal Area when not used as fuel.

Diversions: General

A series of diversions are described in the plan on page 700-16. The design configuration for these diversions is found in Appendix 7-3 of the plan. Appendix 7-3 is arranged to describe the design criteria associated with each sediment pond. Included in these designs are the diversions associated with each pond's watershed areas. The designs of the diversions are provided as tables in Appendix 7-3 for each pond.

The methodology submitted for the diversion and culvert designs are considered adequate. The numbers used in the models and calculations were within reason. All calculations are as discussed below. The methodology for the designs of the diversions and culverts are sufficient for this permit. Diversions within the permit area were designed depending on the watershed areas and the sediment pond associated with each diversion and assessed by their respective sediment pond.

To calculate the depth of flow in a diversion, the permittee used a maximum Manning's n value and a minimum channel slope and then added .5 feet of freeboard. This generates a conservative depth that is acceptable. The flow velocity of each diversion was calculated by using a minimum Manning's n value and a maximum channel slope. This produces a high velocity used to determine any riprap requirements.

The text for riprap sizing shows that each diversion will be monitored and if excessive erosion occurs, appropriate remediation is required. Plate 7-6 depicts the locations of all diversions within the permit area. Each sediment pond has a plate that depicts the watersheds, diversions, and culverts associated with each pond. Each pond and associated diversions are discussed below.

Pasture Pond Diversions

The Pasture pond, associated watersheds, diversions and culverts are drawn on Plate 7-1A. The tables in Appendix 7-3 show that nine diversions are used for the Pasture Pond drainage system. The text for the Pasture Pond shows that the diversions and culverts were sized for runoff from the 100-year/6-hour storm because portions drain from the refuse storage areas. Plate 7-1A shows nine diversions. Plate 7-6 shows nine diversions associated with the Pasture pond. The diversions and culverts labeled on Plate 7-6 are consistent with those labeled on Plate 7-1A. The table of culvert designs in Appendix 7-3 for the Pasture Pond shows 5 culverts and nine diversions with culvert C-1 being proposed but not constructed at this time. Plate 7-6 shows 5 culverts, and Plate 7-1A shows four culverts. A change to the plan showing the elimination of culvert C1 in Appendix 7-3 was expected but is yet to be submitted. This culvert is proposed and may be installed if the permittee determines it necessary.

The diversion designs and culvert sizes were evaluated using the FlowMaster 1 version 3.4 program for trapezoidal and triangular ditches and circular pipes. The values presented in the plan match very closely with those generated using the FlowMaster 1 program. The diversions and culverts as designed are adequate to handle the design storm runoff. Riprap is proposed for the pond inlet (D50 = 6") and the outlet of culvert C-4 (D50 = 6").

Old Coarse Refuse Road Pond Diversions

The Old Coarse Refuse Road Pond (OCRR), associated watersheds, diversions and culverts are drawn on Plate 7-1B. The tables in Appendix 7-3 show that three diversions and 1 culvert are used for the OCRR Pond drainage system. The text for the OCRR Pond shows that the diversions and culverts were sized for runoff from the 10-year/6-hour storm. Plate 7-1B and 7-6 shows three diversions and 1 culvert associated with the OCRR pond.

Diversion designs and culvert sizes were evaluated using the FlowMaster 1 program for trapezoidal and triangular ditches and circular pipes. The values presented in the plan match very closely with those generated using the FlowMaster 1 program. The diversions and culverts as designed are adequate to handle the design storm runoff. Riprap is required at the outlet of culvert C-1 (D50 = 24").

In 1994, reclamation of portions of the Old Coarse Refuse Road required the addition of another culvert for drainage control, which was added as an amendment to the plan.

Coarse Refuse Toe Pond Diversions

The Coarse Refuse Toe Pond (CRT), associated watersheds, diversions and culverts are drawn on Plate 7-1C. The tables in Appendix 7-3 show that six diversions and 2 culverts are used for the CRT Pond drainage system. The text for the CRT Pond shows that the diversions and culverts were sized for runoff from the 100-year/6-hour storm. Plate 7-1C and 7-6 shows six diversions and 2 culverts associated with the CRT pond drainage.

The diversion designs and culvert sizes were evaluated using the FlowMaster program for trapezoidal and triangular ditches and circular pipes. The values presented in the plan match very closely with those generated using the FlowMaster 1 program. Diversions and culverts as designed are adequate to handle the design storm runoff. Riprap is required in diversions D-6 (D50 =6") and portions of D-2 (D50 = 6") where the channel slope is greater than 5.2 percent.

Rail Cut Pond Diversions

The Rail Cut Pond was modified in 1994 to incorporate changes to the diversion system because of reclamation of the old coarse refuse road. Associated watersheds, diversions and culverts are drawn on Plate 7-1D. The tables in Appendix 7-3 show that 11 diversions and three culverts are used for the Rail Cut Pond drainage system. The text for the Rail Cut Pond shows that the diversions and culverts were sized for runoff from the 100-year/6-hour storm. Plate 7-1D and 7-6 shows the diversions and culverts associated with the Rail Cut Pond drainage.

The diversion designs and culvert sizes were evaluated using the FlowMaster 1 program for trapezoidal and triangular ditches, and circular pipes. The values presented in the plan match very closely with those generated using the FlowMaster 1 program. Diversions and culverts as designed are adequate to handle the design storm runoff. Riprap is required in diversions RC-D1 and RC-D8. Diversion RC-D6 was eliminated and replaced by a series of three 36-inch culverts. These culverts are steeply inclined and have a capacity in excess of the design 25 CFS.

Clear Water Pond, Slurry Pond 1 and Slurry Pond 2 Diversions

The Clear Water Pond is integrally linked to the operation of Slurry Ponds 1 and 2. These ponds, associated watersheds, diversions and culverts are drawn on Plate 7-5. The tables in Appendix 7-3 show that nine diversions and eight culverts are used for the Clear Water Pond drainage system. The text for the Clear Water Pond shows that the diversions and culverts were sized for runoff from the 100-year/6-hour storm. Plates 7-5 and 7-6 show all nine diversions and the eight culverts associated with the Clear Water Pond drainage.

The diversion designs and culvert sizes were evaluated using the FlowMaster 1 program for trapezoidal and triangular ditches, and circular pipes. Values presented in the plan match

very closely with those generated using the FlowMaster 1 program. The diversions and culverts as designed are adequate to handle the design storm runoff.

The permittee has proposed in the plan that none of the diversion associated with the Clear Water Pond require riprap. Several velocity calculations reviewed were borderline for requiring riprap. These include diversions D2, D4 and D9. The plan is indefinite but does show that all diversions will be monitored and should excessive erosion occur, corrective action will be taken. These diversions should periodically be inspected for erosion problems.

Several culvert analyses showed that riprap would be required at the outlets. The main one is C3 that includes four 8-inch pipes. Water velocities through these pipes could reach 8-11 feet per second. The culvert outlets draining into the number 1 and 2 slurry ponds have borderline velocities. These outlets would be on the inside of the slurry ponds.

Borrow Area Pond Diversions

The Borrow Area Pond, associated watersheds, diversions and culverts are drawn on Plate 7-11B. The tables in Appendix 7-3 indicate that three diversions and no culverts are used for the Borrow Area Pond drainage system. The text for the Borrow Area Pond indicates that the diversions and culverts were sized for runoff from the 100-year/6-hour storm. Plates 7-5 and 7-6 show all three diversions associated with the Borrow Area Pond drainage.

If the industrial borrow area were to become active, a culvert would be required to carry runoff across the access road. The permittee provided the design criteria for this culvert should the need arise in the future.

The diversion designs and culvert sizes were evaluated using the FlowMaster 1 program for trapezoidal and triangular ditches, and circular pipes. The values presented in the plan match very closely with those generated using the FlowMaster 1 program. The diversions and culverts as designed are adequate to handle the design storm runoff. Riprap is not required in these diversions.

East Slurry Cell Diversions

The East Slurry Cell as described in the plan can receive runoff from the same watersheds associated with the Clear Water Pond. Depending on how the ditches are opened and closed determines which impoundment receives runoff. Normally Slurry ponds 1 and 2 and the Clear Water Pond receive surface runoff. If these ponds are being cleaned, the inlets are blocked and runoff is directed to the East Slurry Cell.

The same diversions associated with the Clear Water Pond are associated with the East Slurry Cell and were discussed in the Clear Water Pond diversions discussion. Plates 7-1, 7-5, 7-6, 7-12, and 7-16 describe this structure.

With the recent closure of the Sunnyside Coal Company Mine, no additional slurry material will be produced which will need to be disposed of in this cell. The permittee should consider changing the plan to eliminate water from entering the East Slurry Cell. The East Slurry Cell could be designated a refuse storage area and not a slurry pond which would reduce the weekly inspection requirements. Sediment laden runoff would be prevented from entering the East Slurry Cell that contaminates and reduces the BTU value of the slurry material thus creating additional ash content that requires disposal. By eliminating additional inputs of runoff, the quantity of water that flows from the seep at the base of the coarse refuse pile could reduce or potentially eliminate the seep entirely. Less water monitoring analysis would be required if the seep were to dry up. These factors could result in significant savings to the permittee. The areas between slurry ponds 1 and 2 and the East Slurry Cell could be directed to the Pasture Pond with minor modifications.

West Slurry Cell Diversions

The design and hydrologic discussion of the West Slurry Cell is located in Appendix 7-3. Plates 7-1, 7-12 and 7-16 describe this structure. The West Slurry Cell has not been used as such since the 1970's. No diversions are associated with the West Slurry Cell. Precipitation is retained within the confines of the cell. Since there are no discharge structures, the plan used the 6-hour Probable Maximum Precipitation event for runoff calculations. Using a curve number of 100, 10.7 inches of precipitation produces 33.9 acre-feet of runoff contained within the cell. The area of the West Slurry Cell is about 58 acres. The runoff volume above would be retained inside this cell.

Diversions: Perennial and Intermittent Streams

No perennial or intermittent streams exist within the permit area that would require diverting.

Diversions: Miscellaneous Flows

Two areas were identified in Appendix 7-3 where miscellaneous flows are diverted through culverts away from the disturbed area. These areas are discussed on page 700-16 in the diversion text portion of Chapter 7.

The first area is a natural watershed consisting of 67 acres of Juniper-grass, desert brush, and mountain brush. This watershed drains to two 24-inch culverts that drain under the road 150 feet south east of the Old Coarse Refuse Road. The 100-year/6-hour storm was used in calculating flows from the watershed. A peak flow of 15.5 CFS was calculated using Sedimot II. Each culvert can handle over 15 CFS. If the flow is divided between the two culverts, each culvert easily handles the 7.8 CFS.

The second area is a natural watershed consisting of 15 acres of Juniper-grass, desert brush, and mountain brush. This watershed drains to a 36-inch culvert that drains the natural area west of the refuse pile under the railroad tracks. This area drains into the channel where the coarse refuse seep originates. Two runoff volumes were calculated by the permittee. The 100-year/6-hour storm and the 10-year/6-hour storm were used in calculating flows from the watershed. Using Sedimot II, a peak flow of 13 CFS and 4 CFS was calculated from the 100-year/6-hour storm and the 10-year/6-hour storm respectively. The 36-inch culvert is more than adequate to handle the 13 CFS from the 100-year/6-hour storm. The permittee installed weirs upstream of this culvert to monitor and define the flow regimes of the seep that originate in this drainage.

Two areas that divert miscellaneous flows through culverts are considered adequate. The two 24-inch culverts easily control the 7.8 CFS per culvert. The second area's 36-inch culvert is more than adequate to handle the 10.9 CFS from the 100-year/6-hour storm.

Stream Buffer Zones

No mine disturbance is proposed in the plan near an intermittent or perennial stream. No buffer zones are proposed.

Sediment Control Measures

Chapter 7, Section 750 of the plan states that sedimentation control measures will be maintained, reclaimed and constructed if needed and approved, according to R645-301-732, 742, and 763. This statement and other commitments in the plan ensure that additional contributions of suspended solids and sediment to streamflow or runoff outside the permit area will be prevented to the extent possible using the best technology currently available.

The plan shows that sediment control measures consist of collector ditches and sediment ponds. The statement was added, "Some siltation fences may be placed to improve erosion control."

Before installation of any silt fences or other sediment control measures, the permittee will need to obtain Division approval and appropriate maps will need to be updated to reflect placement of these sediment controls. The installation design must be specified which includes trenching and keying the toe of the fence. Any reinforcement backing must be described. Typical designs for silt fences can be found on Plate 10-2.

Siltation Structures: General

The plan shows that sediment control measures consist of collector ditches and sediment ponds. Many diversion ditches and impoundments make up the sediment controls within the permit area. Topsoil stockpiles are located on the permit area and use berms for containment of topsoil material. The design criterion for these berms is in Appendix 7-7. Any additional siltation structures that the permittee intends to use will need to be permitted before installation.

Siltation Structures: Sedimentation Ponds

The permit area encompasses eleven impoundments. Seven of these are sediment ponds. The Slurry Cell 1 and 2 and the East slurry cell receive surface water runoff. The West Slurry Cell only receives runoff as direct precipitation. The design criteria, watersheds, and cross-sections for each pond are provided in Appendix 7-3. The diversions associated with each pond within the permit area are depicted on Plate 7-6. Plate 7-1 is a general watershed map for the permit area. Each sediment pond will be analyzed separately.

The sediment ponds in the SCA permit area are adequate to control sediment production from the permit area. The cleanout level for the ponds is the decant elevation. The decant will be used as a sediment marker inside these ponds to detect when the sediment cleanout levels are reached.

Analysis and calculations for each pond design are as follows:

PASTURE POND

The Pasture Pond design drawing is found on Plate 7-9. The watersheds are drawn on Plate 7-1A and the cross sections are on Plate 7-14. The Pasture Pond was divided into six sub-watersheds. The areas associated with these six sub-watersheds were digitized from the maps by the Division and were found to match those used in the plan closely. Curve numbers used for each sub-watersheds were averaged from three vegetation types found in the area. These curve numbers were found adequate.

The volumes based on the maps provided were checked using the OSM, Earth Vision software. These volumes based on elevations are provided below.

PURPOSE	ELEV. (Feet)	CALCULATED VOLUME (Acre-feet)	PROPOSED PLAN VOLUME (Acre-feet)
Pond bottom	6484.5	0.0	0.0
Max. sediment level	6485.5	0.10	0.003[1]
Primary spillway	6486.6	0.15	0.20[3]
10-year/24-hour storm	6490.09	0.39	0.55[2]
Emergency spillway	6490.6	0.77	0.73[3]
Dam crest	6492	1.00	

1: This value from the computed sediment production.
2: This value from the Sedimot II model for the 10-year/24-hour event.
3: This value from the stage capacity curve on the design plate.

Stage discharge and stage capacity curves are provided on Plate 7-9. Sedimot II was used to calculate runoff volumes, peak flows, and sediment loads. The numbers generated produced a sediment load of 6.25 tons and a runoff volume of 0.55 acre-feet from the 10-year/24-hour event. The runoff volume from the 100-year/6-hour event was calculated at 0.71 acre-feet contained in the pond. This allows for the single spillway exemption. The 25-year/6-hour Sedimot model produced a peak flow of 4.02 CFS. The 18-inch CMP spillway can discharge up to 7.2 CFS and is adequate to handle this flow.

Sediment calculations from the 10-year/24-hour event produced 6.25 tons of sediment. Converting this amount to a volume produces 0.003 acre-feet of sediment per storm event. According to the volume analysis mentioned above, the pond has 0.095 acre-feet of sediment capacity.

OLD COARSE REFUSE ROAD POND

The Old Coarse Refuse Road Sediment Pond design drawing is found on Plate 7-10. The watersheds are drawn on Plate 7-1B and the cross sections are on Plate 7-14. The Old Coarse Refuse Road sediment pond analysis involved dividing the watershed into three sub-watersheds. The areas associated with these sub-watersheds were digitized by the Division and found to match closely with the submittal. Curve numbers used for each sub-watersheds were averaged from three vegetation types found in the area. These curve numbers were found adequate.

The volumes based on the maps were checked using the OSM, Earth Vision software. The volumes calculated were generally larger than those provided in the plan and are within acceptable limits.

PURPOSE	ELEV. (Feet)	CALCULATED VOLUME (Acre-feet)	PROPOSED PLAN VOLUME (Acre-feet)
Pond bottom	6394.03	0.0	0.0
Max. sediment level	6394.75	0.11	0.06[1]
Primary spillway	6395.75	0.18	
10-year/24-hour storm	6398.85	0.39	0.51[2]
Emergency spillway	6399.4	0.87	0.79[3]
Dam crest	6400	1.05	0.92[3]

1: This value from the computed sediment production.
2: This value from the Sedimot II model for the 10-year/24-hour event.
3: This value from the Stage Capacity Curve on the design plate.

Stage discharge and stage capacity curves are provided on Plate 7-10. Sedimot II was used to calculate runoff volumes, peak flows, and sediment loads. The numbers generated produced a sediment load of 110.8 tons and a runoff volume of .51 acre-feet from the 10-year/24-hour event. The runoff volume from the 100-year/6-hour event was calculated at 0.65 acre-feet contained by this pond. This allows for the spillway exemption according to R645-301-742.224. The 25-year/6-hour Sedimot model produced a peak flow of 4.06 CFS. The 18-inch CMP spillway can discharge up to 13.6 CFS and is adequate to handle this flow.

According to the applicant's sediment production calculations from the 10-year/24-hour event, 110.8 tons of sediment is delivered to the pond. Converting this amount of sediment to a volume produces 0.06 acre-feet of sediment. According to the volume analysis mentioned above the pond has .07 acre-feet of sediment capacity.

COARSE REFUSE TOE POND

The Coarse Refuse Toe Pond design drawing is on Plate 7-7. The watersheds are drawn on Plate 7-1C and the cross sections are on Plate 7-13. The Coarse Refuse Toe pond was divided into eight sub-watersheds. The areas associated with these eight sub-watersheds were digitized and averaged within 1.2 percent of those submitted in the plan. Curve numbers used for each sub-watersheds were averaged from three vegetation types found in the area. These numbers were adequate.

The volumes based on the maps provided were checked using OSM's TIPS, Earth Vision volumetrics program. These volumes were less than the volumes calculated in the plan.

	ELEV.	CALCULATED VOLUME	PROPOSED PLAN VOLUME

PURPOSE	(Feet)	(Acre-feet)	(Acre-feet)
Pond Bottom	6176.0	0.0	0.0
Max. Sediment level	6177.0	0.10	0.03[1]
Primary spillway	6178.2	0.15	
10-year/24-hour volume	6180.66	0.40	0.51[2]
Emergency Spillway	6183.63	0.77	1.01[3]
Dam Crest	6185.51	1.00	1.63[3]

1: This value from the computed sediment production.
2: This value from the Sedimot II model for the 10-year/24-hour event.
3: This value from the stage capacity curve on the design plate.

Stage discharge and stage capacity curves are provided on the design drawing, Plate 7-7. Sedimot II was used to calculate runoff volumes, peak flows, and sediment loads. The numbers generated produced a sediment load of 416 tons and a runoff volume of 0.40 acre-feet from the 10-year/24-hour event. The runoff volume from the 100-year/6-hour event was calculated at 0.48 acre-feet contained by this pond. This allows for the spillway exemption. The 25-year/6-hour model produced a peak flow of 4.45 CFS.

The dimensions of the diversion for the pond outlet were used for assessing the spillway. The open channel spillway can handle 8.6 CFS and is adequate to handle the flow from a 25-year/6-hour storm. A typical cross section of this spillway must be provided on Plate 7-13, or on design Plate 7-7.

Sediment calculations from the 10-year/24-hour event produced 416 tons of sediment. Converting this amount to a volume produces 0.22 acre-feet of sediment per storm event. According to the volume analysis mentioned above, the pond has 0.03 acre-feet of sediment capacity.

RAIL CUT POND

The Rail Cut Pond design drawing is found on Plate 7-8. The watersheds are drawn on Plate 7-1D and the cross sections are on Plate 7-13. The Rail Cut Pond was divided into nine sub-watersheds. The areas associated with these nine sub-watersheds were digitized and averaged within 2.2 percent of those submitted in the plan. Curve numbers used for each sub-watershed were averaged from three vegetation types found in the area. These numbers were adequate.

The volumes based on the maps provided were checked using OSM's Earth Vision Software. The volumes calculated are within acceptable limits.

PURPOSE	ELEV. (Feet)	CALCULATED VOLUME (Acre-feet)	PROPOSED PLAN VOLUME (Acre-feet)
Pond Bottom	6206.0	0.0	0.0
Max. Sediment level	6207.7	0.22	0.35[1]
Primary spillway	6209.07	0.63	
10-year/24-hour volume	6212.31	2.19	1.80[2]
Emergency Spillway	6212.34	2.34	2.16[3]
Dam Crest	6400	4.07	4.81[3]

1: This value from the computed sediment production.
2: This value from the Sedimot model for the 10-year/24-hour event.
3: This value from the stage capacity curve on the design plate.

Stage discharge and stage capacity curves are provided on the design drawing, Plate 7-8. Sedimot II was used to calculate runoff volumes, peak flows, and sediment loads. The numbers generated produced a sediment load of 667 tons and a runoff volume of 1.80 acre-feet from the 10-year/24-hour event. The 100-year/6-hour event produced a runoff volume of 2.38 acre-feet. This allows for the spillway exemption. The 25-year/6-hour model produced a peak flow of 11.5 CFS. The 48-inch CMP spillway can handle 156 CFS that is more than adequate to handle the flow from the 25-year/6-hour storm.

Sediment calculations from the 10-year/24-hour event produced 667 tons of sediment. Converting this amount to a volume produces 0.35 acre-feet of sediment that matches the maximum sediment volume in the proposed plan.

CLEAR WATER POND, SLURRY POND 1, and, SLURRY POND 2

The Clear Water Pond is in series with the Slurry Ponds 1 and 2 and receives effluent from these two slurry ponds. It serves as the final clarifier before water being discharged. These three impoundments will be reviewed as one sediment control system using the two slurry ponds in series with the Clear Water Pond as the final pond. These structures will be called the Clear Water Pond system. These ponds were constructed primarily to treat slurry water from the now defunct Sunnyside Mine. This mine is now closed and no additional slurry material will be directed to these ponds. Surface runoff from 143 acres is treated by this system.

The design drawings for these ponds are found on plate 7-4. The watersheds are drawn on Plate 7-5. The cross section for the Clear Water Pond is found on Plate 7-15. The cross sections for Slurry Ponds 1 and 2 are found on Plate 7-17.

The Clear Water Pond system was divided into 13 sub-watersheds. The areas associated with these 13 sub-watersheds were digitized and averaged within 3.8 percent of those submitted

in the plan. Curve numbers used for each sub-watershed were averaged from three vegetation types found in the area. These numbers were adequate.

The volumes of each of these ponds are presented in the tables below. Based on the maps provided, the volumes were checked using OSM, Earth Vision software. These volumes were within acceptable limits.

Clearwater Pond

PURPOSE	ELEV. (Feet)	CALCULATED VOLUME (Acre-feet)	PROPOSED PLAN VOLUME (Acre-feet)
Pond Bottom	6522	0	
Max. Sediment level	6527	2.7	0.18[1]
Primary spillway	6529.6	4.57	
100-year/6-hour volume		2.5[2]	
Emergency Spillway	6530.08	4.96	0.0[3]
Dam Crest	6530.1	4.98	4.86[3]

1: This value from the computed sediment production.
2: This value from the Sedimot model for the 100-year/6-hour event.
3: This value from the stage capacity curve on the design plate.

Slurry Pond #1

PURPOSE	ELEV. (Feet)	CALCULATED VOLUME (Acre-feet)	PROPOSED PLAN VOLUME (Acre-feet)
Pond Bottom	6530	0	0
Max. Sediment level	6537.5	12.35	0.18[1]
100-year/6-hour volume	6538.9	15.29	2.5[2]
Dam Crest	6540.1	17.91	16.4[3]

1: This value from the computed sediment production.
2: This value from the Sedimot model for the 100-yr./6-hr. event.
3: This value from the stage capacity curve on the design plate.

Slurry Pond #2

PURPOSE	ELEV. (Feet)	CALCULATED VOLUME (Acre-feet)	PROPOSED PLAN VOLUME (Acre-feet)
Pond Bottom	6530	0	0

Max. Sediment level	6537.5	12.67	0.18[1]
100-year/6-hour volume	6538.7	15.09	2.5[2]
Dam Crest	6538.8	15.30	15.27[3]

1: This value from the computed sediment production.
2: This value from the Sedimot model for the 100-year/6-hour event.
3: This value from the stage capacity curve on the design plate.

Stage capacity curves are provided on the design drawing, Plate 7-4. Sedimot II was used to calculate runoff volumes, peak flows, and sediment loads. The numbers generated produced a sediment load of 342 tons and a runoff volume of 2.2 acre-feet from the 10-year/24-hour event. The runoff volume from the 100-year/6-hour event calculated to 2.5 acre-feet. The ponds can contain this volume and therefore allow for the single spillway exemption. The 25-year/6-hour model produced a peak flow of 6.9 CFS. The 8-inch spillway pipe and the open channel spillway are adequate to handle this flow. Plate 7-15 showing the Clearwater Pond cross-sections show the same elevation for the pond bottom and the maximum sediment level.

Sediment calculations from the 10-year/24-hour event produced 342 tons of sediment. Converting this amount to a volume produces 0.18 acre-feet of sediment per storm event. Slurry ponds 1 and 2 are the primary receptacles for sediment from this watershed and according to the volume analysis mentioned above Slurry Pond 1 and Slurry Pond 2 have 12.4 and 12.7 acre-feet of sediment capacity respectively.

The permittee included a table that details the configuration of the spillways for the ponds in question. The cross section dimensions and slopes are provided in each pond's diversion descriptions. The Slurry Ditch associated with the old Sunnyside Mine operation has been cut off. No additional slurry material will be introduced into the East or West Slurry Cell. The 100-year/6-hour PMP produces a runoff volume of 15.8 acre-feet that is totally contained by the East Slurry Cell. The 100-year/6-hour PMP is completely contained within the impoundment structure.

The Clear Water pond no longer receives runoff or slurry from the Sunnyside Mine area. This reduces the inflow to the pond. Runoff from the Sunnyside Mine area now is treated in the lower sediment pond on the Sunnyside Mine permit area.

BORROW AREA POND

The Borrow Area Pond design drawing is on Plate 7-11. The watersheds are drawn on Plate 7-11B and the cross sections are on Plate 7-15.The Borrow Area Pond was divided into 2 sub-watersheds. The areas associated with these two sub-watersheds were digitized and averaged within 0.6 percent of those submitted in the plan. Curve numbers used for each sub-

watershed were averaged from three vegetation types found in the area. These numbers were adequate.

The volumes based on the maps provided were checked using OSM's TIPS, Earth Vision volumetrics program. These volumes were within acceptable limits.

PURPOSE	ELEV. (Feet)	CALCULATED VOLUME (Acre-feet)	PROPOSED PLAN VOLUME (Acre-feet)
Pond Bottom	6510	0	0
Max. Sediment level	6513.3	1.82	0.40[1]
Primary spillway	6514.3	2.77	2.5[3]
10-year/24-hour volume	6516.16	4.52	2.05[2]
Emergency Spillway	6517.03	5.44	5.25[3]
Dam Crest	6519.5	8.5	8.3[3]

1: This value from the computed sediment production.
2: This value from the Sedimot model for the 10-yr./24-hr. event.
3: This value from the stage capacity curve on the design plate.

Stage discharge and stage capacity curves are provided on the design drawing, Plate 7-11. Sedimot II was used to calculate runoff volumes, peak flows, and sediment loads. The numbers generated produced a sediment load of 770 tons and a runoff volume of 2.05 acre-feet from the 10-year/24-hour event. The runoff volume from the 100-year/6-hour event calculated to 3.23 acre-feet. This allows for the spillway exemption. The 25-year/6-hour model produced a peak flow of 3.3 CFS. The open channel spillway is adequate to handle this flow. A typical cross section of this spillway must be provided on Plate 7-15, or on design Plate 7-11.

Sediment calculations from the 10-year/24-hour event produced 770 tons of sediment. Converting this amount to a volume produces 0.40 acre-feet of sediment per storm event. According to the volume analysis mentioned above the pond have 1.82 acre-feet of sediment capacity.

EAST SLURRY CELL

The East Slurry Cell design drawing is located on Plate 7-12. The watersheds are drawn on Plate 7-5 and the cross sections are on Plate 7-16. The East Slurry Cell potentially receives runoff from the same drainages associated with the Clear Water Pond system. Normally, the East Slurry Cell does not receive runoff except when the Clear Water ponds are being cleaned. Curve numbers used for the watersheds were averaged from three vegetation types found in the area. These numbers were adequate.

The volumes based on the maps provided were checked using OSM's TIPS, Earth Vision volumetrics program. These volumes were within acceptable limits.

PURPOSE	ELEV. (Feet)	CALCULATED VOLUME (Acre-feet)	PROPOSED PLAN VOLUME (Acre-feet)
Pond Bottom	6528	0	0
Max. Sediment level	6531	15.99	0.41[1]
100-year/6-hour volume	6528.8	3.91	3.05[2]
Emergency Spillway	6532.4	26.62	>22[3]
Dam Crest	6533	31.51	27.0[3]

1: This value from the computed sediment production. Actual stage elevation would be approx. 6528.1.
2: This value from the Sedimot model for the 100-year/6-hour event.
3: This value from the stage capacity curve on the design plate.

A stage capacity curve and table are provided on the design drawing, Plate 7-12. Sedimot II was used to calculate runoff volumes, peak flows, and sediment loads. The numbers generated produced a sediment load of 773 tons and a runoff volume of 3.5 acre-feet from the 100-year/6-hour event. The 100-year/6-hour model produced a peak flow of 15 CFS. The permittee has proposed an open channel spillway to be constructed for this slurry cell. The design information is found in the East Slurry Cell discussion in Appendix 7-3. The design is as follows:

Bottom width:	30 feet
Side slopes:	2H:1V
Channel Slope	0.5 %
Manning's n:	0.03
Depth:	0.5 feet
max. Flow:	33 CFS

A typical spillway cross section provided is provided in Appendix 7-3 G. Sediment calculations from the 100-year/6-hour event produced 773 tons of sediment. Converting this amount to a volume produces 0.41 acre-feet of sediment per storm event. According to the volume analysis mentioned above, the pond has over 3.9 acre-feet of sediment capacity at the one-foot stage level. This volume is more than adequate to accommodate the sediment production.

WEST SLURRY CELL

The West Slurry Cell design drawing is found on Plate 7-12. There are no watersheds associated with this impoundment. The cross sections for the West Slurry Cell are on Plate 7-16. The area associated with the West Slurry Cell is just the internal surface of the cell. Curve numbers used for this impoundment were 100. This number is adequate.

The volumes based on the maps provided were checked using OSM's TIPS, Earth Vision volumetrics program. These volumes are more than adequate to contain the runoff from the 6-hour Probable Maximum Precipitation event.

PURPOSE	ELEV. (Feet)	CALCULATED VOLUME (Acre-feet)	PROPOSED PLAN VOLUME (Acre-feet)
Pond Bottom	6500	0	0
	6515	189	125
PMP 6-hour volume	6522	319	34

Sedimot II was used to calculate runoff volumes and peak flows. The numbers generated produced a runoff volume of 33.9 acre-feet from the Probable Maximum Precipitation 6-hour event. Based on the above volume analysis, this cell can contain the runoff from the 6-hour Probable Maximum Precipitation event.

COAL PILE SEDIMENT POND

The Coal Pile Sediment Pond (CPSP) design drawing and cross section is on Plate 7-18. The watershed is drawn on Plate 7-1A. The CPSP watershed encompasses 2.3 acres. The area was digitized and matched closely with the plan. Curve numbers used were averaged from three vegetation types found in the area. These numbers were adequate.

The volumes based on the maps provided were checked using the TIPS Earth Vision software. These volumes based on elevations are provided below. The volumes calculated were generally larger than those provided in the plan and are within acceptable limits.

PURPOSE	ELEV. (Feet)	CALCULATED VOLUME (Acre-feet)	PROPOSED PLAN VOLUME (Acre-feet)
Pond bottom	6473.0	0.00	0.00
Primary spillway	6476.0	0.74	0.50[3]
10-year/24-hour storm	6476.3	0.83	0.55[3]
Max. Sediment level	6477.5	1.20	0.90[1]
Emergency spillway	6479.0	1.70	1.20[3]

Dam crest	6480.0	2.08	1.50[3]

1: This value from the computed sediment production.
2: This value from the Sedimot II model for the 10-year/24-hour event.
3: This value from the stage capacity curve on the design plate.

Stage discharge and stage capacity curves are provided on the design drawing, Plate 7-18. Sedimot II was used to calculate runoff volumes, peak flows, and sediment loads. The numbers generated produced a sediment load of 1.4 tons and a runoff volume of 0.14 acre-feet from the 10-year/24-hour event. The pond has an open channel emergency spillway. The 25-year/6-hour Sedimot model produced a peak flow of 2.2 CFS. The 6-inch CMP spillway can discharge up to 3.7 CFS and is adequate to handle this flow.

Siltation Structures: Other Treatment Facilities

The permittee reclaimed the Old Coarse Refuse Road in late 1994. A silt fence was installed at the base of this road for sediment control during the reclamation. Erosion control matting, surface roughening and vegetation are considered the sediment control for this area.

Topsoil stockpiles are located on the permit area and use berms for runoff control and containment of topsoil material. The design criteria for these berms are in Appendix 7-7. Nine topsoil stockpiles exist for the SCA permit area. These are discussed further in the Siltation Structures: Exemptions section below.

Siltation Structures: Exemptions

No exemptions from this requirement are proposed in the plan. BTCA areas have been proposed and include the nine topsoil piles located throughout the permit area. These are shown on Plate 7-6 and Plate 2-1. Runoff and sediment control are provided by a berm around these stockpiles. Individual designs for all topsoil stockpile berms are included in Appendix 7-7.

The only other approved BTCA area is adjacent to the Clear Water pond. This area contains the Clear Water Topsoil stockpile plus the outer slopes of Slurry Pond 1 and the Clear Water Pond.

Discharge Structures

Discharge structures for each sediment pond are provided on the design or cross section plates for that respective pond. The spillways for the Coarse Refuse Toe Pond, the Borrow

Pond, and the Clear Water Pond are described in the diversion table located in the diversion section for each pond.

Impoundments

The permittee has discussed the regulatory requirements of each sediment pond under the Sedimentation Ponds section above. This discussion included the sizing criteria according to 30 CFR 77.216, spillway analysis, a Professional Engineer certification, and a volumetrics analysis. Inspections are committed to on page 700-2 of the plan.

There are 11 impoundments at this site: the East Slurry Cell, the West Slurry Cell, Slurry Pond No. 1, Slurry Pond No. 2, the Clear Water Pond, the Pasture Sediment Pond, the Coarse Refuse Toe Sediment Pond, the Rail Cut Sediment Pond, the Coarse Refuse Road Sediment Pond, the Borrow Area Pond, and the Coal Pile Sediment Pond.

The East Slurry Cell, the West Slurry Cell, Slurry Pond No. 1, Slurry Pond No. 2, and the Clear Water Pond were analyzed for stability by the engineering firm of Rollins, Brown, and Gunnell, Inc. in 1984. The results of this analysis are found in Appendix 5-3 and indicate that these structures are all satisfactorily stable. The East Slurry Cell embankment displays the required static safety factor of 1.5. The West Slurry Cell embankment displays a static safety factor of 2.39; greater than the required safety factor of 1.5. The report also shows that the seismic safety factor of both these structures is satisfactory. Slurry Pond No. 1, Slurry Pond No. 2, and the Clear Water Pond are incised structures with no earthen embankments and are therefore exempt from the requirement to display a stability safety factor.

The plan states that the East Slurry Cell will be used only to receive overflow from Slurry Ponds #1 and #2. However, since the Sunnyside Mine is no longer operating, this will not be necessary any longer. The West Slurry Cell does not receive water, but is now a temporary coarse refuse storage site. Since the East and West Slurry Cells no longer function as slurry cells, they should not be designated as such. Drainage to these areas should be rerouted to one of the sediment ponds and the accumulated slurry should be allowed to drain and dry. This course of action would eliminate both the necessity of weekly MSHA inspections and the necessity of continually assessing the stability of the slurry cell embankments as their configurations are changed by excavation.

The Coarse Refuse Toe Sediment Pond and the Coarse Refuse Road Sediment Pond were analyzed for stability by the engineering firm of Rollins, Brown, and Gunnell, Inc. in 1985. The results of this analysis are found in Appendix 5-4. The results show that these structures are both satisfactorily stable. Both structures display a static safety factor of 1.5; greater than the required 1.3.

Using the material properties determined by Rollins, Brown, and Gunnell, Inc., the stability of the Pasture Sediment Pond, the Rail Cut Sediment Pond, and the Borrow Area Pond was analyzed in 1992. This analysis is found in Appendix 5-1. The results of the analysis show that these structures are satisfactorily stable. The Pasture Sediment Pond displays a static safety factor of 11.1, the Rail Cut Sediment Pond 2.1, and the Borrow Area Pond 1.5, all greater than the required 1.3.

The plan states that those structures that meet the qualifying criteria will comply with all applicable MSHA standards. The description of compliance methods and practices is found in Appendix 5-8.

A professional engineer or specialist experienced in the construction of earth and waste structures will inspect the Noncombustible Waste Disposal Area quarterly and during foundation preparation, placement of under drains and protective filter systems, installation of final surface drainage systems, and the final graded and revegetated facility. The professional engineer or specialist will compile a certified report of each inspection and copies of the report will be kept at the site and at the offices of the permittee's consultant. The plan specifies that copies of the inspection reports be sent to the Division, as required by R645-301-514.230.

A professional engineer will inspect all impoundments. Weekly inspections will be done on the East and West Slurry Cells, which qualify as MSHA structures, and quarterly inspections will be done on all other impoundments. The professional engineer will compile a certified report of each inspection and copies of the inspection reports will be kept at the site and at the offices of the permittee's consultant. The plan specifies that copies of the inspection reports be sent to the Division, as required by R645-301-514.312.

If the slurry ponds are to be used as refuse disposal and storage areas, then the surface plans will need to be configured to provide positive surface water drainage. No water may be impounded on the surface of refuse piles.

Ponds, Impoundments, Banks, Dams, and Embankments

Casing and Sealing of Wells

No ground water wells exist within the SCA permit area. The plan discusses potential well drilling and casing and sealing on page 700-21 of the plan. It commits to drilling any wells in accordance with the State of Utah Administrative Rules and Water Well Drillers, Appendix 1. The permittee also proposes to case and seal any monitoring wells that they install in accordance with the State of Utah Administrative Rules and Water Well Drillers, Appendix 1.

Exploration boreholes within the refuse piles or the slurry impoundments are not scheduled to be sealed where the hole only penetrates coal material. If these boreholes penetrate into native soil or bedrock, then the interval within the soil or rock will be sealed with bentonite.

Findings:

Information regarding this section was found to meet the minimum regulatory requirements.

SUPPORT FACILITIES AND UTILITY INSTALLATIONS

Regulatory Reference: 30 CFR Sec. 784.30, 817.180, 817.181; R645-301-526.

Analysis:

On page 500-10, the permittee has discussed utility installations within the permit area. A power line traverses the east edge of the site within a utility corridor that runs from south to north. A map showing the location of the power lines is shown on Plate 5-1. The application states that all operations will be conducted to minimize damage, destruction, or disruption of services provided by this power line.

Information regarding additional crushing and conveying facilities has been incorporated into the plan and is found in Chapter Five of the plan. The Coal Waste Handling Facilities and the adjacent cogeneration plan are depicted on Plate 4-5.

Those facilities required for the handling and processing of the waste material that are part of the permit area include the waste coal receiving hopper, transfer conveyors, scalping screen/oversize crusher system and the product sizing crusher. This system (within the permit area) encompasses material sizing and crushing of material in preparation for the cogeneration facilities and includes the circuit in which waste material may be rejected from the crushing/sizing operations that may be returned to the Excess Spoil Disposal Area rather than be burned as fuel in the cogeneration plant.

This area was incorporated into the permit area following initial permit approval. The Division determined that these facilities should be included in the permit area because the crushing and sizing operations were an integral part of coal/waste preparation required to make the refuse material useable, and, those portions of the stream of materials within this part of the coal/waste handling system had been and could be a source of waste material that would be stored and disposed of within the permit area.

Findings:

Information in the plan was found to meet the minimum regulatory requirements under this section.

SIGNS AND MARKERS

Regulatory Reference: 30 CFR Sec. 817.11; R645-301-521.

Analysis:

The plan provides for the placement of perimeter markers, disturbed area markers, and topsoil stockpile markers, as required by this section. The coke ovens in the northeastern corner of the permit area, noted as a historically significant site, have been fenced. The locations of the various markers and signs are shown on Plate 3-1 and the markers and signs themselves are described in detail in Chapter 5 of the plan.

Findings:

Information provided in the plan meets the minimum requirements of this section.

USE OF EXPLOSIVES

Regulatory Reference: 30 CFR Sec. 817.61, 817.62, 817.64, 817.66, 817.67, 817.68; R645-301-524.

Analysis:

General Requirements

Page 500-8 of the plan states that explosives will not be used at this site and that, therefore, this section is not addressed in the plan.

Preblasting Survey

General Performance Standards

Blasting Signs, Warnings, And Access Control

Control of Adverse Effects

Records of Blasting Operations

Findings:

Information provided in the plan fulfills the requirements of this section.

MAPS, PLANS, AND CROSS SECTIONS OF MINING OPERATIONS

Regulatory Reference: 30 CFR Sec. 784.23; R645-301-512, -301-521, -301-542, -301-632, -301-731, -302-323.

Analysis:

Affected Area Maps

Plate 9-7 depicts the areas of permanent mining activity. The legend and the map delineate the permit boundary, the extent of the disturbed area, the extents of the coal refuse pile, and areas depicted as permanent mining area. Those areas delineated on the map as permanent mining areas are those areas in which mining activities will occur throughout the life of the mine. The affected (disturbed) areas from this drawing depict the borrow area as being disturbed in the future. This borrow area is located along the eastern side of the permit area and included in the affected area.

Mining Facilities Maps

Mining facilities are shown on Plate 9-7 and Plate 4-5 of the plan. These exhibits show the location of coal/waste handling facilities, the truck dump loop and road, and the temporary storage and handling areas used in conjunction with the mining operations.

Mine Workings Maps

Mine workings consist of the refuse facilities within the permit area. Mining plans and maps showing the sequencing of the mining operations are found in Chapter Nine of the plan.

Monitoring and Sampling Location Maps

Water monitoring stations are depicted on Plates 7-2 and 7-3. The baseline water quality sites are shown on Plate 7-2. Plate 7-3 shows locations of the UPDES permitted discharge locations.

The permittee has submitted maps showing surface and groundwater monitoring locations. The sites used for baseline water monitoring will continue as operational monitoring sites as referenced in appendix 7-8.

Certification Requirements

Findings:

Information found in the plan meet the regulatory requirements of this section.

RECLAMATION PLAN

GENERAL REQUIREMENTS

Regulatory Reference: PL 95-87 Sec. 515 and 516; 30 CFR Sec. 784.13, 784.14, 784.15, 784.16, 784.17, 784.18, 784.19, 784.20, 784.21, 784.22, 784.23, 784.24, 784.25, 784.26; R645-301-231, -301-233, -301-322, -301-323, -301-331, -301-333, -301-341, -301-342, -301-411, -301-412, -301-422, -301-512, -301-513, -301-521, -301-522, -301-525, -301-526, -301-527, -301-528, -301-529, -301-531, -301-533, -301-534, -301-536, -301-537, -301-542, -301-623, -301-624, -301-625, -301-626, -301-631, -301-632, -301-731, -301-723, -301-724, -301-725, -301-726, -301-728, -301-729, -301-731, -301-732, -301-733, -301-746, -301-764, -301-830.

Analysis:

Chapter 10 of the plan constitutes the Final Reclamation Plan for the surface operations. When removal of coal refuse and coal slurry materials from the site are completed, SCA indicates that they will notify the Division of cessation of mining operations and commence final reclamation of the remaining disturbed areas. A conceptual surface configuration is provided in the plan as Plate 10-1. Prior to cessation of mining operations, SCA may have partially or fully reclaim portions of the surface disturbed areas. The proposed post-mining land use for the entire permit area is wildlife habitat as discussed in Chapter 4 of the plan.

While the general concepts presented in the reclamation plan might be adequate, a precise reclamation plan for reclamation will primarily depend on how much refuse material reprocessed in the cogeneration plant and how much refuse material remaining on site for permanent disposal. Depending on the state of the operations, various scenarios must be assessed to optimized reclamation treatments and meet regulatory performance standards. Detailed designs for reclamation sufficient for reclamation construction can only be developed at the time of reclamation. Consequently, the amount of bond required for reclamation should also reflect these costs.

Findings:

Refer to the following sections regarding specific findings for reclamation requirements.

POSTMINING LAND USES

Regulatory Reference: 30 CFR Sec. 784.15, 784.200, 785.16, 817.133; R645-301-412, -301-413, -301-414, -302-270, -302-271, -302-272, -302-273, -302-274, -302-275.

Analysis:

The stated post mining land use is wildlife habitat. Other inferred post mining land use is the historical value. The permit states that other uses of the area such as agriculture and livestock grazing are not practicable because of lack of water and steep slopes. Figure 4-3 contains a letter from the landowner, Sunnyside Cogeneration Associates, concerning the proposed post mining land use. The letter states that any use proposed in the plan is agreeable to them.

The wildlife species most likely to inhabit the reclaimed site would include a variety of birds; larger mammals such as deer and coyote; small mammals; snakes and other reptiles; and potentially small amphibians (page 400-7). The plan presents several wildlife enhancement features for reclamation. The placement of rock piles may provide habitat for small mammals and reptiles. The establishment of Pinyon/juniper plantings may provide cover for large mammals, and food for small mammals and birds. The approved seed mixes have been selected for wildlife use.

The plan previously stated (see Technical Analysis dated October 4, 1995) that the coke ovens will be offered to the City of Sunnyside or other organization at the time of reclamation. This portion of the plan has been removed and now the disposition of the coke ovens at the time of reclamation is unknown. Since the ovens are on the historic register SCA will have to finalize plans for future preservation and ownership of the ovens at the time of reclamation.

Findings:

The permittee has met the minimum requirements of this section.

PROTECTION OF FISH, WILDLIFE, AND RELATED ENVIRONMENTAL VALUES

Regulatory Reference: 30 CFR Sec. 817.97; R645-301-333, -301-342, -301-358.

Analysis:

Comments are made in the plan (page 300-7) that no polluted waters enter Icelander Creek from the permit area. The plan states that vegetation in the area of the seep and along its watercourse is lush and therefore water quality cannot be viewed as harmful. No apparent adverse effects are noted in the wildlife that uses the area. No analytical data is given to support this observation. The Division is concerned about the heavy metal content of the soil and vegetation in the wetland. Wetlands are known to filter pollutants and uptake metals that remain in the wetland. During reclamation the soil and vegetation may need to be removed from this

wetland and the wetland reconstructed. The Division will conduct soil and plant tissue analysis before final reclamation to evaluate the need for restoration of the wetland.

The seed mixture provides for a variety of grass, forb, and shrub species that have a high value as big game forage use. The seed lists found in Appendix 3-3 is a recommendation from the operator's consultant and are included in the consultants reports. The seed lists found in Appendix 3-3 are not the approved seed mixtures. The approved seed mixes are found in Figures 10-2, 10-3 and 10-4.

As described in section 9.9.1 of the plan, Plate 10-7 delineates those areas in which Pinyon and Juniper tublings will be planted. Six areas of approximately 1,000 tublings will be created with a density of about 200 shrubs per acre. Plantings of Pinyon/Juniper are for providing cover for wildlife habitat.

Other habitat measures include the placement of rock piles placed randomly throughout the site. Approximately four rock piles per acre will be constructed varying from 6 to 10 feet in diameter and 3 to 8 feet in height. The rock piles will be created for habitat for small mammals and reptiles. Rock for these piles will be derived from the borrow area and will typically be 1 foot in diameter or larger. The number of piles will be limited to the amount of rock available in the borrow area (page 900-20).

Findings:

Information provided in the plan meets the minimum requirements of this section.

APPROXIMATE ORIGINAL CONTOUR RESTORATION

Regulatory Reference: 30 CFR Sec. 784.15, 785.16, 817.102, 817.107, 817.133; R645-301-234, -301-412, -301-413, -301-512, -301-531, -301-533, -301-553, -301-536, -301-542, -301-731, -301-732, -301-733, -301-764.

Analysis:

The final reclamation configuration is presented in Chapter 10 of the plan. A generalized 3-D model of the site following reclamation is presented as Plate 10-1. Contour maps showing the final reclamation are presented on Plates 10-3 through 10-3E.

Recontouring the site consists of removal of the coal waste, refuse and coal processing waste resultant from prior underground mining activities. These waste materials will be removed from their existing location and reprocessed by burning in the adjacent cogeneration plant. Contours shown for the final reclamation design have been approximated to meet pre-mining contours based on historic data and maps of the area prior to mining activities. Those original

contours were used to develop the final contours of the site except for the Reclamation Borrow Area and the Excess Spoil Disposal Area.

The Excess Spoil Disposal Area as further discussed in the Operation Plan section of this Technical Analysis, will be the repository for waste and other materials found to be unsuitable burning in the cogeneration facilities. The Reclamation Borrow Area is the primary source of cover material and substitute soil materials for covering refuse material and re-establishing soils and vegetative cover during reclamation.

The Excess Spoil Disposal Area is situated on a promontory. The extent of the Excess Spoil Disposal Area is approximately 14.2 acres. The outslopes of the waste embankments are designed as fairly steep slopes at 2.5:1. While the maximum height of waste material is designed not to exceed 70 feet, the apparent height of the spoil pile will reach approximately 150 feet in some areas due to the geometry of the underlying topography. Lateral slopes shown on the drawings show that the slope length in some areas will reach about 400 feet. These slopes are terraced with 14 foot wide. Benches spaced vertically at intervals of 25 to 35 feet limit continuous slopes of 2.5:1 to about 95 feet in length maximum.

The Reclamation Borrow Area will be the predominant source of soil and cover material necessary for reclamation. Only about 8,000 yd^3 of soil materials have been salvaged and stockpiled within the permit area. The remainder of the materials required for reclamation will be derived from the Reclamation Borrow Area and a smaller area labeled as the Industrial Borrow Area. The extent of the Reclamation Borrow Area is approximately 34.4 acres and the extent of the Industrial Borrow Area is approximately 9.5 acres. The plan estimates that approximately 960,000 yd^3 of soil/cover materials are available from these borrow areas.

Findings:

Information regarding this section is considered to meet the minimum regulatory requirements.

BACKFILLING AND GRADING

Regulatory Reference: 30 CFR Sec. 785.15, 817.102, 817.107; R645-301-234, -301-537, -301-552, -301-553, -302-230, -302-231, -302-232, -302-233.

Analysis:

General

Final reclamation plans and the final surface configuration for the site are found in Chapter Ten of the plan. Plates 10-3 through 10-3E show the final reclamation phasing plan and

Plates 10-4 through 10-4E show identical final contours and depict the final grading plan. The existing surface contours are based on aerial photography taken in 1994. The final contours and surface configuration are based on historic information, including USGS topographic maps (15 min. - 1915 and 7 1/2 min. - 1972), USDA-APFO aerial photographs taken in 1952, 1969, and 1980, and contour maps obtained from Sunnyside Coal Company in 1992.

Mining activities will eliminate the existing refuse disposal facilities by removal and reprocessing of the refuse and coal processing waste materials. This removal should eliminate the excess spoils placed within these older facilities. Materials that cannot be used for the cogeneration plant will be disposed of as excess spoil in a new location designed by the permittee as the Excess Spoil Disposal Area. A large borrow area located on the eastern side of the site will be the primary source of cover material for the Excess Spoil Disposal Area.

If any precipitate material is found following removal of the refuse material, it will be disposed of within the approved excess spoils disposal area. The plan states that any acid- and/or toxic-forming materials are to be removed and placed in the excess spoils disposal area, as well as any un-utilized refuse material.

Previously Mined Areas

Backfilling and Grading On Steep Slopes

Special Provisions for Steep Slope Mining

Findings:

Information regarding the minimum requirements of this section is considered adequate.

MINE OPENINGS

Regulatory Reference: 30 CFR Sec. 817.13, 817.14, 817.15; R645-301-513, -301-529, -301-551, -301-631, -301-748, -301-765, -301-748.

Analysis:

Page 500-17 of the plan states that there are and will be no mine openings at this site. Therefore, the closure of mine openings is not and does not need to be discussed.

Because the operations consist of surface salvage of refuse materials, no underground mine openings are expected.

Findings:

Information provided in the plan fulfills the requirements of this section.

TOPSOIL AND SUBSOIL

Regulatory Reference: 30 CFR Sec. 817.22; R645-301-240.

Analysis:

Redistribution

Topsoil material for final reclamation will be obtained from the Reclamation Borrow Area and Industrial Borrow Area 1 & 3. These borrow areas contain approximately 963,805 yds^3 of suitable material.

The permittee contemplates the use of sediment pond waste as substitute topsoil (Section R645-301-526.300, page 500-10). Unsuitable material will be identified and characterized for disposal in the Excess Spoil Disposal Area. The permittee may allocate some soil material for fire suppression. In such an event, the source of said material must be identified before use of such material for fire suppression. The sediment pond waste will be analyzed to determine that it is equal to or more suitable for sustaining vegetation than existing topsoil materials.

Essentially three reclamation scenarios exist. One alternative is placing four feet of suitable cover over the entire coarse refuse pile as it currently exists and areas contaminated with coal mine waste (i.e., worst case). Based on the current site conditions approximately 127.39 acres is covered and/or contaminated with coal refuse (Plate 8-1). Covering 127.39 acres with four feet of suitable non-acid and no-toxic and noncombustible material would require approximately 822,090 yd^3 of topsoil for cover. Prior to topsoil redistribution and for facilitating drainage, the refuse pile (i.e., East and West Slurry Cells, Coarse Refuse Pile) would require major regrading.

A second scenario is the partial removal of refuse. In this case, redistribution of topsoil would be as follows: four feet in areas contaminated with refuse or any other material deemed unsuitable (i.e., Precipitate layer at the refuse/Mancos shale interface), 1.5 feet in areas that are not influenced by the precipitate layer or subsequent to removal of the precipitate layer or other acid- and/or toxic-forming materials found uncovered.

The third scenario would be the removal of all the refuse material as proposed in the plan. This would require removal of the precipitate layer and other unsuitable material with subsequent redistribution of 1.5 feet of topsoil material (Section 9.8.4). At this time the permittee commits to disposal of the precipitate material in the noncombustible waste disposal area. The volume of noncombustible waste (i.e., precipitate, burned coal, capping material used for fire suppression, etc.) contained within the refuse pile has not been reliably determined. The amount of this material, its physicochemical characteristics and its waste classification will influence the design and location of the Excess Spoil Disposal Area, or additional permanent disposal facilities if the capacity of the currently planned site is exhausted. Until the material is adequately characterized and quantified through operations, disposal plans can only be considered tentative. The permittee may choose to develop various waste disposal scenarios that account for quality and quantity of waste produced during mining activities. Adequate capacity for permanent storage and disposal of excess spoil has been provided in the plan for at least the current permit term. The operator currently predicts that no additional facilities will have to be constructed for the life of the operations, but has committed to design and develop additional disposal areas should the need arise.

Prior to disposal or use as substitute soil material, sediment pond waste must be adequately sampled and analyzed to determine its acid- and/or toxic-forming potential. Refer to the Title V Coal Program Guideline for Disposal of Sedimentation Pond Waste, dated November 26, 1990, for sediment pond waste sampling and analysis protocol. Prior to removal and placement of sediment pond waste, such analysis must be provided to the Division for approval as to its final disposition.

Information found in the plan characterizes acid- and/or toxic-forming materials and other waste materials found within the permit area. The determination of the suitability and the adequacy of cover materials and the soils for reclamation can be accomplished to the extent that a minimum of four feet of suitable cover material must be established over all refuse materials. The plan does not indicate that any amount of cover less than four feet can be used to accomplish reclamation.

Findings:

Information regarding this section is considered to meet the minimum regulatory requirements.

ROAD SYSTEMS AND OTHER TRANSPORTATION FACILITIES

Regulatory Reference: 30 CFR Sec. 701.5, 784.24, 817.150, 817.151; R645-100-200, -301-513, -301-521, -301-527, -301-534, -301-537, -301-732.

Analysis:

Reclamation

Reclamation of roads is discussed in section 10.5.2 of the plan. All roads, except five sections of roadways that include portions of roads B, E, J, Q, and R as identified on Plate 5-2. The portions of these roads that will be retained are shown on Plates 10-3, 10-4, 10-6, and 10-7.

All other roads will be reclaimed in accordance with the backfilling and grading plan as found in Chapters 9 and 10 of the plan. Any refuse material used in the construction or surfacing of roads within the permit area will have to be disposed of in accordance with the requirements described in the plan for the disposal of excess spoils.

Retention

The roads to be retained will remain with the same alignment and in the same condition, as they currently exist within the permit area. These roads existed prior to current permitted mining activities and will be retained as existing right-of-ways or easements through the property. Use of these roads will continue after mining as access for power lines and the railroad through and adjacent to the permit area. The use of these roads will be minimal.

Findings:

The permittee has met the minimum regulatory requirements regarding the reclamation of roads and other transportation facilities.

HYDROLOGIC INFORMATION

Regulatory Reference: 30 CFR Sec. 784.14, 784.29, 817.41, 817.42, 817.43, 817.45, 817.49, 817.56, 817.57; R645-301-512, -301-513, -301-514, -301-515, -301-532, -301-533, -301-542, -301-723, -301-724, -301-725, -301-726, -301-728, -301-729, -301-731, -301-733, -301-742, -301-743, -301-750, -301-751, -301-760, -301-761.

Analysis:

Hydrologic Reclamation Plan

Ground-water monitoring.

No discussion of post-mining ground-water monitoring is provided in Chapter 10: Reclamation Plan. On page 700-14 of the hydrology section the permittee states:

"Surface water monitoring will continue as described in Appendix 7-8, through the end of the operations of the Sunnyside mine preparation plant (end of necessary slurry and coarse refuse disposal), through the reclamation process until the bond release."

Surface-water monitoring.

No discussion of post-mining surface-water monitoring is provided in Chapter 10: Reclamation Plan. However, page 700-14 of the hydrology section the permittee states:

"Surface water monitoring will continue as described in Appendix 7-8, through the end of the operations of the Sunnyside mine preparation plant (end of necessary slurry and coarse refuse disposal), through the reclamation process until the bond release."

Operational monitoring sites for surface- and ground-water will continue to be monitored after reclamation until final bond release.

Acid- and toxic-forming materials.

Six boreholes through the slurry cell and coarse refuse were used to characterize the acid- and/or toxic-forming potential of the site. This drilling was performed in June 1995 and the results were used to determine reclamation alternatives.

Transfer of wells.

No water wells exist within the SCA permit area. Should wells arise which require transfer, the permittee commits to these transfers in accordance with the State Engineer's office.

SCA has drilled a water well within the Sunnyside Mine permit area for power plant water.

Discharges into an underground mine.

There are no underground mine openings associated with this operation. Therefore, this regulation does not apply.

Gravity discharges.

There are no mine openings associated with this operation. Therefore, this regulation is not applicable to permitting requirements.

Water quality standards and effluent limitations.

The permittee has acquired UPDES permit #UT0024759 for the SCA facility. The reclamation plan states that seven sediment ponds will remain to handle runoff from the reclaimed site until Phase II Bond release criteria are met. The Clear Water, Pasture, Coal Pile, Coarse Refuse Toe, Rail Cut, Old Coarse Refuse Rood, and the Borrow Ponds will be retained into phase I reclamation. These ponds will be monitored in accordance with the UPDES permit.

Diversions.

The plan shows a series of permanent diversions to be constructed on the slopes below the excess spoil disposal area. Constructing a large disposal site in this location will increase the height of the slope. Erosion of this surface could cause sedimentation of the diversions and movement of refuse down slope. According to the design in Appendix 9-5 the excess spoil pile will be approximately 70 feet above the level of the existing pediment. The diversions are actually terraces that are to be 14 feet wide, 1 foot deep with a slope between 2 and 4 degrees.

Additionally, the SHB-AGRA report recommends and the permittee has specified that a 25-foot buffer would be left along the edge of the interface between the natural pediment and the excess spoil material. The slope below the interface is already a 1.4:1 slope. Where the diversions specified are installed, the permittee will need to ensure that drainages down stream from the diversions are adequate to handle design flows.

If diversions are not adequately maintained, accumulations of eroded material will create ponding, instability, and eventual failure of the diversion system. Continued erosion will expose buried refuse material, allowing transport down slope into the lower diversions and the natural drainages. Final reclamation design must contain sufficient information regarding the stability of the diversions and the soils materials covering the waste material to demonstrate long-term stability of the site. Where vegetative cover is used primarily to control rills and gullies and prevent surface erosion of the cover material over the spoil facilities, designs and information demonstrating that the proposed vegetative cover is capable of controlling erosion will need to be provided. Current vegetation plans are made only in respect to density and diversity requirements and have not been determined as adequate to control erosion. Prior to implementation of final reclamation, adequate designs must be presented to and approved by the Division.

Once erosion occurs, the excess spoil becomes exposed, revegetation potential will be reduced which in turn accelerates erosion and creates additional stability and maintenance problems. If the location of the disposal area were moved to a more gentle sloped area, such as the Borrow area or the Slurry Pond 1 and 2 location, the potential for erosion, diversion sedimentation and exposure of buried refuse material will be greatly reduced as well as a lower need for continued maintenance.

Appendix 10-1, Table Four, includes diversion design criteria for all channels designed for use during and after reclamation. Diversion design information for the main channel to be re-established through the coarse refuse pile area is provided as the diversion designs for the channels reporting to the Coarse Refuse Toe Pond. These diversions will remain as the permanent diversions following removal of the sediment pond. Diversions for the main channel to remain as a permanent diversion through the Coarse Refuse Pile area are currently based on a 10-year/6-hour storm event.

Because of seeps associated with this channel and the steep slopes associated with the gradient of this channel, the Division has determined that the design criteria for the channel should be based on the 100-year/6-hour storm event rather than as proposed in the plan. Establishing and maintaining this channel is critical to the protection of the steep slopes of the drainage area and to protection of any riparian areas that may be established within and adjacent to the permanent diversion resulting from the seeps in that area.

The permanent diversion channel through the removed refuse pile is a series of diversions linked together from the Phase 1 period and the Phase 2 period.

Information presented in Appendix 10-1 provides permanent steep channel diversion designs based on the 100-year/6-hour storm event as prescribed by the Division. However, the permittee has assumed that the capacity of these channels should only be determined for Phase Two criteria as described in their plan. Phase Two indicates that vegetative cover has been established and that the curve number for the watershed areas would be reduced to 69. Assumption during Phase One that curve number 84 (corresponding to zero percent vegetative cover) is used for areas covered with borrow material. Because the diversions are to be used in both Phase One and Phase Two activities, curve number 84 should be considered in sizing these diversions.

Table Three in Appendix 10-1 also shows various peak flows for different design events and periods of reclamation. Variation in the peak flows and runoff calculations shows the sensitivity of the hydrologic modeling programs used for runoff design. Consequently the comparisons of flows to those calculated in the Table Four Design Flow calculations vary from those based on the 100-year/6-hour values are based on a curve number of 69. The 100-year/6-hour design events calculated on the higher curve number or other modifications to the reclamation design may be required at the time of reclamation since no vegetative cover may reliably exist at the time that these channels are constructed. Prior to commencing reclamation work, a more detailed design for permanent diversions will be required by the Division.

On page 15 of Appendix 10-1 submitted on November 17, 1995, SCA commits to: "investigating the potential for water velocity controls after the refuse pile is removed." On page 1000-6, the permittee states, "Large boulders encountered during excavation of borrow material could occasionally be placed in the channel bottom in locations that appear relatively stable."

Placement of large boulders in this fashion does not armor the channel but creates blockages where the channel will migrate around these boulders causing additional erosion and de-stabilization of the banks. Riprap design for these channels has been included in the plan, but will need to be re-evaluated prior to conducting reclamation work.

This drilling program was conducted in August 1995. The results of the drilling did not find large areas of potentially toxic precipitate. The drill logs and analysis results are provided in Appendix 6-7. Acid- and/or toxic-forming material is present in the refuse pile. Acid- and/or toxic-forming material disposed of in the excess spoil disposal area will need to be covered with four feet of material. If reclamation occurs before the elimination of the existing refuse pile, designs must be provided in a manner that will prevent permanent diversions from being established on or over refuse materials.

Stream buffer zones.

No mine disturbance is proposed near an intermittent or perennial stream. No buffer zones are proposed.

Sediment control measures.

Page 1000-4 of the reclamation plan shows that berms and silt fences will be used as additional sediment controls. Runoff from re-contoured areas will be diverted to the sediment ponds.

Installation of silt fences or other sediment control measures will need Division approval. Appropriate maps will need to be updated to reflect placement of these sediment controls. The installation design must be specified which includes trenching and keying the toe of the fence. Any reinforcement backing must be described. A design typical can be found on Plate 10-2.

Siltation structures.

The plan indicates that sediment control measures consist of collector ditches and sediment ponds. Many diversion ditches and impoundments make up the sediment controls within the permit area described in Chapter 7.

The only approved BTCA areas include the topsoil stockpile berms and the area adjacent to the Clear Water pond. This area contains the Clear Water Topsoil stockpile plus the outer slopes of Slurry Pond 1 and the Clear Water Pond.

Sedimentation ponds.

According to the reclamation plan, seven sediment ponds will be retained to control sediment during Phase 1 reclamation. These include the following ponds: Pasture, Coarse Refuse Toe, Coal Pile, Rail Cut, Borrow, Old Coarse Refuse Road, and the Clear Water.

These ponds will retain their current size and configuration as described in the operational plan. The watersheds associated with each pond may change due to topographic changes following mining. Several ponds will have a decrease in watershed area whereas some will have an increase in area. The following table compares the watershed areas for the operational and reclamation phases for each pond scheduled for use during Phase 1 reclamation.

POND NAME	OPERATIONAL AREA	RECLAMATION AREA	CHANGE
Pasture	17.0	14.3	-2.7
Coal Pile	2.3	2.8	+0.5
Coarse Refuse Toe	6.1	41.2	+35.1
Railcut	70.4	81.4	+11.0
Old Coarse Refuse Road	13.9	8.2	-5.7
Borrow	280	220.9	-59.1
Clearwater	143.4	153.2	+9.8
Totals	533.1	522	-11.1

Ponds that have a decrease in watershed area will receive less runoff following reclamation. Therefore, these ponds will meet the requirements. The Coarse Refuse Toe, Railcut and Clearwater will have an increase of area.

The Coarse Refuse Toe pond has a capacity of 1.63 acre-feet. The 10-year/24-hour storm event produces 2.19 acre-feet of runoff of which 1.27 acre-feet is routed through this pond with a peak discharge rate of 4.9 CFS. The permittee has not demonstrated that this pond configuration is adequate to treat the runoff volumes it will experience with increased watershed areas during all phases of reclamation. The Coarse Refuse Toe Pond design does not adequately show that the capacity of the pond is adequate to contain or otherwise treat the design event to control runoff and meet applicable effluent limitations and will most likely require additional design before phase one reclamation work can be conducted.

The Railcut pond has a capacity of 2.24 acre-feet below the emergency spillway. The 10-year/24-hour storm event produces 4.48 acre-feet. Approximately 2.69 acre-feet are routed

through the pond during the 10-year/24-hour event with a peak discharge rate of 0.73 CFS. This pond will also require additional design and sizing before phase one reclamation work.

The Clearwater pond has a capacity of 4.98-acre feet. The 10-year/24-hour storm event produces 2.39 acre-feet of runoff. According to the Sedimot model approximately 0.003-acre feet of water would be routed through the pond with a flow rate of 0.001 CFS. This pond should be capable of handling and treating the runoff volumes as designed for the reclamation plan.

Other treatment facilities.

The permittee reclaimed the Old Coarse Refuse Road in late 1994. A silt fence was installed at the base of this road for sediment control during the reclamation work and to prevent down slope movement of loose soils during reclamation activities. Erosion control matting, surface roughening and vegetation are considered the primary sediment control measures for this area. An evaluation of the site and a determination whether or not the silt fence can be removed should be accomplished by the permittee.

Exemptions for siltation structures.

No exemptions from this requirement are proposed in the reclamation plan.

Discharge structures.

Discharge structures are a combination of pipes, culverts and open channels. The adequacy of the discharge structures for each pond was checked for capacity to handle the peak flows from the 25-year/6-hour storm. All of the discharge structures can control these peak flows. For ponds that contain the runoff volume for treatment, the design details for open channel spillways are specified in the diversion section for each pond.

Impoundments.

Seven impoundments will be retained through the Phase 1 bond period. The permittee has discussed the regulatory requirements of each sediment pond under the Sedimentation Ponds section above. This discussion included the sizing criteria according to 30 CFR 77.216, spillway analysis, a Professional Engineer certification, and a volumetric analysis. Inspections are committed to on page 700-2 of the plan.

There are 7 impoundments at this site that will be used through the Phase 1 bond period: the Clear Water Pond, the Pasture Sediment Pond, the Coarse Refuse Toe Sediment Pond, the Rail Cut Sediment Pond, the Old Coarse Refuse Road Sediment Pond, the Borrow Area Pond, and the Coal Pile Sediment Pond.

A professional engineer will inspect all non-MSHA impoundments quarterly. The professional engineer will compile a certified report of each inspection and copies of the inspection reports will be kept at the site. The plan states that copies of the inspection reports will be sent to the Division, as required by R645-301-514.312.

Casing and sealing of wells.

The plan discusses potential well drilling and casing and sealing on page 700-21 of the plan. It commits to drilling any wells in accordance with the State of Utah Administrative Rules and Water Well Drillers, Appendix 1. The permittee also proposes to case and seal any monitoring wells that they install in accordance with the State of Utah Administrative Rules and Water Well Drillers, Appendix 1.

Findings:

The permittee has met the minimum requirements regarding hydrologic designs for reclamation. Information regarding the sizing requirements for ponds and diversion may require re-evaluation at the time of reclamation to ensure that all applicable performance standards can be met. Such additional information must be provided to the Division before conducting reclamation.

CONTEMPORANEOUS RECLAMATION

Regulatory Reference: 30 CFR Sec. 785.18, 817.100; R645-301-352, -301-553, -302-280, -302-281, -302-282, -302-283, -302-284.

Analysis:

General

Areas of contemporaneous reclamation are designated on Plate 9-3 and in a series of plates in Plates 10-3. Reclamation will proceed as described in Chapter 9. Page 900-24 commits to the reclamation of areas 2 acres or larger as they become available.

The Old Coarse Refuse Haul road was contemporaneously reclaimed in 1994. All acid- and/or toxic-forming materials were removed from the outslope of the road and buried on the inside slope of the road with a minimum of four feet of borrow material. The surface foot of borrow had an organic amendment incorporation of 1 ton per acre straw. The surface was then roughened, seeded, fertilized, and mulched with 2 tons per acre straw. The steeper outslopes had an erosion control matting applied after fertilization and seeding.

Reclamation efforts of the Old Coarse Refuse Road were accomplished as contemporaneous (permanent) reclamation. Consequently, the vegetation success determination standards as described in section 9.95 apply to this area. According to the plan, this area will be monitored according to the schedule as shown in section 9.9.5 and according to the reclamation performance standards described in section R645-301-350, page 300-16, of the plan.

Specific plans for contemporaneous reclamation of areas no longer associated or needed to conduct mining activities are presented in the plan for the current permit term. The plan also includes a series of maps showing the reclamation sequence proposed for the life of the mining operations that is general in nature and does not provide for detailed plans and designs for areas to be contemporaneously reclaimed. At a minimum, the plan provides for specific areas and detailed reclamation designs for those areas planned or proposed to be reclaimed within the current permit term.

Contemporaneous reclamation activities documented in the plan are to be monitored to determine whether the reclamation treatments used in the areas can be proven successful. Field data and monitoring reports are to be provided to the Division as part of the annual reports. These reclaimed areas can provide invaluable information and demonstrating by field trials that reclamation treatments for those areas and other future reclamation areas will be successful.

As currently proposed, mining operations will focus primarily on the central area of the site and large areas within the site will be used to remove coal processing waste and mine refuse. Because of the nature of the mining design, only a small portion of the site will have all of the refuse removed until near the end of the life of the operations.

As indicated in section 10.3 of the plan, SCA states that there are not any areas (except the Old Coarse Refuse Road) that are currently planned, or proposed to be, contemporaneously reclaimed within the current permit term. If areas become available for final (contemporaneous) reclamation that are currently not anticipated, DOGM will be notified of SCA's intent to do final reclamation before commencement of the work.

While the permittee indicates that no additional contemporaneous reclamation is planned to occur within the current permit term, several areas within the site may be considered and evaluated for contemporaneous reclamation. These areas include, but are not limited to, the areas next to the Clearwater Pond, areas to the east of the slurry ponds, and other areas where only a small veneer of refuse or waste material covers the site. While SCA currently maintains that the operations will continue to use these areas at present, conditions may change to allow additional contemporaneous reclamation activity. Should reclamation of these areas become feasible, the permittee will notify DOGM as stated above.

A detailed plan for all contemporaneous (final) reclamation activities must be provided with SCA's application for permit renewal adequately to address reclamation planned for the five

years following permit renewal. Although SCA has committed to reclaim all areas as contemporaneously as possible and to reclaim areas of two acres or larger as refuse materials are removed, a more precise schedule and details of reclamation treatments should be provided for each successive permit term.

According to R645-301-352, detailed designs and a schedule for contemporaneous activities must be presented in the plan and approved by the Division before conducting any reclamation activities. The plan must, at a minimum, encompass contemporaneous reclamation work to occur during the permit term. Reclamation efforts, including detailed designs and a schedule for all contemporaneous reclamation activities for successive permit renewal must be provided to the Division for approval at least 180 days before the expiration date of the current permit term.

Findings:

Information regarding this section is considered to meet the minimum regulatory requirements.

REVEGETATION

Regulatory Reference: 30 CFR Sec. 785.18, 817.111, 817.113, 817.114, 817.116; R645-301-244, -301-353, -301-354, -301-355, -301-356, -302-280, -302-281, -302-282, -302-283, -302-284.

Analysis:

Revegetation: General Requirements

The details of the revegetation procedures are given on page 900-19 to 900-20. The seed mixtures are specified in Figures 10-2, 10-3, and 10-4. A Pinyon/Juniper/Sagebrush, Hydrophytic Vegetation, and Atriplex/Grass are the three seed mixtures proposed for final reclamation. The Riparian seed mixture will be used along the reclaimed channel to Icelander Creek. The Atriplex/Grass mixture will be used on the outslopes of the refuse embankment and road cut. The remainder of the site will be seeded with the Pinyon/Juniper/Sagebrush mixture. Plate 10-7 illustrates the areas in which the three different seed mixtures are to be applied. The seed mixture is composed primarily of species native to the area and are as follows:

PINYON/JUNIPER/SAGEBRUSH AREAS

	DRILL RATE		BROADCAST RATE	
	SEEDS/FT2	#PLS/ACRE	SEEDS/FT2	#PLS/ACRE
GRASSES				
Elymus cinereus				

Gt. Basin Wildrye	6.5	3.0	13.0	6.0
Elymus lanceolatus				
Thickspike Wheatgrass	5.8	2.0	11.6	4 0
Elymus spicatus				
Bluebunch Wheatgrass	3.5	3.0	7.0	6.0
Stipa Comata				
Needle-and-Thread	6.8	2.0	13.6	4.0
Stipa hymenoides				
Indian Ricegrass	6.8	2.0	13.6	4.0
FORBS				
Achillea millifolium				
Yarrow	6.4	0.1	12.8	0.2
Aster chilensis				
Pacific Aster	6.0	0.1	12.0	0.2
Hedysarum boreale				
Northern Sweetvetch	1.5	2.0	3.0	4.0
Linum lewissi				
Lewis Flax	6.7	1.0	13.4	2.0
Melilotus officianalis				
Yellow Sweetclover	6.0	1.0	12.0	2.0
Penstemon palmeri				
Palmeri's Penstemon	7.0	0.5	14.0	1.0
SHRUBS				
Amelanchier utahensis				
Serviceberry	1.3	2 0	2.6	4.0
Artemisia tridentata				
Big Sagebrush (Wyoming)	6.7	0.1	13.4	0.2
Cercocarpus ledifolius				
Mountain Mahogany	2.3	2.0	4.6	4.0
Atriplex canescens				
Fourwing Saltbrush	1.2	1.0	2.4	2.0
Rhus trilobata				
Squawbush	1.0	2.0	2.0	4.0
TOTALS	75.5	23.8	151.0	47.6

ATRIPLEX/GRASS AREAS

	DRILL RATE		BROADCAST RATE	
	SEEDS/FT2	#PLS/ACRE	SEEDS/FT2	#PLS/ACRE
GRASSES				
Elymus lanceolatus	2.9	1.0	5.8	2.0
Thickspike Wheatgrass				

Elymus smithii Western Wheatgrass	5.8	2.0	11.6	4.0
Sitanion hystrix Squirreltail	13.2	3.0	26.4	6.0
Stipa comata Needle and Thread grass	3.4	1.0	6.8	2.0
Stipa hymenoides Indian Ricegrass	8.6	2.0	17.2	4.0
Elymus trachycaulus	1.3	0.5	2.6	1.0
FORBS				
Linum lewsii Lewis Flax	13.1	2.0	26.2	4.0
Melilotus officianalis Yellow Sweetclover	11.9	2.0	23.8	4.0
Sphaeralcea grossularifolia Gooseberry Globemallow	11.5	1.0	23.0	2.0
SHRUBS				
Atriplex canescens Fourwing Saltbrush	4.4	3.0	8.8	6.0
Atriplex confertifolia Shadscale	4.5	3.0	9.0	6.0
Ceratoides lanata Winterfat	5.1	2.0	10.2	4.0
Atriplex gardneri	3.0	1.0	6.0	2.0
TOTALS	88.7	23.5	177.4	47.0

HYDROPHYTIC VEGETATION AREAS

	DRILL RATE		BROADCAST RATE	
	SEEDS/FT2	#PLS/ACRE	SEEDS/FT2	#PLS/ACRE
GRASSES				
Agropyron smithii Western Wheatgrass	8.0	3.0	16.0	6.0
Elymus cinereus Gt. Basin Wildrye	9.0	3.0	18.0	6.0
Phalaris arundinacea Reed canarygrass	12.0	1.0	24.0	2.0
Typha latifolia Broad-leaved Cattail	23.0	0.1	46.0	0.2
Sporobolus airoides Alkali Sacaton	20.2	0.5	40.4	1.0

FORBS				
Iris missouriensis				
Rocky Mountain Iris	2.0	5.0	4.0	10.0
Castelleja exilis				
Marsh Indian Paintbrush	10.5	0.1	21.0	0.2
Geranium viscosissimum				
Wild Geranium	0.1	0.1	0.2	0.2
SHRUBS				
Amelanchier alnifolia				
Saskatoon Serviceberry	1.0	1.0	2.0	2.0
Cornus stolinifera				
Redosier dogwood	2.0	0.5	4.0	1.0
TOTALS	87.0	14.3	175.6	28.6

All seeding will be done by broadcast or drill seeding methods. Either hydro seeding or hand broadcasting methods may be used in areas inaccessible to mechanized seeding equipment. All seeded areas will be raked to ensure good soil/seed contact (page 900-20). This method has been acceptable to the Division in past reclamation projects. A commitment is made to limit the amount of time the seed is in the hydroseeder to 30 minutes (page 900-20).

A commitment is made in the plan to leave the site in a roughened state (page 900-19). This roughened state is very important to the success of the reclamation project. Drill seeding may reduce the surface roughness to an undesirable level. The operator may find at the time of reclamation that broadcast seeding will maintain the desirable surface roughness. The commitment is made to conduct the last pass of the grading operation in the direction of the contour rather than perpendicular to the contour on all slopes less than 2:1. Running on contour is an important practice in revegetation operations. The outslopes of the first and second lift of the refuse pile shows evidence of equipment having run vertically on the slope and success has been marginal.

Revegetation: Timing

The plan commits to planting between October 1, and November 30 (page 900-19). This is the normally accepted time of year to be seeding in the region. December seeding would also be acceptable if the ground is not frozen and can be worked. Areas that cannot be seeded during the fall window will be stabilized by seeding with an annual grain, mulching, or netting until the window has opened. The plan states that barley or oat seeding will not take place after September 15 in areas to be seeded with a permanent seed mixture that fall due to the potential competition the annual grain may have.

Revegetation: Mulching and Other Soil Stabilizing Practices

The plan commits to applying 2 tons per acre wood fiber plus tackifier by a hydroseeder as mulch (page 900-20) on slopes less than 2:1. Hydro mulching has been effective in controlling erosion and stabilizing the soil surface on slopes less than 2:1. The success of hydro mulch and subsequent seed germination has been variable in the arid west. The Sunnyside area should receive adequate precipitation for hydro mulch. Two tons per acre straw was applied to the Coarse Refuse Haul Road in the fall of 1994 as mulch. A track hoe was used to anchor the mulch to the soil surface. Long fiber mulch such as alfalfa or grass hay has been successfully used for erosion control and seed germination in Carbon County. Erosion control matting will be used on all slopes 2:1. Erosion control matting is essential for stabilizing soil surface and seeded slopes on these steep areas.

Revegetation: Standards For Success

The success of the revegetation will be compared with two reference areas. Most of the site will be compared with the Pinyon/Juniper/Sagebrush reference area (Plate 10-1). The embankments of the refuse pile and the south facing ridgeline will meet the Atriplex/Grass reference area standard. No standard has been established for the Riparian community that has been disturbed and may need to be recreated. The Division is investigating the possible contamination of the seep area soils and plant tissue and may require that a success standard be established for this area. Quantitative monitoring will be done in years 2, 3, 5, 9, and 10 for vegetative cover and woody plant density. Year 5 sampling will evaluate the 80/60 rule for shrub establishment.

The minimum tree and shrub numbers used for determining success on both the Pinyon/Juniper/Sagebrush and Atriplex/Grass areas are recommended to be 1,000 per acre and composed of three shrub species of which any one species can make up more than 50 percent of the number. The Division in consultation with DWR (E-mail dated 2/23/96, from Bill Bates, DWR) has set this standard based on existing shrub densities (1319/acre on the Atriplex/Grass reference area and 2923/acre on the Pinyon/Juniper/Sagebrush reference area) within the region and similar standards required by other coal mines within the area.

An extensive evaluation was made in 1992 of Sunnyside revegetation efforts. The data is reported in Appendix 3-5. Vegetation data was collected and reported from five sites (excluding Sacco Test Plot) in the SCA permit area. Of those five sites, two would meet the vegetation cover requirement of the reference area and none would meet the diversity requirement. Vegetative cover has a high annual weed component that was not included in the seeding evaluation. The fact that weed seed is so available on site and in topsoil piles can be very limiting to revegetation success. If the operator were to conduct an extensive effort to eliminate annual weedy species through establishment of an interim perennial vegetative cover, this could

greatly increase the chance of permanent vegetation success. The statement is made on page 900-26 that mulching during seeding will partially control weed emergence. The operator was asked to explain this method of weed control and describe how the mulch will selectively prevent weed seed from germinating and not desirable seed, the operator declined to expand this idea. The operator commits to the reduction of annual weedy vegetation on topsoil piles and borrows areas (900-21) through establishment of an interim perennial vegetative cover in these areas.

Sacco Flats test plots were designed to test the minimum amount of plant growth medium required over refuse to meet the vegetation success standards. The design included exposed coarse refuse, topsoil and up to 48 inches of borrow material. The test plots were installed in 1985. The 1992 vegetation inventory (Appendix 3-5) data summary show that 48 inches of borrow material produced the greatest perennial cover (25 percent). Perennial cover decreased with a corresponding decrease in plant growth medium over coarse refuse. The most successful plot, 48 inches of borrow, is still not sufficient to meet the revegetation success standard for bond release. The data shows that the greater the amounts of material over the coarse refuse material, the greater the perennial cover. The operator must investigate using more than 48 inches of growth medium over the refuse material and/or other treatment methods necessary to meet the revegetation success standard. The plan infers that the Sacco Flats test plots convey optimism for reclamation potential along with the reclamation work at the Old Coarse Refuse Road. To date, monitoring data has failed to demonstrate suitably that the reclamation treatments used for the field trials are adequate to meet the performance standards.

Besides the Sacco Flats test plots, all areas to be permanently (contemporaneously) reclaimed are to be monitored to reclamation success standards according to the plan under section 9.9.5. Resultant data to be submitted in the annual reports will determine whether reclamation efforts are affective or if changes to the reclamation treatments are necessary to achieve reclamation success. Maintaining accurate data and detailed analysis of the test plots and contemporaneously reclaimed areas is considered critical in showing that reclamation success standards can be met.

The plan includes (page 900-22 and 900-23) maintenance related commitments. The operator should be aware that any maintenance or replanting after reclamation is completed and during the liability period has the potential to reset the bond clock as described in R645-301-357.100. The liability period for this site is a minimum of ten years.

Findings:

Information found in the plan meets the minimum regulatory requirement of this section. To date, field trails have unsuccessfully shown that reclamation density and diversity can be met utilizing methods and treatments used in those test plots. Additional information will be provided

by the permittee through continued monitoring of test plots and reclaimed areas to ensure that the revegetation requirements of this section can be achieved.

STABILIZATION OF SURFACE AREAS

Regulatory Reference: 30 CFR Sec. 817.95; R645-301-244.

Analysis:

Information regarding this section is found in part 9.11.3 of the plan that shows that all exposed surface areas will be protected and stabilized to control erosion and air pollution attendant to erosion to the extent possible. The plan further states that when rills or gullies deeper than 9 inches develop in areas regraded and/or topsoiled, they will be filled, graded or otherwise stabilized. If rills or gullies less than 9 inches deep develop, they will be stabilized and reseeded if they are disruptive to post-mining land use or the reestablishment of the vegetative cover, or may result in additional erosion and sedimentation that should cause or contribute to a violation of water quality standard for receiving streams.

A mixture of 3#PLS/acre barley and 3#PLS/acre oats will be used to reduce surface erosion at times of the year when the interim seed mix is not planted.

The diversions within the permit area will be periodically inspected and if necessary, maintenance will be provided to meet design requirements.

Mulching practices as described in section 9.9.4 of the plan show that wood hydro mulch is planned to be applied over all areas to be reclaimed at a rate of 2,000 pounds per acre. No additional soil preparation or conditioning practices or incorporation of mulch into the soil as part of the reclamation treatments was described under this section of the plan.

Treatments used for the reclamation of the Old Coarse Refuse Road are incorporated into the text of the plan in section 10.8.1. This area included additional mulching and soil stabilization practices including but not limited to, incorporation of 1.5 tons of straw mulch into the soil, excelsior type mats, installation of silt fences, and roughening of the reclaimed surface. These practices are not however discussed as typical treatments in section 9.9.4 of the plan.

Section 10.5.3 of the plan discusses erosion controls to be used during reclamation activities. SCA commits to using BTCA practices for reducing soil erosion. A description of the designed revegetation practices is discussed in Chapter 9. Designs are included for the mitigation of rills and gullies.

Alternate treatments and practices may be required, similar to those used in reclamation of the Old Coarse Refuse Road for effective soil stabilization and using BTCA during

reclamation activity. The general plan, using 1 ton of hydro mulch per acre will most likely need to be enhanced for effective stabilization. Various practices should be tried and evaluated during contemporaneous reclamation work to decide which methods are most effective.

Findings:

The permittee met the minimum requirements regarding stabilization of surface areas for reclamation. Additional information may need to be provided by the permittee before conducting additional reclamation activities to assure that BTCA practices are being met.

CESSATION OF OPERATIONS

Regulatory Reference: 30 CFR Sec. 817.131, 817.132; R645-301-515, -301-541.

Analysis:

On page 500-6 of the plan, the permittee has stated that before cessation of excavation of the refuse pile or reclamation activities for 30 days or more, or when it is known that a temporary cessation will extend beyond 30 days, SCA will submit to DOGM, a notice of intention to cease or abandon operations. It is understood by SCA that temporary abandonment will not relieve a person of their obligation to comply with any provisions of the approved permit.

The permittee further states that all surface facilities will be effectively secured in areas in which there are no current operations. There are no underground coal mines within the SCA permit area, therefore, the topics of access openings, surface access openings, surface facilities, and underground operations will not be addressed in this Permit Application. No description of the procedures required for temporary cessation of operations is provided for in the plan.

According to the requirements of R645-301-515.300, the plan incorporates a description of procedures including, a statement of the exact number of acres that will have been affected in the permit area before such temporary cessation, the extent and kind of reclamation of those areas that will have been accomplished, and identification of the backfilling, regrading, revegetation, environmental monitoring, and water treatment activities that will continue during the temporary cessation.

Findings:

Information regarding cessation of mining operations was found adequate regarding this section of the regulations.

MAPS, PLANS, AND CROSS SECTIONS OF RECLAMATION OPERATIONS

Regulatory Reference: 30 CFR Sec. 784.23; R645-301-323, -301-512, -301-521, -301-542, -301-632, -301-731.

Analysis:

Affected Area Boundary Maps

The affected area boundary is presented on several drawings and series of drawings presented in the plan. Plate 10-3 (A through E) best show the areas to be affected over the life of the operations with the anticipated schedule for contemporaneous reclamation of the affected area.

Bonded Area Map

The bonded area is the permit area as can be found on Plate 1-1. Any changes to the permit area that occur should be revised and reflected on this map as the bonded area map, as provided for in the plan and the Reclamation Agreement.

Reclamation Backfilling And Grading Maps

Plates 10-3 through 10-3E show the final reclamation phasing plan and Plates 10-4 through 10-4E show identical final contours and depict the final grading plan.

Cross sections of the existing and the proposed final configuration are not provided as part of the reclamation plan. Volumetric calculations were derived from gridded data based on existing and proposed final surface elevations.

Reclamation Facilities Maps

Refer to comments below.

Final Surface Configuration Maps

The final surface configuration maps are notably different from the configuration found in and resultant from the mining operations to remove the refuse materials from the site. While specific designs and other information necessary to support the final surface configuration have

not been provided in the reclamation plan, the final surface configuration does provide for evaluation of the site regarding AOC requirements. Because the configuration and the specific design requirements for actual reclamation construction can and will change according to refuse material moved and used over the life of the operation, detailed designs cannot be developed until actual reclamation work is planned. Accordingly, prior to approval by the Division, such maps must be provided before conducting actual reclamation work.

Reclamation Monitoring And Sampling Location Maps

Reclamation monitoring maps and sampling locations for monitoring requirements through all phases of reclamation have not been presented in the reclamation plan. Maps must be provided which reflect those locations. Reclamation monitoring points following backfilling and grading will be different from those currently shown in the operation plan. Such changes should be shown in the monitoring plan and presented on the maps.

Reclamation Surface And Subsurface Manmade Features Maps

Comments regarding these requirements are incorporated into the reclamation treatments maps section below.

Reclamation Treatments Maps

Certification Requirements.

Findings:

Information provided in the plan regarding maps, plans and cross sections for reclamation operations are considered adequate to meet the requirements of this section. However detailed design information regarding specific reclamation treatments within the site and details showing the locations of monitoring sites following reclamation activities have not been effectively presented in the plan. While the operational requirements for the facilities have been provided, more detailed information, including maps and plans, will be provided by the permittee before initiation of any contemporaneous or final reclamation activities.

BONDING AND INSURANCE REQUIREMENTS

Regulatory Reference: 30 CFR Sec. 800; R645-301-800, et seq.

Analysis:

General

Form of Bond

A Reclamation Agreement was signed and became effective on February 4, 1993. The form of bond as provided in the Reclamation Agreement is as a Letter of Credit, issued by First Security Bank, letter #S-09742-00018, for $1,500,000.00.

Determination of Bond Amount

Bond amount was determined by the Division at the time of issuance of the Permit. The Permittee met the requirements for providing the Division with adequate information to detemine the bond amount. The Division based the reclamation cost estimates on the assumption that bond forfeiture would occur before the coal mine waste was shipped off site.

Terms and Conditions for Liability Insurance

Findings:

Information provided in the plan regarding bonding and insurance requirements for reclamation operations are considered adequate to meet the requirements of this section.

REQUIREMENTS FOR PERMITS FOR SPECIAL CATEGORIES OF MINING

INTRODUCTION

Regulatory Reference: 30 CFR Sec. 785; R645-302, et seq.

Analysis:

Based on current information found in the plan, the permittee is not required to nor has applied for any variances or special conditions that would be required to respond to the following sections of the regulations. If the permit requires compliance with such requirements, they will be addressed accordingly.

Findings:

The permittee has met the requirements for permits for special categories of mining.

EXPERIMENTAL PRACTICES MINING

Regulatory Reference: 30 CFR Sec. 785.13; R645-302-210, -302-211, -302-212, -302-213, -302-214, -302-215, -302-216, -302-217, -302-218.

Analysis:

The permittee has not applied for Experimental Practices Mining as conditioned under this section of the regulations.

Findings:

The permittee is not obligated to meet the requirements of this section of the regulations.

MOUNTAINTOP REMOVAL MINING

Regulatory Reference: 30 CFR Sec. 785.14, 824; R645-302-220, et. seq.

Analysis:

Special Permanent Program Performance Standards--Mountaintop Removal

The permittee has not applied for nor intends on conducting mountaintop removal mining as shown under this section of the regulations.

Findings:

The permittee is not obligated to meet the requirements of this section of the regulations.

STEEP SLOPE MINING

Regulatory Reference: 30 CFR Sec. 785.15; R645-302-230 et. seq.

Analysis:

No information found within the plan shows that the permittee intends to conduct steep slope surface coal mining and reclamation operations as provided under the requirements of this section of the regulations.

Findings:

The permittee is not obligated to meet the requirements of this section of the regulations.

PRIME FARMLAND

Regulatory Reference: 30 CFR Sec. 785.16, 823; R645-301-221, -302-300 et seq.

Analysis:

Prime Farmland Application Contents

The conclusion of the Prime Farmland as described in the Environmental Resource Information section of this Technical Analysis states that the soils in the area do not meet the criteria of either Prime or Important Farmlands.

Consultation with Secretary of Agriculture

Issuance of Permit

Soil Removal and Stockpiling

Soil Replacement

Revegetation and Restoration of Soil Productivity

Findings:

The permittee is not obligated to meet the requirements of this section.

COAL PREPARATION PLANTS NOT LOCATED WITHIN THE PERMIT AREA OF A MINE

Regulatory Reference: 30 CFR Sec. 785.21, 827; R645-302-260, et seq.

Analysis:

Coal preparation facilities are within this permit area. These facilities are used to size and sort refuse materials in preparation for use as fuel in the adjacent cogeneration plant. Mining in the permit area consists only of the reprocessing of coal waste materials.

Findings:

The applicant has met the requirements of this section. The mining and reclamation operations associated with this permit are not considered as a coal preparation plant not located within the permit area of a mine.

OPERATIONS IN ALLUVIAL VALLEY FLOORS

Regulatory Reference: 30 CFR Sec. 822; R645-302-324.

Analysis:

Refer to comments made in the Technical Analysis in the Environmental Resource Information section under Alluvial Valley Floors.

Essential Hydrologic Functions

Protection of Agricultural Activities

Monitoring

Findings:

Information regarding this section of the regulations is considered adequate. The Division waives the requirements of R645-302-320 that deal with providing additional technical information, findings and performance standards for operations affecting designated alluvial valley floors (AVF's).

IN SITU PROCESSING

Regulatory Reference: 30 CFR Sec. 828; R645-302-254.

Analysis:

The applicant does not propose to conduct in situ processing as part of the permitted operations.

Findings:

The requirements of this section are not considered applicable to this permit.

AUGER MINING

Regulatory Reference: 30 CFR Sec. 785.20, 819; R645-302-240 et. seq.

Analysis:

The applicant does not intend to conduct any auger mining within the permit area.

Findings:

The requirements of this section are not considered applicable to the requirements of this permit.

CUMULATIVE HYDROLOGIC IMPACT ASSESSMENT (CHIA)

Regulatory Reference: 30 CFR Sec. 784.14; R645-301-730.

Analysis:

The Division prepared a Cumulative Hydrologic Impact Analysis (CHIA), dated February 1993, when this permit was originally issued to SCA. This document has not been revised since the issuance of the permit.

The permittee will continue to collect baseline water quality information from the five sites identified in the plan. This information plus additional information generated during drilling operations into the refuse pile will need to be incorporated into the plan. Baseline water quality for the seep, surface waters and groundwater sources is being collected and will be submitted to the Division.

If information presented in the probable hydrologic consequences or the geologic requirements change, suitable changes to the CHIA will also need to be accomplished.

APPENDICES

-SUMMARY OF COMMITMENTS

-PERMIT INFORMATION TABLE

APPENDICES

SUMMARY OF COMMITMENTS

The summary below presents a list of commitments stated within the mining and reclamation plan (MRP). This list provides the following information for each commitment, when applicable:

- Title.
- Objective.
- Frequency.
- Status.
- Reports.
- Citation.

BEGIN COMMITMENT LIST BELOW

PERMIT INFORMATION TABLE

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