ACT/007/007-86B
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KAISER COAL

KAISER COAL CORPORATION
Sunnyside Coal Mines
P.O. Box 10
Sunnyside, Utah 84539
Telephone (801) 888-4421

November 6, 1987

NOV 9 1987

FILE COPY

Mr. John J. Whitehead
Permit Supervision/
Reclamation Hydrologist
Division of Oil, Gas & Mining
355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203

Dear Mr. Whitehead:

Re: August 13, 1987, Letter Concerning As-Built Drawings, Sunnyside Surface Facilities Pond, and Coarse Refuse Toe Pond, Kaiser Coal Corporation, Sunnyside Mines

The following submittal shall put to rest most of the loose ends associated with the as-built drawings. All of the revised text necessary for Kaiser's MRP pertaining to the SSF Pond and CRT Pond will be submitted by November 20, 1987.

Sunnyside Surface Facilities Pond (SSF)

The operator should incorporate the as-built dimensions for all ditches, culverts, and ponds into the October 16 and October 30, 1986, submittals for the SSF Pond. Ditch dimensions, pond dimensions, and the culvert summary sheet should be modified. The October submittals should be carefully reviewed to ensure that the text is consistent with the as-built design details. The SSF Pond design package should be of a compatible format for insertion into the MRP.

The above is under revision and shall be submitted for the Division's approval by November 20, 1987.

1. Topsoil was not salvaged as stated in the orginal submittal. Verbage is required to justify why this was not accomplished.

The soil was of such poor quality at the SSF Pond site that it could not be classified as topsoil. Therefore, a need to salvage the top layer of soil for topsoil was not warranted.

2. A final reclamation plan for the pond is required. The operator must also address temporary revegetation of the contruction area and when this will be performed.

The final reclamation plan for the SSF Pond is discussed in the Sunnyside MRP. One such reference is found on Page 52, Chapter III, Section 3.5.3.3.

Temporary revegetation of the SSF site will occur by mid-November, 1987, weather permitting. If not, during the next favorable planting season, the site will be revegetated.

3. A typographical error in the October 16, 1986, submittal must be rectified. Please adjust the volume of sediment for the three-year period to reflect 22,512 ft^3/yr X 3 yr = 67,536 ft^3

The typographical error has been corrected, and the adjustment to the volume of sediments for the three-year period has been made.

4. Install and depict on the appropriate drawing a berm along the longitudinal length of the emergency spillway.

Enclosed is a copy of Drawing D4-0157 which depicts the requested data.

5. The operator should ensure that the proper NPDES permits have been attained for both ponds.

Enclosed are copies of letters, one requesting the two NPDES discharge permits and the other an approval letter from the United States Environmental Protection Agency.

Coarse Refuse Toe Pond (CRT)

The operator should modify the submittal of February 25, 1987, to reflect the as-built field disposition of the pond and associated facilities. Which borrow area was actually used? The operator intended to use a cement culvert but installed a CMP culvert. Please modify this and other pertinent portions of the text.

On Drawing D4-0158, there is an unidentified area and culvert to the south of the pond inlet. Please label this area and supply the culvert dimensions. Will outlet protection for the culvert be required? According to ditch sections D-D and E-E, adequate headwater protection is not provided. The original submittal for this ditch requires a total depth of two feet.

Enclosed is a copy of Drawing D4-0158 which illustrates the above request.

A temporary revegetation plan is required for the pond and associated disturbed areas. The operator should state when the temporary revegetation plan will be accomplished.

The temporary revegetation is scheduled for the same time frame as the SSF Pond site.

If you have any further comments or questions, do not hesitate to call.

Sincerely,

B. Grosely
Mine Engineer

BG:th

Enclosures

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VIII
999 18th STREET—SUITE 500
DENVER, COLORADO 80202-2405

AUG 19 1987

NOV 9 1987

Ref: 8WM-C

Barry G. Grosely, Mine Engineer
Kaiser Coal Corporation
Sunnyside Coal Mines
P.O. Box 10
Sunnyside, Utah 84539

Re: Two New NPDES Discharge Points
under Permit No. UT-0022942

Dear Mr. Grosely:

We are in receipt of your August 10 submittal, establishing new discharge points.

The submittal, as allowed, has become part of your permit.

Sincerely yours,

Robert J. Burm
Chief, Permits Section
Compliance Branch

cc: Fred Pehrson
Utah Dept. of Health

KAISER COAL

KAISER COAL CORPORATION
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August 10, 1987

Mr. Bob Burm
Chief Permit Section
One Denver Place
999 Eighteenth Street
Suite 1300
Denver, Colorado 80202-2413

Dear Mr. Burm:

Re: Request To Establish Two New NPDES Discharge Points
Under Permit No. UT-0022942

This is a request to establish two new NPDES discharge points designated as 012 and 014 on the attached map. The discharge points have already been approved, but the location of the discharge points has moved.

Discharge from the Coarse Refuse Toe Pond, 012, has been moved approximately 350 feet to the southeast. This sedimentation pond was reconstructed in a new location because of the future expansion of the coarse refuse pile.

The SSSF Pond, Discharge Point 014, has been constructed in a different location than originally planned. The new location is marked on the enclosed map.

The source of the discharge is surface runoff from the permitted area of the Sunnyside Coal Mines. The runoff will be collected in the two sedimentation ponds, SSSF Pond and CRT Pond.

The ponds are designed to contain a 10-year 24-hour storm. Discharge will occur when this event is exceeded. The discharge will be monitored to ensure compliance with all NPDES requirements per our Permit No. UT 0022942.

Please call if there are any questions. Typically, your timely response to this request is critical to our operations.

Sincerely,

B. Grosely

Barry G. Grosely
Mine Engineer

BGG:th
cc: Fred Peahrson, Utah Department of Health
Bruce L. Welling
Enclosure

COARSE REFUSE TOE POND

See Plate III-5

COARSE REFUSE TOE SEDIMENT POND
(REVISED 2/25/87)
(REVISED 12/7/87)

The Coarse Refuse Toe (CRT) drainage area is located at the base of the West Slurry Cell embankment. The drainage area covers the disturbed area between the bottom collection ditch and the first terrace. Soil type in the drainage area is NJF2 which is described and located on Plate VIII-1. Soil conditions were assumed to be poor (CN = 86).

The earthen dam was designed to contain the runoff from a 100-year 24-hour storm with SCS Type 2 distribution. Side slopes on the structure are 3h:1v for the upstream side and 2h:1v for the downstream side slope which yields a combined upstream and downstream side slope of 5h:1v. Width of the crest is 20 feet which exceeds the quotient (H+35)/5(10.2') where H, in feet, is the height of the embankment (16') as measured from the upstream toe of the embankment. Water will be removed from the structure after a 24-hour period with a 2-inch decant pipe. Material in the embankment fill will be compacted ~~in 6" lifts~~ using a rubber-tired loader. The construction elevation (6,186) is 1 foot or 5% higher than the design elevation of 6,185 feet.

Borrow material in the embankment will come from the pond site and from a borrow area located 50 feet northeast of the site or alternately, a borrow area approximately 400 feet northeast of the site or Industrial Borrow #3 illustrated on Plate III-1, 1 of 3. Approximately 3,400 cy of borrow will be used constructing the dam. The primary borrow site was previously approved by the Division. The alternate borrow area will be covered by the expanded refuse pile and will have no permanent environmental effects. Should the alternate borrow area be used but not covered by the refuse pile by December 31, 1988, it will be permanently reclaimed.

Twelve inches of top soil will be removed from the dam and borrow site (if used) prior to consruction and stored in a top soil pile drawn on Drawing D4-0142 (Plate III-5). The top soil will be protected from water erosion by building a ditch around the pile and seeding the soil. After the useful life of the sediment pond, the borrow material will be returned to the borrow site and the approximate original contour as shown on Drawing D4-0117 (Plate III-5). Rip rap will be buried under the material covering the borrow site. The top soils will then be redistributed. Vegetation will be planted as outlined in Section 3.5 of the Sunnyside Permit, Book 1.

Sediment control for the borrow area will be affected by a total containment berm surrounding the borrow area. Water and sediments will remain on site. The berm will be two feet high and five feet wide at the base. The site will be contained as depicted on Drawing D4-0117 (Plate III-5) to prevent runoff.

In the event the alternate borrow area is used, no topsoil will be removed from it. This is due to the steep slopes on which the borrow area is located. As previously stated, this borrow area will be buried

by the expanded coarse refuse pile so no lasting environmental effects will occur by its use. No additional sediment control will be required for this borrow area. The borrow area which is selected will designated on Drawing D4-0158.

Temporary revegetation will be accomplished by using one of the methodology discussed in Kaiser's MRP (hydroseeding), utilizing the approved seed mix described in Kaiser's MRP, Table III-18. Revegetation will occur by mid-November, 1987, weather permitting. If not, the site will be revegetated during the next favorable planting season.

Runoff was calculated using a storm hydrograph computer program written by Richard H. Hawkins and Kim A. Marshall at Utah State University, Logan, Utah. The following information was used in the calculation:

Area	7.53 Acres (See Drawing D4-0142-Plate III-5)
Slope	20.01%
Channel Length	1,320 Feet
Curve Number	86
Storm	10 Year 24 Hour - 1.86 Inches
	25 Year 24 Hour - 2.20 Inches
	100 Year 24 Hour - 2.66 Inches
Distribution	SCS Type 2
Soil	NJF2 (See Plate VIII-1 for Description-Location)
Type	B-D (Use C)
Condition	Poor
Curve Number	86 (Table 9.1, National Engineering Handbook, Hydrology: Section 4)

INPUT SUMMARY
FOR W. S.: C. R. TOE AREA 1

STORM: 100 YR 24 HR			WATERSHED:		
DISTRIBUTION	=	SCS TYPE 2	LAND SLOPE	=	20.0010 PCT
			CURVE NUMBER	=	86.00
PRECIP. DEPTH	=	2.66 IN	CHANNEL LENGTH	=	1320 FT
			TIME OF CONC.	=	.1210 HR
DURATION	=	24.00 HR	AREA	=	7.53 AC
NUMBER OF LINES	=	1503	D	=	.0161 HR

OUTPUT SUMMARY

RUNOFF DEPTH	=	1.3697 IN	
INITIAL ABSTRACTION	=	.3256 IN	
PEAK FLOW	=	10.44 CFS	(1.3745 IPH)
AT T	=	12.52 HRS	

Runoff Volume -

43560 Ac. X 1.3697 In. X 7.53 Ac. - 12 In./Ft. = 37,447 $Ft.^3$

Sediment Load -

Using the Universal Soil Loss Equation $A = RKL_sC_p$ where:

R = 20
K = 0.22; % OM = 1.22, % Sand = 62.33; % Silt = 27.78; % Clay = 9.87
L_s = 12; Slope = 28%; Length = 280 Ft.
C_p = 0.54 Barfield, Appendix 5A, Seed and Fertilize After 6 Months

Gives a Loss of 28.5 Tons Per Acre or 3,904 $Ft.^3$ Per Year.
Volume of Sediment for a Three-Year Period is:

3,904 $Ft.^3$ X 3 Years = 11,712 $Ft.^3$

Maximum sediment level has been set at elevation 6,176. When sediment reaches 60% of allowed height (as indicated by a wooden stake as shown on Drawing D4-0142-Plate III-5, Typical Dam Section), the pond will be cleaned.

Volume of the pond is calculated by measuring the horizontal cross sections at five-foot intervals and then finding an equation which meets those conditions.

1. $Area = Ah^2 + Bh + C$

Cross-Sectional Area As A Function Of Height

0	=	3,825 $Ft.^2$
5	=	8,575 $Ft.^2$
10	=	14,500 $Ft.^3$

Substituting the known values into Equation 1 for h = 0,5 and 10 yields 3 equations which are:

2. 0, $C = 3,825$

3. 5, $25A + 5B + 3,825 = 8,575$

4. 10, $100A + 10B + 3,825 = 4,156$

Solving Equation 4 for A gives:

5. $A = 107.25 - .1B$

Substituting the value from Equation 5 into Equation 3 gives:

6. $B = 827.5$

Substituting the value from Equation 6 into Equation 5 gives:

7. $A = 24.5$

Equation 1 can then be expressed as:

$$8.\quad \text{Area} = 24.5h^2 + 827.5h + 3{,}825$$

Integrating Equation 8 gives the volume as a function of height h. (Calculus and Analytic Geometry, George B. Thomas, Section 5-4, p. 238.)

$$9.\quad \int_c^h \text{Area} = V = 8.37\,h^3 + 413.75\,h^2 + 3{,}825\,h$$

Height of sediment can then be calculated using Equation 9 at h = 1', $V = 4{,}243$ ft.^{3} which is greater than the expected yearly sediment volume of 3,904 ft.^{3}.

Height of the decant pipe is calculated by adding 3 feet to the maximum sediment level (1 foot) which yields h = 4 feet. Volume at 4 feet is 22,443 ft.^{3}.

Height of the 100-year 24-hour storm runoff volume is calculated by adding the volume at 4 feet (22,443 ft.^{3}) and the runoff volume (37,439 ft.^{3}) and then using Equation 9 at h = 8 ft., $V = 61{,}263$ ft.^{3} which is larger than the required volume of 59,887 ft.^{3}.

The course refuse toe ditch collects runoff from the bottom slope of the refuse pile as shown on the 1" = 200' drainage area insert on Drawing D4-0142 (Plate III-5).

Using the following information and the methodology presented in Summary of Ditch Design Calculations in Appendix III-1 of the Sunnyside Permit, the flow characteristic of the ditches shown on Drawing D4-0142 (Plate III-5) can be calculated:

	New	Existing
Slope	2%	28%
Width	6'	6'
Channel Side Slope	2h:1v	2h:1v
Depth of Water Flow	0.42 ft.	0.19 ft.
Velocity	3.59 ft./sec.	8.40
n	.03	.03

Headwater depth (1.6') was taken from a 1962 Portland Cement Culvert Capacity Chart for Circular Concrete Pipe (Figure 7A.1b., Page 9 of Culvert and Pond - Size and Outlet Protection in Appendix III-1, Sunnyside Permit). Assumptions used were as follows:

Slope	4.3%	$\frac{L}{100\ So} = 16.3$
Diameter	2.0'	
Discharge (CFS)	10.44 CFS	
Length	70'	

Two feet of freeboard will be used 100' upstream of the culvert to allow for headwater conditions.

Exit velocity (6.7 ft./sec.) was calculated using the methodology presented in Appendix III-1, Culvert and Pond - Size and Culvert Protection, Page 1, Sunnyside Permit). Assumptions used were as follows:

Slope	4.3%
Diameter	2.0'
Discharge (CFS)	10.44 CFS

Erosion protection for the culvert exit, pond entrance, emergency spillway, and decant outlet will be grouted rip rap. The rip rap will be dry set using mortar mix or wet set using a premixed slurry grout. This will prevent rolling of rip rap and erosion under the rocks. The decant outlet will use the stilling basin of the emergency spillway for protection. The grouted rip rap will be keyed in place with 12" deep by 12" wide keyways across the spillway, pond entrance, and culvert exit as indicated on Drawing D4-0121 (Plate III-35). Keyways will be every 10 linear feet.

Using the following information and the methodology present in Summary of Ditch Design Calculations in Appendix III-1 of the Sunnyside Permit, the flow characteristic of the emergency spillway crest section and side slope section can be calculated:

	Crest	Side Slope
Slope	0%	28%
Bottom Width	2	2
Channel Side Slope	2h:1v	2h:1v
Depth of Water Flow	1.49'	0.34'
Velocity	1.41 ft./sec.	11.3 ft./sec.
n	.03	.03

Channel flow was designed for the 100 year-24 hour event. The Manning's n value of 0.03 was used because the grouted rip rap surface is left rough with protruding rock faces.

The splash basin was designed using the following methodology:

$V = 11.3$ ft./sec.

$$A = \frac{Q}{V} = \frac{10.5 \text{ CFS}}{11.3 \text{ ft./sec.}} = 0.9292 \text{ ft.}^2$$

$$d = A^{\frac{1}{2}} = 0.964 \text{ ft.}$$

$$F = \frac{V}{(gd)^{\frac{1}{2}}} = 2.03$$

$\frac{W}{d} = 4.25$ from Figure 6-10, small channel structures, p. 310

$$W = d\left(\frac{W}{d}\right) = 0.964\ (4.25) = 4.09 \qquad 4.0'$$

Splash basin size is 4 ft. X 5.5 ft. X 1.5 ft. with a 6-inch adverse slope. Dimensions of the splash basin are after the installation of the rip rap.