0028

STATE OF UTAH
NATURAL RESOURCES
Oil, Gas & Mining

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

355 W. North Temple • 3 Triad Center • Suite 350 • Salt Lake City, UT 84180-1203 • 801-538-5340

October 1, 1985

CERTIFIED RETURN RECEIPT REQUESTED
P-592-429-557

Mr. Glenn Sides
General Manager
U. S. Steel Mining Company, Inc.
Western District
P. O. Box 1270
Paonia, Colorado 81428

Dear Mr. Sides:

Re: Approval of MRP Amendment, Modification to Refuse Pond Dikes, Wellington Coal Cleaning Plant, ACT/007/012, Folder No. 3 and 4, Carbon County, Utah

The Division of Oil, Gas and Mining has completed its review of U. S. Steel's final construction plans to elevate the embankments of the North Dike and Upper Refuse Dike at the Wellington Coal Cleaning Plant. The Division finds the plans satisfactory to fulfill our requirements and hereby grants our final approval for construction.

However, this approval does not constitute approval for the other state agencies which may also be reviewing these plans. U.S. Steel must obtain separate approvals from the State Engineer's Office and the Division of Environmental Health in accordance with their laws and regulations prior to implementation.

Please contact me should questions arise concerning this approval.

Sincerely,

D. Wayne Hedberg

D. Wayne Hedberg
Permit Supervisor/
Reclamation Hydrologist

Permit Chronology:
A. Operator Submittals
1. June 21, 1985

B. Dogm Responses
1. October 1, 1985

DWD:jvb

cc: Kenneth Alkema, Health
Robert Morgan, Water Rights
Susan Linner

0005R-18

Lynn look at this to see if you have any comments. Maps are on my wall. If no comments please send the attached letter.
DAVE D.

MRP REVISION/NOV TRACKING FORM
(Revised: 3/28/85)

Type of Proposal: X COAL ___ NONCOAL

___ Exploration
___ NOV/CO Abatement, NOV # _____, Abatement Deadline _____
(?) ___ MRP Revision
X MRP Amendment

Issuing Inspector _____

Title of Proposal: Refuse Pond Embankment Enlargement

Company name: U.S. Steel Mining Co., Inc. Project/Mine Name: Wellington Coal Cleaning Plant

File # (PRO/ACT): 007/012 Disturbed (Fed/State/Fee): ___/___/___
(CEP/EXP) Acres

Assigned Reviewers:		Review Time (hrs):	OTHER AGENCIES: (# of copies & date)
(Hydrology)	Summers/Cline	7 hrs	OSM
(Wildlife/Veg.)	~~Lynn~~	✓	USFS
(Engineering)	Randy Rand 6/28	10 hrs	BLM
(Soils)			Health
(Geology)			History
			H2O Rts
		USFWS	Wildlife

DATES:

(a) Initial Plan Received June 21/85
Tech Review Due July 12/85
Tech Review Complete 9-30-85
DOGM Response Sent _____

(b) Operator Resubmission _____
Tech Review Due _____
Tech Review Complete _____
DOGM Response Sent _____

(c) Operator Resubmission _____
Tech Review Due _____
Tech Review Complete _____
DOGM Response Sent _____

(d) Optr. Resubmission _____
Tech Review Due _____
Tech Review Complete _____
DOGM Response Sent _____

(e) Bond Revised _____
Amount ($) _____

(f) Cond'l. Approval _____
Stipulations Due _____
Stips Received _____
Final Approval _____

(g) MR-9 Received _____
MR-9 Acknowledged _____

COMMENTS: _____

NOTE (INSPECTORS): Please attach a copy of the NOV issued to the abatement plan when received from the operator.

NOTE (REVIEWERS): Please prepare review comments in a format referencing the appropriate regulation or statute. State the deficiency as well as the minimum requirement necessary to demonstrate compliance. Fill in the # of hours spent in review by discipline. Return completed form to the Special Permits Supervisor when complete.

7566R

DOGM WORK COPY
FILE WHEN REVIEW
COMPLETE

U. S. Steel
Mining Co., Inc.

WESTERN DISTRICT

a Subsidiary of United States Steel Corporation

P.O. Box 1270
PAONIA, COLORADO 81428
303/527-4816

June 19, 1985

Mr. Lowell P. Braxton
Administrator, Mined Land Development
Division of Oil, Gas & Mining
355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, UT 84180-1203

RECEIVED
JUN 21 1985
DIVISION OF OIL
GAS & MINING

RE: Modifications to Refuse Ponds, Wellington Coal Cleaning Plant
ACT/007/012

Dear Mr. Braxton:

U. S. Steel Mining Co., Inc. proposes to increase the height of the North Dike and the Upper Refuse Dike to a crest elevation of 5395.75 (11.25 feet relative to the Lower Refuse Dike). These changes are included in the approved Operation and Reclamation Plan (ORP) for the Wellington Coal Cleaning Plant, refer to Appendix E. The discussion in Appendix E requires that the final construction plans be submitted to the Division prior to construction.

Enclosed with this letter are seven copies of the final construction plans. Should you wish to insert them in the ORP, the pages have been formatted for insertion in Appendix E following page E-3.

Please advise us if you do wish to insert this plan in the ORP and we will provide revised index pages for the front of the ORP.

U. S. Steel Mining Co. is currently planning to begin construction in August 1985. Should you have any questions regarding this submittal, please contact V. R. Watts at 303-527-4816.

Sincerely,

GH Sides

G. H. Sides
General Manager

GHS/kb
Enclosure

cc: B. A. Filas
V. R. Watts
J. F. Sweeney

w/o encl.: EC File

ROLLINS, BROWN AND GUNNELL, INC.
PROFESSIONAL ENGINEERS

May 25, 1985

U.S. Steel Mining Corporation, Inc.
P.O. Box AE
Paonia, Colorado 81428

Attn.: V.R. Watts, District Engineer

Re: Impoundment Modifications for Upper Refuge Dike and North Dike at Wellington Coal Cleaning Plant

Gentlemen:

In accordance with your request, we have reveiwed the construction drawings and specifications for the Upper Refuge Dike and North Dike Modifications. In addition to this, stability analyses have been performed for both dikes for static and seismic conditions. The results of our review and analysis are presented below as follows:

I. Construction Drawings

A. Sheet E9-3455

We recommend that survey information be shown for construction layout. In particular, the curve data and stationing at which the curves are to be located should be shown on the the North Dike alignment.

B. Sheet E9-3456

1. It is our opinion that the Contractor will have difficulty excavating the keyway in the fine refuge as shown in Section AA and Section DD if the water in the ponds is near the surface of the fine refuge. It is also questionable if the slurry will stand on a slope of 0.5 vertical to one horizontal during compaction of the course refuge. It is our opinion that the course refuge could be placed directly on the fine

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refuge without excavating a key into the fine refuge. If a keyway is to be placed, however, we suggest that the slurry be excavated with a bottom width of ten feet and side slopes of two horizontal to one vertical. The drawings should show the depth of the excavation and also the side slopes.

2. Consideration might be given to making the top width fifteen feet including riprap, thus reducing the quantity of course coal refuge by several thousand cubic yards. It should be noted that the stability analysis performed was based upon a fifteen foot crest width including riprap.

3. Details of the antiseep collars should be shown.

4. Dimensions of details of the concrete support at the overflow elbow should be indicated.

5. Where the front dike extends onto the natural ground surface as shown in Section CC and Section EE, we recommend that a keyway be provided. The keyway should extend in the natural material for a depth of five feet. From a construction standpoint, we recommend that the base width be at least ten feet wide and that the slide slopes be two horizontal to one vertical.

C. Sheet E9-3457

1. We recommend that a section view be shown indicating the slide slope of the abutment keyways.

2. We recommend that a profile view of the abutment be shown indentifying the extent of the keyway into the abutments.

II. Specifications

A. Item 411

We suggest that the Contracter be required to submit a work progress schedule for approval prior to being awarded the contract. This schedule could then be incorporated into the contract.

B. Item 702

The following should be inserted: "...of 8 inches, moisture condition, and compacted..."

C. Item 704

The following should be inserted: "...12 inch layers, moisture conditions such that the moisture content is in the range of 2% below to 2% above the optimum, and compacted..."

D. Item 802.3

The following should be inserted: "...of 8 inches, moisture condition, and compacted..."

E. Item 804

The following should be inserted: "...12 inch layers, moisture conditions such that the moisture content is in the range of 2% below to 2% above the optimum, and compacted..."

F. Item 811

We suggest that this item be changed to more clearly identify the task. Consideration might be given to pluging the pipe if removal is difficult.

G. Item 903

Drawing E9-3435 was not furnished. This drawing may clarify details of the antiseep collar.

H. Items 904 and 905

We suggest that the Owner furnish the design for the walkway.

I. Item 907

This item appears inconsistent with Item 902 which requires that existing overflow structure to be relocated.

III. Stability Analysis

A. Upper Refuge Dike

The cross section shown on Sheet E9-3456 has been modified from the cross section on which the static stability analysis was performed in the March 1983 report. It will be observed from Figure No. 33, that the cross section analyzed had a side slope of two horizontal to one vertical on the lower refuge pond side and three horizontal to one vertical on the upper refuge pond

side. Sheet E9-3456 indicates a slide slope of three horizontal to one vertical on the lower refuge pond side and two horizontal to one vertical on the upper refuge pond side. It should be noted that the critical slope is the lower refuge pond side. Since the side slope has been flattened from two to one to three to one, the factor of safety for the static condition should increase from that shown in Figure No. 33 of the March 1983 report. A stability analysis was performed for the static condition for both the lower pond and the upper pond sides and the results of this analysis are presented in Figure No. 1 attached hereto. The stability analysis used effective stress parameters and was based on Bishop's Modified Method. The strength parameters are compatible with those used in the March 1983 report. It will be observed from this figure that a static factor of safety of 1.5 was obtained for the lower pond side while a factor of safety of 2.2 was obtained for the upper pond side. It should be noted that during the analysis for the upper pond side, the water level was assumed to be at elevation 5381.5. During the March 1983 report, no consideration was given to seismic stability for the Upper Refuge Dike. As indicated in the March 1983 report, the proposed facilities are located in Seismic Zone 2. The probability of a large intensity earthquake was relatively small. In order to obtain an indication of the effect of seismic activity a pseudostatic analysis has been performed. During this analysis for the Upper Refuge Dike, it will be observed from Figure No. 1 that a horizontal force of 0.1 g was applied and that factors of safety of 1.2 and 1.6 were obtained during the pseudostatic analysis. This approach indicates that a degree of safety exists for the dikes under seismic activity.

B. North Dike

The cross section for the North Dike is essentially the same as that shown in Figure No. 34 of the March 1983 report. During that report, the unit weight for the course coal refuge was assumed to be 94 pounds per cubic foot. During the construction of the Lower Refuge Dike in 1984, the average unit weight of the course coal refuge was 103 pounds per cubic foot. This value was used during the present analysis and it will be observed from Figure No. 2 that the static factor of safety was 1.8 compared to 1.9 during the 1983 analysis. The pseudostatic analysis applying horizontal force 0.1 g resulted in a factor of safety of 1.3.

Based upon the results of the stability analysis performed during this review, it is our opinion that the cross sections as shown on Sheet E9-3456 will be stable. It should be noted that the stability analyses were performed assuming a crest width of fifteen feet. If there are any questions regarding the information discussed above, please contact our office.

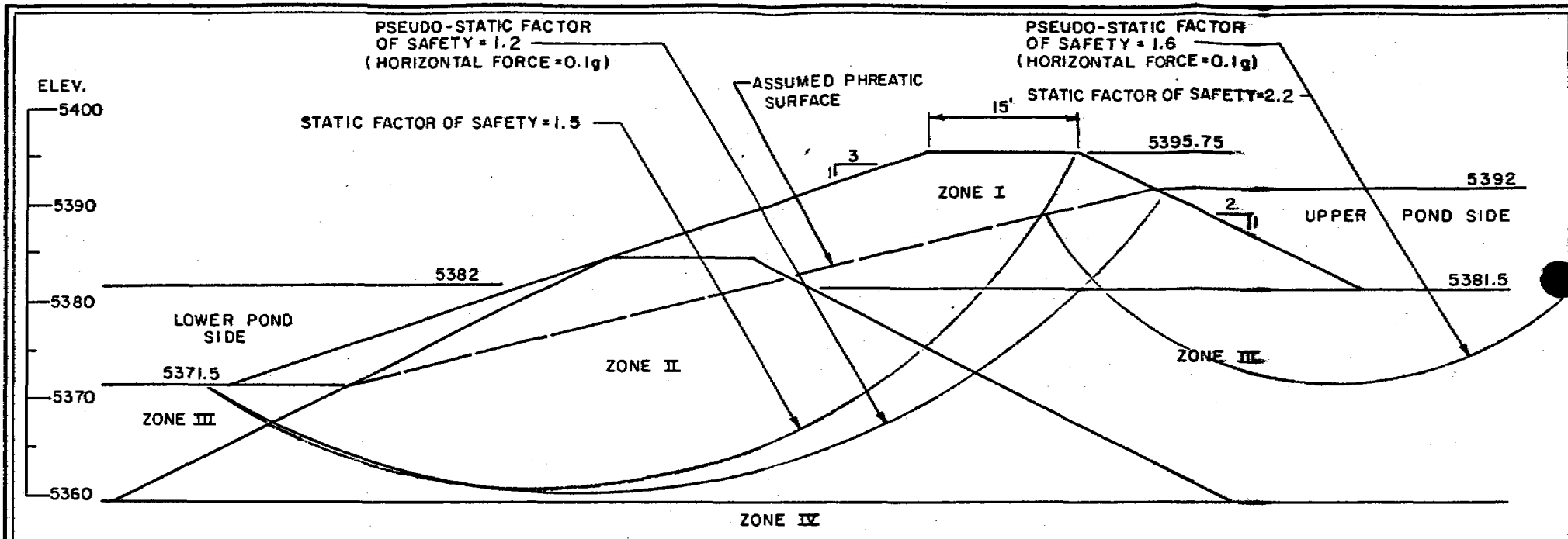
Sincerely,

ROLLINS, BROWN, AND GUNNELL

Ralph L Rollins

Ralph L. Rollins

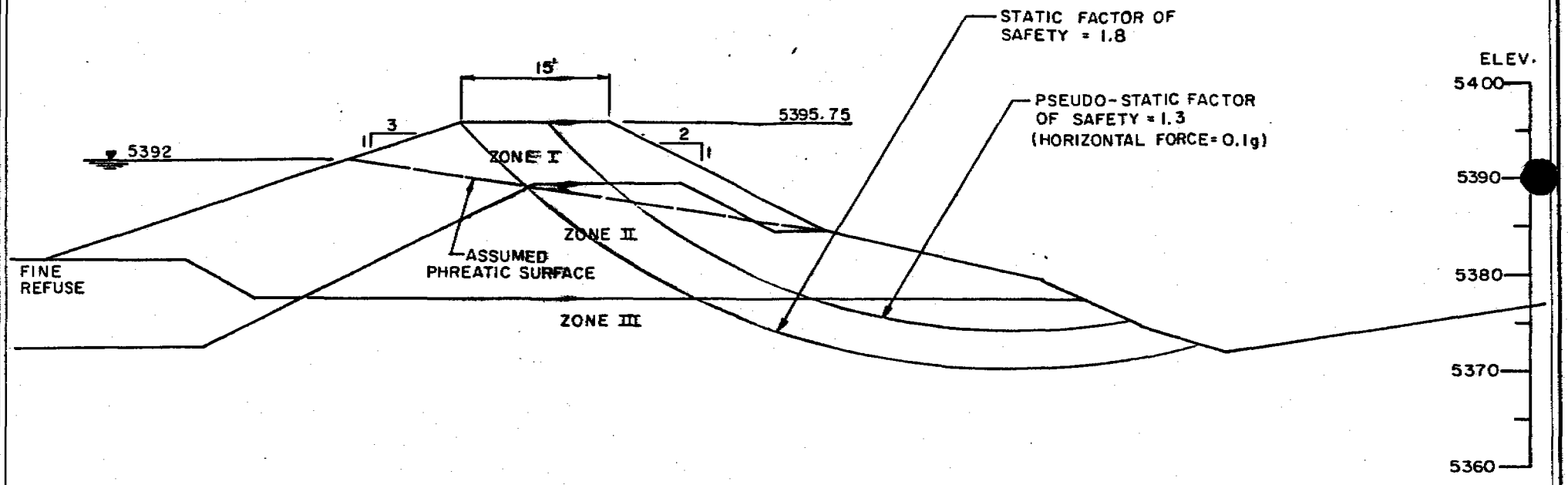
BP/jbt



ZONE	MATERIAL TYPE	TOTAL UNIT WEIGHT	SHEAR STRENGTH	
			COHESION P.S.F.	FRICTION ANGLE
I	COARSE REFUSE	103	100	33
II	EXISTING COARSE REFUSE	94	100	33
III	FINE COAL REFUSE	70	150	31
IV	SILTY CLAY	110	200	28

ROLLINS, BROWN AND GUNNELL, INC. PROFESSIONAL ENGINEERS	U.S. STEEL	UPPER REFUSE DIKE	STABILITY ANALYSIS

FIGURE NO. 1



ZONE	MATERIAL TYPE	TOTAL UNIT WEIGHT	SHEAR STRENGTH	
			COHESION P.S.F.	FRICTION ANGLE
I	COARSE COAL REFUSE	103	100	33
II	SILTY CLAY	110	250	28
III	SILTY CLAY	110	200	28

ROLLINS, BROWN AND GUNNELL, INC.
PROFESSIONAL ENGINEERS

U.S. STEEL

NORTH DIKE

STABILITY ANALYSIS

FIGURE NO. 2

U. S. STEEL MINING CO., INC.

Western District

Wellington Coal Cleaning Plant

Raise Upper Refuse Dike and North Dike
Final Construction Plans

The Wellington Coal Cleaning Plant and its associated refuse ponds have been operated for approximately 27 years. Waste Rock and coal fines are pumped to the refuse disposal area east of the Price River through one of two pipelines. The refuse ponds are a major component of the refuse disposal area and serve to clarify the water discharged with the waste rock and coal fines. The clarified water is then returned to the plant for reuse. As the plant ages, the refuse ponds will gradually fill with sediments. This fact was recognized in the Wellington Coal Cleaning Plant Operation and Reclamation Plan (ORP) and Appendix E presented long range plans for modifications to the refuse dikes.

In approximately 1978, the Upper Refuse Pond was removed from service and all clarification was done in the Lower Refuse Pond. In 1983, the height of the Lower Refuse Dike was increased some 11.1 feet to provide additional sediment storage capacity with an adequate freeboard. Work on the Lower Refuse Dike was completed in the spring of 1984.

In order for the refuse ponds to work most efficiently and to provide adequate sediment storage capacity for the life of the plant, the Upper Refuse Pond must be returned to service. U. S. Steel Mining Co. proposes to proceed with Phase 2 of the refuse pond modifications as outlined in the ORP (Appendix E). Detailed construction plans are as follows:

Proposed Modifications

U. S. Steel Mining Co. proposes to increase the height of the Upper Refuse Dike and the North Dike some 11.25 feet to a crest elevation of 5395.75 (5395 + 0.75 for settling). A plan view and cross sections of the proposed modifications are shown on Drawings E9-3455 and E9-3456 respectively. Drawing E9-3457 shows the design for keying the impoundments into the natural hillside east of the Upper Refuse Pond. The current contours of the area are shown on Drawing E9-3458.

Construction Details

The height of the impoundments will be raised using coarse slurry as a construction material. The fill material will be placed in 12 inch lifts and compacted to 92% of the maximum laboratory density as determined by ASTM D 1557-78. Vegetation material will be stripped from all areas the impoundments will contact to prevent vegetation from being included in the fill. The upstream faces of both impoundments will be riprapped with 18 inches of coarse refuse as shown on Drawing E9-3456. The construction will be similar to the work performed on the Lower Refuse Dike in 1983-1984.

Stability

U. S. Steel Mining Co., Inc. contracted with Rollins, Brown and Gunnell, Inc. to review the design drawings and detailed construction specification. and to provide a stability analysis. A copy of Rollins, Brown and Gunnell's report is attached along with U. S. Steel Mining Co.'s comments. Please note that the construction specification is not included as part of this submittal, but a more general description of construction methods is included in the preceding paragraph.

Rollins, Brown and Gunnell, Inc. estimated the minimum safety factors for the Upper Refuse Dike to be 1.5 (1.2 seismic). The North Dike was estimated to have a minimum safety factor of 1.8 (1.3 seismic). Therefore, the structures will be stable. A detailed site investigation was included in 1983 and is included in Technical Revision No. 1 to the ORP.

Hydrology

Technical Revision No. 1 contains complete hydrologic calculations for the Upper Refuse Pond, Lower Refuse Pond, and the Clear Water Pond. The Upper Refuse Pond is contained by two impoundments, the Upper Refuse Dike and the North Dike. The hydrologic calculations for the Upper Refuse Pond will apply to both impoundments.

Technical Revision No. 1 contains full calculations for the following:

1. Storm hydrographs for various precipitation events.

2. Estimates of water levels in all ponds during various precipitation events.

3. Calculations showing that the overflow structure can pass a 100 year 24 hour storm.

The Lower Refuse Pond has been in full operation for approximately 1 year. No seepage has been experienced through the dike to date. The existing North Dike is constructed of a relatively low permeability clay material. This material will be left in place, but compacted to a higher density. This should help prevent any seepage into the diversion ditch. Any seepage through the Upper Refuse Dike would enter the Lower Refuse Pond.

Pond Operation

The calculations in Appendix A of Technical Revision No. 1 indicate that the water level in the Upper Refuse Pond would rise 0.22 feet during a 100 year 24 hour precipitation event. In order to maintain a 3 foot freeboard during a 100 year 24 hour precipitation event, the maximum water level must be 3.22 feet below the crest. Drawing E9-3456 shows the maximum water level as 5392.0 which is 3.75 feet below the crest.

Sedimentation Control

It is proposed to construct a nominal 1 foot high earthen berm along the toe of the North Dike parallel to the diversion ditch. Silt fence will be installed every 500 feet. This structure will provide sedimentation control for any runoff from the downstream face of the North Dike. Any runoff from all other areas will be contained in the refuse ponds and treated with the process water.

Topsoil

The Upper Refuse Pond is surrounded by coarse slurry on the west, vertical cliffs on the east, and dikes on the north and south. Therefore, the area which contains soil suitable for use in reclamation is small, refer to Drawing E9-3458. A soil sample was taken to determine how much soil should be salvaged for future use in reclamation. The results of the sample are shown on Table 1. These sample results were compared with Table II-A (Determination of the Completeness Response of the ORP) to determine the soil suitability for reclamation. Samples 11a and 11b could generally be categorized as fair to good while 11c was generally poor. In accordance with the requirements of the ORP, soil in the area shown on Drawing E9-3458 will be salvaged to an approximate of 32 inches. The salvaged soil will be stockpiled at the location shown on Drawing E9-3458 in accordance with the ORP.

Reclamation

The proposed modifications to the North Dike and the Upper Refuse Dike are included in the approved Wellington Operation and Reclamation Plan. No modifications to the reclamation plan or reclamation bond are required.

TABLE 1

	Sample		
	11a	11b	11c
Sample Interval	0-16 in.	16-32 in.	32-42 in.
pH	8.00	7.80	7.80
% Sand	51.28	52.28	50.56
% Clay	14.72	10.72	15.08
% Silt	34.00	37.00	34.36
Texture	Loam	Sandy Loam	Loam
% Organic Matter	1.10	0.47	0.46
PPM P	9.09	6.47	5.47
PPM K - Av.	188.80	51.20	124.80
EC x 1000	1.44	3.60	6.30
% N	0.066	0.027	0.029
PPM Ca	155.84	291.36	330.40
PPM Mg	51.20	174.08	312.32
PPM Na	79.84	113.60	881.28
SAR	1.41	1.30	8.31
Saturation %	31.5	31.6	36.5
% $CaCO_3$	6.63	0.96	1.26
Alkalinity mg/l	358	304	240

Response to Rollins, Brown and Gunnell Review

Impoundment Modifications to Upper Refuse Dike and North Dike

U. S. Steel Mining Co. contracted with Rollins, Brown and Gunnell, Inc. to review the construction drawings and specifications for the proposed modifications to the Upper Refuse Dike and the North Dike. Section I of the review concerns the design drawings and Section II concerns the detailed construction specification. U. S. Steel Mining Co. is providing this response as a convenience to a reviewer to show that any concerns affecting the stability of the proposed structures have been adequately considered.

I. Construction Drawings

A. U. S. Steel Mining Co. will locate the center line of the two dikes in the field.

B.1. The keyway into the fine coal refuse referred to by Rollins, Brown and Gunnell is really a ditch adjacent to the North Dike. Therefore, these comments do not apply.

2. U. S. Steel Mining Co. elected to maintain the width of the proposed structures at 15 feet, not including the riprap. This will result in the stability safety factor for the impoundments being higher than estimated.

3. Details of the anti-seep collars are shown on Drawing E9-3435.

4. The concrete support will be similar to the one shown on E9-3435, except shorter since only two overflow pipes are used on the Upper Refuse Dike.

5. The recommended keyway has been added to the drawing.

C. Sheet E9-3457

The recommended cross-sections have been added.

II. Specifications

A. Item 411

This item is only relevant to U. S. Steel Mining Co. and will not affect the stability of the structure.

B. Item 702

The recommended change has been made to the construction specification.

C. Item 704

The recommended change has been made to the construction specification.

D. Item 802.3

The recommended change has been made to the construction specification.

E. Item 804

The recommended change has been made to the construction specification.

F. Item 811

U. S. Steel Mining Co. believes the task is adequately described for the Contractor. As a last resort, plugging would be considered.

G. Item 903

The details of the anti-seep collar are shown on E9-3435 which is provided as a part of the construction specification.

H. Items 904 and 905

U. S. Steel Mining Co. believes the walkway is adequately designed for the purpose intended. This will not affect the operation or stability of the structure.

I. Item 907

Item 907 is not inconsistent with Item 902 and this would be clear during a site visit to inspect the proposed work.