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*orig & man
cc P. Gumbrecht
Barbara Roberts
DAD*

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April 14, 1988

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DIVISION OF
OIL, GAS & MINING

Dr. Dianne Nielsen
Director
Utah Division of Oil, Gas & Mining
III Triad, Suite 350
355 West North Temple
Salt Lake City, Utah 84180-1203

Dear Diane:

Enclosed is a draft permit transfer application package for the Sunnyside Cogeneration Project.

Please let me know if you need anything further.

Very truly yours,

Denise A. Dragoo

DAD: jmc

Enclosure

cc: Barbara Roberts, Esq.

DRAFT

ENVIRONMENTAL POWER CORPORATION

UPS OVERNIGHT

April 14, 1988

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DIVISION OF
OIL, GAS & MINING

Ms. Denise Dragoo
FABIAN & CLENDENIN
Twelfth Floor
215 South State Street
Salt Lake City, UT 84111-2309

RE: Sunnyside Cogeneration Project
Permit Transfer

Dear Denise:

Enclosed is the latest draft of permit documents:

- 1) Appendix A, Operation and Reclamation Plan
- 2) Sunnyside Fuel Corporation, Waste Disposal Area, Partial Permit No. ACT/007/007, UMC788.18 Application for Approval, Transfer, Assignment or Sale of Permit Right

Sincerely,

ENVIRONMENTAL POWER CORPORATION

Robert L. Neill, Jr.

Robert L. Neill, Jr.

RLN:mf

Enclosure

2920 North Academy Boulevard
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Colorado Springs, CO 80917
(719) 591-4800
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DRAFT

SUNNYSIDE FUEL CORPORATION

WASTE DISPOSAL AREA

PARTIAL ASSIGNMENT OF PERMIT NO. ACT/007/007

UMC788.18 APPLICATION FOR APPROVAL,
TRANSFER, ASSIGNMENT OR SALE OF PERMIT RIGHT

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DIVISION OF
OIL, GAS & MINING

UMC 788.18 APPLICATION FOR APPROVAL,
TRANSFER, ASSIGNMENT OR SALE OF PERMIT RIGHT
(Partial Assignment of ACT/007/007)

This is an application for transfer of permit rights under the Utah Coal Program for the Sunnyside Mines tailing ponds located in Carbon County, Utah, from the existing permittee, Kaiser Coal Corporation, a Delaware corporation, to Sunnyside Fuel Corporation.

788118(a)(2)(i):

Existing Permittee

Kaiser Coal Corporation
102 South Tejon, Suite 400
Colorado Springs, Colorado 80903

District Office Representing the Existing Permittee

Kaiser Coal Corporation
Sunnyside Coal Mine
P. O. Box D
Sunnyside, Utah 84539

788.18(a)(2)(ii):

District Office Representing the Proposed Permittee

Sunnyside Fuel Corporation
136 South Main Street
Salt Lake City, Utah 84101

Resident Agent of Service

Denise A. Dragoo, Esq.
FABIAN & CLENDENIN,
a Professional Corporation
215 South State, 12th Floor
Salt Lake City, Utah 84111
Phone: (801) 531-8900

782.13 Identification of Interests

(a) Names and Addresses

(1) Permit Applicant

Sunnyside Fuel Corporation
136 South Main Street
Salt Lake City, Utah 84101

(2) Legal or Equitable Owners of Record

The legal or equitable owners of the areas to be affected by the surface operations and facilities are:

Sunnyside Fuel Corporation
136 South Main Street
Salt Lake City, Utah 84101

(3) The holders of record of any leasehold interest in areas to be affected by surface actions or facilities:

None

(4) There are no purchasers of record under a real estate contract of the areas affected by surface operations and facilities.

(5) The Operator is:

Kaiser Coal Corporation of Sunnyside
District Office - Sunnyside Mine
P. O. Box D
Sunnyside, Utah 84539

(6) The resident agent of the Applicant who will accept service of process:

Denise A. Dragoo, Esq.
FABIAN & CLENDENIN
a Professional Corporation
215 South State, 12th Floor
Salt Lake City, Utah 84111

782.13(b)

Applicant is a corporation, incorporated as Sunnyside Fuel Corporation.

782.13(b)(1)

Names and addresses of officers and directors of Sunnyside Fuel Corporation are as follows:

Joseph E. Cresci	President, Treasurer and Director	Exchange Place 53 State Street 30th Floor Boston, MA 02109
Donald A. Livingston	Vice President and Direcotr	Exchange Place 53 State Street 30th Floor Boston, MA 02109
Joseph L. Serafini	Secretary and Director	Exchange Place 53 State Street 30th Floor Boston, MA 02109
Bayard R. Krafat, III	Assistant Treasurer	Box 45 100 Union Street Manchester, VT 05254

782.13(b)(2)

Names and addresses of principal shareholders of applicant:

All common stock of Sunnyside Fuel Corporation is controlled by Environmental Power Corporation located at 53 State Street, Boston, Massachusetts 02109. The details of control of this stock are outlined in Environmental Power Corporation's Form 10K filed with the Securities and Exchange Commission for the fiscal year ended December 31, 1987.

782.13(b)(3)

Names under which the applicant and principal shareholders have previously operated mining activities:

Principal Shareholder and applicant have not previously conducted mining activities.

782.13(c)

See 788.18(a)(2)(ii) and 782.13(b)(1)(2)

782.13(d)

Current or previous coal mining permits or pending permit applications:

None.

782.13(e)

Owners of record of surface and subsurface areas contiguous to the permit area are listed below :

(i) Surface Owners

United States of America
Department of the Interior
Bureau of Land Management
Utah State Offices
University Club Building
136 East South Temple
Salt Lake City, UT 84111

East Carbon City
Greg Palacios, Mayor
Columbia Branch
East Carbon City, UT 84520

Kaiser Coal Corporation
102 South Tejon, Suite 400
P. O. Box 2679
Colorado Springs, CO 80903

(ii) Subsurface Owners:

N/A

782.13(f)

The Mine Safety and Health Administration Mine Permit ID Numbers for the Sunnyside Mine:

No. 1 Mine	42-00093
No. 2 Mine	42-00094
No. 3 Mine	42-00092

Issued verbally by Mine Enforcement and Safety Administration, Department of Interior in 1970 (now Mine Safety and Health Administration, Department of Labor.

Sunnyside Surface Operations: ID Number 42-01813

Issued verbally by Mine Safety and Health Administration, Department of Labor, in 1983.

782.13(g)

The following is a statement of all lands, interests in land options or pending bids on interest held or made by the applicant for lands which are contiguous to the area to be covered by the permit:

An affiliate of Sunnyside Fuel Corporation holds a lease and an option to purchase lands contiguous to the permit area. These lands are shown as parcel 'A' on Plate A-1.

782.14 Compliance Information

(a) Statement of Compliance

Neither the applicant, nor any of its subsidiaries, affiliates or persons controlled by or under common control with the Applicant has had a federal or state mining permit suspended or revoked in the last five years; nor forfeited a mining bond or similar security deposited in lieu of bond.

(b) This section does not apply.

(c) Violation Notices received by the Applicant in connection with any underground or surface coal mining activities within the last three years:

None.

782.15 Right-of-Entry and Operations Information

(a) Applicant Sunnysides Fuel Corporation obtained the legal right to enter and begin activities pursuant to a Deed, Assignment, and Bill of Sale between Kaiser Fuel Corporation, Grantor, and Sunnyside Fuel Corporation, Grantee, dated December 28, 1987. The legal description of the lands affected is set forth at UMC 788.18(b)(1).

(b) This section does not apply.

782.16 Relationship to Areas Designated Unsuitable for Mining

(a) The permit area is not within an area designated

unsuitable.

(b) N/A

(c) Surface operations are not located within three hundred feet of an occupied dwelling.

782.17 N/A

782.18 Personal Injury and Property Damage Insurance Information

Not available at this time. (Binder for EPC or Sunnyside Fuel Corp?)

782.19 Other Licenses and Permits

A list of other licenses and permits under applicable State and Federal land-use, air and water quality, water rights and health and safety laws and regulations needed by Sunnyside Fuel Corporation to conduct the waste coal mining activities are as follows:

- (1) NPDES Discharge Permit for Kaiser Coal Corporation, Sunnyside Mines, UT-0022942.

Issued on September 2, 1977 by:

Enforcement Division
U. S. Environmental Protection Agency
Region VIII
1860 Lincoln Street
Denver, CO 80203

- (2) MESA Identification Number 1211-UT-9-0017 for Sunnyside Preparation Plant Tailings Ponds, Sunnyside Mines, Kaiser Coal Corporation.

Issued on March 15, 1976 by:

U. S. Department of the Interior
Mining Enforcement and Safety Administration
Coal Mine Health and Safety
P. O. Box 15037
Denver, CO 80215

788.18(b)(1) Newspaper Advertisement and Proof of Publication

Notice of this proposed transfer will be submitted to the Newspaper Agency Corporation in Salt Lake City, Utah and the Sun Advocate in Price, Utah in substantially the following form on the Closing Date. Proof of publication will be submitted to the Division upon publication.

Notice is hereby given that Sunnyside Fuel Corporation has submitted an application to the State of Utah, Department of Natural Resources, Division of Oil, Gas and Mining, for transfer of a portion of a permit to Sunnyside Fuel Corpora-

tion under the provisions of the Utah Coal Mining and Reclamation Act (Utah Code Ann. 40-10-1, et seq.) and the Utah Coal Program Regulation UMC 788.18. The previous permittee was the Kaiser Coal Corporation, Permit No. ACT/007/007. The permit area is located in Carbon County, Utah as follows:

PARCEL B:

Describing a parcel of land located in Carbon County, Utah, which is located in the east half of Section 6, Township 15 South, Range 14 East, Salt Lake Base and Meridian and being more particularly described according to the following courses and distances, to wit:

Beginning at the East one quarter corner of Section 6, Township 15 South, Range 14 East, Salt Lake Base and Meridian and running thence S 0°13'39" W, 1818.48 feet along the east section line of Section 6 to the south right of way line of an existing railroad track; thence northwesterly along a curve to the right with a radius of 450.00 feet, through an angle of 83°37'47", for a distance of 656.83 feet having a chord that bears N 40°27'18" W, 600.05 feet; thence N 1°21'36" E, 68.00 feet along the westerly right of way line of an existing railroad track; thence S 57°11'02" W, 338.86 feet to an existing 5/8 inch rebar; thence S 66°14'45" W, 220.17 feet to an existing 5/8 inch rebar; thence S 86°11'30" W, 261.34 feet to a metal fence post; thence N 4°41'13" W, 264.09 feet to a roof bolt on the west side of a gate in a fence line; thence N 10°54'48" W, 189.49 feet to a metal fence post; thence N 0° 39'10" W, 254.39 feet to a metal fence post; thence N 10°09'48" W, 315.48 feet to a metal fence post; thence N 6°32'57" W, 232.70 feet to a roof bolt in an existing fence line; thence N 6°32'57" W, 65.24 feet to the south right of way line of a Denver and Rio Grande Railroad as described in a certain deed dated July 29, 1912; thence N 71°27'00" E, 1209.07 feet along the south line of a 50 foot wide right of way for the Denver and Rio Grande Railroad; thence northeasterly along a curve to the left with a radius of 979.93 feet, through an angle of 9°19'48", for a distance of 159.57 feet, having a chord that bears N 66°47'06" E, 159.40 feet to the

Beginning at a point on the north boundary line of said Section 7, which point is Station 102+50.0 P.O.C. of the Railroad Center Line Survey, said point being N 89°27'59" E, 633.0 feet, more or less, along the north line of said Section 7, said point being on a curve to the right with a radius of 572.96 feet through an angle of 114°43' for a distance of 1147.2 feet and having chord bearing of S 1°24'18" E and a distance of 443.97 feet, the tangent to curve at this point bearing S 24°12' E; thence continuing on the same curve right 455.9 feet in a southerly direction to Station 107+05.9 P.T.; thence S 21°23' W, 245.5 feet to Station 109+51.4 P.C., which point is the beginning of a curve to the left with a radius of 716.20 feet through an angle of 28°20' for a distance of 354.2 feet and having a chord bearing of S 7°13' W and a distance of 350.57 feet to Station 113+05.6 P.T.; thence S 6°57' E, 973.89 feet to Station 122+79.49, said point being on the south line of the north one half of the south one half of the northwest one quarter of said Section 7.

Containing 9.318 acres, more or less.

Pertinent comments are solicited from anyone affected by this proposal. Such comments should be filed within the next thirty (30) days with;

State of Utah
Department of Natural Resources
Division of Oil, Gas & Mining
355 West North Temple
III Triad, Suite 350
Salt Lake City, Utah 84108

788.18(c)(1)

Applicant hereby agrees to conduct the operations covered by Permit No. ACT/007/007 in accordance with the applicable criteria specified in UMC 785, 786.19, and 786.21, the requirements of the Utah Coal Mining and Reclamation Act (Utah Code Ann. 40-10-1 et seq.), the applicable Chapter and the Utah Coal Program.

788.18(c)(2)

Applicant has submitted a Surety Bond in conjunction with this application which is satisfactory to the Division and meets the criteria of the Utah Coal Program in the amount of _____

which is equivalent to the bond or other guarantee of Kaiser Corporation, the original permittee.

788.18(c)(3)

Applicant agrees to continue to conduct the operations involved in full compliance with the terms and conditions of Permit No. ACT/007/007, unless and until it has obtained a new permit in accordance with the Utah Coal Program.

771.25

A filing fee of \$5.00 is submitted with this application.

771.27 Verification of Application

This application is submitted on behalf of _____ Fuel Corporation as of this _____ day of _____, 1987 by _____, the _____ of _____ Fuel Corporation.

STATEMENT OF VERIFICATION

STATE OF UTAH)
 : SS.
COUNTY OF SALT LAKE)

_____, having been first duly sworn, states as follows:

1. That he is the person who executed the foregoing application as _____ of Sunnyside Fuel Corporation.
2. That he has read the same and knows the contents thereof.
3. That the matters stated therein are true to his knowledge.

SUBSCRIBED AND SWORN to before me this _____ day of _____, 1988.

Notary Public

Residing in: _____

My Commission Expires:

STATE OF _____ :
)
COUNTY OF _____) ss:

On the _____ day of _____, 19____, personally appeared before me _____ who being by me duly sworn did say, for himself, that he, the said _____ is the _____ of said corporation by authority of a resolution of its board of directors and said _____ duly acknowledged to me that said corporation executed the same and that the seal affixed is the seal of said corporation.

Notary Public

Residing at: _____

My Commission Expires:

DRAFT

APPENDIX A OPERATION AND RECLAMATION PLAN

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DIVISION OF
OIL, GAS & MINING

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APPENDIX A

A.1 Scope

This appendix covers requirements for reclamation and operation plans under UMC 784.

Total acreage in the permit area is 310.068, of which 169.20 acres are disturbed. Consequently, 169.20 acres will be reclaimed within the Sunnyside Fuel Corporation permit area.

Surface facilities and operation plans are described in this Appendix and are illustrated with appropriate maps.

Impacts of mining on human and natural resources as well as mitigating measures and monitoring procedures are presented with reference to more detailed information from the Sunnyside Mines Permit Application No. ACT/007/007.

Since the Sunnyside Mines is an established operation, most of the measures needed for the protection and preservation of human and natural resources are already in practice and are being monitored by regulatory authorities including the DOGM, OSM and MSHA.

Reclamation plans, including estimated schedule and cost, are presented.

A.2 Surface Facilities/Construction Plans

Table III-1 and Plate III-1 list the surface facilities and show the location of the facility or structures and the year of construction if available. The location of each structure is shown on Plate III-1 by its identification number. These identification numbers are also referred to in the narrative as appropriate.

Some new surface facilities or structures may be constructed during the permit period. Some existing facilities also may be modified or reconstructed.

The support facilities area will be maintained and restored (end of mine life) to prevent damage to fish, wildlife and related environmental values and to prevent additional contributions of suspended solids to stream flow or runoff outside the permit area.

A.2.1 Site Selection and Preparation

The Sunnyside Mines have been in continuous operation since the 1890's. Site selection and preparation were carried out many

APPENDIX A

years ago. Details of site preparation are not available.

A.2.2 Portals

There will be no portals located within the permit boundary.

A.2.3 Surface Buildings and Structures

All surface buildings and structures are listed in Table A-1 and identified on Plate A-1.

A.2.4 Coal Handling, Processing, Preparation and Storage

There will be no run-of-mine coal handled, processed, prepared, or stored as part of this permit application.

A.2.5 Power System, Transmission Lines, Substations, Mine Feeders

Power for the Sunnyside Fuel operation is supplied by Utah Power and light through a 44,000 V transmission line. It is distributed to the five substations (E 1 to E 5) identified in Table A-1.

From the substations, power is distributed at 4,160 V to surface facilities.

A.2.6 Water Supply System

The culinary water lines supplying Kaiser Coal, East Carbon City and the City of Sunnyside run underground down the canyon parallel to the existing road from Grassy Trail Reservoir to the cities. At the mouth of Pasture Canyon the City of Sunnyside has a chlorinator and a 50,000 gallon surface water storage tank. From a tee above the tank, two water lines run down the canyon, one through the chlorinator and water tank for Sunnyside and the other past the tank for East Carbon. Sunnyside Fuel will receive its water from Sunnyside Cogeneration Associates, an affiliate that will be located adjacent to the permit area.

APPENDIX A

A.2.7 Sewage System

No. sewers are located in the Sunnyside Fuel Permit area.

A.2.8 Water Diversion Structures

Diversions such as clear water ditches are used to divert runoff from crossing a disturbed area. The designs for the diversions are located in Appendix III-1 of the Sunnyside Mines Permit along with the sediment ponds.

There will not be any new stream channel diversions.

A.2.9 Sedimentation Control Structures and Water Treatment Facilities

Sedimentation control structures are used to store water runoff from disturbed areas up to and including a 10 year 24 hour event. Designs of the sediment control structures are located in Appendix III-1, of Sunnyside Mines Permit.

Rainfall in excess of a 10-year 24-hour event is passed through the structure with a vertical standpipe emergency spillway. Sediment control structures are periodically cleaned of sediments when the sediment height reaches a predetermined design level. The State Board of Health requires that three feet be maintained between the sediment and the water outlet. Division and State Board of Health approvals for existing ponds are in Appendix III-2 of the Sunnyside Mines Permit. The maximum sediment level is marked on the vertical standpipe spillway or on a ground stake. Water accumulations in the pond are discharged after storing the water for at least twenty-four hours allowing the settling of sediments.

All sediment ponds will be inspected a minimum of four (4) times per year for structural weakness, erosion, proper function, sediment levels and other hazardous conditions. A written record of findings will be maintained at the mine office for inspection. Reports of adverse dam conditions including erosion structural weakness or other hazardous conditions will be submitted to the Division within thirty (30) days of the inspection. Hazardous conditions will be reported directly to the Division immediately after the finding.

Sediments removed from the ponds will be disposed in the industrial waste dump or used as a borrow material. If the material is to be used as a borrow material, the operator will

APPENDIX A

contact the Division to receive approval of the location and the amount of material to be used. The Division may require a chemical analysis of the sediments prior to disposal as borrow depending upon the area of disposal.

Sediment control measures approved by the Division (see Appendix III-3) of the Sunnyside Mines Permit include adding a flocculent to the water to drop out suspended iron particles. A loose straw and rock gabion structure is located at the bottom to wash out the sediments. Total iron values at the base of the gabion and at the permit boundary are in compliance with the standard.

The east slurry cell will be used as an alternate evaporation pond for slurry when the primary settling ponds are both full. Use of the east slurry cell will be limited.

A.2.10 Transportation, Roads, Parking Areas, Railroad Spurs

All culverts under roads are listed in Table III-22 of the Sunnyside Mines Permit along with specifications and are plotted on Plate III-1 of the Sunnyside Mines Permit as RC-1 through RC-10-4. Permanent road culverts are found on Plate III-28 of the Sunnyside Mines Permit and listed in the culvert design summary of Appendix III-1 of the Sunnyside Mines Permit. All other culverts designs are found in the appropriate disturbed area calculations of Appendix III-1 of the Sunnyside Mines Permit.

Typical cross sections of each road and side ditch are located on Plate III-7 of the Sunnyside Mines Permit.

Table III-2 of the Sunnyside Mines Permit is a list of roads in the permit area. All of these roads existed prior to enactment of PL-95-87.

Table III-3 of the Sunnysides Mines Permit lists the specifications for these roads.

No plans exist, during the permit period, to alter a natural drainage way, or make alterations involving a steep cut slope.

Roads will be maintained according to UMC 817 road performance standards throughout the life of the facility and during the 10-year responsibility period. Maintenance will consist of basic custodial care to control erosion, repair of structures and drainage systems, removal of debris from culverts and ditches, and replacement of road surface material as needed.

The transportation facilities area will be maintained and restored at the end of the mine life to prevent damage to fish,

APPENDIX A

wildlife, and related environmental values, as well as to prevent additional contributions of suspended solids to stream flow or runoff outside the permit area.

A.2.10.1 Belt Conveyors and Rail Tracks

No belt conveyors will be located in the permit area. Plate III-2 of the Sunnyside Mines Permit shows the surface location of the Denver & Rio Grande Western Railroad tracks. D&RGW tracks are located in the Sunnyside Fuel Permit area.

A.2.11 Total Area for Surface Disturbance During Permit Term

The areas that have been disturbed within the Sunnyside Fuel permit area include a total of 169.20 acres. Consequently, 169.20 acres will be reclaimed within the permit area.

A.2.12 Additional Areas for Surface Disturbance for Life of Mine

New areas of surface disturbance may occur during the permit term or the life of the mine. Plans for such disturbances will be submitted to the appropriate agencies for approval prior to construction.

A.2.13 Detailed Construction Schedule

No schedule has been established for new construction which may occur during the life of the mine.

A.3 Operation Plan

A.3.1 Mining Plans

The Sunnyside coal property has been mined continuously since the late 1890's. Over fifty-five million tons of coal have been extracted during this period. Kaiser Coal Corporation originally leased the No. 2 Mine from Utah Fuel Company in 1942 to provide coking coal to the newly constructed steel mill at Fontana, California. In 1950, Kaiser Coal purchased the Sunnyside coal property and has been the sole operator since that time.

APPENDIX A

A.3.1.1 Orientation and Multiple Seam Considerations

Not applicable.

A.3.1.2 Portals, Shafts and Slopes

Not applicable.

A.3.1.3 Mining Methods

Not applicable.

A.3.1.4 Mine Development

Not applicable.

A.3.1.5 Retreat Mining

Not applicable.

A.3.1.6 Roof Control, Ventilation, Water Systems
Dust Suppression, Dewatering and Electrical

(a) Roof Control:

Not applicable. (b) Ventilation:

Not applicable.

(c) Water Systems:

Not applicable.

(d) Dust Suppression:

Not applicable.

(e) Dewatering:

Not applicable.

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(f) Electrical:

Not applicable.

A.3.2 Barrier Pillars

Not applicable.

A.3.2.2 Protection of Surface Structures and Streams

Not applicable.

A.3.2.3 Property Boundaries

Not applicable.

A.3.2.4 Outcrop Protection

Not applicable.

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A.3.3 Conservation of Coal Resource

A.3.3.1 Projected Maximum Recovery

Not applicable.

A.3.3.2 Justification for Non-recovery

Not applicable.

A.3.3.3 Access to future reserves

Not applicable.

A.3.4 Equipment Selections

A.3.4.1 Surface Equipment

Revise.

A.3.4.2 Underground Equipment

Not applicable.

A.3.5 Mine Safety, Fire Protection, Security

A.3.5.1 Signs

Signs and markers required by the regulations governing DOGM under UMC 817.11 are posted, maintained, and will be removed by the operator at the termination of the bond. The signs are of uniform design, can easily be seen and read, and are made of plastic or steel.

Identification signs showing the name, business address, and telephone number of the person who conducts underground coal mining activities and the identification number of the current regulatory program permit authorizing underground coal mining

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activities are posted at each point of access from public roads to areas of surface operations and facilities on permit areas for underground coal mining activities. Plate III-24 of Sunnyside Mines Permit shows the location of identification signs.

Permit markers are posted and clearly show the perimeter of all areas affected by surface operations or facilities. The markers are four foot by 5/8 inch diameter steel roof bolts or four foot metal fence posts painted blaze orange. Plates III-20 through 23 of Sunnyside Mines Permit show the perimeter of the disturbed areas that the markers denote.

Stream buffer zone markers are posted and clearly show the buffer zone along Grassy Trail Creek. However, due to pre-law disturbances the buffer zone is less than the 100 feet specified in UMC 817.57. Plate III-26 of Sunnyside Mines Permit shows the location of buffer zone signs. Disturbance within the stream buffer zone will not be allowed by the operator.

Blasting signs will be posted prior to blasting at all entrances to areas of the surface operations and facilities in the permit area, from public roads or highways. The signs will say "Warning: Explosives in Use". The immediate area of blasting activities will be flagged or posted with signs that say "Danger: Blasting Area".

Topsoil Stockpile signs will be posted and maintained on all topsoil stockpiles. The signs will say "Topsoil Stockpile: Do Not Disturb."

A.3.5.2 Fences and Gates

Fences and gates have been installed where needed for safety and/or security purposes.

A.3.5.3 Fire Protection

A fire truck is maintained on the property for use by the Sunnyside Mines and the town of Sunnyside. Fire hydrants are strategically located around the mine complex on the surface. This also includes the stockpile/loadout area.

Coal processing waste fires in the coarse refuse dump will be extinguished by the operator in accordance with a plan approved by MSHA. The approval letter for the MSHA fire extinguishing plan is Figure III-1 of Sunnyside Mines Permit. Only those persons authorized by the operator, and who have an understanding of the procedure to be used, shall be involved in the extinguishing operations. An area on fire with open flames will be excavated using dozers and scoops until the fire zone is

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removed. Hot material from the hole will be spread out and covered with 6" to 18" of borrow material. Areas that are hot but not in open flame will be covered with 6" to 18" of borrow material to seal off the air supply.

A.3.5.4 Explosives

Storage, handling and use of explosives are all in compliance with MSHA's rules and regulations. The powder magazine (M 1) and detonator caps magazine (M 2) are located in Number Two Canyon (see Plate III-1 of Sunnyside Mines Permit and the photographs in Section A.7.1).

Explosives are used only sparingly at the Sunnyside operation. Normal use on the surface is to free blocked shutes or storage bins. Concrete foundations and walls or rocks are also cleared with explosives when needed. Sunnyside Fuel Corporation will comply with all applicable state and federal laws regarding the use of explosives. Blasting operations will be conducted by persons who have been trained, examined and certified by the State Industrial Commission and are trained in the applicable regulations of the Division regarding explosives.

On the request of a resident or owner of a dwelling or structure that is located within one-half mile of any surface blasting activity, Sunnyside Fuel Corporation will conduct a preblasting survey of the dwelling or structure and promptly submit a report of the survey to the Division. The survey will comply with the specifications of UMC 817.62.

Prior to blasting, all residents or owners of a dwelling or structure that is located within one-half mile of an area affected by surface blasting will be notified 24 hours prior to the surface blasting event. Blasting will then be conducted between sunrise and sunset. Warning and all clear signals of different character that are audible within a range of one-half mile from the point of the blast will be given. Each person within the permit area and each person who resides or works within one-half mile of the permit area will be notified as to the meaning of the signals.

Access to the blasting area and areas subject to flyrock from blasting will be restricted. Unauthorized personnel and livestock will be controlled to prevent their presence during blasting and until the area is cleared of slides, undetonated charges, or other unusual safety hazards.

Airblast will be controlled so that it does not exceed the values listed in UMC 817.65 (e) (1). Measurements of airblast will be taken when required by the Division.

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Flyrock, including blasted material traveling along the ground, will not be cast from the blasting vicinity more than one-half the distance to the nearest dwelling or other occupied structure and in no case beyond the line of property owned or leased by Kaiser Coal Corporation.

Blasting will be conducted to prevent injury to persons, damage to public or private property outside the permit area, adverse impacts on any underground mine, or change the course, channel or availability of ground or surface waters outside the permit area.

Blasting will not be conducted within 1,000 feet of any building used as a dwelling, church, hospital or nursing facility; and 500 feet of facilities including, but not limited to, disposal wells, petroleum or gas storage facilities, municipal water storage facilities, fluid-transmission pipelines, gas or oil collection lines or water and sewage lines.

Maximum weight of explosives that will be detonated within an 8-millisecond period is three (3) pound. Maximum peak particle velocity will not exceed 1 inch per second at any dwelling, public building, school, church, or commercial or institutional building.

A record of each blast will be retained for three years and will be available for public inspection on request. The record will contain the name of the operator conducting the blast; location, date and time; name, signature and license number of blaster-in-charge; direction, distance in feet to the nearest dwelling, school, church, or commercial or institutional building; weather conditions, including temperatures, wind directions, and approximate velocity; type of material blasted, number of holes, burden, and spacing, diameter of holes and depth, type of explosives used, total weight of explosives used, maximum weight of explosives detonated within any 8-millisecond period, maximum number of holes detonated within any 8-millisecond period, initiation system, type and length of stemming, mats or other protection used, type of delay detonator or delay period, sketch of the delay pattern and number of persons in the blasting crew.

A.3.6 Operations Schedule

A.3.6.1 Annual Production Per Year For Permit Term

Revise.

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A.3.6.2 Operating Schedule

Revise.

A.3.6.3 Manpower Requirements

Total employment is anticipated to be _____ people.

A.3.7 Acreage and Delineation of Mine Permit Area

The total permit area includes 310.068 acres. The permit area boundary is delineated on Plate III-1 of Sunnyside Mines Permit.

A.3.8 Mine Plan Area

Revise.

A.4.1 Preservation of Land-Use

A.4.1.1 Projected Impacts of Mining on Current and Future Land Use

Sunnyside Mines have been in continuous operation for over ninety years. The land-use picture has not changed significantly and is not expected to deviate in the future.

Land-use consists primarily of mining fish and wildlife habitat, limited grazing, and minimal cropland (see Sections 4.4.2 and 4.4.3 of Sunnyside Mines Permit).

Adverse affects of the Sunnyside operation on land-use is minimal and is not expected to change during the permit period.

The operator will notify the Division by the fastest available means when any slide or surface failure occurs that may have potential adverse affects on the public, the property, the health, the safety, or the environment and comply with any remedial measures required by the Division.

There is no prime farmland within the permit area.

A.4.1.2 Control Measures to Mitigate Impact

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Control measures to mitigate impacts on present land-uses include steps to protect surface waters (Section 7.2.5), soil resources (Section 8.11), vegetation (Section 9.6), and fish and wildlife (Section 10.5).

A.4.2 Protection of Human Values

A.4.2.1 Projected Impacts of Mining on Human Values Historical and Cultural

A historical and cultural resources survey of the Sunnyside Mines permit area by the Consulting Services Branch, Antiquities Section of the Utah Division of State History has revealed no previously recorded sites in the listings of the National Register of Historic Places. However, sixteen prehistoric or historic sites were recorded during the survey; ten of these are eligible for nomination to the National Register. (See Chapter V. of Sunnyside Mines Permit)

These sites have coexisted with the Sunnyside Mines for over eighty years and have not been deleteriously affected by the mining operation. Present and future mining are and will be at depths of 1,200 to 2,500 feet such that surface subsidence effect, which may impact these resources, will be very unlikely.

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A.4.2.2 Control Measures to Mitigate Impacts

Protection or mitigation measures may range from excavation or other forms of documentation to total avoidance. At present, none of the recorded prehistoric or historic sites noted in Section A.4.2.1 are in danger of adverse impact. All historic sites and any sites not yet discovered will be avoided, or if disturbance is unavoidable the site will be documented by a trained historian before disturbance.

A.4.3 Protection of Hydrologic Balance

A.4.3.1 Projected Impacts of Mining on Hydrologic Balance

Over ninety years of mining at the Sunnyside Mines has not caused any significant diminution of ground or surface water sources.

Sunnyside Fuel will replace the water supply of an owner of interest in real property who obtains all or part of his or her supply of water for domestic, agricultural, industrial, or other legitimate use from an underground or surface source where the water supply has been affected by surface contamination by Sunnyside Fuel. To be replaced the water supply must be considered not suitable for use as outlined by State Board of Health standards, USDA standards, or other accepted industrial water quality standards. If the water supply is interrupted or diminished by underground surface activities the water supply will be replaced. The owner of interest in real property must prove water quality and or quantity previous to the contamination, diminution, or interruption of the water supply to be eligible for replacement.

A.4.3.2 Control Measures to Mitigate Impact

Water discharged from the mine into Grassy Trail Creek or the Icelander drainage will meet all State and Federal water quality standards. Mine water is ponded to settle suspended solids and to enhance the separation of oil and grease. Oil and grease is trapped in the pond by using a "skimmer" on the discharge (see Appendix III-1 of Sunnyside Mines Permit).

As built, configurations for ponds Coarse Refuse Toe, and Old C.R. Road, have been submitted to the Division. Stability analysis will be performed on all ponds not meeting the required 1v:5h combined upstream and downstream side slopes of

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embankments. The investigation will include test results showing strength parameters, pore pressures, and long-time seepage considerations.

Water leaving small disturbed areas will pass through silt fences (see Plate III-33(1-7) and Plate III-1 for locations of Sunnyside Mines Permit). Plate III-34 of Sunnyside Mines Permit shows the methodology used to install silt fences.

Some of the presently constructed culvert discharges and ditches show potential erosive conditions. However, recent field inspections indicate no signs of erosion problems in most areas. To prevent possible erosion, culvert discharges and ditches inside the disturbed area will be inspected by the operator for any signs of erosion problems three (3) times annually-- spring, summer, and fall. Erosion problems will be noted in a log maintained by the operator. After logging the problem, the operator will have thirty (30) days in which to correct the problem with rip rap, concrete, u.v. resistant plastic, or other protective channel liners.

Erosion problems will be detected by observing a pin or stake driven into the ground within 1-inch of the top. If more than 2 inches of the pin or stake shows during an inspection then a problem exists and the above measures will be taken.

Plate III-36 of Sunnyside Mines Permit shows protective measures for culvert inlets.

Where potential erosion problems in clear water diversion ditches are indicated, or if discovered during an inspection, the ditch will be lined with anchored rip rap, concrete, u.v. resistant plastic or other protective channel liners for the full length of the ditch. Plate III-35 of Sunnyside Mines Permit shows typical placement methodology.

Kaiser Coal Corporation has submitted specific designs, drawings and measures for railcut ditches D-6, D-7, D-8, D-9, D-10, and D-11 of Sunnyside Mines Permit.

Designs for permanent road culverts and bridges (RC2-4, RC3-1, RC3-2, RC3-3, RC3-4, RC3-5, RC3-6, RC7-2, RC7-3, RC10-4, M-BR and M-CV of Sunnyside Mines Permit) have been submitted to the Division. All of the above culverts and bridges which cannot pass a 100-year, 24 hour precipitation event will be replaced at the end of mine life.

A .4.3.3 Monitoring Procedures to Measure Impacts And Control

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Water discharged from the sediment ponds are sampled for surface operational parameters while the ponds are decanted. Any sample exceeding standards on discharge are reported to the State Board of Health and DOGM.

Perennial streams monitoring stations (GT-1, GT-2, GT-3, GT-4, ICE-1 and CRB of Sunnyside Mines Permit) are monitored monthly by Sunnyside Mines for flow and field measurement parameters, and quarterly for water quality. Ephemeral stream monitoring station parameters, (WC-1, BC-1, POC-1, PAC-1 and N2C-1 of Sunnyside Mines Permit) are monitored monthly by Sunnyside Mines for flow, field, and quality measurements. Field and quality operational parameters are shown in Table III-23 of Sunnyside Mines Permit.. Locations of the monitoring stations are found on Plates III-1 and VII-3 of Sunnyside Mines Permit.

A.4.4 Preservation of Soil Resources

A.4.4.1 Projected Impacts of Mining on Soil Resources

Several adverse conditions regarding soils created by mining operations will require consideration and mitigation. Most of the disturbances caused by mining activities at the Sunnyside Mines occurred prior to the Act of 1977. The primary effects of mining operations upon these soils include compaction; loss of microorganisms and consequently, a loss of organic matter and nitrogen; some contamination of topsoil material with coal fines; and some mixing of topsoil with subsoil materials. Generally, soil disturbances usually accelerate erosion by wind and water, especially on steep slopes. During topsoil removal, some subsurface materials will be mixed with topsoil and consequently will lower total soil fertility. Long periods of stockpiling topsoil will cause some loss of microorganisms and soil nutrients. All of these soil conditions are considered during mining operations and reclamation activities so the proper reclamation practices and mitigation techniques are employed.

A.4.4.2 Control Measure to Mitigate Impacts

For the purposes of mitigating impacts of mining activities upon soil resources, standard soil conservation techniques and reclamation practices are used. For areas that were disturbed prior to the Act of 1977, the facilities will be abandoned according to the procedures outlined in this Appendix. The surface materials will be ripped, disked, and analyzed for soil nutrients. These areas will then be amended or topsoiled as

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needed. Revegetation will be completed according to the procedures outlined in section A.5.5.

Although the extent of future disturbances will be small, protective measures will be employed to ensure the conservation of soil resources. In all cases, topsoil will be removed and stockpiled for future reclamation use. These stockpiles will be graded and seeded with a grass seed mix to minimize the loss of soil. Further details are discussed in section A.5.5.

A.4.5 Protection of Vegetative Resources

A.4.5.1 Projected Impacts of Mining on Vegetative Resources

The Sunnyside Mines have been in operation since the end of the nineteenth century. The majority of the impacted vegetation was disturbed before the permit period will begin. Past and future disturbances will account for 2.8 percent of the permit area vegetation.

A.4.5.2 Reduce Impacts on the Vegetative Resources

During any new construction activities, surface disturbance will be confined to as small an area as feasible. Equipment operators will be instructed to disturb as little vegetation as possible.

Federally listed threatened or endangered plant species are not located near and none will be jeopardized by any coal mine developments. No unique or critical germ plasm will be lost.

The intensive vegetation survey conducted in the summer of 1981 characterized the vegetation types assumed to have been disturbed by mining activity. From the survey information, seed mixtures have been devised to aid reestablishment of several plant communities, capable of protecting the soil resource from erosion and developing through plant and soil succession (Section A.5.5.2).

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A.4.5.3 Monitoring Procedures Reference Areas And Revegetation

Reference areas and revegetated areas will be monitored according to the methods discussed in Section 9.8 of Sunnyside Mines Permit.

A.4.6 Protection of Fish and Wildlife

Mining activity has occurred in Whitmore Canyon for the past eighty years. Some activities have been deleterious to wildlife resources, but in the time frame of mining activity, most affected populations have reached an equilibrium with their altered environment or their new environment.

Recent environmental laws, e.g. the National Environmental Policy Act, have heightened the awareness of the lay public to the problems and needs of wildlife. While it is too late for some remedies, problems encountered during the ongoing operations will be addressed promptly. The prevention of problems will be the objective and this will be accomplished by including wildlife resources in the planning process.

A.4.6.1 Projected Impacts of Mining on Fish and Wildlife

The ongoing operations of the Sunnyside Mines have altered the environments of local aquatic and terrestrial faunal communities, e.g. mine water discharge and noise pollution. Unless problems arise, the environments will continue in their altered state until mining operations cease.

A.4.6.2 Mitigating Measures to be Employed to Protect Fish and Wildlife

All disturbed sites no longer needed for mining operations will be reclaimed, according to current reclamation standards. The reclamation techniques and seed mixtures are designed to have the capability to support the post-mining land uses of wildlife habitat and grazing land.

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A.4.7 Protection of Air Quality

A.4.7.1 Projected Impacts of Mining Operation on Air Quality

The primary pollution sources include the fugitive dust from the coal stockpile and fugitive dust from unpaved roads.

A.4.7.2 Mitigating Measures to be Employed to Control Air Pollutants

The main roads and parking areas are paved. Chemical dust suppressants and/or water are applied during dry periods to control fugitive dust.

A.4.7.3 Air Quality Monitoring Plan

Kaiser Coal maintains a weather station at the Sunnyside Mines.

No air quality monitoring devices are in use.

A.4.8 Subsidence Control Plan

Not applicable.

A.4.9 Waste Disposal Plans

The slurry (refuse) ponds (D 1.1 and D 1.2) and coarse refuse disposal areas (D 2a and D 2b) are listed in Table III-1 of Sunnyside Mines Permit and shown on Plate III-1 of Sunnyside Mines Permit and in photographs in Section 3.7.1 of Sunnyside Mines Permit. Additionally, Plate III-5 of Sunnyside Mines Permit represents a more detailed plan and cross-section of the coarse refuse disposal facility.

A.4.9.1 Projected Impacts of Disposal Areas on the Environment

(a) Slurry ponds:

Fine refuse from the preparation plant is moved to

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dewatering or disposal areas by slurry transport in an open ditch. There are four slurry ponds: the West Slurry Cell (WSC), the East Slurry Cell (ESC), Slurry Pond One (SP1), and Slurry Pond Two (SP2) (Plate III-1 of Sunnyside Mines Permit). The East and West Slurry Cells are settling and evaporation impoundments that were constructed prior to or during 1974. Slurry Ponds One and Two are settling and filtration ponds constructed in 1978. Presently, SP1 and SP2 are actively used, while ESC is used as an overflow for SP1 and SP2 when they are not in service. Pond WSC is used as a disposal area for dried slurry from SP1 and SP2.

The West Slurry Cell was the first impoundment to be constructed for the disposal of slurry and refuse material in the late fifties and early seventies. (Appendix III-5 of Sunnyside Mines Permit). Coarse refuse material and other waste was used as fill material to block a wash in the pediment material at the mouth of Whitmore Canyon overlooking the Icelander Drainage. Slurry from the preparation plant was transported to the impoundment by ditch for disposal. As the level of the slurry bank increased, additional coarse refuse was added to the top and sides of the impoundment. The present level of the slurry in the impoundment is over 200 feet above the bottom of the wash. Currently, use of the impoundment is used as a disposal area for dried slurry material from SP1 and SP2. Trucks end-dump the slurry material onto the northwest side of the cell from the top of the dike. A large dozer then spreads and compacts the material. The entire impoundment is expected to be filled at the end of the mine life.

The dried slurry material in the West Slurry Cell will be used as a low grade supplemental power plant feed. If the process becomes a commercial project, the impounded slurry will be removed for use.

Construction of the East Slurry Cell on the east side of WSC was in 1974. Coarse refuse was placed and compacted in dikes to contain the refuse. After the dikes were completed and covered with soil material, the impoundment was filled with slurry. Disposal of slurry continued until 1983. Presently, the impoundment is used as an substitute for SP1 and SP2.

Slurry Pond One and Two were constructed in 1978 to the north of the other slurry cells. These ponds were constructed by excavating a depression in the colluvium on a gentle slope. Material from the depression was spread out down slope of the ponds for 50 to 100 feet. SP1 and SP2 are used in rotation. Slurry is introduced into a pond where it settles and is then filtered (Plate III-13 the Sunnyside Mines Permit). During the use of the first pond, the second pond is decanted and the dried slurry removed by truck to the WSC. After the second pond is cleaned, the cycle is reversed. If both ponds are in the drying and cleaning cycle, the slurry will be diverted to the ESC.

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Water (NPDES 004) from SP1 and SP2 is used to irrigate alfalfa fields or discharged into Icelander Drainage. Discharged water meets all State and Federal water quality standards (see Chapter VII of Sunnyside Mines Permit). The east and west slurry cells are shown on Plate III-37 of Sunnyside Mines Permit.

Design and construction of the slurry ponds was conducted pre-law, consequently, some of the current design standards required in UMC 817.91-.93 and UMC 817.49 are not met. A geotechnical evaluation, certification of the alternate methods of construction and current static and seismic safety factors was conducted to determine compliance with UMC 817.92-93. Results of the evaluations are found in Appendix III-7 of Sunnyside Mines Permit. It was found that the impoundment dikes constructed of coarse refuse are stable with the exception of the west dike of WSC. This dike will become stable as the current coarse refuse pile level reaches the level of the west dike. Present plans are to continue to stabilize the dike. The coarse refuse pile is being specifically constructed in this site to stabilize the dike wall to meet MSHA requirements. Water samples from the seep below the coarse refuse disposal pile meet State and Federal water quality standards (see Section A.4.9.1(b)). The West Slurry Cell will not be used as an impoundment until the coarse refuse pile level reaches the level of the west side dike or obtains a static safety factor of 1.5.

Evaluation of the ESC embankment with steady seepage saturation conditions shows a safety factor of 2.2. Soil conditions encountered during soil testing and the installation of piezometers showed that the coarse refuse material in the embankment is not saturated.

All surface drainage from the areas above the slurry ponds is diverted away from the embankments by diversion ditches designed to carry the peak runoff from a 100-year, 24-hour precipitation event (Plate III-24, Appendix III-1 of Sunnyside Mines Permit). The diversions will be maintained to prevent blockage.

Visual inspections by a qualified registered professional engineer or someone under the supervision of a qualified registered professional engineer will be conducted on a weekly basis to assess the stability of the impoundments and determine the amount of seepage, if any. Piezometers installed 8/6/85, in the East Slurry Cell embankment will be monitored weekly when water is present in the structure to access the amount of embankment saturation, if any. Records of the inspection findings and recommendations will be maintained by the operator. If the inspection discloses that potential hazards exist, the Division will be informed promptly of the findings, the emergency procedures formulated for public protection, and remedial action measures that will be implemented.

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Maintenance of the embankments will consist of filling and grading any erosion or other failure features discovered by the above inspections.

Subsidence is not expected to affect the ponds and embankments since the structures do not overlie the coal seam and are located several miles west of the nearest outcrop. Mudflows, rock debris falls or other landslides are not expected to be a problem because the embankments are located at or above the level of the surrounding topography. Possibility of failure downhill of the embankments is limited to a thin layer of colluvial material on bedrock. Failure of this material would not threaten the embankments.

Reclamation of the East Slurry Cell should pose little or no problem because of potentially saturated slurry material. Past experience has shown that vehicles can travel over the pond surface after the pond has dried for a year. The period of time before reclamation can take place could be shortened by dewatering the slurry with a trench and pump system.

(b) Coarse refuse

Coarse refuse or reject materials from the preparation plant are disposed of in a waste bank. The refuse is hauled by truck from the refuse loadout at the preparation plant to the coarse refuse pile (Plate III-1 of Sunnyside Mines Permit) where it is end dumped in piles. When sufficient material has been hauled to the dump, the refuse is spread out in a 24-inch horizontal layer by a large dozer. Loaded haul trucks transporting the next layer of refuse randomly compact the layer surface to prevent fires and increase the stability of the structure. The outer slope of the refuse pile is maintained at a 27 degree slope (see Plate III-5 of Sunnyside Mines Permit). At 50 feet vertical increments, a 20-foot wide terrace is constructed for water runoff and erosion control.

Refuse material from activities located outside the permit area will be disposed of in the waste bank only if approval is obtained from the Division. There are no plans for outside waste disposal.

Construction of the coarse refuse pile will continue as outlined above. Layering of the pile and compaction has been designed to achieve structural stability and to prevent fires. The material is compacted to attain at least 90 percent of the maximum dry density. Construction of the pile was started in 1977 before enactment of the present regulations. As a result, the subdrainage system required by UMC 817.83(a)(1) was not incorporated in the design; however, a 24-inch perforated culvert was placed in the drainage bottom to collect ground water

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seepage. Geotechnical stability and certification studies have been conducted (see Appendix III-7 of Sunnyside Mines Permit) to prove the adequacy of the alternate method of construction. The study shows a long-term static factor of safety of 2.31.

All surface drainage from the area above the waste bank and from the crest and face of the final structure will be diverted away from the fill into stabilized diversion channels designed to pass safely the runoff from a 100-year, 24-hour precipitation event. A plan view of the diversion ditches are found on Plate III-27 of Sunnyside Mines Permit. Calculations are found in Appendix III-1 of Sunnyside Mines Permit.

After construction of the waste bank, the surface will be covered with a minimum of 4-feet of the best available non-toxic and non-combustible material. Borrow material from the current borrow pits will be used. Vegetation will be planted to minimize surface erosion at the site (see Section 3.5). Test plots are being used to determine the minimum depth of soil material needed to revegetate the refuse pile (see Section 3.5). If less material can be used as indicated by the test plot results, the operator will request that the 4-foot minimum amount of cover be reduced to the amount indicated by the testing and the bond accordingly reduced.

A seep occurs at the toe of the Coarse Refuse Pile. This natural seep has occasionally been found to have a total iron content higher than the UMC 817.42 standard of 7.0 milligrams per liter. The operator will sample this seep monthly for total iron content, and will, if the standard is exceeded at the permit boundary, promptly utilize a polymer flocculent and/or other techniques to remove the iron from suspension. This treatment will be continued until the total iron content of the seep is within the standard.

The coarse refuse pile will be inspected on a quarterly basis by a qualified, registered engineer or other qualified person for slopes, seepage, and other visible factors which could indicate potential failure. The results of the inspections will be recorded and maintained at the mine site. If any inspection discloses that a potential hazard exists, the Division will be informed of the findings and of the emergency procedures formulated for public protection and remedial action.

Maintenance of the embankments will consist of filling and grading any erosion or other failure features discovered by the above inspections. Ditches on the terraces will be cleaned and graded as need warrants. Rip rap in the drainage system will be repaired as needed.

Subsidence is not expected to affect the refuse pile as the structure does not overlie the coal seam and is several miles

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west of the nearest outcrop. Mudflows, rock debris falls or other landslides are not expected to be a problem. Possibility of failure near the sides and downhill of the refuse piles is limited to a thin layer of coluvial material on bedrock. Failure of this material would not threaten the refuse pile.

(c) Return of coal processing waste to abandoned underground workings: Not applicable.

(d) Underground development waste: Not applicable.

(e) Toxic or acid-forming materials: Not applicable.

(f) Industrial waste:

Non-coal waste is disposed in the East Carbon City landfill or the industrial waste dump. Material placed in the industrial waste dump is primarily reject from the rotary breaker such as timbers, cans or other non-coal waste that comes out on the mine belt. All other non-coal waste is sent to the East Carbon City landfill for disposal. See Figure III-7 of Sunnyside Mines Permit Authorization letter from East Carbon City allowing the operator use of their landfill for disposal of non-industrial wastes.

The industrial waste dump has been approved by the State Board of Health (Figure III-2 of Sunnyside Mines Permit). It is located at the northeast end of the East and West Slurry Pond Cells of the refuse disposal area (Plate III-1 of Sunnyside Mines Permit). The dump was constructed and is used by excavating a trench, compacting the sides and bottom for a water barrier, filling the trench with non-coal waste and then covering the waste with a minimum of two feet borrow material.

A.4.9.2 Control Measures to Mitigate Impacts

Based on the characteristics, handling and disposal of various waste products discussed in Section A.4.9.1 above, the impact of the environment is expected to be minimal. The slurry refuse does not go into the hydrologic system.

The coarse refuse is covered with non-combustible waste material and compacted to eliminate ignition effect, if any, on the surface.

No additional waste facilities are planned, since the existing structures should have sufficient capacity to last throughout the proposed permit period.

A.5 Reclamation Plan

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The reclamation and revegetation plans are designed to return the disturbed lands to productive uses once mining activities have ceased. These post-mine land uses will be the same as the current and pre-mine uses, i.e., fish and wildlife habitat, recreation, and livestock grazing.

The majority of the disturbed areas were prior to the Coal Mine Reclamation Act of 1977. The affected acreage of all disturbed areas is minimal. Because topsoil was not saved prior to the Act, many of these areas will be revegetated without topsoil. Although the reclamation plans utilize state-of-the-art techniques, these plans will be revised as new materials and techniques become available.

Site stabilization and erosion control will be obtained through application of the reclamation and revegetation procedures described in Chapters III, VIII and IX of Sunnyside Mines Permit. All of the techniques described, with the exception of those involved in the coarse refuse revegetation trials, are proven techniques.

A.5.1 Contemporaneous Reclamation

Contemporaneous reclamation has been ongoing at Sunnyside for many years. Although written records were not kept, we do know that plantings of crested wheatgrass began in the late 1950's. The streamsidess have been reseeded along channelized sections of Grassy Trail Creek, areas adjacent to roadsides and vacant areas next to buildings.

Variations in the coal market constantly affect the rate and occurrence of mining activities, therefore it is not practical or possible to present a specific timetable for most reclamation activities. Very few contemporaneous reclamation activities are scheduled during this permit term (Section 3.5). No final reclamation is planned at the end of the five year permit term. Timing of all reclamation activities will generally follow the sequential schedule presented in Table III-42 of Sunnyside Mines Permit. The revegetation process will be most successful by adhering to the revegetation schedule in Table III-10 of Sunnyside Mines Permit.

Although none are identified at this time, areas adjacent to any future disturbances would be revegetated as part of contemporaneous reclamation. Contemporaneous reclamation includes the following:

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(1) Coarse refuse disposal area (D2): The coarse refuse pile (Plate III-5 of Sunnyside Mines Permit) is in a state of ongoing construction and reclamation. The pile is being built in approximately 2-foot lifts which are compacted. At 50-foot vertical increments, a 20 foot wide terrace is constructed for water runoff and erosion control. Grading of this structure is a continual process. Revegetation evaluation plots are currently being constructed (Plate III-1 of Sunnyside Mines Permit) to test depth and type of the cover material necessary for supporting diverse and effective vegetative growth. After evaluation of the refuse revegetation plots, revegetation of the refuse pile will begin on the toe slopes and will be ongoing throughout the life of the mine.

Disturbances created prior to the ACT have been delineated from currently used areas on Plates III-20 through III-23 of Sunnyside Mines Permit. Typically these pre-law disturbances were revegetated with crested wheatgrass. These maps illustrate the level of reclamation required as currently interpreted by the DOGM.

Those disturbed areas which have been revegetated prior to the ACT were mapped in the fall of 1983 and are also shown on Plates III-20 through III-23 of Sunnyside Mines Permit. These maps delineate pre-law areas which remain to be revegetated and will enable determination of the level of reclamation required for any pre-law areas which may be redisturbed.

A.5.2 Soil Removal and Storage

Because the Sunnyside Mines have been active since the late 1800' , the permit area is comprised of several types of disturbances. First, approximately 136.64 acres of land were disturbed prior to the 1977 Act that required topsoil removal before commencement of mining operations. The status of these lands is varied, and includes active and inactive areas as well as reclaimed and non-reclaimed sites. Second, the area encompassed by the refuse and slurry piles includes 83 acres of land that will remain active until cessation of mining activities, although some reclamation of this area is occurring and will continue to occur. The third type of disturbance includes any future surface disturbances that may occur within the permit area. The soil removal and storage procedures for each of these disturbance types are discussed in the following sections. Many of the specific and routine reclamation procedures associated with each of these types of activities are identical and will be discussed in tandem.

Very little topsoil will be available for use in reclamation for any lands that were disturbed prior to the 1977 Act because

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topsoil materials were not salvaged. In addition, estimation of the available soil quality or quantity is difficult because many large areas encountered disturbances prior to or concurrent with mining activities. For example, part of the main facilities are located on a pre-existing townsite. Much of Grassy Trail Creek has been channelized, resulting in increased perturbation of the soils. Many large areas have been disturbed, regraded, and spread with clinker; some of these areas have been revegetated. No records exist as to the type of disturbances that have occurred on these areas. Consequently, evaluation or prediction of the potential soil materials is impracticable and difficult.

Large portions of the facilities are located over the HBC mapping unit, which has an average depth of sixty inches (Plate VIII-2 of Sunnyside Mines Permit). Potentially, this material is available for revegetation. Although this soil becomes increasingly alkaline with depth, the texture remains suitable for plant growth. However, the extent of activities on this soil series is unknown. In order to characterize and determine the extent of the in-place soils in these areas, several test pits were dug around the facilities in the fall of 1983.

Within each soil pit, soil samples were taken at twelve inch increments. A visual examination of soil texture, color, and quality was also made. Details concerning the sampling methods, laboratory procedures, and results are contained in Chapter VIII.

One borrow area has been identified for use in future reclamation (Plate III-23 of Sunnyside Mines Permit). The quantity of borrow material that will be required to cover the portals, coarse refuse and fine coal slurry is identified by reclamation area in Table III-44 of Sunnyside Mines Permit. The quantity of borrow material that is available for both industrial and reclamation purposes is identified by Borrow Area in Table III-43 of Sunnyside Mines Permit. The total amount of borrow material that will be required is about 449,643 cu yd; the amount of material available is about 638,650 cu yd. It is anticipated that all of the borrow material will be taken from Reclamation Borrow Area 1 (Appendix VIII-4).

Three test pits were dug to identify and evaluate the soil materials in the borrow area. Information concerning the test methods, laboratory procedures, and results are discussed in Chapter VIII of Sunnyside Mines Permit. It should be noted that the extent and quantity of these borrow soil materials is limited, and the material available will not adequately cover all areas that have been disturbed. In order to cover the entire 169.20 reclaimable acres of disturbance with 12" of topsoil, 7,370,351 cu ft of material would be required. This amount of soil material is not practicably available. The amount of topsoil that is available and has been bonded is discussed in section A.5.7.1.

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Because the practice of borrowing topsoil material requires the area be disturbed, this ultimately results in more acres being disturbed and reduces the total productivity. Therefore, borrow area materials use will be limited. These soils will only be used on areas where vegetation is not successful, or in other required circumstances such as covering the

As a consequence of these factors, many of the disturbed areas will need to be revegetated without the topsoil amendment. Revegetation test plots have been approved by the DOGM and will evaluate revegetation success under several soil depth, amendment, and seeding regimes (Appendix VIII-3 of Sunnyside Mines Permit). The results of these tests should provide information concerning the most appropriate reclamation techniques and procedures to ensure revegetation success.

Several areas in particular will, of necessity, be revegetated without additional topsoil. Topsoil is not expected to be required in areas where suitable soil material may remain in place. Test pits dug around existing facilities indicated that no toxic materials are present, and furthermore, none are anticipated at the time of reclamation. It should be noted that the refuse pile, which has shown indications of acidity problems, has been bonded for four feet of material. Reclamation test plots will assess topsoiling and revegetation methods and techniques for the refuse pile.

Any areas contaminated with oil or other petroleum products will be excavated and the material disposed in the refuse pile. These areas are expected to be few and small in extent, and will be covered with soil material and then revegetated.

Prior to re-disturbance of some areas, five stockpiles of soil materials were saved from several sites. The histories of these soils are unknown. The location of each soil material stockpile is indicated on Plate VIII-1 of Sunnyside Mines Permit, and the quantity of material contained within each stockpile is indicated as follows:

QUANTITIES OF STOCKPILED TOPSOIL

<u>Stockpile Location</u>	<u>Quantity</u>
East Borrow Pit (Industrial Borrow Pit 1)	36,600 cu ft
No. 3 Hoisthouse Pond (Industrial Pit 1)	4,200 cu ft
Slurry Pond Pile (Near Slurry Cell I)	127,900 cu ft
Haul Road Pile (NW corner of Refuse Pile)	102,200 cu ft
Rail Cut Pile (Rail Cut Pond)	15,800 cu ft
Reclamation Test Plot (At Test Plot)	67,500 cu ft

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Twinshaft Pond	<u>32,600 cu ft</u>
Total	386,600 cu ft

The soils contained in these stockpiles are currently committed for use in topsoiling the sites from where the soils were removed, i.e. the sedimentation ponds and the reclamation test plots.

On all areas that are covered with topsoil material, the material will be sampled in order to determine fertilizer or other soil amendment requirements. Soil samples will be taken from each site after the soil has been spread and prepared for seeding. Samples will be taken both from the surface (0-3" depth), and at a depth greater than six inches. Several samples will be taken from each site; the total number at each site will depend upon the soil conditions at the time. Samples will be analyzed for fertility, texture, pH, conductivity, lime, organic matter, nitrogen, phosphorous, potassium, zinc, iron, manganese, and copper. In addition, analyses for metal toxicities will also be run if the material has not yet been evaluated, or if field conditions warrant. The results of the soil testing will be used to establish recommendations for fertilizer or other soil amendments.

Future surface disturbances within the permit area are not currently identified, consequently site specific plans concerning topsoil removal and storage are not possible at this time. If any new areas are to be disturbed in the future, a permit amendment will be submitted to DOGM containing details of the site specific plans for topsoil removal, testing, stockpiling, and redistribution. Generally, however, the soil removal and storage procedures are as follows:

Handling of topsoil during mining operations involves several different activities. These activities include the removal of vegetation, topsoil stripping, stockpiling, and replacement of the topsoil onto the areas to be ultimately reclaimed. Trees and large shrubs will be removed prior to topsoil removal. Small shrubs, grasses, and forbs will be collected with the topsoil material since these materials increase both the available organic matter in the soil and the available seed stock. This procedure will be especially beneficial if the soils are stockpiled for a relatively short period of time. Topsoil will then be removed to the extent possible by front-end loaders and trucks, or by other standard equipment and methods such as scrapers. The stripping depth will be determined prior to removal based on information contained in Appendix VIII-1 of Sunnyside Mines Permit. This information will be confirmed in the field prior to disturbance. Samples of the

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topsoil material will be taken for chemical analyses. Suitable soil materials will be scraped from the areas to be disturbed and then stockpiled.

Stockpiles will be contoured, stabilized, and protected from wind and water erosion by seeding with rapidly establishing grass and forb species. Seedbed preparation will consist of contouring; fertilizer will not be required for stockpiles. Stockpiles will be seeded with the sage/grass seed mix shown in Table III-18 of Sunnysides Mines Permit. Because contractors are frequently used at the Mines for reclamation efforts, the precise equipment that will be used cannot be predicted. However, standard reclamation equipment and techniques will be employed in order to ensure stabilization and vegetation success.

A.5.3 Final Abandonment

A.5.3.1 Sealing of Mine Openings

Not applicable.

A.5.3.2 Removal of Surface Structures

(a) At the conclusion of mining, estimated at twenty-five years, all surface structures, with the exception of those permanent structures marked on Plate III-1 of Sunnyside Mines Permit, will be dismantled, removed and the land graded to blend with the surrounding areas. (b) Outlying surface facilities including substations, equipment and material storage areas, power transmission lines, will be dismantled and eliminated.

(c) Preparation plant reject and industrial waste disposal facilities are in areas approved by MSHA and the Utah State Department of Health (see Plate III-1 and Plate III-5 of Sunnyside Mines Permit). During the period the disposal sites are being actively used, they will conform to applicable state regulations such as degree of slope, compaction and coverage with inert material. Upon completion of mining activity, these areas will be scarified, covered with topsoil or material capable of supporting plant life, if necessary, and revegetated. Ancillary areas such as roads and borrow pits will be ripped, contoured and revegetated. The slurry ponds, coarse refuse disposal areas etc., are located at their final disposal site. Disposal is an ongoing process which includes regrading. Final revegetation plans for refuse are as yet undetermined as evaluation of revegetation methods are still underway (Chapter VIII of Sunnyside Mines Permit and A.5) however, a conservative estimate is included in the bond calculations. If the slurry or refuse

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material is mined, as planned, the final quantity requiring revegetation may be less than currently present.

(d) Most roads will be left to provide access for grazing and recreational activities. Those roads not left for future use will be ripped, contoured and revegetated. The roads which will not be reclaimed are illustrated on Plate III-1 of Sunnyside Mines Permit.

A.5.3.3 Disposition of Dams, Ponds and Diverisions

(a) Grassy Trail Dam and Reservoir: Not applicable.

(b) Slurry ponds: Fine refuse from coal cleaning is sent to several slurry ponds from which clear water is recovered for irrigation of some adjacent alfalfa fields. Upon completion of mining activities, these ponds will be filled, graded, covered with soil material, if necessary and revegetated. See Table III-38 of Sunnyside Mines Permit for pond reclamation requirements.

(c) Sediment ponds: All sediment control ponds no longer needed when reclamation of the disturbed area is completed, will be contoured and revegetated. See Table III-38 of Sunnyside Mines Permit for pond reclamation requirements.

(d) Diversions: No other diversion structures are planned at this time. Should such be constructed in the future, they will be reclaimed in conjunction with adjacent disturbed areas.

A.5.4 Backfilling and Grading Plans

A.5.4.1 Recontouring

Recontouring and regrading will be accomplished with the use of equipment such as a bulldozer, scraper, maintainer, backhoe, or front-end loader. The work will be done prior to replacement of any soil material and after removal of any facilities. The extent of surface disturbances at an underground mine are small compared to a surface mine, and a minimal amount of regrading will be necessary prior to revegetation.

Each site to be disturbed will be contoured to blend with adjacent undisturbed areas. They may not be returned to original contours, as those are unknown in several instances.

Small areas will be restored with a maintainer or front-end loader. A backhoe will be used when practicable for restoring cuts and fills to an approximate original contour such as was

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accomplished in Slaughter Canyon (Appendix III-4 of Sunnyside Mines Permit). Other road bases will be regraded to blend with rugged topography. Berms will be removed and the road bed ripped to blend with rugged topography.

The coarse refuse pile is contoured throughout its construction according to UMC 817.81-93 and the plan submitted in this Appendix.

The post-mine contours will remain approximately the same as the current contours. Final leveling and regrading changes will typically be very small, and they will not appear on the map. The final contours will approximate those shown on Plate III-1 of Sunnyside Mines Permit.

Specific postmining drainage designs and measures which will be used during the final reclamation phase have been provided to the Division. These measures include:

- A. Postmining drainage patterns showing locations and longitudinal profiles of major drainages crossing or originating on the reclaimed area.
- B. Design calculations and cross sections depicting expected peak flows, channel sizing and side slopes, channel bed slopes, expected velocities and erosion and stabilization measures to protect the intermittent and ephemeral drainages that will cross reclaimed areas.
- C. A timetable and method for removal of undisturbed diversions.

This information is contained in Appendix III-12 of Sunnyside Mines Permit, Post mining Hydrologic Design.

A.5.4.2 Removal or Reduction of Highwalls

Not applicable.

A.5.4.3 Terracing and Erosion Control

Terracing for erosion control is being done on the coarse refuse disposal area (Section A.4.9).

Regrading will be done on the contour when possible for erosion control purposes. The large acreages of pre-law revegetation also aid in erosion control. A diversion ditch (Plate III-12 of Sunnyside Mines Permit) has been installed to

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surround part of the surface facilities to minimize erosion across the disturbed area.

To aid in the control of runoff and erosion, drainages will be constructed during the regrading process to compliment the natural existing drainages. These drainages will be riprapped. Any rills or gullies greater than nine (9) inches which form on the regraded or topsoiled areas will be filled, stabilized and reseeded, if necessary (Section A.5.4.1).

A.5.4.4 Soil Distribution and Stabilization

There will be very little topsoil to redistribute. Available topsoil will be used where it will be needed the most. Pre-law revegetation has been generally successful without topsoil. Therefore, the assumption that reclamation can be accomplished without topsoil is valid.

The common depth of topsoil for the mapping units described from the disturbed sites is three inches. Most soil mapping units have only a thin A horizon situated directly over the C horizon. The HBC mapping unit is described to have had a six inch A horizon. All of this mapping unit located within the permit area has been previously disturbed. As almost all pre-mine topsoils were very thin, changes of any remaining undisturbed topsoil are small.

Any borrow material to be used will remain in place (Plate III-1 of Sunnyside Mines Permit) until the material is needed. For placement on large areas the material will be loaded, moved and spread with scrapers to an even depth as determined to be required by revegetation studies. For purposes of bond estimation a four foot depth has been assumed necessary to cover the coarse refuse disposal area. Other areas, such as the slurry ponds will be covered with one foot of borrow material.

After facility removal and regrading, the soil material on each site will be tested for productivity, fertility, and potential toxicities according to the following plan. An average of three samples per acre will probably be needed to determine soil quality and fertility. Each of the three samples will be taken from a different depth to obtain soil profile information. The number of samples ultimately taken will probably vary from site-to-site and depend upon the severity of disturbance.

Native plants are typically adapted to soils of low fertility and certain texture and chemical characteristics. When reclaiming with the use of topsoil, addition of fertilizer is frequently unnecessary. However, this may not be the case with soils still in place beneath buildings and other facilities. For instance, zinc, a necessary micronutrient for plant growth, was

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absent from one source of borrow material.

Any necessary soil nutrients will be spread prior to revegetation according to interpretation of test results and the species to be planted. If needed, phosphorous (P_2O_5) will be disked into the soil prior to planting. Nitrogen fertilizer (ammonium nitrate) will also be added if soil testing and interpretations indicate it is necessary.

Soil material will be worked on the contour whenever possible, unless there are steep slope limitations. Soil will be placed as evenly as possible, with deeper depth on bottom habitat types and more shallow depths on slopes. After facility removal on areas where no soil material will be replaced, the ground will be ripped with a bulldozer to a depth of eighteen to twenty inches to loosen the surface material and increase infiltration. The site will then be graded to its final contour and sampled for chemical analysis prior to planting as described above.

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A.5.5 Revegetation Plan

The revegetation plan has been designed to re-establish several plant communities on the disturbed sites that are self-sustaining and capable of controlling erosion. Species have been selected which are important for supporting and complementing the planned post-mine land uses of fish and wildlife habitat, recreation and livestock grazing. Perennial forage species selected will minimize the amount of disclimax species such as Bromus tectorum. Special plant selections are being tested for growth on the coarse coal refuse pile and final revegetation plans for this site have not been determined.

Little variation in revegetation techniques are expected to be necessary at Sunnyside, with the exception of those potentially required for revegetation of the coarse refuse; these are currently under study. The purposes of this study are presented in Appendix III-7 of Sunnyside Mines Permit. Other supporting information is contained in Chapter VIII of Sunnyside Mines Permit.

The primary differences between sites will be application of seed mixes appropriate to each habitat type. The amount of tackifier is doubled on steep slopes. Soil preparation equipment varies, e.g. bulldozer, tractor, disk, maintainer, front-end loader, etc. At a mine usually the change is more typically based on what is available, rather than because of specific site differences. The same is true for seeding equipment. Although it is planned to seed with a drill on level to gently sloping areas and by hydroseeder on slopes or less accessible areas, their use is interchangeable. If the drill breaks down, the hydroseeder is used. When the hydroseeder is used the seed rate is increased (Tables III-15 through III-18 and III-49 of Sunnyside Mines Permit).

A.5.5.1 Soil Preparation

Prior to seeding, soil will be disked or otherwise scarified if a crust has developed since final grading or disking of phosphorous. Otherwise, no special soil preparation will be necessary after final grading and addition of any necessary nutrients.

Special soil preparation, such as the addition of lime, may be necessary prior to revegetation of coarse coal refuse. This factor is currently under study (Chapter VIII of Sunnyside Mines Permit). No other areas other than coal refuse disposal sites will require special soil preparation.

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A.5.5.2 Seeding and Transplanting

The revegetation plan addresses each habitat type or vegetation type and not each disturbed site. As the disturbed areas are relatively small, each facility or area will be reclaimed to the appropriate habitat type in which it occurs and these are illustrated on Plate III-1 of Sunnyside Mines Permit. The exception is that until the research is completed on the coarse refuse, it will be uncertain what habitat type will be created. It is likely, however, that it will be returned to a shrub/grass type rather than a woodland.

All disturbed areas will be seeded the first planting season after site preparation is complete. Although fall is the typical planting season for the area, because of shrub dormancy periods, spring seeding of grasses and forbs can also be done. Any necessary transplanting will be done in early spring.

The seed mixes have been carefully prepared according to the habitat type to be reseeded, whether final or interim, the post-mine land uses, erosion control capability and seed availability (Tables III-15 through III-18 and III-49 of Sunnyside Mines Permit).

Experience has proven the addition of annual and exotic grasses, which have quick establishment rates, is detrimental to the establishment of natural species, both seeded and invaded (Oaks 1981, Wolfe 1982). Therefore, these have been omitted except in the interim seed mix. All species combined will provide erosion control. Table IX-39 of Sunnyside Mines Permit describes documented forage values of the species to be used for deer and elk. The mixes can be expected to vary from year-to-year as more species become available, and cost and availabilities fluctuate. Table III-19 of Sunnyside Mines Permit delineates cultural characteristics of some of the species selected.

Each seed mixture is titled for the habitat to be reclaimed. Locations of the disturbed areas, mapped according to habitat type, are shown on Plate III-1 of Sunnyside Mines Permit. The revegetation plan is designed to return each site to a community similar to what is thought to have occurred prior to the mining disturbance.

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Seeding rates are based upon critical area (Merkel and Herbel 1973, EPA 1975). The main facility sites and other similar gently sloping areas will be drilled with a native seed drill. Slopes and areas difficult to reach will be seeded with a hydroseeder. The seed will be applied in a water slurry; mulch will be applied in a separate step.

The current plan will require the establishment of about 1,800 shrubs and trees per acre to equal the densities in the pinyon-juniper/grass reference area. This live stem density, as required in UMC 817.117, can be achieved from the shrub seed currently in the seed mix. However, only if necessary to supplement seed mix, shrub transplants (containerized stock) will be hand planted to achieve required stem density.

The transplanting will be done in the spring to allow time for the roots to establish before winter. These species and procedures may be changed as data becomes available from the test plots being instigated this summer.

The other tree type (pinyon-juniper) is only fifteen acres which consist of small sites or long narrow stripes. No trees or shrubs will be transplanted here, as natural invasion shall fill in these areas. The shrub seed in the seed mix will provide enough stems per acre to equal the densities (550 stems/acre) in the pinyon-juniper reference area.

The two shrub types (mountain brush and sagebrush/grass) shall not require transplanting. The amount of shrub seed mix will provide enough stems/acre to comply with UMC 817.117.

A.5.5.3 Mulching

Seeded areas will typically be mulched with native hay at a rate of two tons/acre. The hay will be installed with a hay blower or by hand on small areas. It will be crimped in place on level areas and/or tacked with an application of about 150 pounds/acre wood fiber and liquid organic tackifier such as J-tac. A rate of forty pounds/acre is used on level to gently sloping areas. On steep slopes, the rate of the liquid tackifier is doubled.

Jute matting or excelsior blankets will be used to aid seed establishment in drainage areas or to control localized gullying. Gullies are a common component of the local and regional topography. Therefore drainages through planned sites will be constructed during regrading to help control erosion.

Within limitation of equipment, much of the rock will be replaced. Rocks help act as a deterrent to erosion, improve water harvesting and create specific habitat types.

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Disease and Pest Control

Any necessary insect or rodent control will be guided by the U.S. Fish and Wildlife Services, The Utah State Cooperative Extension Service, and the Animal, Plant, Health Inspection Service.

A.5.5.5 Monitoring

Revegetated areas will be monitored on a schedule recommended by DOGM. Revegetated sites not subject to final reclamation will not be monitored until after final revegetation. Revegetation monitoring is discussed in Section 9.8.

A.5.6 Schedule of Reclamation

3.5.6.1 Detailed Timetable

Contemporaneous reclamation is discussed in Section A.5.1; these activities will continue until mine closure. Upon completion of mining, reclamation will be performed as described in Sections A.5.3, A.5.4 and A.5.5. Table III-10 of Sunnyside Mines Permit presents the proposed reclamation and revegetation time schedule.

The Soil Conservation Service recommends autumn seeding (George Cook, personal communication). Many native shrub seeds have a stratification requirement and autumn planting will allow these seeds to overwinter (Monson and Christensen, 1975). However, spring plantings of grasses and forbs will also be done. If any transplanting becomes necessary, it will be in early spring to allow the trees and shrubs to naturally break dormancy.

Reclamation success of post 1977 disturbed areas will be determined by comparing data from DOGM approved reference areas with the corresponding reclaimed sites, in accordance with UMC 817.116 and 817.117. The parameters to be compared include vegetation cover and stem density.

Following the final seeding and mulching of the reclaimed areas, the monitoring will begin. According to UMC 817.116(b)(1), the 10-year responsibility period cannot begin until ground cover in the reclaimed site equals (within 70%) that in the reference area. For bond purposes we will assume it will take ten years for ground cover and stem densities to achieve approved standards. During this 10-year period, biennial

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sampling will be conducted on the reclaimed sites and the reference areas, resulting in five sampling seasons. Cost calculations for this sampling are shown in Table III-35 of Sunnyside Mines Permit.

Reclamation and revegetation are generally inspected and monitored by OSM and DOGM. Revegetation monitoring is discussed in Section 9.8 of Sunnyside Mines Permit. On federal lands, disturbed acreage and reclaimed areas will be surveyed regularly and reports submitted according to CFR 211.62. Reclaimed site productivity will be determined during the last two years of the 10 year responsibility period prior to bond release.

A.5.7 Cost Estimate for Reclamation

The reclamation bond has been computed for post-law disturbances and pre-law disturbed areas which have been used since 1977. No bond is calculated for areas disturbed and revegetated prior to 1977, (Plates III-20-23 of Sunnyside Mines Permit).

Interim and other minor revegetation work, such as on topsoil stockpiles, is not computed in these figures. No additional final revegetation or reclamation is planned for this permit term, outside of the ongoing regrading during refuse pile construction.

The remaining 169.20 acres will be final reclaimed at the end of the life of the mine. Certain roads and bridges, providing access to the canyons and high country will not be reclaimed. These roads are considered to be necessary and appropriate for the post-mine land uses and include Water Canyon. These are not included in the reclaimable disturbed acreage figures.

There will be additional revegetation of unbonded pre-law areas in the future. These areas have been mapped (Plates III-20 through III-23 of Sunnyside Mines Permit) illustrating the current condition of the pre-law disturbances. In Appendix III-10 of Sunnyside Mines Permit these areas are described and the acreages are listed in Table 2 of Sunnyside Mines Permit. About 50% of these pre-law disturbances were revegetated in the 1960's and about 33% remains in a completely disturbed condition.

Cost estimates for each task in the bond were taken from the Means Site Work Cost Data (1985) when available. For those pieces of equipment not in the Means Site Work Cost Data Book, actual cost experience, depreciation, repair frequency, and cost of operating similar size pieces of equipment were used to estimate ownership and operating costs.

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The coarse refuse area will be reseeded to pinyon-juniper/grass. Successful methods for transplants are pending the results of transplanting on experimental refuse plots, therefore, costs will not be included in the bond at this time. Table A-1 outlines the various separate steps considered in reclamation cost development. Each step is considered separately on the following pages. Every step of reclamation will not always be necessary at each site. For example, some areas will require little regrading. The refuse pile is generally graded to shape during construction. In other cases, minor regrading may be accomplished by finishing. Derivation of these costs are found in the following pages.

A.5.7.1 Cost Estimate of Each Step of Reclamation

The cost estimate is divided into three sections: Structure Demolitions, Earth Work, and Revegetation and Soil Testing.

Removal of Buildings, Facilities and Foundations

The cost of facilities removal was derived from the Means Site Work Cost Data (1985). These costs include facility dismantling and removal from the site. Table III-28 of Sunnyside Mines Permit provides the breakdown and cost estimate for facility removal.

Power lines

Assumptions:

- 1) Poles will be cut off at ground level
- 2) 1000 ft/hr cable winding (\$5.00/hr)
- 3) 4 poles per hour can be cut down (2 men)
- 4) Poles are 300 feet apart
- 5) 2 Hours per pole to strip and load poles
- 6) 3,400 ft power line (10,200 ft cable)

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	<u>Labor Cost</u>	<u>Equipment Cost</u>
Cutting Poles	2 men 2.75 hours (\$22.40/hr) \$123.20	2 chain saws \$300.00 each Maintenance \$2/hr \$ 5.50 each
Pole Striping and Removal	2 men 2 hr/pole 11 poles \$985.60	
Cable Winding	2 men 1000 ft/hr/10.2 hrs \$456.96	\$ 51.00
Subtotal	\$1,565.76	\$662.00
Total Cost	<u>\$2,228.00</u>	

Mine Sealing Cost

Not applicable.

Pond Reclamation Costs

There are five ponds on the Sunnyside Fuel permit that will require filling and leveling during abandonment. These ponds range in size from a 53,000 gallon capacity Pasture Sediment Pond, to an 11.8 million gallon Coal Slurry Sediment Pond system. The total combined capacity of the five ponds is over 13 million gallons.

The ponds will be filled in and leveled to blend with the surrounding topography. A D9L Cat dozer will rip and push the pond embankments to achieve this. In flat areas, the dozer will maintain a minimum 1% grade to prevent ponding.

The volume of material required to fill these ponds is calculated in Table III-38 of Sunnyside Mines Permit. The total volume to be pushed is 61,295 bank cubic yards (BCY). This compacted embankment material has a density of 2400 lb/yd³. Therefore, the estimated loose cubic yards (LCY) of material is (61,295) x (2400/2200) = 66,867 LCY.

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Assumptions:

- 1) Average push distance ... 150 feet
- 2) Volume ... 66,867 LCY
- 3) Unit Cost Rate ... \$0.76/cy, 300 H.P. (Means Site Work Cost Data, 1985, 2.3-163-5220).
- 4) Total Cost
66,867 LCY x \$0.76 = \$50,819

Regrading Costs

Mode of Operation

For the purposes of this estimate, the following mode of operation is generally assumed. After final facility removal, a 300 H.P. dozer will regrade the areas to blend with the typical surrounding contours. Holes from foundation removal (removal assumed to extend about two feet below ground surface) will be filled. Berms and railroad track beds will be graded to match surrounding topography. Refuse piles are assumed to be previously constructed to their final grade. It is assumed that the remaining acreage may require at least some regrading, resulting in a maximum estimate of regrading costs. A scraper will be used to redistribute and level berms and soil stockpiles.

Soil Ripping

Ripping will be required on the sites. There are 169.20 acres which require ripping and disking to reduce compaction and prepare a seedbed. There are 47.04 acres of refuse and 122.26 of slurry that will be covered by 4' and 1', respectively of borrow material unless test plot results indicate that reclamation success will be achieved using less material, or an alternative method. A D-9 dozer will be used to rip the ground. In canyon areas where the scraper becomes immobile, the D-9 dozer will regrade the area by ripping and pushing.

Material to be Moved - Regrading and Ripping Costs

The volume of material to be moved was determined using the cross-sections from the respective areas. These cross-sections are found on Plates III-32 (1 & 2) of Sunnyside Mines Permit. The Means Site Work Cost Data (1985) was used for cost estimations. These costs include overhead and profit. Below is the computed volumes and grading costs by area.

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reclaimed sites to achieve tree and shrub canopy cover found in the reference area.

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The success of tree and shrub establishment will be determined by comparing stem densities of the reclaimed sites with the reference areas. In accordance with UMC 817.117, only shrubs or trees over one foot in height, over two years old, and with at least one-third of its length in the live crown will be counted. Densities will be estimated by counting the number of stems in a known unit area. In the pinyon-juniper types an elbow shaped plot illustrated in Figure IX-5 of the MRP will be used to estimate densities. This plot is two rectangular shaped plots each, 6 x 30 meters, with one parallel to the slope and the other perpendicular. In the mountain brush and sagebrush vegetation types, a plot 13.2 ft x 33 ft (0.01 acre) will be used to estimate shrub density. This size plot was developed because of the size and density of shrubs in this type.

Responsibility Period Timetable

Once the approved densities [UMC 817.11(c)(2)] and ground cover [UMC 817.116(b)(1)] have been achieved, the 10-year responsibility period can begin. Statistically adequate samples and statistical comparisons between the reclaimed sites and the reference areas will be conducted at least four (4) years during the 10-year period. The first two sampling periods will be in the third and sixth years to assure the revegetated areas are progressing and maintaining sufficient cover and density. During the last two years, the areas will be adequately sampled and statistically compared (one tailed t-test) for ground cover and stem density to prove reclamation success and allow for bond release.

Monitoring of the Reclaimed Areas

Qualitative inspections and monitoring of the final reclamation will be done on an annual basis throughout the bonding period. All sites will be inspected at least once a year for seeding or soil stability failure or problem areas (actual or potential); any damaged areas will be repaired.

Vegetation sampling will commence on the reclaimed sites and the reference areas the second year after reseeding. This sampling will continue on a biannual basis until groundcover and stem density reaches the approved standards needed for the ten year responsibility period to begin. For bond purposes, we have assumed the reclaimed sites will require ten years to reach these standards. Therefore, five seasons of sampling will be conducted prior to the start of the responsibility period.

During the ten year responsibility period, sampling will be conducted for four seasons. During the first, third, and fifth seasons, sampling will be conducted to monitor the success of revegetation. The final two years of sampling will be done to demonstrate reclamation success and allow for release of the

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bond. Labor costs for sampling are estimated an \$100.00 per man per day.

Water monitoring during the period between final reseeding and bond release will consist of sampling five sediment ponds. These five ponds are limited discharge ponds and need to be sampled only when a discharge occurs. These ponds are designed to discharge only after a ten year, twenty-four hour storm event. For bonding purposes it was assumed these ponds will require sampling only three times each over the ten year period. The labor cost for sampling was estimated at \$100.00 per man per day and labor costs at \$200.00 per sample.

The monitoring costs are calculated by prorating the monitoring costs developed in Table III-35 of the Sunnyside Mines Permit for the total reclaimable acres of the Sunnyside Mines by the reclaimable acres transferred to Sunnyside Fuel.

A.5.7.3 Forecast of Performance Bond Liability During Permit Term and Forecast of Liability for the Life of the Mine.

There is no difference between bond for the permit term and bond for the life of the mine. There are no additional disturbances planned for the Sunnyside Mine during the 5-year permit term.

Table III-45 gives the estimated costs for facility removal, and reclamation costs for the reclaimed areas. In addition to the total contract and reclamation costs, there are a number of add-on costs including supervision, overhead and monitoring costs. Equipment set-up and demobilization cost includes the cost of transporting necessary reclamation equipment. The total bond was estimated to be \$1,196,936.00 with the pro-rated per acre bond being \$7,074.00.

The type and amount of bond will be negotiated with DOGM per UMC 805.14.

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Table A-1

TOTAL PERFORMANCE BOND FORECASE

AREA DESCRIPTION: Refuse disposal areas, including coarse refuse, industrial waste borrow areas, and slurry ponds

Vegetation Type: Pinyon - juniper and grass

Reclaimable Acres: 169.2

Total Reclamation Cost:

Structure Removal	\$ 2,228
Pond Reclamation	50,819
Ripping, Pushing, Regrading and Borrow Soils	724,395
Soil Testing, Fertilizer & Seed Bed Preparation	33,388
Revegetation	106,044
Field Supervisor (3 months)	20,500
Project Manager (6 months)	30,770
Monitoring (prorate 169.2 acres/287.36 acres=.589)	100,000
Subtotal	\$1,058,144
Contingency at 5%	52,907
Total Bond for Sunnyside Fuel	1,111,051
Cost per Acre (169.20)	6,566
Adjusted Total Bond for 5-year term (F/F,1.5%,5)=(1+i) ⁿ =1.0773	1,196,936
Adjusted Cost per acre (169.20 acres)	7,074