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June 7, 1984

Ms. Mary Boucek
 Utah Division of Oil, Gas and Mining
 State Office Building
 Salt Lake City, Utah 84114

RECEIVED**JUN 11 1984****DIVISION OF OIL
 GAS & MINING**

Re: Revised Final Technical Analysis for Sunnyside Mines
 (SLA Project Number: UT-DOGM-01)

Dear Mary:

Enclosed please find one copy of the Revised Final Technical Analysis (TA) for Kaiser's Sunnyside Mines which incorporates the comments from OSM's review of the draft TA dated April 6, 1984. Also included are review and comments on Kaiser's additional information concerning alluvial valley floors and geotechnical issues which we received April 27, 1984. Please note that reference is made to ACR or DOC responses and letters when this information is not included in the MRP. Some reports (e.g., the Winget Report on aquatic resources) and title pages of appendices in the MRP were not found or were inserted in the wrong chapters.

The Division should be aware that Kaiser has made some revisions in the recent permit application received on May 24, 1984, in areas other than the AVF and Mining Engineering. We have addressed these changes within the time allotted. Some of the stipulations stated in the enclosed TA reflect the additional new information in the permit application.

Certain land use questions remain unanswered concerning the disposition of road and the facilities to remain after reclamation. These are addressed in the TA and require a decision by the Division.

The following can be considered "baseline" stipulations and need to be addressed:

1. Backfilling and grading (817.101)--Kaiser has not responded to all stipulations given in the first TA.
2. Refuse disposal (817.91 to 817.93), Stipulation 2--if more information is submitted to us promptly, we can still address this stipulation.

Ms. Mary Boucek

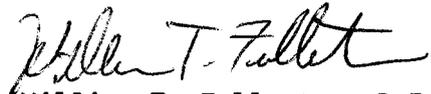
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June 7, 1984

3. Bonding--all stipulations must be cleared up so that we can determine the final bond estimate. Before this can be done, the information from 1 and 2 above must be submitted.

If you have any questions concerning the above comments or the revised final TA, please contact Dr. Rebecca Summer or me.

Sincerely,



William T. Fullerton, P.E.
Senior Hydraulic Engineer

WTF:RMS:bbv
RDF193/R389CL

Enclosures

TECHNICAL ANALYSIS

KAISER STEEL CORPORATION
SUNNYSIDE MINES
ACT/007/007
CARBON COUNTY, UTAH

RECEIVED

JUN 11 1984

DIVISION OF OIL
GAS & MINING

Submitted to

Utah Division of Oil, Gas and Mining
State Office Building
Salt Lake City, Utah 84114

By

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Project Number UT-DOGM-01
RDF193/R389

June 8, 1984

TECHNICAL ANALYSIS
Kaiser Steel Corporation
Sunnyside Mines
ACT/007/007, Carbon County, Utah

INTRODUCTION

The Sunnyside Mines project is proposed by the Kaiser Steel Corporation (KSC) of Oakland, California. The project is located 120 miles southeast of Salt Lake City in the Book Cliffs coal field. Over 14,000 acres make up the permit area which includes Whitmore Canyon, a box canyon incising the Book Cliffs.

Underground mining in the permit area began in the late 1890's and has continued to the present. The expected life or termination date is unknown but is expected to be greater than the 5-year permit. Most of the land in the permit area is owned by Kaiser Steel, the remaining being BLM or privately owned land. Nearly 13,000 acres in the permit area are expected to be surface land overlying the underground workings over the life of the permit.

An application for a mining permit was received by the Utah Division of Oil, Gas & Mining (DOGGM) in March, 1981. An Apparent Completeness Review (ACR) was sent to the applicant on June 21, 1983. Kaiser Steel Corporation responded to the Review with a Supplement Submission to the mine application and submitted it to DOGGM on September 2, 1983. A Determination of Completeness and Technical Deficiencies report was sent to Kaiser on November 17, 1983. Kaiser responded to the DOC by submitting additional material or replacement material for the ACR Supplement Submission to DOGGM on November 18, 1983.

Both the upper and lower Sunnyside seams are mined. Mine workings during the 80-year operation cover an area approximately 6-1/2 x 2-1/2 miles. Since 1961, over half the mining is by the longwall method and the balance is mined through development work and limited room-and-pillar techniques.

About 55 million tons of coal have been produced in the past, and projected production ranges from 1.1 to 1.4 million tons of coal per year during this permit period. Coal is washed at a preparation plant, conveyed to stockpiles, and transported out by unit trains of the Denver & Rio Grande Western Railroad. Coarse refuse is trucked to the disposal area while fine refuse is slurried to slurry ponds for disposal and recovery of water.

The major potential disturbances of the environment are:

- surface water quality - increase in oil and grease and total suspended solids
- surface disturbance of about 244 acres during the permit period

At the conclusion of mining, 25 years from now, surface structures will be removed, the disturbed land surface will be recontoured and revegetated. Some roads are proposed to be left for access to grazing and recreational purposes.

Grassy Trail Reservoir, which supplies culinary water to Sunnyside and East Carbon, is expected to remain.

Existing Environment

Sandstone bedrock cliffs and colluvial slopes dominate the landscape of the mining area. Two pediment surfaces are preserved below the cliffs which support pinyon-juniper stands.

Other vegetation communities include sagebrush-grass, serviceberry-sagebrush, mahogany, cottonwood, willow, birch, rabbitbrush, Douglas fir, and aspen.

No threatened or endangered species have been found in the permit area.

Structurally, the permit area lies within the Book Cliffs region of the northern extent of the San Rafael Swell. The Book Cliffs form a south-facing escarpment and constitutes the boundary between the Canyonlands and Uinta basin section of the Colorado Plateau Physiographic Province.

Although subsidence cracks related to mining have been mapped in this area, there is no obvious evidence of impact to groundwater and springs. Grazing, hunting, trapping and recreational uses of the land are not expected to be affected.

Grassy Trail Creek generally flows year round except for periods of extremely low precipitation. The other creeks in the permit area are intermittent.

Floral communities within the permit area which have been previously disturbed include: (1) mountain brush, (2) pinyon-juniper, (3) pinyon-juniper/grass, (4) riparian, and (5) sagebrush/grass. No threatened or endangered plants are known to exist within the permit area. One plant, Hedysarum occidentale canoe, classified as a high priority two by the Utah Native Plant Society, was found in a side canyon of the permit area; however, it is removed from potential disturbance.

The predominant land use is grazing, although mining has occurred since 1898. The land is also used for recreation and as wildlife habitat. By 1979 there were approximately 80 kilometers of underground tunnels covering an area of 15 square miles. Post-mining land use will be a return to pre-mining uses. In addition, no prime farmlands have been found within the permit area.

GEOLOGY

Regional Framework

The permit and adjacent areas of the Sunnyside mines lie in the Book Cliffs-Roan Plateau region which borders the Wasatch Plateau to the west and the Mancos Shale Lowland to the south. Locally, this lowland area is known as Castle Valley (Stokes, 1977). Elevations range from 4,000 to 6,000 feet at the base of the cliffs to 10,300 feet at the highest caprock of the plateau. Steep escarpments and canyons are the prominent landscape features, above

which are plateaus and below which are plains and pediment surfaces. The south-flowing Green River and Price River cut through the cliffs and have formed the shaley lowlands.

The Sunnyside Mines are located within the Book Cliff coal field. This field includes the Book Cliffs, the plateau, and another escarpment, the Toan Cliffs, ten miles north of the Book Cliffs. The coal beds are exposed along the sinuous south or southwest facing Book Cliffs. The cliffs are formed by a band of strata dipping gently away (north) from the broad San Rafael dome.

The outcropping rocks in the permit and adjacent area include, from oldest to youngest, the Mancos Shale (3,000 to 4,400 feet thick); Blackhawk Formation (460 to 700 feet thick), which includes the Kennilworth, Sunnyside and Aberdeen Sandstones; Castlegate Sandstone (200 feet thick); Price River Formation (150 to 300 feet thick); Flagstaff Limestone (300 to 350 feet thick); Colton Formation (3,000 feet thick); Green River Formation (0 to 125 feet thick); and Quaternary alluvium (0 to 50 feet thick). The Colton Formation, composed of interbedded sandstone and siltstone, is a cliff former and caps most of the mining areas. The Green River Formation, composed of limestone, siltstone and shales, caps the very highest ridges. There are no major unconformities in the area.

The Blackhawk Formation contains the major coal-bearing units in the Book Cliffs. The upper and lower Sunnyside seams occur between the upper Mudstone and Sunnyside Sandstone members. The strike of the beds is generally parallel to the face of the Book Cliffs and dips are generally uniform from three to eight degrees to the north-northeast.

Faulting and Jointing

Two sets of faults running perpendicular to each other cross the permit area. Scattered faults trending west-northwest to northwest (Sunnyside fault zone) are limited to a few miles in length. Several faults with displacements from one to 30 feet trend N 24° W across the work area. The Sunnyside fault zone probably controlled the development of Whitmore Canyon. Several faults trending east-northeast occur in the Whitmore Canyon area.

Joints predominantly trend northwest and east-northeast in the sandstone ledges. The cleavage and near vertical shatter zones in the coal also parallel this trend.

Coal and Overburden

Only two coal seams, the lower and upper Sunnyside beds, are of economic interest and will be mined. The lower bed has been extensively mined in the southwest part of the area and ranges in thickness from four to over 18 feet. The upper bed is from 0.6 to 6.2 feet thick. Total sulfur content is around one percent or less and contains less than 0.2 percent pyritic sulfur with the majority being organic sulfur. Ash contents of the two beds range from 9 to 13 percent.

The interburden ranges from two to 36 feet of siltstone and shale. A problem with mining the upper Sunnyside is its close proximity to the uppermost sub-bed of the lower Sunnyside, e.g. two to three feet in the Sunnyside No. 1 mine (Doelling, 1972).

Strata immediately above and below the coal show extreme lithologic variability. This roof and floor rock contains small amounts of disseminated pyrite and may or may not be calcareous. Total sulfur is usually less than one percent. Most of this is in the form of pyritic and organic sulfur. Clay content is highly variable--from about one to 20 percent.

GROUNDWATER HYDROLOGY

Occurrence

Groundwater occurs naturally in all the geologic formations which are found in the Sunnyside Mine project area. Above the Blackhawk coal-bearing formation lie the Castlegate Sandstone, Price River Formation, North Horn Formation, Flagstaff Limestone, Colton Formation and Green River Formation.

The Colton and Green River Formations are present primarily in the northern quarter of the permit area and along the eastern boundary and form steep, sharply-incised slopes off of the uppermost ridges. The Flagstaff Limestone/North Horn Formation occupies the greatest surface area of any single geologic unit within the permit area and tends to form a broad, gently-sloped arcuate band surrounding the central drainages within the permit area. These central drainages have been incised and expose the Price River Formation; the Castlegate Sandstone, the lowest member of this formation, is exposed along the western boundary of the permit area. The only extensive outcrop of the coal-bearing Blackhawk Formation within the permit area occurs in Whitmore Canyon near the town of Sunnyside, and for this reason the surface facilities of the Sunnyside Mine were developed in this location.

These geologic units are typically not saturated everywhere, being drained within short lateral distances from the walls of deeply incised canyons. The existence of many springs has been documented within several miles north of the permit area in the Colton and Green River Formations which feed Grassy Trail Reservoir; in addition, a number of springs issuing from the Colton and North Horn-Flagstaff Formations have been identified and sampled within the permit area (Kaiser Steel Corp. Mining and Reclamation Plan, (MRP).

Movement

Limited data exist to determine the nature and extent of perched aquifers, regional aquifers and the degree of hydrologic connection with unconsolidated Quaternary alluvial and colluvial deposits. However, regional studies of the same geologic formations in the Wasatch Plateau coal fields (Danielson, et. al. 1981; Danielson and Sylla, 1983; Simons, Li & Associates Inc., 1984a and 1984b) indicate that the movement of groundwater is generally from upland recharge areas to stream and valley discharge zones which overlie the essentially impermeable Mancos Shale. This general movement is not solely controlled by the regional dip of the geologic strata, which is northerly, but is also influenced by local hydrogeologic features including faults, joint

systems, low-permeability mudstone and siltstone layers, high permeability, paleochannel sandstone deposits, and topographic features such as incised drainages. The Sunnyside underground coal mine intercepts this groundwater, short-circuiting the natural flow paths and locally dewatering geologic formations. This intercepted groundwater is held in underground sump areas within the mine prior to discharge to Grassy Trail Creek in Whitmore Canyon or to the Icelfander drainage.

Recharge

The exposed sandstone and limestone outcrops in the project area provide the opportunity for direct recharge of the consolidated bedrock formations. Due to the low surface relief and numerous surface depressions of the Flagstaff limestone as well as its areal distribution throughout the study area, this lithologic unit most likely accounts for the largest percentage of the total basin recharge compared to the other geologic formations. The alluvium and colluvial slope wash deposits provide recharge areas for shallow, canyon-bottom groundwater systems. These shallow systems may recharge, or be recharged by, the surrounding bedrock.

Annual recharge occurs primarily during the May-June snowmelt period when saturated soil conditions prevail for extended periods of time. The USGS estimates that three to eight percent of the annual precipitation recharges the groundwater system (Danielson and Sylla, 1983, p. 25); however, a recent study by Simons, Li & Associates (1984a,b) of the base flow of similar basins in the nearby Wasatch Plateau coal field indicates that a recharge figure of nine to 12 percent of the average annual precipitation may be more applicable to this region, based on long-term stream flow and base flow records. Based on an average annual precipitation of approximately 16 inches over the Grassy Trail Creek drainage basin with an area of 25,390 acres, this amounts to an estimated 3,000 to 4,000 acre-feet of groundwater recharge annually. This is comparable to the 5,100 acre-feet average annual discharge volume of Grassy Trail Creek at USGS gage 09314340 with 25,664 acres of drainage area. The Sunnyside Mine complex reports a long-term average groundwater discharge rate of approximately 730 gpm, or roughly 1,200 acre-feet per year.

Groundwater Data

Groundwater parameters studied in the permit area include mine discharge quality and quantity. Water quality analyses from several springs in the permit area were performed, although no records of discharge rates exist for these sources. No monitoring wells are present within the permit area, although the applicant has stated an intent to instrument future coal exploration drill holes as monitoring wells. Additionally, potentiometric surface data on the various water-bearing formations are lacking, therefore the strength and orientation of vertical and horizontal groundwater gradients are unknown, as are the locations of local and regional groundwater divides.

Groundwater Quality

The quality of groundwater within the permit area has not been well established, although in general the best quality occurs in or near the mountain recharge areas and the poorest quality in lowland areas. The water

quality can vary greatly from point to point within the basin due to geologic conditions which affect transport rates, residence times within the groundwater system, and the opportunity for the dissolution of rock minerals.

Several seeps and springs have been sampled in various geologic formations during August 1983, on or adjacent to the permit area as part of the applicants' supplemental submission in response to the Apparent Completeness Review. In general, the pH of spring water is consistently basic, ranging from 7.8 to 8.4 in the various geologic formations. Total dissolved solids concentrations (TDS) in springs originating in the upper and lower Colton Formations range from 260 to 855 mg/l, which is considered good to fair for drinking water use. Sulfate concentrations were found as high as 445 mg/l from these formations, with most sulfate concentrations being considerably less.

One spring originating from the Flagstaff-North Horn Formation contained a TDS of 1,530 mg/l with a sulfate level of 770 mg/l. This sample represented the highest concentrations found in any groundwater sample, and is in sharp contrast to water quality results from the same formation in the neighboring Wasatch Plateau, where TDS are characteristically less than 250 mg/l. It is unknown if this spring is representative of the water quality within the Flagstaff-North Horn Formation in this area. Further monitoring of springs within the Flagstaff-North Horn Formation is needed to accurately describe the water quality characteristics of this formation.

In-mine water samples from groundwater inflow points yielded TDS and sulfate levels intermediate between the above described observations. The three samples obtained from within the mine (Blackhawk Formation) yielded 575 to 980 mg/l TDS and 179 to 451 mg/l sulfate concentrations.

Below the mine, a spring emanating from the Mancos Shale on the Big Springs Ranch yielded a TDS of 1,110 mg/l and 379 mg/l sulfate. This observation is fairly typical of the Mancos Shale Formation, and further degradation of water quality in the downstream direction can be expected from this highly saline source. Studies in the Price-San Rafael river basins unit (CH2M-Hill, 1983) have shown that TDS ranging from 2,000 to 3,000 mg/l are common downstream from irrigation-return flows from agricultural lands located on Mancos Shale-derived soils.

Water quality observations from selected springs in the area are given in Table 1, excerpted from Table VII-5 and Appendix VII-2 of the applicant's MRP.

An interesting comparison is found between the spring water quality and the quality of mine discharge water. TDS within the mine discharge water range from 820 to 4,320 mg/l, with a mean of 1,760 mg/l (161 samples) (Table VII-1 of MRP). These concentrations are in general considerably higher than the natural groundwater quality as evidenced by the spring water samples. This observation refutes the often-used argument that mine water discharged to local streams should be of better quality than natural groundwater discharge because the flow path, hence residence time and dissolution opportunity, is reduced or short-circuited. Undoubtedly the mine discharge water is affected by in-mine handling, sumping, and exposure to coal and rock dust which

Table 1. Groundwater Quality from Selected Springs on or Adjacent to the Sunnyside Mine Permit Area (August 1983 - single sample).

Sample Designation	Formation	Sample I.D. Number	Iron	pH	TDS	TSS	SO ₄
WC-3	Upper Colton	1056	0.12	8.4	855	14	445
BCLF-1	Upper Colton	1102	0.03	8.4	570	8	220
BCRF-1	Upper Colton	0950	0.09	7.9	390	10	45
PC-1	Flagstaff/North Horn	1114	0.09	8.1	1,530	6	770
PC-1	Upper Colton	1346	0.17	8.3	560	56	218
N2CL-2	Lower Colton/ Flagstaff- North Horn	1535	0.03	7.8	605	6	237
WR-2	Lower Colton	1119	0.05	7.8	295	4	8
WR-1	Lower Colton	1035	0.03	7.9	260	6	4
MSU-1	Shaft, No. 1 mine	(83-3238)	0.03	8.3	575	4	179
PCAS-1	Shaft, No. 1 mine	(83-3250)	0.15	8.1	935	14	451
N2C-25	No. 3 mine	1220	0.15	7.9	980	20	438
F-6	Mancos shale on Big Spring Ranch	1525	0.03	7.9	1,110	14	379

Source: Kaiser Steel Corporation, Mining and Reclamation Plan, 1984.

Note: All units in milligrams per liter (mg/l) except pH (pH units).

accounts for the observed increase in dissolved constituents. TDS may also increase slightly but in general the in-mine method of sumping prior to discharge provides adequate detention time for fine particle settling.

Groundwater Use

According to information presented in the applicant's submittals, no wells are located within the permit or lease areas for either water supply or monitoring purposes. The applicant has stated that future coal exploration holes will be instrumented as monitoring wells for the observation of potentiometric surfaces and for sampling of groundwater quality. At present, excess mine water discharged from the Sunnyside Mines is used for coal cleaning and irrigation of several alfalfa fields, the city park, and the golf course. Unused water is discharged to Grassy Trail Creek. The applicant holds permit VWC 28812 (91-231) which allows this usage, and NPDES permit UT0022942 for effluent discharge to Grassy Trail Creek.

Springs in the area have been developed only for stock and/or wildlife watering. Grassy Trail Reservoir provides domestic water to the towns of Sunnyside and East Carbon City as well as to the facilities of Kaiser Steel and U.S. Steel; the amount of groundwater development for these users is unknown but can be assumed to be negligible or nonexistent.

Groundwater Discharge

Due to lack of information on hydraulic gradients and transmissivities, the amount of groundwater flow across the project area in the regional (bedrock) aquifer is unknown. The direction of groundwater is probably northeastward over much of the site due to the influence of the regional dip of the geologic strata, although this will differ locally due to topographic and structural controls.

Based on a mass-balance approach, it can be assumed that the groundwater basin in which the Sunnyside Mines are located passes approximately 3,000 to 4,000 acre-feet per year. This is based on a regional groundwater recharge rate and assumes that a steady state groundwater flux exists on an average annual basis. Of this amount, 1,200 acre-feet per year, or 30 to 40 percent of the natural underflow, is intercepted by the Sunnyside Mines underground workings and is discharged (removed from the groundwater system).

The amount of groundwater discharge from seeps and springs cannot be quantified based on the limited data available, but is probably less than the mine discharge rate.

SURFACE WATER HYDROLOGY

Occurrence

The Sunnyside Mines permit area occupies a portion of the Book Cliffs coal field which is drained by tributaries to the Price River. The Price River basin is hydrologic unit 1406007 in the national drainage basin category program of the Office of Water Data Coordination within the United States Geological Survey. The headwaters of the Price River basin are 50 miles

northwest of the permit area. The Price River drainage basin encompasses approximately 1,900 square miles at its confluence with the Green River, 30 miles south of the permit area. A total of 46.6 square miles of the basin is located within or above the permit area.

The permit area is drained by Grassy Trail Creek, the only perennial stream in the permit area. It enters the Price River in its lower basin. The Grassy Trail Creek drainage basin ranges in altitude from 10,285 feet at Bruin Point to 4,900 feet at its confluence with the Price River. Grassy Trail Creek flows through the permit area within the confines of Whitmore Canyon. Several side canyons drain into Grassy Trail Creek within the permit area, but are intermittent in nature. In addition, the Grassy Trail Creek watershed receives flow from mine water discharge totaling approximately 1,200 acre-feet on an average annual basis. Approximately one-third of this amount is discharged to Icelander Creek, which has its confluence with Grassy Trail Creek approximately 11 miles from the permit boundary.

The flow of Grassy Trail Creek is affected by Grassy Trail Reservoir located in the NW1/4, Section 7, Township 14 South, Range 14 East. The reservoir lies entirely within the permit area in the northern corner. Grassy Trail Reservoir was constructed in 1952 and provides domestic water to the towns of Sunnyside and East Carbon City as well as facilities of Kaiser Steel. The total amount of this diversion is estimated at 200 to 300 million gallons per year (600 to 900 acre-feet).

Grassy Trail Creek has been monitored continuously since water year 1979 by USGS gaging station 0931430 near the mouth of Whitmore Canyon. The area of the watershed above the gage is 40.1 square miles. This record from 1979 through 1982 has shown an average annual water yield of 5,100 acre-feet representing an average discharge of 7.0 cfs. Maximum flow during this period was 138 cfs with a minimum of less than one cfs.

The majority of the flow occurs as a result of spring snowmelt runoff in May and June. High-intensity summer thunderstorms can also result in high discharges, but unlike the snowmelt runoff these are of short duration. The smallest flows occur during the winter months. During very low flow periods it appears that mine water discharge provides the majority of the flow in Grassy Trail Creek.

Watershed Characteristics

As stated earlier, the entire permit area is within the Grassy Trail Creek watershed. The majority of the permit area drains directly into Grassy Trail Creek within Whitmore Canyon. The area of the permit draining into Whitmore Canyon totals 10,295 acres. In addition, 10,705 acres of watershed above the permit boundary contribute flow to Whitmore Canyon. Permit areas that do not drain into Whitmore Canyon are 3,325 acres in the southern portion of the permit and 1,100 acres along the Western boundary of the permit. This 4,425 acres of drainage flows into Grassy Trail Creek below the permit boundary.

Precipitation in the Grassy Trail Creek watershed within and above the permit area consists of occasional winter snowfall and summer rains. The average annual precipitation over the drainage area is approximately 16 inches. The amount varies with location, with the most important factor being elevation. The Sunnyside precipitation gage is located at an elevation of 6,700 feet and has an average annual precipitation of 12.0 inches for the period from 1958 to 1980. It is expected that precipitation would average around 20 inches per year at the higher elevations in the watershed, although no data are available to substantiate this.

Grassy Trail Creek - Above Grassy Trail Reservoir

The headwaters of Grassy Trail Creek are located on the Book Cliffs upstream of the permit area at an elevation of nearly 10,000 feet. The headwaters are five miles north of the northern boundary of the permit. Two major branches, Left Fork Whitmore Canyon and Right Fork Whitmore Canyon, flow together at Grassy Trail Reservoir and comprise the upper portion of the watershed. The 11,000 acres of the watershed are fairly evenly divided between these two forks. Both forks are approximately six miles long with the Left Fork flowing southeastward and the Right Fork flowing southward.

There are no water quality or quantity monitoring stations along this portion of Grassy Trail Creek.

Grassy Trail Creek - Below Grassy Trail Reservoir

Grassy Trail Creek below the reservoir is a perennial stream receiving flows from reservoir releases, mine water discharge and a small amount of seepage beneath the reservoir. From the reservoir to the point where the stream exits the permit area, Grassy Trail Creek flows through Whitmore Canyon. The length of this reach is five miles and varies in width from 30 to 100 yards. The stream has cut a channel one to several feet deep. The adjacent slopes are of moderate to steep gradient, with variable cover of sage, conifers and grasses.

The drainage area of this portion of Grassy Trail Creek totals 13,490 acres. This area is comprised of numerous side canyons ranging in size from one to several square miles. The majority of the side canyon area lies to the east, with the major side canyons being, in order from upstream to downstream, Water Canyon, Bear Canyon, Pole Canyon, Pasture Canyon, and Number Two Canyon. The only side canyon draining a significant area on the west side of Grassy Trail Creek is Slaughter Canyon, which enters near the mouth of Whitmore Canyon.

The side canyon tributaries are characterized by moderate to steep gradients, narrow canyons, and rocky gravel bottoms. Flow in the side canyons is intermittent. As a result, there is little or no adequate habitat in the side canyons.

Water discharge is measured on a continuous basin by USGS station 0931430 near the mouth of Whitmore Canyon. In addition, water quality is periodically measured by the operator at six stream monitoring points through this reach. The points are designated GT-1 through GT-6, with GT-1 located just upstream of

the Water Canyon confluence and GT-6 at the mouth of Whitmore Canyon. The other monitoring stations are located at intermediate points in order to isolate effects of mine water discharges. Spot measurements of water quality have been taken on several of the side canyons, although no permanent stations exist.

Icelander Drainage

There are 3,325 acres of drainage in the southern portion of the lease that drain into Grassy Trail Creek below the mouth of Whitmore Canyon via Icelander Creek. Since the mouth of Whitmore Canyon is the downstream-most point of Grassy Trail Creek within the permit, this drainage flows off lease prior to joining Grassy Trail Creek. This drainage is composed of Water Canyon South (1,980 acres), Horse Canyon (940 acres) and Columbia (395) acres.

These three drainages originate in the Book Cliffs and flow in a south-westward or southward direction into Icelander Creek, a major tributary of Grassy Trail Creek. The confluence of Grassy Trail Creek and Icelander Creek is 11 miles southwest of the permit boundary.

Stream and watershed characteristics of these intermittent drainages are similar to those of the side canyon drainages flowing into Whitmore Canyon. Although there are no permanent monitoring stations on the main channels, spot water quality samples have been taken on Water Canyon South. In addition, mine water discharge point 004 is within this drainage. Mine water discharged to the Icelander Drainage averaged 250 gpm between 1980 and 1983.

Drainage to Grassy Trail Creek Below the Permit Area - Western Lease Boundary

Along the western lease boundary there are 1,100 acres of Grassy Trail Creek drainage basin within the permit that drain outside the lease areas prior to joining Grassy Trail Creek. The major drainages are Fan Canyon, A Canyon, B Canyon and C Canyon. Headwaters of these drainages are contained within the permit along the Book Cliffs, but leave the permit area prior to reaching the base of the Book Cliffs.

There are no permanent monitoring stations on these intermittent streams nor have any spot water quality samples been taken. Disturbance due to Sunnyside mining activities is minimal in this area with the only disturbance being a road and ventilation shaft in Fan Canyon. There are no discharge points from mine water or sediment ponds in these drainages.

Springs

An inventory of springs located within the permit area was made during the summer of 1983. Due to the heavy spring rains and snowmelt experienced in the region prior to the inventory, more springs and seeps were noted than those which probably exist during years of normal precipitation. Not all of the geologic formations present are represented by the springs sampled.

Discharge rates from springs were not measured but in general were estimated as being either greater or less than 10 gallons per minute. The mode of occurrence of most springs is not reported, although it is likely that the

larger springs represent the lateral movement of groundwater in horizontal, lenticular beds of relatively high permeability which overlie low permeability siltstones or mudstones where they crop out at the surface. The spring characteristics may be further influenced by fractures and bedding planes in the aquifer.

The wide variability in groundwater quality from the sampled springs (refer to Table 1 of this TA) may denote localized bodies of groundwater which are influenced by microgeologic conditions only, and thus are not indicative of the large body of groundwater which is intercepted by the mine workings. Because only one observation from these springs is available for interpretation, it is difficult to assess the representability of the data and impossible to infer seasonal patterns.

It is likely that many of the springs identified during the inventory represent perched aquifers which have limited or no direct hydraulic connection with the underlying areal aquifer. This contention cannot be substantiated with the limited data available, but is a probable condition based on the lenticular, interbedded nature of the various sedimentary formations of the region. Many of these perched layers may be local, temporary bodies caused by periods of high precipitation; however, it is equally likely that some of them may be manifestations of large, laterally extensive perched or semi-perched systems.

In the project area, the only known use of spring discharges are for stock and wildlife watering. The degree of improvements to spring outlets (cisterns, ponds, pipelines, troughs, etc.) is not known at the time of this writing but inferences drawn from the information presented in the permit application indicates that they are probably very minor.

Water Quantity

Grassy Trail Creek has been monitored for water quality on a daily basis at USGS gaging station 0931430 since water year 1979. Data from this station show an average annual discharge of 5,100 cfs for the period 1979 through 1982. The majority of the runoff occurs in May and June with average discharges of 40 cfs and 22 cfs, respectively. All other months have average discharges of one to two cfs, except April and July, which average six and five cfs, respectively.

Quarterly, pumping rates for the four mine water discharge points which empty into Grassy Trail Creek and Icelander Creek are provided in the MRP (Table VII-4). Points 002 and 004 represent the majority of the flow with average quarterly discharges ranging between 340 to 711 gpm and 163 to 370 gpm, respectively. The other points, 001 and 003, only discharge once or twice a year and are insignificant in comparison. The average annual combined flows from discharge points 002 and 004 totals 730 gpm (1.64 cfs) or 1,200 acre-feet.

Water Quality

Six water quality sample points exist on Grassy Trail Creek (Plate III-1 and Figure VII-2 of the MRP). They are designated as GT-1 through GT-6. Only GT-1 and GT-6 had been in operation for sufficient time to provide seasonal variations or representative samples. Water quality information is provided for GT-1 and GT-6 from April 1979 through July 1983 (Tables VII-2 and VII-2A of MRP).

The range of TDS in Grassy Trail Creek at GT-1 (upstream of significant disturbances) ranges from 310 to 539 mg/l. At GT-6 (below the disturbed area) the range is 342 to 1,878 mg/l. Some of the increase at the downstream station is due to mine water discharge from point 002. TDS for this point over the same period range between 1,000 and 1,700 mg/l and are usually above 1,400 ppm. The water discharge from point 002 adds approximately 500 gpm or 1.1 cfs. Therefore, during low-flow periods the water quality is significantly affected by discharge from point 002. Single water quality samples taken in the side canyon drainages between GT-1 and GT-6 in August 1983 (Appendix VII-2) show a range in TDS from 390 to 1,530 mg/l. Therefore, it appears that some of the increase in TDS may be a result of flow from the side canyon drainages. In addition, in comparison with the Price River at Woodside (USGS gaging station 09314500) which has a TDS range of 822 to 6,240 mg/l for the same period, the GT-6 concentrations are low.

Measurements of total suspended solids (TSS) at GT-1 and GT-6 exhibit a range of less than one to 124 mg/l and less than one to 78 mg/l, respectively. Since dates for the measurements were not provided, the water discharges at the time of measurement could not be determined. It is suspected that at higher flows, the concentrations could be in the thousands of mg/l. This is based on comparison with other similar streams in the area. Grassy Trail Reservoir also influences the low TSS concentration due to its trapping of upstream sediments. For comparative purposes, the range of TSS concentration in the Price River at Woodside was eight to 23,800 mg/l for the same period. Concentrations of TSS in the mine water discharge ranged from one to 50 mg/l.

The observed range in pH at GT-1 and GT-6 was 7.5 to 8.4 and 7.0 to 8.4. Comparison of graphical records of pH at these two stations showed that the majority of the time, the pH was nearly equal at both stations. During times when differences occurred, there was no consistent trend in which was higher. The pH of the mine water discharge ranged between 7.4 and 8.2.

Total iron concentrations ranged from 0.030 to 0.286 mg/l and 0.035 to 0.450 mg/l at GT-1 and GT-6, respectively. Iron concentrations in mine water discharge range from less than 0.1 to greater than 1.1 mg/l. The concentration of manganese varied from less than 0.001 to 0.069 mg/l at GT-1 and 0.002 to 0.085 at GT-6. Manganese concentration in mine water discharge ranges between 0.02 and 0.2 mg/l.

The applicant presents graphical representations of water quality parameters at GT-1 through GT-6 to assess seasonal variation (Appendix VII-3). The only parameter with a discernible seasonal variation is TSS. It peaks in the high runoff period in May and June and reaches its lowest value during the winter base flow months. The other parameters show variation throughout the

period of record; however, the variation does not demonstrate seasonal trends.

UMC 805.11 Amount and Duration of Performance Bond

Applicant's Proposal

The total estimated bond is calculated to be \$1,297,546.42 which equals a pro-rated cost of \$5,304.33/acre (244.62 acres, Table III-3C, Chapter III of the MRP). This figure includes the add-on costs of supervision, overhead, monitoring, equipment setup and demobilization, profit, and contingency funds, as well as 5.88 acres of contemporaneous reclamation. The calculations are based on 1983 dollars. Equipment use and ownership costs are based on either Blue Book values or current KSC estimates.

The applicant has used costs estimated by a local salvage contractor for removal of buildings, facilities, and foundations. The costs are supposed to include facility dismantling and removal from the site. Foundations are to be broken up and buried at the site. The applicant has proposed that four brick buildings be retained for possible future use. Commitment by a possible future owner has not been obtained.

Two types of mine seals are proposed by the applicant which are for drift and shaft entries (Chapter III, p. 38, Vol. 1 of the MRP). Eighteen drift entries and eight shafts will require closure. Five of the shafts are eight feet in diameter and the remaining are 16 feet in diameter. Shaft closure was estimated using a steel plate for cover followed by a six-inch concrete cover.

Regrading costs were estimated assuming an average depth of material to be handled of two feet or 4,194.67 loose cubic yards per acre. Given an average dozing distance of 100 feet and application of appropriate factors, it was determined that 6.18 hours per acre would be required for grading. This grading does not consider any specific conditions associated with removal or modification of highwalls or covering of coal seams. Since it is not known what the extent of these activities are, it is not possible to determine the significance of this deletion (see proposed stipulations in this section and under UMC 817.101).

The applicant has included costs for covering of the coarse coal waste material with four feet of material over 24 acres, other coal waste material with one foot over 57 acres, and covering of 26 acres with three inches of topsoil. The cost per acre for these activities were calculated to be \$1,550.20. The weighted average cost divided by total disturbed areas was calculated to be \$678.08.

Both revegetation materials costs and production rates are generally within acceptable ranges. The revegetation portion of the bond estimate was calculated on the basis of vegetation type. Supporting calculations provide sufficient data with which to evaluate the basis for the bond. Cost differences in techniques required by slope variations have been accounted for (Tables III-26 through 3-26, Chapter III of the MRP).

The monitoring costs that the applicant has determined are shown on Table III-35. Over the 10-year responsibility period, the contractor completing the reclamation will be responsible for sampling of discharges from sediment ponds, repairing rills and gullies, revegetation of areas where rills, and gullies have occurred or where revegetation has failed and sampling for revegetation success. The total cost proposal by the applicant is \$40,300.00 for monitoring with an additional \$10,000.00 for maintenance.

Compliance

Several deficiencies in the bond estimate have been identified with respect to facilities removal, backfilling and grading, topsoil and borrow material handling, and monitoring. They are listed below:

1. The cost for removal of the power line shows the labor rate for the truck operators to be \$11.17/hour. This rate is too low for an operator and should be \$23.90/hr.
2. On Table III-28, the cost for Parking Lot Removal was incorrectly recorded. The calculated costs were \$4,817.00.
3. Under the calculation for quantity of soil material to be redistributed, the equipment costs were incorrectly calculated. The correct costs should be \$143.97/acre for the scrapers and \$52.10/acre for the dozer.
4. For placement of the additional three feet of material over the coarse refuse pile, the applicant has proposed the use of a site some distance from the refuse area. However, the scraper productivity should be reevaluated and it may be necessary to add a loader-truck fleet to bring the material to the site.
5. The contingency fee identified under "Monitoring of the Reclaimed Areas", is not included in Table II-35 or in Table III-37. This cost must be added to the final bond amount.
6. Contingency costs should be added to the costs for facilities removal, sealing entries and revegetation since unforeseen costs could arise during reclamation in these categories also.
7. The inflation factor was only applied for one year. This factor must be applied for 2.5 years, at which time the mid-term review will occur.

A correction based on price increases during the past five years has not been included in the bond estimate. An annual increase of one percent based on the Bureau of Labor Statistics, Industrial Commodities Index was used.

In addition, given that Division approval for various structures and roads as a part of the post-mining land use has not been demonstrated, the bond calculations are not considered to be accurate (see UMC 817.111-.117). Cost revisions to the bond estimate will also have to be made as a result of

required revisions to the reclamation plan. When the applicant has adequately addressed the following stipulation, the bond estimate will be in compliance.

Stipulations 805.11-(1-8)

1. The applicant must resolve the inconsistencies in the bond estimate noted above in the Compliance analysis, Items 1 through 7. The total bond amount must be revised to reflect these changes.
2. The applicant must provide additional documentation on the backfilling and grading plan (see conditions under UMC 817.101) prior to determination of the adequacy of the proposed regarding cost.
3. The labor and equipment calculation for phosphorous fertilizer application and subsequent discing in the response do not match with costing Tables (III-29). This discrepancy must be clarified.
4. The cost for tacking hay with a hydroseeder has been eliminated from Table III-26. This elimination must be explained or costs reintroduced into the table and all subsequent bond estimates appropriately revised.
5. Several mathematical errors appear to exist in the "Total" column of Table III-37. These errors must be corrected. In addition, acreages in this table do not total 244.62. This must also be corrected.
6. Pending approval of the coal waste disposal plans (UMC 817.81 and 817.91, final approval of the bond estimate cannot be made.
7. Cost associated with the reclamation of the borrow areas must be included (see conditions under UMC 817.101).

UMC 817.11 Signs and Markers

Applicant's Proposal

The applicant has stated that all signs required by the rules and regulations of the DOGM, OSM and MSHA have been properly posted, maintained, and will be removed at the termination of the bond (Chapter III, p. 17, 18 of the MRP).

Compliance

The applicant is in compliance with the requirements of this section.

Stipulations

None.

UMC 817.13 - .15 Casing and Sealing of Exposed Underground Openings

Applicant's Proposal

Final reclamation of all shafts and slope entries will be constructed to prevent access to the mine workings by people, livestock, and wildlife. For drift or slope entries, a concrete block seal will be constructed at least 25 feet back from the opening and then the entry will be backfilled with noncombustible material for the 25 feet. Shaft openings required to be sealed shall be effectively capped. The cap will consist of a six-inch thick concrete and steel plate cap with a 15-foot high, 2-inch diameter steel vent pipe above the surface of the shaft.

The applicant has committed to compliance with standard USGS stipulations regarding the filling, sealing and abandonment of open drill holes (Table III-4).

Compliance

The applicant is in compliance with the requirements of this section.

Stipulations

None.

UMC 817.21-.25 Topsoil

Applicant's Proposal

An Order 3 soil survey was completed for the permit area and additional information was developed through a limited on-site study by the Soil Conservation Service in 1980 (Chapter VIII, Vol. 7 of the MRP). Additional soil sampling was conducted on the surface facilities in 1983 (Chapter VIII, Table VIII-8, Book 7 of the MRP).

The majority of the soil on the proposed permit area are mollisols, though entisols are common on benches, canyon rims, and sideslopes. Alfisols, aridisols, and entisols are represented by one soil series each. Soils are typically well drained and moderately permeable. The majority of soils are forming in residuum and/or colluvium derived from sandstone, siltstone, and shale. Depth to bedrock varies widely from shallow to very deep. Soils are typically calcareous and alkaline throughout all or a majority of the soil profile. Moderately to strongly calcareous and mildly to strongly alkaline horizons are common. One series exhibits a slightly acid profile. Coarse fragments in the form of gravels and stones are found in most soil horizons. Coarse fragment contents of the control sections can be as high as 35 to 60 percent (Chapter VIII, Vol. 7).

The soils on the proposed permit area are used for rangeland, wildlife habitat, or recreation. Capability classes are primarily VIIe, VIIs and VIIIs (Chapter VIII, Vol. 7).

During the term of this permit, the applicant will not affect existing undisturbed soils. All operations will be conducted on previously disturbed sites where existing soils have been mixed with construction materials such as subsoil and parent material. Five soil stockpiles do exist containing soil removed from previous sediment pond and test plot construction sites (Chapter III, Section 3.5.2, Vol. 1).

The planting medium for the majority of the disturbed acres will consist of either borrow or in-place construction cut-and-fill material. The borrow material will be removed from the existing borrow area and placed on the coal refuse disposal area (81 acres). Samples of proposed borrow material to the proposed depth of recovery have not been submitted with the application. Test plots (Figure VIII-3, Chapter VIII, Vol. 7 of the MRP) are planned to evaluate the quality of borrow material to be used and the depth of borrow required to revegetate the refuse site. Test plot design and objectives as prepared by KSC, were previously accepted by UDOGM. Soil materials salvaged in conjunction with sediment pond and test plot construction will be replaced to the sites from which the soils were taken. Ripping will be conducted to a depth of 18-24 inches on sites to be reclaimed where no seedbed material covering is added, i.e., facilities sites and on sites subject to compaction (Chapter III, Vol. 1).

Following final grading, all disturbed areas will be tested for fertilizer requirements. Fertilizers will be applied at the rates specified by soil tests following grading (Chapter VIII, Section 8.9, Vol. 7 of the MRP).

Compliance

The applicant has not complied with the requirements of this section with respect to the use of borrow material as a substitute for topsoil in the coal refuse disposal area.

Stipulations

1. The applicant must submit soil test analysis results to the Division showing that the borrow material selected for covering coal refuse disposal sites is an acceptable growth medium. Sampling depth or borrow must reflect the provided depth of recovery.

UMC 817.41 Hydrologic Balance: General Requirements

Applicant's Proposal

The applicant proposes to control surface runoff from the disturbed and undisturbed areas by utilizing a combination of structures, i.e., diversion channels, culverts and sedimentation ponds, as described in Chapter VII of the MRP. Runoff from disturbed areas will be routed through the sedimentation ponds. Undisturbed drainage will bypass the operation via temporary diversions.

Impacts to the groundwater system will be minimal and will be monitored via in-mine sampling, observation of mine water discharge quantity and

quality, two existing coal exploration drill holes, and future exploratory drill holes.

Any impacts of the mining operation on the surface water system will be determined through implementation of the surface water monitoring plan and analysis of the data collected. All discharges to receiving waters must be in compliance with applicable State and Federal water quality regulations and effluent limitations.

Kaiser Steel Corporation will minimize changes or impacts to the hydrologic balance by controlling channel velocities, riprapping appropriate channel sections, providing contemporaneous revegetation, and preventing acid- or toxic-forming materials from entering and contaminating the hydrologic system.

Compliance

The operator has proposed designs utilizing best technology control practices to minimize changes to the prevailing hydrologic balance in both the mine plan and adjacent areas. The following sections (UMC 817.42-.57) describe specific design details for the hydrologic facilities proposed.

Reclamation practices will also be instituted to minimize changes to the hydrologic regime.

The applicant's proposal will meet the general requirements for this section when the stipulations in the following sections are met.

UMC 817.42 Water Quality Standards and Effluent Limitations

Applicant's Proposal

The applicant proposes to mitigate impacts to receiving streams below disturbed areas by employing sedimentation ponds, diversions, grading slopes and seeding and planting disturbed areas. Structures controlling water quality will be maintained until the disturbed area has been restored and revegetation requirements of UMC 817.111-817.117 are met and the quality of the untreated discharge from the disturbed (reclaimed) areas meets State and Federal water quality standards and effluent limitations for receiving streams. This information is detailed in Chapter III, page 23, and Chapter VII, pages 9, 10, and 17 through 20.

Excess groundwater intercepted in the underground mine workings is and will be discharged to Grassy Trail Creek and to Icelander Creek after being passed through sedimentation ponds which are equipped with skimmers for oil and grease separation. The expected future rate of discharge is equal to approximately 740 gallons per minute (1,200 acre-feet per year), which is the present average annual discharge rate. Effluent standards of UMC 817.42 have been met consistently for iron, manganese and pH; occasionally the concentrations of suspended solids exceed the limitations but the mean concentration from 161 samples over this period is less than the 30-day effluent limitation (see Appendices VII-2, VII-3, and VII-5).

Mine discharge contributes to the perennial nature of Grassy Trail Creek, and without this flow augmentation, low natural streamflow would be restrictive to many species of aquatic life. However, past mine discharges have contributed to physical and chemical degradation which also limits the aquatic community. The largest single problem appears to be the creation of anaerobic conditions in the stream bed sediments due to the introduction of fine sediments from disturbed areas and from mine discharge. This has created a condition along a portion of Grassy Trail Creek between sampling stations GTC-02 and GTC-05 whereby oxygen-rich stream water cannot flow freely through substrate materials. This condition is worsened by the regulating influence of Grassy Trail Reservoir, which has reduced the seasonal removal of fine sediments from the creek by snowmelt runoff and short duration, high intensity summer thunderstorm events. This condition has been rectified to a large extent by the construction of a network of eleven sediment ponds subsequent to the studies which identified the above-described conditions.

Seepage from the toe of the coarse refuse pile is treated for high concentrations of iron by addition of flocculants, a straw dike and rock gabions. The applicant states the treatment has been successful with iron concentration meeting effluent limitations (Chapter III, p. 6 and 7 of the MRP).

Compliance

The applicant's proposal is in compliance with the general requirements of this section.

Stipulations

None.

UMC 817.43-.45 Diversion and Conveyance of Overland Flow, Stream Channel Diversions and Sediment Control Measures

Applicant's Proposal

Appropriate sediment control measures have been instituted to prevent additional contributions of suspended solids to stream flow and runoff outside the permit area. These measures include constructing diversions, maintenance of appropriate gradients, lining channels, revegetating, and providing drop structures to control channel velocities.

No permanent diversions nor stream channel diversions have been constructed at Sunnyside Mines. None are proposed for the future mining operation (Chapter III, p. 5 and 7 of the MRP).

A number of temporary diversions have been constructed to intercept and divert runoff from undisturbed areas around disturbed areas. These are all associated with drainage areas surrounding sediment ponds. They will be removed during final reclamation. They are described in Chapter III, pages 6 and 7 and Chapter 7, pages 18 and 19 of the MRP. The general locations are provided on Plate III-1 with specific details indicated on Plates III-5 through III-15.

Additional temporary diversions and berms to convey runoff from disturbed areas to sediment ponds have been built. These will be removed during final reclamation.

The Rail Cut Sediment Pond has four diversions associated with it. All four diversions collect water from disturbed areas and convey it to the Rail Cut Sediment Pond. They have been designed to carry the 25-year, 24-hour storm. The flow from the pond empties into the Icelander drainage. This system has been constructed.

The Pasture Sediment Pond has one diversion that collects runoff from the disturbed area and conveys it to the pond. The diversions designed for the 25-year, 24-hour storm. The pond empties into the Icelander drainage. This facility is in operation.

Two diversions of undisturbed drainage and one collection dike for disturbed drainage are associated with the Old Coarse Refuse Road Pond. These diversions were built to convey the 25-year, 24-hour storm. Runoff from this area flows to the Icelander drainage.

Drainage diversions at the Hoist House Sediment Pond consist of seven diversions to convey undisturbed area runoff around the pond and two diversions to transport disturbed area runoff to the pond. The 10-year, 24-hour storm was employed in their design. Drainage from this area empties into Number Two Canyon which then flows into Grassy Trail Creek.

Further upstream in Number Two Canyon, a series of six diversions conveys flow from undisturbed areas around two sediment ponds. The sediment ponds collect flow from the disturbed area via overland flow and berms. Ten-year, 24-hour storms were used in designing the diversion. These facilities have been constructed.

The Manshaft sediment pond has one diversion to collect flow from the disturbed area. Two additional diversions bypass undisturbed area runoff around the pond.

The slurry diversion ditch carries mine water discharge and flow from the preparation plant. The ditch empties into Slurry ponds Number 1 and Number 2, where the water is treated and released into the clear water pond for further settling and storage prior to use for irrigation on nearby alfalfa fields or discharge to Icelander drainage.

Associated with the Coarse Refuse Toe Sediment Pond are two diversions capable of carrying the 10-year, 24-hour storm. One diverts undisturbed runoff around the pond and the other collects runoff at the toe of the refuse disposal area and conveys it to the sediment pond. Discharge from the pond flows into the Icelander drainage.

The diversions and sediment ponds in the eight areas discussed previously have all been approved by the Diversion and are built. In addition another system of diversions and sediment ponds is proposed.

The Sunnyside Surface Facilities proposed drainage plan consists of three channels to collect runoff from the hillsides above the mine and divert it around the disturbed area, one primary diversion ditch and a system of collectors to convey disturbed runoff to a sediment pond, and a diversion that conveys runoff to the slurry ditch. One of the hillside diversions is currently in existence. The MRP contains designs for the sediment ponds, several of the hillside diversions, and the sediment pond final collection ditch. These diversions were designed to convey the 10-year, 24-hour storm peak discharge.

Compliance

The applicant's proposal is in compliance with the general requirements of this section.

Stipulations

None.

UMC 817.45 -.47 Sediment Control Measures, Sedimentation Ponds and Discharge Structures

Sedimentation ponds are used at the Sunnyside Mines to minimize and control the suspended solids associated with runoff from disturbed areas. Eight sediment ponds have been approved by the Division and constructed by Kaiser Steel. These ponds are designated Coarse Refuse Toe, Old Refuse Road, Pasture, Rail Cut, Hoist House, Lower Number Two Canyon, Upper Number Two Canyon, and Man Shaft. The first four of the ponds listed discharge into the Grassy Trail Creek.

Additionally the Number One and Number Two Slurry Ponds have been approved and constructed. These ponds treat and settle the effluent, mainly coal fines, from the preparation plant. Mine water is used as the water supply for the preparation plant. Treated water from these ponds passes into a clear water pond and is then applied to fields or discharged to the Icelander drainage at NPDES point 004. The two pond setup allows cleaning of one pond while the other remains functioning.

A pond currently exists to treat the mine water discharging from NPDES point 003 into Grassy Trail Creek. This pond does not intercept significant surface drainage. Approval of the pond has been given by the Division.

Two additional impoundments are proposed for the permit area. A sediment pond is proposed to collect runoff from the Sunnyside Surface Facilities area and a new mine water discharge pond is proposed for NPDES point 001 (Twin Shaft). Proposed detailed designs including calculations and plans are provided for the Surface Facilities pond in the MRP.

Skimmers have been incorporated into the sediment pond designs to help control oil and grease. Riprap is provided at the inlets and outlets to the ponds to dissipate energy and control velocities.

All sediment pond volumes have been designed to hold the entire 10-year, 24-hour storm. The runoff is to be released after 24 hours of storage if effluent limitations are met.

Sediment ponds are cleaned periodically, with sediments disposed of in the industrial waste dump or used as borrow.

The applicant will remove and reclaim all sediment ponds and discharge ponds during final reclamation of the permit area. The ponds will be filled or graded to match the surrounding area and then reclaimed.

The applicant will sample discharges from the sediment ponds and report any violations of effluent limitations to the Division. NPDES discharge ponds are monitored on a monthly basis.

Compliance

The applicant's proposal is in compliance with the requirements of this section.

Stipulations

None.

UMC 817.48 Acid-Forming and Toxic-Forming Materials

Applicant's Proposal

The bulk of underground development waste generated by the mining operation at Sunnyside mines is disposed of in mined-out areas underground (Chapter III, p. 32 of MRP). Before disposal each geological horizon will be tested for SAR, pH, boron, and acid-base potential. If adverse levels of SAR, pH, boron or acid-base potential are found, the rock will be mixed with other waste rock to achieve acceptable levels of acidity or toxicity. Adverse levels in SAR, pH, boron, and acid-base potential are defined as, SAR values greater than 10, pH less than 5 or greater than 9, boron greater than 5 PPM, and acid base potential less than -5 tons CaCO_3 equivalent per 1,000 tons material. If all the rock to be disposed of shows unacceptable levels of acidity or toxicity the rock will be disposed of in an area that will be hydrologically isolated from the rest of the mine with solid block seals or it will be disposed of in the coarse refuse pile along with the coal processing waste. There is no separate disposal structure for the underground development waste on the surface. Prior to mine disposal of development waste material that exhibits acid or toxic drainage characteristics the operator will submit a map to the Division showing where the material will be placed and the locations of the block seals.

Additional refuse generated from coal processing operations at the surface is disposed of in a coarse refuse disposal area located at the mouth of Whitmore Canyon. This refuse has been used in the past as road surface material on 10.6 miles of road within the permit area; however, this practice has been terminated as of 4/13/79 by order of the Division. Physical and chemical characteristics of the coarse refuse have been provided in Appendix

VI-1. The applicant has committed to a treatment program for drainage from this refuse which currently consists of chemical and physical treatment and may include a treatment pond in the future. Additionally, a burial and revegetation program has been proposed for this refuse pile.

Compliance

The applicant's proposal is in compliance with the requirements of this section.

Stipulation 817.48

None.

UMC 817.49 Permanent and Temporary Impoundments

Grassy Trail Reservoir is the only permanent impoundment located within the permit area. It was constructed in 1952 on Grassy Trail Creek at the confluence of the left and right forks of Whitmore Canyon. It is owned by Kaiser Steel and SOHIO. When constructed the dam had a storage volume of approximately 1,000 acre-feet, a height of 80 feet and a crest length of 650 feet. Kaiser Steel has estimated that the storage volume has been reduced to approximately 750 acre-feet by sedimentation.

The reservoir is used to store culinary water for the towns of Sunnyside and East Carbon City. Kaiser Steel receives its culinary water from the town of Sunnyside. It is estimated that 200 to 300 million gallons of Grassy Trail Reservoir water are used annually.

The reservoir is inspected weekly by qualified personnel. The firm that designed the reservoir, Templeton, Linke and Associates, performs an annual inspection of the reservoir.

Mining is proposed to progress under Grassy Trail Reservoir during the life of the mine.

After mining operations are terminated, Kaiser Steel proposes to leave Grassy Trail Reservoir in place.

Compliance

The applicant's proposal is in compliance with the requirements of this section.

Stipulations

None.

UMC 817.50 Underground Mine Entry and Access Discharges

Applicant's Proposal

The applicant has stated that rates of groundwater discharge from underground mine workings have averaged approximately 740 gpm (1,200 acre-feet per year) for the five years during which discharges have been measured, and that future discharge rates are expected to be similar to this volume (Chapter VII, p. 9 of MRP). The applicant holds NPDES discharge permits for four discharge locations, labeled 001 through 004 in the permit application package. Locations 001, 002 and 003 discharge to Grassy Trail Creek, while location 004 discharges to Icelander Creek. A portion of the mine discharge water is diverted for irrigation of alfalfa fields, and the local city park and golf course. The applicant holds a state permit allowing this use, identified and described in Chapter II, Section 2.9 of the MRP.

Compliance

The applicant's proposal is in compliance with the requirements of this section.

Stipulation

None.

UMC 817.52 Surface and Groundwater Monitoring

Applicant's Proposal

The applicant has committed to monitoring six surface water locations along Grassy Trail Creek on a quarterly basis for water quality (Chapter III, p. 24 of the MRP). Adequate baseline data have been collected for the upstream station GTC-01 and the downstream station GTC-06; the four stations GTC-02 through GTC-05 were added to the monitoring program in the summer of 1983 and will continue to be monitored on a quarterly basis. Streamflow observations are recorded on a daily basis at USGS gage 0931430 which is located on Grassy Trail Creek between the applicant's surface facilities and the town of Sunnyside.

Four NPDES discharge locations are monitored by the applicant on a monthly basis. These points discharge groundwater which is intercepted within the mine workings. Stations 001 and 002 discharge water to Grassy Trail Creek; Stations 003 and 004 discharge to Icelander Creek. All four stations record discharge volumes which are reported on a quarterly basis. Only Stations 002 and 004 discharge water on a continual basis; discharges from Stations 001 and 003 are intermittent and are of small volume.

In-mine water quality samples are taken from inflow points within the mine, including gob piles, faults, fractures and working faces. Quarterly samples of water quality will be taken for all future mine inflow sources which yield inflows of more than 20 gpm. Spring WR-1 (Plate VII-3) will be sampled three times a year for water quality and quantity. The first sample will be as soon as the site is accessible in the spring; later samples will be collected in August and November. Flow measurement will be

accomplished by a weir or flume. An annual report on the spring monitoring will be submitted to the Division (Chapter III, p. 24 of the MRP).

The applicant has stated that if and when future exploratory drilling occurs, the drill holes will be instrumented as groundwater monitoring wells (Chapter VII, p. 10 of the MRP). At the time of this writing, however, no monitoring wells exist in the project area.

Compliance

The applicant's proposal is in compliance with the general requirements of this section when the following stipulation is met.

Stipulation 817.52

1. Standard agreement for mine inflow monitoring developed by OSM Western Technical Center, Denver, Colorado, calls for mine inflows to be monitored at all locations where inflow is greater than one gpm. The applicant must revise the in-mine monitoring program accordingly.
2. Applicant must submit results of the hydrologic monitoring program to the regulatory authority on a quarterly basis and provide an annual summary at the end of each calendar year. The annual summary must include the results of all flow measurements and water quality analyses performed during the year, as well as a water balance accounting of mine inflows, outflows, and evaporation/dust suppression consumption. Additionally, maps showing the location of all surface water, groundwater, spring and in-mine sampling points must be submitted showing geologic formation and modes of occurrence (fault/fracture inflow, roof sandstone inflow, etc.).

UMC 817.53 Transfer of Wells

Applicant's Proposal

The applicant plans to instrument future drill holes as monitoring wells, although no monitoring wells currently exist within the permit area. Based on Table III-14 of the permit application package, approximately 48 drill holes, shafts and vents exist within the permit area. The applicant has committed to the filling, sealing and abandoning of these structures in accordance with standard USGS stipulations covering these procedures. This includes documentation and recording of materials and methods employed. The USGS stipulations are given in Table III-4 of the applicant's proposal.

Compliance

The applicant's proposal is in compliance with the general requirements of this section.

Stipulations

None.

UMC 817.54 Water Rights and Replacement

Applicant's Proposal

The applicant references the following water right application: "Application to Appropriate Water for Miscellaneous Purposes, State of Utah. Application Number 28812 (91-231) by Sunnyside Mines, Kaiser Steel Corporation." This application was approved on June 14, 1961, by the Utah State Engineer's Office. This water right applies to the development and usage of groundwater encountered within the mine (Section 7.1.3.1 of the MRP).

Additional reference is made to other water rights which Kaiser Steel holds in the area, which include (1) 2,000 acre-feet per year for Range Creek water, and (2) 1,000 acre-feet per year for Price River water (Section 7.2.3.1 of the MRP).

Compliance

Although no significant hydrologic disruption is anticipated from mining-related activity, the applicant has committed to replacing any water supply belonging to the owner of a vested water right which is damaged as a result of mining-related activity (Chapter III, p. 23 of the MRP). The applicant should provide a listing of water rights that could possibly be impacted by mining.

Stipulation UMC 817.54 (1)

1. The applicant must provide a listing of water rights, if any, within the permit area or downstream along Grassy Trail Creek that may be affected by mining. It is our understanding that this information is being compiled by the applicant and will be included in the permit.

UMC 817.55 Discharge of Water Into an Underground Mine

Applicant's Proposal

No water from surface sources is utilized in the underground mine workings at the Sunnyside Mines. Sufficient water from natural groundwater inflows is encountered within the mine for dust suppression, with excess water being pumped to the surface.

Compliance

The applicant's proposal is in compliance with the general requirements of this section.

Stipulations

None.

UMC 817.56 Post-Mining Rehabilitation of Sedimentation Ponds, Diversions, Impoundments and Treatment Facilities

The only permanent hydrologic structure remaining on the abandoned permit area will be Grassy Trail Reservoir. The applicant will leave the structures in place for use as a municipal water supply for Sunnyside and East Carbon City. Since the reservoir is used by these two towns (along with culinary water for Sunnyside Mines), it will still be needed after mining operations cease. Kaiser Steel will maintain ownership of the reservoir after the permit period if ownership is not transferred to the towns (Chapter III, p. 39-40 of the MRP).

Compliance

The applicant's proposal is in compliance with the requirements of this section.

Stipulations

None.

UMC 817.57 Stream Buffer Zones

Applicant's Proposal

Grassy Trail Creek is the only stream that supports a biological community within the permit area. The Reservoir Road parallels Grassy Trail Creek for several miles and at several locations is less than 100 feet from the stream. The Reservoir Road was built prior to SMCRA, as is the case with all roads within the mine permit area.

Stream buffer zone markers are posted and clearly show buffer zones along Grassy Trail Creek. However, due to pre-law disturbances the buffer zone is less than 100 feet in some locations. Plate III-26 shows locations of buffer zone signs. Disturbances within the buffer zone will not be allowed by the operator.

Compliance

The applicant's proposal is in compliance with the requirements of this section.

Stipulations

None.

UMC 817.59 Coal Recovery

Applicant's Proposal

The operation utilizes longwall methods for the extraction of coal, which maximizes coal recovery in the panel areas. Barrier pillars are left to protect haulage and ventilation entries, property boundaries, and outcrop protec-

tion. Where multiple seam mining is possible, the upper seam is mined first, allowing later recovery of the lower seam. In some areas suitable techniques to extract both seams are not currently available. However, mining of the upper seam first in these areas does allow for possible future extraction.

Compliance

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.61-.68 Use of Explosives

The applicant stores explosives in the Number Two Canyon. The storage, handling and use of the explosives are all in compliance with MSHA's rules and regulations. Since there is only minimal use of explosives underground and no surface facilities are to be constructed during this permit term, the requirements of these sections do not apply.

UMC 817.71-.74 Disposal of Excess Spoil and Underground Development Waste

There are no plans for disposal of excess spoil or underground development waste, therefore these regulations do not apply.

UMC 817.81 -.85 Coal Processing Waste Banks: Construction Requirements

Applicant's Proposal

The applicant has proposed the continued construction of a coarse refuse disposal pile on the border of Sections 6 and 7 just south of the town of Sunnyside. The pile is being built in approximately two-foot lifts which are compacted to 90 percent of the maximum dry density (see Appendix III-7). At 50-foot vertical increments, a 20-foot-wide terrace is constructed for water runoff and erosion control. Since the refuse pile was started prior to 1977, no underdrain system has been installed. Recent exploratory drilling in the refuse area has shown that no water table exists in the refuse pile. Geotechnical analyses have been provided for the disposal site for the long-term configuration of the fill which show a safety factor of 2.31 (see Appendix III-7). The applicant has proposed to inspect the fill quarterly and maintain results of the inspection at the mine site.

The applicant proposes to cover the coarse refuse disposal site with four feet of borrow material. Revegetation test plots were installed in 1980 to determine appropriate methodologies for revegetating this site. Additional test plots will be constructed in the near future to test the depth of borrow material needed to promote revegetation success. Depths of borrow material to be tested are 0 to 48 inches (ACR responses, section 3.5). When the data from the tests plots are finalized, revegetation will begin on the toe slopes of the disposal site and continue through the life of the mine until revegetation is completed.

The borrow areas are planned to cover 46 acres, and three feet of material will be excavated. This material will be used to cover all coal waste disposal areas used subsequent to 1977. The reclamation of the borrow areas has not been planned (see proposed stipulation under 817.101).

The applicant has installed a system of diversions and sediment ponds around the coarse refuse area to control contributions of suspended solids and oil and grease to receiving drainages. These measures were discussed under UMC 817.45-.47. The applicant has also installed a water treatment system to treat the effluent from a seep at the toe of the coarse refuse disposal site. The system consists of addition of a polymer flocculant, rock gabion and straw filter. The system is used to reduce the high concentration of total iron. The system has been in operation and the applicant reports that iron concentrations below the treatment system meet effluent limitations.

Compliance

The applicant has provided plans that show compliance with the design and construction requirements of UMC 817.81 to UMC 817.85. The applicant has not committed to inspection of the site by a registered professional engineer or other inspector approved by the regulatory authority. In addition, the applicant has not provided construction plans certified by a registered professional engineer as required by UMS 817.71(b) and as referenced in UMC 817.81(a)(1). Therefore, the applicant is not in compliance with the requirements of UMC 817.82(a) and UMC 817.81(a)(1).

The applicant has committed to covering coal processing waste banks with four feet of the best available non-toxic and non-combustible material unless the Division allows a lesser depth based upon analyses which show that revegetation requirements can be attained. The applicant has committed to installing test plots to provide this information which, depending upon test plot results, could release the applicant from the four-foot requirement. However, no data exist at this time to allow for a lesser depth. It should also be noted here that laboratory tests conducted on some coarse refuse samples (including weathered refuse) have shown this material to have low pH (2.1-3.7), high EC (35.9 mmhos) (ACR response, Table III-20), and high SAR values (22.2-101.21) ("Report and Response to Board Order of 28 January 1982 on Coarse Refuse Use as Road Material, 24 March 1982" in Chapter VI of the MRP). When the applicant has adequately addressed the following stipulations, the plan will be in compliance.

Stipulations

1. Within 30 days of permit approval, the applicant must provide certification of the coal refuse disposal site design by a registered professional engineer and provide a commitment that all inspections of the disposal site will be conducted by a registered professional engineer.

UMC 817.86-.87 Burning and Burned Waste Utilization

Applicant's Proposal

The applicant has proposed to extinguish any fires which might occur in the coal refuse pile which meet the requirements of MSHA (Chapter III, p. 18, Vol 1 of the MRP). Specific plans have been provided and provisions have been supplied to ensure that only those persons authorized by the operator will be involved in the extinguishing operations.

Compliance

The applicant's proposal is in compliance with the requirements of this section.

Stipulation

None.

UMC 817.88 Coal Processing Waste: Return to Underground Workings

During the proposed permit term, this activity is not planned. Therefore, the requirements of this section do not apply.

UMC 817.89 Disposal of Non-Coal Wates

Applicant's Proposal

The applicant proposes to dispose of material removed from sediment ponds in the industrial waste disposal site or use as borrow material (Chapter III, p.32 of the MRP). Non-coal wastes such as grease, oil, and timbers are disposed of in the industrial waste disposal site. The site has been approved by the State Board of Health. Non-industrial wastes such as paper and other domestic solid wastes are disposed of in East Carbon City's landfill. Sewage is piped to the town of Sunnyside treatment facilities.

Compliance

The applicant's proposal is in compliance with the requirements of this section.

Stipulations

None.

UMC 817.91-.93 Coal Processing Waste: Dams and Embankments

The applicant has constructed four coal slurry impoundments according to Plates III-1, 2 and 3. These are Slurry Pond West, Slurry Pond East, Slurry Pond #1, and Slurry Pond #2. Slurry Ponds #1 and #2 are depressions without any major embankment structures. Dewatering of fine refuse material in Ponds 1 and 2 occurs prior to its final disposal in the west dike of Slurry Pond

West. Slurry Pond East acts as an overflow pond when Ponds 1 and 2 are both in use.

The applicant has provided an evaluation of the stability of the embankment structures in Appendix III-7. Testing of the refuse material was conducted in two drill holes, and three trenches were excavated. The material was tested to determine cohesive strength, angle of internal friction and density. No saturated conditions were identified in waste embankments during drilling. based upon this information, the stability of the embankments was determined. All of the existing slopes were found to meet the requirements of the regulations except for the existing slope above the west side dike extension. The safety factor for this slope in its current configuration was determined to have a safety factor of 1.03. If the slope angle was reduced, the safety factor for the slope could be increased to 1.47 (see Appendix III-7). The final configuration of the slope will have a safety factor of 2.31. However, in the interim, the applicant has not made an committment to decrease the slope angle to increase stability.

The applicant has provided for quarterly monitoring of the site by a qualified engineer. Records of the inspections will be kept at the mine site.

Compliance

The applicant has provided design information on the embankment structures to show that the stability requirements have been met for the final configuration of the structures under unsaturated conditions. However, this design was not certified by a registered professional engineer as required by CFR 817.49(h) as referenced in CFR 817.93(a). Since the East Slurry Cell acts as an overflow pond for Slurry Ponds 1 and 2, saturated conditions in embankment may occur at some time in the future. The potential applicant must evaluate the effects of water saturation on the stability of this embankment. In addition, the west side dike does not currently meet the safety factor requirements of the regulations. The applicant is not in compliance with the stability requirements of the regulations.

A quarterly inspection plan by a qualified engineer has been provided. The inspection plan should meet the requirements of 30 CFR 77.216-3 as stated in CFR 817.49(f) as referenced in CFR 817.93(a). 30 CFR 77.216-3 states that inspections should be conducted weekly by a person trained to recognize specific signs of structural instability. The applicant has not provided information on the qualification of the person conducting the inspections. The applicant is not in compliance with CFR 817.83(a).

The applicant has not addressed the feasibility of reclamation of the East Slurry Cell which could still exists in a saturated condition since slurry was disposed of at this site up to 1983. The feasibility of dewatering this material sufficiently to allow covering of the site with four feet of non-toxic cover material must be identified.

Stipulation

1. Within 30 days of approval, the applicant must provide certification of the design of coal refuse embankment structures by a registered professional engineer. In addition, provisions for the inspection of the embankment structures on a weekly basis must be provided along with the qualifications of the person conducting the inspection showing training in these types of inspections.
2. Within 30 days of permit approval, the applicant must provide a plan for stabilizing the west side dike extension to meet the stability requirements of the regulations in as timely a manner as possible. In addition, the stability of east side embankment under saturated conditions must be evaluated and plans for stabilizing the structure under these conditions must be provided if necessary. The feasibility of reclamation of the potentially saturated slurry material in the East Slurry Cell must be addressed.

UMC 817.95 Air Resources Protection

Applicant's Proposal

The mine facilities and the application have been evaluated and have been found to be exempt from air quality monitoring requirements of the Utah State Board of Health (Section 2.5, p. 5 of the MRP). The applicant has committed to mitigation measures for fugitive dust control (Section 3.4.7, p. 27, Vol 1 of the MRP), and has complied with remaining air resources regulations.

Compliance

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.97 Protection of Fish, Wildlife and Related Environmental Values

Applicant's Proposal

Habitats within and adjacent to the permit area support a wide variety of wildlife species. Several of these species are designated as economically important or high-interest species. Mule deer, bobcat, black bear, cottontail, beaver, muskrat, waterfowl, raptors, and Utah milk snake are representative of those species requiring special consideration because of their legal or economic status.

The lower portions of Whitmore Canyon and the benches and lower slopes west of West Ridge are designated by the UDWR as "high-priority" mule deer winter range. Continued operation of the Sunnyside Mine will likely preclude mule deer use of small portions of winter range in Whitmore Canyon. The duration of this unavoidable impact will be for the life of the mine and until

reclamation is successful. The applicant has not submitted any plans for fencing to prevent mule deer access to reclaimed areas.

The rimrock cliffs along the eastern boundary of the permit area represent important nesting habitat for cliff-nesting raptor species. Nesting by golden eagle, red-tailed hawk, and prairie falcon has been documented on or in the vicinity of the permit area (Chapter X, Vol. 8 of the MRP). The golden eagle and prairie falcon are species of "high federal interest." Only one identified nest (an inactive golden eagle nest) occurs within one kilometer of the main mine facilities area (Plate X-1).

Another important wildlife habitat in the permit area is Grassy Trail Creek and its associated riparian vegetation. The UDWR considers riparian habitat critical to many species of wildlife in this region. A put-and-take rainbow (Class 3) fishery exists in a three-mile stretch of Grassy Trail Creek immediately below Grassy Trail Reservoir. The remainder of Grassy Trail Creek and other streams in the permit area represent lower quality aquatic habitat and are designated as Class 5 or 6 by the UDWR.

Information presented in Chapter X, Section 10.4 of the MRP indicates that considerable degradation of stream water quality has occurred in Grassy Creek below the point of mine water discharge. This degradation was primarily the result of fine sediments, oil and grease (Chapter VI of the MRP). The applicant has installed sediment ponds with oil and grease skimmers to correct this situation.

No threatened or endangered species or critical habitats for these species has been documented for the permit area.

Since no additional surface disturbances are proposed for the current permit term, the primary impacts to wildlife will result from: (1) the continued loss of habitat previously disturbed by mining activities, (2) continued degradation of Grassy Trail Creek by mine discharge waters, and (3) the effects of human presence and activities on wildlife in adjacent undisturbed habitats.

To reduce the degradation of water quality in Grassy Trail Creek by mine water discharge, the applicant has installed sedimentation ponds with oil and grease skimmers to treat mine water before it is released into the creek. A detailed description of the sediment control plan and other water treatment facilities is provided in Chapter VII of the MRP. Various water quality parameters are being monitored by the applicant on a monthly, quarterly, and semi-annual basis at six points along Grassy Trail Creek to check the effectiveness of water quality control measures. In addition, four signs denoting a 100-foot buffer zone have been placed along undisturbed portions of Grassy Trail Creek in the vicinity of the mine workings.

A USFWS letter (dated October 9, 1981), to UDOGM indicates that the transmission line servicing the Sunnyside Mine does not pose a significant electrocution hazard to raptors and does not need to be modified.

Following cessation of mining, the applicant will reclaim and revegetate disturbed sites. Plant species selection and planting patterns proposed by the applicant were designated to restore wildlife habitat as the principal post-mining land use.

Compliance

Details of the applicant's wildlife educational program and nest-rotation grazing and fencing system for four pasture areas were supplied in various ACR and DOC responses but not included in the final MRP. Also no commitment pursuant to UMC 817.97(b) has been made in the MRP to promptly report to the regulatory authority the future occurrence of any threatened or endangered species or golden eagles in the permit area. In addition, no commitment has been made to avoid the use of persistent pesticides as per UMC 817.97(d)(7).

The applicant's revegetation plan is generally lacking specifics with regard to planting shrubs and trees as required by UMC 817.97(d)(4), (5), and (9), and it is not in compliance with these sections. Restoration of shrubs and trees in the riparian zone is of particular concern to the regulatory authority.

Stipulations

1. The applicant must supply in the MRP details regarding its wildlife educational program and nest-rotation grazing system.
2. The applicant must submit a statement committing to the avoidance of the use of persistent pesticides and to report to the regulatory authority any future occurrence of threatened or endangered species or golden eagles on the permit area.
3. The applicant must supply additional details on shrub and tree plantings with respect to enhancement of wildlife habitat as required by UMC 817.97(d)(4), (5), and (9).

UMC 817.99 Slides and Other Damage

Applicant's Proposal

There are several areas where slides could occur in the waste disposal site as well as on steep slopes where some of the portals are located. The applicant has provided for reporting of potential slides to the Division.

Compliance

The applicant is in compliance with this regulation.

Stipulation

None.

UMC 817.100 Contemporaneous Reclamation

Applicant's Proposal

Contemporaneous reclamation which will occur at the Sunnyside Mine is limited to grading and covering the coarse refuse disposal site. Revegetation will begin as soon as revegetation test plot data are available and the most applicable techniques and viable species are confirmed. Contemporaneous reclamation will also be conducted at the Slaughter Canyon Portal, storage area, and associated access road since these facilities are no longer required for coal production (Chapter III, Section 3.5.1, Vol. 1 of the MRP).

Compliance

Given that this is an existing mine and that existing disturbances are required for continued mine operation, the applicant complies with this section.

Stipulations

None.

UMC 817.101 Backfilling and Grading Plan

Applicant's Proposal

The backfilling and grading plan at the Sunnyside mine will apparently entail very minor handling of material with the exception of covering of the coal waste material (Chapter III, p. 40, Vol. 1 of the MRP). The applicant has stated that at several portal and shaft locations small highwalls have been created. In the backfilling and grading plan, the applicant has stated that, "These highwalls will typically be regraded to blend with adjacent surroundings as rock outcrops or small vertical faces." The specific location and configuration of these highwalls are not known. These highwalls are proposed because of the natural rock outcrops which exist in the permit area, and will therefore blend in with the post-mining topography. In addition, the applicant has stated that, any coal seam exposed near a portal will be covered with four feet of material unless not practicable. Specific plans have not been provided which show how the site is to be backfilled and graded to ensure that an acceptable post-mining topography will be achieved.

The applicant has committed to using borrow material to cover the coarse refuse disposal site and the slurry impoundment (see the Bond estimate, Chapter III, p. 58, 61, Vol. 1 of the MRP). This will entail the use of substantial amounts of borrow material. The applicant has identified on maps the location of borrow sites, and has stated that the area to be excavated is 22 acres and a depth of excavation of three feet is planned. Using a swell factor of 25 percent during handling, sufficient material is available to cover the 81 acres of the refuse disposal area with one foot of cover (see comments under 817.81 concerning the inadequacy of this depth of cover). In addition, material will excavated from the crested wheat grass sample area over 24 acres (see Plate III-23) to cover the coarse coal refuse area with

four foot of cover. A regrading plan for the borrow sites has not been provided.

Compliance

The applicant will be in compliance when the requirements of Section UMC 817.101(b)(1) and (8) are met, which allows the retention of highwalls. In addition, the applicant must commit to a specific backfilling and grading plan showing the volumes of material to be handled and where it will be placed to ensure that the requirements of 817.(b)(2) and 817.101(b)(5) are met.

Stipulations

1. The applicant has stated that portal and shaft cuts will typically be graded to blend into the surrounding topography. Specific plans must be provided which show the location of the highwalls and that the highwalls meet the requirements of UMC 817.101(b)(8) and that they will have a static safety factor of 1.5 as required by 817.101(b)(1). In addition, a specific plan for covering of coal seams exposed in the facilities areas must be provided. These plans must be provided within 30 days of permit approval.
2. Within 30 days of permit approval, a regrading plan for the borrow area must be provided showing how drainage out of the depression created during excavation will be obtained.

UMC 817.103 Backfilling and Grading: Covering Coal and Acid- and Toxic-Forming Materials

Applicant's Proposal

The applicant has committed to bury under four feet of non-toxic material, any acid-or toxic-farming material encountered during grading. The applicant has committed to covering coal slurry materials with one-foot of topsoil material. Past revegetation test plot results have indicated that slurry covered with two to six inches of topsoil has revegetation potential (Chapter VIII, Appendix VIII-3, Vol. 7 of the MRP). However, the long-term revegetation aspects of slurry covered with topsoil are not clear. Therefore, the applicant must commit to continued monitoring of slurry test slots to assess the long-term potential and, if test results show that slurry is not an acceptable growth medium, commit to covering slurry with four feet of non-toxic material.

Compliance

The applicant is not in compliance with this section. The following stipulation must be adequately addressed to show compliance.

Stipulations 817.103(1)

1. The applicant must commit to continued monitoring of slurry test plots to assess the long-term revegetation potential of slurry materials. The applicant must also commit to applying four feet of non-toxic fill over slurry disposal areas during revegetation if the test results show that slurry is not an acceptable growth medium.

UMC 817.106 Regrading or Stabilizing Rills and Gullies

Applicant's Proposal

The applicant has provided plans for the repair of rills and gullies which might form when they become greater than nine inches in depth.

Compliance

The applicant is in compliance with this section of the regulations.

Stipulation

None.

UMC 817.111-.117 Revegetation

Applicant's Proposal

Eighteen vegetation community types have been identified within the permit area. These vegetation types include: (1) Aspen, (2) Douglas Fir, (3) Douglas Fir/Aspen, (4) Douglas Fir/Mountain Brush, (5) Douglas Fir/Aspen/Mountain Brush, (6) Douglas Fir/Pinyon-Juniper, (7) Douglas Fir/Sagebrush, (8) Mountain Brush, (9) Pinyon-Juniper (10) Pinyon-Juniper/Grass, (11) PinyonJuniper/Mountain Brush, (12) Pinyon-Juniper/Sagebrush, (13) Riparian/Bullrush/ Sedge, (14) Riparian/Cottonwood Grove, (15) Riparian Willow, (16) Sagebrush/ Grass, (17) Sagebrush/Mountain Brush, and (18) Agriculture Hay Field. Of these communities only five (underlined above) have been or will be disturbed by surface facilities of the mine.

Disturbance to vegetation communities prior to 1977 totaled 400 acres. However, current acreage figures show only 244.5 acres as bondable under SMCRA. The remaining 155.5 acres of pre-SMCRA disturbance will not be covered by the applicant's bond. Broken down by community, this appears as follows:

<u>Community</u>	<u>Bonded Acreage</u>	<u>Unbonded Acreage</u>	<u>Total Disturbed Acreage</u>
Mountain Brush	5.2	6.0	11.2
Pinyon-Juniper	14.1	0	14.1
Pinyon-Juniper/Grass	122.6	124.6	247.2
Riparian	0	4.0	4.0
Sagebrush/Grass	<u>102.6</u>	<u>20.9</u>	<u>123.5</u>
	244.5	155.5	400.0

Undisturbed portions of each community which had been disturbed were sampled for total ground cover, canopy cover, cover by species, tree density, and shrub density. Productivity estimates were obtained from the SCS (methodologies given in Chapter IX, Vol. 7, p. 1-4 of the MRP). Statistical adequacy was achieved for all sampling data with the exception of ground cover in the Pinyon-Juniper community and shrub density in the Pinyon-Juniper/Grass community. Description (Section 9.3, p. 4-6, Vol 7 of the MRP) of each disturbed community follow:

The Mountain Brush community is dominated by true mountain mahogany (Cercocarpus montanus) and Saskatoon serviceberry (Amelanchier alnifolia) with respective densities of 520 and 265 stems per acre. Shrub cover was estimated at 26 percent while herbaceous cover was estimated at 10 percent, with Salina wildrye (Elymus salina) comprising the majority of this understory cover. The SCS estimates production at 800 pounds per acre (air dry).

The Pinyon-Juniper community is dominated (78 percent of the relative vegetation cover) by Utah juniper (Juniperus osteosperma) and pinyon pine (Pinus edulis), with 125 and 132 stems per acre respectively. A variety of shrubs is found in the understory (over 300 per acre) with true mountain mahogany curlleaf mountain mahogany (Cercocarpus ledifolius), and Stansbury cliffrose (Cowania mexicana) most dominant. Herbaceous cover was estimated at less than two percent. SCS estimated production was 200 pounds per acre.

The Pinyon-Juniper/Grass community is again dominated by Utah, juniper and pinyon pine with 149 and 102 stems per acre respectively. True mountain mahogany is the dominant shrub in the understory while the herbaceous stratum (nine percent cover) is dominated by Indian ricegrass (Oryzopsis hymenoides), penstemon (Penstemon subglaber) and lobeleaf groundsel (Senecio multilobatus). SCS estimated productivity is 300 pounds per acre.

The Riparian community is dominated by willows (64 percent of total vegetation cover and 18,124 stems per acre) with big sagebrush (Artemisia tridentata) dominating the shrub stratum (1,013 stems per acre). The overstory is dominated by narrow leaf cottonwood (Populus angustifolia) and box elder (Acer negundo) with 41 and 36 trees per acre respectively. The herbaceous stratum, except at the stream edge, is sparse, with only 4.4 percent cover. SCS estimated productivity is 3,000 pounds per acre.

The Sagebrush/Grass community has historically received heavy grazing pressure and is dominated by big sagebrush with 3,477 stems per acre. Herbaceous cover averages 36 percent and is comprised mainly of grasses (93 percent). SCS estimated production is 1,000 pounds per acre.

Reference areas have been chosen for each disturbed community and their locations are exhibited on Plate IX-1. These areas were confirmed as valid representations of disturbed communities by the DOGM on February 19, 1981. (Memo to the file from Tonia Torrence dated April 16, 1981). Sampling of reference areas did not occur as all surface disturbance occurred prior to 1977, thereby eliminating any possibility for quantitative comparison with pre-disturbance vegetation (which is the usual reason baseline data are gathered). Qualitative comparison is given on Tables IX-34 through IX-38 (Chapter IX of the MRP). The applicant has committed to permanently marking and protecting these areas from mining disturbances throughout the life of the mine.

No threatened or endangered plants are known to exist within the permit area. One plant, Hedysarum occidentale canone, classified as High Priority Two by the Utah Native Plant Society, was found in a side canyon of the permit area; however, it is removed from potential disturbances.

Following mine closure, all mine openings will be sealed, facilities dismantled (with the exception of a number of permanent buildings in the main complex), and the disturbed areas will be graded on the contour where possible to blend with the surrounding terrain. The coarse refuse disposal site will remain above general grade following revegetation since it is in this position at the present time and grading will not lower the elevation. Borrow material will be required to attain grading objectives for some sites. Borrow will be obtained from within the permit area (Plate III-23, UMC 817.101). The borrow areas will be reclaimed at the Pinyon-Juniper/Grass vegetation type. Portal faces will be left as rock-faced highwalls. All roads to be reclaimed as well as sites where no seedbed material is applied will be ripped to relieve compaction. The applicant proposes to leave several mine access roads for future use but has not received concurrence from the Division. The Grassy Trail Dam and Reservoir structures are also proposed to remain intact following mining. Following grading, available soil materials will be respread. Soil samples will be taken on all disturbed areas (Chapter III, Sections 3.5.2, 3.5.4, 3.5.4.4, Vol. 1 of the MRP).

The proposed schedule for revegetation conforms to normal guidelines. Fertilizer will be spread prior to planting. Phosphorous fertilizer will be disced into the soil surface. Discing or surface roughening will be applied to all areas where a surface crust has developed. Seeding will occur the first appropriate season after site preparation. Gentle slopes will be drilled while steeper slopes will be broadcast (Chapter III, Section 3.5, Vol. 7 of the MRP).

All disturbed areas will be mulched with two tons of native hay per acre. Mulch on gently sloping areas will be crimped or chemically tacked. Mulch on steeper slopes will be chemically tacked. Jute matting or excelsior blankets will be used to mulch in planned drainage areas (Chapter III, Section 3.5.5.3, Vol. 1 of the MRP).

Replanted sites will be protected from livestock grazing. Plastic netting will be used on tree and shrub seedlings, if necessary, to prevent wildlife browse damage. Weed and rodent control programs will be adopted as appropriate. No irrigation is planned (Chapter III, Section 3.5.5.4, Vol. 1 of the MRP).

Two sets of seed mixture (Tables III-5 through III-9 and III-15 through III-18, Chapter III, Vol. 1 of the MRP) are included in the permit application. Both sets of tables contain mixtures for the Mountain Brush, Pinyon-Juniper, Pinyon-Juniper/Grass and Sagebrush-Grass vegetation types. In addition, the first set of tables contains a mixture for the Riparian vegetation type. The applicant must decide which set of mixtures and how many vegetation types will be reclaimed will be used during final revegetation.

The applicant states in Chapter III (p. 45, Vol. 1 of the MRP), that no seedling transplanting will be accomplished. However, the applicant states in Chapter IX (p. 10, Vol. 10) that several species will be transplanted. Tables III-5, III-6, III-7, and III-8 (Chapter III, Vol. 1) also indicate transplanting will be completed. This discrepancy must be resolved.

The methods proposed for revegetation success determination are in compliance with requirements of UMC 817.116 and 117. The applicant proposes to monitor revegetated areas every year until these areas reach 70% of the reference area standard for ground cover and 90% of the density of the reference area woody stems with 90% and 80% confidence respectively. At this time the 10-year responsibility period will begin. Maintenance monitoring will occur the third and sixth years of this period to ensure healthy and vigorous revegetated communities. During the last two years of the responsibility period, the applicant will sample and test both cover and density against the reference area standards using a simple T-test of the means. When revegetated area variables have reached these standards pursuant to UMC 817.116 and 117 for both years, conditions will have been met for bond release.

Compliance

The applicant must adequately address the following stipulations to show compliance with this section.

Feasibility of Reclamation The Sunnyside Mine site receives approximately 12 to 16 inches of rainfall annually. This amount is clearly sufficient for the establishment of the majority of the species included in the planting mixtures. Seedbed materials, although composed primarily of spoil and cut-and-fill material, should provide an acceptable growth medium. Reclamation of the coarse refuse disposal site is considered feasible at this time (prior to revegetation tests being conducted on coarse refuse) only if covered by a sufficient depth of borrow material. The proposed method for determining revegetation success is sufficiently stringent so as to ensure successful revegetation efforts before any bond monies are released to the applicant.

Stipulations

1. The applicant must decide whether seedling transplanting will or will not be accomplished and revise the plan to reflect this decision. The bond estimate may require revision based on this decision.
2. The applicant must decide which set of seed mixtures will be used during final revegetation and revise the plan to reflect this decision. The bond estimate may require revision based on this decision.

UMC 817.121 Subsidence Control Plan: General Requirements

Renewable resources and structures exist over the proposed workings at the Sunnyside Mine. These include roads, pasture lands, wildlife habitats, and a Class 3 put and take fishery as shown on Plate X-1 in Whitmore Canyon which is a perennial stream, and most of the structures as noted on Table III-1 (MRP). In addition, cultural resources have been identified over the mine.

The area above the mine was surveyed by the U.S.G.S. in 1962 (Osterwald). As of that time, mining had progressed under Whitmore Canyon in some areas with 500 feet of cover with full extraction and under the steep-sided walls of Whitmore Canyon. At that time evidence of subsidence was primarily found on the steeply rising east wall of Whitmore Canyon where the depth of cover ranged from 500 to 800 feet. The subsidence feature was described by the applicant as surface cracking (Chapter III, p. 28, Vol. 1 of the MRP).

The only other subsidence survey at the mine was conducted by the applicant in August of 1983 over a longwall panel which was mined in August of 1983 (Chapter III, p. 28, Vol. 1 of the MRP). The mined area was under 1050 feet of cover, and the coal seam was eight feet thick. The subsidence surveys were located in the valley bottom of Bear Canyon. The maximum amount of subsidence which was measured in this short period of time was 0.53 feet. It is expected that the subsidence will continue at this site for some period of time. In other areas of Utah, subsidence has been found to be time dependent and continues for over a year in areas overlain by the Castlegate Sandstone. The full extent of subsidence will be measured as monitoring continues. The applicant has not provided a schedule for monitoring or submittal of reports to the regulatory authority.

The applicant has provided an evaluation of the effects of subsidence on the renewable resources in the mine area (Sections 3.4.8.1 and 3.4.8.2 of the MRP). Due to the duration of time that the mine has existed, some effects of subsidence or lack thereof have already been observed. To date it appears that there has been no impact to the aquifers in the area nor to Grassy Trail Creek. The applicant is planning to monitor for possible future effects (Chapter VII of the MRP) on the ground water system, and will conduct physical and visual surveys of the stream and inflows into the mine. If disruption of the stream occurs, the applicant will consult with the regulatory authority concerning mitigation. The applicant has not provided a schedule for

monitoring nor a time frame for submittal of monitoring reports once the surveys have been completed.

Mining, to date, has not significantly disrupted the grazing lands, roads, cultural resources, nor wildlife habitats in the cliff areas. The cliffs are raptor nesting areas and mining will not occur under the identified Golden Eagle Nests. If new nests are established over proposed mining areas, the applicant will consult with the appropriate authorities on mitigative measures to be taken. Mining has occurred under all inventoried cultural resources. Therefore, no mitigation plans are required.

Proposed mining under Grassy Trail Reservoir will be limited to first mining only. An area of limited mining has been defined using a 20 degree angle of draw from the perimeter of the reservoir. The pillars, left under the reservoir, will have dimensions of 80 by 110 feet, which results in a safety factor of 1.1 for the pillar design. The applicant did not provide an analysis of how the safety factor for the pillars was determined nor justification for the angle-of-draw.

Compliance

Since surface effects of subsidence have been observed in the past in steep slope areas, and the applicant is intending to mine under other similar areas, it is reasonable to expect that subsidence impacts will occur which will be evident at the surface. According to information provided by the applicant, the effects of subsidence have not been significant to date. Continued monitoring will identify future subsidence effects.

The subsidence surveys that the applicant has proposed are not adequate because schedules for monitoring and submittal of the information to the regulatory authority have not been identified.

The applicant has not provided sufficient information to determine the adequacy of the plan for protection of the reservoir. Documentation on the angle-of-draw and pillar design under the reservoir has not been provided.

The operator is not in compliance with UMC 817.121 until the following stipulations have been met.

Stipulations

1. Within 30 days of permit approval, the applicant must provide a schedule for subsidence monitoring that shows when monitoring will occur and when the monitoring information will be submitted to the regulatory authority after the survey is complete.

2. Within 30 days of permit approval, the applicant must provide an analysis showing how the pillars were designed under Grassy Trail Reservoir, and justification for the angle-of-draw. Given the situation of protecting a reservoir, a more conservative angle-of-draw and safety factor may be appropriate, depending upon the methods used to determine pillar size.

UMC 817.122-126 Subsidence Control: Public Notice

Applicant's Proposal

The operator has state that all owners of property in the areas affected by possible subsidence from mining will be notified by mail of the proposed mining schedule six months prior to mining. The notice will contain information on the location of mining, dates that mining is to occur, and measures taken to prevent or control adverse subsidence effects.

Compliance

The applicant is in compliance with this section of the regulations.

Stipulation

None.

UMC 817.131 Cessation of Operations: Temporary

Applicant's Proposal

The applicant will notify the Division before, or as soon as it is known, that a temporary cessation of operations will extend beyond 30 days. The notice will contain all requirements of UMC 817.131.

Compliance

The applicant is in compliance with this regulation.

Stipulation

None.

UMC 817.132 Cessation of Operations: Permanent

Applicant's Proposal

Upon permanent cessation of operations, permanent reclamation will commence. Mine openings will be sealed, all surface equipment, structures and facilities associated with the operation, except those approved by the regulatory authority as suitable for the post-mining land use or environmental monitoring, will be removed, and all affected areas permanently reclaimed. A complete reclamation plan and schedule can be found in Chapter III of the MRP.

Compliance

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.133 Post-mining Land-Use

Applicant's Proposal

In the area of the active mine, underground coal mining has historically been the dominant land use while undisturbed grounds within the permit area were predominantly wildlife habitat or rangeland for domestic livestock grazing. Less significant uses of the land include recreation and a very small (four-acre) area of agriculture (alfalfa field) (Section 4.4.2, p. 4, Vol. 5 of the MRP).

Coal mining has occurred on the permit area continuously since the turn of the century. Mining occurred within both the lower and upper Sunnyside seams, and approximately 60 million tons of coal have been removed (see Section 4.4.2, p. 4, Vol. 5 of the MRP).

The applicant proposes (Section 4.5, p. 5, Vol. 5 of the MRP) to return the areas designated for reclamation to the pre-mining land-uses of wildlife habitat/rangelands/recreation. The areas designated for reclamation include 244.5 acres of the original 400 acres which have been disturbed by historic mining. Reclamation and revegetation practices outlined in Chapter 3 appear feasible and sufficient to return the pre-mining land uses. Release of the final 15 percent of the bond pursuant to UMC 807.12 (c) is dependent upon the successful return of these land uses.

Compliance

The applicant is not in complete compliance with this section.

Stipulations

1. The applicant must obtain written permission of the post-mining landowner and provide appropriate justification pursuant to UMC 817.133 to leave structures following conclusion of mining and reclamation activities as stated in Section 3.5.3.2, p. 38, Vol. 1 of the MRP).

UMC 817.150 - .176 Roads

Applicant's Proposal

The applicant has a total of ten roads on the property. These roads were all constructed prior to enactment of SMCRA. No new roads are planned, although improvements to existing roads may be performed dependent on future mining plans (Chapter III, p. 7 of the MRP). The ten roads within the permit area are listed below.

1. Refuse Road. The refuse road is used as a haul road for waste rock from the coarse refuse bin to the coarse refuse disposal area and as access to the Water Canyon Road.
2. Water Canyon Road. The Water Canyon Road is used as an access road for the No. 2 Mine fan and associated outcrop portals.
3. Number Two Canyon Road. The Number Two Canyon Road is used as an access for the No. 3 Mine fan in Number Two Canyon.
4. Fan Canyon Road. The Fan Canyon Road is used as an access for the No. 1 Mine fan.
5. Slaughter Canyon Road. The Slaughter Canyon Road was used as an access for the Slaughter Canyon Portal. This road was reclaimed in 1982.
6. Pole Canyon Road. The Pole Canyon Road is used as an access for the Pole Canyon exhaust shaft.
7. Manshaft Road. The Manshaft Road is used as an access for the upper bathhouse and manshaft.

Manshaft Fan Road. The Manshaft Fan Road is used as an access for the Twin Shaft fan. (Total length for both roads is 0.7 mile.)
8. Reservoir Road. The Reservoir Road is used as an access for the Whitmore Canyon Dam and as an access for private lands above the dam.
9. Pasture Canyon Road. The Pasture Canyon Road will be used as an access for a future air shaft and fan.
10. Complex Roads. The Complex Roads are used as an access around the mine offices, shop, bathhouse, and preparation plant.

None of the roads are used for transportation of coal and all roads are Class II. The Reservoir Road is a Carbon County road and is an extension of State Highway 123.

Kaiser Steel has provided a profile and plan view of the Refuse Road (Haul Road, Plate III-25). Typical cross sections of each road are provided on Plate III-17. Basic road specifications consisting of length, average grade, maximum grade and average width are provided in Table III-3. Road culverts are identified on Plate III-1 with specifications provided in Table III-22. Appendix III-1 provides design calculations for culverts.

Kaiser Steel proposes to leave most of the existing road system in place as access to rodeo grounds, Grassy Trail Reservoir, and other facilities and for future grazing and recreational uses (Chapter III, p. 8 of the MRP).

Roads which are proposed to remain after mining include Pole Canyon Road, Reservoir Road, Pasture Canyon Road and Fan Canyon Road. Portions of the Manshaft Road, Number Two Canyon, and Complex Roads, and Water Canyon Road will

be removed and reclaimed. These roads are identified on Plate III-1. Kaiser Steel proposes to totally remove the Refuse Road. The Slaughter Canyon Road was removed in 1982 and is being reclaimed.

Compliance

Since all roads were constructed prior to enactment of SMCRA, not all performance standards for Class II roads in UMC 817.160-166 have been incorporated. The applicant has demonstrated compliance with culvert standards for roads which are to remain after mining ceases.

Stipulations 817.150-176(1)

1. The applicant will continue to work with the Division on showing compliance with performance standards for all roads which are to remain after mining.

UMC 817.180 Other Transportation Facilities

Applicant's Proposal

Transportation facilities at the Sunnyside Mines other than roads include a spur of the Denver and Rio Grande, 40" gage mine tracks to link the surface and underground linkage, and ten conveyor belts to transfer coal and coarse refuse. These transportation facilities are all located in the main surface facilities area (Plate III-2). The applicant has committed to restore these facilities as required by UMC 817.180 (Chapter III, p. 38 and 39 of the MRP).

Compliance

The applicant's proposal is in compliance with the general requirements of this section.

Stipulation

None.

UMC 817.181 Support Facilities and Utility Installations

Applicant's Proposal

The applicant has constructed sediment ponds to control runoff from all facility areas with significant disturbances. The sediment ponds control suspended solids and have skimmers to control oil and grease. Runoff from undisturbed areas above support facilities has been diverted around the facilities to help prevent degradation of water quality. In locations where the disturbance area is small around support facilities, straw bales have been used to control suspended solids runoff (Chapter III, p. 23 and Chapter VII, p. 18 and 19 of the MRP).

Compliance

The applicant is in compliance with UMC 817.181.

Stipulations

None.

UMC 822.1 - .14 Alluvial Valley Floors

Applicant's Proposal

The applicant has sought a negative determination for alluvial valley floor impact due to the upland location of the mine facilities (surface slurry impoundments, refuse piles, etc.) and also due to the past success of alfalfa crops grown adjacent to these facilities and which are irrigated with mine water or with Grassy Trail Creek water containing mine water discharge.

Approximately 63 acres of alfalfa are grown on stream-laid deposits of the adjacent area; an additional 89 acres of grasses and lawn are located on these deposits.

Due to the incised nature of present-day Grassy Trail Creek, natural sub-irrigation of the alluvial deposits is very limited or non-existent. Flood irrigation and sprinkler irrigation maintains the alfalfa and grasses on these areas. The land used for farming is owned either by Kaiser Steel on East Carbon City; individuals lease the land for farming and use the landowner's water rights (Section 7.3, p. 22 of the MRP).

Compliance

The applicant has submitted sufficient information in the MRP for the regulatory authority to determine potential future impacts to the alluvial valley deposits and to the agricultural activities thereon.

The regulatory authority finds that no adverse impacts to alluvial valley farmlands will occur during the life of mining and reclamation activity as proposed in this MRP. The applicant is therefore in compliance with this section. The primary reasons for this determination are as follows:

1. No disturbance of alluvial valley deposits presently or historically under agricultural land use is planned for the life of mining and reclamation activities.
2. The potential for sub-irrigation of the alluvial valley deposits is very limited or non-existent due to the incised nature of present-day Grassy Trail Creek.
3. Present flood and sprinkler irrigation of the alluvial valley deposits with mine discharge water currently results in successful agricultural production.

4. Proposed monitoring of the slurry cells and coal refuse piles is adequate to provide protection of these deposits from material damage.
5. The essential hydrologic function of the alluvial valley floor deposits will remain intact throughout the life of mining and reclamation activities as proposed in the MRP.

Stipulations

None.

UMC 823 Prime Farmlands

A determination has been made that no prime farmlands exist on the permit area (Figure IV-1, Chapter IV of the MRP, letter from Theron Hutchings, Utah State Soil Scientist to Marcia Wolf, Kaiser Steel Corp.).

Compliance

The applicant is in compliance with this section.

Stipulations

None.

REFERENCES

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4. Doelling, H. H., 1972, Central Utah Coal Fields, Sevier-San Pete, Wasatch Plateau, Book Cliffs, and Emery, Utah Geology and Mineralogical Survey Mon. Ser. 2, 411 p.
5. Kaiser Steel Corp., 1984, "Mining and Reclamation Plan, Sunnyside Mines," on file at Office of Surface Mining, Western Technical Center, Denver, Colorado.
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7. Osterwald, F. W., C. R. Dunrud, 1966, Instrumentation Study of Coal Mine Bumps, Sunnyside District, Utah, in Central Utah coals, a guidebook prepared for the Geological Society of American and Assoc. Soc. Utah Geological and Mineralogical Surv. Bull. 80, 97-110.
8. Simons, Li & Associates, Inc., 1984(a), "Cumulative Hydrologic Impact Assessment, Cottonwood Creek Basin, Emery County, Utah," Final Report, Contract No. JS120095, Office of Surface Mining, Western Technical Center, Denver, Colorado.
9. Simons, Li & Associates, Inc., 1984(b), "Cumulative Hydrologic Impact Assessment, Huntington Creek Basin, Emery County, Utah," Final Report Contract No. JS120095, Office of Surface Mining, Western Technical Center, Denver, Colorado.
10. Stokes, W. L., 1977, Subdivisions of the Major Physiographic Provinces in Utah, in Utah Geology, Vol. 4, pgs. 1-17.