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**KAISER
STEEL**

KAISER STEEL CORPORATION
SUNNYSIDE COAL MINES
SUNNYSIDE, UTAH 84539
TELEPHONE 801-888-4421

November 17, 1983

Mr. James W. Smith, Jr.
Coordinator of Mined Land
Development - DOGM
4241 State Office Building
Salt Lake City, UT 84114

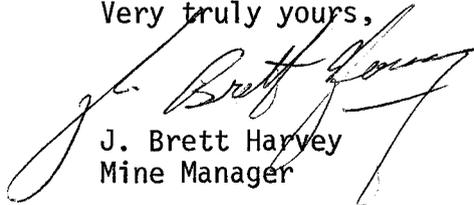
Re: Determination of
Completeness

Dear Mr. Smith:

Responses to the Division's Determination of Completeness (DOC) for the Kaiser Steel Corporation Sunnyside Mines Permit application are enclosed.

The response is organized with answers to the DOC, appendices with additional material or replacement material for the ACR. Additional Plates or replacement Plates for the ACR may be found at the end of each DOC for placement in your ACR.

Very truly yours,


J. Brett Harvey
Mine Manager

JBH:jf

RECEIVED
NOV 18 1983

**DIVISION OF
OIL, GAS & MINING**

SIMONS, LI & ASSOCIATES, INC.

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October 14, 1983

Mr. Steve Cox
Division of Oil, Gas and Mining
4241 State Office Building
Salt Lake City, Utah 84114

RECEIVED
OCT 17 1983

RE: DOC for Kaiser's Sunnyside Mine
(Our Job No. UT-DOGM-01)

**DIVISION OF
OIL, GAS & MINING**

Dear Steve:

Enclosed are eight copies of the DOC for Kaiser's Sunnyside Mine. Should you or other members of the Division's staff have any questions, please contact me.

Sincerely yours,



William T. Fullerton
Senior Hydraulic Engineer

WTF/kdw

Encl: 8 Kaiser DOC

RD148/R389CL

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DETERMINATION OF COMPLETENESS

AND

TECHNICAL DEFICIENCIES

KAISER STEEL CORPORATION

SUNNYSIDE MINES

SUNNYSIDE, UTAH

Submitted To:

Utah Division of Oil, Gas and Mining
4241 State Office Building
Salt Lake City, Utah 84114

Submitted By:

Simons, Li & Associates, Inc.
Post Office Box 1816
Fort Collins, Colorado 80522

Project Number UT-DOGM-01

October 14, 1983

UMC782.14 Compliance Information

(a)&(b) An update of this information must be provided as necessary to reflect changes since the March 1981 application submittal.

DETERMINATION OF COMPLETENESS

This section has been mistakenly labelled in Chapter 1 and contains information concerning individuals who prepared or were consulted in preparing the MRP. This information should fall under UMC 771.23.d.

UMC 782.19 Identification of Other Licenses and Permits

All permits needed to conduct the underground mining operations should be included. The list in the application is incomplete. Permits or licenses that have been applied for but not issued are also required to be listed.

DETERMINATION OF COMPLETENESS

Information appears to be complete except for the possibility of air quality permits. Clarify whether the operation requires air quality permitting and if so, provide the permit information.

UMC 783.12 General Environmental Information

A table giving the exact portions surveyed of the sections identified on page 5 should be provided.

DETERMINATION OF COMPLETENESS

The applicant includes the information requested on Table V-3 and also mentions that Plate V-5 shows the survey area, but Plate V-5 is not included with the submittal. Should the reference to Plate V-5 be to Plate V-1 or is Plate V-5 missing? Please correct or delete the reference to Plate V-5 or provide Plate V-5.

UMC 783.14 Geology Description

(a)(2)(iii) Include results of the studies referenced in Chapter 6.5.3.1 on the quality parameters of the refuse. If the chemical properties of the out-of-seam rock are adverse, additional detail on plans to control its disposal underground to prevent interaction with groundwater will be needed. Provide chemical analyses of clay content of overburden and underburden or estimate the percentage (by volume) of interbedded clay layers which were described in section 6.5.3.1. The applicant calls for variable roof rock. In what way, e.g., competence, bedding thickness? Designate the location of the layers, e.g., immediate overlying layer, interbedded layers between coal seams as illustrated in Figure 6-2, or immediate underlying layers (6.5.3.1).

DETERMINATION OF COMPLETENESS

Pyritic content is not directly given in Table VI-3. Are you assuming that if there is negligible organic sulfur present, then pyritic content can be considered to be equal to the difference between total sulfur and sulfate sulfur?

The text defines clay variability as very high. Please provide, at the least, a qualitative estimate of the clay content of the stratum immediately below each stratum to be mined.

UMC 783.15 Ground Water Information

The applicant makes a general statement that "there are no extensive permanent water tables or aquifers in the semiarid regions of the west." This statement is not true and should be removed from the permit. Although aquifers may be much more limited in size in this region than in other areas of the country, it is not justification for not providing sufficient information to properly assess the impact of mining on the local groundwater system. The fact that, on the average, the mine produces in excess of 700 gpm of water would indicate that there is a high probability that the mine is impacting some locally significant aquifers. The 700 gpm is equal to approximately 1.6 cfs or nearly one quarter of the 7 cfs average flow reported for Grassy Trail Creek during water year 1979.

There is information provided in the permit application that would indicate that recharge does occur. In section 7.1.3.2 it is mentioned that the required pumping rate of water from the No. 2 mine varies with the time of year and the amount of precipitation. This would indicate that there is surface connection and the potential for recharge of aquifers in the permit area. The high flow rate of water into the No. 1 Man Shaft indicates the presence of an aquifer. It is necessary to be able to evaluate the effects the mining activity will have on this aquifer.

The information presented in the permit is inadequate to determine whether additional measures need to be taken, both during and after mining, to prevent significant adverse impacts on the groundwater system within and adjacent to the permit area.

DETERMINATION OF COMPLETENESS

Several items need clarification. The groundwater inflows in table III-14 need to be identified with the date of the estimates (approximate). Map III-4 shows general points as observed groundwater inflow points (labeled "GOB"). More information concerning these points would be helpful such as a description of the inflow point (roof, floor, faulted area, etc...) and estimate of flow. These points could be labeled GOB-1, GOB-2, etc. and a table constructed that provides this information.

The NPDES monitoring points should be shown on Figure VII-3 and a legend provided showing what the various symbols (squares, circles, etc.) represent.

LMC 783.15 (cont.)

(a)(1) Provide the location of localized aquifers and indicate if they are within the interburden, overburden or underburden. The depth to water information from the logs in appendix 6.9 and any additional information should be used to define any aquifers. An attempt should be made to define the piezometric surface of any aquifer over the permit area. The plan for groundwater monitoring in Section 7.1.6 should be updated to reflect the current program

and the monitoring data gathered should be included in the application. Additional information that needs to be provided includes:

1. More detail on the location and quantity of groundwater inflows within the mine.
2. Water quality measurements from seeps and springs in the area.
3. Individual flow rate information for the various mine water discharge points so that seasonal variation can be determined.
4. Information from the applicant's South Lease Mine that would assist in assessing regional groundwater characteristics.

DETERMINATION OF COMPLETENESS

Table VII-4 lists water flow rates from NPDES points 002 and 004. Plate VII-3 also shows mine water monitoring points 001 and 003. Similar information for these locations 001 and 003 should be provided in Table VII-4. In Section 7.1.4 of the original submittal four mine water flow measurement points are identified as UGM-1, UGM-3, 003, and 002. These should be cross referenced to the numbers appearing in the supplement.

The applicant states that the proposed groundwater monitoring program has been abandoned and a new plan, using state-of-the-art technology will be undertaken. Any information on these plans would be useful since, due to the absence of a monitoring plan, except the monitoring of discharge points, the reviewer will have to make some recommendations. It may be in the best interest of the applicant to provide as much detail as is available at this time on the proposed plan to avoid future conflicts.

UMC 783.15 (cont.)

(a)(4) The applicant should update the groundwater quality information in Table VII-1. The information is useful in a general sense, e.g., assess toxicity levels; however it is necessary to provide more detailed information to determine seasonal variations and the variation in water quality from the individual measurement points. Effluent discharge quality must comply with UMC 817.42B(7). A suggested format would be to graphically display the data on a monthly basis for each of the measurement points. Flow rates at the time of measurement should be given, if available.

DETERMINATION OF COMPLETENESS

Information for points 001 and 003 should be provided in Appendix VII-3 as was provided for points 002 and 004.

UMC 783.16 Surface Water Information

(a) The drainage area (in square miles) of Grassy Trail Creek should be given for both areas above the permit and within the permit. A portion of the permit area does not drain directly into Grassy Trail Creek within Whitmore Canyon. This area should also be identified, measured and discussed. This area is mainly along the west boundary of the permit. Except in the Fan Canyon area, there does not appear to be disturbed areas within this western drainage from the permit. The applicant should discuss this fact and whether any future disturbance is planned in the portion of the permit area that does not drain into Grassy Trail Creek within Whitmore Canyon.

Review of the Sunnyside Mine file at the Division showed that a large amount of water quality data has been collected since the original permit submittal. This information should be provided to update the permit. Table VII-2 should be updated to include this data. However, it is also necessary to show seasonal variation which Table VII-2 is insufficient to achieve. The applicant should provide monthly information on the results of water quality monitoring; graphical representation is preferred.

Since the USGS gaging station #0931430 record is the only available discharge measurement site on Grassy Trail Creek, the data for this station should be provided in a format sufficient to assess seasonal variations in flow rates.

Several seeps were noted within the permit area during the site visit in May 1983. This contradicts the statement in 7.2.3.2 of the applicant which says no springs or seeps are located in the area. This point needs to be further discussed by the applicant.

7.2.3.2 also discusses the Slaughter Canyon sediment pond. This discussion needs to be updated to reflect the current status of the reclamation of the sediment pond. Plate III-1 and VII-1 should also be updated.

In general, information on Plate III-1 is hard to utilize due to the lack of a complete legend of symbols, lines and abbreviations. The location of all mine water discharge points should be clearly identified on the map. These deficiencies need to be corrected.

Since the original permit application, the applicant has made a significant effort to improve the surface water drainage system including the construction of sediment ponds, diversions, and a water treatment facility for seepage from the coarse refuse disposal. These new features and any others that control surface water runoff should be included in Plate VII-1.

DETERMINATION OF COMPLETENESS

There is a typographical error in the table listing watershed area on the first page of the response to UMC 783.16 The mine permit area is given as 29,815 which is incorrect.

Information included in Appendix VII-5 for GT1 and GT6 should be provided for the other Grassy Trail monitoring locations (i.e. GT-2 through GT-5).

783.18 Climatological Information

In Section 11.3.5, the applicant should provide accurate site specific wind data such as is typically presented in a "wind rose." Such data should describe the average velocity and direction of winds both annually and monthly.

DETERMINATION OF COMPLETENESS

As agreed at the meeting between the applicant and the UDOGM and its' consultants on July 22, 1983, the applicant would obtain from the UDOGM and/or the Utah State Pollution Control Board a letter of approval with regard to the lack of wind data (direction and speed) and present such a letter in the application. Such a letter could not be found in the response to comments.

UCMC 783.21 Soil Resource Information

(b) The applicant states in section 3.5.3.2c that a soil other than topsoil could be used on preparation plant reject and industrial waste disposal facilities. The applicant should clarify whether this is a soil material (and its potential source) or an alternate material.

Files at the Division contain discussions concerning a revegetation test plot to be constructed with the aid of the Soil conservation Service (SCS). Does such a test plot exist? If so, update the application to include its description and results of testing.

DETERMINATION OF COMPLETENESS

For clarity, the applicant is requested to present a table summarizing the test plot activities which have or will occur on site. This summary should include the general location of plots, basic objectives of the tests, year of test plot construction, and year of test conclusion (actual or assumed for plots currently being tested).

The applicant need identify the source of the alternate "borrow material" mentioned in the ACR response.

Is the "refuse" term used in the ACR response synonymous with "preparation plant reject" and "industrial waste" terms used in the original application? If yes, this should be clarified. If no, the ACR discussion need be amended to address the original concern.

The applicant need amend the permit with the details of the test plot mentioned in the response for completeness.

UMC 784.11(b)(6) Operation Plan: General Requirements

Include the information required for the water treatment measures installed for the seepage from the coarse refuse pile. The discussion of sediment ponds in section 3.2.9 should be updated to reflect current sediment ponds. Maintenance and sediment removal programs should also be addressed.

DETERMINATION OF COMPLETENESS

Label Plate III-1 to clearly show which ponds (No. 1, No. 2, and Clearwater?) are associated with slurry disposal. None of the ponds are labeled as Twin Shaft, Old Coarse Refuse Pond, or Coarse Refuse Drainage; however, plans for these ponds appear in Chapter III of the supplement. All ponds should be labeled in the same manner as referenced throughout the text and drawings.

UMC 784.13 Reclamation Plan: General Requirements

(a) It is unclear, given the statements in the application concerning revegetation techniques proposed, which disturbances the applicant deems Kaiser Steel Corporation (KSC) responsible for under the provisions of the current regulations. KSC is responsible for reclaiming all areas disturbed or used during the course of the life of the mine regardless of when the initial disturbance occurred. It is suggested that a table be developed like Table III-1 showing the facilities, portals, etc. which are proposed to be disturbed or used during the course of the life of the mine versus such facilities which will not be affected and are not included in the bonding. This will help clarify the level of revegetation activities required.

DETERMINATION OF COMPLETENESS

It was requested that a table similar to Table III-1 be submitted that identified all facilities, portals, etc which are to be reclaimed. Is it valid to assume that all items listed in Table III-1 are to be reclaimed? It would be helpful if these items were shown on Plates III-20 through III-23. In Table III-24, the items under the description of each area should include their I.D. numbers as given in Table 3.1. In the original permit, approximately 400 acres of disturbed land are referred to. In the supplement, 245 acres are identified. This needs to be clarified.

UMC 784.13 (cont.)

(b)(3) Cross sections and interim and post-mining contour maps are not provided in the application. The applicant states contours are shown in Plate III-1; however, these are existing contours and some change will be required during reclamation.

It is stated that the upslopes of the ventilation shafts in Pole Canyon [3.5.1(c)] are stable. What evidence supports this?

In subsection 3.5.4.2, the applicant should identify which portal and shaft locations exhibit highwall requiring filling and contouring. Is this activity accounted for in the bond estimate?

DETERMINATION OF COMPLETENESS

The main concern in this comment was the coarse refuse disposal area, slurry ponds, borrow area, and other areas which will change throughout the permit term. A contour representation of what these areas are to look like after reclamation is required. It is doubtful that they will appear as they did at the time of mapping. If need be, contours should be shown on a more suitable scale. The reviewer understands that conditions may change as to how much refuse is produced; however, a best estimate of the volume and final shape of the disposal area should be

made for planning purposes.

UMC 784.13 Reclamation Plan: General Requirements

(b)(4)&(b)(5)(vii) In addition, it is unclear how much topsoil is available for reclamation purposes. Is there sufficient soil material available to adequately reclaim the site? A showing is required from the applicant concerning soil volumes available, material sources, project distribution sites and final cover depth. One option for fulfilling this requirement is to construct a mass-balance table. The table would identify topsoil sources (existing stockpiles, areas to be disturbed, etc.), lift depths, and the material volumes of those sources. The table would also indicate the sites on which the topsoil will be redistributed, showing the disturbed acreages involved, and the projected depth of topsoil cover on each site. Soil materials which are to be used for reclamation but are unavailable for stockpiling or handling due to previous mining (i.e., soils beneath the coarse refuse pile, facilities sites, etc.) must also be identified and included. The depth and quality of these materials must be assessed to determine available volumes. Such materials need only be identified as "in place" on the table since they would not be moved or rehandled unless needed for application on other areas. If such materials are to be redistributed, a more detailed treatment would be required regarding redistribution volumes, etc. A companion table explaining the reasoning behind lift depth selection would also be helpful.

DETERMINATION OF COMPLETENESS

The basis for this comment was to develop an understanding on how available seedbed resources were to be allocated to disturbed bonded areas. This comment was not meant to imply that the operator need to borrow soil from undisturbed (and unbonded) areas or in any other way generate soil other than that which has already been disturbed to cover the entire area. The situation faced by Kaiser Steel regarding pre-law activities, the coal refuse pile, and other factors contributing to the paucity of available topsoil is fully understood. However, the regulatory authority does need to know how and where stockpiled topsoil mater-

ials will be allocated to disturbed areas to be bonded under this permit. To this end, the applicant must make his/her best estimate on how these soil materials can be used to the greatest advantage. (The discussion in section 3.5.4.4 concerning the evaluation and use of "in place" soils is a good example of how a disturbed site could contribute soil materials for other sites.) It is understood that certain areas will need to be revegetated without the addition of topsoil. The applicant must determine, based on site conditions and data, which areas will require soil, which will not, and develop this information in the manner requested in the original comment. A brief discussion must be included explaining why specific disturbances were chosen to be reclaimed without topsoil based on site-specific conditions, factors, or problems. If the applicant will commit to a soil testing plan (explained in detail) for existing facilities sites (conducted as a part of this permit and amended to this permit) to be conducted as soon as possible, existing data and observations can be used to help initially determine which sites would require topsoil application. When soil test results for facilities have been analyzed and revegetation test plot analysis has been completed, changes in allocation can be made to the permit through the amendment process. The applicant must complete this analysis showing how all affected and bonded sites, by name and acreage (adding up to the total disturbed acreage as identified in the permit) will be treated. The applicant, by virtue of its response to the ACR, and disregard portions of the original comment regarding soils beneath the coarse refuse pile. Comments regarding facilities sites remain valid.

UMC 784.13 (cont.)

(b)(4)&(b)(5)(vii)(cont.) The applicant also needs to supply more detailed information concerning the methods to be used to redistribute and grade soil materials. The discussion should include an identification of timing and methodologies used to achieve each of the requirements stated in UMC 817.24 and 817.101-106.

DETERMINATION OF COMPLETENESS

The applicant has explained how borrow materials will be spread in section 3.5.4.4. This information need be provided for topsoil materials. A commitment must be made to reapplying all seedbed materials on the contour as slopes

UMC 784.13 (cont.)

(b.5 ii-v) The reclamation plan under section 3.5 is not entirely consistent with that mentioned under 9.7. Confusion exists between different sources in the application as to what will happen and where. For example, fertilization is mentioned for use on some disturbed sites but not others. Specifications for most reclamation techniques are missing. It is not clear how most, if not all, revegetation techniques will be applied or conducted. These techniques include site preparation, seedbed preparation, fertilization, seedling planting, and mulching. The applicant needs to provide a detailed description of each revegetation technique to be used including: type of equipment, type and amounts of materials (where appropriate), method of application, and technique sequence. This applies to both temporary revegetation and permanent revegetation. It is assumed that differences in slope, seedbed materials and disturbance type will necessitate technique variations. Variations should be explained. Perhaps the easiest way to resolve this issue is an expansion of the discussions in section 3.5.5 in the application. The discussions in section 3.5 dealing with facilities reclamation could then be modified to specifically identify the revegetation techniques to be applied and the sequential timing of techniques for each type of disturbance. It is likely that existing discussions, such as that in subsection 3.5.3.2, would require expansion due to the differences in disturbance types and therefore a difference in applicable revegetation techniques.

DETERMINATION OF COMPLETENESS

The revised reclamation plan provided with the response has rectified many of the concerns identified in the original comment. However, a few concerns are still appropriate.

During the Technical Analysis (TA) stage of permit review, the reclamation plan will be evaluated to be certain that all techniques described in the plan are appropriate for each site to be disturbed unless special provisions for certain areas are noted. The applicant is encouraged to review the revised plan to be certain that this concern has been addressed. Also, comments such as "where practical", "in typical situations", etc. need to be clarified such that no questions remain as to what will be done, in terms of reclamation, on the disturbed areas.

The applicant need also be aware that all disturbances must be accounted for, including the waste disposal site. It is acknowledged that current tests are being run on this material to determine the most suitable techniques. However, the applicant must consider available literature and data and detail a plan for reclaiming this site for the sake of application completeness with a proviso for change through the amendment process as research results are finalized.

The applicant need also include more specifics where possible concerning techniques to be used. For example, the drill seeding description could be expanded to include depth of seeding and drill row spacing. As another example, the recommended planting methods (NMDNR1980) for shrub seedlings can be explained.

Is any vegetation planned for portal and fan disturbances given the type of area in which they are situated? This is not clear from the discussions presented.

UMC 784.13 (cont.)

(b)(5)(vii)(cont.) In subsection 3.5.5.3, the applicant states that "Within the limitations of the equipment, much of this rock will be place, to act as a deterrent to erosion." Is rock to be used in lieu of conventional mulches or in addition to them? To be effective, the rock would need to assume approximately 50 to 60 percent surface cover. Is this possible? The concept is acceptable, the success of the application is in question.

DETERMINATION OF COMPLETION

With respect to this comment, the benefits of applying rock was not questioned. The question is whether such soils will be mulched or otherwise protected from erosion. This question remains to be clarified.

UMC 784.14(b)(1) Reclamation Plan: Protection of Hydrologic Balance

In the presentation of mitigation measures in section 3.4.3.2 mention is made of diverting runoff, regulating channel velocities and sealing roads and berms. However, no details for implementing these measures were found in the mine plan. This information should be provided, e.g., maximum velocity criteria for designing diversions. A sentence in section 7.2.3.2 states that no diversions are planned. Please resolve this conflict.

DETERMINATION OF COMPLETENESS

Design criteria to prevent erosion should be included. For example, limiting velocities to a maximum, dependent on material the diversion is located. Several of the design calculations show velocities in excess of 5 ft/sec. There could be erosion problems with these ditches that need to be addressed.

Is there a maintenance plan to periodically clean buildup of oil and grease from the pond skimmers?

UMC 784.16 Reclamation Plan: Ponds, Impoundments, Banks, Dams, and Embankments

(a)(1)(ii) The details of the sediment pond in Figure VII-1 is inadequate since it is not site specific. Individual plans for each sediment pond must be provided.

DETERMINATION OF COMPLETENESS

The applicant states that there are or will be 13 sediment or settling ponds in the permit area. The applicant should provide a listing of which ponds are currently in existence and which are to be constructed in the future. If a tentative timetable for construction has been made, this should also be provided. There is some confusion on Plate III-1 as to which sediment ponds are actually shown. The reviewer did not find any ponds labeled as the Twin Shaft, Old Coarse Refuse Road, or Coarse Refuse Drainage. However, plans for these ponds are given. Is this because the latter two have not been constructed? Please clarify as to which sediment ponds are discharge points 001, 002, 003, and 004. It would appear that the Manshaft pond is discharge point 001, the Twin Shaft is 002, the Clearwater Slurry Pond is 004. Is there a pond associated with discharge point 003? And, if so, please provide a drawing. If a drawing has not been provided for 003, please do so.

784.20 Subsidence Control Plan

Present survey data to support the statements in the application (sections 1,2, 3.4.3.1, 12-4) that subsidence is not probable and damage or diminution of structures and renewable resource lands are not expected due to subsidence. The survey should address the items in sections (a) through (d) in 784.20. Also provide information on joint orientation since this often controls subsidence cracks and the effect, if any, of mining under or near Grassy Trail Reservoir considering that the third 5-year permit plans appears to be within several hundred feet of the reservoir. Sections 3.4.8.1 states that the massive Castlegate sandstone occurs about 200 feet above the upper coal seam. Provide information verifying that this sandstone does not taper out or become thinner, thereby being somewhat more susceptible to collapse. Document the methods and calculations for substantiating subsidence or no subsidence.

DETERMINATION OF COMPLETENESS

The mine application stated that pillars 400 feet wide are used under heavy cover and poor condition. Please state if this is the pillar design to be used in the permit area. Does this include areas under canyons which, according to comparisons of Maps III-3 and III-4, have 1000 feet or less of overburden? In areas where both seams will be mined, the design plan for superposition of the pillars must be provided.

The applicant said that first mining was done in the past in areas of shallow overburden. Is any of the proposed mining area considered to be within "shallow overburden", e.g. less than 1000 feet? If so, please provide locations of these areas and an analysis on long term pillar stability, pillar design, and maximum size of opening.

From the revised Plate III-3, it appears that the fifth, five-year mining period (i.e., 25 years in the future) nearly or does extend beneath Grassy Trail Reservoir. If this is true, subsidence control beneath this area is critical and should be addressed. To avoid confusion, Grassy Trail Reservoir should be shown on the map since, from the applicants response to a similar question previously proposed on the subject, the applicant does not agree with the reviewer's conclusion concerning the closeness of mining to Grassy Trail Reservoir.

A subsidence net study from May 1982 to August 1983 was conducted. Table III-21 states that the survey is accurate within 10 feet. Is this a typographical error? If not, then the surveyed differences in elevations are meaningless. Also, please provide calculations to substantiate that subsidence will or will not cause material damage or diminish renewable land resources over the long term. This analysis should provide information on expected total subsidence over the long-term, rather than for only 1 year.

The subsidence analysis should be provided for the worst case situation for the several types of conditions that exist. These would include mining both seams, areas under the shallowest overburden con-

ditions, near faults (Plate VI-1) and edges of canyons. Of particular importance is the potential subsidence under Grassy Trail Reservoir, because even a small amount of settlement could produce tension cracks resulting in leakage of reservoir water. This situation could degrade with time resulting in increased water loss and/or dam instability. Please address this potential problem.

In regard to this, periodic monitoring should continue during mining and for a period of time until subsidence, if any, has ceased. However in areas where pillars will be left and will not be removed after mining, it is perhaps more appropriate to monitor the stability of the pillars in the mine to determine if they are remaining stable under design loads. Periodic subsidence measurements may include limit angle and break angle.

UMC 784.22 Diversions (Chapter III and VII)

No information in the application is provided concerning diversions in the permit area. If diversions do exist, such as ditches to convey runoff undisturbed area around disturbed areas, the appropriate information, as per UMC 784.22, must be provided. If no diversions exist, a statement to that effect should be provided.

DETERMINATION OF COMPLETENESS

Appendix 7.6.1 is not found in the supplement. The information in 7.6.1 of the original application does not address diversions. The calculations provided in Appendix III-1 of the supplement may not be adequate since they are based on average slopes. If substantially flatter sections exist than the average slope indicates, channel depths must be increased in these areas. In significantly steeper sections, high velocities may cause erosion problems. The applicant needs to justify the use of average slopes. Profiles of the diversions showing that slopes do not vary appreciably from the average would be adequate. All the sheets are not complete either, for example, width is not included for ditch 3, Rail Cut Pond; side slope (Z) is not included for Ditch 2, Rail Cut Pond;

and the slope on channel 3D is given as 10.87 decimal percent (this would make it nearly vertical). The actual design depth should be given for each channel (depth of flow plus freeboard). It would be useful to provide a summary table with the identification of each diversion, design flow, side slope, width, design slope, flow depth, freeboard and design depth.

On Plate III-1, the diversions should be given identification numbers or names that correspond to the calculation sheets. Also, label the ditches on the drainage plans associated with each sediment or settling pond.

UMC 784.24 Transportation Facilities (Chapter III)

The application is lacking specifications for culverts (size, slope, length, material). Although the applicant states no new culverts are planned, the adequacy of existing culverts must be evaluated since an improper design can create significant erosion and runoff control problems. If any drainage ditches exit along the roads, they should be shown on plans and specifications provided. Drawings of road profiles and typical cross sections for all roads used in the permit area must be submitted with certification from a Registered Professional Engineer.

DETERMINATION OF COMPLETENESS

During the July 27, 1983 meeting at the UDOGM office the issue of providing road profiles was discussed. It was tentatively agreed that providing profiles would not serve a useful purpose. Please submit a letter from UDOGM releasing the applicant from submitting road profiles as normally required by UMC 784.24.

UMC 784.26 Air Pollution Control Plan

The applicant states that "climatological" monitoring is facilitated by the weather station at the mine; however, this instrumentation is not adequate for an Air Quality Monitoring Program, and Air Pollution Control Plan, or a Fugitive Dust control Plan (as required under UMC 817.95). Appropriate plans must be developed by the applicant and presented in the application, or

a copy of a letter from the Division releasing the applicant from these requirements must be presented.

The application does not identify all potential emissions sources at the project. A quantitative estimate of the emissions from each source is lacking. Control measures planned for each source should be explained, and an estimate of their effectiveness should be provided. A total estimate of the amount of emissions from the mine can be determined from this information and included in the plan.

The application does not provide a Utah Department of Health waiver of air quality monitoring. Any emissions permits or emission permit applications must be included with the plan (see UMC 782.19).

DETERMINATION OF COMPLETENESS

Response to deficiency comments for this section could not be found in the applicant's response to the ACR. Please review the original comments and provide an Air Pollution Control Plan.

UMC 805.11 Determination of Bond Amount

Roads are not included in the estimate. No agreement with the Division has been provided showing that such roads can remain after mining operations are completed.

Deficiencies

All roads and bridges affected by mining operations must be reclaimed and included in the bond estimate unless agreement is reached with the Division that roads can remain after mining. A showing to this effect must be included in the permit if such an agreement is concluded.

UMC 805.11 (cont.)

Supporting calculations are needed to adequately evaluate the bond necessary to be posted and to evaluate the potential success of reclamation. Calculations for each step in the reclamation plan for each type of distur-

bance should be included. Variations in reclamation/revegetation techniques with respect to site conditions (e.g., level versus 2:1 slopes) should be addressed. The following example format is one possible method of satisfying this requirement.

Mulching-Main complex

A. Mulch Application

$$\begin{aligned} & (\text{Equipment cost/hr.} \times \text{production rate/acre}) + \\ & \quad (\text{labor rate/hr.} \times \text{production rate/acre}) + \\ & \quad (\text{materials cost/acre}) = \text{cost per acre} \end{aligned}$$

B. Mulch Crimping

$$\begin{aligned} & (\text{Equipment cost/hr.} \times \text{production rate/acre}) + \\ & \quad (\text{labor rate/hr.} \times \text{production rate/acre}) = \\ & \quad \text{cost per acre.} \end{aligned}$$

Total: Total Cost/Acre

DEFICIENCIES

Costs for soil testing (including laboratory costs) after the completion of grading, fertilization (equipment, labor, and materials) of disturbed sites, and ripping are not apparent in the bond costs provided. Those cost must be identified in existing calculations or provided if they are not included.

The applicant need modify Table III-24 to use the same terminology as is used in Table III-1 of the original application. The column "Area to be Reclaimed" of Table III-24 should reflect all sites listed on Table III-1 which will be affected and bonded using a common terminology. It is assumed that the applicant has consolidated disturbances under different titles in Table III-24. However, a comparison of tables is not possible at this time.

The statement "The reclamation bond has been computed for post law disturbances and pre-law disturbed areas which have been used since 1977." in

section 3.5.7 may indicate an error in computation. Bond need only be posted for previously disturbed areas only if such areas will be redisturbed or affected during the life of this permit. For example, if an area was disturbed in 1977, but will not be disturbed under this permit, it need not be bonded with this permit. The applicant need consider this and make the necessary corrections, if any. Plates III-20 through III-23 should show exactly which disturbed areas are to be bonded rather than pre-law and post-law since the applicant may be responsible for reclamation to present standards of a portion of the pre-law disturbances.

In the same section, the operator states that "Other minor revegetation work, such as on topsoil stockpiles, is not computed in these figures." The purpose of the bond is to insure that sufficient monies are available to the Division to ensure that reclamation can be completed in case of default. Work on topsoil piles would not need to be included, as the applicant indicates, since this would be part of on-going operations tenet with the mining process. However, it is unclear what "other minor revegetation work" consists of. If this work could be considered part of final reclamation or be of a type which the Division would have to address after abandonment, it must be included in the bond. Depending upon what this work consists of, the applicant must either include such activities in bond calculation or clearly identify the nature of this work in section 3.5.7.

The applicant must adjust the calculated bond amount to include an additional amount based on factors of cost changes during the preceding 5 years for the types of activities associated with the reclamation to be performed. This can be done by adjusting individual calculations, totals for subsets of calculations (i.e. sealing entries on Table III-36), or by including a line item at the close of Table III-36.

UMC 817.97 Protection of Fish, Wildlife, and Related Environmental Values

The applicant needs to supply documentation of correspondence with the Division (and UDWR) regarding the extent of fish and wildlife baseline information required to determine compliance with UMC 784.21 and 817.97. At a

minimum, baseline information should be of sufficient detail to enable the applicant to devise impact control measures, management techniques, and monitoring methods to protect or enhance federally listed threatened or endangered species; other species that have high federal or state interest; and habitats of unusually high value for fish and wildlife. Consultation with the Division and the UDWR would aid the applicant in determining which species and habitats require special protective measures pursuant to UMC 784.21.

DEFICIENCIES

The applicant supplies additional information regarding species of high federal and state interest and also supplies a copy of a UDWR cover documenting the submittal of a UDWR wildlife report to the applicant. Since the UDWR report is used as one of the principle sources of wildlife information for the permit area, a copy of this report must also be filed with the application.

UMC 817.97 (cont.)

Very little site-specific information regarding the extent and timing of mule deer use of winter range in the permit area is provided. Also, more detailed information needs to be provided on the extent of mule deer winter range within the canyon.

DEFICIENCIES

The applicant states that Whitmore Canyon and pediment slopes east of the permit area are considered mule deer winter range. Doesn't the applicant mean the pediment slopes west of the permit area rather than the east?

Also, the symbols and legend on Plate X-1, Wildlife Map, are somewhat confusing. What do the large "slashed" areas west of the permit area represent? If these are the areas claimed in the past by the BLM, their acreages are certainly much larger than indicated in the text in Chapter X. According to the map legend, claimed areas are designated by

light solid lines, but on the map, areas encircled by solid line correspond to areas mapped on the original wildlife map as raptor cliff nesting areas. Please clarify these discrepancies.

UMC 817.97 (cont.)

The applicant provides very little information on how impact control measures, management techniques, and monitoring methods will be utilized to protect or enhance high interest species and high value habitats potentially affected by mining activities.

The applicant states that a management plan is being developed and is scheduled for completion in August 1981. This plan has not been included in the permit application.

DEFICIENCIES

The applicant has provided additional information on measures employed to protect wildlife and important habitat. Documentation of UDOGM approval of the sedimentation pond location and design must also be provided. The applicant must also commit to an education and training program for mine personnel to limit potential impacts that could result from harassment or unintentional disturbance of wildlife by mine employees while on the permit area.

UMC 817.97 (cont.)

Since the applicant has identified Whitmore Canyon as Mule Deer winter range, the applicant should commit to monitoring the incidence of Mule Deer winter road-kills along the haul road unless it can be demonstrated that Mule Deer road-kills along the haul road have not been significant. If monitoring indicates that Mule Deer road-kills are a problem, the applicant must commit to limiting haul road speeds to 35 mph to reduce the potential for vehicle-wildlife collisions. A reduction in haul road speed limits would be particularly valuable during the early morning and evening hours and during the winter when mule deer-vehicle collisions are likely to increase.

Pursuant to 780.14(b)(9), the applicant must supply specifications (e.g., number of strands and height) for the fencing to be installed to manage grazing pressure along Grassy Creek. Fencing should be designed to allow passage by Mule Deer. The UDWR should be consulted for suitable fence design.

According to the Winget (1980) report, mine water discharge into Grassy Creek causes substantial degradation of stream water quality, particularly with respect to increased levels of oil and grease. The applicant must provide specifications in this section (or reference appropriate sections) regarding the measures employed to correct this problem.

A statement needs to be provided assuring that the proposed power transmission line from the Whitmore Canyon Substation to the Pasture Canyon site be designed and constructed in accordance with environmental guidelines set forth in manuals approved by the Division. This would also apply to all powerlines which will service the mine during the five-year permit period.

DEFICIENCIES

The applicant states that the new power transmission line has been dropped from the development plans. The applicant still must state that all powerlines which will service the mine during the five-year permit period are constructed in accordance with appropriate guidelines. If existing powerlines do not meet these criteria, they must be modified or a waiver to this requirement can be obtained from the UDWR or USFWS if it is determined that the lines do not pose a significant electrocution hazard to raptors.

817.116 Revegetation: Standards for Success [Previously addressed under 783.9 Vegetation Information]

The discussion in section 9.3.2.8, page IX-60 with regard to the applicant's use of reference areas is too brief. Please elaborate as to how reference areas will be used for determination of revegetation success (explain full methodology). In addition, a detailed explanation of how reference areas were chosen, and their characteristics, should be provided.

(The original vegetation section provided this information for proposed reference areas; similar data should be provided for established reference areas.) If these areas have been checked by the Division, a letter of approval should be obtained and presented in the application; if not, approval must be obtained.

DEFICIENCIES

The applicant must outline the full methodology proposed for the determination of revegetation success. Such methodology must include proposed sampling techniques (clearly presented) to be used on revegetated communities and corresponding reference areas; the statistical testing procedures including formulae and hypotheses to be tested (clearly presented) for comparing parameters of the revegetated areas with corresponding reference areas; and the criteria which must be met by the testing procedure to trigger final bond release.