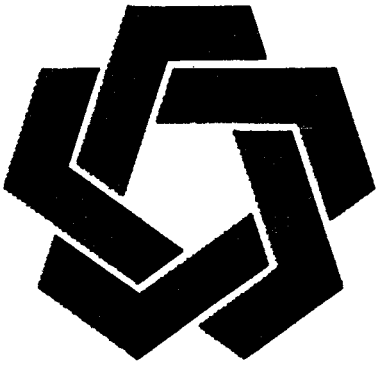
STATE DECISION PACKAGE

STAR POINT MINE
PLATEAU MINING COMPANY
5 YEAR RENEWAL / NEW LANDS



STATE OF UTAH

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS, AND MINING

AUGUST 1987

UTAH DIVISION OF OIL, GAS AND MINING
STATE DECISION PACKAGE
PLATEAU MINING COMPANY
STAR POINT MINES
FIVE-YEAR RENEWAL/NEW LANDS ADDITION

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STATE OF UTAH
NATURAL RESOURCES
Oil, Gas & Mining

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

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

August 7, 1987

Mr. Peter A. Rutledge, Chief
Division of Federal Programs
Western Field Operations
Office of Surface Mining
Brooks Towers, 1020 15th Street
Denver, Colorado 80202

Dear Mr. Rutledge:

Re: State Decision Package, Five-Year Renewal and New Lands Additions, Plateau Mining Company, Star Point Mines, ACT/007/006, Folder #2, Carbon County, Utah

Attached is the Division's State Decision Package (SDP) for the above referenced actions. Based upon the findings for permit approval, the technical analysis, and the Cumulative Hydrologic Impact Assessment, Permit ACT/007/006, 8/87, has been issued to the applicant and the Five-Year Permit Renewal for both the New Lands parcels and the Five-Year Permit Renewal. No major issues were identified by the federal or state agencies involved in either action.

No public comments were received during the public comment period for these actions.

It is, therefore, the Division's recommendation that the federal mining plan be approved by the Department of Interior.

If you should have any questions on this matter, please feel free to contact me or my staff.

Best regards,

Kenneth E. Wyatt

for Dianne R. Nielson
Director

JJW/djh
Attachments
cc: J. Spiecha, PMC
Technical Review Team
1093R/1

Five Year Permit Renewal
Administrative Overview

Plateau Mining Company
Star Point Mine
ACT/007/006
Carbon County, Utah

1987

Background

The Star Point Mines are located approximately 10 miles west of Price, Utah on the east side of the Wasatch Plateau Coal Field. The permit area consists of 6,085 acres comprised of State, Federal coal leases and privately owned holdings.

The Star Point Mines were in operation prior to the enactment of SMCRA and the subsequent Utah Code Annotated (UCA) 40-10-1 et. seq. A permanent program permit was issued to Plateau Mining Company on January 27, 1982.

During the review of the recompiled five-year renewal application, it became apparent that the OSM approved permit of 1982 had not adequately addressed several items currently required under the Utah program. These items included: (a) a detailed permanent channel reclamation and restoration plan; (b) culvert sizing, inlet and outlet protection measures; (c) topsoil mass balance caculations; (d) pond inlet and outlet protection measures; (e) operational plan for sampling overburden above and below coal seams mined; (f) backfilling details and cross sections for permanent reclamation; and (g) road specifications.

Due to the scope of several of the issues, stipulations are contained in the renewal permit to rectify these items. In fact, the applicant has undertaken studies and data gathering efforts since these issues were identified to allow a timely response to stipulations during 1987.

The operator published notice for the five year permit renewal as required for four consecutive weeks ending on October 22, 1986. No comments were received.

Permit Changes

During the previous permit term numerous amendments and revisions were approved. These items have been incorporated into the recompiled five-year renewal application.

Recommendation for Approval

Approval for five year permit renewal is recommended, based on the Permit Application Package (PAP), as updated through July 29, 1987, a review of the current permit, including all conditions, amendments and revisions approved to date, and conformance with criteria for approval of permit renewal applications (UMC 788.14 - .16) (See attached Findings). The permit renewal term will not exceed the original permit term of five years.

SUPPLEMENTAL ATTACHMENT "A"
(REVISED AUGUST 3, 1989)

Stipulation 817.71-.74-(1)-(HS)

1. Cyprus-Plateau must conduct a refuse pile monitoring program, at least two years prior to topsoil redistribution in the following manner:

   (a) A grid system encompassing the entire surface of the refuse pile will be laid on 300 foot centers. If acid and/or toxic or alkaline-producing materials are encountered through the initial sampling procedures, sub-samples will be taken at 150 foot intervals or a lesser distance to identify the extent of the suspect high level contaminant.

   (ii) At each sample site, the refuse will be sampled at 0-6 inches, 6-12 inches, 12-24 inches, 24-36 inches, and 36-48 inch depths.

   (iii) At a minimum, the following constituents will be analyzed for each depth-segregated sample: Selenium, Acid-Base Potential [to include Pyritic-Sulfur percent and Organic-Sulfur percent], Electrical Conductivity, Sodium Adsorption Ratio [SAR], Boron, and pH. Laboratory methodologies of the above constituents will follow those procedures outlined in Table Six of the Division's Guidelines for Management of Topsoil and Overburden.

   (iv) If acid and/or toxic alkaline-producing is identified, a total cover depth of four feet of non-combustible, non-acid, non-toxic and non-alkaline producing material will be utilized to cover the said acid and/or toxic or alkalinity-producing materials.

   (v) Based on current results obtained from the revegetation test plots, the upper 10 inches of the four feet of non-acid, non-toxic, and non-alkaline producing material shall be comprised of topsoil material. The total depth of topsoil redistributed may vary in accordance to future test plot results.

Attachment
AT8/70

FINDINGS DOCUMENT

Plateau Mining Company
Five-Year Renewal
Star Point Mines
ACT/007/006, Carbon County, Utah

August 5, 1987

1. The plan and the permit application are accurate and complete and all requirements of the Surface Mining Control and Reclamation Act (the "Act"), and the approved Utah State Program have been complied with (UMC 786.19[a]).

2. The applicant proposes acceptable practices for the reclamation of disturbed lands. These practices have been shown to be effective in the short-term; there are no long-term reclamation records utilizing native species in the western United States. Nevertheless, the regulatory authority has determined that reclamation, as required by the Act, can be feasibly accomplished under the Mining and Reclamation Plan (MRP) (UMC 786.19[b]).

3. The assessment of the probable cumulative impacts of all anticipated coal mining activities in the general area on the hydrologic balance has been made by the regulatory authority. The reclamation plan proposed under the application has been designed to prevent damage to the hydrologic balance in the permit area (UMC 786.19[c] and UCA 40-10-11[2][c]). (See Cumulative Hydrologic Impact Analysis (CHIA) attached to this Findings Document.)

4. The proposed permit area for the Star Point Mines is:

   A. not included within an area designated unsuitable for underground coal mining operations;

   B. not within an area under study for designated lands unsuitable for underground coal mining operations;

   C. not on any lands subject to the prohibitions or limitations of 30 CFR 761.11[a] (national parks, etc.), 761.11[f] (public buildings, etc.) and 761.11[g] (cemeteries);

   D. not within 100 feet of the outside right-of-way line of a public road (UMC 761.11);

E. not within 300 feet of any occupied dwelling (UMC 786.19[d]). (See MRP Section 782.16.).

5. The regulatory authority's issuance of a permit is in compliance with the National Historic Preservation Act and implementing regulations (36 CFR 800) (UMC 786.19[e]). (See attached letter from State Historic Preservation Officer (SHPO) dated October 30, 1986).

6. The applicant has the legal right to enter and complete reclamation activities in the permit area through federal coal leases SL-031286, U-7949, U-37045, U-13097, state land lease 22729 and certain fee-owned/leased parcels.

7. The applicant has shown that prior violations of applicable laws and regulations have been corrected (UMC 785.19[g]). (Memo of May 11, 1987 from George Stone, OSMRE).

8. Neither Plateau Mining Company nor its parent company, Cyprus Western Coal Company, are delinquent in payment of fees for the Abandoned Mine Reclamation Fund (UMC 786.19[h]). (Memo of May 11, 1987, from OSMRE, Washington, D.C.).

9. The applicant does not control and has not controlled mining operations with a demonstrated pattern of willful violations of the Act of such nature, duration and with such resulting in irreparable damage to the environment as to indicate an intent not to comply with the provisions of the Act (UMC 786.19[i]) (Memo of May 11, 1987, from OSMRE, Washington, D. C.).

10. Underground coal mining and reclamation operations to be performed under the permit will not be inconsistent with other operations anticipated to be performed in areas adjacent to the proposed permit area (UMC 786.19[j]).

11. A detailed analysis of the proposed bond has been made. The bond estimate is $3,407,322.00. The regulatory authority has made appropriate adjustments to reflect costs which would be incurred by the state, if it was required to contract the final reclamation activities for the mine site. The bond shall be posted (UMC 786.19[k]) with the regulatory authority prior to final permit issuance.

12. No lands designated as prime farmlands or alluvial valley floors occur on the permit area (UMC 786.19[l]).

13. The proposed postmining land-use of the permit area has been approved by the regulatory authority (UMC 786.19[n]). (See TA, Section UMC 817.133.)

14. The regulatory authority has made all specific approvals required by the Act, and the Cooperative Agreement and the Federal Lands Program (UMC 786.19[n]).

15. The proposed operation will not affect the continued existence of any threatened or endangered species or result in the destruction or adverse modification of their critical habitats (UMC 785.19[o]).

16. All procedures for public participation required by the Act, and the approved Utah State Program have been complied with (UMC 786.11-.15).

Findings Specific to the Five-Year Renewal

17. The permit renewal term will not exceed the original permit term of five years (UMC 788.15).

18. The terms and conditions of the existing permit are being satisfactorily met (UMC 788.16[a][1]).

19. The present underground coal mining activities are in compliance with the environmental protection standards of the Act and the Utah Program (UMC 788.16[a][2]).

20. The requested renewal will not substantially jeopardize the operator's continuing responsibility to comply with the Act and the Utah Program (UMC 788.16[a][3]).

21. The operator has provided evidence that the performance bond will remain in full effect for the additional permit period. No additional surface disturbances requiring an increase in bond are proposed (UMC 788.12[a][4]).

Prior to the permit taking effect, the applicant must agree to comply with the special stipulations in the permit and post the performance bond for reclamation activities.

John J. Whitehead
DOGM Lead Reviewer

Lowell P. Braxton
Administrator, Mineral Resource
Development and Reclamation Program

Kenneth E. May
Associate Director, Mining

Kenneth E. May for Dianne R. Nielson
Director

1093R/13-16

file ACT/007/006 #2
cc. J. Whitehead

RECEIVED
NOV 04 1986
DIVISION OF
OIL, GAS & MINING

NORMAN H. BANGERTER
GOVERNOR

STATE OF UTAH
DEPARTMENT OF COMMUNITY AND
ECONOMIC DEVELOPMENT

Division of
State History
(UTAH STATE HISTORICAL SOCIETY)

MAX J. EVANS, DIRECTOR
300 RIO GRANDE
SALT LAKE CITY, UTAH 84101-1182
TELEPHONE 801/533-5755

October 30, 1986

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

RE: Plateau Mining Company's Five-Year Permit Renewal Application for the Star Point Mines, ACT007/006, Carbon County, Utah

In Reply Please Refer To Case No. J343

Dear Mr. Whitehead:

The Utah Preservation Office has received for consideration the above referenced document. After review of the material, our office notes that the cultural resource surveys were completed in 1980 through 1982, reports are found in Volume II, Exhibit 4. Our office notes that as long as renewal of the permit is for expansion underground, and involves no new surface areas that have not been surveyed, the material provided appears to be adequate for OSM regulations.

The above is provided on request for assistance as outlined by 36 CFR 800 or Utah Code, Title 63-18-37. If you have questions or need additional assistance, please contact Jim Dykman at 533-7039.

Sincerely,

Max J. Evans

Max J. Evans
Director and
State Historic Preservation Officer

JLD:jrc:J343/3485V

Board of State History: Thomas G. Alexander, Chairman • Leonard J. Arrington, Vice Chairman • Douglas D. Alder

AFFIDAVIT OF PUBLICATION

STATE OF UTAH }
County of Emery, } ss.

I, Dan Stockburger, on oath, say that I am the General Manager of The Emery County Progress, a weekly newspaper of general circulation, published at Castle Dale, State and County aforesaid, and that a certain notice, a true copy of which is hereto attached, was published in the full issue of such newspaper for Four (4) consecutive issues, and that the first publication was on the 1st day of October, 19 86 and that the last publication of such notice was in the issue of such newspaper dated the 22nd day of October, 19 86

Dan Stockburger

Subscribed and sworn to before me this 22nd day of October, 19 86

Holly Jo Baker
Notary Public.

My Commission expires My Commission Expires October 22, 1990

Residing at Price, Utah

Publication fee, $ 105.60

NOTICE OF APPLICATION FOR RENEWAL OF PERMIT PLATEAU MINING COMPANY

Notice is hereby given that Plateau Mining Company, P.O. Drawer PMC, Price, Utah 84501, a wholly owned subsidiary of Cyprus Western Coal Equipment Company, 7200 South Alton Way, Englewood, Colorado 80112, has submitted an application to the State of Utah, Department of Natural Resources, Division of Oil, Gas and Mining, for renewal of its permit (ACT/007/006) to mine under the provisions of the Utah Coal Mining and Reclamation Act (Utah Code Annotated 40-10-1 et. seq.) and the Utah Coal Program Regulation UMC 788.13. The permit area is located in Carbon and Emery Counties, Utah as follows:

Township 15 South, Range 7 East, SLBM
Section 1, portion; Section 2, portion; Section 11, portion; Section 12, all; Section 13, portion; Section 14, portion; Section 23, all; Section 25, portion; Section 26, portion.

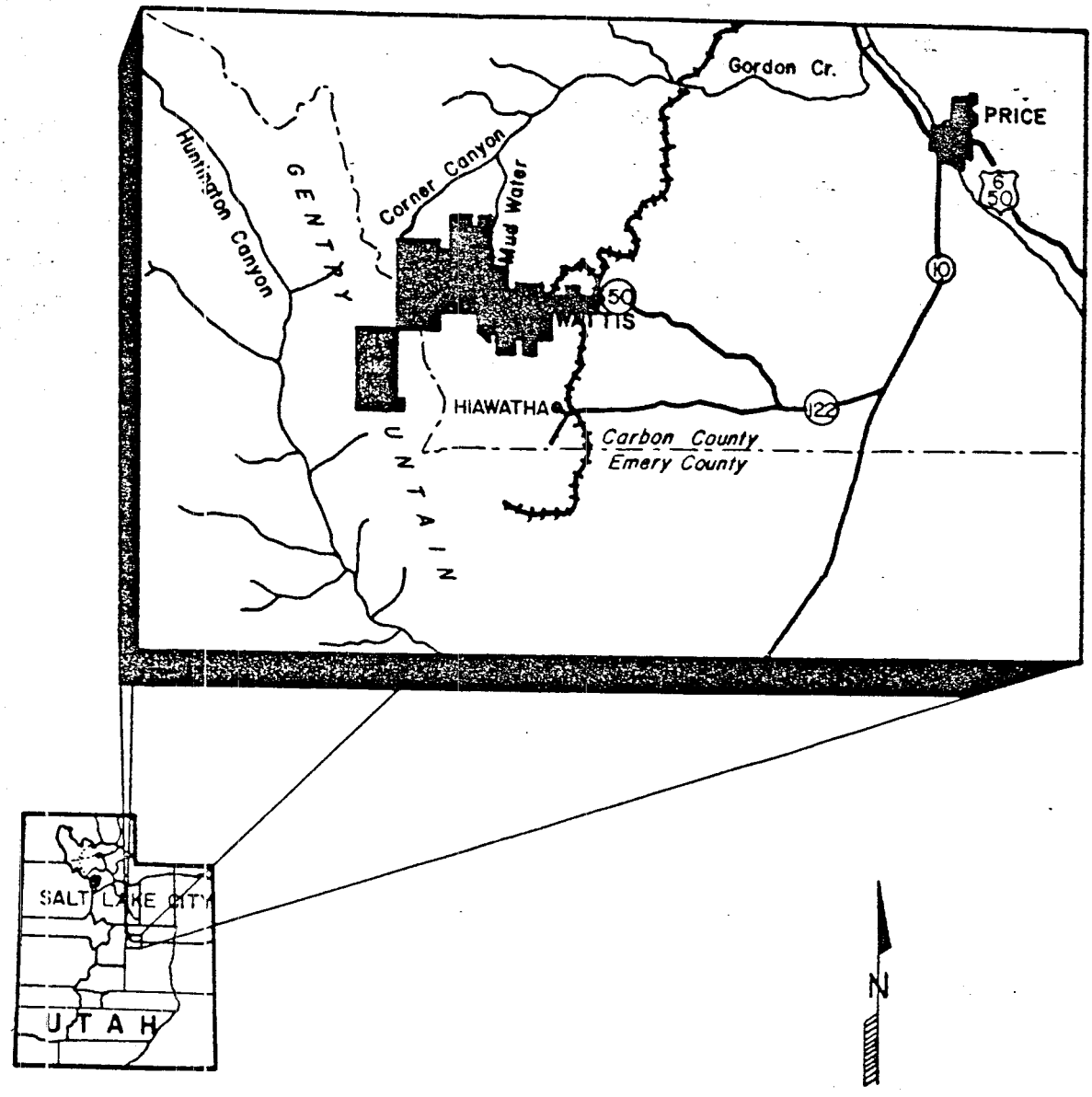
Township 15 South, Range 8 East, SLBM
Section 5, portion; Section 6, portion; Section 7, all; Section 8, portion; Section 9, portion; Section 10, portion; Section 11, portion; Section 14, portion; Section 15, portion; Section 16, all; Section 17, portion; Section 18, portion, Section 20, portion; Section 21, portion.

The project area is shown on the following U.S. Geological Survey 7.5-Minute Quadrangle Maps: Pinnacle Peak, Wattis and Hiawatha.

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

State of Utah
Department of Natural Resources
Division of Oil, Gas and Mining
355 West North Temple
II Triad Center, Suite 350
Salt Lake City, Utah 84180-1203

Published in the Emery County Progress October 1, 8, 15 and 22, 1986.



0 4 8

Scale in Miles

(ENLARGED VIEW)

LOCATION MAP

PLATEAU MINING COMPANY

CARBON & EMERY COS., UTAH

file A4/007/006 #2
cc J. Whitehead

United States Department of the Interior

OFFICE OF SURFACE MINING
Reclamation and Enforcement
WASHINGTON, D.C. 20240

TAKE PRIDE IN AMERICA

RECEIVED
JUN 01 1987
DIVISION OF
OIL, GAS & MINING

MAY 11, 1987

Memorandum

To: Ranvir Singh, Chief
Federal Lands Branch
Western Field Operations

From: George M. Stone, Acting Chief
Division of Regulation and Inspection

Subject: Compliance Findings for Plateau Mining Company
Application No. UT-0018, in Utah

We have reviewed the subject permit applicant(s) and surface mining and reclamation operations owned or controlled by the applicant (as set forth in the Revised Parker Order of 2/1/85) for linkages to outstanding cessation orders; air and water violations; past due civil penalties; and past due or non-reporting of abandoned mine land (AML) fees.

Based upon our review, we have found that the applicant and listed surface mining and reclamation operations owned or controlled by the applicant do not owe any past due reclamation fees or fee reports from previous and existing operations. In addition, we have found that none of the surface coal mining and reclamation operations owned or controlled by the applicant currently have outstanding cessation orders; or past due civil penalties. Based upon information supplied by the States and the Environmental Protection Agency nationwide noncompliance quarterly reports for air and water, we found that the applicant and operations owned or controlled by the applicant do not have outstanding air or water violations. Moreover, we have found in accordance with 30 CFR 773.15(b)(3) "that the applicant, or the operator specified in the application, neither controls or has controlled surface coal mining and reclamation operations with a demonstrated pattern of willful violations of the Act of such nature and duration and with such resulting irreparable damage to the environment as to indicate an intent not to comply with the Act."

Attachment

cc: Ray Lowrie, AD-Western Field Operations
Stuart Sanderson, Regional Solicitor, CO

PLATEAU MINING COMPANY
FIVE-YEAR PERMIT RENEWAL
CHRONOLOGY

1/21/82	OSM Approval of Plateau Mining Company's Star Point Mine
1/27/82	DOGM Approval letter for Plateau Mining Company's Star Point Mine
10/4/82	Approval issued for Emergency Lease Modification to SL-031286 (160 acres)
9/28/84	Unit Train Loadout Revision Approval (ROW U-52404)
5/2/85	Approval of Incidental Boundary Change at Unit Train Loadout
9/29/86	PMC submits recompiled, updated Five-Year Renewal Application
10/22/86	Renewal Public Notice published in local newspaper for four consecutive weeks
11/20/86	DOGM identifies deficiencies in PMC's 9/29/86 submittal
11/21/86	Public comment period closes, no comments received
1/5/87	PMC responds to 11/20/86 DOGM deficiency letter
2/9/87	DOGM letter transmits remaining deficiencies in the five-year renewal application
3/13/87	PMC responds to 2/9/87 deficiency letter
4/17/87	DOGM letter transmits remaining deficiencies to the five-year renewal application
5/8/87	PMC responds to 4/17/87 deficiency letter
5/11/87	OSMRE "510 C" Compliance clearance made
7/29/87	PMC forwards updated, complete, recompiled 5-year renewal application
8/5/87	DOGM makes necessary findings and issues permit.

TECHNICAL ANALYSIS

Plateau Mining Company
Star Point Mine
ACT/007/006, Carbon County, Utah

August 5, 1987

UMC 785.19 Alluvial Valley Floors-(RVS)

Existing Environment and Applicant's Proposal

Unconsolidated streamlaid deposits do not occur within, or in close proximity to, the permit area. Limited Quarternary alluvium (Qal) has been identified along lower Nuck Woodward Canyon and Huntington Creek (Doelling, 1972). Technical staff inspection of the mine site and adjacent area have not identified the existence of flood irrigation (or its historical use) or the capability of stream valleys to be flood irrigated or subirrigated.

Compliance

Sufficient information about alluvial streamlaid deposits and irrigation are available for DOGM to determine as required by UMC 785.19(c)(2) that no alluvial valley floors exist with or in close proximity to the proposed permit area.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.11 Signs and Markers-(PGL)

Existing Environment and Applicant's Proposal

This regulation has not been addressed in the PAP.

Compliance

The applicant did not submit information in the PAP.

TECHNICAL ANALYSIS

Plateau Mining Company
Star Point Mine
ACT/007/006, Carbon County, Utah

August 5, 1987

UMC 785.19 Alluvial Valley Floors-(RVS)

Existing Environment and Applicant's Proposal

Unconsolidated streamlaid deposits do not occur within, or in close proximity to, the permit area. Limited Quarternary alluvium (Qal) has been identified along lower Nuck Woodward Canyon and Huntington Creek (Doelling, 1972). Technical staff inspection of the mine site and adjacent area have not identified the existence of flood irrigation (or its historical use) or the capability of stream valleys to be flood irrigated or subirrigated.

Compliance

Sufficient information about alluvial streamlaid deposits and irrigation are available for DOGM to determine as required by UMC 785.19(c)(2) that no alluvial valley floors exist with or in close proximity to the proposed permit area.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.11 Signs and Markers-(PGL)

Existing Environment and Applicant's Proposal

This regulation has not been addressed in the PAP.

Compliance

The applicant did not submit information in the PAP.

The applicant will be in compliance when the following stipulation is met.

Stipulation 817.11-(1)-(PGL)

The Plateau Mining Company shall submit by October 31, 1987 for inclusion in the PAP, all details about signs and markers as required by this regulation.

UMC 817.13-.15 Casing and Sealing of Underground Openings-(RVS)

Existing Environment and Applicant's Proposal

Boreholes

The applicant has drilled 43 exploration boreholes along Gentry Ridge, Hoag Ridge, and Star Point, within and adjacent to the permit area (Maps 26 and 27). Borehole 86-26-4, located at the southern terminus of Gentry Ridge, has been developed into a ground-water monitoring well. Two additional water wells were drilled in Section 10, T15S, R8E during the late 1970's (PAP, page 783-38).

The applicant states that upon abandonment, all exploration drillholes are to be completely plugged with an approved cement to within three (3) feet of the surface (PAP, page 784-57).

Boreholes to be retained for water monitoring during mine operations will be temporarily sealed with locking caps or by enclosing the well head in a locked manhole (PAP, page 784-58).

Entries

The applicant identifies the development of three portals in Corner Canyon, seven portals at Mud Water Canyon, two portals at Lion Deck, and two portals at Portal Area No. 2. Ten portals have been abandoned and sealed in the No. 1 and No. 2 Mine areas.

Temporarily inactive entries will be fenced or barricaded and posted with warning signs (PAP, page 784-58). Temporary seals will be periodically inspected.

The applicant commits to sealing all mine entries upon completion of mining (PAP, page 784-57). Seals will be constructed of solid concrete blocks in a double wall thickness, located a minimum of 25 feet inby the entryway and recessed 16 inches into the rib and 12 inches into the floor (PAP, page 784-57 and 784-58). A pilaster will be incorporated into the center of the seal. A two-inch drain pipe will be installed from the concrete seal to the entryway (PAP, Figure 20).

Entries will be backfilled to the seal with noncombustible material. The entryway and adjacent highwall (including exposed seam) area will be backfilled with noncombustible material, graded, covered with suitable topsoil material and revegetated (PAP, page 784-58).

Compliance

The applicant's plans for permanently sealing boreholes and entries are designed to prevent access and preclude toxic drainage from entering ground or surface water as required by UMC 817.13 and 817.15.

The applicant has provided adequate plans for temporarily sealing boreholes and entries that are temporarily inactive as required by UMC 817.14.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.22 Topsoil: Removal-(DD)

Existing Environment and Applicant's Proposal

The only areas proposed for topsoil removal are the proposed Gentry Mountain Shaft Site which consists of less than one acre and 14.67 acres on the southwest corner of the refuse expansion area. Profile descriptions for these areas are given in Exhibit 19, page 40-42 for the refuse expansion area, and page 48-50 for the Gentry Mountain area. These descriptions of soils are delineated on maps 39 and 40 respectively. Chemical and physical analysis for these areas are also given in Tables 59 and 65 of the PAP.

Compliance

According to profile description along with the chemical and physical data provided. There are no limiting chemical or physical characteristics within the proposed salvage depths. The soils on the refuse expansion area, to be removed, will be live-hauled to the extent that adequate reclaimed acreage is available. If this material cannot be used in reclamation, then the balance will be hauled to the subsoil stockpile for storage (page 784-27 of the PAP). The soil placed on this stockpile will be stabilized by planting the interim seed mixture. According to the PAP, page 784-28, the Gentry Mountain topsoil plan cannot be presented at this time due to lack of detailed planning. In the event that it becomes

operationally necessary to construct this facility within the permit term of this application, PMC will submit detailed plans outlining the exact location of the shaft facilities, topsoil removal depths, sediment control plans, and detailed reclamation plans (PAP, page 784-28).

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.24 Topsoil: Redistribution-(DD)

Existing Environment and Applicant's Proposal

In areas constructed prior to SMCRA, before topsoil was salvaged, the applicant proposes to use existing fill materials as a plant growth medium. Where encountered, buried topsoil will be salvaged and used. Table 61 provides chemical and physical characteristics of the cut and fill material. According to these analyses, the material does not show any major restrictive parameters.

The applicant proposes to reduce potential slippage on the interface between the regraded fill and respread topsoil by scarifying or ripping the soil prior to redistribution of the topsoil. To avoid unnecessary compaction of the respread soil materials, the applicant commits to spreading topsoil when moisture conditions will not increase the likelihood of compaction, and by avoiding trafficking of equipment across the retopsoiled areas. The applicant also proposes to rip areas retopsoiled where trucks, loaders, dozers, or scrapers were used to alleviate compaction where slopes permit.

Six inches of topsoil will be spread over the unit train load out facilities. This includes Sedimentation Pond 8, the silo area, and the southern end of the coal conveyor. This material is presently stored near the coal silo, and is designated on the Disturbed Area Soil Map No. 39 in the PAP. This stockpile contains 1,500 cubic yards of material. Soils removed from the northern end of the conveyor are stockpiled adjacent to the existing topsoil stockpile and contain 200 cubic yards of material.

Topsoil will be redistributed at the corner canyon fan site using the topsoil originally removed from the site. This topsoil consists of 200 cubic yards and is stockpiled adjacent to the existing stockpile. The topsoil will be transported back through the mine to the fan site. Five thousand (5,000) cubic yards of subsoil is also being stored in the mine adjacent to the fan site.

This will be redistributed prior to topsoiling. For the .44 acre site these volumes of soil material are equivalent to 7 feet of subsoil and 3 inches of topsoil.

Topsoil was not salvaged when the Lion Deck access road was constructed. The Board granted a variance on August 8, 1979, approving the cut and fill construction method without topsoil salvaging. The applicant has committed to reclaiming the road using the fill material.

The applicant's volumetric estimates indicate that approximately 17 inches of stockpiled soil material is available for redistribution on the coal refuse and lower facilities area. Surveys of the stockpiles indicate there are 192,065 cubic yards of material available.

Compliance

Samples taken in the cut and fill material are located on Map No. 39. Table 61 of the PAP gives chemical and physical parameters of this material. According to the analyses, this material is suitable for use as a plant growth medium.

According to acreage given in bond calculations, Exhibit 36 of the PAP, the unit train loadout facilities to be retopsoiled are equivalent to approximately 7.7 acres, which would require approximately 6,200 cubic yards of material to retopsoil this area at a depth of 6 inches. These figures should be verified so all areas that are to be retopsoiled are accounted for, since the PAP states there are only 1700 cubic yards stockpiled.

Table 60 of the PAP gives chemical data of samples taken from the Lion Deck access road. Samples 79-3820 and 79-3821 are saline based on Ec measurements suggesting this material should not be used for root growth medium. Before reclamation, sampling should be accomplished to verify these values and to locate saline materials so they are not placed in the root zone.

Present study plots on the coal refuse are addressing the amount of topsoil necessary to successfully reclaim the coal refuse and other applicable sites. To date, results of these study plots are promising, and indicate that 17 inches of topsoil soil should be sufficient to reclaim these sites, based on the proposed post mining land use. Acreage figures and locations must be given though, to clarify all areas which will receive 17 inches of topsoil from the 192,065 cubic yards of material stockpiled.

The applicant will be in compliance when the following stipulation is met.

Stipulation 817.24-(1)-(DD)

Plateau Mining Company must submit by October 31, 1987, for insertion into the PAP, a mass balance of all areas to be retopsoiled. This will include acreage figures of all locations to be retopsoiled, depth of topsoil to be redistributed, and amount and location of material presently stockpiled. The applicant must also commit to sample soils before reclamation on areas of the Lion Deck Portal that will be used for reclamation.

UMC 817.25 Topsoil Nutrients and Soil Amendments-(DD)

Existing Environment and Applicant's Proposal

The applicant proposes to supplement all reclaimed areas with 40 pounds of Nitrogen and 30 pounds of Phosphorus per acre (PAP, page 784-39). These application rates are based on soil tests conducted on 40 samples for Nitrogen and 69 samples for Phosphorus. Potassium, Iron and Zinc were also analyzed for, but these parameters did not show deficiencies; therefore they will not be supplemented.

Compliance

According to recommendations by Utah State University (Personal communication from Carl Topper), the proposed supplementary rates for Nitrogen and Phosphorus are within adequate ranges. It should be recognized that there are many forms of Nitrogen fertilizers available, and when selecting a Nitrogen form, season of application is important to consider. Nitrate and Ammonium are the forms available for plant uptake. Nitrate is readily leached from the soil because of its negative charge, therefore a fall application of this form may be mostly lost from the soil before it can be used by plants in the spring. A fall application of an organic form of Nitrogen, such as Urea, would help prevent this loss because Urea must first be converted to Ammonium and then to Nitrate by soil microorganisms before it can be used by plants or leached from the soil. This conversion is temperature dependent, so in the cooler winter months when plants and soil microbes are inactive, most of the applied Nitrogen will be retained in the soil.

The applicant does not propose to use an organic mulch on areas that will be drill seeded. An organic amendment should not be ruled out in all cases. During reclamation there may be site specific cases which could benefit from an organic mulch; these would include sandy soil materials with little inherent organic matter content. The added organic matter will increase the water and nutrient holding capacity of these materials and aid in revegetation. Clayey soils derived from the Mancos shale also can benefit from organic

amendments. The organic matter increases infiltration and can improve soil structure and lower temperatures of these dark carboneous shales. Organic mulches also provide surface protection and are important for erosion control on steep slopes (at the time of final reclamation, the Division may require mulches on a site specific basis; see UMC 817.114)

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.41-.42 Hydrologic Balance: General Requirements

Existing Environment and Applicant's Proposal

Ground Water-(RVS)

The applicant provides information about aquifers, springs and mine inflows on pages 783-7 through 783-52, 784-59, 784-60, 784-63, 784-64 and 784-80 through 784-105 of the PAP. Supplementary ground water data are given on Maps 25, 26, 27, 28, 31, and in Tables 4 through 9.

Aquifers. The applicant describes undifferentiated North Horn/Price River formation and the Blackhawk Formation/Star Point Sandstone as the major water-bearing lithostratigraphic units in the permit and adjacent area. The applicant concludes that a zone of "perched" aquifers occurs within certain permeable lithologies of the undifferentiated North Horn/Price River formation, whereas a regional aquifer occurs within the Blackhawk Formation/Star Point Sandstone. The applicant also delineates a north-south trending extensional fault and joint system that functions as a significant conduit for ground water. A preliminary piezometric surface for the regional aquifer is given on Map 27.

Ground-Water Use. Ground water within and adjacent to the permit area is used by wildlife and for stockwatering, domestic and industrial purposes. Table 9 lists 72 ground-water rights and Map 30 shows 78 ground-water rights within and adjacent to the permit area. Of these, 28 ground-water rights occur within the permit area. Mining has occurred beneath seven ground-water rights and is projected to occur beneath an additional nine ground-water rights.

Springs. Table 7 and Map 27 indicate 201 springs and ten seeps occurring within and adjacent to the permit area. Total discharge from springs is approximately 1200 gpm (Table 7). One hundred fifty-one (151) springs are identified as discharging from the

"perched" aquifer zone (about 1000 gpm); 25 springs discharge from the Castlegate Sandstone (about 60 gpm); 18 springs discharge from the regional aquifer (about 70 gpm); and seven springs discharge from the Mancos Shale (about 45 gpm).

Table 4 summarizes 99 water quality samples, collected between 1979 and 1985, for 11 springs that discharge from the "perched" aquifer zone. Table 7 presents 58 water quality analyses from 1986 for an additional 58 springs. These data indicate water from the "perched" aquifer zone average 260 mg/l bicarbonate, 238 mg/l TDS, 66 mg/l calcium and 20 mg/l sulphate. Three samples from three springs discharging from the Castlegate Sandstone were acquired for water quality analyses during 1986 (Table 7). These data indicate water from the Castlegate Sandstone is similar to water from the "perched" aquifer zone. Four samples from four springs that discharge from the regional aquifer were acquired for water quality analyses during 1986 (Table 7). These data differ from overlying ground-water resources in that the average water quality is degraded (e.g., 317 mg/l HCO_3, 298 mg/l TDS, 72 mg/l Ca, 298 mg/l SO_3). Three samples from three springs located in the Mancos Shale were acquired for water quality analyses during 1986 (Table 7). These data indicate water quality is further decreased within the Mancos Shale (e.g., 393 mg/l HCO_3, 442 mg/l TDS, 91 mg/l Ca, 88 mg/l SO_3).

Mine Inflow. Total mine inflow is measured at 16 monitoring locations (Map 28) and estimated to be 134 gpm, whereas total discharge from the mine is approximately 129 gpm (Table 8). The difference (5 gpm) between inflow and discharge values reflects in-mine and culinary water uses. Mine inflows are considered to be regional aquifer discharge. Five samples from these monitoring locations were acquired for water quality analyses during 1985 (Table 6). These data indicate mine inflow from the regional aquifer has the poorest water quality (e.g., 375 mg/l, HCO_3, 442 mg/l TDS, 91 mg/l Ca, 319 mg/l SO_3).

Mine inflow is collected at two major sump areas entitled the "Mother Goose Sump" located in the Wattis seam and "Father Goose Sump", located in the Third seam (PAP, p. 783-44). Water from the "Father Goose Sump" is used for coal washing, fire protection and mining operations. Excess water from the "Mother Goose Sump" is discharged to the surface at Mud Water Canyon.

Mining Methods. Room and pillar mining has occurred beneath Star Point in all three coal seams and is projected to occur in the Hiawatha seam beneath the northern portion of Hoag Ridge. Approximately six springs overlie these previously mined areas. Longwall mining is currently occurring within the Wattis seam and is projected to occur within the Third seam beneath the northern portion of Hoag Ridge where overburden thickness ranges from

approximately 700 to 1500 feet. Approximately eight springs overlie these areas of current and projected mining. Longwall mining is also projected to occur in the Wattis seam beneath Gentry Ridge where overburden thickness ranges from approximately 1000 to 1700 feet. Approximately 30 springs overlie this area of projected mining.

Graben Crossing. The applicant proposes to develop a two-or three-entry tunnel across the Bear Canyon Graben to access the Wattis seam beneath Gentry Ridge. Boreholes CVR-5A, 83-14-3-C and CVR-6 encountered ground-water resources within Bear Canyon Graben. A comparison of water levels from CVR-5A (8,445 feet) and 83-14-3-C (8,315 feet) with water levels from boreholes drilled in areas of current mining (P-86-02-HD, P-86-03-WD, P-86-01-TD) suggests the regional aquifer occurs at a lower elevation within Bear Canyon Graben. The elevated water level (8,741 feet) penetrated by CVR-6 may be due to the occurrence of a localized saturated zone, either associated with encountering a zone of fault gouge or other permeable lithology.

Borehole 86-26-6 encountered the regional aquifer beneath Gentry Ridge at an elevation of 8,160 feet (personal communication, 2/4/87, B. Grimes). This data suggests that the piezometric surface of the regional aquifer beneath Gentry Ridge is elevated with respect to Bear Canyon Graben. If the ground-water gradient is similar to that derived from in-mine boreholes (Map 27), then mining operations beneath Gentry Ridge may encounter the regional aquifer in close proximity to the western terminus of the access tunnel.

As discussed previously, faults (and associated breccia zones) within and bounding Bear Canyon Graben are believed to function as significant conduits for ground-water movement. The applicant provides information about ground-water inflows that resulted from mine workings contact with the eastern boundary fault zone at the 10th West Section (8,180 feet) in the King IV Mine and 2nd Left (8,490 feet) and 2nd West Mains (8,780 feet) in the Star Point No. 1 Mine. Sustained high inflow has occurred at fault zone encounters in the King IV Mine, whereas inflows have diminished rapidly in the Star Point No. 1 Mine. A lateral borehole drilled approximately 400 feet into the Bear Canyon Graben from the 2nd Left Section in the Star Point No. 1 Mine experienced an initial flow of 150 gpm that eventually decreased to zero. These data suggest that the eastern boundary fault zone in the vicinity of active operations in the Star Point No. 1 Mine does not function as a significant conduit for ground water. However, towards the south along the western side of Hoag Ridge the eastern boundary fault zone conveys a significant amount of ground water and is considered to be the recharge source for three Huntington City wells located near the junction of Wild Cattle Hollow and Gentry Hollow (PAP, page 784-95).

The applicant infers that ground water is recharged along Hoag Ridge and infiltrates towards the southwest until encountering the gouge (impermeable) zone associated with the eastern boundary fault zone. Thereafter, ground water is conveyed adjacent to the gouge zone within permeable breccia and/or fracture zones.

Data are not available to demonstrate whether the western boundary fault zone or other faults internal to the Bear Canyon Graben transmit significant amounts of ground water. However, if the Gentry Ridge ground-water regime is similar to that postulated for Hoag Ridge, wherein ground water moves from areas of high to lower topographic relief, then access tunnel development may encounter significant inflow at the western boundary fault.

The applicant proposes to control "significant sustained inflows . . . encountered during the Graben Crossing . . . by use of a pressure grouted seal (PAP, p. 784.63)." Map 46 depicts cross-sectional diagrams of pressure-grouted injection holes for arched and rectangular tunnels.

Surface Water-(TM)

The applicant provides information about sediment pond discharges, disturbed area drainage plans and control, and general surface water quality information on pages 783-53 through 783-67, 784-62 through 784-88 and 784-116 through 784-130. Supplementary surface water data are given on Maps 26, 19, 31, 42, 43, 50 through 60, Tables 10 through 14, 75 through 82, and 84 through 88, and on Figures 10 through 18 and 21 through 37.

Seven sediment ponds and one treatment facility are used to treat disturbed area drainage at Plateau's mine. Ponds No. 2, No. 4, No. 6, No. 7 and No. 8 are certified by a registered professional engineer (Exhibit 31, PAP). A variance was granted by the regulatory authority following a stability analysis for sediment ponds No. 3 and No. 5, and treatment facility No. 1.

Compliance

Ground Water-(RVS)

The applicant has provided information about the use, occurrence and characteristics of ground-water resources within and adjacent to the permit area. Moreover, the extent and location of underground coal mining activities (past, present and future) have been identified and described.

Springs. Baseline and operational spring monitoring data have been superimposed over projected areas of mining to identify potential impacts to the ground-water resource. Although overburden

thickness in conjunction with extraction methods suggest minimal longwall-induced aquifer deformation, the applicant recognizes that the potential for impacts to spring recharge and discharge above mine workings and the productivity of the Huntington City wells cannot be totally precluded. The applicant proposes to conduct water monitoring at representative springs and the Huntington City wells to identify longwall-induced impacts.

Mine Inflow. Mine inflow rates have been quantified and a limited suite of water quality data indicates inflows and subsequent discharges to Mud Water Canyon exceed effluent limits. The applicant has submitted a request for approval to exceed effluent limits and commits to initiating remedial action on halting discharges as required by the Utah State Health Department (PAP, pages 817-2 and 817-3).

Graben Crossing. The applicant proposes to drive a tunnel across Bear Canyon Graben to access coal reserves in Lease U-13097. Piezometric data indicate that the regional aquifer will not be encountered within the graben, but will be intercepted during early development of Lease U-13097. Tunnel development will intersect the east and west boundary fault zones and three faults that occur within the graben. Available data suggests the tunnel will not encounter significant inflow at the eastern boundary fault zone. However, data are not available to determine whether the western boundary fault zone acts as significant ground-water conduit. The applicant commits to drilling a horizontal borehole through the western boundary fault zone to assess ground water resources and the need to initiate a pressure-grouting program (PAP, page 784-64a). Pressure-grouting will be initiated if inflow exceeds 50 gpm for longer than three months, and will continue until sustained inflow is decreased by 90 percent. If inflow exceeds 50 gpm, the operator commits to installing water seals at each end of the tunnel upon abandonment (PAP, page 784-63).

The applicant is in compliance with this section.

Surface Water-(TM)

All NPDES discharges have been made in compliance with the discharge permits except for sediment pond No. 8. Plateau studied the effluents and inflows to pond No. 8 for a one-year period after which a request for change of the limitation was made to State Health and E.P.A. based on the results of that year's data. The operator applied for a revised limit as of December, 1986, and upon receiving this permit will revise their current limit. They are currently operating under a 1-Ton, 1-Day dissolved solids limit until this permit application is reviewed and approved.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.43 Hydrologic Balance: Diversions and Conveyances of Overland Flow, Shallow Ground Water Flow, and Ephemeral Streams-(TM)

Existing Environment and Applicant's Proposal

The discussion of applicant's disturbed and undisturbed area drainage conveyance system, peak flow determination, and methodologies, sediment control, channel flow design, channel lining design, and culvert design, is given on pages 784-65 through 784-74 of the PAP.

Compliance

The applicant has met all the requirements regarding peak flow methodologies and determinations for diversions in regards to this regulation. The applicant has not supplied the necessary information to verify culvert sizing, inlet and outlet protection, riprap location, riprap type, and showing this information on maps.

The applicant will be in compliance with this section when the following stipulation is met.

Stipulation 817.43-(1)-(TM)

Plateau Mining Company shall submit by October 31, 1987, for inclusion in the PAP, flow, velocity, and sizing calculations, location maps, and inlet and outlet protection measures for all culverts in the disturbed area.

UMC 817.44 Hydrologic Balance: Stream Channel Diversions-(TM)

Existing Environment and Applicant's Proposal

The applicant does not address reclamation of any channels in their current reclamation plan. No place in their current Permit Application Package summarizes or provides detailed plans for channel reclamation techniques or channel stabilization after reclamation.

The applicant has stated in their Initial Completeness Review response document that for a reclamation plan to be completed, it will require detailed investigations into channel reclamation techniques and channel stabilization.

Compliance

The current PAP as it exists was approved by Office of Surface Mining, Reclamation and Enforcement without a detailed channel reclamation plan. The applicant must bring the current PAP into compliance with current regulations.

The applicant has not supplied the necessary information to address channel reclamation concerns. The applicant will be in compliance with this section when the following stipulation is met

Stipulation 817.44-(1)-(TM)

Plateau Mining Company shall submit by October 31, 1987 for inclusion in the PAP, complete and adequate design, calculations, profiles, cross sections, and drawings to detail final reclamation and channel restoration measures which will be employed. This will include post mining drainage patterns, and water monitoring locations.

UMC 817.45-.47 Hydrologic Balance: Sedimentation Ponds-(TM)

Existing Environment and Applicant's Proposal

Seven sediment ponds and one treatment facility have been constructed in conjunction with the runoff control plan and as on-site water pollution control facilities. These structures have been designed to contain the 10-year 24-hour design storm runoff event from disturbed areas and to remove excess suspended sediments picked up from the disturbed areas. They are temporary in nature and will be removed upon completion of the mining operations. No past, present, or future mining has, or will be, conducted beneath any existing sediment pond. One mine water discharge is located in Mud Water Canyon.

The overall sediment control plan, including pond location, drainage area characteristics associated with each pond, and other required runoff facilities are illustrated in Map 42 and 43, Surface Water and Sedimentation Control Facilities, Maps A and B (page 784-118, PAP).

Design details for the one treatment facility is shown on Map 53. Sediment Pond design details for ponds 2 through 8 are illustrated on Maps 54 through 60. A stage capacity curve for Treatment Facility 1 is shown on Figure 28, Stage Capacity Curve for Treatment Facility No. 1. The stage capacity curves for the as-built ponds are presented on Figures 29 through 35, Stage Capacity Curve for Sediment Ponds 2 through 8.

Additional Design Details for Sediment Volume, Runoff Volume, Pond Detention, Spillway Capacity, Embankment Height and Width, Side Slopes, Anti-Seep Collars, Riprap Protection, and Compactions are discussed on page 784-119 through 784-128 of the PAP. The adequacy of these design parameters will be discussed in the Compliance section.

Compliance

The applicant adequately describes the standard engineering practices used to design, construct, and certify all treatment facilities at Plateau (p. 784-117 and 784-118). All of the sedimentation ponds have been approved by the Division. The eight sedimentation ponds are classified as Treatment Facility No. 1 and Sedimentation Pond Nos. 2 through 8. Sedimentation Pond No. 1 was officially designated as Treatment Facility No. 1 by a letter from Dianne R. Nielson to PMC on July 19, 1984. Additionally, variances were granted for Sedimentation Ponds #3 and #5 for 817.46(r) (design and inspection during construction under the supervision of a registered professional engineer). As-built survey information was submitted for Ponds #3 and #5 with a certified stability analysis. The Division granted variances for these two ponds in a letter dated December 7, 1984.

Sedimentation ponds #4, #6, and #7 were certified on November 16, 1981. Sedimentation Pond #2 was certified on August 19, 1986. Sedimentation Pond #8 was certified and approved with the Unit Train Loadout, May 2, 1985.

The sediment design parameters for Ponds 1 through 8 have been summarized in Table 85. The applicant has not stated the design cleanout elevations for any of their ponds. In the applicant's response to the Division's renewal review, the applicant stated that he will survey the ponds to determine if they have reached the 60 percent cleanout level, and then determine if cleanout is necessary. Therefore, the applicant will include on their quarterly pond inspection forms, the cleanout volume (ac. ft.) for each facility and an updated sediment volume (ac. ft.) based on a current survey of each facility. This will supply adequate documentation for inspection of these facilities to be carried out.

The applicant states that the riprap protection for all ponds and treatment facilities is currently in place in inlet channels, around spillway risers, and at spillway outlets. The applicant has chosen to postpone a response to the Division's request for the D-50 of the riprap, manning's n values, and the depth, width and length of protection for all pond inlets and outlets. The applicant states that this will require assembling data from past submittals and field work to verify inlet and outlet protection, riprap location, riprap type, and showing this information on maps.

The applicant will be in compliance when the following stipulations are met.

Stipulation 817.45-.47-(2)-(TM)

1. Plateau Mining Company shall submit by October 31, 1987, for inclusion in the PAP, detailed calculations, maps and drawings showing the nature and location of pond outlet and inlet protection measures presently installed with supporting calculations which demonstrate the adequacy of these measures.

2. Plateau Mining Company will include on their quarterly sediment pond inspection forms, the cleanout volume (Ac.Ft.) for each facility and an updated sediment volume (Ac.Ft.) based on a current survey of each pond and treatment facility.

UMC 817.48 Acid-Forming and Toxic-Forming Materials-(DD)

Existing Environment and Applicant's Proposal

Page 783-132 of the PAP states sufficient evidence is available to quantify that the coal refuse material is not acid or toxic-forming as defined in UMC 700.5, and therefore does not need to have four feet of buffer material applied prior to topsoiling. Given the available data, the applicant requests that the Division concur with this position.

The available data, Table 64 of the PAP, gives chemical and physical analysis of the Coal Refuse. A series of test plots were also initiated on the Coal Refuse to determine adequate topsoil depths for reclamation. Sampling results from the test plots are submitted annually in the applicant's annual report.

Compliance

At this time it is premature for the Division to agree with the applicant's position that the coal refuse is non-acid or toxic-forming.

Sample locations of the coal refuse in Table 64 of the PAP were not located on a map of the coal refuse, and explained if the samples are depth increments or individual surface samples across the refuse pile.

Although most parameters appear to be within acceptable limits, Ec values are saline for samples WP2 middle, B-2, B-3, and VHA. Samples 12058 and 12059 are above suspect concentration for

selenium. Procedures used to analyze refuse and soil parameters need to be submitted to determine if values are total concentrations or plant available concentrations.

The test plot study must be completed and the refuse must be sampled in a representative fashion to determine the presence of acid or toxic-forming materials.

The applicant is currently developing an operational plan to address the presence of acid or toxic-forming materials in each stratum of overburden to be removed, including the stratum immediately above and below each coal seam to be mined and materials presently in the refuse pile. The plan shall include a discussion of the potential for, and mitigation of, water quality impacts and revegetation problems attendant to the refuse pile. This plan shall be submitted by September 15, 1987. After submittal, the plan will be reviewed for completeness by the Division.

The applicant will be in compliance with this section when Stipulation 817.71-.74 is met.

Stipulations

(See UMC 817.71-.74)

UMC 817.49 Temporary and Permanent Impoundments-(PGL)

Applicant's Proposal

Treatment Facility #1 and Sediment Ponds #2 through #8 are the only impoundments on the permit area. Page 784-129 states that temporary impoundments will be reclaimed upon completion of mining. Page 784-145 notes ponds may be permanently retained for wildlife use. All impoundments are less than 20 acre feet.

Compliance

Since the applicant is potentially planning to retain some impoundments for the postmining land use, the application has not addressed this section. The applicant will be in compliance with this section when the following stipulation is met.

Stipulation 817.49-(1)-(PGL)

Prior to final reclamation, Plateau Mining Company must submit definite plans for the disposition of all of the impoundments. If the applicant retains any of the impoundments permanently, all of the criteria for permanent impoundments must be met according to UMC 817.49.

UMC 817.50 Hydrologic Balance: Underground Mine Entry and Access Discharge-(RVS)

Existing Environment and Applicant's Proposal

Rocks in the mine plan and adjacent area strike northwest and dip approximately three degrees to the southeast. Mine inflow is measured to be 134 gpm and is collected in two sump areas prior to dispersal throughout the mine and to surface discharge. Mine inflow is of marginal quality.

Portals are updip from the workings and located at elevations ranging from 8,600 to 8,400 feet. Lion Deck Portal is located at the lowest elevation. Portal seals incorporate two-inch diameter drain pipes to accommodate the flooding of workings and associated build-up of hydraulic head following mine closure.

Compliance

Portals were located and constructed to control gravity discharge from the mine. The mine currently experiences inflows of marginal water quality.

Following mine closure, workings will flood and unplanned discharges of marginal water quality may occur. The applicant commits to monitoring unplanned discharges after mining for compliance with UMC 817.42 and other applicable state and federal regulations. Monitoring will be conducted quarterly (as accessible) and treatment will be initiated, if necessary, during the period of discharge or until bond release (PAP, page 817-4).

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.52 Surface and Ground Water Monitoring-(RVS/TM)

Existing Environment and Applicant's Proposal

Baseline water quality samples will be analyzed for the parameters listed in Table 82, Baseline Low Flow Water Quality Analytical Schedule. Operational water quality samples will be analyzed for the parameters presented in Table 81, Operational Water Quality Analytical Schedule. Baseline and operational monitoring will be conducted at the monitoring stations identified on Map 26, Ground and Surface Water Monitoring Sections with Water Quality Data in accordance with the time schedule indicated in Table 80.

The parameter sampling frequency procedures and future sampling intent has been stated on pages 784-79 through 784-88 of the PAP.

On April 9, 1987, the Division met with Plateau Mining Company (PMC) to discuss a revised spring monitoring plan based on the information received to date. Based on that meeting, PMC proposes to drop from the plan as outlined in the 5-year permit renewal PAP and New Lands PAP the following springs: S17-2, S7-1, S11-1, 530, 85-26-1, 734 and 452. The following springs will be added to those sampled: 518, 429, 433, 443, and 444.

Springs 429, 433, 443, and 444 will be monitored for baseline starting this year, then dropped until mining commences in Lease U-13097. Spring 518 will be monitored on an operational basis starting this year.

Compliance

The Division has concurred with the applicant on their revision to the proposed monitoring schedule in the PAP. The Forest Service has reviewed these changes and discussed these changes with the Division in a June 2, 1987 meeting. They also concur with these changes except that they would like the applicant to continue monitoring Spring S11-1 through 1987 with at least one sample being collected at low flow. This request was based on the water rights associated with Little Park Creek and mining to the east of this spring. The Forest Service will assess the data collected from sampling Spring S11-1 at the end of this year to determine if they would like continued monitoring in 1988. USFS is also compiling a list of springs on their own this field season, and this winter will provide a comprehensive list of high resource value springs.

The applicant has proposed to drop certain parameters from their surface and ground water quality sampling program. The Division does not concur with elimination of the baseline parameters spelled out on pages 784-82 through 784-85 for baseline data collection. If at the end of one year's baseline data collection for new sites (four water quality samples including high and low flow), certain parameters (those mentioned on pages 784-82 through 784-85 of the PAP) are not found in significant concentrations, then the Division would consider approving an amendment to the plan for the the second year of baseline monitoring. The complete baseline parameter list will be sampled every fifth year for all sites.

The applicant will be responsible to keep the Division informed of mining sequence changes on a yearly basis so that spring monitoring sites can be revised according to mining sequence changes and adequate baseline data can be collected prior to any mining impacts being realized.

The applicant will be in compliance with this section when the following stipulation is met.

Stipulation 817.52-(2)-(TM)

1. Plateau Mining Company (PMC) shall upon permit approval, utilize the monitoring stations proposed in PMC's April 30, 1987 letter to the Division. Moreover, PMC shall monitor springs S11-1, 238, and 494 at least one time in 1987 during low flow conditions in accord with the approved monitoring plan.

2. By October 31, 1987, Plateau Mining Company shall update the PAP water monitoring plan including text and tables, to:

   a. reflect the revised monitoring stations proposed in PMC's April 30, 1987 letter to the Division as well as to add springs 238 and 494 to the monitoring program.

   b. reflect that all new source and existing baseline monitoring points for surface and groundwater monitoring shall be monitored in accord with the Division's baseline parameter list for a two year period.

UMC 817.53 Hydrologic Balance: Transfer of Wells-(RVS)

Existing Environment and Applicant's Proposal

The applicant states that upon final reclamation, ground-water monitoring wells will be sealed from bottom to top (PAP. page 784-58) and exploration boreholes will be plugged following abandonment (PAP, page 784-57).

Compliance

The applicant indicates exploration boreholes and ground-water monitoring wells will not be transferred for further use as water wells.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.57 Hydrologic Balance: Stream Buffer Zones-(KMM)

Existing Environment and Applicant's Proposal

The permit area contains the headwaters of two small perennial streams - Miller and Tie Fork Creeks. The latter includes Gentry Hollow and Wild Cattle Hollow Forks. There is currently no mining or surface facilities within 100 feet of these streams. Aquatic resource studies (pages 783-115 to 123) indicate no degradation to water quality or quantity from the applicant's operations. Subsidence cracks are the only surface disturbances in the Miller Creek drainage area and these are limited to the ridge (page 783-121). Subsidence is not expected to impact Wild Cattle or Gentry Hollow (page 783-122).

Mine water discharge from the Mudwater Fan Breakout has changed Mudwater Creek to a perennial stream. The water discharge is subject to an NPDES permit and is monitored regularly to determine impacts on water quality (page 784-146).

The Corner Canyon Fan Breakout is the only facility in proximity to an intermittent channel. The breakout was constructed so as not to impact the stream and the site has been posted for a stream buffer area (page 784-147).

Compliance

Mining activity, except for the breakouts described above, has not and is not expected to disturb land within 100 feet of a perennial or intermittent stream. Continued spring and stream monitoring is conducted to document any changes in water quality or quantity which might necessitate mitigation. The applicant is committed to mitigate impacts to water quality or quantity that affect wildlife (page 784-145d).

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.59 Coal Recovery-(PGL)

Existing Environment and Applicant's Proposal

The operator has committed to maximum coal recovery while using the best technology currently available and maintaining environmental integrity through underground coal mining activities. An approved Resource Recovery and Protection Plan is shown in Exhibit 39.

Compliance

The applicant's Resource Recovery and Protection Plan approved March 20, 1981 is valid.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.61-.68 Explosives-(PGL)

Existing Environment and Applicant's Proposal

For surface blasting activities incident to underground coal mining in the Star Point Mines, the applicant will comply with all Federal and State laws in the use of explosives. Blasting will be conducted by certified blasters only. Records of surface blasts will be filed at the minesite for 3 years (PAP, page 817-17).

Compliance

The applicant commits to comply with all applicable State and Federal laws for surface blasting activities incident to underground coal mining.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.71-.74 Disposal of Underground Development Waste and Excess Spoil and Non-Acid and Non-Toxic Forming Coal Processing-(PGL)

Existing Environment and Applicant's Proposal

The applicant presently disposes of underground development waste and excess spoil in the coal processing waste pile which is located south and east of the preparation plant.

The mine development will proceed through a Graben crossing. The development waste from the graben crossing is proposed to be conveyed to the surface by the regular coal conveyor. Rock may be mixed with the mined coal and conveyed to the coal preparation plant where it will be removed during the coal washing. The waste rock will then be mixed with the regular coal refuse and deposited on the refuse pile (page 784-133).

Two other alternatives for the proposed development waste have been proposed. The waste may be conveyed by conveyor belts on on-shifts to the surface where it would be disposed directly on the refuse pile. The other alternative would be the creation of "gob" rooms underground for the waste rock disposal. (Approximately 45,000 cy of material are involved in this development.)

The "refuse pile" used for the waste rock disposal was designed by professional engineers (and is certified). Recent stability investigations by Chen and Associates verified the stability of the fill (Geotechnical investigation in Exhibit 38, dated December 5, 1986).

The fill is continually being placed and compacted. The lifts are 2 feet, and designed to ensure mass stability and prevent mass movement. The outslope of the fill is 2H:1V.

Compliance

The applicant has proposed three alternatives for the disposition of the development waste. The waste program must be specific and identify the provisions for disposal of acid or toxic forming materials.

The applicant will be in compliance when the following stipulation is met.

Stipulation 817.71-.74-(1)-(PGL/DD/RVS)

The Plateau Mining Company shall submit by October 31, 1987, for inclusion in the PAP, an operational plan for collection and analyses of each stratum of overburden to be removed, including the stratum immediately above and below each coal seam to be mined, graben crossing waste rock, and materials presently in the refuse pile, to identify potential acid or toxic-forming, or alkalinity producing materials. The plan shall include a discussion of the potential for, and mitigation of, water quality impacts and/or revegetation problems attendant to the refuse pile. Moreover, the operator shall submit the calculated volume of waste rock to be generated during the permit term.

UMC 817.81-.88 Coal Processing Waste Banks-(DD/PGL)

Existing Environment and Applicant's Proposal

The refuse pile for the PMC preparation plant is located south and east of the plant site. Currently, the waste pile is in Phase II as described in Exhibit 33, Star Point Mines Refuse Pile Evaluations, Operation and Maintenance Plan. This plan contains a detailed operation and maintenance plan.

Page 784-17 outlines how the refuse pile will be operated including spreading the refuse in two foot lifts, compaction will achieve 90 percent of the maximum dry density, and side slopes will be constructed at a maximum 2H:1V. The refuse pile plan continues and commits to monitoring and maintenance procedures throughout the life of the mine (detailed on page 784).

Waste rock generated from the underground projects which is known to be non-acid or non-toxic is transported to the refuse pile. The estimated amount of waste rock is 45,000 cy (page 784-133), which at the present projections, would be 2.15 feet over the active portion of the refuse pile or one lift. When the coal processing waste pile is full or no longer needed, it will be reclaimed by covering with suitable material and revegetating the area with the approved seed mixture. There are a series of test plots constructed in the area to determine vegetation success with differing soil material at various depths.

Compliance

The applicant's operational and maintenance procedures are acceptable as described in the PAP. Recent stability investigations as of December 1986 have demonstrated stability. The reclamation of the site will depend upon the results of the series of test plots. Presently, however, the bond estimate consists of covering the area with four feet of topsoil unless successfully demonstrated otherwise with the series of test plots.

The applicant commits to "visual monitoring quarterly, for evidence of structural weakness, ponding or impounded water and general appearance" (page 784-16). This inspection will be conducted by a registered professional engineer or other person approved by the Division. All of the monitoring procedures are acceptable.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.89 Disposal of Non-Coal Waste-(PGL)

Existing Environment and Applicant's Proposal

There are dumpsters and concrete containment areas located throughout the mine area where non-coal waste is collected. The non-coal waste is hauled to the Carbon County landfill (page 784-16).

Compliance

The applicant collects non-coal waste in a designated portion of the permit are and removes it to the approved Carbon County landfill.

The applicant is in compliance with this section.

Stipulations

None.

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

Existing Environment and Applicant's Proposal

The coal processing waste dams and embankments are not employed at the Star Point Mines. A thickener tank is utilized to settle out fines from the preparation plant process water.

Discharge from the thickener underflow treatment ponds is recycled back to the coal wash plant, and is not released back into natural stream courses. Therefore, these regulations are not applicable.

UMC 817.95 Air Resources Protection-(PGL)

Existing Environment and Applicant's Proposal

The applicant outlines on page 784-153 that all surface operations including construction and reclamation operations are conducted utilizing dust control measures. Dust control approval orders have been received by the Utah State Department of Health for all facilities at PMC and are found in Exhibit 34.

Compliance

The applicant has approved dust control plans for all surface facilities at the mine. The applicant is in compliance with this section.

Stipulations

None.

UMC 817.97 Protection of Fish, Wildlife and Related Environmental Values-(KMM)

Existing Environment and Applicant's Proposal

On pages 783-93 through 783-124, the operator describes the fish and wildlife resource of the permit area and affected adjacent areas. Information is based on literature, consultation with appropriate agencies, and field studies. Continuing studies include annual raptor surveys, and water quality and quantity monitoring which will identify potential problems.

Compliance

Much of the Star Point Mine's facilities were in existence before passage of SMCRA or Utah's Rules. Wildlife has adapted to some extent to the presence of the mine as evidenced by big game use of sediment ponds and wildlife sightings in the mine facilities area. The applicant has tried to minimize impacts on wildlife from existing facilities and to design new facilities to take wildlife into consideration, including raptor-proof power lines and conveyors constructed to allow deer crossing (pages 784-144 - 145a). The applicant has committed to notify the Division of threatened or endangered species and their habitats, of the use of pesticides and fires and to fence, cover or buffer hazard areas (page 784-145d).

Mitigation of impacts and enhancement of wildlife resources include employee education, deer winter range vegetation enhancement and a guzzler to compensate for the Unit Train Loadout and refuse expansion areas (page 784-145b), availability of sediment ponds for deer use and interim and final revegetation planned to maximize benefit to wildlife.

Final reclamation will include retention of sediment ponds and vegetation enhancement of them if appropriate for wildlife use (see discussion following page 784-145). Stream channel reconstruction will include riparian vegetation re-establishment where appropriate.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.99 Slides and Other Damage-(PGL)

Existing Environment and Applicant's Proposal

The applicant commits on page 817-19, that "at any time a slide occurs which may have a potentially adverse affect on public property, health, safety, or the environment, Plateau Mining Company

will notify the Division by the fastest available means and will comply with remedial measures that are required by the Division's standard safety and construction procedures".

Compliance

The applicant commits to notify the Division if a slide occurs and comply with standard and acceptable measures required by the Division. The applicant is in compliance with this section.

Stipulations

None.

UMC 817.100 Contemporaneous Reclamation-(KMM)

Existing Environment and Applicant's Proposal

The applicant has committed to reseeding as contemporaneously as possible with regrading (page 784-49). Map 34, Disturbed Area Vegetation, indicates areas disturbed prior to August 3, 1977 and current disturbance. Areas of interim revegetation and final reclamation are also indicated.

Compliance

The applicant has either performed or committed to timely interim reclamation or final reclamation on all areas not currently used for mine facilities.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.101 Backfilling and Grading-(PGL)

Existing Environment and Applicant's Proposal

The proposed final surface contour plan provides a variety of topographic features enhancing the postmining land use.

Backfilling operations, utilizing equipment such as rubber-tired scrapers, front-end loaders, and dump trucks will be undertaken in the portal, sedimentation pond, and stope hole areas. Holes or depressions will be filled when the mining operation is concluded. After the portals are sealed they will be backfilled (page 784-25).

Highwalls will be reduced by dragging a portion of the fill material from the outslope of the operation benches to the toe of the highwall. Roads will be reclaimed by pulling fill back up from the downslope and placing it in the cuts. Natural drainages will be re-established and erosion protection across the fill provided.

Some highwalls will be retained. The post-mining topography is graphically represented on Map 47 - "Post Disturbance Topography" and "Reclamation Cross Sections" on Map 49.

Compliance

The applicant described how the disturbed areas will be backfilled. The backfilling plan outlined on Map 47 where highwalls will be retained, but did not demonstrate how highwall retention criteria was met. The backfilling and grading did not demonstrate how a minimum static safety factor of 1.3 would be achieved.

The applicant will be in compliance when the following stipulation is met.

Stipulation 817.101-(1)-(PGL)

Plateau Mining Company shall submit by September 1, 1987, for inclusion in the PAP, cross sections, calculations, and plans to demonstrate that backfilled areas will meet the minimum static safety factor of 1.3. This shall include justification for retention of highwalls, and four more cross sections of the final configuration proposed for the coal refuse pile.

UMC 817.106 Regrading of Stabilizing Rills and Gullies-(PGL)

Existing Environment and Applicant's Proposal

The applicant commits on page 817-20 that when rills or gullies deeper than 9" form in areas that have been regraded and topsoiled, the rills and gullies will be filled, graded, or otherwise stabilized.

Compliance

The applicant's commitment to fill, grade, or stabilize rills and gullies deeper than 9" in topsoiled or regraded areas meets the requirements of UMC 817.106.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.111 Revegetation: General-(KMM)

Existing Environment and Applicant's Proposal

Following completion of topsoiling and seedbed preparation, areas will be seeded with appropriate mixes (Map 73, Tables 70-79 and 93). Slopes accessible to a seed drill will be either drill seeded or dragged with a harrow or chain to adequately cover the seed (page 784-51). Areas too steep for a drill will either be broadcast or hydroseeded depending on accessibility. Seeding rates are provided in Tables 70-79 and 93. Seeding rates range from 52-87 PLS per square foot for drill seeding and 90-174 PLS for broadcast seeding (page 784-41).

Compliance

Seeding mixes and seeding rates have been calculated for prompt revegetation compatible with the designated post mining land uses. Tree and shrub seeding and planting rates and distribution have been designed to meet the woody density standards. PMC has also made the commitment to use grazing management to increase shrub densities if necessary. Grazing management is acceptable if it will result in meeting the success standard. Since bond release is dependent on meeting the success standard, proposed use of these revegetation and management techniques meet the requirements of UMC 817.111.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.112 Use of Introduced Species-(KMM)

Existing Environment and Applicant's Proposal

The applicant proposes use of small amounts of several introduced species in the seed mixes including Smooth brome, Timothy, Intermediate wheatgrass, Kentucky bluegrass, Alfalfa, Meadow foxtail, Yellow sweetclover, Regar meadow brome, Small burnet, Tall wheatgrass, Pubescent wheatgrass and Orchard grass (see Tables 70-73 and 75-79). The topsoil stockpile interim seed mix (Table 74) is predominantly introduced species.

Compliance

The applicant has provided a species by species and area by area justification for use of introduced species in permanent reclamation mixes. Various species are justified for their adaptability, forage quality, ease of establishment, value as a

nurse crop, nitrogen fixing ability and other soil building attributes. Small quantities of these species will not have a competitive advantage over natives and will add diversity to the permanent reclamation areas.

The principal justification for use of introduced species on the existing topsoil stockpile is their ability to "promote long term viability of the biological activity of the stockpiled soil material" based on rooting depth and overall root biomass.

The applicant has provided an extensive literature review to support their use of introduced species at the Star Point Mine. The applicant is in compliance with this section.

Stipulations

None.

UMC 817.113 Revegetation: Timing-(KMM)

Existing Environment and Applicant's Proposal

Following completion of topsoiling and seed bed preparation, seeding will be done in either spring or fall. The fall period may extend throughout the winter if soil is not frozen (page 784-48).

Compliance

Spring, if the site is accessible, and fall are normal periods for favorable planting conditions. If seeding is done in either period, the applicant will meet the requirements of UMC 817.133.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.114 Revegetation: Mulching-(KMM)

Existing Environment and Applicant's Proposal

The applicant proposes to mulch only on areas that are not drill seeded, harrowed or chain dragged to adequately cover seed (page 784-51). On areas too steep for the above treatments, an organic mulch (2000 lb/acre) or planted annual crop (20 lb/acre) will be used as mulch. Regrading to leave a roughened surface and pits, depressions and contour furrows will also aid in water retention and erosion control.

Compliance

The applicant performed two studies to evaluate various mulch treatments. While there were implementation problems associated with both studies, the information presented in conjunction with the literature review of mulching (Exhibit 40) is adequate to justify not mulching on relatively flat areas where seed is adequately covered. The Division may require mulch on a case by case basis if problem areas are evident, or if revegetation projects completed over the next permit terms indicate problems. Incorporation of organic mulch into the surface soil may also be required on a case by case basis if soil analyses indicate that organic matter would be beneficial.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.116 Revegetation: Standards for Success-(KMM)

Existing Environment and Applicant's Proposal

Reference areas have been established for all of the disturbed vegetation types (Map 34 and 36). Reference areas will be used for most cover and production standards. A woody density standard of 2200 plants per acre on east and north facing slopes and 900 plants per acre for south and west facing slopes has been negotiated for most reclamation sites. The applicant provides a history of permitting actions which led to establishment of this standard (see deficiency response document (January 5, 1987, p. 34-41). Map 73 specifies the reference area or other success criteria to be used at each reclaimed area.

For cover and productivity the 80/10 standard will be used for all shrublands (most types) and the 90/10 standard for herbaceous types (Mountain Grassland and Grass-Sagebrush) (page 784-54). Sampling techniques will be similar to those used over the last several years (10 point frames for cover and belt transects for density [page 783-77A and 784-53]).

Compliance

Cover and productivity are the basic parameters which must be measured for revegetation success. Shrub density must be considered for areas developed for fish and wildlife management. PMC proposes to measure all three parameters at the required statistical levels.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.121-.126 Subsidence Control-(RVS)

Existing Environment and Applicant's Proposal

The applicant provides information about subsidence on pages 784-134 through 784-143. Supplementary subsidence information is given on Maps 5, 6, 61, 62 and in Table 89.

Mining will occur in the Hiawatha seam, Third seam and Wattis seam. Coal extraction will occur by longwall methods in the Wattis and Third seams and by continuous room and pillar methods in the Hiawatha seam (PAP, page 784-3). Multiple seam mining will primarily occur beneath the northern portion of Hoag Ridge (Section 12, T15S, R7E). The operator estimates that maximum subsidence will be 70 percent of extraction height (PAP page 784-136). Accordingly, in Section 12 where three seams are projected to be mined (total thickness of approximately 20 feet) cumulative maximum subsidence is anticipated to be less than 14 feet. Maximum subsidence beneath Gentry Ridge, where the Wattis seam is projected to be mined, will be less than 5 feet.

Overburden thicknesses range from 700 to 1500 feet in the northern portion of Hoag Ridge (includes Section 12) and 1000 to 1700 feet in the Gentry Ridge area. The operator gives a value of 22 1/2 degrees for the angle-of-draw within and adjacent to the permit area (PAP, 784-136). Map 61 locates subsidence-induced tension cracks that have developed over previously mined areas above Star Point.

The applicant identifies renewable resource lands above areas of current and projected mining. The applicant concludes, on the basis of mining methods, stratigraphy and overburden thickness that surface manifestations of subsidence (tension cracking, catastrophic failure) and impacts to renewable resource lands (springs, livestock grazing) will be minimal. However, where subsidence causes tension cracks that are hazardous to livestock or wildlife, the applicant commits to restoring the land surface. Where tension cracks preclude grazing or result in injured or killed livestock, the applicant commits to compensating owners at fair market value for losses. Ground-water resources (springs) that are materially damaged by mining-induced subsidence will be rehabilitated or mitigated (PAP, pages 817-22 and 817-23).

The operator identifies three structures (powerline, cabin, TV towers) that occur above areas that were mined prior to 1977 (Map 1, Sheet 2) and therefore, are considered to be located above areas that have stabilized. The operator does not anticipate subsidence-induced damage to these structures and does not propose specific mitigation plans.

The operator proposes to monitor vertical and horizontal ground movement by photogrammetric methods, surveying of monuments and visual observations during surface traverses. Photogrammetry will be the primary method for quantifying ground movement. Surface monument surveys will be utilized to determine the resolution of photogrammetric methods. Maps 61, 61A, and 61C show the subsidence monitoring points above longwall panels. Maximum measured subsidence, to date, is two feet (Map 61). The operator commits to conducting an annual field survey (surface traverse) and indicates that monument surveying will be conducted on an irregular basis and eventually phased out (PAP, p. 784-141). Results of surveys will be submitted to the Division on an annual basis (PAP, page 784-142). Surface owners will be notified of the mining schedule according to UMC 817.122.

Compliance

The applicant has provided information about mining methods and locations, overburden thickness and lithology, vertical movement, renewable resource lands and structures.

Maximum subsidence of up to 14 feet is projected for areas of Hoag Ridge where approximately eight springs occur. In addition, approximately 30 springs occur above portions of Gentry Ridge where maximum subsidence is projected to be less than five feet. The applicant cannot exclude the possibility of subsidence-induced material damage that results in the reduction of reasonably foreseeable use of surface lands and has provided commitments to restore surface lands and compensate owners in compliance with 817.124.

The applicant has identified structures above previously mined areas that have experienced vertical movement and are currently stable.

The applicant has provided a subsidence monitoring plan that describes schedules for collecting and submitting quantitative data as required by 817.121 and notifying surface owners according to 817.122.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.131 Cessation of Operations: Temporary-(PGL)

Existing Environment and Applicant's Proposal

The applicant commits to the requirements of 817.131 on page 817-24.

Compliance

The applicant commits to effectively support and maintain all surface access openings to underground operations, and secure surface facilities in areas in which there are no current operations, but operations are to be resumed under an approved permit, even if temporary abandonment occurs.

The applicant will submit to the Division a notice of intention to cease or abandon operations if temporary cessation extends beyond 30 days, with all necessary information outlined in UMC 817.131.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.133 Postmining Land Use-(KMM)

Existing Environment and Applicant's Proposal

The applicant describes pre-mining land use on pages 783-134 to 140. These include recreation, wildlife habitat, grazing, forestry and mining.

Compliance

The reclamation plan is consistent with these same uses (page 784-111), including enhancement of vegetation for wildlife, leaving sediment ponds for wildlife use and leaving the Lion Deck Portal road for recreation and other uses (see page 817.150-170.).

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.150-.176 Roads-(PGL)

Existing Environment and Applicant's Proposal

On page 784-10, the applicant describes the silo access road and transfer tower access road. These roads are single lane, 15 feet wide, with a gravel surface.

The silo access road is 3,700 feet with a uniform grade of 0.75 percent. The transfer tower road is 1,000 feet long with an overall grade of 7.4 percent.

Compliance

The applicant did not adequately describe with descriptions, maps, and cross-sections, the configuration and reclamation of all the roads on the Star Point Mines permit area.

The applicant will be in compliance when the following stipulation is met.

Stipulation 817.150-.176-(1)-(PGL)

Plateau Mining Company shall submit by October 31, 1987, for inclusion into the PAP, detailed descriptions and specifications for each road within the permit area to include: maintenance and reclamation details, maps showing location, and cross sections of each road in the permit area.

UMC 817.180 Other Transportation Facilities-(PGL)

Existing Environment and Applicant's Proposal

The conveyor, railroad siding, and unit train loadout were designed and constructed and are maintained to prevent damage to environmental values. The maintenance of the facilities is outlined on page 784-15 of the PAP.

Compliance

The transportation facilities were designed and constructed, and are maintained to prevent damage to fish, wildlife, and related environmental values and minimize the degradation of water quality, minimize erosion and siltation, and pollution. The facilities will be removed in an environmentally sound manner.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.181 Support Facilities and Utility Installations-(PGL)

Existing Environment and Applicant's Proposal

The mine buildings, coal storage, sheds, shop and coal preparation were designed and constructed and are maintained as outlined on page 784-15 to prevent damage to environmental values.

Compliance

The applicant has designed and constructed and will maintain and remove, the support facilities in an environmentally sound manner.

The applicant is in compliance with this section.

Stipulations

None.

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GENTRY MOUNTAIN

CUMULATIVE HYDROLOGIC IMPACT

ASSESSMENT

Bear Canyon Mine, ACT/015/025

Hiawatha Mines Complex, ACT/007/011

Star Point Mines, ACT/007/006

Trail Canyon Mine, ACT/015/025

Carbon County and Emery County, Utah

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I. INTRODUCTION

The purpose of this report is to provide a Cumulative Hydrologic Impact Assessment (CHIA) for Gentry Mountain located in Carbon and Emery counties, Utah. This assessment encompasses the probable cumulative impacts of all anticipated coal mining in the general area on the hydrologic balance and whether the operations proposed under the application have been designed to prevent damage to the hydrologic balance outside the proposed mine plan area. This report complies with legislation passed under Utah Code Annotated 40-10-1 et seq. and the attendant State Program rules under UMC 786.19(c).

Gentry Mountain occurs within the Wasatch Plateau Coal Field approximately 10 miles southwest of Price, Utah (Figure 1). The eastern margin of the Wasatch Plateau forms a rugged escarpment that overlooks Castle Valley and the San Rafael Swell to the east. Elevations along the eastern escarpment of the Wasatch Plateau range from approximately 6,500 to over 9,000 feet.

Precipitation varies from 40 inches at higher elevations to less than 10 inches at lower elevations. The area encompassed by the Wasatch Plateau may be classified as semiarid to subhumid.

GEOLOGY

Outcropping rocks of the Wasatch Plateau Coal Field range from Upper Cretaceous to Quarternary in age. The rock record reflects an overall regressive sequence from marine (Mancos Shale) through littoral (Star Point Sandstone) and lagoonal (Blackhawk Formation) to fluvial (Castlegate Sandstone, Price River Formation and North Horn Formation) and lacustrine (Flagstaff Limestone) depositional environments. Oscillating depositional environments within the overall regressive trend are represented by lithologies within the Blackhawk Formation. The major coal-bearing unit within the Wasatch Plateau Coal Field is the Blackhawk Formation.

VEGETATION

Vegetation of the Wasatch Plateau area is classified within the Colorado Plateau Floristic Division (Cronquist et al., 1972). The area occupies parts of both the Utah Plateaus and the Canyon Lands Floristic Sections. Vegetation communities of the area include Desert Shrub (Shadscale) at the lowest elevations through Sagebrush, Sagebrush-Grassland, Pinyon-Juniper, Mountain Brush, Douglas Fir-White Fir-Blue Spruce and Englemann Spruce-Subalpine Fir.

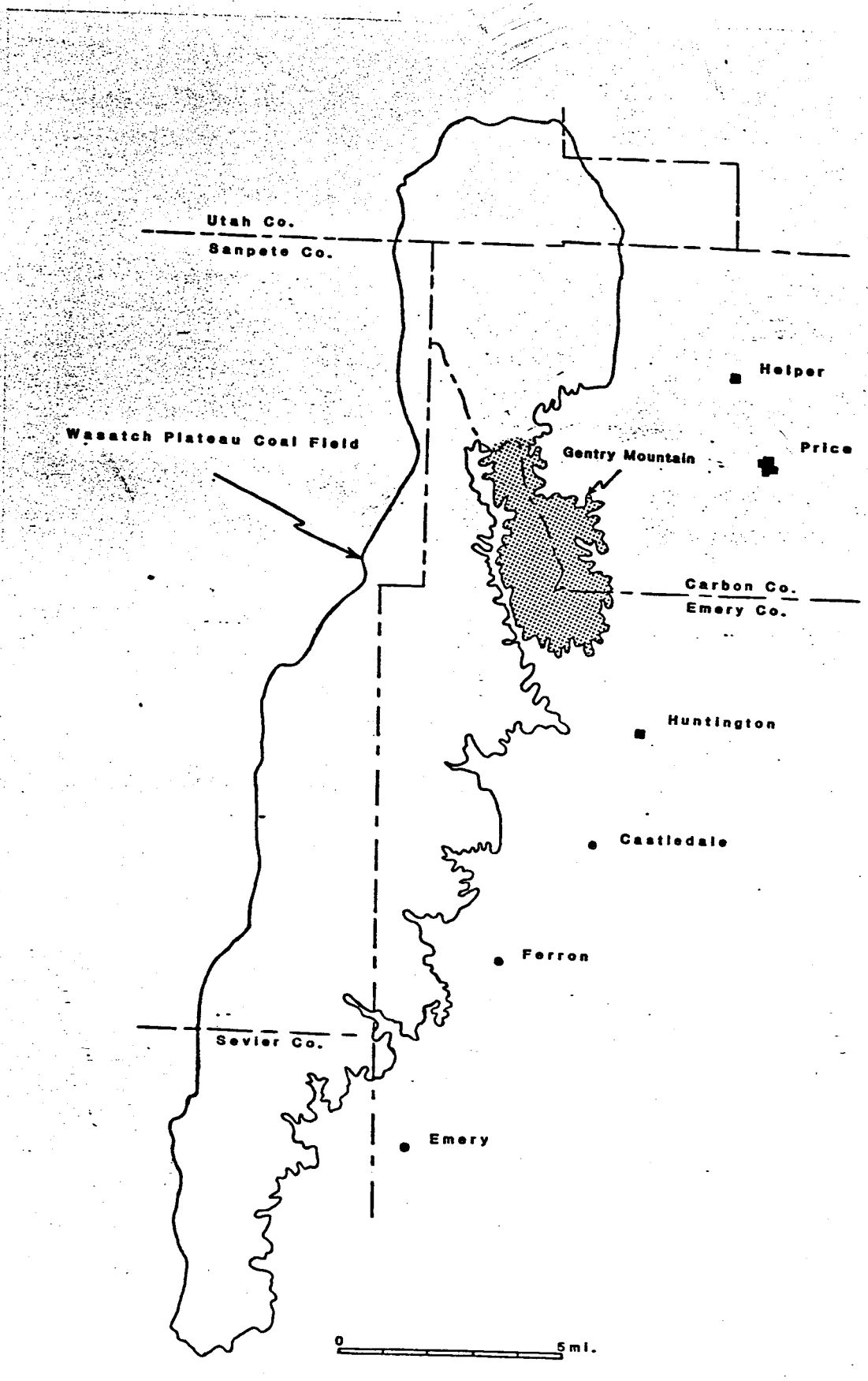

Figure 1. Wasatch Plateau Coal Field.

Desert Shrub communities are sparsely vegetated shrublands that, depending on elevation and soils, may be dominated by Shadscale (Atriplex confertifolia), Fourwing saltbush (A. canescens), Castle Valley clover (A. nuttallii) or Mat saltbush (A. corrugata) and can include Winter fat (Ceratoides lanata), Mormon tea (Ephedra spp.), Budsage (Artemisia spinescens), miscellaneous buckwheats (Erigonum spp.), Indian ricegrass (Oryzopsis hymenoides), Galleta grass (Hilaria jamesii), Grama grass (Bouteloua spp.), Needle and thread grass (Stipa comata), Sand dropseed (Sporobolus airodies) and Squirrel tail (Sitania hystrix). Greasewood (Sarcobatus vermiculatus) - Saltgrass (Distichlis stricta) can dominate bottomlands.

Many Sagebrush communities of the area are relatively dense shrub stands of (Artemisia tridentata var tridentata) with very little understory growth. In relatively undisturbed Sagebrush communities, Rabbitbrush (Chrysothamnus nauseosus or C. viscidiflorus), Mormon tea, and several perennial grasses including Thickspike and Western wheatgrass (Agropyron dasystachyum and A. smithii), Great Basin wildrye (Elymus cinereus), Indian ricegrass and Dropseed species may be common.

In the Sagebrush-Grassland type, the typical Big sage may give way to Artemisia tridentata var vaseyana (Mountain big sage) with a co-dominant perennial grass understory. Salina wildrye (Elymus salinus) can be co-dominant in these communities and may dominate an herbaceous Grassland type. Black sage (A. nova) with Salina Wildrye or Western wheatgrass understory is also common.

Pinyon-Juniper woodlands occupy drier sites often with stoney to very rocky soils. Pinus edulis and Juniperus osteoperma are co-dominant in the overstory. Understory vegetation ranges from sparse to moderate ground cover on range sites in poor to excellent condition. Understory species include Sagebrush, Mountain mahogany (Cercocarpus montanus), Snowberry (Symphoricarpus oreophilus), and several perennial grasses including Slender wheatgrass (Agropyron trachycaulum), Salina wildrye, Junegrass (Koeleria cristata) and Indian ricegrass.

Dominant shrubs of the Mountain Brush communities will vary depending on elevation and aspect. The drier south and west facing slopes may support dense stands of Gambel's oak (Quercus gambellii). Other dominants of this community may include Serviceberry (Amelanchier utahensis), Mountain mahogany (Cercocarpus montanus or C. ledifolius), Bitterbrush (Purshia tridentata) and Snowberry.

The range of the Douglas Fir-White Fir-Blue Spruce community is about 8,000 to 10,000 feet. Douglas Fir (Pseudotsuga mensiesii) is usually the dominant tree with White Fir (Abies concolor) and Blue

Spruce (Picea pungens) usually limited to the most mesic sites, often along streams. With dense canopies, understory vegetation may be sparse. Common shrubs include Serviceberry (Amelanchier spp.), Oregon grape (Berberis repens), Chokecherry (Prunus virginiana), Rocky Mountain Maple (Acre glabrum), Mountain lover (Pachistima myrsinites) and Snowberry. Bluebunch wheatgrass (Agropyron spicatum), Mountain brome (Bromus marginatus), and Kentucky bluegrass (Poa pratensis) are common grasses. Aspen stands (Populus tremuloides) can be found throughout the zone, particularly in mesic sites and as successional communities.

Picea engelmannii and Abies lasiocarpa dominate the Spruce-Fir zone at the highest elevations of the hydrologic impact area. While receiving about the same precipitation as the Douglas Fir communities, lower evapo-transpiration with cooler temperatures can permit a more lush vegetation in the Spruce-Fir zone. Limber pine (Pinus flexilis) often occupies steep or rocky, drier sites of this zone.

Small riparian communities are found at all elevations within the impact assessment area. With greater water availability and cooler temperatures, the riparian zone often includes more mesic species, e.g., those from a higher vegetation zone. Shrub species from the Mountain Shrub type may be found at most elevations.

Additional riparian zone shrubs include Narrowleaf cottonwood (Populus angustifolia), Redosier dogwood (Cornus stolonifera), Skunk bush (Rhus trilobata), river birch (Betula occidentallis) and various willows (Salix spp.). Grass species from the mesic zones may be represented (Mountain Shrub and higher zones) along with fescues (Festuca spp.) and miscellaneous sedges (Carex spp.). Small wet areas around springs and seeps will often support a dense growth of grasses, sedges and willows.

HYDROLOGY

Surface runoff from the Wasatch Plateau area flows either to the Price River Basin or the San Rafael River Basin. The Price River Basin, which includes about 1,800 square miles in six counties, is located primarily in Carbon and Emery Counties in East-Central Utah. The San Rafael River Basin, which includes about 2,300 square miles in three counties, is located mainly in Emery County to the south of the Price River Basin. The Price River drainage originates in the Wasatch Plateau about 12 miles west and south of Scofield Reservoir. Downstream from the reservoir the river flows in a generally southeasterly direction. The drainage is bounded by the Book Cliffs on the northeast, the Wasatch Plateau on the west, and the San Rafael Swell on the south. The San Rafael River Basin occupies part of two physiographic sections of the Colorado Plateau

- The High Plateaus to the north and west and Canyonlands to the south and east (Fenneman, 1946). Principal streams in the basin are Huntington and Cottonwood creeks, which merge to form the San Rafael River, and Ferron Creek, which joins the San Rafael River within a mile of that confluence. The San Rafael River also flows in a southeasterly direction to eventually join the Green River, after travelling from its headwaters in the Wasatch Plateau.

The water quality of both the Price River and the San Rafael Rivers is good in the mountainous headwater tributaries, but deteriorates rapidly as flow traverses the Mancos Shale. The shale lithology typically has low permeability, is easily eroded and contains large quantities of soluable salts that are major contributors to poor water quality. Depending upon the duration of contact, water quality degrades downstream to where Total Dissolved Solids (TDS) levels of 4,000 milligrams per liter (mg/l) are not uncommon. The predominant ion leached from the Mancos Shale is sulfate (SO_4) with values over 1,000 mg/l common in the lower reaches of the Price River.

Ground water is present in all lithostratigraphic units within the Wasatch Plateau Coal Field. Ground water occurs under localized conditions that often form a system of "perched" aquifers and associated springs and/or seeps. Significant localized ground-water resources are associated with the North Horn Formation and Price River Formation. The U.S. Geological Survey has identified and formally designated the Star Point-Blackhawk aquifer as the only regional ground-water resource occurring in the Wasatch Plateau Coal Field (Danielson, et al., 1981 and Lines, 1984).

II. CUMULATIVE IMPACT AREA (CIA)

Figure 2 delineates the CIA for current and projected mining in the Gentry Mountain area. The CIA encompasses approximately 112 square miles and includes Gentry Mountain, Wild Cattle Ridge and Star Point. The western and northern CIA boundaries are designated by drainages and drainage divides, whereas the southern and eastern boundaries are defined by T16S/T17S and R8E/R9E SLBM, respectively.

III. SCOPE OF MINING

STAR POINT MINES (PLATEAU MINING COMPANY)

The Plateau Mining Company permit area encompasses approximately 7,000 acres. There are three federal coal leases that are designated by the Bureau of Land Management as "Logical Mining Units" (LMUs): U-13097, SL-031286, and U-037045.

Mining operations began in 1916 when the Wattis Brothers and Mr. Browning bought 160 acres from the United States and developed the property for coal production. Coal was shipped in the autumn of 1917 when the railroad was completed, to the town of Wattis. The Lion Coal Company bought the coal interests in 1919. In 1967 Plateau Limited opened a new mine in the Hiawatha Seam. In 1971 United Nuclear purchased the mine and in July 1980 Plateau Mining Company bought the properties.

Historically, the Star Point #2 Mine (where mining has ceased) developed coal resources in the Hiawatha, Third, and Wattis seams by the room and pillar technique. During the permit term of 1987-1992, mining will occur in the Wattis and Third seams and development work is projected for the Hiawatha seam in the Star Point #1 Mine. Subsequent permit terms will involve further mining in all three of the coal seams through the year 2010. There will be room and pillar mining and longwall mining in the Wattis and Third seams and longwall mining in the Hiawatha seam.

There are certain areas where the cumulative effects of multiple seam mining will be experienced. The area of T15S R7E, Section 12, will have combined subsidence effects, and potentially, Section 18 of T15S R8E.

HIAWATHA MINES COMPLEX (U.S. FUELS COMPANY)

The Hiawatha Mines Complex permit area encompasses about 12,000 acres and is located adjacent to the Plateau Mining Company permit area. The Federal coal leases currently designated as LMUs are SL-025431 and U-026583. A large portion of the remainder of the coal is owned by U.S. Fuels. Coal is projected to be mined until the year 2014.

The Hiawatha Mines Complex is a consolidation of the original King, Hiawatha, Black Hawk, and Mohrland coal mines which began operating in the early 1900's. U.S. Fuels Company was organized in 1915 and began operating in 1916, when it took over the properties of the Consolidation Fuel Company, Castle Valley Coal Company, and Black Hawk Coal Company, all of which were located within the current permit boundary.

Mining has occurred throughout large portions of the permit area by the room and pillar technique: King 4 (A & B Seams), King 5 (B Seam), King 6 (A & Hiawatha Seams), King 7 (Hiawatha Seam), and King 8 (Upper Seam). Future longwall mining will be undertaken in the King 5 (A Seam) and King 8 (Upper Seam).

BEAR CANYON AND TRAIL CANYON MINES (CO-OP MINING COMPANY)

Co-Op Mining Company owns two mines located south of the Plateau Mining Company and Hiawatha Mines Complex permit areas.

The Bear Canyon Mine encompasses 991 acres. Mining during the first five-year permit term will occur in the Bear Canyon coal seam and thereafter, in the Hiawatha seam. There are two federal coal leases designated as LMUs at the Bear Canyon Mine, U-024316 and U-024318. Production will be from room and pillar mining methods with secondary pillaring.

The Trail Canyon Mine, located immediately west of the Bear Canyon property, has been operated by Co-Op Mining Company since 1938. Production to date has been from the Bear Canyon coal seam. The Trail Canyon Mine was declared suspended during 1983 and will be reclaimed.

IV. STUDY AREA

GEOLOGY

The Gentry Mountain CIA is characterized by cliffs, narrow canyons and pediments. Stratigraphic units outcropping within the area include, from oldest to youngest, the Mancos Shale, Starpoint Sandstone, Blackhawk Formation, Castlegate Sandstone, Price River Formation, North Horn Formation, Flagstaff Formation and Quarternary deposits. Lithologic descriptions and unit thicknesses are given in Figure 3.

Rocks in the study area strike northwest and dip approximately three degrees to the southeast. Four major normal faults or fault zones (Pleasant Valley Fault, Trail Canyon Fault, unnamed fault, Bear Canyon Fault) trend north in the western portion of the CIA (Figure 4). Displacements range from several feet to approximately 800 feet.

HYDROLOGIC RESOURCES

Ground water

The ground-water regime within the CIA is dependent upon climatic and geologic parameters that establish systems of recharge, movement and discharge.

Snowmelt at higher elevations provides most of the ground-water recharge, particularly where permeable lithologies such as fractured or solution limestone are exposed at the surface. Vertical migration of ground water occurs through permeable rock units and/or along zones of faulting and fracturing. Lateral migration initiates

System	Series	Stratigraphic Unit	Thickness (feet)	Lithology and Water-Bearing Characteristics
Quarternary	Holocene and Pleistocene	Quarternary deposits	0-100	Alluvial and colluvium; clay, silt, sand, gravel, and boulders; yields water to springs that may cease to flow in late summer.
Tertiary	Paleocene	North Horn Formation	300 ±	Varigated shale and mudstone with interbeds of tan-to-gray sandstone; all of fluvial and lacustrine origin; yields water to springs.
Cretaceous	Upper Cretaceous	Price River Formation	200-250	Gray-to-brown, fine-to-coarse, and conglomeratic fluvial sandstone with thin beds of gray shale; yields water to springs locally.
		Castlegate Sandstone	150-200	Tan-to-brown fluvial sandstone and conglomerate; forms cliffs in most exposures; yields water to springs locally.
		Blackhawk Formation	1000 ±	Tan-to-gray discontinuous sandstone and gray carbonaceous shales with coal beds; all of marginal marine and paludal origin; locally scour-and-fill deposits of fluvial sandstone within less permeable sediments; yields water to springs and coal mines, mainly where fractured or jointed.
		Star Point Sandstone	350-450	Light-gray, white, massive, and thin beaded sandstone, grading downward from a massive cliff-forming unit at the top to thin interbedded sandstone and shale at the base; all of marginal marine and marine origin; yields water to springs and mines where fractured and jointed.
		Mancos Shale	1000 ±	Dark-gray marine shale with thin, discontinuous layers of gray limestone and sandstone; yields water to springs locally.

Figure 3. Stratigraphy of the Gentry Mountain Area (modified from Plateau Mining Company PAP, 1986, and Danielson, et al., 1981).

when ground water encounters impermeable rocks and continues until either the land surface is intersected (and spring discharge occurs) or other permeable lithologies or zones are encountered that allow further vertical flow.

The Star Point Sandstone and lower portion of the Blackhawk Formation, Castlegate Sandstone, Price River Formation, North Horn Formation, Flagstaff Limestone, and Quarternary deposits are potential reservoirs or conduits for ground water in the CIA. Reservoir lithologies are predominantly sandstone and limestone. Sandstone reservoirs occur as channel and overbank, lenticular and tabular deposits, whereas limestone reservoirs have developed through solution processes and fracturing. Shale, siltstone and cemented sandstone beds act as aquacludes to impede ground-water movement. The Mancos Shale is considered a regional aquaclude that delimits downward flow within the CIA. Localized aquacludes include relatively thin, impermeable lithologies occurring within the stratigraphic section above the Star Point Sandstone.

The Star Point-Blackhawk aquifer is present and represents the only identified regional ground-water resource in the study area (Danielson, et al., 1981). Ground water associated with the Price River Formation and North Horn Formation may be characterized as occurring within an extensive "perched" aquifer zone and represents a significant hydrologic resource.

Faults and fractures act as effective conduits for ground water and allow unsaturated downward flow. Springs having significant discharges (10 gpm or greater) are most commonly located in proximity to major north-south trending fault or fracture zones (Figure 4). In particular, Bear Canyon Fault appears to act as a significant conduit for ground water. Mine workings contact with the Bear Canyon Fault at the 10th West Section in U.S. Fuels' King IV Mine has resulted in a sustained inflow of 900 to 1,000 gpm.

Other encounters with the Bear Canyon Fault in Plateau Mining Company's Star Point No. 1 Mine resulted in an initial high inflow rate that subsequently diminished. Three municipal wells (Huntington) have been developed adjacent to the Trail Canyon Fault near the junction of Wild Cattle Hollow and Gentry Hollow (Figure 4).

Data from seven boreholes located within and adjacent to the Star Point Mines permit area indicate ground water associated with the regional aquifer moves toward the south (Figure 4).

Approximately 325 seeps and springs occur within the CIA. Total spring discharge exceeds 1500 gpm. One hundred eighty-nine springs discharge from the North Horn Formation and Price River Formation (1,200 gpm); 37 springs discharge from the Castlegate Sandstone (80 gpm); 53 springs discharge from the Blackhawk

Formation and Star Point Sandstone (200 gpm); and eight springs discharge from the Mancos Shale (40 gpm). Analyses from spring samples indicate water quality progressively decreases from the North Horn Formation to the Mancos Shale.

Mine inflow is estimated to be 134 gpm in the Star Point Mines, 950 gpm in the Hiawatha Mines Complex, and less than 50 gpm in the Trail Canyon Mine and Bear Canyon Mine. The majority of mine inflow (80 percent) is from faults and fractures with a lesser amount from paleochannels and wall weeps. Mine inflow is discharged to Mud Water Canyon at Star Point Mines and to Cedar Creek and Miller Creek at the Hiawatha Mines Complex. Mine inflow is not discharged at Bear Canyon Mine or Trail Canyon Mine. Mine water within the CIA represents ground-water depletion from storage in the Blackhawk Formation and Star Point Sandstone and the interception of flow along faults/fractures.

Surface Water

The CIA has been divided into six major drainage basins representing seventeen sub-drainage areas. The CIA encompasses drainage to both the San Rafael and Price River Basins (see Figure 5 and Table 1).

1. Serviceberry Creek Drainage

The Serviceberry Creek Drainage (1) includes the majority of disturbed area associated with the Plateau Mine. The mine exists in the headwaters of this creek drainage area of 6,135 acres. The average gradient of the creek within the CIA is 21 percent. Serviceberry Creek (1) is ephemeral within the CIA and eventually joins Miller Creek (16), east of the CIA, which is a perennial creek.

Vegetation communities in this drainage system include Douglas Fir-White Fir, Aspen, Mountain Brush, Sagebrush, including both Black sage and Big sage associations, Mixed Grass - Forb communities, and Pinyon - Juniper Woodlands. Riparian communities are generally small and may be dominated by willows, River birch or an occasional Cottonwood. Desert Shrub communities, particularly Shadscale, occupy the lowest elevations in the eastern section of the drainage system.

Mining has been confined to the extreme upper reaches of the watershed. The approximately 330 acres of surface disturbance associated with the surface facilities of the Plateau Mine has also been confined to the upper reaches of this watershed. All of Plateau's surface disturbance is treated by maintained sediment controls.

2, 3. Mud Water Canyon Drainage

Approximately 2978 acres drains Mud Water (2) and Los Angeles Canyon (2) to join 7080 acres draining Seely, Corner, and First Water canyons (3) to form Gordon Creek of the Price River Basin. The average gradient in the headwaters of these drainages is 19 percent. Mining has occurred within the extreme headwater reaches of Mud Water (2), Los Angeles (2), and Seely canyons (3), and the South Fork of Corner Canyon (3). Presently, Mud Water, Seely and the South Fork of Corner Canyon are perennial in their lower reaches, sustained by high elevation spring flow and mine water discharge (Mud Water Canyon).

Vegetation communities of the Mud Water Canyon Drainage area include Spruce-Fir, Douglas Fir-White Fir, Aspen, Mountain Brush, Sagebrush, including both Big sage and Black sage associations, Mixed Grass - Forb communities and shrub and grass-forb dominated riparian communities on the headwater streams.

Mining has not occurred beneath any stream channels, but has been restricted to the ridges separating the drainages.

4, 5, 6, 7 & 8 Gentry Ridge Drainage

Approximately 7,777 acres drain Wild Cattle Hollow (6) and Gentry Hollow (7) to form Tie Fork Canyon (8) tributary to Huntington Creek. Approximately 5516 acres drains areas directly tributary to Huntington Creek on Nuck Woodward Canyon (4). The average gradient of Gentry (7) and Wild Cattle Hollow (6) is 13 percent. Tie Fork Canyon's gradient is 44 percent. Miscellaneous side tributaries to Huntington Creek (Pole Canyon, McElprang Canyon, Vicks Canyon, Grange Hole, Biddlecome Hollow) (5) have average gradients of 40-50 percent.

All of the ephemeral drainages are not within the range of current underground mining plans. Portions of the Gentry Hollow (7) and Wild Cattle Hollow (6) drainage areas will be mined under within current mining sequences. Portions of the Gentry Hollow drainage area have been mined under by the Hiawatha Mine. Wild Cattle Hollow's main channel will not be mined under but longwall panels of the current Plateau Mine sequence will abut the channel as the mine progresses in a southwesterly direction. Both Gentry Hollow and Wild Cattle Hollow are designated perennial creeks on the U.S. Geological Survey quadrangle map.

Vegetation communities of the Gentry Ridge Drainage area include Spruce-Fir, Douglas Fir-White Fir, Aspen, Mountain Brush, Sagebrush, including both Big sage and Black sage associations, Mixed Grass - Forb communities and a variety of riparian communities.

The latter range from Cottonwood dominated associations along Huntington Creek to narrow bands of dense fir in the bottoms of steep canyons.

9, 10, 11, 12 & 13 Bear Creek - Trail Creek Drainage

Approximately 8,620 acres of drainage contribute to Trail Canyon (9), Bear Canyon (10), and three miscellaneous tributaries to Huntington Creek (11,12,13). The average gradient of Trail and Bear Canyon is approximately 20-25 percent. The average gradient of the miscellaneous tributaries ranges from 40 to 70 percent.

Bear Creek (10) is characterized by steep gradients, narrow canyons, and large sediment loads (28,092 mg/l Total Suspended Sediments (TSS) measured during a major storm event). Trail Creek (9) is characterized by steep gradients, narrow canyons, and good water quality. Mining occurs above Trail Creek.

About 10 acres of mine surface disturbance occurs in both Bear and Trail canyons. An additional 3 acres are associated with the living quarters and surface facilities of Co-Op Mining Company. The Trail Canyon Mine is currently in the process of being permitted for reclamation. No future disturbance is planned for either mine, other than reclamation of the Trail Canyon site.

Vegetation communities in this drainage system include Spruce-Fir, Douglas Fir-White Fir, Aspen, Mountain Brush, Sagebrush, dominated by Black sage associations, Mixed Grass - Forb communities with Salina wildrye and Bluebunch wheatgrass dominants, Pinyon - Juniper Woodlands and a variety of riparian communities including the Huntington and Trail Creek Narrowleaf Cottonwood and willow associations.

(14, 15) Cedar Creek - Fish Creek Drainage

Approximately 19,289 acres drain both the Cedar Creek (15) and Fish Creek (14) drainage areas. The average gradient of Fish Creek is 19 percent and the average gradient of Cedar Creek is 13 percent. Both Cedar Creek and Fish Creek are ephemeral drainages with Cedar Creek exhibiting perennial characteristics in certain reaches due to mine water discharge and spring flow. The Hiawatha Mines Complex permit area encompasses portions of the Right and Left of Cedar Creek. The Right Fork is ephemeral and the Left Fork exhibits perennial characteristics in certain reaches.

Vegetation communities in this drainage system include Spruce-Fir, Douglas Fir-White Fir, Aspen, Mountain Brush, Sagebrush, including both Black sage and Big sage associations, Mixed Grass - Forb communities, Pinyon - Juniper Woodlands, riparian communities

which include Narrowleaf cottonwood, Sandbar willow (Salix exigua) and River birch (Betula occidentallis), and Desert Shrub communities at the lowest elevations in the southeastern section of the drainage system.

Surface facilities associated with the Mohrland Mine of U.S. Fuels Company are adjacent to Cedar Creek, and a major mine discharge of 500-1000 gpm occurs at the low point of the Mohrland Mine. Surface facilities disturb less than 25 acres of this drainage area.

(16, 17) Miller Creek - Sand Wash Drainage

Miller Creek (16) and Sand Wash (17) encompass 18,053 acres of the CIA drainage area. Miller Creek has an average gradient of 15 percent and the Sand Wash has an average gradient of 17 percent. The upper reaches of Sand Wash and the Right and Left Forks of Miller Creek contain approximately 350 acres of the surface facilities disturbance of the Hiawatha Mines. These include permanent diversion of a portion of Miller Creek to accommodate the coal processing waste pile. Miller Creek has been mined under by the Hiawatha Mines Complex. Plateau Mining Company will mine under the upper reaches of the North Fork of the Right Fork of (NFRF) Miller Creek. NFRF is perennial and therefore, the North Fork of Miller Creek is also a perennial stream, whereas the Middle Fork and Left Fork of Miller Creek are ephemeral.

Vegetation communities in this drainage system include Spruce-Fir, Douglas Fir-White Fir, Aspen, Mountain Brush, Sagebrush, including both Black sage and Big sage associations, Mixed Grass - Forb communities, and Pinyon - Juniper Woodlands. Riparian communities are generally narrow bands at the edge of intermittent and perennial streams or springs and may be dominated by willows, River birch or an occasional Cottonwood. Riparian zones of the headwaters may be distinguished from the uplands primarily by density and vigor of vegetation. Desert Shrub communities, particularly Shadscale with Slender wheatgrass, occupy the lowest elevations in the southeastern section of the drainage system.

V. POTENTIAL IMPACTS

GROUND WATER

Dewatering and subsidence related to mining have the greatest potential for impacting ground-water resources in the CIA. The impact of changes in vegetation on ground-water recharge should be minimal since mining will disturb less than 1000 acres of the 70,000 acre CIA. Disturbance of phreatophytic vegetation (primarily cottonwoods and some willow) is negligible. The impacts of coal waste disposal on water quality are discussed in the surface water section.

Dewatering. The volume of water being discharged from mines within the CIA (1,200 gpm) approximates the amount of water that is currently being withdrawn from the ground-water system. The current and projected withdrawal values may be totalled and compared to estimates of ground-water discharge and recharge within the CIA and thereby, allow an assessment of cumulative dewatering impacts.

Approximately 37,000 acres within the CIA overlie the coal resource and represent a potential recharge area (Figure 6). Average annual precipitation is approximately 20 inches over the potential recharge area and hence, the total annual precipitation over the outcropping recharge area is 64,000 acre-feet.

Table 2A gives estimates for the total annual discharge of springs from water-bearing rock units that overlie the coal resource. Discharge also occurs directly to perennial streams where channels intersect ground water within the Blackhawk Formation and Star Point Sandstone. Table 1 identifies the ten perennial streams that occur within the CIA. Nine of these streams intersect the lower Blackhawk Formation and Star Point Sandstone. A study conducted along the NFRF Miller Creek (16) indicates streamflow substantially increased (from 8 to 115 gpm) as a result of discharge from the Blackhawk Formation and Star Point Sandstone (Plateau Mining Company PAP, page 783-40). The results from the Miller Creek study suggest the other eight perennial streams that traverse the regional aquifer also sustain ground-water discharge (or base flow recharge). Accordingly, total base flow recharge to perennial streams within the CIA is estimated to be 900 gpm.

Table 2A. Precipitation and Spring Discharge Estimates for Areas above the Coal Resource, Gentry Mountain, CIA.

Lithologic Unit(s)	Outcrop Area (Acres)	Normal Annual Precipitation on Outcrop (Acre-Feet)	Total Annual Discharge of Springs	
			Acre Feet	Percent of Normal Annual Precipitation on Outcrop
Undivided Flagstaff Limestone, North Horn Formation, Price River Formation	19,500	34,125	1,900	.05
Castlegate Sandstone	3,000	5,250	129	.02
Blackhawk Formation, Star Point Sandstone	14,900	26,075	322	.01
TOTAL	37,400	64,450	2,351	.04

Table 2B. Estimated Ground-water Discharges to Perennial Streams and Wells and from Mines, Gentry Mountain, CIA.

Discharge to Perennial Streams (9 total)	900 gpm
Discharge to Huntington Municipal Wells (3 total)	100 gpm
Discharge from mines (2 total)	1,200 gpm
TOTAL	2,200 gpm

Table 2C. Approximate Atmospheric Discharges from Active Mines, Gentry Mountain, CIA.

Mine(s)	Ventilation Rate (cfm)	Approximate Discharge Rate (gpm)
Bear Canyon	150,000	10
Star Point Mines	650,000	44
Hiawatha Mine Complex	350,000	24
TOTAL	1,150,000	88 gpm

Table 2B lists estimated ground-water discharges to perennial streams and wells and from mines. Table 2C approximates the amount of ground water discharged to the atmosphere by mine ventilation systems. Psychrometric formulas were utilized to derive ventilation discharge values and extrapolated to the mine elevations. Average relative humidity data from the Central Weather Station in the Manti-LaSal National Forest were also used in the psychrometric calculations.

Total ground-water discharge within the CIA (summed from Tables 2A, 2B, and 2C) is currently about 3,800 gpm, where 63 percent (2,400 gpm) of the total represents natural discharge to stream and springs and 34 percent (1,500 gpm) results from mining activities. The remaining 3 percent (100 gpm) may be attributed to well discharge.

Lines (1985) investigated the Trail Mountain area and indicated regional aquifer inflow to mines is derived from aquifer storage (80 percent) and aquifer discharge (20 percent). Extrapolating these percentages to the Gentry Mountain CIA (16 miles) allows depletion, due to present mining activities (7,200 acres mined) of regional aquifer storage and discharge to be estimated at 360 and 90 gpm, respectively. Assuming future mining encompasses 3,300 acres and will continue to encounter steady-state inflow from the regional aquifer, then depletion would increase to 471 gpm for storage and 118 gpm for discharge.

The Hiawatha Mines Complex has encountered major ground-water inflow associated with the Bear Canyon Fault. Diversion of flow from this conduit has altered and will continue to alter (deplete up to 1,000 gpm) recharge to the regional aquifer and, possibly, surface discharge in the Gentry Hollow area. Future development in the Hiawatha Mines Complex will retain a barrier pillar adjacent to the Bear Canyon Fault. Plateau Mining Company has proposed to access coal reserves beneath Gentry Ridge by driving a rock tunnel across the Bear Canyon Graben and associated western (unnamed) and eastern (Bear Canyon) boundary faults. Previous encounters with the Bear Canyon Fault (eastern) in the Star Point Mines have resulted in limited inflow. Data are not available to assess whether the western (unnamed) boundary fault acts as a significant groundwater conduit. A pressure grouting program will be initiated if the tunnel encounters inflow(s) that exceed 50 gpm for more than three months. Thus, tunnel development may result in a maximum diversion of flow from the two Bear Canyon boundary faults that will not exceed a total of 100 gpm.

Future mining-induced dewatering is projected to encompass 141 gpm and hence, the cumulative dewatering total would be approximately 1,650 gpm. Following the cessation of mining, the discharge of ground water to Mud Water Canyon (2), Cedar Creek (15), Miller Creek (16), and the atmosphere, will cease and workings will begin to flood.

The impact associated with the reduction in surface flow is considered temporary. Mine flooding will conceivably recharge regional aquifer storage and re-establish the natural ground-water conduit system that was operational prior to mining. The maximum time span required for complete mine flooding may be derived by assuming the final workings (10,500 acres) will remain open (average 5 foot height) and caving will not occur. Accordingly, for workings that experience inflow (Hiawatha Mines Complex, Bear Canyon Mine, Trail Canyon Mine, Star Point Mines) an upper limit of 20 years may be derived for complete mine flooding. It should be noted that complete flooding will, undoubtedly, never be achieved because the hydraulic head generated as flooding proceeds will increase until the hydraulic properties of the roof, floor and rib are exceeded and flow within the rocks initiates.

Subsidence. Subsidence impacts are largely related to extension and expansion of the existing fracture system and upward propagation of new fractures. Inasmuch as vertical and lateral migration of water appears to be partially controlled by fracture conduits, readjustment or realignment in the conduit system will inevitably produce changes in the configuration of ground-water flow. Potential changes include increased flow rates along fractures that have "opened", and diverting flow along new fractures or within permeable lithologies. Subsurface flow diversion may

cause the depletion of water in certain localized aquifers and potential loss of flow to springs that will be undermined. Increased flow rates along fractures would reduce ground-water residence time and potentially improve water quality.

Mining will occur beneath approximately 80 springs that have a combined flow in excess of 400 gpm. Overburden thickness averages more than 1000 feet beneath areas where springs are located. Diversion of spring flow is considered to be at overall low risk.

Mining will occur beneath a portion of NFRF Miller Creek where overburden thickness ranges from 500 to 825 feet. The risk for development of tension cracks within the stream channel is considered to be moderately high.

SURFACE WATER

The cumulative impacts associated with mining within the CIA will be summarized by individually discussing impacts associated with the Star Point Mines, Hiawatha Mines Complex and Bear Canyon Mine and Trail Canyon Mine. Creeks or drainage areas which are referenced by (#) or discussed, are shown on Figure 5, Surface Water Drainage Map.

Star Point Mines. The Plateau Mining Company's surface facilities are primarily found in Sage Brush Canyon tributary to Serviceberry Canyon (1). Sage Brush Canyon and Serviceberry Canyon flow only in response to storm events.

The coal processing waste pile (Figure 4) at the Star Point Mines is at 7,400 foot elevation, annual precipitation is 12 inches, and the vegetation surrounding the waste pile are salt desert shrub and pinyon-juniper-sagebrush communities. The waste pile is not adjacent to any perennial streams or known ground-water resources. The mine presently produces 1.2 million tons of coal annually with a capacity of four million tons. Twenty percent of the material mined is processing waste.

Table 64 of the PAP indicates waste materials are sandy or coarse in nature, with a high organic matter content and have a relatively high cation exchange capacity for coarse textured materials. To date, six waste samples have been analyzed for acid-base potential. One sample had a potential to be acid-forming. The other samples tested had excess base, which should be sufficient to neutralize drainage or seepage from areas which could potentially form acid. The alluvium which underlies the coal waste is calcareous and will also neutralize any acid drainage from the refuse.

Selenium was the only parameter tested for in the waste which had concentrations above suspect levels. This suspect concentration is .1mg/kg and is for toxicities which may occur to animals feeding on vegetation grown on this material. The suspect value which may be detrimental to water quality is not known. Selenium in the coal waste should not be a concern to water quality because drainage from the pile should be minor. The waste, although hauled to the pile in a wet form is not a slurry, and most of the water associated with the waste evaporates in the dry climate of the area.

Data given in Table 64 indicate waste could contribute slightly to increasing TDS levels in surface or ground water. The electrical conductivities of four samples were saline (greater than 4mmhos/cm^2).

Although most water associated with the waste will evaporate, some water will inevitably percolate through the pile and underlying alluvial deposits. Eventually, seepage would contact the Mancos Shale and further degradation of water quality would take place. Accordingly, drainage from the waste pile would have little down gradient effect.

All surface water drainage is treated by running disturbed area drainage through sediment ponds. There are no water rights within or adjacent to the mine plan area that could be impacted by operation of surface treatment facilities. Runoff conveyance systems and treatment facilities have been designed to minimize the amount of area that is tributary to the sediment ponds. The quantity of runoff detained by sediment ponds is minimized by diversion of undisturbed waters (PAP, page 784-62).

The Plateau treatment facilities have operated in compliance with all NPDES discharge limitations except for TDS exceedence at the Mud Water Canyon Mine Water and Sediment Pond No. 8. Requests for modifications to the limits currently in effect has been made for these facilities but not yet granted by State Health and EPA. The current TDS limitation for the Mud Water Canyon (2) discharge is 650 mg/l TDS. The request to raise this limit to 1,450 mg/l (an average of the naturally occurring concentration of the Mud Water Canyon stream) has been made. The average annual flow for the period of 4/85 through 3/86 is approximately 129 gpm to Mud Water Canyon, associated with the Mine Water Discharge (PAP, page 783-46). Of 15 TDS samples taken from the Mud Water Canyon discharge in 1985, the TDS concentration varied from a low of 598 mg/l taken in late May to a high of 772 mg/l taken in late October. The sample mean was 689 mg/l with a standard deviation of 53 mg/l. TDS effluent concentrations at Pond No. 8 have been recorded as high as 3,913 mg/l on March 10, 1986. An undisturbed area sample taken on the same day near Pond No. 8 discharge was 6,024.0 mg/l. Plateau Mining Company is in the process of monitoring inflows to Pond No. 8 for a one-year period (PAP, page 784-79).

The effects of the discharge associated with Plateau Mining Company's mine water result in approximately 485.62 Tons/Yr of dissolved solids being added to the surface water system tributary to the Price River and to the Colorado River. This is based on average data for the period of 1/22/86 through 12/18/86 taken from the mine water discharge point.

Of the potential discharge locations (Treatment Facility No. 1, Ponds 2 through 8, and Mud Water Canyon discharge) only five facilities have available water quality data. These include discharges from Ponds 4, 5, 6, and 8, and Mud Water Canyon discharge.

Summary of Water Quality Data

Mean Values	Total Dissolved Solids (mg/l)	Total Suspended Solids (mg/l)	Period
Pond No. 4	1531.7	38.5	10/83-9/85
Pond No. 5	791.1	33.0	4/83-10/85
Pond No. 6	1037.2	18.5	4/83-9/85
Pond No. 8	1846.3	25.0	7/85

All four of the facilities drain to an ephemeral drainage; Serviceberry Creek (1), and then to the Price River, tributary to the Colorado River. Background TDS values for the lower parts of this drainage have been measured at 7,300 mg/l. The discharges from the ponds listed above are less than background TDS measured at Surface Water Station 10-1 in Sage Brush Canyon (1) downstream of the ponds. The average value for TDS at this station in 1985 was 1,932 mg/l. The values ranged from 599 mg/l on 6/13/85 to 3,168 mg/l on 6/27/85. The lowest TDS value is reflective of runoff occurring during a snowmelt period. Figure 14 in the Plateau PAP shows examples of this snowmelt dilution effect. The TSS data given in the above table indicates that Pond #4, 5, 6, and 8 have operated in compliance with the 70 mg/l limit identified in their NPDES permit.

Plateau Mining Company has committed to providing an adequate surface water reclamation plan for the Star Point Mine by October 1, 1987. This plan will identify the necessary measures to provide for contemporaneous reclamation of the disturbed areas preventing impacts to the quality and quantity of surface water. In addition, the use of adequate sediment controls mitigates the overall effects of mining on the surface water system. The effects of discharging mine water into the Mud Water Canyon drainage will be determined by maintaining an effective monitoring system to determine if any adverse impacts to the environment would occur and could be prevented.

As mentioned in the previous section on subsidence, the Star Point Mines will mine a portion of the headwaters of the NFRF Miller Creek (16) and the risk for development of tension cracks within the stream channel is considered to be moderately high. Because of this potential impact, the Plateau Mining Company will be required to develop a sophisticated monitoring system to detect any changes in the hydrologic regime of this stream channel during and after mining. This monitoring system will include identification of gaining and losing reaches through stream surveys and the installation of a continuous monitoring system directly below the area of potential impact.

Plateau Mining Company will use one of the following engineering methods to mitigate any change to the hydrologic regime of the NFRF Miller Creek if an impact is detected through monitoring.

1. Seal the cracks in the stream channel with bentonite or other environmentally safe materials.
2. If cracks are too large, rags or some other material will be hand placed in them at a depth of approximately two feet to provide a stop point for bentonite pellets.
3. Concrete or epoxy mixtures.
4. Surface stabilization accomplished by hand tools.

Implementation of one of these engineering methods will occur following the diversion of surface flow around the impact area by culvert, flexible fabric tubing or plastic liners and an assessment and approval of the appropriate engineering method to mitigate impact to the stream channel.

Hiawatha Mines Complex. In the vicinity of the Hiawatha Mines Complex, the CIA is dissected by two drainage systems, Miller Creek (16) and Cedar Creek (15). The drainage area for Miller Creek, above the confluence with Serviceberry Creek (1), is about 29,700 acres. Streamflow in Miller Creek is perennial from the headwaters of the NFRF Miller Creek. Cedar Creek is also a perennial stream with a drainage area of approximately 5,300 acres. Cedar Creek receives approximately 800 gpm of discharge from the old Mohrland Mine portal located south of the Hiawatha Mines Complex.

Mine water is used by U.S. Fuels Company for fire prevention and dust suppression in King 4 Mine and by the town of Hiawatha for culinary purposes. These uses are covered by water rights claimed by U.S. Fuels Company for 4,758 gpm (3,746 gpm in surface water rights and 1,012 gpm in ground-water rights). Mine water discharge from the Mohrland Mine portal is regulated under the National Pollutant Discharge Elimination System (NPDES) permit UT-0023094.

Water is piped to the town of Hiawatha (20 gpm) and coal preparation facility (545 gpm) from the mines. The Left fork of the North Fork of Miller Creek is diverted into an underground water storage reservoir that provides water for the town of Hiawatha. This water, together with the water intercepted in the mine, is stored in the mined-out section of the abandoned Hiawatha No. 2 Mine. Maximum storage volume in this underground reservoir is about 120 million gallons (368 acre-feet). Approximately 60 million gallons (184 acre-feet) are normally stored in this reservoir.

Water in excess of that used in the mining operation is routed south by gravity to the Mohrland Mine Portal where it is collected and piped to the town of Hiawatha. Excess water is discharged into Cedar Creek (15). At the town of Hiawatha there are four water storage tanks with a combined capacity of 245,000 gallons (0.75 acre-feet). Water is treated and then stored in the 40,000 gallon (0.1 acre-feet) tank 5A near the preparation plant.

Coal processing waste piles (Figure 4) at Hiawatha Mines Complex are at 7,200 feet elevation and receive 12 inches of annual precipitation. The vegetation in the refuse area is a mixed salt desert shrub community. The waste piles have been in existence since the 1940's, encompass approximately 133 acres and include 4 slurry ponds. Table XIII-11 of the PAP indicates coal waste samples are above suspect levels for selenium with concentrations ranging from 1.93 to .91 mg/kg. However, the contribution of selenium to ground or surface waters by the coal waste should have minimal effects on water quality. Any seepage from the slurry ponds would flow to Miller Creek because of its proximity and the gradient to the creek. The amount of seepage compared to the flow of Miller Creek would dilute any diletarious concentration of selenium in seepage waters. The average flow of Miller Creek is 428 gpm.

Other parameters listed in Table VIII-11 of the PAP were within acceptable limits, except for boron and iron in one sample from slurry pond 3 and 4, respectively. Boron should not pose a problem since this element is of concern in irrigated areas where toxicities can occur in crops. The water quality of adjacent Miller Creek has a high inherent salinity hazard for irrigation waters and should not be used for irrigation without intensive management. Again, the flow of Miller Creek would dilute any boron concentration in seepage water.

Iron is a product of pyrite weathering, and may indicate acid mine drainage. The pH of the sample with the high value was 7.35. At this pH, the material is still buffered and does not indicate acid-forming material. Iron at this pH is also not readily soluable, and therefore, iron should not pose a problem to receiving waters.

The coal waste was not analyzed for acid-base potential, but pH values indicate that the refuse is basic, with only one sample being neutral (pH 6.8). Existing water quality data from Miller Creek, which is adjacent to the waste pile, indicate there are no degrading effects from seepage of the coal waste piles or slurry ponds. Considering the time involved in oxidation of the waste, the calcareous nature of the soils and the buffering capacity of the water in Miller Creek, along with the alkalinity of the slurry pond water (PAP, page 81A), these factors should be great enough to neutralize any acid produced in the coal processing waste piles.

A comparison (PAP, page 81A) of slurry pond water and Miller Creek water sampled adjacent to the slurry ponds shows that the pond water is slightly higher in sulfates, iron, and TDS. Although the slurry water may degrade further with increased contact time with slurry sediments, any seepage should have little consequence on the water quality of Miller Creek. The natural quality of Miller Creek water is poor since it traverses the Mancos Shale. The contribution of salts into the Price River basin by the Mancos Shale has been well documented (Mundorff, 1972; Ponce, 1975; Laronne and Schumm, 1977).

Surface water at a higher elevation in the CIA has a low TDS concentration, usually less than 400 mg/l, and a low TSS concentration, usually less than 30 mg/l. Concentrations of dissolved sodium and chloride are usually less than 15 mg/l. The predominant dissolved chemical constituents are calcium and bicarbonate. Water quality during snowmelt runoff tends to be higher in calcium carbonate and water quality from ground-water discharge tends to have higher concentrations of magnesium and sulphate. Values of pH were fairly constant, ranging from 7.6 to 8.1.

The Utah State Board of Health has established water quality standards to protect against controllable pollution to beneficial use of water. For the Miller Creek basin (16), the pertinent water quality standards are for nongame fish (Class 3c) and irrigation of crops and stockwatering (Class 4) (Utah State Board of Health, 1978).

TDS levels of surface waters immediately below some of the active mine areas exceed the water quality standard for irrigation use, but the effects are mitigated by dilution from undisturbed surface waters. TDS concentrations in Miller Creek are within the water quality standards at the point that it flows out of the Hiawatha Mines Complex permit area; however, TDS concentrations increase about two-fold when comparing above-mining stations and below-mining stations.

Dissolved constituents continue to increase in Miller Creek as water flows across the Mancos Shale. At the junction of Miller Creek and Utah Highway 10 (about 10 miles east of the permit area), TDS concentrations average more than 3,200 mg/l, and the dominant dissolved chemical constituent is sulfate (Mundorff, 1972). The only parameter to exceed pertinent water quality standards is TDS.

The sodium adsorption ratio (SAR) for the area is low. For the headwater areas of the Miller Creek and Cedar Creek drainages, the SAR is less than 0.5. At the base of the Wasatch Plateau, the SAR values are usually between 0.8 and 2.0. On the Mancos Shale, the SAR values range between 1.0 and 4.0. Surface water derived from snowmelt flow usually has a lower SAR value, however, both sodium and SAR increase during the low flow period as streams traverse the Mancos Shale.

Both SAR and TDS combine to degrade irrigation water. All of the water in the study area exhibits a low sodium hazard for snowmelt flows, but Miller Creek at Utah Highway 10 shows a medium sodium hazard during low flow periods. This increase in TDS and SAR as streams cross the Mancos Shales is a natural nonpoint source of pollution.

TDS concentrations in surface water below the elevation of coal mining activities are higher than in areas above coal mining activities. TDS increases are associated with increases in sulfate, chloride, magnesium and sodium concentrations. Current TDS levels do not exceed any existing recommended water quality criteria for current water uses. Future mining will cause an increase in TDS concentration, but this level will also be below state and federal water quality criteria. TDS loads (i.e., concentration multiplied by flow rate) are approximately 900 tons per year from nonpoint sources associated with existing mining operations on Miller Creek. Because no new surface disturbances are proposed, the TDS load should not increase in the future. There is no current active surface mining operation on Cedar Creek, but an increase of 180 tons per year from nonpoint sources is projected in relation to future mining operations on Cedar Creek.

Water chemistry of surface waters in the CIA naturally change from a calcium carbonate type to a magnesium type as streams traverse the Blackhawk Formation and the Mancos Shale. The Mancos Shale has a significant impact on surface water quality. TDS concentrations of streams that interact the Mancos Shale area are as much as 100 times higher than TDS levels of streams that interact overlying lithologies within the CIA. Most of these increases are natural and are probably caused by rain and leaching within stream channels or ground water flowing through the formation leaching available salts from the marine shales, and discharging into the

surface waters. Impacts resulting from the surface facilities associated with mining in the CIA are overshadowed by the degradation of water quality from streams traversing the Mancos Shales.

Sulfate levels are presently below established water quality standards, and if projected estimates by the mine of sulfate increases are accurate, surface disturbances associated with the King 7 and 8 Mines will cause about a two-fold increase in sulfate concentrations. Projected sulfate concentrations will remain below water quality standards.

TSS concentrations are also higher downstream from surface facilities associated with mining. Most of the increased suspended sediment naturally settles out before Miller Creek or Cedar Creek leaves the permit area because of relatively flat stream gradients. In the Office of Surface Mining Technical Analysis a model was used to route the known water quantity and quality of Miller Creek (16) (at the town of Hiawatha) and of Serviceberry Creek (1) (near the town of Wattis) to the confluence of the two streams. According to the results of the model, the TDS concentration below the confluence of Serviceberry Creek and Miller Creek will exceed the water quality standard for irrigation use during the middle and late summer months. Most of the TDS concentration is caused by the Serviceberry Creek traversing the Mancos Shale, however.

Both concentrations of TSS and TDS are higher downstream than upstream of the mine site and can be attributed to both natural and mine-related causes. The Division considers the Mancos Shale as the major source for surface water contamination.

Bear Canyon Mine and Trail Canyon Mine. The Trail Canyon and Bear Canyon mines' surface facilities are primarily found in the Bear Creek-Trail Creek Drainage Areas (9, 10, 12). Both Trail Canyon and Bear Canyon are perennial streams which flow in response to storm events and maintain a base flow associated with perennial springs. The main concern in terms of water quality deterioration downstream is T.S.S. The TSS concentrations in Bear Creek (10) in 1984 varied from a high of 28,092 (mg/l) in May of 1984 to a low of 122 (mg/l) in September of 1984 with five monthly readings within the 1,000-2,000 mg/l range. The suspended sediment concentrations in Trail Creek (9) in 1984 varied from 1,400 mg/l in May of 1984 to a low of 1.0 mg/l in February of 1984 with seven monthly readings below 100 mg/l. These high TSS values are associated primarily with natural climatic and erosional processes, although a proportion may be attributed to removal of vegetation from roads and mine pads and normal mine operations, e.g., loading coal. Sediment controls do exist for all surface disturbances in both canyons. Therefore, the impact associated with 20 acres of mining disturbance in Trail and Bear canyons is minimized by surface controls (i.e., sediment ponds, diversion ditches, filter fences, dugout ponds, etc.).

VI. Summary

Mine operations within the CIA currently intercept regional aquifer (450 gpm) and fault conduit flow (1,050 gpm) at an approximate rate of 1,500 gpm. Of this total, approximately 630 gpm are consumptively lost to mine ventilation (80 gpm) and evaporation at coal preparation facilities (545 gpm). The remaining 870 gpm are discharged, without interbasin transfer of water, to streams.

Mine water discharges, with the exception of Star Point Mines, meet required effluent limitation.

Future mining operations are designed to avoid interception of fault conduit flow and accordingly, inflow from the regional aquifer is estimated to increase from 450 gpm to 591 gpm. Approximately 80 percent of the inflow will be derived from storage and 20 percent from discharge. Consumptive use is not anticipated to increase. Mine water discharge (1,350 gpm) and ventilation losses (300 gpm) will be discontinued upon cessation of mining. Concommitantly, flooding of abandoned workings will initiate. An upper limit of 20 years has been estimated for complete flooding of workings and re-establishment of the premining ground-water system.

Division of spring flow is considered to be at overall low risk. However, reduction in flow along the upper reach of the NFRF Miller Creek is considered to be at moderately high risk. A generalized mitigation plan has been proposed for minimizing mining-induced impacts to NFRF Miller Creek. Division approval of the method implemented to restore the stream channel will be contingent upon an assessment of the mining induced impacts.

Sediment control measures have been and will be designed and implemented to reduce and stabilize contamination of surface waters.

Following cessation of mining and coal processing, waste piles will be adequately covered with topsoil and all disturbed areas will be stabilized and revegetated to prevent surface water contamination.

Future development in the Wild Horse Ridge and Mohrland areas and/or the recommencement of mining at the Trail Canyon Mine may result in further dewatering of the ground-water system. Permitting of new development will require implementation of sediment control measures that minimize impacts to surface water.

The designs proposed for all anticipated mining operations within the CIA are herein determined to be consistent with preventing damage to the hydrologic balance outside the proposed mine plan areas.

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CHIA

MINE PLAN INFORMATION

Mine Name: Star Point Mines
State ID: ACT/007/006

Operator: Plateau Mining Company
County: Carbon

Controlled By: Cyprus Coal Company
Contact Person(s) Ben Grimes
Telephone: (801) 637-2875
Position: Sr. Environmental Engineer

New/Existing: Existing
Mining Method: Longwall/Room & Pillar

Federal Lease No(s): SL-031286, U-7949, U-37045, U-13097
Legal Description(s): See page 2 of permit

State Lease No(s): 22729
Legal Description(s): See page 1 and 2 of permit

Other Leases (Identify): GL-20903, 288 (state leases)
Legal Description(s): See page 1 and 2 of permit

Ownership Data:

Surface Resources (acres)	Existing Permit Area	(New Lands) Proposed Permit Area	Total Life of Mine Area
Federal	4680	5120	5120
State	640	640	640
Private	765	1285	1285
Other			
TOTAL	6085	7045	7045

Coal Ownership (acres):

Federal	4680	5120	5120
State	640	640	640
Private	765	1285	1285
Other (USA)			
TOTAL	6085	7045	7045

Coal Resource Data:	Total Reserves (1981)*	Total Recoverable (60%) Reserves (1981)
Federal	55,571,000	37,788,300 est.
State	7,217,000	4,078,000 est.
Private	9,382,000	7,211,000 est.
Other		
TOTAL	72,170,000 est.	49,077,300 est.

*Source: Original MRP

Recoverable Reserve Data	Name	Thickness	Depth
Seam	Wattis	4' - 8'	0 - 1500'
Seam	Third	5' - 15'	0 - 1600'
Seam	Hiawatha	2' - 7'	0 - 1700'
Seam			
Seam			
Seam			

Mine Life: 2010 (23 years)
Average Annual Production: 2-3 Million Tons Percent Recovery: 75% (Longwall)
(Room & Pillar) 55-60%
Date Projected Annual Rate Reached: Currently
Date Production Begins: Currently Date Production Ends: 2010
Reserves Recoverable By: (1) Surface Mining:
(2) Underground Mining: Room and Pillar & Longwall
Reserves Lost Through Management Decisions:
Coal Market: Steam Coal and Stoker Coal

Modifications That Have Been Approved:	Date:
See chronology in State Decision Package	

TECHNICAL ANALYSIS ADDENDUM
Plateau Mining Company
Star Point Mine
ACT/007/006
New Lands Application

August 7, 1987

The following sections are modified versions of the Star Point Mines Five-Year Renewal Technical Analysis. Sections have been added and/or modified to appropriately discuss the New Lands addition in conjunction with the Five-Year Renewal analysis.

The primary focus of the New Lands Technical Analysis is in Section 18, T15S, R8E, where longwall mining poses potential subsidence related impacts.

*UMC 782.15 Right of Entry and Operation Information-(JJW)

Applicant's Proposal

The application depicts five additional parcels of land to be added to the existing Star Point Mines permit area (PAP Map 71 as revised). Map 2, Surface Ownership, indicates that Bureau of Land Management public lands outside the coal lease are included in the permit boundary.

Compliance

Since no additional surface disturbance is proposed for the BLM land being included in the permit area adjacent to the existing surface facilities, the application can be approved. However, as outlined in an April 22, 1987 letter from the BLM, if any additional surface disturbance is undertaken on BLM lands, the appropriate rights-of-way, permits and/or leases must be obtained.

The applicant will be in compliance when the following stipulation is met.

Stipulation UMC 782.15-1-(JJW)

Plateau Mining Company shall amend the Permit Application Package (PAP) by October 31, 1987 to commit that prior to initiating additional surface disturbance within the permit area on lands administered by the Bureau of Land Management, the required rights-of-way and/or permit will be obtained from the BLM.

*UMC 817.45-.47 Hydrologic Balance: Sedimentation Ponds-(TM)

Existing Environment and Applicant's Proposal

Seven sediment ponds and one treatment facility have been constructed in conjunction with the runoff control plan and as on-site water pollution control facilities. These structures have been designed to contain the 10-year 24-hour design storm runoff event from disturbed areas and to remove excess suspended sediments picked up from the disturbed areas. They are temporary in nature and will be removed upon completion of the mining operations. No past, present, or future mining has, or will be, conducted beneath any existing sediment pond. One mine water discharge is located in Mud Water Canyon.

Sediment traps are used in various locations on the property. Sediment traps where they are used in conjunction with sediment ponds are not designed structures. They vary in size but are generally less than 3,000 square feet and an average depth of four feet. They are equipped with an overflow culvert or a spillway channel. When they become silted in, they are cleaned out with loaders or a backhoe to make them functional again (PAP, page 784-121).

The overall sediment control plan, including pond location, drainage area characteristics associated with each pond, and other required runoff facilities are illustrated in Map 42 and 43, Surface Water and Sedimentation Control Facilities, Maps A and B (page 784-118, PAP).

Design details for the one treatment facility is shown on Map 53. Sediment Pond design details for ponds 2 through 8 are illustrated on Maps 54 through 60. A stage capacity curve for Treatment Facility 1 is shown on Figure 28, Stage Capacity Curve for Treatment Facility No. 1. The stage capacity curves for the as-built ponds are presented on Figures 29 through 35, Stage Capacity Curve for Sediment Ponds 2 through 8.

Additional Design Details for Sediment Volume, Runoff Volume, Pond Detention, Spillway Capacity, Embankment Height and Width, Side Slopes, Anti-Seep Collars, Riprap Protection, and

Compactions are discussed on page 784-119 through 784-128 of the PAP. The adequacy of these design parameters will be discussed in the Compliance section.

Compliance

The applicant adequately describes the standard engineering practices used to design, construct, and certify all treatment facilities at Plateau (p. 784-117 and 784-118). All of the sedimentation ponds have been approved by the Division. The eight sedimentation ponds are classified as Treatment Facility No. 1 and Sedimentation Pond Nos. 2 through 8. Sedimentation Pond No. 1 was officially designated as Treatment Facility No. 1 by a letter from Dianne R. Nielson to PMC on July 19, 1984. Additionally, variances were granted for Sedimentation Ponds #3 and #5 for 817.46(r) (design and inspection during construction under the supervision of a registered professional engineer). As-built survey information was submitted for Ponds #3 and #5 with a certified stability analysis. The Division granted variances for these two ponds in a letter dated December 7, 1984.

Sedimentation ponds #4, #6, and #7 were certified on November 16, 1981. Sedimentation Pond #2 was certified on August 19, 1986. Sedimentation Pond #8 was certified and approved with the Unit Train Loadout, May 2, 1985.

The sediment design parameters for Ponds 1 through 8 have been summarized in Table 85. The applicant has not stated the design cleanout elevations for any of their ponds. In the applicant's response to the Division's renewal review, the applicant stated that he will survey the ponds to determine if they have reached the 60 percent cleanout level, and then determine if cleanout is necessary. Therefore, the applicant will include on their quarterly pond inspection forms, the cleanout volume (ac. ft.) for each facility and an updated sediment volume (ac. ft.) based on a current survey of each facility. This will supply adequate documentation for inspection of these facilities to be carried out.

In the case of ditches 43, 44, and 45 designed and placed along the existing access road to Sediment Pond No. 4, located in Section 10, T15S, R8E, two sediment traps or silt fences will be used instead of a sediment pond. Since these structures are to be used in lieu of a sediment pond, the applicant must submit detailed drawings for the sediment traps planned, or the silt fences, if used. The dimensions suggested of 30 by 100 feet, 4 feet deep, appear in excess of a small sediment trap design.

The applicant states that the riprap protection for all ponds and treatment facilities is currently in place in inlet channels, around spillway risers, and at spillway outlets. The applicant has

chosen to postpone a response to the Division's request for the D-50 of the riprap, manning's n values, and the depth, width and length of protection for all pond inlets and outlets. The applicant states that this will require assembling data from past submittals and field work to verify inlet and outlet protection, riprap location, riprap type, and showing this information on maps.

The applicant will be in compliance when the following stipulations are met.

Stipulation 817.45-.47-(3)-(TM)

1. Plateau Mining Company shall submit by October 31, 1987, for inclusion in the PAP, detailed calculations, maps and drawings showing the nature and location of pond outlet and inlet protection measures presently installed with supporting calculations which demonstrate the adequacy of these measures.

2. Plateau Mining Company will include on their quarterly sediment pond inspection forms, the cleanout volume (Ac.Ft.) for each facility and an updated sediment volume (Ac.Ft.) based on a current survey of each pond and treatment facility.

3. Plateau Mining Company shall submit by October 31, 1987, detailed silt fence design drawings showing design height, materials used, and general field construction details. Moreover, PMC shall submit by October 31, 1987,detailed sediment trap design drawings showing size, depth and location, a 60 percent sediment cleanout elevation for these structures with a location map of a scale greater than Map 43, sufficient to determine drainage area, ditch location, and ditch length contributing to these structures.

*UMC 817.52 Surface and Ground Water Monitoring-(RVS/TM)

Existing Environment and Applicant's Proposal

Baseline water quality samples will be analyzed for the parameters listed in Table 82, Baseline Low Flow Water Quality Analytical Schedule. Operational water quality samples will be analyzed for the parameters presented in Table 81, Operational Water Quality Analytical Schedule. Baseline and operational monitoring will be conducted at the monitoring stations identified on Map 26, Ground and Surface Water Monitoring Sections with Water Quality Data in accordance with the time schedule indicated in Table 80.

The parameter sampling frequency procedures and future sampling intent has been stated on pages 784-79 through 784-88 of the PAP.

On April 9, 1987, the Division met with Plateau Mining Company (PMC) to discuss a revised spring monitoring plan based on the information received to date. Based on that meeting, PMC proposes to drop from the plan as outlined in the 5-year permit renewal PAP and New Lands PAP the following springs: S17-2, S7-1, S11-1, 530, 85-26-1, 734 and 452. The following springs will be added to those sampled: 518, 429, 433, 443, and 444.

Springs 429, 433, 443, and 444 will be monitored for baseline starting this year, then dropped until mining commences in Lease U-13097. Spring 518 will be monitored on an operational basis starting this year.

In regards to monitoring the Right Fork of North Fork of Miller Creek, the applicant plans on using Station ST-1 to monitor for any changes in flow. It will be monitored monthly June through October (PAP, page 784-62b). PMC will also inspect the stream channel of the North Fork of the Right Fork of Miller Creek during the season when access is possible (June through October).

The applicant has stated that they will monitor springs 229, S18-2, and 500 in their ICR/TD response. After looking at the springs in the vicinity and where they are located on the spring map, the applicant feels that these springs would be adequate to monitor for mining subsidence impacts.

Compliance

The Division has concurred with the applicant on their revision to the proposed monitoring schedule in the PAP. The Forest Service has reviewed these changes and discussed these changes with the Division in a June 2, 1987 meeting. They also concur with these changes except that they would like the applicant to continue monitoring Spring S11-1 through 1987 with at least one sample being collected at low flow. This request was based on the water rights associated with Little Park Creek and mining to the east of this spring. The Forest Service will assess the data collected from sampling Spring S11-1 at the end of this year to determine if they would like continued monitoring in 1988. USFS is also compiling a list of springs on their own this field season, and this winter will provide a comprehensive list of high resource value springs.

The applicant has proposed to drop certain parameters from their surface and ground water quality sampling program. The Division does not concur with elimination of the baseline parameters spelled out on pages 784-82 through 784-85 for baseline data collection. If at the end of one year's baseline data collection for new sites

(four water quality samples including high and low flow), certain parameters (those mentioned on pages 784-82 through 784-85 of the PAP) are not found in significant concentrations, then the Division would consider approving an amendment to the plan for the the second year of baseline monitoring. The complete baseline parameter list will be sampled every fifth year for all sites.

In Section 18, T15S, R8E, a separate assessment of impacts to surface and groundwater has been carried out due to potential impacts associated with undermining the NFRF Miller Creek. Based on the Division's monitoring guidelines and paucity of baseline data in this area and current mining sequence in Section 18, the following springs were chosen by the Division to be monitored: (Springs 229, 238, 239, 494, and 500). Springs 238 and 494 are in excess of the springs chosen for monitoring by Plateau.

Two sources of data exist to describe the hydrologic characteristics of surface waters found in the NFRF Miller Creek. The major source of data is found in Plateau's annual water quality data listings through 1986 for Station ST-1. This station is located approximately 3.3 miles downstream from the headwaters of the NFRF Miller Creek. Six years of record have been recorded at this site. The average flow for this site over the period of record is .56 CFS or 251.3 GPM with a high flow recorded on 6/13/85 of 2.0 CFS or 897.6 GPM and a low flow recorded on 2/18/81 of .05 CFS or 22.4 GPM.

At this same site the average electrical conductivity was 1334.7 UMHOS/CM with a high value recorded on 9/17/80 of 1900 UMHOS/CM and a low value recorded on 6/22/82 of 370 UMHOS/CM. Fourteen discharge values were used to complete the average and seventeen conductivity values were used to complete the average.

The second source of data for the NFRF Miller Creek is a stream survey completed on the upper reaches of the creek in Section 18 and 17, T.15S. R8E. The purpose of this survey was to identify the gaining and losing reaches of the creek in these two sections. Flow measurements and conductivity readings were taken approximately every 1000 feet. All inflows were identified and measured. If mining were to occur as identified in the New Lands Permit Application, Stations M-1 through M-8 would be the closest to the potentially subsided area. An average of the electrical conductivity readings in this reach of the creek was 391.3 UMHOS/CM for Stations M-4, 6 and 8. The total flow at Station M-8 was 62 GPM.

The data from each station in this portion of the creek identified each reach in this stretch of creek as a gaining reach.

From Station M-6 to M-8 was identified as gaining the most flow of +15 GPM.

The data collected at the downstream Station ST-1 does not adequately represent or define what is occurring in the upper reaches of Miller Creek. The variance in electrical conductivity, the abundance of springs and the physical distance of 3.3 miles between the two sites does not reflect similarities in data or provide an avenue for assessment between ST-1 and the upper reaches of the NFRF Miller Creek.

Both water quality and quantity of flow in the upper reaches of Miller Creek has not been well defined. A continuous monitoring station at M-8 on map 29 must be installed and that data must be collected on a continuous basis for at least 2 years on a monthly basis per Division guidelines to define the hydrologic resources of this reach of Miller Creek. Also, stream surveys in July and September defining gaining or losing reaches would be appropriate to define base flow recharge conditions in this reach of stream.

Baseline water quality parameters and baseline flow data from a continuous monitoring station at M-8 must be established for this reach of Miller Creek prior to any mining.

The applicant will be responsible to keep the Division informed of mining sequence changes on a yearly basis so that spring monitoring sites can be revised according to mining sequence changes and adequate baseline data can be collected prior to any mining impacts being realized.

The applicant will be in compliance with this section when the following stipulations are met.

Stipulation 817.52-(4)-(TM)

1. Plateau Mining Company (PMC) shall upon permit approval, utilize the monitoring stations proposed in PMC's April 30, 1987 letter to the Division. Moreover, PMC shall monitor springs S11-1, 238, and 494 at least one time in 1987 during low flow conditions in accord with the approved monitoring plan.

2. By October 31, 1987, Plateau Mining Company shall update the PAP water monitoring plan including text and tables, to:

   a. reflect the revised monitoring stations proposed in PMC's April 30, 1987 letter to the Division as well as to add springs 238 and 494 to the monitoring program.

b. reflect that all new source and existing baseline monitoring points for surface and groundwater monitoring shall be monitored in accord with the Division's baseline parameter list for a two year period.

3. Plateau Mining Company will, by August 31,1987, install a continuous monitoring station at Station M-8 as shown on Map 29. PMC will begin to monitor stream flow continuously and water quality monthly from August 31, 1987 until October 31, 1987, weather permitting. Monitoring will be undertaken from June until October per the baseline water quality parameter list through 1988 and 1989.

4. Plateau Mining Company will amend the current PAP by August 31, 1987 to commit to carry out stream surveys equivalent to the one carried out in the NFRF Miller Creek on July 2, 1986, in July and September of every year mining occurs, including 1987, within Section 18 of the New Lands Permit Area, and until subsidence impacts have been stabilized. PMC will flag and determine the exact location of each monitoring station for the survey so the survey can be carried out at the same stations using the same monitoring methods, on a yearly basis.

*UMC 817.57 Hydrologic Balance: Stream Buffer Zones-(KMM)

Existing Environment and Applicant's Proposal

The permit area contains the headwaters of two small perennial streams - Miller and Tie Fork Creeks. The latter includes Gentry Hollow and Wild Cattle Hollow Forks. There is currently no mining or surface facilities within 100 feet of these streams but mining is planned in Section 18 beneath the NFRF Miller Creek. Aquatic resource studies (pages 783-115 to 123) indicate no degradation to water quality or quantity from the applicant's operations. Subsidence cracks are the only surface disturbances in the Miller Creek drainage area and these are limited to the ridge (page 783-121). Subsidence is not expected to impact Wild Cattle or Gentry Hollow (page 783-122), but may impact NFRF Miller Creek (page 784-62a-c) (See also UMC 817.126 discussion).

Mine water discharge from the Mudwater Fan Breakout has changed Mudwater Creek to a perennial stream. The water discharge is subject to an NPDES permit and is monitored regularly to determine impacts on water quality (page 784-146).

The Corner Canyon Fan Breakout is the only facility in proximity to an intermittent channel. The breakout was constructed so as not to impact the stream and the site has been posted for a stream buffer area (page 784-147).

Compliance

In discussions found on pages 783-122, 784-62b-c, mitigation measures are discussed regarding the possible repair of cracks in the stream channel of the NFRF Miller Creek. The applicant suggests the following mitigation measures will be tried.

1. Seal the cracks in the stream channel with bentonite or other environmentally safe materials;
2. If cracks are too large, rags or some material, will be hand placed in them at a depth of approximately two feet to provide a stop point for bentonite pellets;
3. Concrete or epoxy mixtures;
4. Surface stabilization accomplished by hand tools.

All these methods will be accomplished by diverting flow with culverts, flexible fabric tubing, or plastic liners. These methods will be carried out until the ground stabilizes (page 784-62b & c). Of the methods mentioned, Method #2, the use of rags or other materials to fill large cracks, does not appear to be a permanent environmentally sound method, and therefore is not recommended. Methods 1, 3, and 4 may involve transportation of large amounts of materials into a very remote area (i.e., grout, bentonite, epoxy, etc.), but appears to be common engineering practice. The Division considers foot travel or helicopter the only acceptable means of transportation suggested by the applicant due to the remote steep canyon environment.

In regards to diversion of the stream during implementation of any of these methods, a detailed assessment of flow regimes in the NFRF Miller Creek will be required. Data will be collected at the monitoring station set up at Station M-8 per the requirements spelled out under Stipulation #2, UMC 817.52, to help define flow regimes. The applicant will be required to provide details regarding the use of cutoff walls, etc., upstream of the diversion to enable the flow to enter the culvert (flexible tubing or plastic liner). The applicant will have to maintain this diversion until such time as the subsidence stabilizes and the stream is restored.

Since it is impossible to predict what exactly will occur, Plateau will be required to notify the Division immediately upon discovery of a subsidence crack or potential problem, and have the appropriate mitigation measure to restore the integrity of the NFRF Miller Creek in place within seven (7) days of discovery.

The applicant will be in compliance when the following stipulations are met.

Stipulation UMC 817.57-(2)-(TM)

1. Plateau Mining Company will amend the PAP by October 31, 1987 to commit to notify the Division immediately upon discovery of a crack or surface related impact to the NFRF Miller Creek. PMC will undertake the most appropriate approved mitigation plan to restore the integrity and flow of the NFRF Miller Creek channel and have this measure in place within seven (7) days of discovery of a crack or subsidence related impact.

2. Plateau Mining Company shall provide by October 31, 1987, for insertion into the PAP, design detail for the cutoff walls to be used in the event of a temporary diversion of North Fork of the Right Fork of Miller Creek.

*UMC 817.59 Coal Recovery-(PGL)

Existing Environment and Applicant's Proposal

The operator has committed to maximum coal recovery while using the best technology currently available and maintaining environmental integrity through underground coal mining activities. An approved Resource Recovery and Protection Plan is shown in Exhibit 39.

Compliance

The applicant's Resource Recovery and Protection Plan approved March 20, 1981 is valid.

Section 18 (fee land) will be mined in compliance with UMC 817.121-.126, and therefore, meet the requirements of maximizing recovery while maintaining environmental integrity.

The applicant is in compliance with this section.

Stipulations

None

*UMC 817.121-.126 Subsidence Control-(RVS)

Existing Environment and Applicant's Proposal

The applicant provides information about subsidence on pages 784-134 through 784-143. Supplementary subsidence information is given on Maps 5, 6, 61, 62 and in Table 89.

Mining will occur in the Hiawatha seam, Third seam and Wattis seam. Coal extraction will occur by longwall methods in the Wattis

and Third seams and by continuous room and pillar methods in the Hiawatha seam (PAP, page 784-3). Multiple seam mining will primarily occur beneath the northern portion of Hoag Ridge (Section 12, T15S, R7E). The operator estimates that maximum subsidence will be 70 percent of extraction height (PAP page 784-136). Accordingly, in Section 12 (three seams) and Section 18 (2 seams) are projected to be mined with cumulative maximum subsidence anticipated to be less than 14 and 10 feet respectively. Maximum subsidence beneath Gentry Ridge, where the Wattis seam is projected to be mined, will be less than 5 feet.

Overburden thicknesses range from 700 to 1500 feet in the northern portion of Hoag Ridge (includes Section 12) and 1000 to 1700 feet in the Gentry Ridge area. The operator gives a value of 22 1/2 degrees for the angle-of-draw within and adjacent to the permit area (PAP, 784-136). Map 61 locates subsidence-induced tension cracks that have developed over previously mined areas above Star Point.

The applicant proposes to conduct single and double-seam mining beneath the NFRF Miller Creek, a perennial stream (maps 5 and 6). The applicant commits to restricting single- and double-seam mining to areas where overburden exceeds 400 and 480 feet, respectively. Two risk areas labelled "A" and "B" (Figure 1, Exhibit 30) have been identified for development of surface tension cracks.

The applicant identifies renewable resource lands above areas of current and projected mining. The applicant concludes, on the basis of mining methods, stratigraphy and overburden thickness that surface manifestations of subsidence (tension cracking, catastrophic failure) and impacts to renewable resource lands (springs, livestock grazing) will be minimal. However, where subsidence causes tension cracks that are hazardous to livestock or wildlife, the applicant commits to restoring the land surface. Where tension cracks preclude grazing or result in injured or killed livestock, the applicant commits to compensating owners at fair market value for losses.

Ground-water resources (springs) that are materially damaged by mining-induced subsidence will be rehabilitated or mitigated (PAP, pages 817-22 and 817-23). The applicant presents a plan for sealing tension cracks that may potentially form and divert flow within the channel of NFRF Miller Creek (PAP, page 784-62b). The plan incorporates inserting bentonite pellets, rags, concrete, or epoxy into tension cracks to prevent flow loss. The applicant recognizes that mining past outcropping Castlegate Sandstone in Section 18 may cause cliff failure (PAP, page 783-113).

The operator identifies three structures (powerline, cabin, TV towers) that occur above areas that were mined prior to 1977 (Map 1,

Sheet 2) and therefore, are considered to be located above areas that have stabilized. The operator does not anticipate subsidence-induced damage to these structures and does not propose specific mitigation plans.

The operator proposes to monitor vertical and horizontal ground movement by photogrammetric methods, surveying of monuments and visual observations during surface traverses. Photogrammetry will be the primary method for quantifying ground movement. Surface monument surveys will be utilized to determine the resolution of photogrammetric methods. Maps 61, 61A, and 61C show the subsidence monitoring points above longwall panels. Maximum measured subsidence, to date, is two feet (Map 61). The operator commits to conducting an annual field survey (surface traverse) and indicates that monument surveying will be conducted on an irregular basis and eventually phased out (PAP, p. 784-141). Results of surveys will be submitted to the Division on an annual basis (PAP, page 784-142). Surface owners will be notified of the mining schedule according to UMC 817.122.

Compliance

The applicant has provided information about mining methods and locations, overburden thickness and lithology, vertical movement, renewable resource lands and structures.

The applicant has provided a subsidence monitoring plan that identifies monitoring stations and describes schedules for collecting and submitting quantitative data. The subsidence monitoring plan does not incorporate deriving vertical and horizontal movement data from stations located along NFRF Miller Creek. The proposed subsidence monitoring plan does not comply with the requirements of UMC 817.121.

The applicant commits to notifying surface owners according to UMC 817.122.

Maximum subsidence of up to 14 feet is projected for areas of Hoag Ridge where approximately eight springs occur. In addition, approximately 43 springs occur above portions of Gentry Ridge and section 18, where maximum subsidence is projected to be less than five and ten feet respectively. The applicant cannot exclude the possibility of subsidence-induced material damage that results in the reduction of reasonably foreseeable use of surface lands. Although the applicant has provided mitigation plans for loss of grazing habitat and springs, the PAP lacks a plan for evaluating impacts and rehabilitating or restoring vegetation that is impacted by cliff failure. The applicant has also provided a plan that is evaluated under UMC 817.57 for mitigating material damage to NFRF Miller Creek. In summary, the applicant has not provided adequate plans to completely address the requirements of UMC 817.124.

The applicant has integrated site-specific subsurface data with information from elsewhere (New Mexico, Europe) to derive a plan for mining beneath NFRF Miller Creek and identify potential subsidence-induced material damage to the perennial stream (Exhibit 30). The Division concurs with the applicant's assessment of the risk for development of material damage (tension cracking) at localities A and B. Further technical review revealed that premises used to predict rock failure are based on tenuous geologic and topographic analogies, and therefore, are considered of limited applicability to the Wasatch Plateau Coal Field or Section 18. Hence, derived overburden thicknesses (400 and 480 feet) do not substantiate that proposed development will prevent subsidence-induced material damage to NFRF Miller Creek. The applicant's proposal for longwall development beneath NFRF Miller Creek does not comply with the requirements of UMC 817.126.

The applicant will be in compliance with this section when the following stipulations are met.

Stipulation UMC 817.121-(1)-(RVS)

1. Plateau Mining Company will provide, by August 31,1987, a subsidence plan for monitoring vertical and horizontal movement along NFRF Miller Creek.

Stipulation UMC 817.124-(1)-(KMM)

1. Plateau Mining Company will, by October 31, 1987, commit to providing in the Annual Subsidence Report:

   (A) an assessment of the impacts of cliff failure and resulting talus slope formation on vegetation and wildlife resources.

   (B) An acceptable vegetation/mitigation plan to be implemented in the first normal season after significant subsidence and cliff failure ceases.

Stipulation UMC 817.126-(2)-(RVS)

1. Plateau Mining Company will, by October 31, 1987, commit to restricting longwall mining in panel three (Section 18) of the Wattis seam to areas of 500 or more feet of overburden. Moreover, in areas of 400 to 500 feet of overburden in Panel three (Section 18), the applicant will commit to mining by the room and pillar method with retention of pillars that are properly sized to maintain the integrity of NFRF Miller Creek.

2. Longwall mining and development in Panels 7 and 8 (Section 18, third panel), may not proceed until:

   (A) PMC has identified, to the Division's satisfaction, subsidence-induced material damage associated with Wattis seam mining, and

   (B) the Division has evaluated potential environmental degradation.

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PLATEAU MINING COMPANY
STAR POINT MINES
NEW LANDS
SUPPLEMENTAL REPORT

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PLATEAU MINING COMPANY
STAR POINT MINES
NEW LANDS
SUPPLEMENTAL REPORT

I. DESCRIPTION OF MINING AND RECLAMATION OPERATIONS

A. Location and History-(PGL)

The New Lands revision for the Star Point Mines encompasses approximately 1,000 acres in portions of Section 11 and 14, T15S, R7E and Sections 9, 10, 15 and 18, T15S, R8E in Carbon County, Utah.

Mining operations began in 1916 when the Wattis Brothers and Mr. Browning bought 160 acres from the United States and developed the property for coal production. Coal was shipped in the autumn of 1917 when the railroad was completed to the town of Wattis. The Lion Coal Company bought the coal interests in 1919. In 1967 Plateau Limited opened a new mine in the Hiawatha Seam. In 1971, United Nuclear purchased the mine, and in July 1980 Plateau Mining Company bought the properties.

B. Summary of Mining and Reclamation Activities-(PGL)

Mining is proposed to be undertaken in Section 18 for the New Lands permit. There will be double seam mining in the Wattis Seam and Third Seam with a combination of eight longwall panels (six in the Wattis Seam and two in the Third Seam), and room and pillar mining. There is no new surface disturbance associated with lands in this addition.

II. DESCRIPTION OF THE AFFECTED AREA WITHIN ITS RESOURCE SETTING

A. Topography (RVS)

The New Lands permit area is characterized by cliffs and narrow canyons. Over 50 percent of the permit area encompasses rugged topography where slopes range from 30 to 60 degrees.

B. Geology (RVS)

Outcropping rocks within the New Lands permit area are Upper Cretaceous in age. Mapped stratigraphic units include, from oldest to youngest, the Star Point Sandstone, Blackhawk Formation, Castlegate Sandstone, and Price River Formation.

Four faults have been identified within the area of proposed development. The three northerly trending faults are displaced less than ten feet, whence the east-west trending fault is displaced from zero to four feet. Faults and fractures that trend northerly are considered to be "open" and actively transmit water. The east-west fault is presumed to be "closed".

C. Climate (KMM)

The New Lands area varies with elevation from a typically subalpine to a typically cold desert climate in central Utah. Temperature is both seasonally variable and influenced by elevation. January temperatures range from a mean minimum of approximately 13° F to a mean maximum of 30° F. July means vary from 54° F to 82° F.

The normal annual precipitation at the nearest weather station (Hiawatha) is about 13 inches. Less than one third of the annual precipitation occurs from May through September. Normal precipitation at the highest elevations in the New Lands areas may be as much as 10 inches greater. At the higher elevations the summer is short, with snow occurring as early as September and as late as early June. Up to two feet of snow may accumulate and remain from November to April.

Average wind speeds are light to moderate with averages less than 20 mph. Local winds vary from canyon to canyon and with warming and cooling of the surrounding rocks in the mornings and evenings.

D. Hydrology

1. Surface Water-(TM)

The permit and adjacent areas are characterized by a perennial stream and spring flow which supply flow to the North Fork of the Right Fork (NFRF) of Miller Creek. The Miller Creek drainage area encompasses 12,328 acres which drain steep canyon environments onto the flat Mancos shale flats which in turn drain into the Price River and eventually into the Colorado River.

Miller Creek has an average gradient of 15 percent. The Right and Left Forks of Miller Creek encompass approximately 350 acres of the Hiawatha Mines Complex. Plateau Mining Company will mine under the upper reaches of NFRF Miller Creek. The North Fork of Miller Creek is a perennial stream, whereas the Middle Fork and Left Fork of Miller Creek are ephemeral.

Streamflow from the NFRF Miller Creek varies depending upon precipitation and spring flow. The only local long term data is collected at stream monitoring station ST-1 on the North Fork of Miller Creek 3.3 miles downstream of the area of mining impact. Based on six years of record collected at station ST-1, the average flow for this station over the period of record is .56 CFS or 251.3 GPM, with a high flow recorded on 6/13/85 of 2.0 CFS or 897.6 GPM and a low flow recorded on 2/18/81 of .05 CFS or 22.4 GPM.

At this same site, the average electrical conductivity was 1334.7 UMHOS/CM with a high value recorded on 9/17/80 of 1900 UMHOS/CM and a low value recorded on 6/22/82 of 370 UMHOS/CM. Fourteen discharge values were used to compute the average and seventeen conductivity values were used to compute the average.

The second source of data for the NFRF Miller Creek is a stream survey completed July 2, 1986, on the upper reaches of the creek in Section 17 and 18, T15S, R8E. The purpose of this survey was to identify the gaining and losing reaches of the creek in these two sections. Flow measurements and conductivity readings were taken approximately every 1000 feet. All inflows were identified and measured. If mining were to occur as identified in the New Lands Permit Application, Stations M-1 through M-8 would be the closest to the potentially impacted area. An average of the electrical conductivity readings in this reach of the creek was 391.3 UMHOS/CM for stations M-4, 6 and 8. The total flow at Station M-8 was 62 GPM.

2. Ground Water-(RVS)

Thirteen springs, having a combined flow of 46 gpm, occur within the zone of projected subsidence for the New Lands permit area.

The Star Point-Blackhawk aquifer is present and represents the only identified regional ground-water resource in the New Lands permit area. Ground water associated with the Price River Formation and Castlegate Sandstone may be characterized as occurring within "perched" aquifer zones.

E. Soils-(DD)

Soils in the permit area have been mapped by the Soil Conservation Service (SCS), the Forest Service, and EPS, a consulting group. All information from these mappings have been

integrated. Soil Series have not been correlated to all taxonomic units, but based on taxonomic classification, there were 24 different soils mapped on the permit area and 10 mapped within the disturbed area. Soils mapped on the disturbed area are as follows:

Series	Taxonomic Classification
DeCross Complex	Typic Cryorthents
J E	Typic Cryoboralls
DeCross	Pachic Cryoborolls
U P	Typic Ustortheits
Pishkum	Typic Cryorthents
Featherlegs	Avidic Argiustolls
Harvey	Ustollic Calciorthids
Badland-Rubbleland Complex	
Doney	Typic Asfotheats
Ildefonso-Shingler	Ustic Torrifluents
Haverson	Ustic Torrifluents

Regional differences in soils usually reflect differences in climate and vegetation, but local differences are more often caused by differences in relief, parent material and time.

In the permit area all of these factors have influenced soil differentiation. Parent materials in the area consist of residuum that weathered from shale and sandstone; glacial outwash that was derived from primarily sandstone and quartzite; and alluvium or colluvium that was derived mainly from shale or from glacial outwash. Relief in the permit area ranges from approximately 6,700-10,000 feet, with precipitation increasing with elevation from 12" to 30". Most of this is received as snowfall between October and April. None of the soils are strongly weathered but soils that have well-developed profiles are leached to a limited extent such features reflect the influence of climate and vegetation.

F. Land Use and Vegetation (KMM)

Vegetation types of the New Lands areas are Douglas fir, Aspen, Mountain Shrub, Mountain Grassland and Pinyon-Juniper. Current land uses are grazing, wildlife, recreation, and coal mining. Cattle are grazed on both public and private lands. Wildlife use is discussed below. Recreational use of the area consists primarily of hunting and camping. Elk and deer hunting with associated camping is common

on Gentry Mountain. The area does not include significant merchantable timber, although much of the area is covered with Douglas fir and Aspen. Steep slopes limit forestry on much of the Douglas fir habitat in the New Lands area.

G. Wildlife (KMM)

The mine plan area has potential habitat for about 53 mammalia, 63 bird, 3 amphibian, and 12 reptile species (see the Star Point Mine Permit Application Package). Since the New Lands areas include most of the vegetation types of the permit area, the potential wildlife habitat for the new lands addition is similar. Habitats of special importance include elk and deer winter range and calving and fawning areas, small riparian zones along the perennial NFRF Miller Creek and cliff nesting habitat, including three nests, for Golden eagles, in Section 18.

H. Cultural Resources (KMM)

The New Lands areas have been inventoried for cultural resources in parcels contained in Sections 11 and 14 (T15S, R7E) and Section 18 (T15S, R8E), by Abajo Archeology. Site 42Fm 2118 located in Sections 11 and 14 contained lithic scatter with a projectile point which indicates occupation within a broad time range from the Archaic Period to the Fremont period.

I. Transportation (PGL)

The existing Lion Deck access road (paved) is contained in the parcel being added to the permit area in the New Lands revision in the S1/2 of Section 9, T15S, R8E.

J. Aesthetics (PGL)

No new surface disturbance is associated with the New Lands addition.

K. Socioeconomics (KMM)

The Star Point Mine is located in Carbon County on County Road 50 about three miles north of the town of Hiawatha. The mine workforce has averaged 230 to 300 people over the past five years. Employees are drawn from several small towns in the vicinity. The largest community is Price.

III. ENVIRONMENTAL IMPACTS

A. Topography and Geomorphology (RVS)

Mining impacts to topography and geomorphology include subsidence-induced cliff and ground failure.

The potential for cliff failure has been assessed to be moderately high and constitutes an acceleration in natural weathering processes. Accordingly, cliff failure impact to the New Lands permit area topography and geomorphology is not considered significant.

The potential for ground failure (e.g., sinkhole development) has been assessed as low. No significant impacts to the New Lands permit area are anticipated.

B. Air Quality (PGL)

Since no new surface disturbance is planned for the new lands addition, air quality impacts should not occur.

C. Hydrology

A Cumulative Hydrologic Impact Assessment (CHIA) for mining activities within the permit and adjacent area is included as part of the Decision Document. Mining-induced impacts to surface and ground water within the New Lands permit area are discussed therein.

D. Soil and Overburden-(DD)

Plateau is currently analyzing the coal refuse to determine the presence of toxic and acid-forming materials. From these results, Plateau will develop a monitoring plan to continue sampling the refuse. Furthermore, Plateau will address in the plan, if necessary, how they will neutralize or bury any acid-forming or toxic materials which may come from the New Lands addition and which may be detrimental to vegetation or may adversely affect water quality if not treated or buried.

E. Vegetation and Land Use Impacts (KMM)

Addition of the New Lands to the Star Point Mine will have very little long term impact on vegetation or land use. Much of the New Lands property is adjacent to existing facilities and is included for administrative reasons rather than because of any change in use. Other than subsidence, no new surface disturbance is planned for any of the New Lands areas. Section 18 will be undermined and may experience impacts of mining. Cliff failure may bury small

portions of Aspen or Douglas fir forests in talus. Subsidence cracking may temporarily impact small areas of riparian vegetation on the NFRF Miller Creek. Mitigation for these impacts will be necessary.

Livestock grazing in this section is limited due to steep topography. The applicant has committed to restoring areas where subsidence impacts the value of grazing. Wildlife use is discussed below. Cliff failure from subsidence poses a short term safety hazard to hunters but long term recreational use should not be impacted.

F. Wildlife Impacts (KMM)

Impacts on wildlife will be limited since the only surface disturbance should be subsidence in Section 18. Wildlife impacts due to loss of springs and creek flows have been limited through modifications in the mine plan and through mitigation measures which include repairing subsidence cracks which divert water and providing guzzlers. While cliff subsidence may impact Golden eagles or their nests, the applicant will be issued a "take permit" for experimental purposes in order to monitor the impacts of longwall mining on the cliffs and on raptor nesting. The proposal includes deterring use of the Golden eagle nests which could be affected by subsidence. The applicant has committed to mitigation measures as appropriate.

G. Cultural Resources (KMM)

Since surface disturbance from the New Lands addition is limited to subsidence, impacts on cultural resources should be minimal. The one site noted which straddles Sections 11 and 14 should not be undermined without additional inventory and mitigation being undertaken, if applicable.

H. Transportation (PGL)

No additional impacts are anticipated from transportation facilities. Existing roads and conveyors will be utilized.

I. Noise, Aesthetics, and Safety (PGL)

Most of the New Lands revision consists of underground area. Upon completion of mining, the landscape will be restored to conditions similar to that which existed prior to mining.

J. Socioeconomic Impacts (KMM)

A coal mine has operated at the Star Point site since the early 20th century. Historically, mining has fluctuated with the economy. Since the mining boom in the 1970's coal production has dropped substantially and the economy of the area has suffered. While coal production has recovered somewhat in the 1980's, the change from more labor intensive room and pillar mining with continuous mining units to longwall mining techniques has reduced the required workforce per ton of coal. Future production estimates indicate a stable workforce with some hope of increasing employment up to about 300 employees. The Star Point Mine will continue to benefit the local and state economies through tax revenue and employment. Continuation of mining into the New Lands section should have little or no effect on social and technical services of Carbon or Emery County since the workforce is relatively stable.

FEDERAL
(April 1987)

Permit Number ACT/007/006, 8-87

STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING
355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203
(801) 538-5340

This permit, ACT/007/006, is issued for the state of Utah by the Utah Division of Oil, Gas and Mining (DOGM) to:

Plateau Mining Company
P. O. Drawer PMC
Price, Utah 84501
(801) 637-2875

for the Star Point Mines. Cyprus Western Coal Company, parent company of Plateau Mining Company, is the lessee of federal coal lease SL-031286, U-7949, U-37045, and U-13097, the lessee of state coal lease 22729 and/or the owner of certain fee-owned parcels. A performance bond is filed with the DOGM in the amount of $3,407,322.00, payable to the state of Utah, Division of Oil, Gas and Mining and the Office of Surface Mining, Reclamation and Enforcement (OSMRE). DOGM must receive a copy of this permit signed and dated by the permittee.

Sec. 1 STATUTES AND REGULATIONS - This permit is issued pursuant to the Utah Coal Mining and Reclamation Act of 1979, Utah Code Annotated (UCA) 40-10-1 et seq, hereafter referred to as the Act.

Sec. 2 PERMIT AREA - The permittee is authorized to conduct underground coal mining activities on the following described lands (as shown on the map appended as Attachment B) within the permit area at the Star Point Mines situated in the state of Utah, Carbon County, and located:

T15S, R7E

Sec. 1:	S1/2
Sec. 2:	SE1/4 SE1/4
Sec. 11:	E1/2 NE1/4, NE1/4 SE1/4
Sec. 12:	All
Sec. 13:	N1/2
Sec. 14:	S1/2, E1/2 NE1/4, SW1/4 NE1/4
Sec. 23:	All
Sec. 25:	W1/2 NW1/4
Sec. 26:	N1/2

T15S, R8E

Sec. 5:	W1/2 NW1/4, NW1/4 SW1/4
Sec. 6:	E1/2 NW1/4, E1/2 SW1/4, SW1/4 SW1/4 W1/2 NE1/4, SE1/4 NE1/4, SE1/4
Sec. 7:	All
Sec. 8:	W1/2 NW1/4, SW1/4, SE1/4 SE1/4, S1/2 SW1/4 SE1/4
Sec. 9:	SW1/4 SW1/4, SE1/4, E1/2 SW1/4
Sec. 10:	SW1/4, W1/2 SE1/4, SE1/4 SE1/4
Sec. 11:	Portions of S1/2 SW1/4
Sec. 15:	N1/2 NW1/4, N1/2 NE1/4
Sec. 16:	All
Sec. 17:	E1/2, NW1/4, portions of NW1/4 SW1/4
Sec. 18:	N1/2, Portions of N1/2 SE1/4, N1/2 SW1/4
Sec. 20:	NE1/4
Sec. 21:	E1/2 NW1/4

Sec. 3: PERMIT TERM - This permit expires on January 27, 1992.

Sec. 4 ASSIGNMENT OF PERMIT RIGHTS - The permit rights may not be transferred, assigned or sold without the approval of the Director, DOGM. Transfer, assignment or sale of permit rights must be done in accordance with applicable regulations, including but not limited to 30 CFR 740.13(e) and UMC 788.17-.19.

Sec. 5 RIGHT OF ENTRY - The permittee shall allow the authorized representative of DOGM, including but not limited to, inspectors and representatives of OSMRE, without advance notice or a search warrant, upon presentation of appropriate credentials, and without delay to:

A. have the rights of entry provided for in 30 CFR 840.12, UMC 840.12, 30 CFR 842.13 and UMC 842.13; and,

B. be accompanied by private persons for the purpose of conducting an inspection in accordance with UMC 842.12 and 30 CFR 842, when the inspection is in response to an alleged violation reported by the private person.

Sec. 6 SCOPE OF OPERATIONS - The permittee shall conduct underground coal mining activities only on those lands specifically designated as within the permit area on the maps submitted in the permit application and approved for the term of the permit and which are subject to the performance bond.

Sec. 7 ENVIRONMENTAL IMPACTS - The permittee shall minimize any adverse impact to the environment or public health and safety through but not limited to:

A. accelerated monitoring to determine the nature and extent of noncompliance and the results of the noncompliance;

B. immediate implementation of measures necessary to comply; and

C. warning, as soon as possible after learning of such noncompliance, any person whose health and safety is in imminent danger due to the noncompliance.

Sec. 8 DISPOSAL OF POLLUTANTS - The permittee shall dispose of solids, sludge, filter backwash or pollutants in the course of treatment or control of waters or emissions to the air in the manner required by the approved Utah State Program and the Federal Lands Program which prevents violation of any applicable state or federal law.

Sec. 9 CONDUCT OF OPERATIONS - The permittee shall conduct its operations:

A. in accordance with the terms of the permit to prevent significant, imminent environmental harm to the health and safety of the public; and

B. utilizing methods specified as conditions of the permit by DOGM in approving alternative methods of compliance with the performance standards of the Act, the approved Utah State Program and the Federal Lands Program.

Sec. 10 AUTHORIZED AGENT - The permittee shall provide the names, addresses and telephone numbers of persons responsible for operations under the permit to whom notices and orders are to be delivered.

Sec. 11 COMPLIANCE WITH OTHER LAWS - The permittee shall comply with the provisions of the Water Pollution Control Act (33 USC 1151 et seq,) and the Clean Air Act (42 USC 7401 et seq), UCA 26-11-1 et seq, and UCA 26-13-1 et seq.

Sec. 12 PERMIT RENEWAL - Upon expiration, this permit may be renewed for areas within the boundaries of the existing permit in accordance with the Act, the approved Utah State Program and the Federal Lands Program.

Sec. 13 CULTURAL RESOURCES - If, during the course of mining operations, previously unidentified cultural resources are discovered, the permittee shall ensure that the site(s) is (are) not disturbed and shall notify DOGM. DOGM, after coordination with OSMRE, shall inform the permittee of necessary actions required. The permittee shall implement the mitigation measures required by DOGM within the time frame specified by DOGM.

Sec. 14 APPEALS - The permittee shall have the right to appeal as provided for under UMC 787.

Sec. 15 SPECIAL CONDITIONS - In addition to the general obligations and/or requirements set out in the leases, the federal mining plan approval, and this permit, the permittee shall comply with the special conditions appended hereto as Attachment A.

The above conditions (Secs. 1-15) are also imposed upon the permittee's agents and employees. The failure or refusal of any of these persons to comply with these conditions shall be deemed a failure of the permittee to comply with the terms of this permit and the lease. The permittee shall require his agents, contractors and subcontractors involved in activities concerning this permit to include these conditions in the contracts between and among them. These conditions may be revised or amended, in writing, by the mutual consent of DOGM and the permittee at any time to adjust to changed conditions or to correct an oversight. DOGM may amend these conditions at any time without the consent of the permittee in order to make them consistent with any new federal or state statutes and any new regulations.

THE STATE OF UTAH

By: _____

Date: _____

I certify that I have read and understand the requirements of this permit and any special conditions attached.

_____
Authorized Representative of
the Permittee

Date: _____

APPROVED AS TO FORM:

By: _____
Assistant Attorney General

Date: _____

ATTACHMENT "A"

STIPULATIONS

Plateau Mining Company
Star Point Mine
ACT/007/006, Carbon County, Utah

August 5, 1987

Stipulation UMC 771.19-(2)-(JW)

1. Underground coal mining activities shall not commence within any federally leased coal contained in the New Lands parcels until the Mining Plan Modification is approved by the U.S. Department of Interior. The Division reserves the right to amend this permit (ACT/007/006) to incorporate any changes or requirements set out in the approved Mining Plan Modification.

2. Plateau Mining Company shall complete further testing of site 42Em2118 as described in the Abajo Archeaology report of July 1987 in order to determine eligibility for the National Register of Historic Places. The testing shall be done in accord with standards prescribed by the Utah Division of State History. Results from the testing will be forwarded to the Division of Oil Gas and Mining by October 31, 1987. If site 42Em2118 is determined to be eligible for listing, then PMC shall avoid any further disturbance of the site until appropriate mitigation measures are approved by the Utah Division of State History and the measures are fully implemented

Stipulation UMC 782.15-1-(JW)

Plateau Mining Company shall amend the Permit Application Package (PAP) by October 31, 1987 to commit that prior to initiating additional surface disturbance within the permit area on lands administed by the Bureau of Land Management, the required rights-of-way and/or permit will be obtained from the BLM.

Stipulation 817.11-(1)-(PGL)

The Plateau Mining Company shall submit by October 31, 1987 for inclusion in the PAP, all details about signs and markers as required by this regulation.

Stipulation 817.24-(1)-(DD)

Plateau Mining Company must submit by October 31, 1987, for insertion into the PAP, a mass balance of all areas to be retopsoiled. This will include acreage figures of all locations to be retopsoiled, depth of topsoil to be redistributed, and amount and location of material presently stockpiled. The applicant must also commit to sample soils before reclamation on areas of the Lion Deck Portal that will be used for reclamation.

Stipulation 817.43-(1)-(TM)

Plateau Mining Company shall submit by October 31, 1987, for inclusion in the PAP, flow, velocity, and sizing calculations, location maps, and inlet and outlet protection measures for all culverts in the disturbed area.

Stipulation 817.44-(1)-(TM)

Plateau Mining Company shall submit by October 31, 1987 for inclusion in the PAP, complete and adequate design, calculations, profiles, cross sections, and drawings to detail final reclamation and channel restoration measures which will be employed. This will include post mining drainage patterns, and water monitoring locations.

Stipulation 817.45-.47-(2)-(TM)

1. Plateau Mining Company shall submit by October 31, 1987, for inclusion in the PAP, detailed calculations, maps and drawings showing the nature and location of pond outlet and inlet protection measures presently installed with supporting calculations which demonstrate the adequacy of these measures.

Stipulation 817.45-.47-(2)-(TM) (Cont'd.)

2. Plateau Mining Company will include on their quarterly sediment pond inspection forms, the cleanout volume (Ac.Ft.) for each facility and an updated sediment volume (Ac.Ft.) based on a current survey of each pond and treatment facility.

3. Plateau Mining Company shall submit by October 31, 1987, detailed silt fence design drawings showing design height, materials used, and general field construction details. Moreover, PMC shall submit by October 31, 1987, detailed sediment trap design drawings showing size, depth and location, a 60 percent sediment cleanout elevation for these structures with a location map of a scale greater than map 43 sufficient to determine drainage area, ditch location, and ditch length contributing to these structures.

Stipulation 817.49-(1)-(PGL)

Prior to final reclamation, Plateau Mining Company must submit definite plans for the disposition of all of the impoundments. If the applicant retains any of the impoundments permanently, all of the criteria for permanent impoundments must be met according to UMC 817.49.

Stipulation 817.52-(2)-(TM)

1. Plateau Mining Company (PMC) shall upon permit approval, utilize the monitoring stations proposed in PMC's April 30, 1987 letter to the Division. Moreover, PMC shall monitor springs S11-1, 238, and 494 at least one time in 1987 during low flow conditions in accord with the approved monitoring plan.

2. By October 31, 1987, Plateau Mining Company shall update the PAP water monitoring plan including text and tables, to:

   a. reflect the revised monitoring stations proposed in PMC's April 30, 1987 letter to the Division as well as to add springs 238 and 494 to the monitoring program.

Stipulation 817.52-(2)-(TM) (Cont'd.)

b. reflect that all new source and existing baseline monitoring points for surface and groundwater monitoring shall be monitored in accord with the Division's baseline parameter list for a two year period.

3. Plateau Mining Company will by August 31, 1987, install a continuous monitoring station at Station M-8 as shown on Map 29. PMC will begin to monitor stream flow continuously and water quality monthly from August 31 1987 until October 31, 1987 weather permitting. Monitoring will be undertaken from June until October per the baseline water quality parameter list through 1988 and 1989.

4. Plateau Mining Company will amend the current PAP by August 31, 1987 to commit to carry out stream surveys equivalent to the one carried out in the NFRF Miller Creek on July 2, 1986, in July and September of every year mining occurs, including 1987, within Section 18 of the New Lands Permit Area, and until subsidence impacts have been stabilized. PMC will flag and determine the exact location of each monitoring station for the survey so the survey can be carried out at the same stations using the same monitoring methods, on a yearly basis.

Stipulation UMC 817.57-(1)-(TM)

1. Plateau Mining Company will amend the PAP by October 31, 1987 to commit to notify the Division immediately upon discovery of a crack or subsidence related impact to the NFRF Miller Creek. PMC will undertake the most appropriate approved mitigation plan to restore the integrity and flow of the NFRF Miller Creek channel and have this measure in place within seven (7) days of discovery of a crack or subsidence related impact.

2. Plateau Mining Company shall provide by October 31, 1987, for insertion into the PAP, design detail for the cutoff walls to be used in the event of a temporary diversion of North Fork of the Right Fork of Miller Creek.

Stipulation 817.71-.74-(1)-(PGL/DD/RVS)

The Plateau Mining Company shall submit by October 31, 1987, for inclusion in the PAP, an operational plan for collection and analyses of each stratum of overburden to be removed, including the stratum immediately above and below each coal seam to be mined, graben crossing waste rock, and materials presently in the refuse pile, to identify potential acid or toxic-forming, or alkalinity producing materials. The plan shall include a discussion of the potential for, and mitigation of, water quality impacts and/or revegetation problems attendant to the refuse pile. Moreover, the operator shall submit the calculated volume of waste rock to be generated during the permit term.

Stipulation UMC 817.121-1-(RVS)

1. Plateau Mining Company will provide, by August 31, 1987, a subsidence plan for monitoring vertical and horizontal movement along NFRF Miller Creek.

Stipulation UMC 817.124-1-(KMM)

1. Plateau Mining Company will, by October 31, 1987, commit to providing in the Annual Subsidence Report:

   (A) an assessment of the impacts of cliff failure and resulting talus slope formation on vegetation and wildlife resources.

   (B) An acceptable vegetation/mitigation plan to be implemented in the first normal season after significant subsidence and cliff failure ceases.

Stipulation UMC 817.126-1,2-(RVS)

1. Plateau Mining Company will, by October 31, 1987, commit to restricting longwall mining in panel three (Section 18) of the Wattis seam to areas of 500 or more feet of overburden. Moreover, in areas of 400 to 500 feet of overburden in Panel three (Section 18), the applicant will commit to mining by the room and pillar method with retention of pillars that are properly sized to maintain the integrity of NFRF Miller Creek.

Stipulation UMC 817.126-1,2-(RVS) Cont'd.)

2. Longwall mining and development in Panels 7 and 8 (Section 18, third panel), may not proceed until:

   (A) PMC has identified, to the Division's satisfaction, subsidence-induced material damage associated with Wattis seam mining, and

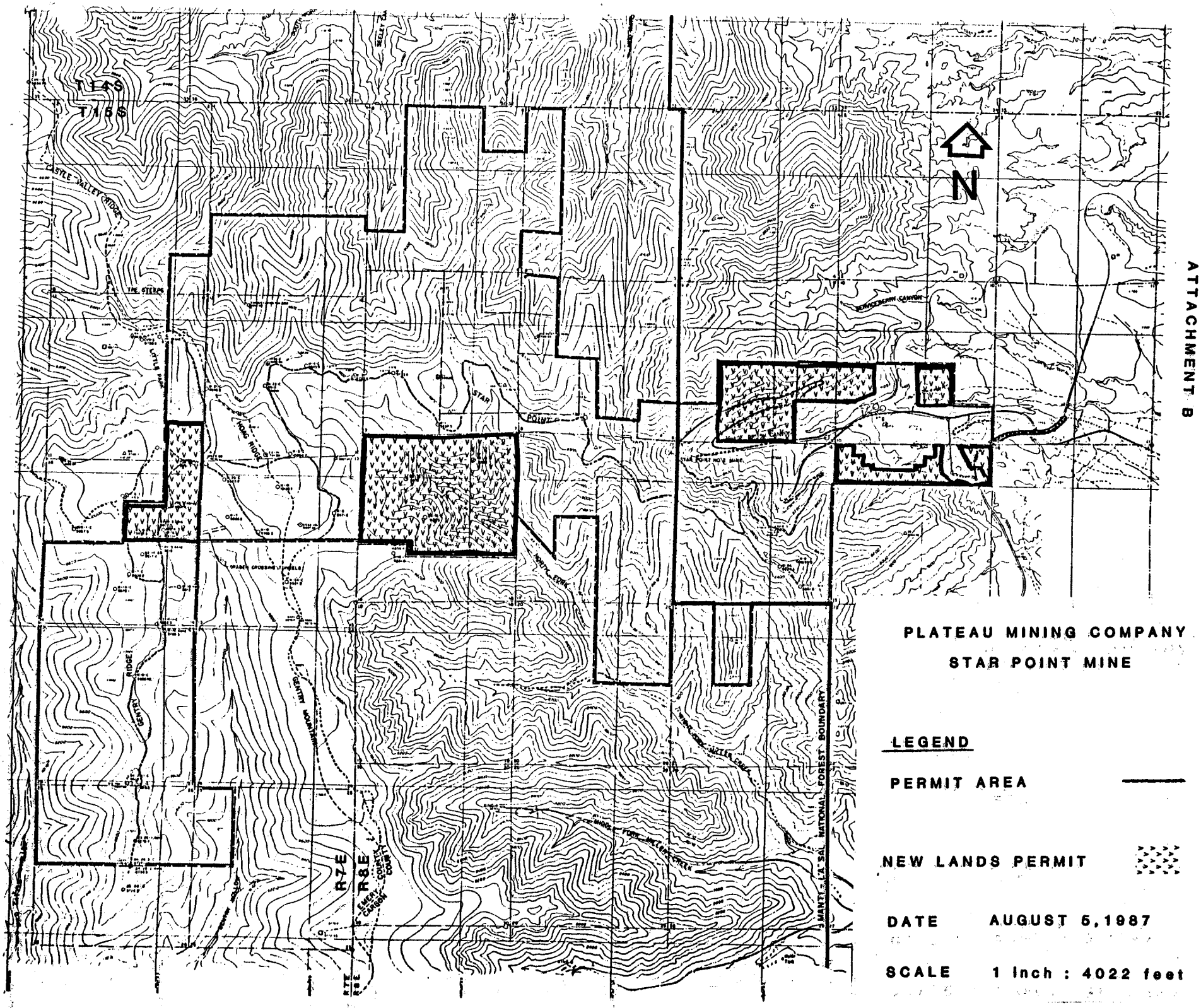
   (B) the Division has evaluated potential environmental degradation.

Stipulation 817.150-.176-(1)-(PGL)

Plateau Mining Company shall submit by October 31, 1987, for inclusion into the PAP, detailed descriptions and specifications for each road within the permit area to include: maintenance and reclamation details, maps showing location, and cross sections of each road in the permit area.

1260/16-21

ATTACHMENT B



PLATEAU MINING COMPANY
STAR POINT MINE

LEGEND

PERMIT AREA ——

NEW LANDS PERMIT

DATE AUGUST 5, 1987

SCALE 1 Inch : 4022 feet