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Act 007/006 #3

TECHNICAL ANALYSIS

For The Castle Valley Ridge Lease Star Point Mine ACT/007/006

January 6, 1995

ENVIRONMENTAL RESOURCE INFORMATION

VEGETATION RESOURCE INFORMATION

Regulatory Reference: R645-301-321

Analysis:

Permit Area Vegetation Map, 321.100a, delineates the vegetative communities within the Castle Valley Lease Tract. Species list by vegetation type are included in Table 321.100c, page 300-5. In addition to this vegetation information, the mining and reclamation plan includes Color-Infrared photography from the United States Forest Service of the permit area (page 500-29a) as baseline information. The permittee has assisted financially with this study.

Findings:

The vegetation resource information in the plan is acceptable and found to be complete and technically adequate.

FISH AND WILDLIFE RESOURCE INFORMATION

Regulatory Reference: R645-301-322

Analysis:

Map 322.220a, Wildlife Habitat Type, delineating fish and wildlife information, includes the area of the Castle Valley Ridge. The area is designated as high priority elk winter range. There is the area, a redtail hawk nest in an aspen tree. Table 322.2 300-66 through 300-79 list the mammals, birds, reptiles and likely to occur within the permit area. Annual raptor surveys

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ACT/007/006#3

TECHNICAL ANALYSIS

For The Castle Valley Ridge Lease Star Point Mine ACT/007/006

January 6, 1995

ENVIRONMENTAL RESOURCE INFORMATION

VEGETATION RESOURCE INFORMATION

Regulatory Reference: R645-301-321

Analysis:

Permit Area Vegetation Map, 321.100a, delineates the vegetative communities within the Castle Valley Lease Tract. Species list by vegetation type are included in Table 321.100c, page 300-5. In addition to this vegetation information, the mining and reclamation plan includes Color-Infrared photography from the United States Forest Service of the permit area (page 500-29a) as baseline information. The permittee has assisted financially with this study.

Findings:

The vegetation resource information in the plan is acceptable and found to be complete and technically adequate.

FISH AND WILDLIFE RESOURCE INFORMATION

Regulatory Reference: R645-301-322

Analysis:

Map 322.220a, Wildlife Habitat Type, delineating fish and wildlife information, includes the area of the Castle Valley Ridge. The Castle Valley Ridge area is designated as high priority elk winter range. There is only one nest shown in the area, a redtail hawk nest in an aspen tree. Table 322.200a, b, and on pages 300-66 through 300-79 list the mammals, birds, reptiles and amphibians that are likely to occur within the permit area. Annual raptor surveys have been conducted by

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the permittee and the Division of Wildlife Resources. This nest activity status is summarized in Table 322.200f, page 300-89.

Hymenoxys helenoides, is considered by the Forest Service to have sensitive status. Forest Service reported a population of H. helenoides in Nuck Woodward Canyon. However, a site survey did not locate this population. No other plant species of special status is known to occur in the Castle Valley Ridge area (page 300-59).

The bald eagle is a rare winter resident of this region. There is a possibility that trees in the area would be utilized for roosting (page 300-89).

Baseline data for macroinvertebrates in Nuck Woodward Creek will be reported in the 1993 and 1994 annual report.

Findings:

The fish and wildlife resource information in the plan is acceptable and found to be complete and technically adequate.

OPERATION PLAN

VEGETATION AND FISH AND WILDLIFE INFORMATION

Regulatory Reference: R645-301-330

Analysis:

No surface disturbance is proposed within the Castle Valley Ridge lease area. Therefore, the only expected impacts to fish, wildlife or vegetation would be from subsidence. The permittee has committed to mitigation or replacement of any material damage caused by subsidence (page 500-29). Although no resource damage is expected from subsidence, monitoring of vegetation, macroinvertebrates and raptors will verify this position. The permittee has committed to annual raptor surveys and to report the results of such surveys (page 300-89). No identified nests are within the subsidence zone of mining activities within the Castle Valley Ridge lease area.

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Nuck Woodward Stream will be monitored for macroinvertebrates according to the schedule shown in Table 322.220b, page 300-101. The intent of the monitoring is to assess if subsidence has increased sediment loading on the stream. No mining is to occur under the stream area itself. The intermittent stream channel of Little Park Canyon will also not be undermined. (page 500-29).

The effects of subsidence on vegetation will be assessed by Color-Infrared photography. The photography is done every five years and reports submitted to the U.S. Forest Service and the Division (page 500-29a).

Findings:

The vegetation and fish and wildlife information in the plan is adequate and found to be complete and technically adequate.

Certifications

Regulatory Reference: R645-301-512

Analysis:

The maps which have been revised for the Castle Valley Ridge lease tract are Map 112.500a--Surface Ownership, Map 112.500b--Coal Ownership, Map 222.100a--Permit Area Soils Map, Map 321.100a--Permit Area Vegetation Map, Map 322.220a--Wildlife Habitat Type, Map 521.121f--Subsidence Monitoring Plan, Map 521.121g1--Subsidence Monitoring Plan, Map 624.110Xb--Geologic Cross Section b-b', Map 722.100c--1993 Piezometric Surface, Map 728a--Regional Hydrology, Map 728b--Gentry and Castle Valley Ridge Mine Inflows and Stream Inventory Locations, and Map 722.100c--1993 Piezometric Surface.

Of the maps listed above, only Maps 112.500a, 112.500b, 624.110Xb, 722.100c, 728a, 728b, and 722.100c require certification by a registered professional engineer or land surveyor. These maps have the required certification.

Findings: The application fulfills the requirements of this section.

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COMPLIANCE WITH MSHA REGULATIONS AND MSHA APPROVALS

Regulatory Reference: R645-301-513

Analysis:

The entire Castle Ridge Valley lease tract will be accessed underground through the existing mine. There are, therefore, no coal processing waste dams and embankments, sedimentation ponds, impoundments, spoil or waste disposal facilities, refuse piles, discharges into underground facilities, surface coal mining activities, or coal mine waste fires associated therewith, which require regulation and approval by MSHA.

No surface facilities or proposed with this lease addition.

Findings: The application fulfills the requirements of this section.

CROSS SECTIONS AND MAPS

Regulatory Reference: R645-301-521

Analysis:

The maps which have been revised for the Castle Valley Ridge lease tract are Map 112.500a--Surface Ownership, Map 112.500b--Coal Ownership, Map 222.100a--Permit Area Soils Map, Map 321.100a--Permit Area Vegetation Map, Map 322.220a--Wildlife Habitat Type, Map 521.121f--Subsidence Monitoring Plan, Map 521.121g1--Subsidence Monitoring Plan, Map 624.110Xb--Geologic Cross Section b-b', Map 722.100c--1993 Piezometric Surface, Map 728a--Regional Hydrology, Map 728b--Gentry and Castle Valley Ridge Mine Inflows and Stream Inventory Locations, and Map 722.100c--1993 Piezometric Surface.

These maps have all been revised to show the anticipated mine layout, the surface and subsurface ownership, the surface configuration, the geology, the anticipated surface facilities, and the subsidence monitoring system associated with the new lease tract. As the entire Castle Valley Ridge lease tract is underground, the rest of the mining operation remains as it is represented in the approved plan.

Findings: The application fulfills the requirements of this section.

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COAL RECOVERY

Regulatory Reference: R645-301-522

Analysis:

The permittee is committed to maximum coal recovery. Mining in the Castle Valley Ridge lease tract will be done mainly by longwall methods, which allow for the highest coal recovery rates of any available technology. Continuous mining machinery will be used to create permanent pillars beneath Little Park Channel and, of course, to do the entry development work for the longwall panels. Pillars will be recovered in continuous miner sections wherever possible. Using these methods, the permittee expects to reach an overall net coal recovery rate of approximately 75%.

A Resource Recovery and Protection Plan (R2P2) was approved by the BLM in September of 1991 and modified in November of 1992 to allow for increased production. The modified R2P2 allows for a raw production rate of 3 million tons per year through the year 2000, after which the production rate will drop to 700,000 tons per year for the remaining 10 years of anticipated mine life.

Location in Plan: Pages 500-7 through 500-13.

Findings: The application fulfills the requirements of this section.

MINING METHOD(S)

Regulatory Reference: R645-301-523

Analysis:

Mining in the Castle Valley Ridge lease tract will be done mainly by longwall methods, which provide the highest coal recovery rates of any available technology. Continuous mining machinery will be used to create permanent pillars beneath Little Park Channel, and, of course, to do the entry development work for the longwall panels.

Location in Plan: Pages 500-8 through 500-14.

Findings: The application fulfills the requirements of this section.

SUBSIDENCE

Regulatory Reference: R645-301-525

Analysis:

The permittee has performed a subsidence survey of the surface area, as required by this section. The land is used mainly for cattle grazing and wildlife habitat, and somewhat less for recreation. There are several natural springs. The only manmade structure in the area which could be adversely affected by subsidence is an unimproved U.S. Forest Service road, and this the permittee has committed to repair in the event that it is damaged by subsidence.

To measure subsidence, the permittee will extend the present network of monitoring points to cover the area of the lease tract. The placement of subsidence monitoring points is shown on Maps 521.121f and 521.121g1. The coal in the lease tract will be cut east to west, figuratively speaking, into two large blocks. The northern block will be crossed from east to west by a line of monitoring points. The southern block will also be crossed from east to west by a line of monitoring points, while another line of monitoring points will extend northward from about the midpoint of the southern edge of the block to join this line near its midpoint. Several lines of monitoring points also extend and will extend east to west from the potential subsidence zone into Nuck Woodward Canyon. All monitoring points will be placed at 200-foot intervals.

The permittee has had concern about the possible deleterious effect of subsidence on Little Park Channel, which crosses the lease tract area in an east-to-west direction, and on Nuck Woodward Canyon, which parallels the western boundary of the area. The permittee is particularly concerned about Nuck Woodward Canyon because a perennial stream flows there.

To prevent damage to Little Park Channel, the permittee will leave a large barrier pillar beneath the channel to prevent subsidence from occurring above the entries which will be located there. This barrier pillar was designed to have a minimum static safety factor of 2.04 using a 26° angle of draw, which is the largest angle of draw encountered during previous mining in this area.

To prevent damage to the perennial stream in Nuck Woodward Canyon, the permittee has designed the placement of mine workings so that subsidence, projected upward using the conservative 26° angle of draw, will fall several hundred feet short of the stream channel. If this precaution proves inadequate and subsidence approaches too near the stream channel, as measured by the movement of the surface monitoring points, mining in a westerly direction will be stopped.

The permittee also commits to the mitigation, in general, of subsidence damage. Where cracks or fissures occur which injure or endanger livestock, the permittee will repair the crack or fissure and reimburse the livestock owner for the lost livestock. Where groundwater sources are damaged or impaired by subsidence, the permittee will either directly repair and rehabilitate the water source or else develop an alternative water source in the same area. The mitigation of damage to groundwater sources is treated more fully in Section 700 of the plan

Subsidence information is found on pages 500-16 through 500-32, Map 521.121f, and Map 521.121g1.

Findings: The application fulfills the requirements of this section.

MINE FACILITIES

Regulatory Reference: R645-301-526

Analysis:

There will be no surface facilities above the Castle Valley Ridge lease tract. The coal will be accessed through the existing underground mine.

Findings: The application fulfills the requirements of this section.

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TRANSPORTATION FACILITIES

Regulatory Reference: R645-301-527

Analysis:

No roads or transportation facilities are proposed to be constructed with the Castle Valley Ridge Tract.

Findings: The application fulfills the requirements of this section.

HANDLING AND DISPOSAL OF COAL, OVERBURDEN, EXCESS SPOIL, AND COAL MINE WASTE

Regulatory Reference: R645-301-528

Analysis:

The entire Castle Valley Ridge lease tract operation will be underground. There are, therefore, no disposal facilities for coal, overburden, excess spoil, noncoal mine waste, or coal mine waste associated therewith.

Findings: This section is not applicable to the application.

MANAGEMENT OF MINE OPENINGS

Regulatory Reference: R645-301-529

Analysis:

The entire Castle Valley Ridge lease tract operation will be underground. There are, therefore, no breakouts or other mine entries associated therewith.

Findings: The application fulfills the requirements of this section.

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ROADS

Regulatory Reference: R645-301-534

Analysis:

No roads or transportation facilities are proposed to be constructed with the Castle Valley Ridge Tract.

Findings: The application fulfills the requirements of this section.

GEOLOGIC INFORMATION

CHEMICAL ANALYSES OF STRATA IMMEDIATELY ABOVE & BELOW THE COAL SEAM TO BE MINED

Regulatory Reference: R645-301-624.210 through R645-301-624.330

Analysis:

The permittee's proposal to assess the acid- or toxic forming or alkalinity producing potential for the strata immediately above and below the coal seam within the Castle Valley Ridge Lease Tract may be located on page Confidential 16, Volume VII and reads as follows: *As mining progresses into the Castle Valley Ridge area, additional roof, floor and split rock samples will be analyzed for the toxic forming/acid forming potential according to the parameters list shown on page Confid 17. Sites for these samples are shown on Map 116. 100c Mine Plan, Wattis Seam, as solid hexagon with no number. Four sample locations are anticipated to characterized the material. This material ultimately becomes coal processing waste deposited in the refuse pile.*

Findings:

The permittee's commitment to chemically analyze the strata immediately above and below the coal seam to be mined is adequate to fulfill the requirements of R645-301-624.220 & 320.

The permittee must submit to the Division upon receipt analytical results from the aforementioned roof, floor and mid seam sample collection.

If determined to be necessary to protect the hydrologic balance or the meet the performance standards of R645-301 and R645-302, the Division may require the collection, analysis and description of geologic information in addition to that required by R645-301-624.

HYDROLOGIC INFORMATION

Regulatory Reference: R645-301-729

Analysis:

The Operator has provided the necessary supporting information to describe the impacts to the hydrologic balance and the potential for impacts outside the permit area. The operator has minimized impacts to the hydrologic balance inside the permit area. Any impacts have been described in the PHC and are currently being monitored and will continue to be monitored for as long as wells are accessible underground. These impacts can be described as a redistribution of ground water from the aquifers above and below the coal seam which is drained into current mine workings and then pumped to abandoned mine workings. This intercepted ground water is pumped across the Bear Canyon Graben to old mine works. The range in-mine pumping rates is from 800 to 1300 gpm at the "Graben Goose" flow meter, a central pumping point. A graph of these flows is found in Exhibit 728a in the PAP

The most significant inflows as of October 1993, within the Gentry Ridge area, are found in the southern extent of the mine workings. As the mine progresses in a southerly direction beneath Gentry Ridge, mining continues to dewater the ground water found in fractures immediately above the mine. No mining-related impacts to the hydrologic balance outside the permit area have been substantiated to

date. All potentially-impacted resources have been described, and the sampling schedule is summarized in Table 731.211a and the sampling sites are as shown on Map 722.200a. Water levels and water quality data is included in the Annual Hydrologic Summary Reports for six surface wells and from seven in-mine wells. A summary of the data used in the analysis of the local water table is shown in Table 728c, pages 700-80 and 700-81 of the PAP.

In regard to the Castle Valley Ridge Lease UTU-64263, two wells were drilled to confirm the location of the water table in relation to the coal seam. Well 92-10-1 was drilled in Little Park Canyon and was completed in the upper 35 feet of the Star Point Sandstone. The water table in this well was found in the Star Point Sandstone well below the Wattis coal seam (mineable coal seam in this lease). The second Well P-91-01-WD was drilled in-mine to a depth of 144 feet below the coal on October 1, 1993 and as of October 19, 1993 this well was found to be dry. This has confirmed the previously collected data for water levels and confirmed the data collected from Well 92-01C-WD. Additionally, as the mine progresses, the permittee has committed to drilling two additional wells into the Star Point Sandstone, in the Castle Valley Ridge Lease, to monitoring long term changes to the hydrologic balance in the permit area, and to verifying water levels to the north. These locations are shown on Map 728b and commitment to drill these are found on page 700-82.39 of the PAP. P92-02-WD and P92-04-WD will be left as in-mine monitoring wells. The surface well, 86-26-6, at the south end of gentry ridge will be used to monitor long term impact following mine closure.

Findings:

The operator has provided an adequate assessment of the Probable Hydrologic Consequences on the quality and quantity of surface and ground water under seasonal flow conditions for the proposed expansion into lease UTU-64263. After an analysis of all baseline hydrologic, geologic, and other information found in the PAP, the division concludes that the proposed coal mining operation and reclamation activities have been designed to prevent material damage to the hydrologic balance outside the permit area.

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RECLAMATION PLAN

Casing and Sealing of Underground Openings

Regulatory Reference: R645-301-551

Analysis:

During the exploration of the Castle Valley Ridge Lease, one drill hole (92-10-1) was completed as a ground water monitoring well. This well will continue to be monitored until during final reclamation it will be plugged. The operator has committed to plug all monitoring wells from bottom to top at final reclamation.

Findings: The application fulfills the requirements of this section.

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