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STATE OF UTAH
NATURAL RESOURCES
Wildlife Resources

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cc: DR Nielson
J Whitehead
K Mutz
org to mine file

Norman H. Bangerter, Governor
Dee C. Hansen, Executive Director
William H. Geer, Division Director

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DIVISION OF
OIL, GAS & MINING

ACT/015/019
#13

March 25, 1986

Dr. Dianne R. Nielson, Director
Utah Division of Oil, Gas and Mining
355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, UT 84180-1203

Attn: John Whitehead and Kathy Mutz

Dear Dianne:

In regard to Utah Power & Light Company's proposed monitoring plan for eagle nesting and subsidence associated with the Cottonwood Mine, the following is offered for your consideration.

The division has reviewed the Company's proposed monitoring plan and find the seven objectives to be cumbersome and without the appropriate definition. It is recommended that the objectives be trimmed and modified such that only four exist. The following are recommended:

1. Establish trend data for golden eagle nest populations within UP&L's East Mountain mine plan area and nearby environments. This would be known as the study area.

2. Determine the rate of cliff spalling as affected by subsidence in the Newberry (experimental) and Miller Canyon (control) nesting areas.

3. Determine the effects of mining and subsidence on golden eagle nest activity in Newberry and Miller Canyons.

4. Identify potential mitigation measures for subsidence impacts to golden eagle nests.

In order to accomplish Objective 1, the Company needs to contract for a helicopter, either a Hughes 500 or a Jet Ranger with complete onboard communications, capable of transporting three field personnel. It is recommended that those personnel be represented by the Division of Wildlife Resources, U.S. Fish and Wildlife Service and Utah Power & Light Company. The helicopter inventory needs to make an intensive survey of the entire study area to determine the location of raptor nests and the status of such during the last half of the month of May. Such a task would require approximately ten hours of flying time.

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In order to accomplish Objective 2, the cliffs associated with Newberry Canyon need to be monitored through the use of electronic distance meters (EDM) this should occur at two month intervals throughout the period of mining as well as during post-mining until a time when subsidence has ceased. Although UP&L anticipates that the subsidence would be fairly rapid following the completion of mining, that question still remains unresolved. Therefore, it is recommended that monitoring with EDM equipment continue for a minimum of two years post-mining. In addition a photographic sampling of ten percent of the cliff face in Newberry and Miller Canyons, which represents experimental and control situations respectively, should be made to determine the degree of spalling. This can be accomplished by having permanent photo locations over which a grid can be laid for statistical analysis. Such a grid should be of complexity to allow replications and pooled data analysis.

In order to accomplish Objective 3, the Newberry Canyon area needs to be monitored from the ground for a four hour period during six different time periods (late February, early and late March, mid-April, mid-May and early June). The purpose of this monitoring is to determine the nature of eagle activity associated with the four nest sites known in Newberry Canyon. Data collected is to be correlated with underground mining activities, EDM measurements and cliff spalling data.

In order to accomplish Objective 4, the company needs to search the literature and determine what other scientists have accomplished in the arena of mitigation relative to raptor nesting, particularly eagles. Without question, the mitigation potential can be expanded and manipulated by Utah Power and Light Company to fit the needs of their particular mining operation.

It is important to stress that the monitoring plan submitted to date by UP&L roughly indicates a monitoring technique. From a cursory position this technique appears to be nearly adequate. However, UP&L should be encouraged to draft a very detailed, but yet concise, monitoring plan such that the anticipated goals and associated methodology can be adequately evaluated. It is also important to note that the data collected under Objective 1 will have the least utility in the decision making process concerning the effect of underground coal mining and subsidence on raptor nesting.

Thank you for an opportunity to review and provide comment on this plan.

Sincerely,

William H. Geer
Director

Cottonwood Amendment
#10 and #3
ACT/015/019

GOLDEN EAGLE NESTING/CLIFF SUBSIDENCE

MONITORING PLAN

INTRODUCTION

Under provisions of the Eagle Protection Act (16 U.S.C. 668-668d), disturbance to golden eagles, their eggs or nests is prohibited. Additionally, all raptor nests are protected under the Migratory Bird Treaty Act (16 U.S.C. 703-718).

Active golden eagle nests have been located by the Fish and Wildlife Service (FWS) within the boundaries of Utah Power and Light Company's (UP&L) coal mining properties. Several nests are situated on vertical sandstone cliffs which overlie the Sixth and Seventh East longwall panels in the Cottonwood Mine. FWS has expressed concern that potential subsidence associated with mining may affect the cliffs and nesting sites.

The effects of subsidence on the local golden eagle population are unknown. Therefore, as a condition for mining permit approval, UP&L must prepare and implement a monitoring plan to study the effects of mining related subsidence on nest sites, and the effects of nest losses, if they occur, on the local golden eagle population. Data acquired from the study will be made available to the various agencies.

The monitoring plan area encompasses UP&L's Wilberg/Cottonwood, Des Bee Dove and Deer Creek Mine properties with two (2) specific study locations, Newberry Canyon and Miller Canyon, designated for intensive study.

OBJECTIVES:

Following are the objectives of the monitoring plan.

1. Establish golden eagle population baseline data within the mine plan area. large area

2. Establish baseline inventory data on golden eagle nest sites.

3. Determine if subsidence occurs in the Newberry Canyon nesting area. Milw

4. Determine the effects of subsidence on golden eagle nest sites in Newberry Canyon.

5. Determine the effects of subsidence on golden eagle nesting behavior. success. / abandon

6. Determine the effects of subsidence on the local golden eagle population.

7. Determine the need for and identify mitigation measures for lost active golden eagle nests, if a loss occurs. compensate?

METHODOLOGY

The subject nest sites are located on vertical sandstone cliffs in Newberry Canyon (see Drawing WU-216E). A cluster of four (4) golden eagle nests was located during FWS Raptor Surveys in 1981 and 1982. The nests are situated on vertical sandstone cliffs approximately 61 meters (200 feet) in height. The nests are located at an elevation of approximately 2591.5 meters (8500 feet) ASL.

BASELINE DATA

Population baseline data will be collected annually using a helicopter and observation personnel selected by UP&L. Currently accepted available methods will be employed to estimate the golden eagle population and assess the accuracy of the estimate. Population data will be collected and analyzed for the mining area. This will establish the control necessary to determine population trends and assess the impact of subsidence on the local eagle population. Nesting population trend indices may include; annual use patterns of nest sites, the number of active nests located per hour of survey time or other viable parameters. A nest will be considered active if egg laying has occurred.

define

FWS will check def?

Baseline nest site inventory data will be collected concurrently with the population data. Inventory data will include:

1. Location of all golden eagle nests in the study area. (Mapped at scale of 1" = 500').
2. Qualitative description of physical condition of nest and nest site.
3. Assessment of nest use status.
4. Photographs of nest and nest site.

Collection of the baseline data will require that the helicopter approach the nest in close proximity; therefore, proper scheduling of the annual inventory flights is essential to avoid unnecessary disturbances. Current information indicates that golden eagles most readily abandon their nests during the period of incubation. Therefore, the inventory flights will be completed between May 1st and June 1st to minimize disturbance of the nest during the incubation and brooding periods. This will result in less stress to the nestlings if the parents should leave the nest temporarily.

too late?

2 flights? - can you tell Fledge 2-3rd wk June.

Additional baseline data to be collected at the Newberry Canyon nest sites will include:

1. Electronic distance meter (EDM) subsidence monitoring data.
2. Ground station photographs of nests and nest site areas.

Visible?

3000' distance across canyon

Ground photo-station data will also be collected at Miller Canyon. The methodology of data collection is discussed in the monitoring portion of this plan.

MONITORING

Subsidence monitoring in the mine plan area will be completed as presently outlined in the UP&L Subsidence Monitoring Plan.

at 4900'
h 2 1/2"
V .86"

Additional subsidence monitoring will be accomplished in the Newberry Canyon area through the use of EDM equipment. Prior to longwall mining, a permanent control station will be located (horizontally and vertically) from which the cliff nesting area can be observed. Reflector prisms will be installed on the sandstone cliff above the nest sites. The prisms will be located (horizontally and vertically) in reference to the permanent control station. This will provide a method of determining both horizontal and vertical movement in the cliff strata.

Initial pre-mining observations will provide baseline information for the cliff strata. Once extraction of the longwall panel begins, observation will be conducted at two (2) month intervals as conditions permit throughout the mining period until such time that data indicates subsidence has ceased or a maximum of two (2) years after mining is completed. This method of observation will facilitate correlation of surface subsidence with the position of the longwall face, and will provide data on subsidence following termination of mining.

Fracturing and spalling of the cliff face will be determined by a ground station photo/grid system. Permanent photo stations will be located from which photographs of the nests and related cliff face can be taken.

Photographs will be taken using a 35 mm SLR camera with a tele-photo lens. A grid system will be superimposed upon the photographs whereby areas of fracturing and/or spalling can be identified. Photographic observations will be conducted according to the same schedule as the EDM monitoring.

Photo/grid observations will also be conducted at the Miller Canyon nest site area. The photo/grid system will provide quantifiable data for comparing subsidence related cliff spalling in Newberry Canyon and natural spalling in Miller Canyon.

A report summarizing the results of data collection and analysis will be submitted as a section of UP&L's Annual Subsidence Monitoring Report, a copy of which will be provide to FWS.

MITIGATION

Success

Assessment, of the effects of subsidence on golden eagle nesting behavior and the local population trends, will be based upon data obtained from the baseline and monitoring studies.

The need for mitigation of lost active nests, birds or eggs will be determined on a case by case basis. Use of alternate nests by a breeding pair of golden eagles is well documented. It has also been observed that some pairs nest during alternate years. These factors, in addition to the availability of an extensive area for natural nest sites, must be considered in the development of proposed mitigation.

SUMMARY

The Golden Eagle Nesting/Cliff Subsidence Monitoring Program encompasses the mine plan area, within which a control study area (Miller Canyon) and the affected area (Newberry Canyon) are identified. Four (4) golden eagle nests have been observed in Newberry Canyon which overlies Sixth and Seventh East longwall panels. Ten (10) nests have been observed in Miller Canyon.

Assessment of golden eagle population trends will be based on annual nest inventories conducted in the mine plan area.

Assessment of the impact of subsidence on golden eagle nesting activity will be based on data collected in Newberry Canyon (affected area) and Miller Canyon (control area). The data will be analyzed by UP&L personnel and the results will be submitted as part of the Annual Subsidence Monitoring Report.

Mitigation of lost active nests, birds or eggs, will be determined on a case by case basis. Development of mitigation measures will be accomplished in cooperation with the appropriate agencies.