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ECological Evaluation of Proposed Monitoring Well Sites

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CYPRUS PLATEAU MINING CORPORATION
WILLOW CREEK PROJECT
ECOLOGICAL EVALUATION OF PROPOSED MONITORING WELL SITES

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June 1994

CYPRUS PLATEAU MINING CORPORATION
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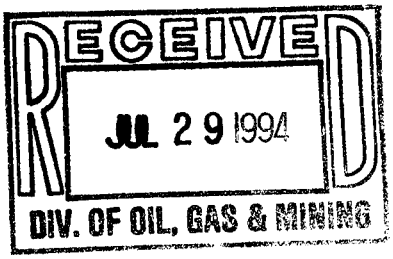
ECOLOGICAL EVALUATION OF PROPOSED MONITORING WELL SITES



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ECOLOGICAL EVALUATION OF PROPOSED MONITORING WELL SITES

Alrad Canyon Proposed Monitoring Well Site

The Alrad Canyon monitoring well site is proposed within a previously unaltered location within the NW¼ of Section 12, T13S, R10E at an elevation of approximately 7,300 feet. Associated with the proposed site will be an approximate 100 foot spur access road from an existing "2-track" road which extends up the canyon bottom. This portion of the canyon is dominated by a mountain brush community with a scattered intermix of pinyon/juniper woodland. Occasional patches of grassland are observable on slope faces exhibiting deeper soils. The immediate vicinity of the proposed drill site and access road can be characterized as an oakbrush vegetation community with intermittent patches of sagebrush/snowberry. Cattle were directly observed in this immediate area, and evidence of significant past use (paucity of decreaser species) was readily evident.

Rimrock typical of the Bookcliffs is well expressed in Alrad Canyon, however, use of these rock faces by cliff nesting raptors appears to be limited by prey availability or some other factor as opposed to nesting opportunities. Evidence of this phenomenon is expressed by the availability of a multitude of ledges, shallow caves, and/or wind blown pockets of which only a very few of such opportunities exhibit indications of nesting. In this regard, only two raptor nests were found within one-half mile of the proposed drill sites during helicopter surveys conducted on June 6, 1994[1]; however, two additional nests were located just outside the one-half mile radius search area the following morning. As observable on figure WCBL-W1, the closest nest to the proposed monitoring well site is located approximately 600 feet ESE and 300 feet above. This nest is located in a large vertical crack in south-facing rimrock with no direct "line-of-sight" to the proposed well location. The nest is of stick construction; apparently inactive during 1994 as evidenced by the lack of whitewash, fresh sticks, or recent feathers; and large enough to be that of a Golden Eagle.

The second nest is located about 1,000 feet NNE and 300 feet above the proposed monitoring well site. This nest is located on a ledge in south-facing rimrock with a direct "line-of-sight" to the proposed well location. The nest is of stick construction; apparently inactive during 1994 as evidenced by the lack of whitewash, fresh sticks, or recent feathers; and small enough to likely be that of a raven, however, occupancy by red-tailed hawks would be possible,

The third and fourth nests are located over 3,000 feet distant within Cordingly Canyon west of the proposed well site. These two nests appear to be alternates as they are located on rimrock along a rock ledge with approximately 80 feet of separation. Both nests are of stick construction; apparently inactive during 1994 (although one nest looked to have a small amount of material which might have been fresh in 1993); and were of a size sufficient to support a buteo such as a red-tailed hawk.

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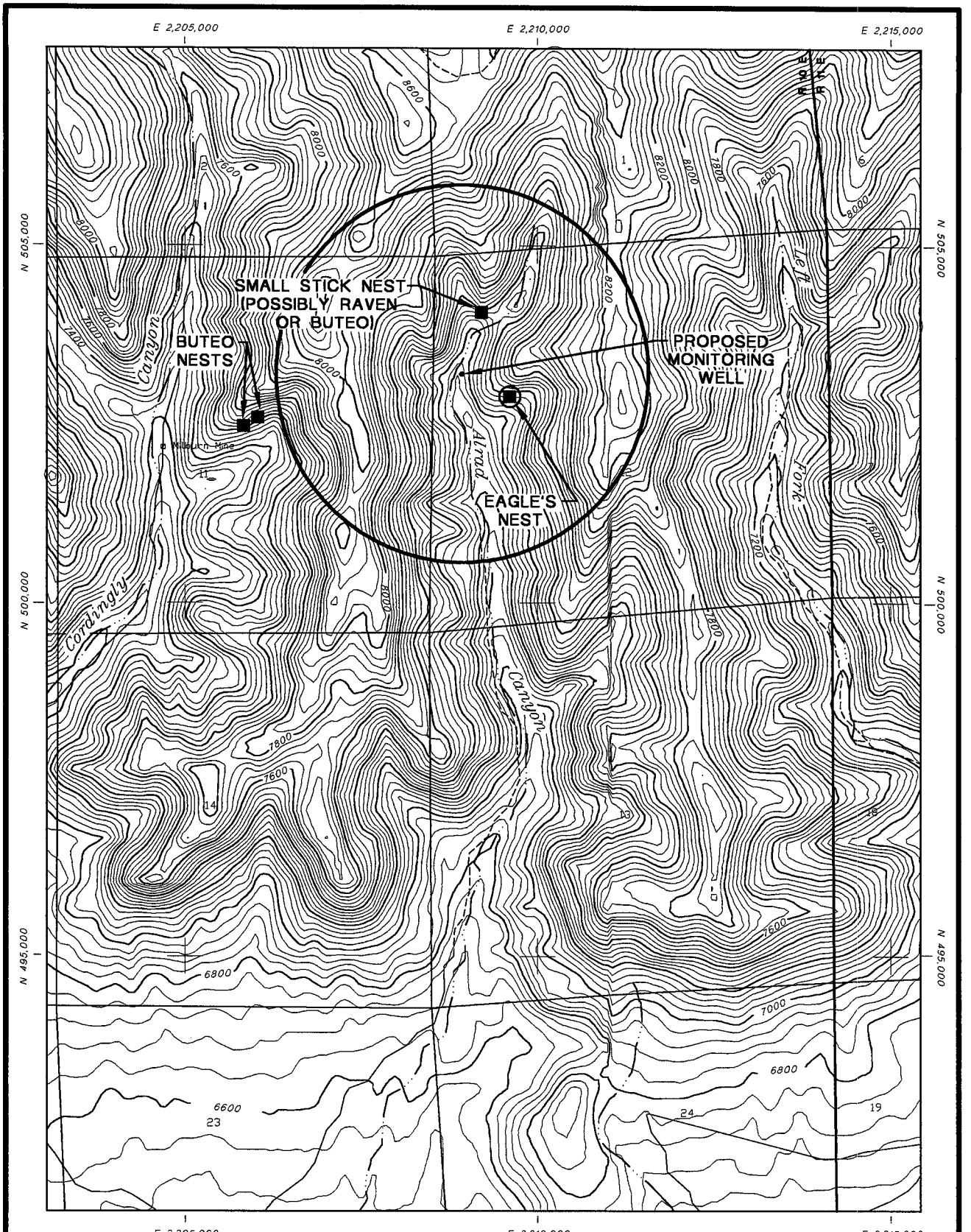
[1]Helicopter surveys of the three proposed monitoring well sites and a one-half mile buffer zone were implemented the morning of June 6, 1994 with Mr. Bill Bates of the UDWR as primary observer and Mr. Ben Grimes of Cyprus as the additional observer. Only two nests were observed as discussed in text. The following morning, a second, less intensive survey was implemented with Mr. Steven Viert of Cedar Creek Associates, Inc. as primary observer. Two additional nests were located immediately outside the one-haft mile buffer during the second survey. In addition, to the helicopter surveys, follow-up ground surveys were implemented on June 7, to verify previous observations and to visually evaluate any evidence of tree nesting by raptors.



Project No.:	Design By:	Scale:
866-3200	J.NETTLETON	1"=2000'
File:	Drawn By:	Date:
RAPNEST.DWG	K.CONRATH	JULY 1994

TerraMatrix
Engineering & Environmental Services
1475 Pine Grove Road, P.O. Box 774018
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FIG. WCBL-W1

CYPRUS Plateau Mining

ALRAD CANYON WELL SITE
RAPTOR SURVEY 6/94

With regard to sensitive flora on the well site and access road proper, none were observed. Furthermore, no unique habitats were identified which might predispose the existence of sensitive plants. The area is dominated by Gambel's oak *(Quercus gambelii),* Mountain big sagebrush *(Artemisia tridentata* ssp *vaseyana),* and Western snowberry *(Symphoricarpos occidentalis).* Subdominant species include: Utah serviceberry *(Amelanchier utahensis),* rubber rabbitbrush *(Chrysothamnus nauseosus),* and Douglas rabbitbrush (*Chrysothamnus viscidiflorus).* Remaining species observed in the area of the proposed well site are as follows:

Achillea millefollium	Western yarrow
Agropyron smithii	Western wheatgrass
Antennaria parvifolia	Littleleaf pussytoes
Artemisia ludoviciana	Louisiana sagewort
Carex sp.	Sedge
Crepis acuminata	Western hawksbeard
Elymus salina	Salina wildrye
Erigeron eatonii	Eaton fleabane
Eriogonum microthecum	Wild buckwheat
Festuca sp. (ovina ?)	Sheep fescue
Juniperus scopulorum	Rocky Mountian juniper
Lupinus argenteus	Silvery lupine
Mertensia viridis	Greenleaf bluebells
Penstemon watsonii	Watson penstemon
Phlox longifolia	Longleaf phlox
Pinus edulis	Pinyon pine
Senecio pauperculus	Balsam groundsel

From an ecological perspective, the brief and limited activity of establishing a monitoring well at this location will have at most a negligible measurable impact on the local flora and fauna.

Panther Canyon Proposed Monitoring Well Site

The Panther Canyon monitoring well site is proposed within a previously disturbed location (old road bed constructed in the early 70's) within the SW¼ of Section 5, T13S, R10E at an elevation of approximately 6,920 feet. This portion of the canyon is dominated by pinyon/juniper woodland and mountain brush communities with an occasional patch of grassland on slope faces exhibiting deeper soils. The immediate vicinity of the proposed drill site can be characterized as a blend of mixed brush and pinyon/juniper communities. Significant past use by livestock was readily evident given the paucity of decreaser species.

Rimrock typical of the Bookcliffs is also well expressed in Panther Canyon, and like Alrad Canyon, use of these rock faces by cliff nesting raptors appears to be limited by prey availability or some other factor as opposed to nesting opportunities. Following the helicopter surveys and

ground verification, no raptor nests were discovered within one-half mile of the proposed monitoring well location.

With regard to sensitive flora on the well site proper, none were observed. Furthermore, no unique habitats were identified which might predispose the existence of sensitive plants. The area is dominated by Mountain big sagebrush *(Artemisia tridentata* ssp *vaseyana)* and rubber rabbitbrush *(Chrysothamnus nauseosus)* with subdominance by Western snowberry *(Symphoricarpos occidentalis).* Remaining species observed in the area of the proposed well site are as follows:

Acer glabrum	Rocky Mountain Maple
Achillea millefollium	Western yarrow
Agropyron cristata	Crested wheatgrass
Agropyron smithii	Western wheatgrass
Antennaria parvifolia	Littleleaf pussytoes
Artemisia ludoviciana	Louisiana sagewort
Astragalus diversifolius	Meadow milkvetch
Bromus tectorum	Cheatgrass
Carex sp.	Sedge
Chrysothamnus viscidiflorus	Douglas rabbitbrush
Crepis acuminata	Western hawksbeard
Cryptantha humilis	Cryptantha
Elymus salina	Salina wildrye
Grindelia squarrosa	Curlycup gumweed
Juniperus scopulorum	Rocky Mountian juniper
Lepidium perfoliatum	Clasping pepperweed
Opuntia polyacantha	Plains prickly pear
Oryzopsis hymenoides	Indian ricegrass
Pinus edulis	Pinyon pine
Poa pratensis	Kentucky bluegrass
Quercus gambelii	Gambel's oak
Ribes cereum	Wax currant
Senecio pauperculus	Balsam groundsel

From an ecological perspective, the brief and limited activity of establishing a monitoring well at this location will have at most a negligible measurable impact on the local flora and fauna.

Dry Canyon Proposed Monitoring Well Site

The Dry Canyon monitoring well site is proposed within a previously disturbed location (old road bed constructed in the early 70's) within the NW¼ of Section 33, T12S, R10E at an elevation of approximately 7,020 feet. This portion of the canyon is dominated by

pinyon/juniper woodland and mountain brush communities on the south-facing slopes and Douglas-fir woodland and oakbrush along the bottoms and on north-facing slopes. The immediate vicinity of the proposed drill site can be characterized as a mix of early successional and Douglas-fir woodland communities. During the course of surveys for raptors and sensitive flora, definitive sign of several large and mobile wildlife species was noted along the access road, including: elk, mule deer, coyote, and black bear.

Rimrock typical of the Bookcliffs is also well expressed in Dry Canyon, and like Panther and Alrad Canyons, use of these rock faces by cliff nesting raptors appears to be limited by prey availability or some other factor as opposed to nesting opportunities. Following the helicopter surveys and ground verification, no raptor nests were discovered within one-half mile of the proposed monitoring well location. However, during ground surveys, both red-tailed hawks and turkey vultures were observed hunting over the canyon.

Furthermore, because of identified concern for potential nesting within Dry Canyon by goshawks (a protected tree-nesting species), an eliciting protocol was implemented on June 7, 1994. This protocol followed Kennedy and Stahlecker (1991), whereby an alarm call is broadcast during the nestling period (June through mid-July) in the effort to detect territorial defense activity on the part of goshawks. Implementation in Dry Canyon consisted of establishing a call station every 500 feet along the access road and at the proposed monitoring well location. At each station, an alarm call in excess of 100 decibels was broadcast for approximately 30 seconds in all directions followed by a 30 second rest period. Following the initial call, subsequent calling occurred for 10 second intervals in the direction of each major compass point with 30 seconds of rest between. Based on past experience with this protocol, any goshawks nesting within the canyon would have easily been summoned by this level of effort. However, no responses to the alarm call were elicited. This lack of observation is not unexpected given the marginal quality of habitat exhibited by the relatively sparse and submature nature of the Douglas-fir woodland presently existing within Dry Canyon.

With regard to sensitive flora on the well site proper, none were observed. Furthermore, no unique habitats were identified which might predispose the existence of sensitive plants. The area is dominated by young Douglas-fir *(Pseudotsuga menzieii),* Gambel's oak *(Quercus gambelii),* and rubber rabbitbrush *(Chrysothamnus nauseosus)* with subdominance by Western snowberry *(Symphoricarpos occidentalis),* Kentucky bluegrass *(Poa pratensis),* and goldenrod *(Solidago* sp.- likely *canadensis).* Remaining species observed in the area of the proposed well site are listed in the following table.

From an ecological perspective, the brief and limited activity of establishing a monitoring well at this location will have at most a negligible measurable impact on the local flora and fauna.

Achillea millefollium	Western yarrow
Agropyron cristata	Crested wheatgrass
Amelanchier utahensis	Utah serviceberry
Antennaria parvifolia	Littleleaf pussytoes
Artemisia ludoviciana	Louisiana sagewort
Astragalus diversifolius	Meadow milkvetch
Carex sp.	Sedge
Chrysothamnus viscidiflorus	Douglas rabbitbrush
Cirsium pulchellum	Thistle
Crepis acuminata	Western hawksbeard
Cryptantha humilis	Cryptantha
Cynoglossum officinale	Houndstongue
Erysimum inconspicuum	Smallflower erysimum
Grindelia squarrosa	Curlycup gumweed
Ipomopsis aggregata	Skyrocket gilia
Juniperus scopulorum	Rocky Mountian juniper
Melilotus officinalis	Yellow sweetclover
Oryzopsis hymenoides	Indian ricegrass
Penstemon eatonii	Firecracker penstemon
Phlox longifolia	Longleaf phlox
Pinus edulis	Pinyon pine
Plantago major	Common plantain
Ribes cereum	Wax currant
Rosa woodsii	Wood's rose
Sambucus cerulea	Elderberry
Senecio pauperculus	Balsam groundsel
Stipa viridula	Green needlegrass
Taraxacum officinale	Common dandelion
Tradescantia bracteata	Bracted spiderwort
Verbascum thapsus	Flannel mullein
Vicia americana	American vetch