INCORPORATED
EFFECTIVE:
JUL 3 0 1997
97B
UTAH DIVISION OIL, GAS AND MINING

APPENDIX 3-14

WOODY PLANT SPECIES DENSITY MEASUREMENTS OF THE PROPOSED DISTURBED RIPARIAN AREAS OF CRANDALL CREEK JUNE 1997

INCORPORATED
EFFECTIVE:
JUL 3 0 1997
97B
UTAH DIVISION OIL, GAS AND MINING

WOODY PLANT SPECIES DENSITY MEASUREMENTS OF THE PROPOSED DISTURBED RIPARIAN AREAS OF CRANDALL CREEK

1997

INCORPORATED
EFFECTIVE:
JUL 3 0 1997
97B
UTAH DIVISION OIL, GAS AND MINING

Prepared by

MT. NEBO SCIENTIFIC, INC.
330 East 400 South, Suite 6
P.O. Box 337
Springville, Utah 84663
(801) 489-6937

Patrick D. Collins, Ph.D.

for

ANDALEX RESOURCES, INC.
P.O. Box 902
Price, Utah 84501

June 1997

INCORPORATED
EFFECTIVE:
JUL 30 1997
97B
UTAH DIVISION OIL, GAS AND MINING

INTRODUCTION

The Crandall Canyon Mine is situated within Crandall Canyon, a tributary of Huntington Canyon. These canyons are located within a portion of the Wasatch Plateau in Emery County, Utah. Elevation of the study area ranged from 7,770 ft to 7,850 ft above sea level.

An area has been proposed for disturbance to accommodate expansion of the coal mine's surface facilities. The proposed disturbed area would primarily affect riparian and spruce/fir/aspen plant communities. The spruce/fir/aspen communities have been sampled previously (July 1996) and reported by *MT. NEBO SCIENTIFIC, INC.* (February 1997). Although vegetation sampling has also been conducted earlier in the riparian area by EIS (August 1995), biologists from the State of Utah, Division of Oil, Gas & Mining (DOGM) determined that woody species density measurements were also necessary as required by state regulations. This report documents results from woody species sampling within the riparian area at the Crandall Canyon mine site.

INCORPORATED
EFFECTIVE:
JUL 30 1997
97B
UTAH DIVISION OIL, GAS AND MINING

METHODS

Woody Plant Species Density

Density of woody plant species of the proposed disturbed areas were made using belt transects. These 5 ft by 25 ft belts were placed randomly adjacent to the creek in the areas where the stream flow influences the vegetation. Most of the entire length of the area that was proposed for disturbance were represented by the transects.

Total number of individuals by species were counted in each of the belt transects. The average number was then calculated followed by the number of individuals per acre.

Sample Adequacy

Sampling adequacy was calculated using formulas from Cochran (1977), with the goal of at least 80% confidence level with a 10% change in mean. The formula used is given below.

$$nMIN = \frac{t^2 s^2}{(dx)^2}$$

where,

nMIN	= minimum adequate sample
t	= appropriate confidence t-value
s	= standard deviation
x	= sample mean
d	= desired change from mean

INCORPORATED
EFFECTIVE:
JUL 3 0 1997
97B
UTAH DIVISION OIL, GAS AND MINING

Photographs

Color photographs were taken of the study area at the time of sampling. The photographs were not included in this report but are available upon request.

RESULTS

Total woody species density was estimated to be 11,224 individuals per acre in the riparian area. The most important woody plant species by density were Wood's rose (*Rosa woodsii*), whiplash willow (*Salix lucida*), and red-osier dogwood (*Cornus sericea*). Results of all species densities are shown on Table 1.

TABLE 1: Woody species densities of the proposed disturbed riparian areas of Crandall Creek.

	NUMBER/ACRE
Chrysothamnus nauseosus	217.80
Cornus sericea	1756.92
Juniperus scopulorum	29.04
Populus tremuloides	479.16
Picea pungens	14.52
Pseudotsuga menziesii	29.04
Ribes viscosissimum	14.52
Rosa woodsii	6112.92
Salix lucida	1960.20
Sherperdia canadensis	43.56
Symphoricarpos oreophilus	566.28
TOTAL MEAN DENSITY	11223.96
(STANDARD DEVIATION)	(3483.32)

INCORPORATED
EFFECTIVE:
JUL 30 1997
UTAH DIVISION OIL, GAS AND MINING