

The Effects of the Deer-Creek Mine  
C-2 Overland Conveyor  
on

Mule Deer Migration

RECEIVED

JUN 9 8 1993

DIVISION OF  
OIL, GAS & MINING

THE EFFECT OF THE DEER CREEK MINE

C-2 OVERLAND CONVEYOR

ON

MULE DEER MIGRATION

BY

VAL PAYNE

APRIL 1983

## ABSTRACT

This study indicates that the Deer Creek Mine, C-2 Overland Conveyor does not detrimentally affect the migration activities of mule deer in Deer Creek Canyon. The data obtained shows that deer cross the conveyor system at various locations and the installation of specific crossing structures is not necessary for migration to occur.

## INTRODUCTION

Man-made installations such as roads, fences and overland conveyors can have a detrimental effect on mule deer migration activities. These structures can form barriers which obstruct established migration routes between winter and summer ranges, thus disrupting normal activities which are essential for the animals survival.

The Deer Creek Mine, C-2 Conveyor System transects established migration routes which cross Deer Creek Canyon, thus creating a potential obstruction.

This study was designed for two purposes: (1) To determine if the conveyor system creates such an obstruction, and (2) Determine if crossing structures need to be installed to facilitate cross-canyon migration.

THE EFFECT OF THE DEER CREEK MINE C-2 OVERLAND CONVEYOR  
ON MULE DEER MIGRATION

The Deer Creek Mine C-2 Overland Conveyor traverses approximately 1.2 miles of broken terrain along the bottom of Deer Creek Canyon. It extends in a straight line, bearing N 49°34'50" E, from the C-1, C-2 Transfer Structure to the Huntington Power Plant Receiving Building (see Appendix B, Drawing DS-652B). The overall drop in elevation is approximately 400 feet. The height of the conveyor structure ranges from six feet to thirteen feet with ground clearances ranging from approximately one foot to seven feet. (The height and ground clearances in the area of the receiving building approach seventy feet.)

Deer Creek Canyon is transected by migration routes of Mule Deer. The location of the C-2 Conveyor results in it intersecting migration routes, particularly along the lower portion of the conveyor. The presence of the conveyor in the canyon could create a potential disruption of Mule Deer migration activities.

Reported deer activity near the conveyor indicates that negative effects are minimal. Mule Deer activity has been observed adjacent to the conveyor with deer being reported crossing under the conveyor.<sup>1</sup> The conveyor system was studied to assess the extent of crossing occurrences and thus determine if the need for crossing structures is indicated.

---

<sup>1</sup>State of Utah, Department of Natural Resources, Division of Oil, Gas and Mining, Inspection Memo, ACT/015/018-A, March 15, 1983.

The conveyor corridor was examined for evidence of deer crossing activity. The presence of deer tracks beneath the conveyor was interpreted as an indication that crossings had occurred. No attempt was made to estimate actual numbers of deer which had crossed at each site. The concentration of activity at the various crossing locations ranges from a single set of tracks to established trails.

Reported crossings have indicated that the deer crawl under the conveyor rather than jump over it; therefore, adequate ground clearance is a factor which could affect migration activity.

The height from the ground, directly beneath the conveyor, to the lowest point on the conveyor system was recorded at each crossing site. The location of crossing sites was related to the numbering system for the inverted "U" support structures. (See Appendix B, Drawings DS-653D and DS-589D, sheets 5 through 11.) The conveyor corridor was examined from C-1, C-2 Transfer to support #198, a distance of 5746 feet. Rigid structure spans the area from support 198 to the receiving building with ground clearance approaching 70 feet; therefore, this area was not included in the study.

Sixty eight crossing sites were located. This is an average of one crossing site every 84.5 feet. The crossing site height characteristics are summarized in Table 1. The heights indicate the clearance from the ground, directly beneath the center of the

conveyor, to the lowest point on the conveyor system. The lowest point on the conveyor system is the conveyor belting or the North cover panel.

TABLE 1. CROSSING HEIGHT SUMMARY

Height Range (Ft.)	Number of Sites	Average Height (Ft.)	% of Total
0 to 1	0	-	0
1 to 2	34	1.74	48.5
2 to 3	25	2.23	38.2
3 to 4	4	3.45	5.9
4 to 5	1	4.70	1.5
5 to 6	2	5.15	2.9
6 to 7	2	6.40	2.9

As indicated, 86.7% of all crossings occur in areas where the ground clearance ranges between one and three feet. It is estimated that 85% of the conveyor system is within this height range.

One factor which is presumed to affect the deers' willingness to pass an obstruction is the "Passage Window" (unobstructed opening) that is presented to the animal. As illustrated in the photos (Appendix A), the "window" appears to present less clearance than was measured at crossing sites. A factor which appears to affect the "window" size is the lower portion of the North cover panel. However, the panel is missing at only eleven of the sixty eight

crossing sites, which seems to indicate that increased "window" size is not as significant of factor as once assumed.

An additional parameter for assessing the negative effect on migration activity was evidence of lateral movement parallel to the conveyor system. Lateral movement was interpreted to indicate a hesitancy on the part of the animals to cross the conveyor. At the majority of the crossing sites, the lateral movement was less than 50 feet. In areas where substantial lateral movement was evidenced, there was also evidence of heavy browsing activity, which indicates that lateral movement was not necessarily associated with hesitation to cross the conveyor but rather with feeding activity.

The greatest concentration of evidence of Mule Deer activity (crossing sites, feeding activity, established trail) occurs near the eastern third of the conveyor system at the mouth of Deer Creek Canyon (See Appendix B, Drawings DS-652B and DS-653D). This area provides a natural migration path between a low saddle on the North side of the canyon and a saddle on the South side of the canyon. The concentrated activity in this area seems to indicate that the deer are continuing to use naturally established migration routes with minimal effect resulting from the presence of the conveyor. This may be the result of the deer having adapted to the presence of the conveyor during the nine years it has been in operation.

Tracks, measuring two inches or more in length, were found directly beneath the center of the conveyor system. The track size indicates that adult Mule Deer<sup>2</sup> have crossed under the conveyor where the ground to conveyor clearance is less than 24 inches.

---

<sup>2</sup>Correlation of track size and animal size was discussed with Dr. Michael J. Wolfe, Utah State University.

## CONCLUSIONS

The number of crossing sites and the size of tracks observed beneath the conveyor system indicate that cross-canyon migration activities of Mule Deer are not significantly affected by the presence of the C-2 Conveyor in Deer Creek Canyon. The need for construction of specific crossing structures is not indicated by the results of the study.

The results of the study suggest that Mule Deer migration patterns and activities are determined by the natural topographic features rather than man-made structures. The primary migration routes follow the natural topography taking advantage of side canyons and low saddles.

APPENDIX A

PHOTOGRAPHS

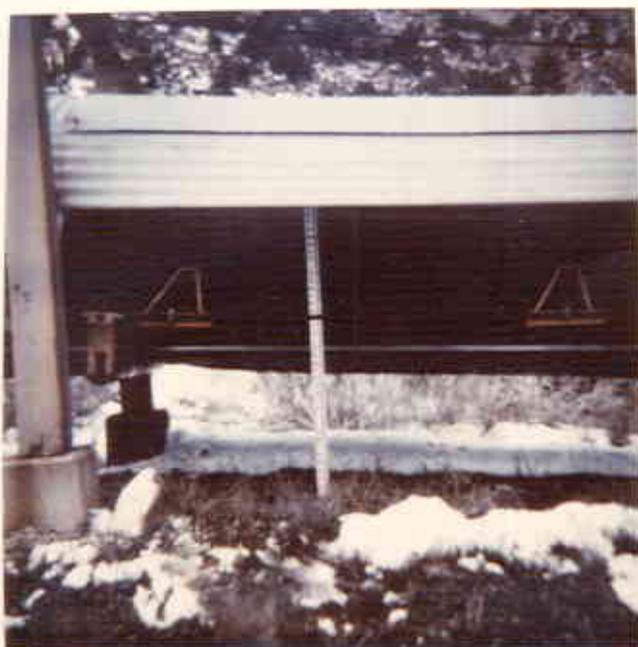
Note: Location indicates the area between support structures.



LOCATION: 0 to 1  
COMMENTS: Note tracks under belt.



LOCATION: 22 to 23  
COMMENTS: Tracks 2" long on  
concrete anchor base. Distance  
from track to belt is 26".



LOCATION: 108 to 109  
COMMENTS: Single track crossing  
North.



LOCATION: 95 to 96  
COMMENTS: Note tracks at upper  
right-center of photo.



LOCATION: 95 to 96  
 COMMENTS: 2 1/2" tracks under belt.  
 Note small "window" size.



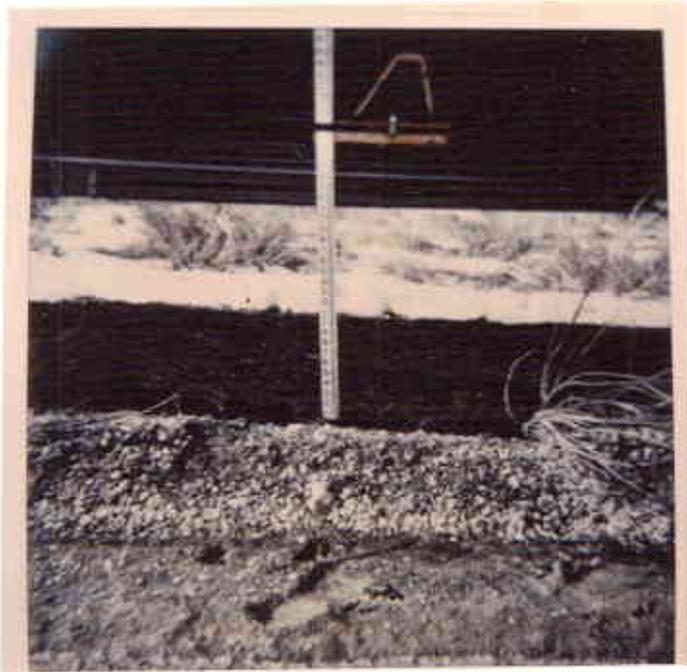
LOCATION: 95 to 96  
 COMMENTS: Note location of track  
 in relation to conveyor ropeline  
 and belt.



LOCATION: 89 to 90  
 COMMENTS: Single track crossing  
 North.



LOCATION: 77 to 78  
 COMMENTS: Track crossing North  
 and South.



LOCATION: 144 to 145  
COMMENTS: Tracks crossing North.  
Lateral movement 15' along service  
road (see next photo).



LOCATION: 134 to 135  
COMMENTS: Track crossing South.



LOCATION: 129 to 130  
COMMENTS: Tracks crossing  
North and South.



LOCATION: 144 to 145  
COMMENTS: Note tracks along road.



LOCATION: 118 to 120  
COMMENTS: North side of conveyor system. Note tracks in foreground.



LOCATION: 119 to 120  
COMMENTS: Tracks crossing North and South and between columns at 119.



LOCATION: 133 to 134  
COMMENTS: Tracks 2 1/4" long crossing North and South.



LOCATION: 149 to 150  
COMMENTS: Two inch track under belt. Clearance is 19 1/2".



LOCATION: 158 to 159

COMMENTS: Location of established trail under conveyor.



LOCATION: 158 to 159

COMMENTS: Looking East along North side of conveyor. Trail crossing is at right-center of photo.



LOCATION: 159

COMMENTS: Trail crossing stream bed South from 159.



LOCATION: 158 to 159

COMMENTS: North side of conveyor at trail crossing.



LOCATION: 159

COMMENTS: Looking East along South side of conveyor at trail crossing.



LOCATION: 165 to 166

COMMENTS: Tracks at concrete pad.



LOCATION: 183-184

COMMENTS: Tracks crossing North and South.

APPENDIX B

DRAWINGS