

**UTAH POWER & LIGHT COMPANY**  
**MINING DIVISION**

**1987 CLIFF SUBSIDENCE  
EAGLE MONITORING REPORT**

**COTTONWOOD COAL MINE**  
**EMERY COUNTY, UTAH**

COTTONWOOD COAL MINE

CLIFF SUBSIDENCE AND EAGLE MONITORING

REPORT

1987

PREPARED BY  
VAL PAYNE

**RECEIVED**

FEB 18 1988

DIVISION OF  
OIL, GAS & MINING

## INTRODUCTION

The Golden Eagle Nesting/Cliff Subsidence Monitoring program, initiated in 1986, continued through 1987. Results of the monitoring are discussed in the report entitled Assessment of Mining Related Impacts In Newberry Canyon, submitted in December, 1987. The following report provides information which is supplemental to the previously issued document.

## DISCUSSION

Eagle nesting data was collected from ground observations and an aerial inventory survey conducted May 18 and 19, 1987. This data and the 1986 data is presented in Table I and the Appendix.

Ninety-four (94) nests were observed, during the aerial survey, of which, six (6) were active. Two (2) of the active nest failed for unknown reasons but six (6) young were observed with fledging of three (3) verified. In 1986, sixty-eight (68) nests were observed, seven (7) of which were active. One (1) active nest failed but a total for six (6) young were observed with fledging of three (3) verified. Thus, the data indicate that productivity within the ten (10) mile radius area was stable during the past two (2) years.

As discussed in the previously mentioned report, nesting occurred in Newberry Canyon at nest 61C. Nesting occurred concurrently with significant subsidence activity in the area. Therefore, it appears that nesting behavior is not negatively impacted by subsidence, if the active nest is not directly affected.

Two (2) inactive nests within the 61C territory were destroyed as a result of cliff spalling. An attempt will now be made to assess the possible impact this may have on the nesting behavior of the pair of eagles associated with nest 61C.

TABLE I

UTAH POWER & LIGHT COMPANY  
MINING DIVISION  
COTTONWOOD MINE - GOLDEN EAGLE STUDY  
(10 Mile Radius Area)

(1986 and 1987 Surveys Conducted by UP&LCO, UDWR and USFWS)

<u>Nest No.</u>	<u>1986</u>	<u>1987</u>
4	Inactive	Tended
5 A,B	1 not found 1 inactive	2 inactive
6	Inactive	Inactive
7	Not observed	No data
8	Inactive, delap.	No data
16 A,B,C,D,E,F	4 inactive, 1 tended	5 inactive, 1 not found
17 A,B,C	3 inactive	3 inactive
18 A,B,C	2 inactive, 1 tended	2 tended, 1 inactive
19 A,B	2 tended	2 tended
22 A,B,C	2 inactive, 1 not found	3 inactive
26 A,B,C,D,E,F	Inactive	5 inactive, 1 active - failed
27 A,B,C,D	3 inactive, 1 active (1 young)	1 inactive, 2 tended, 1 active (2 young)
30 A,B,C,D	2 inactive, 1 tended	4 inactive
34	Not observed	Inactive
36 A,B	Not observed	Not found
37 A,B C	Not observed	2 inactive, 1 active (1 young), Outside 10 mile radius
50	Inactive buteo	No data
53	Not found	Not found

<u>Nest No.</u>	<u>1986</u>	<u>1987</u>
54 A,B	Not found	Not found
55	Inactive	Inactive
56 A B	Not observed	Not found Active (1 young) (new nest)
57	Inactive	Inactive
59	Not found	Not found
61 A,B,C A B C	2 tended, 1 inactive	Destroyed (February 1987) Destroyed (September 1987) Active (1 young fledged)
62	Tended	Inactive
63 A,B	Not found	Nests not found, perch site only
67 A,B,C	1 active (1 young), 1 inactive	3 inactive
68 A,B	1 inactive, 1 tended	2 inactive
70	Tended	No data
72 A,B	1 active (1 young), 1 inactive	1 inactive, 1 no data
74 A,B,C	Not observed	No data
75	Not observed	No data
78	Not observed	No data
80	Not observed	No data
87 A,E B C D	1 active (1 young fledged), 1 not found	2 Inactive Not found Status unknown (located in October) Tended
88 A B C	1 tended Inactive	Not found 1 tended 1 inactive
91	Active (1 young fledged)	Active (2 young fledged)

<u>Nest No.</u>	<u>1986</u>	<u>1987</u>
95	Not observed	4 SISN
97 A,B	Inactive	2 Inactive
98 A,B,C,D,E	1 active (incubating adult), 4 inactive	1 occupied - failed, 4 inactive
99 A,B	Inactive	2 inactive
100	Inactive	Inactive
103	Inactive	No data
107 A,B,C	Inactive	3 inactive
109 A,B,C	Inactive	3 inactive
111 A,B	Not found, 1 inactive	1 not found, 1 inactive
113 A,B	Inactive	1 inactive, 1 occupied (pair present)
114 A,B,C	Inactive (only 1 nest found)	Inactive
115	Inactive	Inactive
116	Inactive, old delap.	Not found
119	Inactive	Inactive
120	Not observed	Inactive
121	Not observed	No data
123 A,B	Not observed	No data
124 A,B,C	Not observed	No data
190	Inactive	Inactive
191	Not observed	No data
296 A,B,C	3 inactive, delap.	3 inactive, delap.
SW-1/4 Sec. 35 T16S, R8E	1 GE; active (1 young fledged)	2 inactive, 1 active - failed (2 eggs)
Sec. 12 T18S, R7E A,B	1 tended	2 tended (adults present)

The territorial boundaries of the 61C pair and two (2) adjacent 1987 breeding pairs are indicated on Map CM-10680-EM. The pair of adults associated with territory 56B nested at nest 87A in 1986. Selection of an alternate nest in 1987 resulted in a northward shift of the territorial boundary.

Subsidence monitoring data indicates that subsidence activity is significantly reduce within approximately two (2) months after mining has ceased in an area. Monitoring will be continued to determine the extent and duration of post-mining subsidence.

### CONCLUSIONS

Thus far, the monitoring program has resulted in the following conclusions:

1. Longwall mining beneath the Castlegate sandstone escarpment does result in subsidence impacts in some areas.
2. Mining related escarpment failure can impact nest sites of cliff nesting golden eagles.
3. Escarpment failure need not have a negative impact on eagle nesting behavior.

The monitoring will continue in Newberry Canyon with the following objectives:

1. Determine the extent and duration of post-mining subsidence.
2. Determine the response of the resident pair of eagles to the loss of nest sites. (Due to known eagle nesting patterns, this may require two (2) or more breeding seasons.)
3. Assess the need for mitigation of lost nest sites. (This also may require two (2) or more breeding seasons.)

**APPENDIX**

RAPTOR FIELD OBSERVATION FORM\*  
ACTIVE NESTS

1. Nest ID# - SEC 35 C
2. Common Name - GOEA
3. Substrate - CLF
4. Exposure - SW
5. Elevation - 6,450
6. Biome - 711
7. Habitat Assc. - 634
8. Status - ACFA
9. Productivity -
10. Disturbance Y (N)
11. Photo # -
12. Comments - Two eggs abandoned  
in nest

1. Nest ID# - 27 B
2. Common Name - GOEA
3. Substrate - CLF
4. Exposure - SO
5. Elevation - 7,600
6. Biome - 711
7. Habitat Assc. - 320
8. Status - ACTI
9. Productivity - ∅
10. Disturbance Y (N)
11. Photo # -
12. Comments - 2 downy young observed,  
fledging not verified.

1. Nest ID# - 26 E
2. Common Name - GOEA
3. Substrate - CLF
4. Exposure - WE
5. Elevation - 8,600
6. Biome - 711
7. Habitat Assc. - 320
8. Status - ACFA
9. Productivity -
10. Disturbance Y (N)
11. Photo # -
12. Comments - Egg shells in  
nest, no young.

1. Nest ID# - 56 B
2. Common Name - GOEA
3. Substrate - CLF
4. Exposure - NO
5. Elevation - 8,800
6. Biome - 711
7. Habitat Assc. - 320
8. Status - ACTI
9. Productivity -
10. Disturbance Y (N)
11. Photo # -
12. Comments - 1 downy young  
observed, fledging  
not verified.

\*Standard Raptor codes from USFWS publication, Raptor Nest Information Management System.

RAPTOR FIELD OBSERVATION FORM\*  
ACTIVE NESTS

1. Nest ID# - 61 C
2. Common Name - GOEA
3. Substrate - CLF
4. Exposure - NE
5. Elevation - 8,400
6. Biome - 822
7. Habitat Assc. - 320
8. Status - ACTI
9. Productivity - 1
10. Disturbance Y (N)
11. Photo # -
12. Comments - Fledging verified by ground survey.

1. Nest ID# - 91
2. Common Name - GOEA
3. Substrate - REP
4. Exposure - NE
5. Elevation - 6,400
6. Biome - 634
7. Habitat Assc. - 632
8. Status - ACTI
9. Productivity - 2
10. Disturbance Y (N)
11. Photo # -
12. Comments - Fledging verified by ground survey.

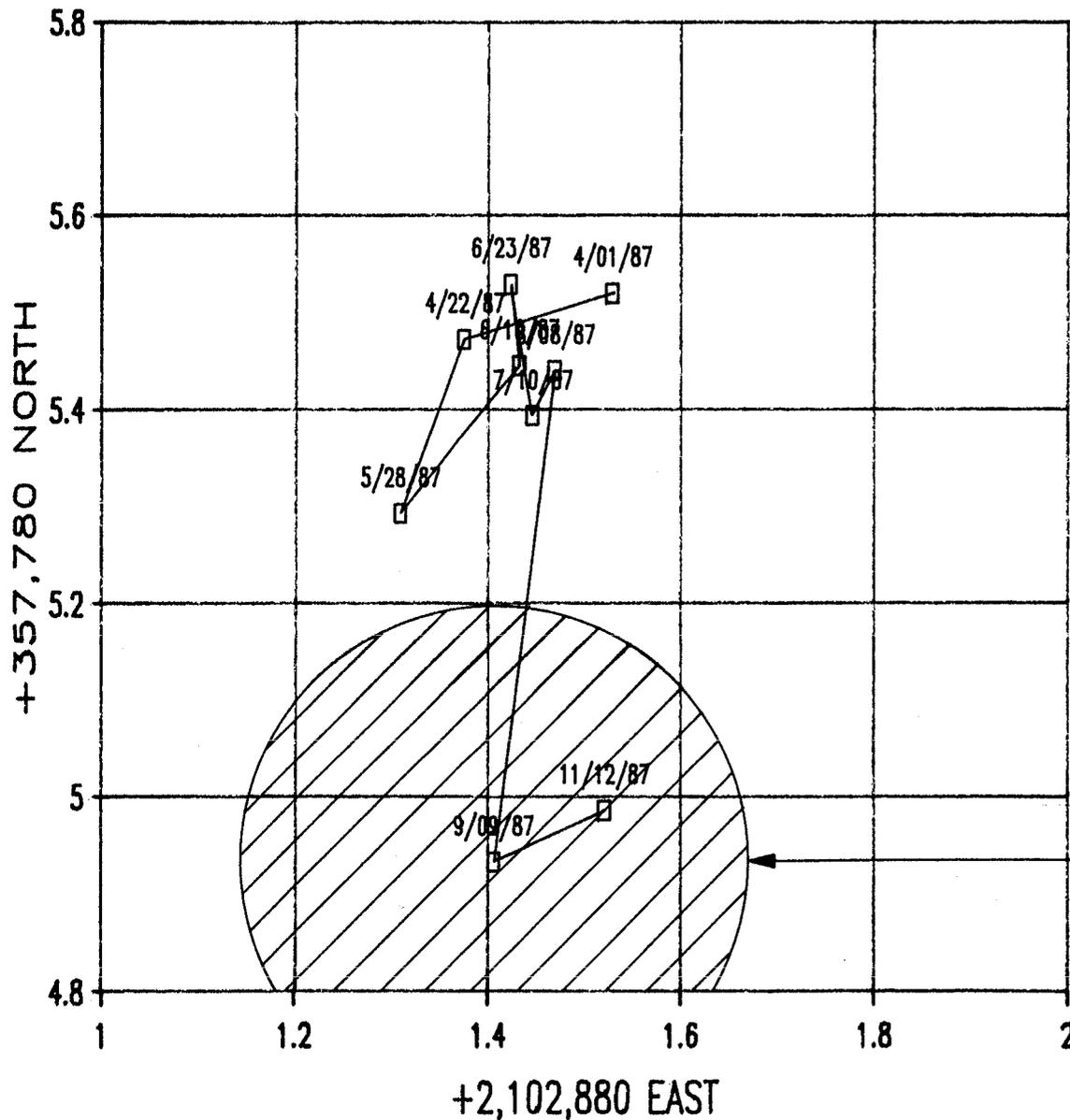
1. Nest ID# -
2. Common Name -
3. Substrate -
4. Exposure -
5. Elevation -
6. Biome -
7. Habitat Assc. -
8. Status -
9. Productivity -
10. Disturbance Y N
11. Photo # -
12. Comments -

1. Nest ID# -
2. Common Name -
3. Substrate -
4. Exposure -
5. Elevation -
6. Biome -
7. Habitat Assc. -
8. Status -
9. Productivity -
10. Disturbance Y N
11. Photo # -
12. Comments -

\*Standard Raptor codes from USFWS publication, Raptor Nest Information Management System.

# NEWBERRY CANYON SUBSIDENCE MONITORING

PLAN VIEW OF POINT 1  
9-9-87 TO 11-12-87



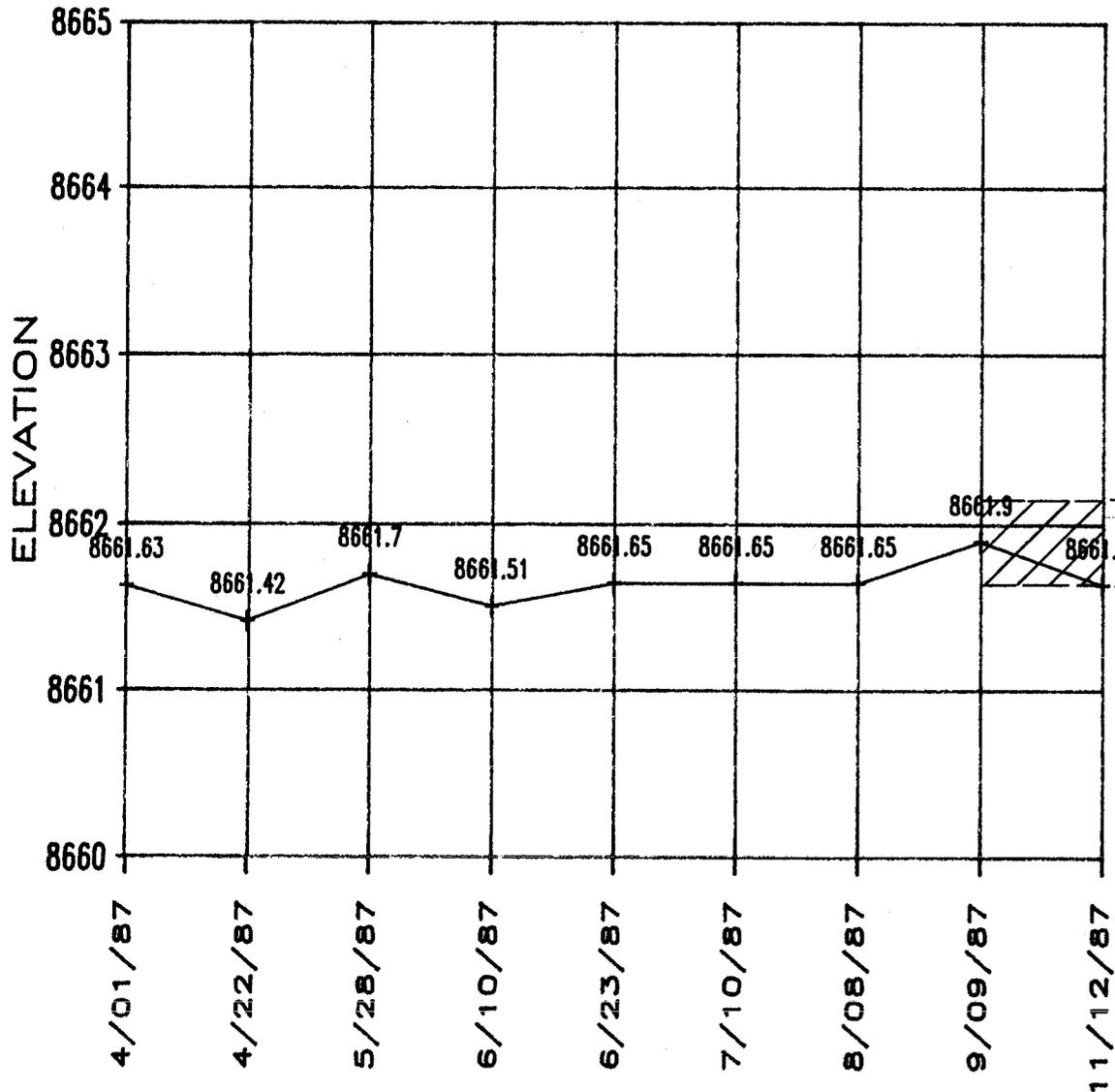
SCALE: 1" = 0.19'

NOTE:  
NET HORIZONTAL MOVEMENT  
SEPT. 9, 1987 TO NOV. 12, 1987  
IS WITHIN THE ACCURACY RANGE  
THEREFORE IT IS INTERPRETED  
AS ZERO.

ACCURACY RANGE  
1/20,000

# NEWBERRY CANYON SUBSIDENCE MONITORING

PT#1 CHANGE  
9-9-87 TO 11-12-87



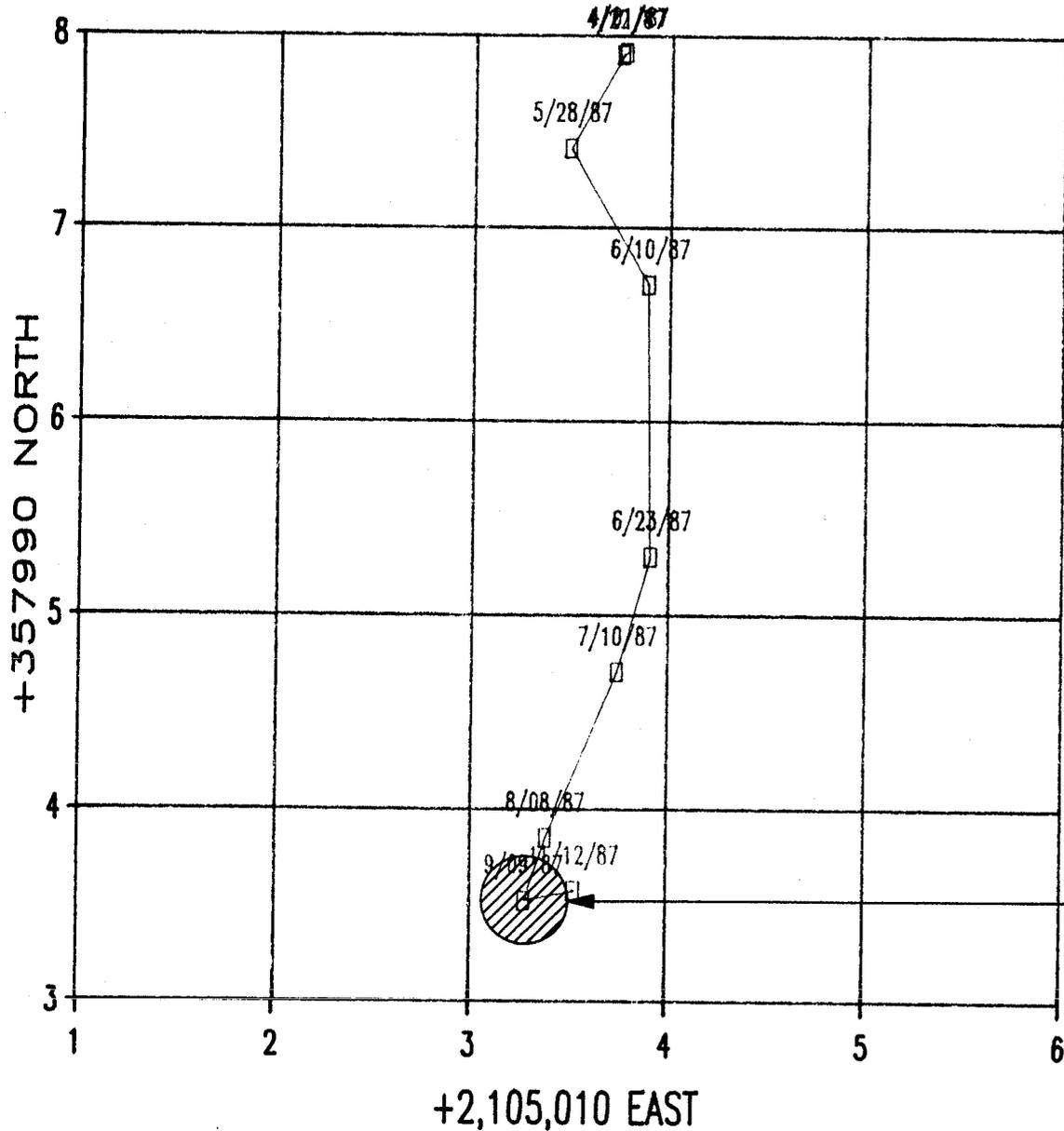
SCALE: 1" = 1.11'

NOTE:  
NET VERTICAL MOVEMENT  
SEPT. 9, 1987 TO NOV. 12, 1987  
0.26 FT.

ACCURACY RANGE  
1/20,000

# NEWBERRY CANYON SUBSIDENCE MONITORING

PLAN VIEW OF POINT 3  
9-9-87 TO 11-12-87



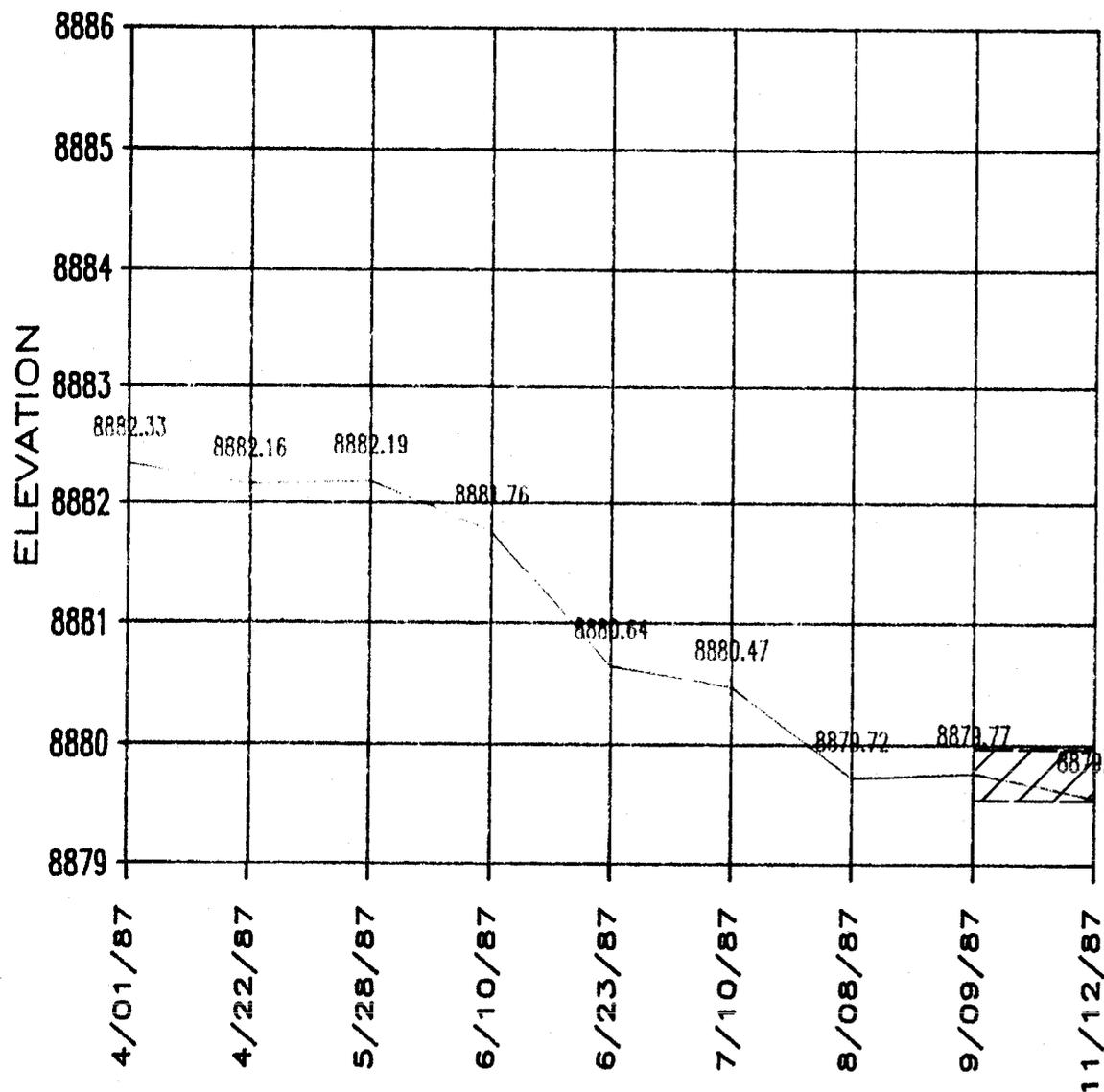
SCALE: 1" = 0.92'

NOTE:  
NET HORIZONTAL MOVEMENT  
SEPT. 9, 1987 TO NOV. 12, 1987  
N 78° 28' 27" E 0.26 FT.

ACCURACY RANGE  
1/20,000

# NEWBERRY CANYON SUBSIDENCE MONITORING

PT#3 CHANGE  
9-9-87 TO 11-12-87



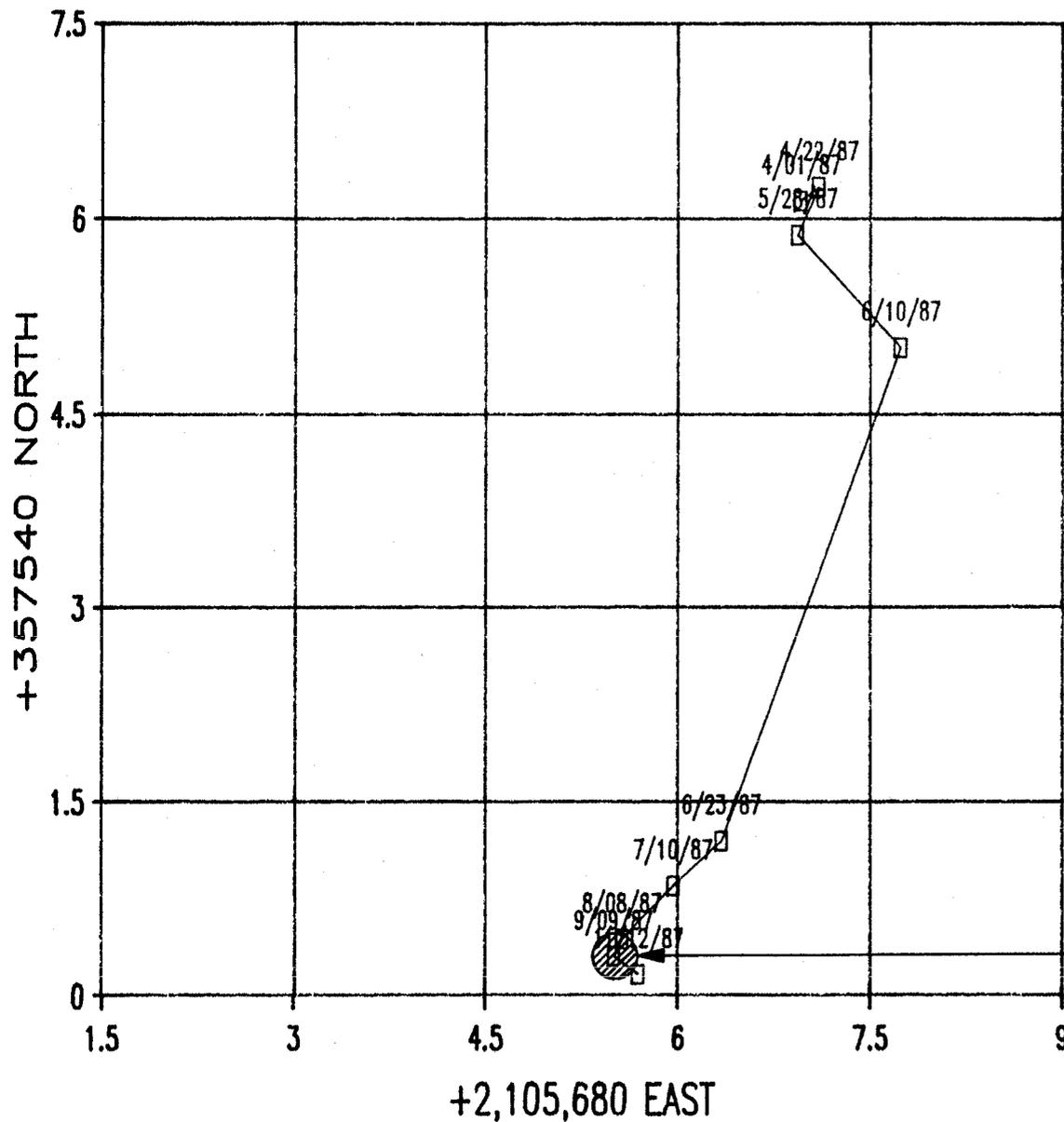
SCALE: 1" = 1.59'

NOTE:  
NET VERTICAL MOVEMENT  
SEPT. 9, 1987 TO NOV. 12, 1987  
0.21 FT.

ACCURACY RANGE  
1/20,000

# NEWBERRY CANYON SUBSIDENCE MONITORING

PLAN VIEW OF POINT 4  
9-9-87 TO 11-12-87



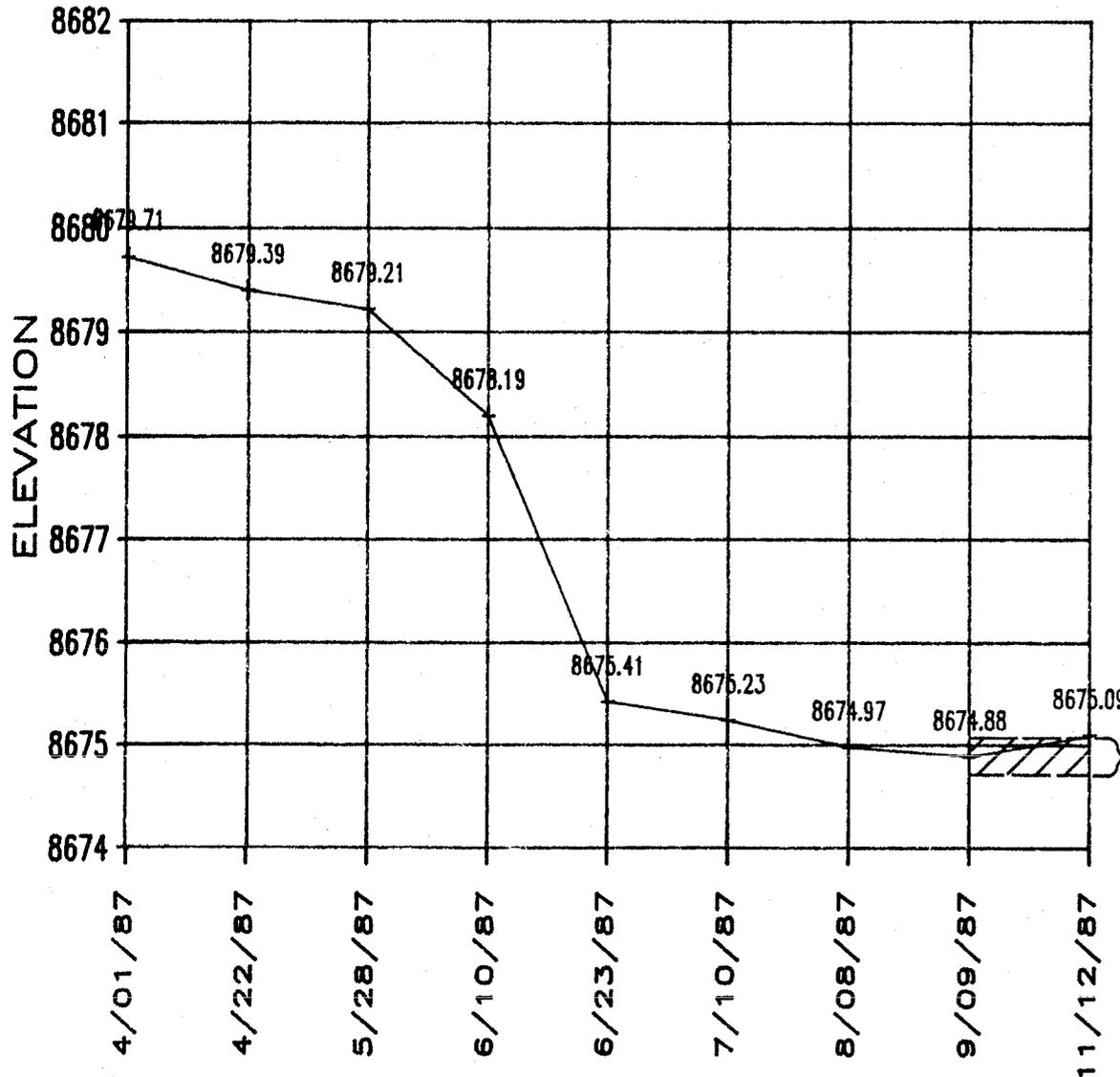
SCALE: 1" = 1.40'

NOTE:  
NET HORIZONTAL MOVEMENT  
SEPT. 9, 1987 TO NOV. 12, 1987  
S 54° 11' 50" E 0.24 FT.

ACCURACY RANGE  
1/20,000

# NEWBERRY CANYON SUBSIDENCE MONITORING

PT#4 CHANGE  
9-9-87 TO 11-12-87



SCALE: 1" = 1.75'

NOTE:  
NET VERTICAL MOVEMENT  
SEPT. 9, 1987 TO NOV. 12, 1987  
0.21 FT.

ACCURACY RANGE  
1/20,000