

CHAPTER X

CLIMATE, AIR QUALITY, CULTURAL RESOURCES, LAND USE

Chapter X
CULTURAL RESOURCES, CLIMATE, LAND USE, AIR QUALITY

10.0 Table of Contents

	<u>Page</u>
10.0 Table of Contents	1
10.1 Cultural and Historic Sites	2
10.2 Climate	6
10.3 Land Use	16
10.3.1 Present Land Use	16
10.3.2 Post Mining Land Use	17
10.4 Air Quality Protection Plan	20
10.5 References	22

List of Tables

10.2-1 Climate Study for Woodside	7
10.2-2 Climate Study for Price	8
10.2-3 Climate Study for Sunnyside	9
10.2-4 Estimated Normal Months Pan Evaporation Totals.	14

List of Figures

10.2-1 Probabilities of Weekly Precipitation Accumulations, Emery	11
10.2-2 Probabilities of Weekly Precipitation Accumulations, Hiawatha	12
10.2-3 Probabilities of Weekly Precipitation Accumulations, Green River	13

List of Appendices

X-1	BLM Cultural Resources Information
X-2	CRMS Cultural Resources Information

10.1 Cultural and Historic Sites

On September 10, 1980 a class I (existing data) cultural resource inventory was completed by the BLM Price River Resource Area staff at the request of U. S. Steel for the Geneva Mine area. This survey included all of the following property:

T. 16 S., R. 14 E. Sections 2, 3, 4, 5, 9, 11, 12, 14, 15, and 16.

T. 15 S., R. 14 E. Sections 32, 33, 34, and 35

The above described property includes the disturbed surface area of the Geneva Mine, the proposed Permit Area Boundary, the proposed topsoil borrow area, and adjacent areas.

The results of this search indicated that there were no cultural resources previously recorded for the study area. A subsequent search by the Utah Division of State History indicated the same.

Additional investigations in the field by the BLM resulted in the location and description of two historic sites. The first site is located in T. 16 S., R. 14 E., Section 3, SE1/4 SW1/4 NW1/4 and is the historic signature of Sam Gilson blazed on a tree in 1878. This site is fenced and fitted with a historic

marker by the Utah Historical Society (Appendix X-1). It has been placed on the National Historic Register. The second site is located in T. 16 S., R. 14 E., Section 3, NE1/4 SW1/4 NE1/4 and consists of a nonsignificant "wooden root cellar" dug into an embankment. Both of these sites were recorded by the BLM and were given site numbers 42Em1222 and 42Em1223 respectively. The locations of both sites are shown on the maps included in Appendix X-1.

In anticipation of potential rejuvenation of the Geneva Mine facilities, Kaiser Coal contracted the Cultural Resources Management Services (CRMS) of Brigham Young University in September of 1985 to conduct a Class I and Class III inventory of the Horse Canyon Mine facility area. This area also included all of the area included within the proposed permit area boundary (see Figure V-2 of Appendix X-2). The report of these inventories is reproduced in its entirety in Appendix X-2.

The CRMS report notes several other historic sites in addition to those already mentioned. Site 42Em 2099 consists of the Geneva Mine facility itself and includes all of the pads and structures in Horse Canyon. This site is not considered to be significant. Site 42Em 2096 is a loading platform along the railroad tracks at the mouth of Horse Canyon in the SE1/4 SE1/4 SE1/4 of Section 4 T16S R14E. It is not considered to be significant. Sites 42Em 2097 and 42Em 2098 are historic hunting

camps near the mouth of Horse Canyon and are not considered to be significant.

Two small prehistoric sites were discovered to the north of Horse Canyon along the railroad tracks. Site 42Em 2100 is in the NE1/4 NE1/4 SW1/4 of Section 5 T16S R14E (see Figure V-2, Appendix X-2). The site consists of a space scatter of lithic fragments including chert and quartzite flakes. No visible features, tools, artifacts or depressions were noted and the site is considered to be non-significant. Site 42Em 2101 is another small lithic scatter north of 42EM 2100 in the NW1/4 SE1/4 NW1/4 of Section 5 T16S R14E. It consists of chert and quartzite flakes with no subsurface depth or obvious features. Two arrow heads were collected and determined to be diagnostic of a temporary, non-significant site. Both of these sites are located about 1/4 mile away from the permit area.

There are no other known cultural or historic sites within or adjacent to the proposed Permit Area Boundary and there are no public parks within the boundary either. Site 42Em 1222, the Gilson tree, should be protected through avoidance. None of the other sites require any protection or other mitigation steps.

As the scope of the maintenance plan and reclamation plan is limited to the present disturbed area only, with the addition of the approximately 5-acre topsoil borrow area, there should be no

adverse affects on these historic sites. The regrading and reclamation plan has been designed to avoid disturbance of the Gilson tree blaze.

10.2 Climate

Weather records have not been collected at the Horse Canyon Mine and this description of the local climate is based on work done by E. Arlo Richardson, State Climatologist, for the Kaiser Steel Corporation, South Lease Coal Property which is located approximately 5 miles to the south along the Book Cliffs in almost identical terrain.

The climate in general is continental with hot summers and cold winters marked by relatively little precipitation. Temperatures exceeding 100°F occur during most summers and winter minimums can be subzero. The climate of the Horse Canyon area is also affected by the diurnal temperature and wind fluctuations that are common to steep canyon topography.

Climatological records for the general area that are applicable to the Horse Canyon area have been collected from Woodside, elevation 4900 feet, Price 5560 and Sunnyside 6716 feet are shown in Tables 10.2.1, 10.2.2 and 10.2.3. Of these locations, the data from Sunnyside, approximately 7 miles to the north in almost identical terrain, is probably most similar to the Horse Canyon conditions.

Precipitation in the area is caused by three general weather patterns, winter and early spring Pacific storm fronts, upper

Table 10.2-1 Climate Study of Woodside, Utah

Station: Woodside, Utah

Longitude: 110°25'

Elevation: 4900

Latitude: 39°19'

Period of Record: 1911-1916
1951-1958
10 years total

Month	TEMPERATURE							PRECIPITATION TOTALS (Inches)					
	MEANS			EXTREMES				Mean	Greatest Daily	Year	SNOW		
	Daily Maximum	Daily Minimum	Monthly	Record Highest	Year	Record Lowest	Year				Mean*	Maximum Monthly	Year
Jan.	37.0	7.1	22.0	59	1956+	-33	1914	.68			8.6		
Feb.	42.3	11.8	27.1	59	1956	-20	1955	.41			4.9		
Mar.	56.1	23.1	40.0	78	1913	0	1916	.49			1.2		
Apr.	58.8	33.0	51.1	84	1914	14	1911	.52			0		
May	78.1	41.2	59.7	94	1951+	24	1953	.43			0.3		
June	87.3	47.8	67.8	104	1954	34	1954+	.48			0		
July	94.3	57.4	76.0	104	1951+	40	1913	.52			0		
Aug.	92.3	55.1	73.9	104	1914	42	1914	.75			0		
Sept.	83.5	45.3	64.4	99	1955	25	1913+	.76			0		
Oct.	69.2	32.4	50.6	86	1957+	14	1913	.93			0		
Nov.	52.8	21.1	36.0	72	1915	-3	1952	.65			0.8		
Dec.	37.4	10.2	23.8	62	1958	-22	1911	.50			4.2		
Annual	65.8	32.1	47.4					7.12			20.0		

*Based on 6 years of poor data

Table 10.2-3 Climate Study for Sunnyside, Utah

Station: Sunnyside, Utah

Longitude: 110° 22'

Elevation: 6750

Latitude: 39° 34'

Period of Record: 1958-1980*

Month	TEMPERATURE							PRECIPITATION TOTALS (Inches)					
	MEANS			EXTREMES				Mean	Greatest Daily	Year	SNOW		
	Daily Maximum	Daily Minimum	Monthly	Record Highest	Year	Record Lowest	Year				Mean	Maximum Monthly	Year
Jan.	34.3	13.1	23.7	60	1971	-16	1963	.80	1.46	1959	11.3	30.5	1978
Feb.	41.3	19.3	30.3	59	1963	-11	1962	.90	1.63	1969	11.3	41.0	1969
Mar.	45.4	22.1	33.8	65	1978 ⁺	0	1971	1.08	.85	1968	6.8	18.1	1979
Apr.	55.0	29.7	42.4	81	1962	4	1975	.94	1.09	1969	2.6	17.0	1979
May	65.7	39.6	52.7	88	1967	20	1975	1.07	1.10	1969	0.2	2.7	1978
June	77.6	48.4	63.0	95	1968	28	1976	.84	1.60	1970	0	0	
July	85.5	56.3	70.9	95	1969	32	1968	1.08	.89	1969	0	0	
Aug.	82.7	53.6	68.2	98	1969	35	1968	1.27	1.20	1969	0	0	
Sept.	73.5	45.7	59.6	92	1967	28	1978 ⁺	1.34	1.24	1960	T	T	1978
Oct.	60.9	35.6	48.3	80	1960	10	1975	1.26	1.25	1972	0.6	4.0	1970
Nov.	47.0	24.6	35.8	67	1960	-1	1976	.76	.91	1960	2.0	13.0	1961
Dec.	37.3	16.2	26.8	62	1966	-12	1978	.64	.84	1978	5.3	24.0	1959
Annual	58.9	33.7	46.3	98	Aug. 1969	-16	Jan. 1963	11.98	1.63	Feb. 1969	40.1	#	

*The records at this station are very erratic, especially snowfall.

#Insufficient annual snowfall information available.

level low pressures which are most common during October and late April to May, and summer thunderstorms. The wettest month in the area is usually in the summer and is associated with the thunderstorm activity. This is clearly shown in Figures 10.2.1 through 10.2.3 which display the probabilities of selected precipitation accumulations for Emery, Hiawatha, and Green River, Utah. The seasonal precipitation data of the State Climatologist for the period 1931-1960 indicate that the Horse Canyon area would receive a normal annual precipitation accumulation of 8 to 17 inches with between 4 and 7 inches during the growing season and 5 to 10 inches during the winter.

Temperature information from the State Climatologist indicates that average January maximum temperature is about 32°F and the average January minimum is about 4°F. The average July maximum temperature is 84°F and the minimum is 52°F. The average annual temperature is approximately 48°F and the normal growing season is approximately 120 days.

Estimated monthly pan evaporation totals from the State Climatologist data for Price, Sunnyside, and Hiawatha are shown in Table 10.2.4. This data indicates that the annual evaporation at Horse Canyon is estimated at approximately 62 inches. Estimates are that minimum humidities in the Horse Canyon area probably range on the average of 25 to 30 percent during the summer evaporation season with minimums of near 10 percent during

Figure 10.2-2 Probabilities of selected accumulations of precipitation during any one week period of the year at HIAWATHA, UTAH

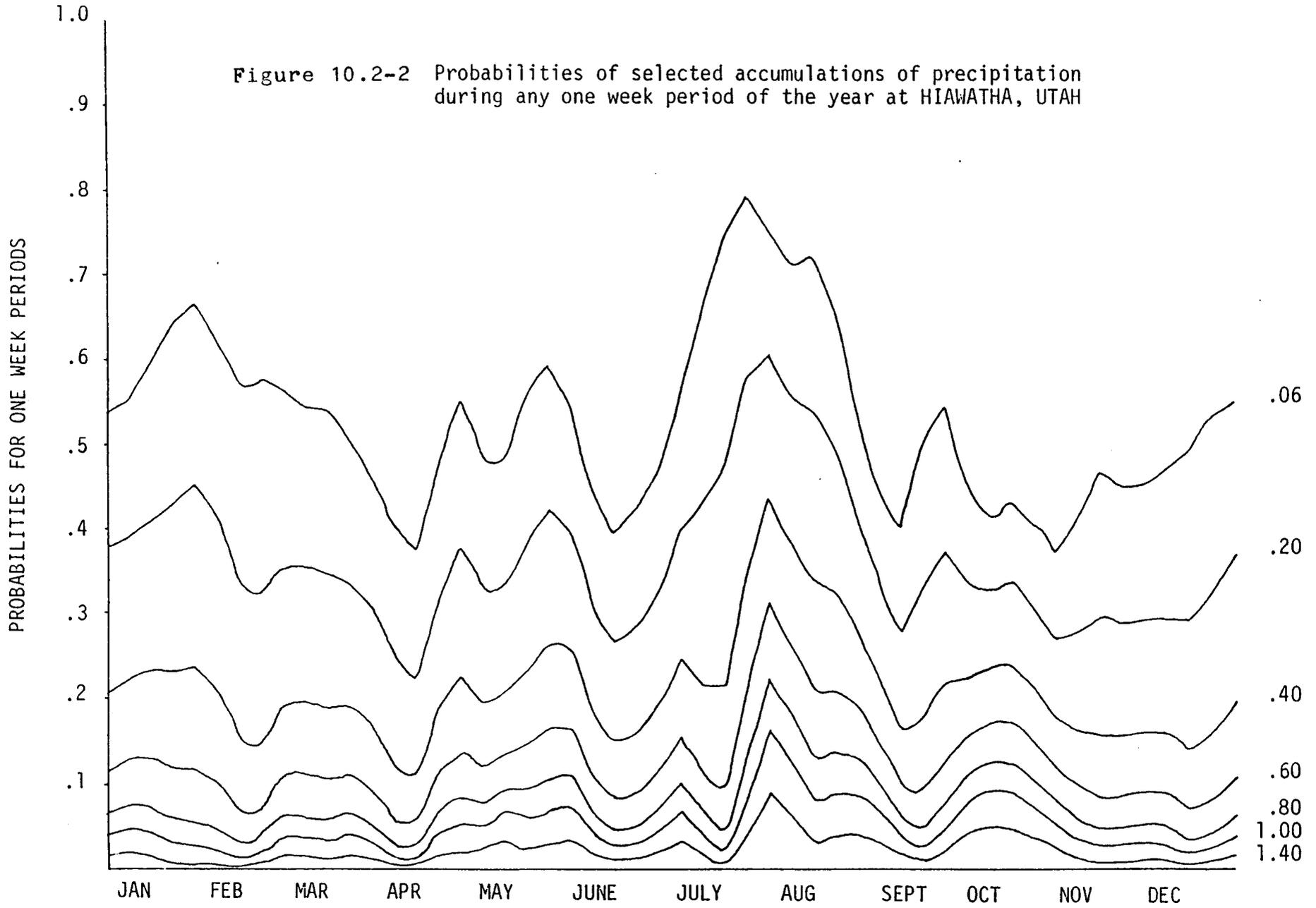


Figure 10.2-3 Probabilities of the accumulation of selected amounts of precipitation during any one week period of the year at GREEN RIVER, UTAH

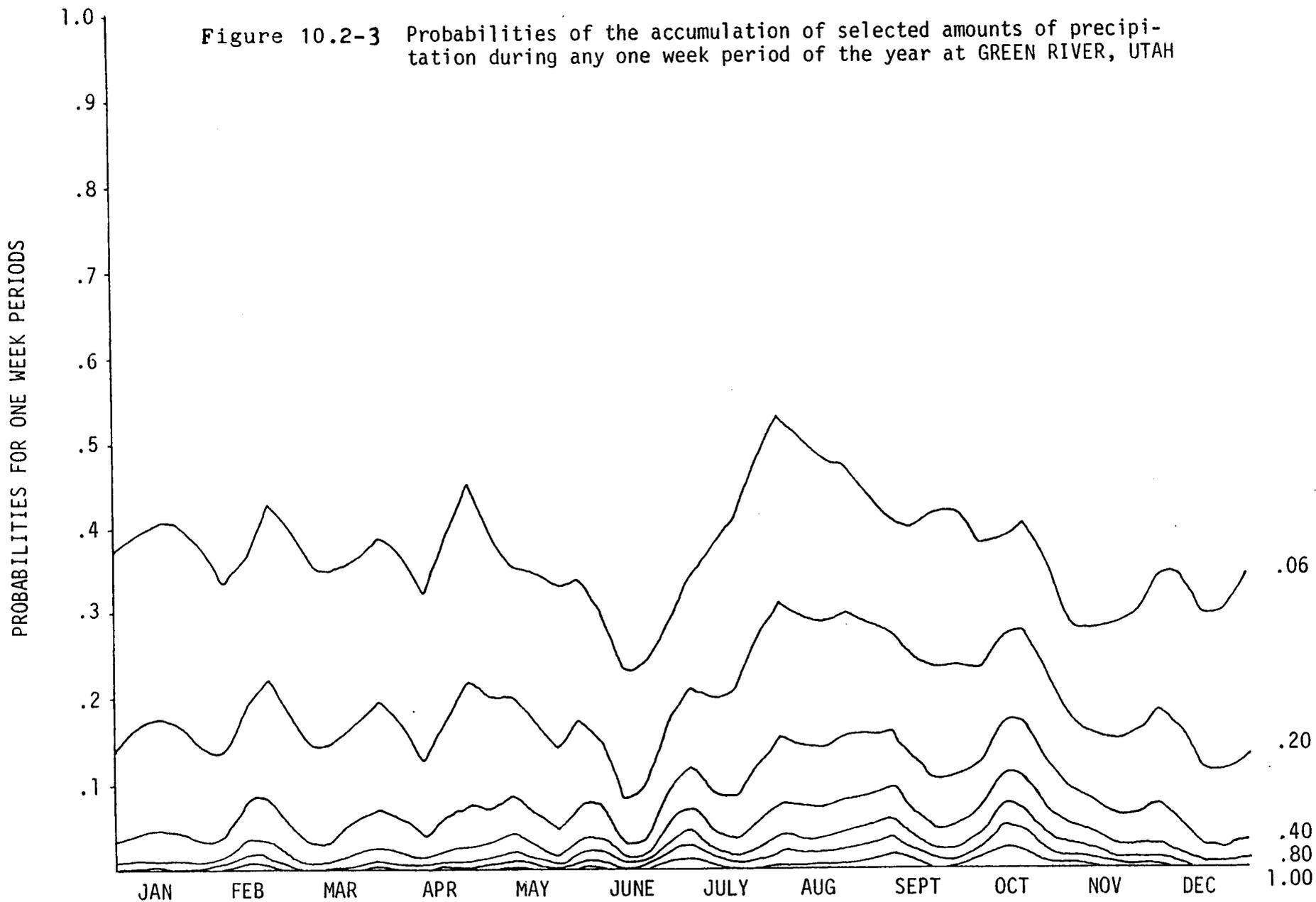


Table 10.2-4 Estimated Normal Months Pan Evaporation Totals

	Elevation	Jan.	Feb.	Mar.	Apr.	May	June	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
Price(Warehouse)	5500	0.8	1.7	3.3	6.0	9.4	10.9	12.3	10.9	8.2	5.0	1.7	1.0	71.2
Sunnyside	6750	0.7	1.5	2.9	5.2	8.1	9.4	11.1	9.4	7.1	4.3	1.5	0.9	62.1
Hiawatha	7230	0.6	1.4	2.7	4.9	7.6	8.8	9.9	8.8	6.6	4.0	1.4	0.8	57.5

*The pan coefficient in this area to convert pan evaporation to lake as extracted from Technical Paper #37 of The National Weather Service is .69.

periods of extreme dryness.

The prevailing wind directions in the area are from west to east. The rugged canyon topography of Horse Canyon would be expected to modify the wind directions near the ground to more nearly parallel the canyon alignment.

10.3 Land Use

10.3.1 Present Land Use.

The present land use in the permit area is for maintenance of existing surface facilities that may be used in the future to support underground coal mining. The area affected by this land use is bounded by the permit boundary shown on Plate II-1 A,B, Facilities Map. The current locally designated land use is industrial/commercial.

Coal mining is thought to have begun in the area in the late 1800's or early 1900's. Prior to this time, Horse Canyon was used as a cattle trail. In 1936, the Cedar Ridge Coal Company was formed and was operated until the takeover by the Defense Plant Corporation in 1942. US Steel developed the site as it is today and operated the mine until 1984. Since Kaiser Coal's purchase of the property in 1984, no coal production has taken place in Horse Canyon. Some level of mining activity and mining disturbance has taken place in the area for nearly a century, with essentially the current level of disturbance having been in existence for 45 years.

The pre-disturbance land use for this area was probably wildlife forage and big game winter range with cattle grazing taking place during drives. No data is available for the pre-

mining productivity in terms of forage for the disturbed area in Horse Canyon. The vegetation data contained in Chapter VIII for the surrounding undisturbed hillsides on comparable slopes or aspects provides reasonable assumptions for pre-disturbance production in the disturbed area.

U.S. Steel mined the lower Sunnyside coal bed. The room and pillar mining method followed by extensive retreat mining was employed. The locations of mine openings are shown on the Facilities Maps, Plates II-1A & B. Underground workings are shown on Plate II-2, Underground Development Map. Locations of coal and non-coal wastes are discussed in Sections 2.1 and 4.2 and their distribution is shown on Plates II-1 A & B, the Facilities Maps.

There are no identified cemeteries or Native American burial grounds within the disturbed area. None of the area in or adjacent to the permit area includes areas within the boundaries of the National System of Trails or the Wild and Scenic Rivers System.

10.3.2 Post-Mining Land Use.

The planned post-mining land use will be for wildlife habitat, the apparent pre-mining land use. This use is compatible with the surrounding land uses, which are also used

primarily for wildlife habitat and, to a lesser extent for livestock grazing.

The use of the land, following reclamation, for any non-industrial or commercial purpose more intensive than for wildlife habitat, does not seem to be justified. Sufficient land for significant cropland development does not exist, nor is there sufficient water for irrigation.

The reclamation plan, as described in Chapter III is designed to achieve the post mining land use. The topography will be returned to a condition that is similar to the probable pre-disturbance terrain appearance. Revegetation plans call for planting of species that are found in nearby, undisturbed reference areas where the current land use is for wildlife habitat. Certain areas that are not the reclamation responsibility of Kaiser Coal under the exclusionary provisions of SMCRA will not be reclaimed. These areas are discussed in Section 2.1.

If it is determined by Kaiser Coal or its successor that the maintenance plan is to be suspended and further production of coal from these facilities shall not take place, the reclamation plan as described in Chapter III shall be initiated in a timely manner following such decision and according to the reclamation schedule set forth in Section 3.5.

The public road currently in existence through the permit area will be retained during and following the reclamation period.

10.4 Air Quality Protection Plan

The protection of air quality at the Horse Canyon mine will be addressed separately for the maintenance period and the reclamation period. Because of the inactive nature of the operation there will be none of the point sources of air emissions attributed to ventilation fan exhausts, coal crushing, conveying, stacking, loading, and transportation at other underground coal mining operations. The only air emissions will be caused by fugitive dust.

During the maintenance period, the fugitive dust emissions will be caused by wind erosion of exposed pads, roads, and parking lots and by vehicular traffic on unpaved roads and other surfaces. Those surfaces that are not required for access during the maintenance period or future mining operations have already been revegetated (Section 2.2, Reclamation Accomplished to Date) and some additional surfaces will be revegetated during the maintenance period (Section 2.5, Revegetation). Other disturbed areas and roads that are unpaved will be fenced or otherwise blocked to eliminate unauthorized vehicular access.

During the reclamation phase, the fugitive emissions will be largely due to the loading and transportation of topsoil from the soil borrow area to the areas to be topsoiled and the subsequent redistribution of the topsoil on those areas. Other dust

emissions will occur largely from the regrading activities and mulching operations. These emissions will be temporary in nature, with all reclamation construction occurring within one or two construction season. Because fugitive dust emissions during rural construction activities are normally exempted from emission controls, no air emission controls are proposed other than watering of roads as required for safe and efficient construction work. Following the completion of construction work the reclaimed surfaces will be a temporary source of fugitive dust from wind erosion until the vegetation cover is established (Section 3.10, Revegetation).

The bare earth surfaces to be revegetated during the maintenance and reclamation periods will thereafter realize a 60% reduction in fugitive dust emissions (PEDCo, 1974) compared to the unprotected state. However the actual degree of dust impacts are impossible to predict due to the variables included in the wind erosion of these surfaces including: wind speed, surface roughness, moisture, and aspect in relation to the wind direction.

REFERENCES

PEDCo Environmental Inc., 1974, Investigation of Fugitive Dust,
VOL I - Sources, Emissions and Control, Report No. EPA-45-
0/3-74-036a.

List of Appendices

- X-1 BLM Cultural Resources Information
- X-2 CRMS Cultural Resources Information

Appendix X-1

BLM Cultural Resource Information



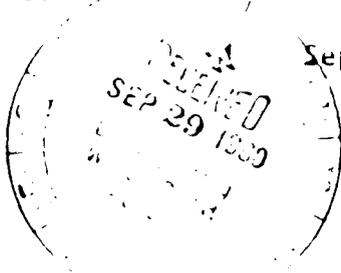
United States Department of the Interior

IN REPLY REFER TO

3400
(U-601)

BUREAU OF LAND MANAGEMENT
Moab District
Price River Resource Area
P. O. Drawer AB
Price, Utah 84501

September 10, 1980



U. S. Steel Corporation
P. O. Box 807
East Carbon, Utah 84520

Attention: Scott Nordness

Gentlemen:

In regard to your request for information pertinent to preparing your mine permit application, our staff archaeologist has completed the following cultural resource data.

As per your communication the area under consideration for surface disturbance/reclamation is as follows:

T. 16 S., R. 14 E.,

<u>Section</u>	<u>Land Ownership</u>	
2	Private	All
3	Private	Except NE $\frac{1}{4}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$, S $\frac{1}{2}$ NE $\frac{1}{4}$ (BLM)
4	Private	All
5	U.S.	Except SE $\frac{1}{4}$ SE $\frac{1}{4}$
9	Private	Except SE $\frac{1}{4}$, NE $\frac{1}{4}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$
11	Private	Except SE $\frac{1}{4}$ SW $\frac{1}{4}$, S $\frac{1}{2}$ SE $\frac{1}{4}$
12	U.S.	Except NW $\frac{1}{4}$, SE $\frac{1}{4}$
14	U.S.	All
15	Private	Except SW $\frac{1}{4}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$
16	Private	All

T. 15 S., R. 14 E.,

32	Private	All
33	Private	All
34	Private	All
35	Private	All

A class I (existing data) Inventory was completed by this office using the BLM Price River Archaeological data file. The results of this search indicate that no cultural resources have been located or inventoried within the above locations. Concurrence of these findings was sought from the Utah State Historic Preservation Officer (SHPO). A subsequent computer search by the Division of State History indicated the same.



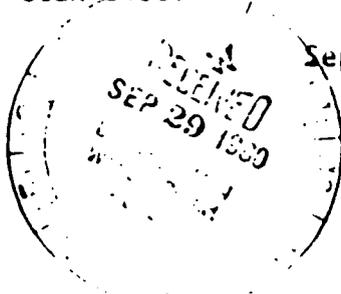
United States Department of the Interior

IN REPLY REFER TO

3400
(U-601)

BUREAU OF LAND MANAGEMENT
Moab District
Price River Resource Area
P. O. Drawer AB
Price, Utah 84501

September 10, 1980



U. S. Steel Corporation
P. O. Box 807
East Carbon, Utah 84520

Attention: Scott Nordness

Gentlemen:

In regard to your request for information pertinent to preparing your mine permit application, our staff archaeologist has completed the following **cultural resource data**.

As per your communication the area under consideration for surface disturbance/reclamation is as follows:

T. 16 S., R. 14 E.,

<u>Section</u>	<u>Land Ownership</u>	
2	Private	All
3	Private	Except NE $\frac{1}{4}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$, S $\frac{1}{2}$ NE $\frac{1}{4}$ (BLM)
4	Private	All
5	U.S.	Except SE $\frac{1}{4}$ SE $\frac{1}{4}$
9	Private	Except SE $\frac{1}{4}$, NE $\frac{1}{4}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$ SE $\frac{1}{4}$
11	Private	Except SE $\frac{1}{4}$ SW $\frac{1}{4}$, S $\frac{1}{2}$ SE $\frac{1}{4}$
12	U.S.	Except NW $\frac{1}{4}$, SE $\frac{1}{4}$
14	U.S.	All
15	Private	Except SW $\frac{1}{4}$ NE $\frac{1}{4}$, SE $\frac{1}{4}$
16	Private	All

T. 15 S., R. 14 E.,

32	Private	All
33	Private	All
34	Private	All
35	Private	All

A check of existing data inventory was completed by this office using the BLM Price River Archaeological data files. The results of this search indicate that no cultural resources have been located or inventoried within the above locations. Concurrence of these findings was sought from the Utah State Historic Preservation Officer (SHPO). A subsequent computer search by the Division of State History indicated the same.

U. S. Steel's employee Scott Nordness had indicated that a historic signature was located in T. 16 S., R. 14 E., Section 3, SE $\frac{1}{4}$, SW $\frac{1}{4}$, NW $\frac{1}{4}$. As this potential historic site had not been recorded a field examination was conducted. Results of this spot survey indicate that the site was fenced in and interpretation posted by the Utah Historical Society. The inscription "1878 Sam Gilson By God" was carved in a Utah Juniper. Another historic site was located in T. 16 S., R. 14 E., Section 3, NE $\frac{1}{4}$, SW $\frac{1}{4}$, NE $\frac{1}{4}$. This site consists of a "wooden root cellar" located in an embankment adjacent to a dirt road. Both of these sites were recorded and were given site numbers 42Em1222 and 42Em1223 respectively.

These sites are located within the reclamation area. No direct impact(s) by U. S. Steel Corporation were noted for these cultural resources. The significance of the historic signature is noteworthy as the name Samuel Gilson most probably is associated with Gilsonite and the Gilsonite formation, (Gilsonite being utilized in road pavement). Consequently, this site has potential National Register significance.

The following excerpts are presented as reference to S. Gilson and Gilsonite. "Gilsonite a solid pyrobitumen, an asphaltite, named after S. H. Gilson, the owner of the deposit where it was first observed, and found in the Uinta Mountains of Eastern Utah."¹

"Considerable information has been presented about the unique, black hydrocarbon, Gilsonite since its original discovery by Samuel H. Gilson in the early 1880's. The Uinta Basin of Eastern Utah has subsequently received specific recognition for its sizable ore deposits of this interesting mineral, as well as providing the general mining locations for numerous individuals and companies in their continuing effort to effectively mine and develop this valuable natural resource."²

Enclosed are copies of the archaeological site forms for the two sites mentioned above. The original forms have been sent to the SHPO, Division of State History, Salt Lake City for accession.

Sincerely yours,

Leon E. Berggren
Area Manager

- Enclosures (2)
- 1-Site Form 42Em1222
- 2-Site Form 42Em1223

UNITED STATES
 DEPARTMENT OF THE INTERIOR
 BUREAU OF LAND MANAGEMENT
 UTAH STATE OFFICE
 ACTIVITIES SITE INVENTORY

PROJECT NAME U.S. Steel BLM REPORT ID# 11 14 20
 5 PREHISTORIC 8 RECORDED BY Benson/Yearsley
 6 HISTORIC X 9 INSTITUTION BLM
 7 PALEONTOLOGICAL 10 DATE 08/11/80

11 BLM DISTRICT NO. 6 12 BLM RESOURCE AREA P R
21 22 23
 Salt Lake = 2 Cedar City = 4 Vernal = 8
 Richfield = 5 Moab = 6
 13 COUNTY Emery
 14 UTM GRID: ZONE 24 25 Easting 26 31 Northing 32 38
 15 LEGAL DESCRIPTION: T 15 S R 14 E Sec. 0 3 Qu-Sec. S E (10 acre) (40 acre) (160 acre)
Fill in spaces 42 or 46 only if: 39 42 43 46 47 48 49 50 51 52 53 54
 42 V = Vernal Meridian 46 H = Half Range
 H = Half Township
 16 MAP NAME AND SCALE: Woodside 15 minute

17 SURFACE OWNER: Pvt OTHER:
55 56
 18 NATIONAL REGISTER POTENTIAL: S S=Significant, N=Nonsignificant Why:
57
Name Gilson (Gilsonite possibly found here)

19 MANAGEMENT VALUES: Interpretational Potential X Scientific
 20 SITE CONDITION Excellent % DESTROYED 1 0
58 59 60

21 AGENT CAUSING IMPACT E R, V A, 22 PHOTO TAKEN: Color # X
ER = Erosion VA = Vandalization PR = Project OT = Other NO = No Impact Y Y=Yes B/W #
61 62 63 64 65 66 67 N=No

23 RECOMMENDED PROTECTION Fence Exists and recorded/site is known by Utah Historical Society

24 SITE TYPE - CULTURAL O T, , RA=Rock Art, LA=Limited Activity, ST=Structural
68 69 70 71 72 73 RS=Rock Shelter, OT=Other

25 PALEONTOLOGICAL: Invertebrate Vertebrate Flora

26 CULTURAL FEATURES O T, , , , ,
74 75 76 77 78 79 80 81 82 83 84 85 86 87
 LS = Lithic Scatter SH = Shelter PI = Pictograph
 CS = Ceramic Scatter RA = Rock Alignment PE = Petroglyph
 GS = Ground Stone Scatter RM = Rubble Found BU = Burial
 HE = Hearth SC = Stab-lined cists HS = Historical Structure
 QU = Quarry MG = Masonry Granary MN = Mines
 BS = Burned Stone MR = Masonry Room/Wall CD = Corral
 MO = Midden TD = Tower TR = Trail
 DE = Depression WC = Water Control GL = Glass
 OT = Other M7 = More than 7 of the above.

Description: An Historical Landmark - tree blazed 1878 "Sam Gilson by God"
Utah Historical Marker & fence protecting tree & signature

27 SITE DIMENSIONS: L. 1 M Ft. w .2 M Ft. Depth .001M Ft

28 DEPTH OF FILL N Y=Yes N=No U=Undetermined
88 entire site 3x3m UT 8100-1 (4/79)

42Em1222

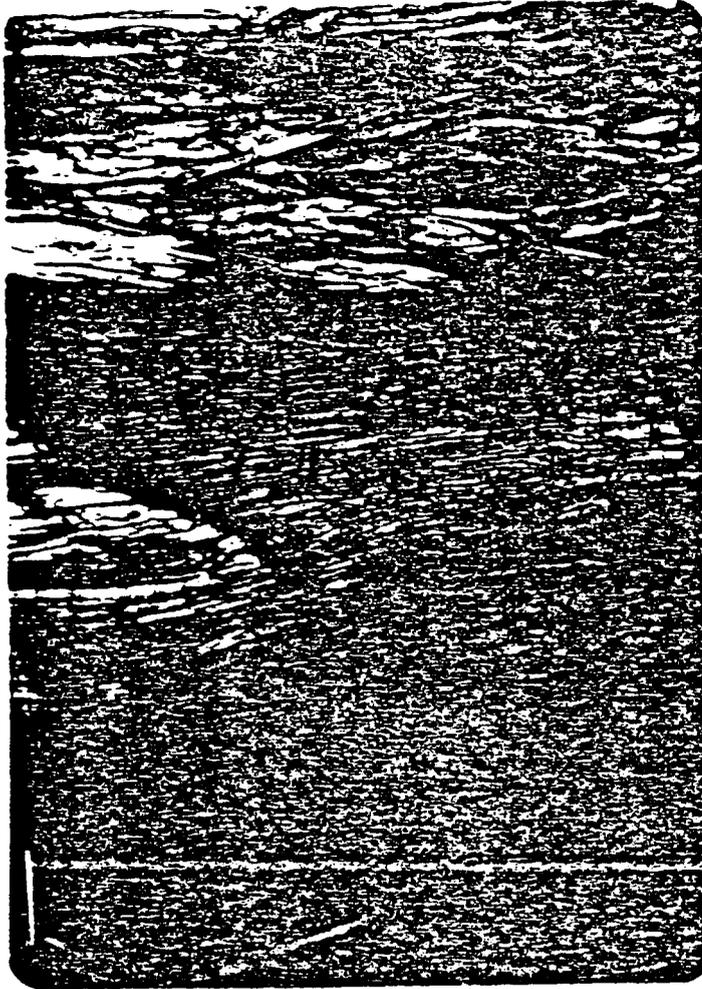
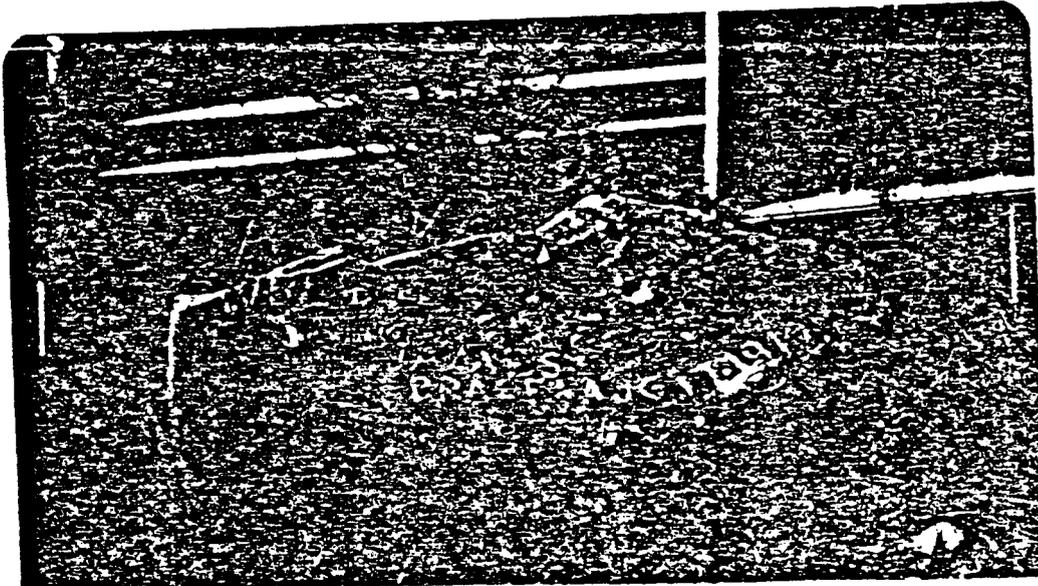


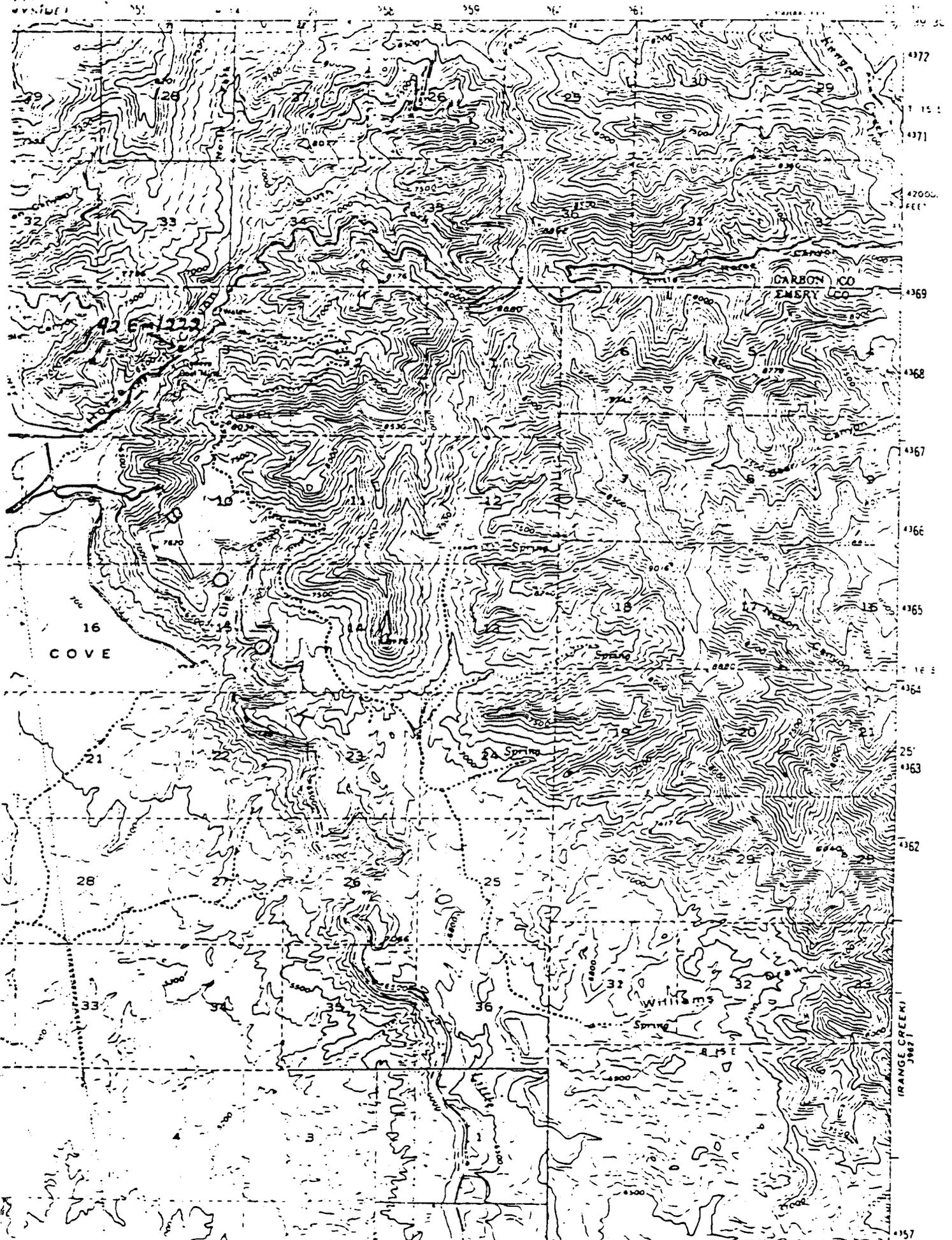
Photo looking West, note faint inscription
by S. Gilson.



Utah Historical Marker, Photo looking North



Other Historic signatures on boulder just south of Gilson tree.



DEPARTMENT OF THE INTERIOR
 BUREAU OF LAND MANAGEMENT
 UTAH STATE OFFICE
 ANTIQUITIES SITE INVENTORY

3 PROJECT NAME _____ 4 BLM PORT ID# 10
 5 PREHISTORIC _____ 8 RECORDED BY Yearsley/Benson
 6 HISTORIC X 9 INSTITUTION BLM Price RA
 7 PALEONTOLOGICAL _____ 10 DATE 08/11/80

11 BLM DISTRICT NO. 6 12 BLM RESOURCE AREA P R
 Salt Lake = 2 Cedar City = 4 Vernal = 8
 Richfield = 5 Moab = 6
 13 COUNTY Emery
 80 = Bonneville, WA = Wasatch, HR = House Range, WS = Warm Springs,
 SE = Sevier River, NM = Henry Mtns., BR = Beaver River, DX = Dixie,
 KA = Kanab, ES = Escalante, SJ = San Juan, GR = Grand, PR = Price River,
 SR = San Rafael, DM = Diamond Mountain, BC = Book Cliffs.

14 UTM GRID: ZONE _____ Easting _____ Northing _____
 15 LEGAL DESCRIPTION: T 15S R 14E Sec. 03 (10 acre) (40 acre) (160 acre)
 Qu-Sec. NE Qu-Sec. SW Qu Sec. NE
 Fill in spaces 42 or 46 only if: 39 42 43 46 47 48 49 50 51 52 53 54
 42 V = Vernal Meridian 46 H = Half Range
 H = Half Township
 16 MAP NAME AND SCALE: Woodside 15' Quad

17 SURFACE OWNER: Pvt OTHER: U.S. Steel Corporation
 18 NATIONAL REGISTER POTENTIAL: N S=Significant, N=Non-significant Why: Example of
an historic storage unit. Condition and its unique character not outstanding.

19 MANAGEMENT VALUES: Interpretational Potential _____ Scientific _____
 20 CONDITION Fair % DESTROYED 50

21 AGENT CAUSING IMPACT ER, _____, _____ 22 PHOTO TAKEN: Color # X
 ER = Erosion 61 62 63 64 65 66 Y = Yes B/W # _____
 VA = Vandalization 67 68 69 70 71 72 73 N = No
 PR = Project
 OT = Other
 NO = No Impact

23 RECOMMENDED PROTECTION None

24 SITE TYPE - CULTURAL SIT, _____, _____ RA=Rock Art, LA=Limited Activity, ST=Structural
 58 59 70 71 72 73 RS=Rock Shelter, OT=Other

25 PALEONTOLOGICAL: Invertebrate _____ Vertebrate _____ Flora _____

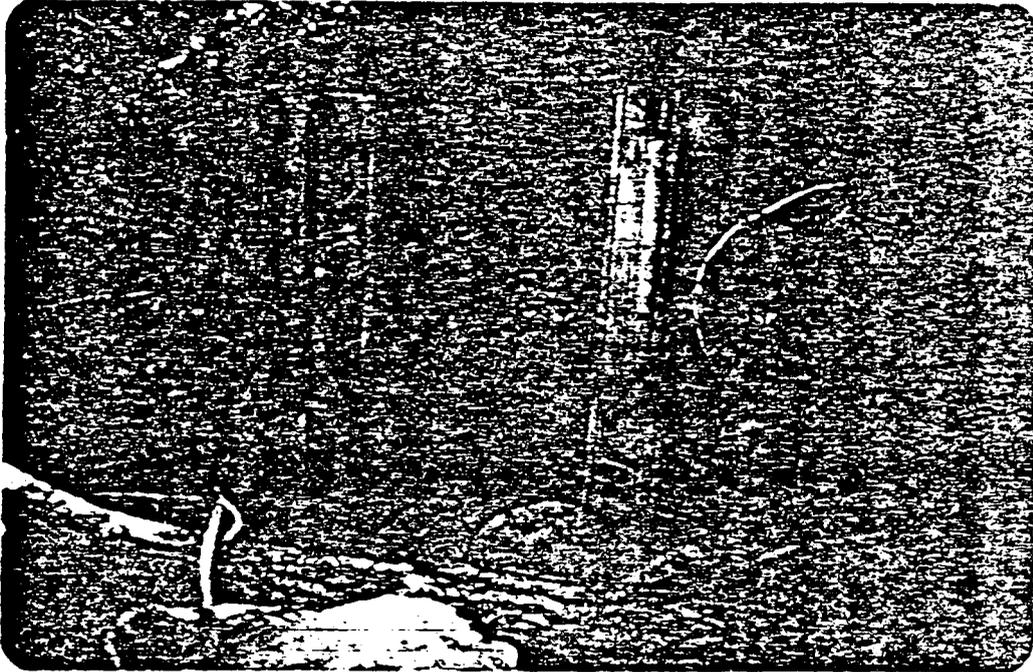
26 CULTURAL FEATURES H S, _____, _____, _____, _____, _____, _____
 74 75 76 77 78 79 80 81 82 83 84 85 86 87
 LS = Lithic Scatter SH = Shelter PI = Pictograph
 CS = Ceramic Scatter RA = Rock Alignment PE = Petroglyph
 GS = Ground Stone Scatter RM = Rubble Mound BU = Burial
 HE = Hearth SC = Slab-lined cists HS = Historical Structure
 QU = Quarry MG = Masonry Grinary MN = Mines
 BS = Burned Stone MR = Masonry Rooms/Wall CD = Corral
 MO = Midden TR = Trail
 DE = Depression WC = Water Control GL = Glass
 OT = Other M7 = More than 7 of the above.

Description: Historic structure consists of a wood blank - "root cellar" constructed in
embankment adjacent to road. Door to structure is missing, but shelves remain.
Most probable that this is an outbuilding of a historic settlement in vicinity
(other components not located).

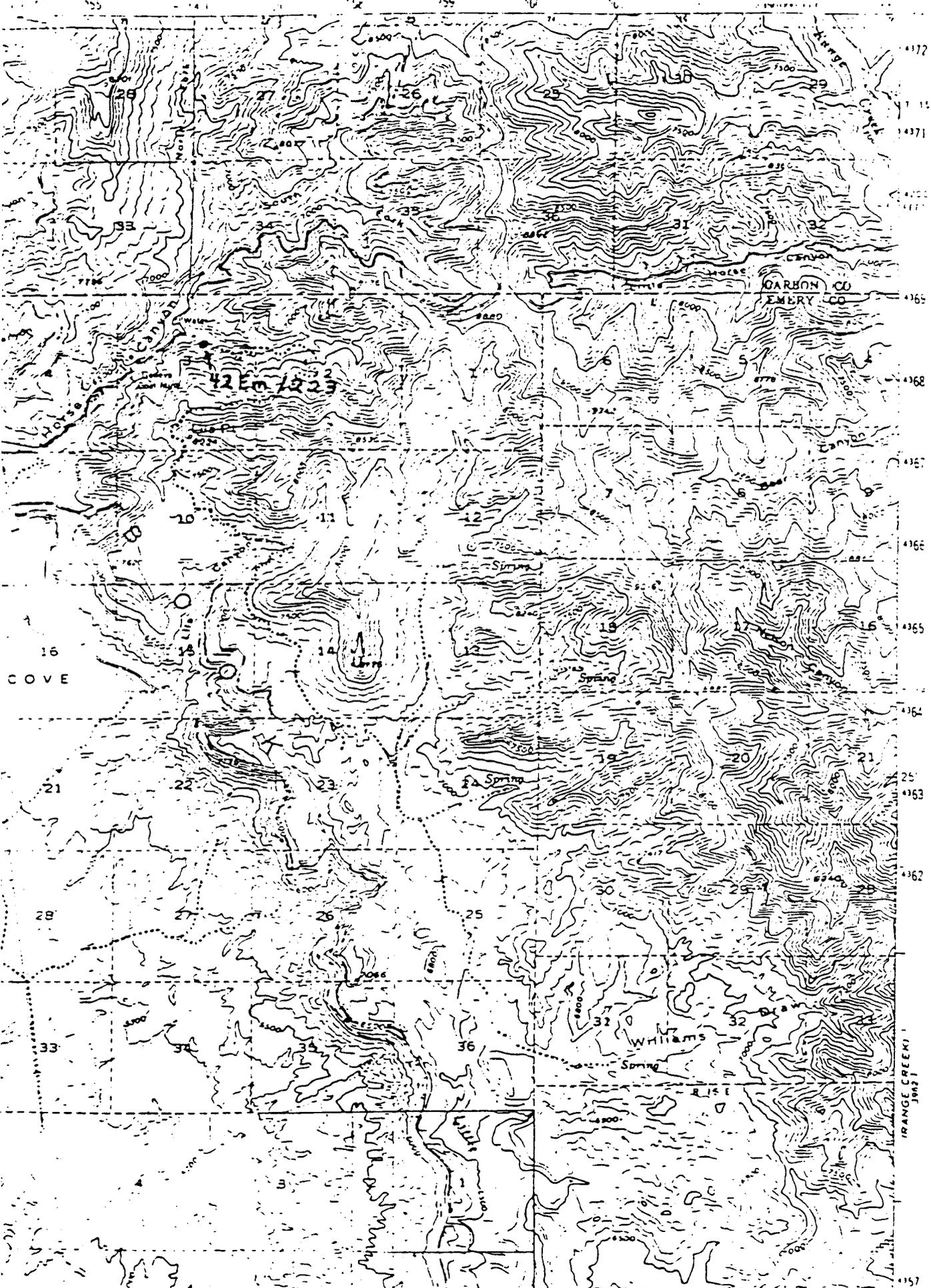
27 DIMENSIONS: L. 4 Ft. w 3 Ft. Depth 2 Ft

28 DEPTH OF FILL U Y=Yes N=No U=Undetermined UT 8100-1 (4/79)

42Em1223



Historic 'root cellar' looking West.



Appendix X-2

CRMS Cultural Resources Information



Brigham Young University

Cultural Resource Management Services

10 March 1986

Ms. Susan D. Hasenjager
Permitting/Environmental Consultant
Kaiser Steel Corporation
P.O. Box 1109
Arvada, Colorado 80004

Ms. Hasenjager:

Please find enclosed five (5) copies of "An Archaeological/Historical Inventory of the Kaiser Steel Corporation Horse Canyon Mine Lease, East Carbon County, Utah," by Don Southworth and Asa S. Nielson. We have included all original paste-ups for your future copying needs. We have forwarded the IMACS site forms to the appropriate federal and state agencies. You will notice that we have added a title page with a Museum of Peoples and Cultures Technical Series Number to the report. Please feel free to discard the title page if you need to for the permit application.

For your information, copies of this report have also been sent to Mr. Richard Fike, State Archaeologist, Bureau of Land Management; Mr. Blaine Miller, Price Resource Area Archaeologist, Bureau of Land Management; and Mr. La Mar Lindsay, Assistant State Archaeologist, Utah Division of State History.

If you have any questions or concerns, please feel free to contact us.

Sincerely,

Lorna Billat
Staff Archaeologist
CRMS/BYU

**BRIGHAM YOUNG UNIVERSITY
MUSEUM OF PEOPLES AND CULTURES
TECHNICAL SERIES NO. 86-19**



AN ARCHAEOLOGICAL/HISTORICAL INVENTORY OF THE
KAISER STEEL CORPORATION HORSE CANYON MINE LEASE,
EAST CARBON COUNTY, UTAH

by
Don Southworth and Asa S. Nielson

Cultural Resource Management Services
A. S. Nielson, Principal Investigator
Museum of Peoples and Cultures
Brigham Young University
Provo, Utah 84602

prepared for

Kaiser Steel Corporation
Arvada, Colorado

10 March 1986

Federal Antiquities Permit Number 85-Ut-54624
Utah State Project Authorization Number U-85-18-597b,p

AN ARCHAEOLOGICAL/HISTORICAL INVENTORY OF THE
KAISER STEEL CORPORATION HORSE CANYON MINE LEASE,
EAST CARBON COUNTY, UTAH

PERMIT APPLICATION

for

Kaiser Steel Corporation
Horse Canyon Mine Lease
Horse Canyon, Utah

CHAPTER V

HISTORICAL AND CULTURAL RESOURCES

NOTE

This chapter on historical and cultural resources was prepared, under contract to Kaiser Steel Corporation, by the Cultural Resource Management Services of Brigham Young University, who also conducted the field survey.

CHAPTER V

HISTORICAL AND CULTURAL RESOURCES

5.0 Table of Contents

5.0 Table of Contents

5.1 Scope

5.1.1 Abstract

5.1.2 Introduction

5.1.3 General Information and Legal
Background

5.1.3.1 General Goals

5.1.3.2 Location

5.1.4 Environmental Overview

5.1.4.1 Physical Features for the Site
Area: Topography, Drainage and
Elevation

5.1.4.2 Geology

5.1.4.3 Soils

5.1.4.4 Vegetation

5.1.4.5 Fauna

5.1.4.6 Present Climate

5.1.4.7 Past Climate

5.1.4.8 Present Land Use

5.1.4.9 Historic Land Use

5.1.5 Prehistoric Overview

5.1.6 Historic Overview

5.1.7 Previous Archaeological Research

Kaiser Steel Corporation
Horse Canyon Mine Lease

5.2 Methodology

5.2.1 Project Objectives

5.2.2 Project Methods

5.3 Historic Resources Survey Results

5.3.1 Historic Inventory

5.3.2 Mining Impacts to Historic Resources

5.4 Prehistoric Resource Survey Results

5.4.1 Prehistoric Inventory

5.4.2 Mining Impacts to Prehistoric Resources

5.5 Public Parks

5.6 Evaluation of Resources

5.6.1 National Register Criteria

5.6.2 Summary of Cultural Resources and
National Register Criteria

5.7 Project Recommendations

Bibliography

Appendix A - Site Forms

Appendix B - BYU Artifact Accession Numbers

Figure V-1 General Project Area

Figure V-2 Project and Site Location

Figure V-3 Projectile Points from 42Em 2101

Table V-1 Climatic Summary for Price

Table V-2 Climatic Summary for Green River, Utah

Table V-3 Site Summary

CHAPTER V

HISTORICAL AND CULTURAL RESOURCES

5.1 Scope

5.1.1 Abstract

The Cultural Resource Management Services (CRMS) of Brigham Young University (BYU) has completed a Class I (literature) and Class III (100% intensive) cultural resource inventory of the Kaiser Steel Corporation Horse Canyon Mine Lease in eastern Carbon County, Utah. CRMS recorded five cultural sites and isolated artifact, all within probable impact zones. A previously recorded site, is listed on the National Register of Historic Places. This site is near, but not within the proposed impact zone. New cultural sites include one historic mine, one historic coal loadout, two historic camp sites, two prehistoric lithic scatters and one prehistoric isolated artifact. None of the new materials are considered to be significant.

5.1.2 Introduction

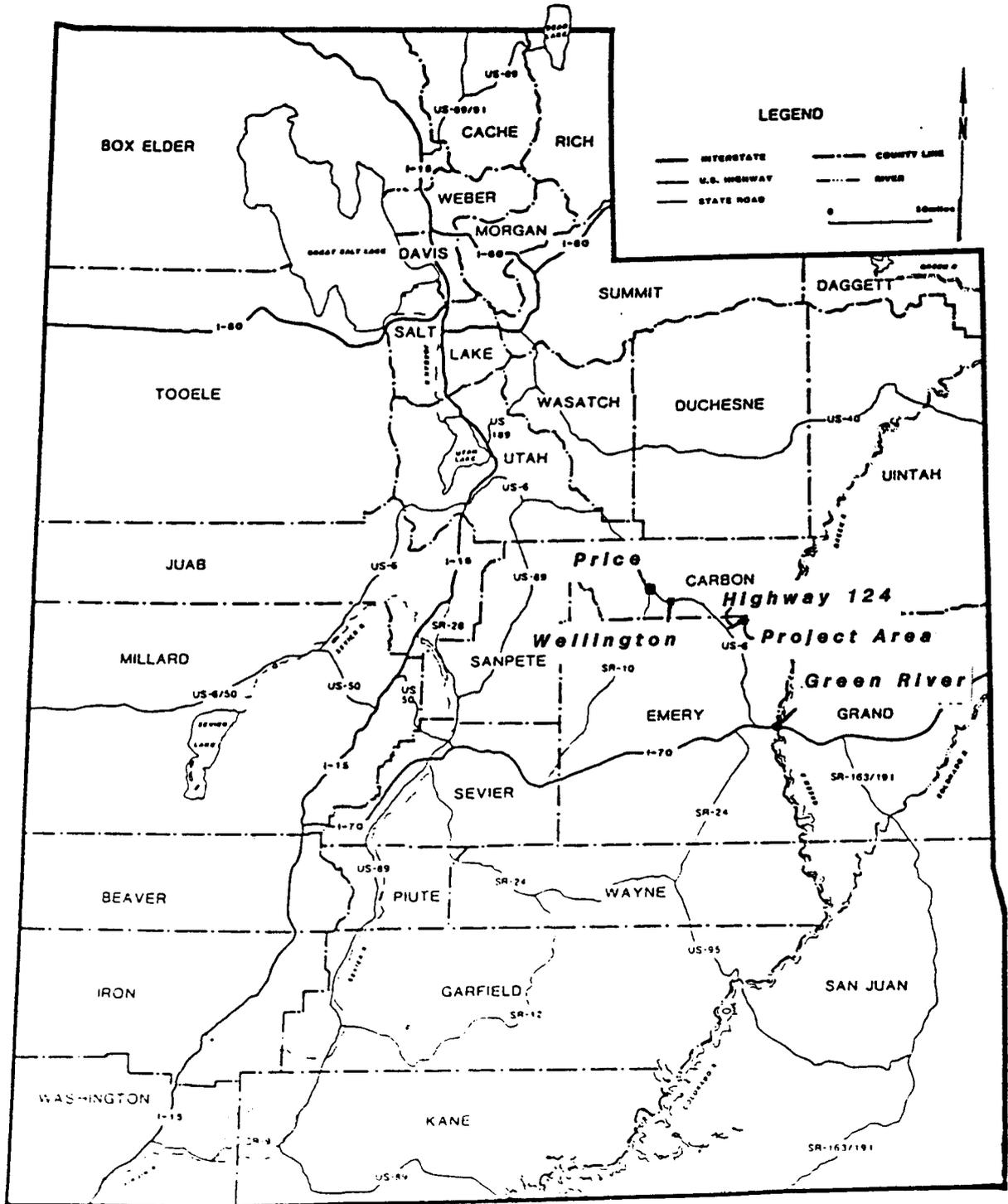
Between 3 and 23 September 1985, CRMS completed a Class I (literature) and Class III (100% intensive inventory of the Kaiser Steel Corporation Horse Canyon Mine Facility area in

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Horse Canyon, eastern Carbon County, Utah (Figure V-1). This report is in partial fulfillment of an agreement between CRMS and Kaiser Steel, dated 26 September 1985. It is part of the base-line environmental studies required for a Utah Mine Permit Application. This report follows the basic format of the Permit Application General Guidelines for Organization Format and Content, revised November 1980, published by the Utah Division of Oil, Gas and Mining. CRMS has made a few minor modifications of the headings and heading numbers.

CRMS was contacted by Ms. Susan Hasenjager, Permitting/Environmental Consultant for Kaiser Steel, in August for a bid estimate. A letter of agreement was dated 26 September 1985. The work was accomplished under Utah State Project Authorization Number U-85-18-579b,p, and Federal Antiquities Permit Number 85-Ut-54624.

Field work was completed between 10 and 23 September of 1985. Literature reviews began on 3 September. The field work was directed by Asa S. Nielson, assisted in the field and during the literature review by Don D. Southworth, Ken Wintch and Rodger Prueitt. The report was prepared by Don Southworth and Asa Nielson. Drafting was accomplished by Richard Beaty, art work by Kae



General Project Area

Figure V-1

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Smith and word processing by Lorna C. Billat. Literature reviews were conducted at the Utah Division of State History (USHPO) in Salt Lake City, at the Price Resource Area Office of the Bureau of Land Management (BLM) in Price and the Emery County Courthouse, in Castledale. Actual field work required about 8 person-days, travel included. The literature research required 5 person-days. Many of the old Geneva Mine records were absorbed by Kaiser Steel Corporation, and in their recent move from California to Colorado, the records have misplaced. The report required seven person-days to process.

5.1.3 General Information and Legal Background

Kaiser Steel proposes to renovate and expand the existing Horse Canyon Mine Facility. This will include renovation of existing buildings, old mine portals and roads. New roads, portals, coal stockpile areas and support buildings may be added as needed. The mine gains access to deep coal deposits by tunnels, and the resource will be removed by the long-wall process.

Surface disturbance (beyond facilities, coal stockpile and roads) would be restricted to possible subsidence only. The mine expansion pro-

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cess involves both State and Federal Permits, which requires Kaiser Steel to comply with various legal mandates. First, the study fulfills requirements of the Utah Coal Mining and Reclamation Act of 1979. The study also helps Kaiser Steel to comply with federal legislation, i.e., Executive Order 11593 "Protection and Enhancement of the Cultural Environment" (Federal Register, Vol. 36, No. 95, May 15, 1971), The National Historic Preservation Act of 1966 (80 Stat. 915) as amended in 1976, The Archaeological and Historical Data Preservation Act of 1974:, which is an amendment of "Reservoir Salvage Act of 1960" (74 Stat. 220), and finally, the "Archaeological Resources Protection Act of 1979". In general, these laws recognize the fragile, non-renewable nature of historic and prehistoric cultural resources. The legislation has been enacted in order to identify, report and evaluate these resources prior to any proposed impacting action.

5.1.3.1 General Goals

The project has three specific goals. First, is to identify all previously reported projects and sites within the specified disturbance zone. It is important to place these materials within the phy-

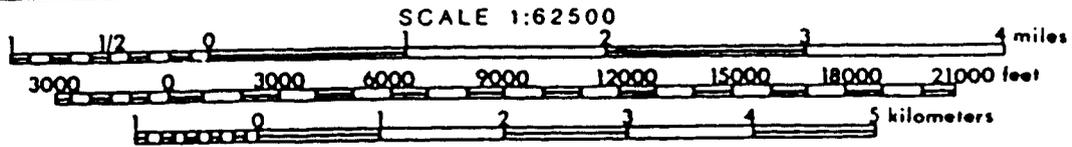
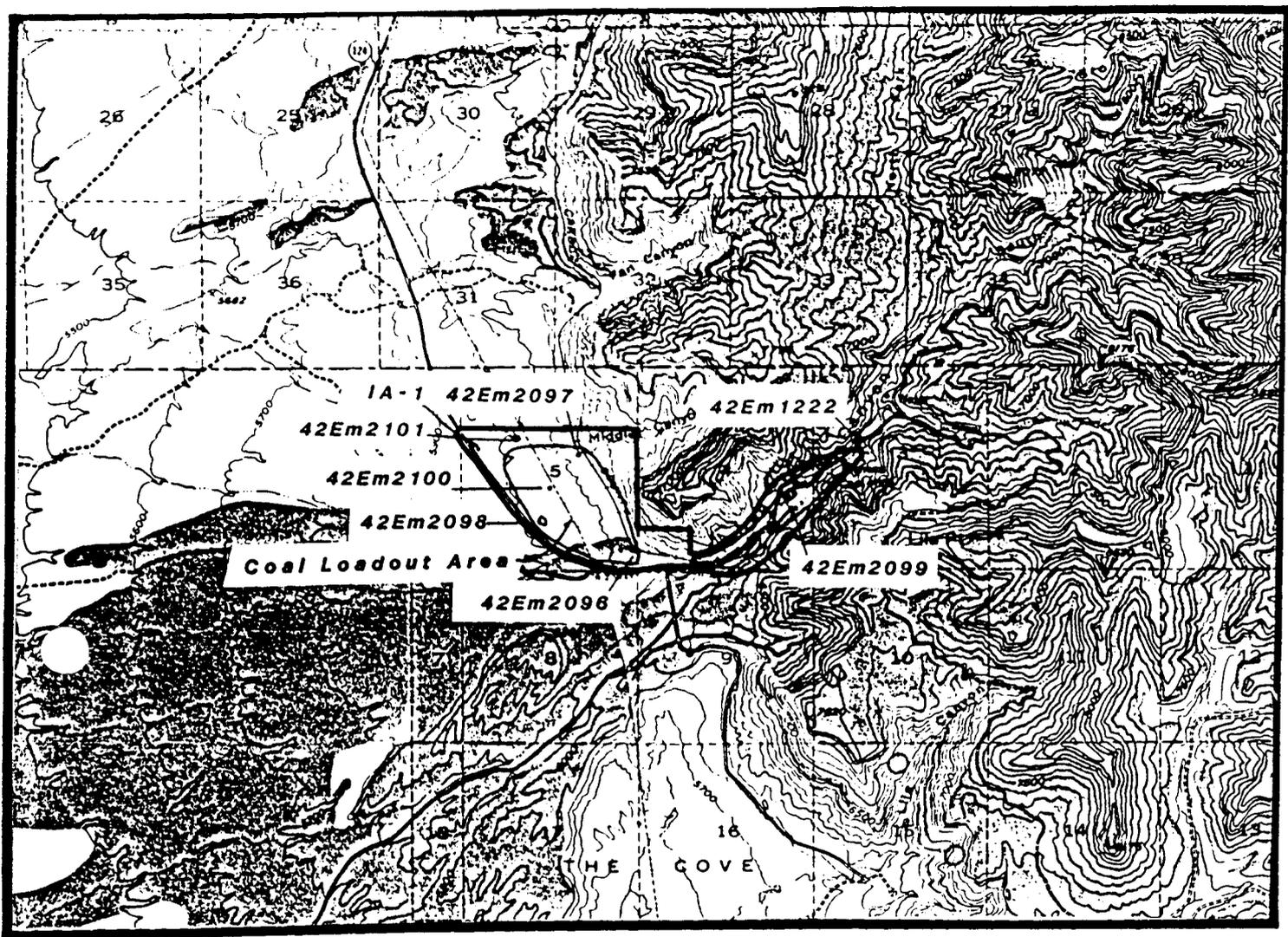
**Kaiser Steel Corporation
Horse Canyon Mine Lease**

sical and historic context and to assess the sites potential of significant data recovery potential. Second is to assess potential of the sites is based on various criteria set forth in the National Register (see 5.6.1 National Register Criteria).

The third major goal is to assess the nature of the impacts to the identified cultural resources. Impacts would possibly occur in a variety of forms including minor modification of existing buildings, total or partial removal of the resource for any number of reasons, and possible disturbance by surface subsidence. If significant sites (those with data recovery potential) are discovered, and are within potential impact zones, steps to protect or recover data from the sites prior to impact would be recommended.

5.1.3.2 Location

The Horse Canyon Mine property is about 10 miles (16 km) south of the East Carbon-Sunnyside townsites and about 28 miles (45 km) southeast of Price City (Figure V-1) in eastern Carbon County. The site is accessed by proceeding northeast on Utah Highway 124, from its junction with U.S. 60/50. The mine area (Figure V-2) is an irregular land parcel that includes (with land locator an-



PROJECT: Kaiser Horse Canyon Mine Area T. 16S R. 14E

COUNTY: Emery **QUAD:** Woodside, Utah 15-minute

LEGEND: Project Boundary
Archaeological Site

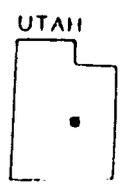


Figure V-2

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chored to southeast section corners) portions of the SW1/4 NW1/4 and the NW1/4 NW1/4 SW1/4 of Section 3, T16S R14E. It includes most of the SE1/4, and the S1/2 of SW1/4 of Section 4, the extreme NW1/4 NW1/4 NE1/4 and the extreme NE1/4 NE1/4 NW1/4 of Section 9. These lands are privately owned by Kaiser Steel Corporation. The mine expansion also includes nearly all of the SE1/4, most of the NE1/4 SW1/4, the NE1/4 SE1/4 SW1/4, the S1/2 of the NW1/4 and the S1/2 of the NW1/4 NE1/4 NW1/4 of Section 5. This land is administered by the Price Resource Area Office of the Bureau of Land Management. All map references are from the Woodside Quadrangle, Utah, 15-Minute series Topographic.

5.1.4 Environmental Overview

5.1.4.1 Physical Features and the Site Area:
Topography, Drainage, and Elevation

The Kaiser Steel Horse Canyon Mine area is rugged, broken and precipitous, as is typical of the dissected Book Cliffs area. The mine area extends from 5950 feet above sea level (asl) near State Highway 124 up to about 6500 feet near the Geneva Mine Portal east of the high Lila Point, a prominent ridgetop southeast of the mine reaches 8034 feet asl. The gr

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Cliffs exceed 9000 feet asl in some locations further east and north of the mine. With the exception of the area east of Section 5, the mine is dominated by steep, unstable colluvial slopes and exposed bedrock cliffs.

The dominating topographic feature is Horse Canyon after which the mine area is named. Horse Canyon drains generally west toward Icelfander Wash. The northern mine area is bordered by Middle Canyon. It too drains toward Iceland Wash (Figure V-2). Icelfander Wash drains south toward Cottonwood Creek, which in turn drains into the Price River, about 8 miles (12.8 km) southwest of the mine. Numerous small, unnamed arroyos and small canyons also drain into Horse Canyon. Horse Canyon is formed by the juncture of North Fork and South Fork Canyons, beginning about one mile (1.6 km) northeast of the mine. Horse Canyon is a relatively broad mature feature with deep colluvial and alluvial deposits. Side canyons enter principally from the north and south and tend to be immature V-shaped features lacking alluvial deposits.

5.1.4.2 Geology

The mine permit area straddles the boundary

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between the Mancos Shale lowlands (principally Section 5) and the western edge of the faulted Book Cliffs-Roan Plateau subsections of the Colorado Plateau (Stokes 1977).

Book Cliffs-Roan Plateau Section:

"The area between the Uinta Basin and the shale valleys of Carbon, Emery and Grand counties has relatively simple structure but rugged topography. Here strata of Cretaceous and Tertiary age rise gradually upwards to elevations of 8,000 to 10,000 feet where they are abruptly cut off by great south-facing cliffs that descend in giant steps to the valley below where elevations are between 4,000 and 5,000 feet. The name Book Cliffs-Roan Section is appropriate for this unit.

The great linear systems of cliffs are characteristic. The lower and best known is the Book Cliffs; above this and separated from it by a bench or valley up to 10 miles across is the Roan Cliffs. For that part of the Uinta rim in Carbon County there is a third abrupt rise, the Badland Cliffs.

The Roan Plateau grades northward into the Uinta Basin where an arbitrary boundary may be drawn roughly between areas that contain well-marked canyons and areas that lack them. The Roan Plateau is cut by the Grey and Desolation Canyons of the Green River and deeply dissected by many north-trending drainage ways" (Stokes 1977:3).

Mancos Shale Lowlands Section

"The largest tract of fairly level land in eastern Utah has the shape of an inverted S extending roughly from the town of Emery to the Colorado Border. Geologically it is cut in the weakly resistant Mancos Shale, hence the name Mancos Shale Lowlands Section. On one

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side the boundaries follow the base of the slope below the Book Cliffs and their equivalents along the Wasatch Plateau; on the other side the boundary is the zone where streams enter canyons cut in the Dakota Sandstone" (Stokes 1977:3).

The two areas form distinctive units within the mine area. Section 5 (Figure V-2) is in the Mancos Shale lowlands. The area is predominantly eroded Mancos Shale Pediments that extend westward into the valley. Erosion and flooding have deposited Quaternary Age gravels. Relatively recent gravels and silt deposits exist in the courses of Horse and Middle Canyons.

The east portion of the mine is within the Book Cliffs, dominated by steep exposed escarpments that dip north and east toward the Uintah Basin. The cliffs themselves are exposures of Cretaceous Mesa Verde Group. These are in turn, capped by Paleocene North Horn and Flagstaff Formation and the Eocene Green River Formation (Hintze 1980).

5.1.4.3 Soils

Soils, where they exist are generally thin and poorly developed. For the most part, the steep colluvial slopes and high energy erosion environment within the Book Cliffs allow for little soil development. Landslide areas may have some A-Horizon development, and occasional plant cover

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allows for some loam development. What soil forms in the Book Cliffs section tends to be sandy, bouldery entesols, inceptisols, and aridisols. The Mancos Shale section (Section 5 - Figure V-2) is dominated by eroded Mancos shale. Soils are nearly non-existent, except under some vegetation where shallow loam develops. Most soils are poorly drained, clay-cobble deposits. The general lack of soil would generally prevent any long term agriculture, relegating the area to a gathering location for natural plants and animals only.

5.1.4.4 Vegetation

The mine area is within the general Sagebrush Vegetation Zone as defined by Tidestrom (1925) and Conquist et al. (1972). There is some overlapping of the zone into the general Pinyon/Juniper Zone, especially along pediment ridgelines and the upper slopes of the mine area. Recent historic mining activity has somewhat altered or depleted the natural flora and allowed the establishment of intrusive species. Most of the vegetation should have been detailed elsewhere on the mine permit application and an exhaustive relisting of flora is viewed as unnecessarily redundant. Briefly, among the basic flora observed by CRMS are various

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Compositae, such as big sagebrush, sand sagebrush, rabbitbrush, broom snakeweed, bitterweed, skeleton plant and mule ears. Chenopodiaceae include shadscale, four-wing saltbush, spiny hopsage and Russian thistle. Ephedraceae is dominated by Nevada joint fir. Gramineae include three-awn, and foxtail.

5.1.4 Fauna

The project is within the Colorado Plateau Fauna Area - Canyonlands Province: San Rafael Subcenter (Durrant 1952). This particular subcenter is unique with the presence of various subspecies of pocket gopher, woodrats and kangaroo rats (Durrant 1952:486). During the inventory, CRMS observed directly or indirectly (tracks, droppings, etc.), mule deer, coyote, black-tailed jackrabbit, cottontail, rock squirrel, least chipmunk, harvest mouse, porcupine, bobcat, badger, white-tail prairie dog, magpie, horned lark, chukar and pinyon jay. The area likely supports a variety of predatory birds (red-tailed hawk, sparrow hawk, owls and eagles), migratory mourning dove, weasles, skunks, fox and bats.

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5.1.4.6 Present Climate

There was no on-site climatic information available to CRMS for the survey area. Two weather stations, northwest at Price and southeast at Green River, have been summarized in Tables V-1 and V-2 respectively. Both stations are at a lower elevation than Horse Canyon, therefore comparison is difficult. Climatic information for Hiawatha, in Carbon County may be more applicable because of its elevation, but there would likely occur different orographic effects. Briefly, there are about 200 frost-free days at Hiawatha. Moisture peaks in August, derived principally from Gulf of Mexico tropical storms. Winter moisture in the form of snowpack is derived from cyclonic Pacific based storms. Effective moisture will vary from north to south facing slopes. The open lowlands west of Horse Canyon will average about nine inches of moisture per year. The mine area could receive as much as 14 inches (U.S. Department of Commerce 1965). Late summer storms can be brief, but torrential, often causing flash flooding. Both spring runoff and summer rains currently cause considerable arroyo cutting and general soil sheet erosion. Overall, the area is not well suited for intensive horticulture.

TABLE V-1

CLIMATIC SUMMARY FOR PRICE
(from Rauch 1981)

(Elevation 5680 ft.)

<u>Months</u>	<u>Precipitation</u> (in inches)	<u>Temperature</u> (in degrees F)
January	.74	23.6
February	.62	29.7
March	.68	39.3
April	.61	49.4
May	.68	58.5
June	.70	67.1
July	.93	74.3
August	1.11	72.2
September	.83	64.4
October	.94	52.1
November	.51	37.0
December	.92	28.0
-----	-----	-----
Totals	9.27	49.6

Precipitation and Temperature figures are an average from 1931 to 1960, and are from the Climatology of the United States No. 60-42; No. 86-37 published by the U.S. Government Printing Office, Washington, D.C., 20402, Department of Documents.

TABLE V-2

CLIMATIC SUMMARY FOR GREEN RIVER, UTAH
(from Rauch 1981)

(Elevation 4070 ft.)

<u>Months</u>	<u>Precipitation</u> (in inches)	<u>Temperature</u> (in degrees F)
January	.36	23.1
February	.40	32.2
March	.41	42.7
April	.43	53.6
May	.39	63.0
June	.45	71.6
July	.52	79.6
August	.83	76.9
September	.52	67.6
October	.71	54.0
November	.38	37.5
December	.45	28.3
-----	-----	-----
Totals	5.85	52.5

Precipitation and Temperature figures are an average from 1931 to 1960, and are from the Climatography of the United States No. 60-42; No. 86-37 published by the U.S. Government Printing Office, Washington, D.C., 20402, Department of Documents.

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5.1.4.7 Past Climate

It is difficult at best to characterize the past environment, let alone its effect on past cultures in the mine permit area. There are no known paleoenvironmental studies reported in the Book Cliffs. There have been a few studies completed beyond the region, however, and these have been summarized in Nielson, Merrill and Oviatt (1981).

"The last major period of Pleistocene glacial climate (about 22,000 to 13,000 B.P.) had profound effects on nearby areas of Utah. Due to the marked increase in effective moisture there were vast pluvial lakes in the Great Basin and extensive glaciers in the high mountain areas during this period (Morrison 1965).

There were no glaciers or pluvial lakes in the Sunnyside area during the Pleistocene. However, during each of the 19 major world-wide glacial events in the last 700,000 years (Shackleton and Opdyke 1973), the area probably underwent significant environmental changes. These probably included: decreased temperatures and/or increased precipitation, altitudinal lowering of vegetation zones, increased runoff in streams, increased soil moisture and higher ground water tables, increased snow pack, increased colluvial activity on slopes, and an increase in large-scale mass-wasting. Packrat (*Neotoma* sp.) middens are abundant in the permit area, and are a potential source of paleoecological data (Wells 1976) for future research.

Higher frequency Holocene (10,000 B.P. to the present) climatic changes are documented from several nearby places in Utah (e.g. Madsen and Currey 1979; Currey

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1976; Currey 1980; Lindsay 1980). The general pattern in the period 13,000 to 8,000 B.P. is of gradual warming with several lesser episodes of cooling following rapid deglaciation in the mountain areas. The Altithermal, or mid-post-glacial warm period, lasted from about 8,000 B.P. to 5,000 B.P. with possibly a short period of cooler or wetter conditions around 6500 to 6000 B.P. Subsequent to 5,000 B.P. there were at least three periods of increased effective moisture (Neoglaciation) leading up to modern climatic conditions at the end of the "Little Ice Age" (about A.D. 1850). The effects of Holocene climatic fluctuations on the geology and ecology of the Sunnyside area is not known. But, it is likely that the environmental changes had a significant effect on prehistoric peoples as has been noted in surrounding areas (Benedict 1979; Madsen 1980).

5.1.4.8 Present Land Use

At the present time, the mine area is controlled by Kaiser Steel. Until recently, U.S. Steel mined coal in the canyon, ending in 1984. Other uses include some livestock grazing, occasional hunting (deer, rabbits and chukar) and vehicle recreation (motor bikes, 4-wheel drive, etc.). The canyon is a major access to the western rim of the Book Cliffs and lower Range Creek.

5.1.4.9 Historic Land Use (See Historic Overview 5.1.6)

During the historic period, the mine area has been used principally for stock raising, Book

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Cliffs access (transportation) and mining. There is no evidence for early historic trapping.

Transportation -- The first known use of Horse Canyon was that of Samuel Gilson, who used the canyon on numerous occasions for a corridor to move horses from Juab County to Wyoming for sale. It was during one of these trips that Gilson inscribed the now famous "Sam Gilson by God" - a National Register Site (42Em 1222).

Stock Raising/Homesteading -- The first livestock raising is believed to have occurred in the late 1800s or early 1900s. By 1913, the area was claimed by James Ives and Thomas Kelley. Homesteads appeared southeast of the mine permit area in the 1930s (Rauch 1981:33).

Mining -- The first mining may have occurred in the late 1890s or early 1900s, possibly by Mr. Kelley (Richardson 1909). In 1936, Kelley's widow, Olive, formed a partnership with Mr. Ives and formed the Cedar Ridge Coal Company which remained active until 1942. U.S. Steel obtained the property in 1942, operating the mines until 1984.

5.1.5 Prehistoric Overview

Over the past few years, numerous overviews of the prehistory of the region, covering the permit

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area specifically, have become available. The overviews range from a generalized approach, covering the entire history (Jennings 1978; Hauck 1977; Pierson 1980; Thompson, Thompson and Embry 1983; Nickens 1980) to more culture specific (Schroedl 1976; Madsen and Lindsay 1977; Holmer and Weder 1980). Nielson, Merrill and Oviatt (1980) and Rauch (1981) have provided overviews of two mine areas, the former near Sunnyside and the latter for Kaiser Steel immediately adjacent to the Horse Canyon Mine Area. That of Nielson, Merrill and Oviatt (1980:25-36) is more detailed and will serve as the principal reference point.

Paleo-Indian -- The earliest inhabitants believed to have occupied the region were those of the Paleo-Indian tradition, the Llano, Folsom and Plano cultures. The Llano or Clovis Culture (ca. 12,500-11,000 B.P.-Before Present) (Sellers 1952) is most often associated with kill sites of Late Pleistocene megafauna such as mammoth (Haury 1953; Haury, Sayles and Wasley 1959). Little else is known about the subsistence base of the Clovis people. The kill sites are usually associated with former spring, marsh, lake side or riverine environments. There is little doubt that Clovis hunters exploited mammoth but to infer that megafauna were the principle source of subsistence may be presumptuous. The environments most often associated with megafauna kill site are rich in a variety of potential resource (Niering 1966; Odum 1963) that likely were exploited along with other environments.

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Horse Canyon Mine Lease

The Clovis point is the single distinctive artifact of the Llano Culture, and is a lanceolate, fluted dart point. It has been found in association with megafauna (usually mammoth) at several locations in the Southwest and on the Great Plains (Haury, Sayles and Wasley 1959). No such association has been found in Utah, although the point type has been recovered from surface sites in the region (Madsen, Currey and Madsen 1976). Utah mammoth remains are also known from environments similar to classic kill sites elsewhere.

The Llano Culture was followed closely by the Folsom Culture (11,000-9,000 B.P.) (Jennings and Norbeck 1955) and is most often associated with bison (Bison antiquus) kill sites (Frison 1978). As with the earlier Llano Culture, little else is known about Folsom Culture subsistence beyond the demonstrated bison exploitation. The distinctive Folsom point, the hallmark of the culture, is smaller, and thinner than the Clovis point. It is lanceolate, fluted and often eared. Point finds associated with bison remains occur on the High Plains. Isolated surface finds have been reported in Utah (Madsen, Currey and Madsen 1976). Bison antiquus and other fauna associated with Folsom sites have also been found (Nelson and Madsen 1978; Miller 1976) but not in association with human artifacts.

The Folsom Culture was followed by the Plano Culture (9,000-7,000 B.P.) (Jennings and Norbeck 1955; Frison 1978). Plano Culture groups continued to exploit large fauna, with increased use of jump-kills. Jump-kill sites are known at several locales on the Great Plains (Frison 1978) but none are known in Utah.

Plano groups developed a wide variety of projectile point types. Most are lanceolate, non-fluted and precisely flaked. Isolated Plano style points have been found in Utah (Hauck and Weder 1980;

Kaiser Steel Corporation
Horse Canyon Mine Lease

Reed and Nickens 1980).

The Paleo-Indian traditions remain the least studied cultural phenomenon on the Utah portion of the Colorado Plateau and the northeastern Great Basin. Some have argued that the classic Paleo-Indian traditions never existed west of the Rocky Mountains (Jennings 1957). The evidence of projectile points and megafauna (albeit not in association) suggests otherwise. It is possible that such assemblages as the Pinto Basin Complex (Campbell and Campbell 1935) may in fact be a Great Basin temporal counterpart to the Paleo-Indian. Non-diagnostic deposits in lower levels of Danger Cave (Jennings 1957) in the Great Basin and Cowboy Cave (Jennings 1978) southeast of the lease area may date to Paleo-Indian times (Madsen, Currey and Madsen 1976). No evidence of any Paleo-Indian traditions have been located within the mine lease area.

Archaic Period -- The Archaic Period is viewed by some prehistorians as being contemporaneous in part with the latter Paleo-Indians in the Great Basin (Jennings 1957; Hauck 1977; Irwin-Williams and Haynes 1970) or a follow-up to the Paleo-Indians (Madsen, Currey and Madsen 1976; Holmer 1978; and Schroedl 1976). The term archaic was first used to define a non-ceramic assemblage at the Lamoka Site in New York (Ritchie 1932) but later developed into a general, technological stage status for the New World (Willey and Phillips 1958). In the Great Basin and on the Northern Colorado Plateau, the term has developed more specific spatial and temporal meanings. The status of current research favors a combination of technological, temporal and adaptive definitions. The Archaic is viewed as four distinctive periods based upon population changes, statistical groupings of projectile points and regional adaptation to intensive hunting and gathering strategies keyed to specific species of flora and fauna (Schroedl 1976; Holmer

Kaiser Steel Corporation
Horse Canyon Mine Lease

1976).

The Black Knoll Phase (8,300-6,200 B.P.) has been recognized at Cowboy Cave (Jennings et al. 1980, Sudden Shelter (Jennings et al. 1980, Hells Midden (Lyster 1951), Deluge Shelter (Leach 1962) and Joe's Valley Alcove (1976). All of these sites are well stratified rockshelters or caves with good chronological control and preservation. The phase is statistically dominated by Pinto and Northern Side-notched points used on spear throwers (atlatls). Populations appear to slowly increase. Cave and shelter deposits indicate that populations tend to select specific resources in each area.

The Castle Valley Phase (6,200-4,500 B.P.) indicates a possible change in environment which may have resulted in a shift in subsistence. The population declines, relative to the Black Knoll Phase and shows an increased dependence on grasses and less on hunting. A good portion of the Castle Valley Phase is dominated by the Rocker Base and Sudden and Hawken Side-notch points. The latter portion of the phase may have witnessed an increase in population and dominance of unnamed lanceolate and Humboldt points. Slab-lined firepits are used more extensively during this period as opposed to earlier or later times. This phase is recognized only at Sudden Shelter (Schroedl 1976).

The Green River Phase (4,500-3,000 B.P.) is recognized by Schroedl at the aforementioned Sudden Shelter, Deluge Shelter and Hells Midden in addition to Pint-Size Shelter (Lindsay and Lund 1976) and Throne Cave (Day 1964). The phase may have a western and eastern variant. The western variant is statistically dominated by the Gypsum point style with later introduction of the San Rafael Side-notch point. The eastern variant is marked by the Duncan-Hannah point, which appears to be a Plains style influence.

Kaiser Steel Corporation
Horse Canyon Mine Lease

Overall, there is a possible minor increase in population and a return to more reliance on hunting and less on grass collecting.

The Dirty Devil Phase (3,300-1,800 B.P.) is in Schroedl's words "the most tenuous of the four outlined..." (1976:68). Schroedl recognizes the phase at Cowboy Cave, Clyde's Cavern (Winter and Wylie 1974) and Deluge Shelter. The principle projectile point is still the Gypsum with the addition of an unnotched triangular point.

Little is known about population or subsistence changes. It is now believed that corn was introduced sometime around 2,100 B.P. (Berry 1980). The overall effect of the advent of corn and the possibility of horticulture is still a subject of research. The Dirty Devil Phase is arbitrarily ended near 1,500 B.P. with the introduction of the bow and arrow and the shift to a different subsistence strategy keyed to horticulture.

Formative Cultures -- The Archaic sequence is followed by incipient Formative Stage cultures (1,500-650 B.P.). Formative groups are usually characterized by a sedentary village life, with widespread use of ceramics and increased reliance upon, and in some cases, complete dependence on horticulture (Lipe 1978; Willey and Phillips 1958). The three Formative groups in Utah are the Mesa Verde and Kayenta Anasazi, and the Fremont cultures. The Anasazi occupied the extreme southern and southeastern portions of Utah, the Fremont Cultures nearly all of Utah north of Cedar City and Escalante and west of the Colorado River. The principle concern in the mine lease area is the Fremont. The Fremont was defined as typologically distinct from the Pueblo Cultures of the Southwest by Morss (1931). Morss' Fremont was largely confined to the Fremont River drainage of south-central Utah. Since 1931, the Fremont have been shown to

Kaiser Steel Corporation
Horse Canyon Mine Lease

inhabit nearly all of northern Utah. In addition, the Fremont Culture has been divided and redivided into sub-groups. The boundaries waxed and waned with each additional foray into the field. Sub-groups were most often defined by separate trait lists, a technique that is now viewed as futile (Ambler 1970; Madsen and Lindsay 1977). A recent attempt to divide the Fremont into three groups (Sevier Culture, Fremont and an unnamed Plains derived) has resulted from review of subsistence data (Madsen and Lindsay 1977) and is favorably upheld by statistical analysis of settlement patterns and architecture (Lohse 1980). The Sevier Culture (1,300-650 B.P.), occupies the portion of the state west of the Wasatch Plateau. Large village areas contain semisubterranean pit houses, that are often clay-lined. Surface adobe storage structures are common. Several varieties of coiled gray, corrugated and black-on-white ceramics were manufacture. Settlement patterns favor riverine or marsh habitats. The subsistence base appears to be dependent on horticulture and marsh exploitation. the degree of one over the other probably varied from one village to the next (madsen and Lindsay 1977; Nielson 1978).

The Fremont Culture (1500-700 B.P.) occupied the region east of the Wasatch Plateau and north of the Colorado River and retains the original name applied by Morss. Small villages of rock-lined semisubterranean pit house and masonry storage structures are common. The Fremont were predominantly horticulturalists, The degree of dependence on supplemental gathering of natural resources, other than hunting of wild game, has not been fully examined. The ceramic assemblage of the Fremont Culture was greatly influenced from outside, as evidenced by high percentages of Kayenta Anasazi pottery types (Madsen and Lindsay 1977; Wilson and Smith 1976; Jennings 1978).
2The extent of the relationship between the Fremont and Kayenta people evidenced

Kaiser Steel Corporation
Horse Canyon Mine Lease

in the ceramics is not understood. If reciprocal trade items exist, originating with the Fremont in exchange for Anasazi ceramics, they have yet to be identified.

The unnamed Plains derived (1,300-650 B.P.) is limited to north and northeastern Utah. The group is characterized by shallow saucer-shaped pit houses. It is possible that this area had an influx of Anasazi (Pueblo II) influence as evidenced in masonry styles at Winterrock Village (Shields 1967) around 800 B.P. Much of the ceramic assemblage is the result of the paddle and anvil technique rather than coiling as in the Sevier and Fremont regions. It is assumed that subsistence centered around horticulture with additional reliance on pre-equestrian Plains style bison hunting (Madsen and Lindsay 1977).

Numic Athabascan Period -- Beginning at around 800-750 B.P., the Formative Cultures began to decline. Generally, the eastern Great Basin and northern Colorado Plateau were abandoned, beginning about 800 B.P. in the southwest part of the state. By about 700 B.P. the abandonment was complete. At about the same time, Numic speaking peoples began to spread into Utah from southeastern Nevada (Lamb 1958; Miller, Tanner and Foley 1969). Numic speakers had reached northern Utah by 700-650 B.P. (Madsen 1975; Gruhn 1961). Through time, this language group divided into: Utes (Central and eastern Utah into Colorado), Paiutes (western Utah), Goshiute-Shoshoni (north and northwestern Utah, Idaho, and Wyoming) and Southern Paiute (south and south-central Utah) (Eular 1964; Kelley 1966). Territory often overlapped with trade and intertribal warfare being common.

The Numic groups practiced an Archaic style subsistence round. Steward (1938) describes small family bands that moved from resource to resource, occasionally collecting into larger groups for special hunting or gathering

Kaiser Steel Corporation
Horse Canyon Mine Lease

activities. In some southern areas a limited horticulture was practiced (Eular 1964). Around Utah Lake marsh plants and fish allowed for large villages, while bison hunting was practiced in northeastern Utah and into Wyoming and Colorado. The basic nomadic style fostered excellent basketry, but a low quality ceramic technology. Desert Side-notch points predominate.

The temporal movement of Athabascan (Navajo) groups into southern Utah is not well documented, but a few Navajo sites have been recorded in San Juan County (Hurst 1976, 1977). Beyond the limited number of sites, little is known in the region about Navajo material culture or subsistence. It is known that the Utes and Paiutes considered the Navajo as enemies and often engaged them in warfare. During the early historic pioneering efforts, it is known that Navajo incursions resulted in considerable shrinkage of Utah and Paiute tribal lands (O'Neil and Thompson 1980).

It was the Numic and Athabascan people that early explorers and trappers encountered. The first recorded and generally friendly contacts were made by Dominguez-Escalante Expedition in 1776-1777. The expedition crossed the Wasatch Plateau north of the mine lease area. Sometime before the early Spanish fathers made their epic journey, some of the Utes in eastern Utah had obtained horses, which likely caused considerable changes in lifestyle. With the influx of early fur trappers and trade along the old Spanish Trail, depletion of game and food sources began. The early Mormon settlements often displaced Indian bands from better resources and traditional foraging territory. During the 1850-1870s, Mormon settlement, Texas and Colorado cattle industry, and early mining efforts resulted in violent clashes such as the Black Hawk and Walker Wars. By the late 1880s the Indian population, were fairly well confined to reserva-

Kaiser Steel Corporation
Horse Canyon Mine Lease

tions, and nomadic life style came to an end (O'Neil 1973 1973; O'Neil and Thompson 1980; Miller 1969; McElprang et al. 1949).

5.1.6 Historic Overview

The early pre-pioneer history of the area has been detailed elsewhere in the nearby South Kaiser Lease Mine Plan (Rauch 1981) and need not be repeated. There are no specific pre-pioneer trails in the mine permit area.

Beginning in 1877, Mormon pioneers entered the Castle Valley Region of Carbon and Emery counties. These early settlers came from some of the original communities along the Wasatch Front in Sanpete and Utah counties. Having heard reports from stockmen, who had visited the area while grazing livestock, Brigham Young sent Jefferson Tidwell to survey the potential resources and establish a community. Tidwell chose an area just south of present-day Wellington (Nielson, Merrill and Oviatt 1980). Other groups of settlers moved in to the region and established Price, Castle Dale, Ferron and Huntington during 1877 (Miller 1980).

The first five years proved to be the hardest as attempts to control the flooding of the Price

Kaiser Steel Corporation
Horse Canyon Mine Lease

River and construct irrigation systems were met with repeated disaster. Dams were washed out, as well as crops. By 1883, a dam was built which withstood an entire flooding season and crops survived to maturity with enough water (Nielson 1983). Cattle ranching began to prosper in the area. George C. Whitmore arrived in 1878 and started the Whitmore Ranch along Grassy Trail Creek and in Whitmore Canyon.

In 1897, Jefferson Tidwell relocated with his family and his brother's family (John Tidwell) into Whitmore Canyon (Reynolds 1948). Coal had already been discovered in the region and Whitmore Canyon proved no different. The Tidwells filed claim in 1898 and sold it to Royal C. Peabody in 1900 (Nielson 1983). Utah Fuel Company, a subsidiary of the Denver and Rio Grande Railroad, bought the claim in 1899 and completed laying track the next year.

The railroad brought increased coal production and the coal industry was in a "boom" from the 1880s through 1920 (Scamehorn 1983). The coal boom did not reach Emery and Carbon counties until 1883 when the Denver and Rio Grande Railroad entered the region, connecting Denver and Salt Lake City (Poll 1978). Consumers, such as railroads, industry and

**Kaiser Steel Corporation
Horse Canyon Mine Lease**

households, were now able to benefit from the Utah coal fields. One such company to benefit was the Columbia Steel Co. (a subsidiary of U.S. Steel) which opened the Columbia Mine in 1922. This mine was three miles southwest of Sunnyside (Whitmore Canyon) and was used to supply coal for the Ironton steel plant in Provo, Utah (Reynolds 1948).

The mid-1920s saw the coal industry in a depression which would last until 1960, except for a minor raise during World War II, when the demand for clean burning coal would increase due to new electrical power requirements for municipal and industrial growth (Scamehorn 1983). This depression was brought on by the influx of petroleum and natural gas entry into the energy market. By 1930, oil and gas had captured 34% of the market (Scamehorn 1983). By 1960, the demand for more electrical power brought about increases in coal production. The "energy crunch" of the 1970s, also, contributed to a new demand to become less dependent upon OPEC oil.

The history of Horse Canyon begins in June 1878 when Samuel Henry Gilson drove a herd of horses up the canyon. He was bringing the animals from his ranch in Juab county to the railroad in Wyoming where he would sell the horses. While

**Kaiser Steel Corporation
Horse Canyon Mine Lease**

camped in the canyon, he took the time to carve into the trunk of a tree, "Sam Gilson by God - June 1878." Sam Gilson made several trips from Juab to Wyoming but he also became a U.S. Marshal among many things. Sam Gilson's big claim to fame, however, is discovery and exploitation of "asphaltum", also known as "Gilsonite". This discovery, however, did not impact Horse Canyon.

The first major interest shown in Horse Canyon occurred on September 26, 1913, when Thomas F. Keeley (or Kelley) and James Ives obtained land patents to the area. Thomas Kelley was a resident of Woodside, a town 25 miles south and situated along the Denver and Rio Grande Railroad, and a prominent farmer. The Polk Directory lists Mr. Kelley as owning 400 acres valued at \$86,600 in 1918. Mr. Ives was not located in the directory. Both men maintained co-ownership of the land until 1936 and probably operated a small enterprise, as a small vein of coal from the "Horse Canyon Mine" was tested. The results of the test and location for the mine recorded on an accompanying map were discussed in a report to the Department of the Interior, dated 1909 (Richardson 1909).

The August 18, 1934 issue of the Salt Lake Tribune lists the obituary of Thomas F. Kelley. He

**Kaiser Steel Corporation
Horse Canyon Mine Lease**

died of a heart attack on August 17, 1934 in Chicago, Illinois. At the age of 65 years, he is said to have been the president of Kelley Brewing Company. At the time of his death, Emery County land records indicate that his wife, Olive G. Kelley, inherited the property. She continued in partnership with James Ives, his wife and Mrs. Kelley's daughter. In 1936, they formed the Cedar Ridge Coal Company which remained in business until 1942.

The entry of the United States into World War II prompted the Defense Plant Corporation to buy the Horse Canyon Mine in June 1942. The plans for constructing a steel plant near Orem, Utah had been in the works since early 1941. The Horse Canyon Mine was now needed to supply coal for the new Geneva Steel Plant. U.S. Steel Corporation built the Geneva Steel Plant for the government at a cost of \$180,000,000 (Brum 1948), and operated the Geneva Mine (Horse Canyon) in connection with the steel plant. At the end of the war (1946), U.S. Steel bought the Geneva Steel works and inventories for \$47,000,000 and, also, acquired the mine.

The Geneva Mine was started in the spring of 1942 and was in full operation by October of the same year. The Carbon County Railway Company

**Kaiser Steel Corporation
Horse Canyon Mine Lease**

extended a spur from Columbia to Horse Canyon the same year (Reynolds 1948). The mine complex included many new buildings, transfer house, conveyor, tippie, electrical and machine shops, welding shed, acetylene and oxygen storage house, sand storage, oil storage, warehouse, boiler and heating house, transformer station, switch house, wash house, office building, garage, cap house and powder house (Lacher 1943). These buildings remained in constant use until 1984 when the mine was closed by U.S. Steel Corporation.

5.1.7 Previous Research

Prior to beginning the actual Class III inventory, CRMS conducted a Class I literature review at the Price Resource Area Office, BLM, and at the USHPO in Salt Lake City. Records were also checked for historic information at the Emery County Courthouse. The exact mine permit area covered by CRMS appears to have had no specific projects within its boundary.

There have been several projects in the immediate vicinity and general region. In August of 1980 Benson and Yearsly of the Price Resource Area BLM recorded several sites in Horse Canyon. Of specific interest is site 42Em 1222, the Sam Gilson

Kaiser Steel Corporation
Horse Canyon Mine Lease

inscription. This site is a blazed tree, dated 1878, inscribed "Sam Gilson by God". This is believed to be the same Sam Gilson, rancher, trail blazer and discoverer of "Gilsonite" (see 5.1.6 Historic Overview). In addition to the Gilson inscription, the site also contains the signature of W.B. Liddell (July 11, 1906) and James Brace (August 17, 1912) on a rock outcrop on the southwest corner of the site area. The site is in the SE1/4 SW1/4 NW1/4 of Section 3 T15S R14E. The site has been nominated to the National Register. It is on private land and is several meters north of the proposed mine permit area surveyed by CRMS.

Site 42Em 1223 was also noted by the BLM and is a log cabin/rootcellar noted in the NE1/4 SW1/4 NE1/4 of Section 7 T15S R14E. The site is considered non-significant and is 200+ meters northeast of the surveyed mine permit area.

The only other major study conducted nearby is that of the University of Utah Archaeological Center (Rauch 1981). This report is part of the Kaiser Steel Corporation South Mine Lease Permit Application. The report summarizes several small scale impact specific inventories conducted for Kaiser Steel (Rauch 1979; O'Connell 1980; and Horne 1981). The mine permit inventory included 3,300

Kaiser Steel Corporation
Horse Canyon Mine Lease

acres at 100% intensity, nearly 25 miles of corridor and access, and a 10% of the remaining 8,931 acres (893 acres). The inventory (10%) was biased to slopes of 20^o or less and specifically anchored to known springs, believed to be indications of high site probability. The inventory recorded seven historic sites, five historic isolated artifacts, ten prehistoric sites, twenty-eight prehistoric isolated artifacts and two combined historic/prehistoric sites.

One of the prehistoric sites, 42Em 1343, was selected for testing. The site is a small rock shelter noted about six miles south of the Horse Canyon Mine permit area. The site was tested with a single trench, and recovered a small amount of flaked tools, groundstone, floral and faunal remains but no discernable features. Based on the presence of Rose Spring Corner-notched points and Desert Side-notched points, Rauch (1981:128-129) dates the site to the Fremont Culture (A.D. 300 to A.D. 850) and later Numic or Shoshoni (A.D. 500 to historic) times. The site appears to have been a short-term field camp, used sporadically over the centuries.

None of the sites noted or tested by Rauch (1981) are within the present mine permit area, nor

Kaiser Steel Corporation
Horse Canyon Mine Lease

will any of them be directly impacted by the proposed mine action. Numerous other projects have occurred regionally, beyond the mine permit area (cf. Nielson, Merrill and Oviatt 1981; Nielson 1986; Billat 1983; and Hauck 1977). While a multitude of sites have been noted by these inventories, none will be within the mine permit area, nor will any be directly impacted by the mine activity.

5.2 Methodology

5.2.1 Project Objectives

The objectives of the inventory were three-fold. First, the inventory sought through files and literature reviews to identify all previously recorded sites, note their National Register potential and assess the probability of finding more significant material. The literature review also prevents site number duplication and provided valuable background data.

Second, the field inventory had as a specific goal to locate, identify and define all non-recorded cultural resources, that occur within the mine permit area. The significance of these sites and their eligibility for inclusion to or nomination to the National Register of Historic Sites (see 5.6.1 National Register Criteria, is

**Kaiser Steel Corporation
Horse Canyon Mine Lease**

part of the field identification process.

Third, the inventory was to assess the specific types of impacts that may occur to the sites noted. If significant sites are noted and direct impact is to occur, it would then be necessary to develop avoidance or mitigation plans for the sites involved.

5.2.2 Project Methods

The project was accomplished by carefully reviewing the various file records at the Price Resource Area Office BLM, the State Historic Preservation Office in Salt Lake City and the land records at the office of the Emery County Recorder in Castledale. Reports or records pertinent to the mine permit area were carefully reviewed and notes or copies of records made for report preparation by CRMS.

The field inventory was conducted by a single three-person crew, on three separate days. The crew members were generally spaced about 15 meters apart, and were guided by topographic alignment or compass guided transects. Cultural resource sites were recorded on IMACS site forms, and plotted on a USGS topographic map. A site plan, sketch location map was also drawn. Photographs were taken of the general site areas and specific site features.

Kaiser Steel Corporation
Horse Canyon Mine Lease

Artifact collection was limited to three lithic tools (see 5.4 Prehistoric Resource Survey Results). Notes were completed on flora, fauna, topography, soils and general geology. All original notes and photo negatives are on file at the Museum of Peoples and Cultures and Brigham Young University. The collected artifacts are also permanently housed at the museum.

5.3 Historic Resources Survey Results

5.3.1 Historic Inventory

This survey located and recorded seven cultural resource sites within the project area; five historic and two prehistoric. The sites are summarized on Table V-3. The historic sites range from National Register quality to non-significant. The largest is the Geneva Mine Works (42Em 2099) located within the canyon, as well as the National Register Site 42Em 1222. Those located out of the canyon and to the west in the intended coal stock-pile area are trash dumps and camping/hunting sites, along with the two prehistoric sites.

Site 42Em 2099, is the Geneva Mine Works which is the largest, newest, and most technologically complex of all the sites. The site occupies a large portion of the SE1/4 of Section 4 T16S R14E (Figure

Kaiser Steel Corporation
Horse Canyon Mine Lease

TABLE V-3

SITE SUMMARY

Site No.	Site Type	Cult Affil	Signif/ Natl. Reg.	Recommend.
42Em 1222	Inscrip	Hist	Yes	Avoid
42Em 2096	Mine Facility	Hist	No	None
42Em 2097	Campsite	Hist	No	None
42Em 2098	Camp/dump	Hist	No	None
42Em 2099	Mine (Geneva)	Hist	No	None
42Em 2100	Lithic Scatter	Prehist Unknown	No	None
42Em 2101	Camp	Prehist Numic	No	None

V-2). The mine works were built in the spring of 1942 and continued in operation until 1984 when it was closed by its previous owners, U.S. Steel Corporation. The mine structures begin at the mouth of Horse Canyon where the Carbon County Railway ends underneath the tipple and up the canyon from the tipple to the transfer house and the main complex of buildings. Among these structures are the following:

Kaiser Steel Corporation
Horse Canyon Mine Lease

- 1) Wash house
- 2) Office building
- 3) Garage
- 4) Warehouse
- 5) Transformer station
- 6) Oil storage building
- 7) Welding shed
- 8) Sand storage building
- 29) Electrical and machine shops
- 10) Acetylene and oxygen storage building
- 11) Boiler and heating house
- 12) Switch house
- 13) Miscellaneous sheds and buildings

Beyond these buildings is the mine entrance and the tressle by which the tram cars move across the canyon. Further up the canyon on the east side are the cap house and powder house. The site does not meet National Register Criteria for age, unique architecture, historic persons or events.

Site 42Em 1222 is fifty meters up the canyon at the very edge of the mine works. It is just outside of the mine permit area, in the SE1/4 SW1/4 NW1/4 of Section 3 T16S R14E. The site is a tree which has been placed on the National Register of Historic Places. The significance of the tree is

Kaiser Steel Corporation
Horse Canyon Mine Lease

the carving in the trunk which states, "Sam Gilson by God - June 1878". Sam Gilson was an individual who occupied an important position in local Utah history as an early rancher, U.S. Marshal, inventor and pervader of the uses of "Gilsonite". The tree is marked and protected by a white painted fence. Two additional names, W.B. Liddell July 11 1906 and James Brace August 17 1912 are carved in a small rock face on the southwest corner of the site.

Site 42Em 2096 is at the mouth of Horse Canyon, overlooking the coal stockpile area. It is in the SE1/4 SE1/4 SE1/4 of Section 4 T16S R14E (Figure V-2). The site is near the railroad tracks. It is a loading platform which appears to have been used to load railroad cars and coal carrying trucks. The platform is constructed of large timbers built into the side of a small dirt hill. Coal residue is abundant on top of, and at the base of, the structure. Behind the platform, and on the slope of the hill, is a good size trash dump. The dump appears to have been deposited over several years during the 1960s. Metal, glass, cable, paper and other debris constitute the material remains at the dump. The site is late in the mine's history and is not considered significant.

Site 42Em 2097 is a historic camp site, about

Kaiser Steel Corporation
Horse Canyon Mine Lease

25 meters south of the Carbon County Railroad tracks, across a paralleling dirt road and a mile and one-third west from the end of the tracks. Specifically, it is in the SE1/4 SW1/4 NE1/4 of Section 4 T16S R14E (Figure V-2). The site is small and indicates signs of having been used once or twice, probably for hunting. Tin cans, a few bottles and a pair of children's boots litter the area. There are no features or depth associated with the site. It is considered to be non-significant.

Site 42Em 2098 is a combination camp site and trash area. It is in the SE1/4 NE1/4 SW1/4 of Section 5 T16S R14E (Figure V-2). The camp site has a stone fire ring and is likely the result of hunting activity. The trash dump has spread by erosion and wind, causing the trash from the camp to mingle with that from the dump. A feature found within the trash area is a shallow square depression lined with wood timbers. The timbers have been cut with an axe and have weathered making dating difficult. It is estimated that the wood timbers and depression range from about 1900 to 1940s. Their function is undetermined. The trash dump is of more recent dates and ranges in time from the 1950s to 1970s. The camp site is probably

post-1940, but this is not certain. The site and its features are not unique or historically important. The site is considered to be non-significant.

5.3.2 Mining Impacts to Historic Resources

CRMS noted a total of five historic sites in or very close to the proposed mine property. Site 42Em 1222, which is on the National Register, is just outside of the permit area and is already visibly protected by fencing and signs. No impacts should occur at this site.

Sites 42Em 2096-2098 are in Section 5, the area slated for development of the coal stock pile and train load out facilities. All three of these resources face potential total removal by development. All three are non-significant, and their probable demise is not viewed as an adverse impact to the cultural database.

Site 42Em 2099 is the Geneva Mine Works, active until 1984. It is not certain exactly what will occur to any one feature. It is assumed that impacts will range from minor remodeling to possible total removal of some buildings. Again, the site is not considered eligible for the National Register, therefore proposed impacts are not considered adverse.

5.4 Prehistoric Resource Survey Results

CRMS noted the presence of two small prehistoric lithic scatters (42Em 2100 and 2101). A single isolated artifact was also noted.

5.4.1 Prehistoric Inventory

Site 42Em 2100 is in the NE1/4 NE1/4 SW1/4 of Section 5 T16S R14E (Figure V-2). The site is a sparse scatter of dark gray chert and occasional dark quartzite flakes, spread over a 75 m north-south by 75 m east-west area. The site faces west and is flanked by two arroyos. Erosion has moved some material downslope. A small 25 cm by 25 cm trowel test, cut 30 cm deep, revealed no depth. There are no visible features or depressions. There are no observed lithic tools or diagnostic artifacts. The site has no specific concentrations and the resource is considered to be non-significant.

Site 42Em 2101 is another small lithic scatter near the edge of the proposed coal stockpile and load out area. It is in the NW1/4 SE1/4 NW1/4 of Section 5 T16S R14E (Figure V-2). The site is a scatter of chert and sparse quartzite flakes spread over a 50 by 50 m area. There is no specific concentration of artifacts, nor was there any

Kaiser Steel Corporation
Horse Canyon Mine Lease

subsurface depth or obvious features. A small trowel test at the site center proved negative.

Two Rose Spring Corner-notched points (Figure V-3) were collected from near opposite ends of the site. The eastern most specimen (Figure V-3a), is a complete gray chert point, measuring 1.85 cm by 1 cm by 3 mm. It has a total weight of .5 grams. It is finely flaked along the edges, with a slightly expanding base. The point has a flat surface, and is slightly plano-convex in cross section.

The second specimen (Figure V-3b) is a poor quality production apparently made from a curved secondary gray/brown chert flake. It is 2 mm by 1.3 mm by .35 mm. It weighs about .9 grams with a base that is slightly expanding, but crudely finished and off center. It has a prominent ridge along its top side and the tip appears to have been broken in impact.

A third biface fragment, made from gray chert was noted near the trowel test (Figure V-3c). It is elongate, missing both the proximal and distal ends. It is 1.7 mm by .7 mm by .4 mm and weighs .65 grams. The artifact is non-diagnostic, and appears to have been part of a drill.

The two diagnostic points, both Rose Springs Corner-notched, are usually associated with the



A



B



C

Figure V-3

Projectile Points from 42Em 2101

A and B - Rose Spring Corner-notched

C - Possible Drill Fragment

post-Formative, Athabaskan-Numic period, ca. A.D. 1500-historic (Holmer and Weder 1980). Given the lack of other diagnostics, this suggests that Site 42Em 2101 is a temporary, non-significant Numic location.

IF-1 (Figure V-2) is a single secondary decortificant flake on the edge of the coal stockpile and loadout area. The flake is a gray chert, with a small amount of outer cortex adhering to one edge. It was noted nearly 340 m west of 42Em 2101. It is not significant.

5.4.2 Mining Impacts to Prehistoric Resources

CRMS noted two prehistoric lithic scatters and a single isolated gray chert flake. Site 42Em 2100 is in the northwest corner, but well within the proposed coal stockpile and loadout area. It most certainly will be totally obliterated. Site 42Em 2101 is perhaps 25 m northwest of the coal stockpile and loadout area. IF-1 is nearly 150 m northwest of the stockpile. It is highly likely that 42Em 2101 will receive some impact, if not, in the long run, total obliteration. IF-1 is not likely to be impacted. None of these resources are significant, hence, no adverse impact to the cultural data base is anticipated.

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Horse Canyon Mine Lease

5.5 Public Park

There are no public parks within the proposed mine permit area, nor are any parks anticipated for development.

5.6 Evaluation of Resources

CRMS recorded the presence of seven cultural resource sites and a single isolated artifact. Only Site 42Em 1222 is significant and eligible for the National Register. The site is in fact on the Register listing. The criteria for assessing site significance and National Register potential are included in the U.S. Government Code of Federal Regulations (36 CFR 60) as follows:

National Register criteria for evaluation.

The quality of significance in American history, architecture, archeology, and culture is present in district, sites, buildings, structures, and objects of State and local importance that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and

(a) That are associated with events that have made a significant contribution to the broad patterns of our history; or

(b) That are associated with the lives of persons significant in our past; or

(c) That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

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(d) That have yielded, or may be likely to yield, important information in prehistory or history.

These criteria are, unfortunately, somewhat subjective and leave considerable room for interpretation.

5.7 Project Recommendations

Based upon the above criteria, each site can be assessed as to its National Register potential and suggested possible recommendations for future protection or mitigation given.

Site 42Em 1222 is already on the National Register. Sam Gilson was a prominent historic figure in the region's history and economic development. The site is already protected by fencing and highly visible signs. Kaiser Steel should take special precautions to avoid the site and remind visitors and employees to avoid impact to the site.

Site 42Em 2096-2098 are all small, non-significant historic remains. 42Em 2096 is likely associated with the mine activity of the 1960s at the Geneva Mine (42Em 2099) and is not significant. Sites 42Em 2097 and 2098 are both historic camps and trash dumps, likely associated with hunting or other recent recreation activity. Neither site can

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Horse Canyon Mine Lease

be associated with historic persons or events. Therefore, no specific mitigation or avoidance is recommended.

Site 42Em 2099 is the recently closed Geneva Mine, associated with World War II and post-World War II steel production. The site is of recent vintage (post-1942), and is not of any specific architectural uniqueness. There are no historically important persons or events of historic significance associated with the site. No specific preservation or other mitigation steps are recommended for the site. At best, it would be suggested that Kaiser Steel locate missing records of the Geneva Mine and preserve them. The records were transferred from U.S. Steel to Kaiser, and in the Kaiser Steel move from California to Colorado, the records have been misplaced.

Sites 42Em 2100 and 2101, plus the isolated artifacts are not considered significant. The sites lack depth, features and have been impacted by erosion and grazing. The sites have no data recovery potential beyond their recording, which has already been completed. No specific mitigation procedures are suggested for either site or the non-diagnostic artifact.

Kaiser Steel Corporation
Horse Canyon Mine Lease

In summary, only Site 42Em 1222 should be protected through avoidance. Impacts to other cultural resources in the mine area are not considered to be adverse to the cultural resource database. If Kaiser Steel Corporation avoids 42Em 1222 and locates the records for 42Em 2099, CRMS recommends that a cultural resource clearance be granted to Kaiser Steel Corporation for the Horse Canyon Mine Lease Area.

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CHAPTER XI

ALLUVIAL VALLEY FLOORS

Chapter XI Alluvial Valley Floor

11.0 Table of Contents

	<u>Page</u>
11.0 Table of Contents	1
11.1 Evaluation of Alluvial Valley Floor	
Characteristics	2
11.1.1 Discussion of Characteristics	2
11.1.2 Conclusion	3

11.1 Evaluation of Alluvial Valley Floor Characteristics

This section addresses the concerns of UMC 785.19 regarding the existence of an alluvial valley floor in the permit or adjacent areas. According to the regulations, the applicant must supply information describing the geologic, hydrologic, land use, soils, and vegetation conditions of the site to allow DOQM to make an alluvial valley floor determination.

11.1.1 Discussion of Characteristics

The evaluation of alluvial valley floors requires that information be submitted to allow a determination on:

- 1) unconsolidated stream-laid deposits in and adjacent to the permit area;
- 2) all agricultural lands, flood irrigation, pasture lands, and undeveloped range lands;
- 3) all flood irrigated lands;
- 4) all sub-irrigated lands; and
- 5) ability for lands to be flood irrigated or sub-irrigated.

For this document all of the above information will not be provided, due to the limited scope of the operation proposed.

For this site, the area available for either flood or sub-irrigation would be so limited, due to the limited annual water supply, that an economic agricultural farming or ranching operation would not be feasible. The annual runoff from snowmelt does not support runoff in Horse Canyon Creek past the late spring. Thunder storm runoff is not a reliable water source. Therefore, it would not be possible to insure an adequate water supply.

11.1.2 Conclusions

Based on the above information, it is not possible to consider the permit area or the adjacent area to contain an alluvial valley floor.