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ACT/007/009

August 28, 1981

Mr. Jim Dykman
Cultural Resource Advisor
Utah Division of State History
300 Rio Grande
Salt Lake City, Utah 84104

Re: Cultural and Historical Resources
Sage Point-Dugout Canyon Project

Dear Jim:

Enclosed for your review is the revised archeology section from our mine permit application. I have also included a map showing the mine plan area, the areas surveyed, areas of potential surface disturbance, and site locations. I am looking forward to our August 9 meeting. It will give us an opportunity to discuss parts of the text which you may find require further clarification and amplification. I have already invited Dr. F. R. Hauck (AERC) to attend this meeting.

Please call me if you have any questions.

Sincerely,

Nicolas Temnikov

NICOLAS K. TEMNIKOV
Regulatory Coordinator

NKT:mg

cc: FRHauck
CASlaboszewicz

Enclosures

Section IV-I

CULTURAL AND HISTORICAL RESOURCES

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1. INTRODUCTION

Between late summer 1979 and early summer 1980, Archeological-Environmental Research Corporation (AERC) conducted a cultural resource inventory for the proposed Sage Point-Dugout Canyon Project. A total of about 4.5 square miles and 30 miles of corridors for the mine portals, central facilities, and communication and transportation routes was intensively examined. In addition, a biased set of sample areas totalling 180 acres was examined in the potential subsidence zone.

A total of 38 cultural resource sites, was located and evaluated (see Drawing No. D03-0139). Of the 38 sites, 33 sites which are within the permit area are discussed in this report. The 33 sites include nine historic structures, 23 prehistoric sites, and one combination historic and prehistoric artifact scatter. The majority of the datable prehistoric sites belong to the Post-Archaic/Fremont period with less common evidence of occupation during the Archaic and Shoshonean periods. The historic sites are primarily homesteads or mine portals. All of the cultural resource sites, regardless of age, tend to cluster along the Soldier Creek drainage within the Pinyon-Juniper vegetation community.

All field notes and site data are filed at AERC headquarters in Bountiful, Utah. Artifacts collected during the

surveys are being curated at the Museum of Archaeology and Ethnology at Brigham Young University.

1.1 GUIDELINES

The material on cultural and historical resources has been prepared in accordance with draft guidelines issued September 18, 1979 by the Office of Surface Mining (OSM) and additional correspondence between the Applicant and OSM.

The cultural resources inventory was designed to locate, identify, describe, and evaluate all prehistoric and historic cultural resources within the area of impact. The survey, conducted by qualified archeologists, included intensive coverage of 100% of areas to be impacted by surface facilities. In addition, an intensive survey was conducted for 20% of the area to be affected by subsidence; the amount of coverage in this partial survey is in accordance with discussions with OSM.

The analysis of all sites recorded in the survey discusses the significance of the cultural resources. The resources are examined in terms of local and regional cultural history. After gathering available cultural information and combining it with field work data from the sites, National Register eligibility recommendations were made pursuant to the criteria defined under title 36 CFR 60.6.

In addition, the impact of the proposed mining operations on the cultural resources in the permit area has been evaluated. Potential impacts are identified and categorized

as direct or indirect, and measures have been proposed to mitigate or prevent any potential adverse impacts.

1.2 METHODOLOGY

1.2.1 FIELD RESEARCH

Between July 23 and November 28, 1979, and between April 17 and July 3, 1980, a cultural resource inventory of various areas and corridors was conducted in the Sage Point-Dugout Canyon Project area of the Soldier Creek locality of Carbon County, Utah.

The cultural resource inventory included a sample survey of 180 acres in the uplands and an intensive examination of one large parcel (approximately 4.5 square miles) surrounding the central facilities area, mine portals, fan portals, reservoirs, diversion canals, telephone lines, power lines, conveyor belts, access roads, and a railroad spur. In all, a total of 3,428 acres and 30 linear miles of corridor was examined (see Map D03-0139).

Locations of the sample units and their land ownership and acreage are shown on Table IV-I.1 (see Figures IV-I.5 through IV-I.10 for specific locations).

Table IV-I.1

Sample Unit	Acreage	Location	Ownership
1	10	T12S., R12E., Sec. 32	Private, State
2	10	T13S., R12E., Sec. 15	Private
		" " " 16	"
3	10	T13S., R12E., Sec. 16	Private
		" " " 21	BLM
4	30	T13S., R12E., Sec. 15	Private
5	10	T13S., R12E., Sec. 22	BLM
6	10	T13S., R12E., Sec. 14	Private
7	10	T13S., R12E., Sec. 14	"
8	20	T13S., R12E., Sec. 23	BLM
		" " " 24	Private
		" " " 25	"
		26	BLM
9	10	T13S., R12E., Sec. 24	Private
10	40	T13S., R12E., Sec. 24	"
11	10	T13S., R12E., Sec. 24	"
12	10	T13S., R12E., Sec. 19	"

The purpose of the sample survey was to assess the nature of historic and prehistoric activity in the upland region where future subsidence potential could threaten any significant cultural resource sites. 12 sample units ranging from 10 to 40 acres in size were established for these subsidence zones (see Map D03-0139). These units were situated to cover 180 acres of the surface in the subsidence zones where prehistoric or historic activities were most probably concentrated. The extremely rugged nature of the upland area precluded much of the surface area from being

considered in this sample survey; the majority of the zones lie on steep terrain which is inaccessible. Sample unit #1 was located at the junction of Soldier Creek and a side canyon about one-third of a mile north of the mouth of Pine Canyon. The remaining 11 units were placed along the upland portion of the Book Cliffs.

Methodology utilized to evaluate the sample units was identical to the intensive survey techniques used in the lower elevations. Inventoried areas at both the lower and higher elevations were examined by examining parallel transects with the survey personnel spaced approximately 15 meters (50 feet) apart. An exception to this procedure was utilized during the examination of the proposed portal areas. Because of the steepness of the terrain and the narrowness of the canyons at the portal areas, these areas were examined by checking all benches and all cliff faces for rock art or overhangs.

All corridors were examined by surveying parallel transects spaced approximately 15 meters apart. With the exception of the utility corridor between Pace Canyon and Dugout Creek, for which a corridor width of 15 meters was inventoried, all corridors were examined at a width of at least 30 meters, centered on the surveyed flagging. The railroad spur had not been flagged; a corridor width of 90 meters was examined in order to ensure that the corridor was adequately covered. Most of the railroad spur lies outside the permit area and is not covered in this report.

All cultural resource sites, regardless of surface ownership, were recorded on Bureau of Land Management site forms, photographed, and sketched. Their location was marked on a topographic map.

1.2.2 HISTORICAL RESEARCH

In researching the past of the historical sites, four areas of inquiry were pursued:

1. Local government records were checked. Abstracts of Title, mortgages, deeds, and other legal documents on file in the Carbon County Recorder's Office were reviewed to determine land history. Also, current plats and Bureau of Land Management plats were checked.
2. Archival materials were consulted. The Price City Library, College of Eastern Utah Library, University of Utah Library, and State Division of History Library were checked for pertinent information.
3. Local inhabitants were interviewed regarding local historical activities.
4. Some of the sites were revisited so that the field and historical data could be integrated.

Once the data were compiled, they were reviewed and summarized by a qualified archeologist, who also did the research, for presentation in this application.

1.2.3 LABORATORY RESEARCH

The analyses performed in the laboratory concerned the evaluation of projectile points, miscellaneous lithics, and ceramic fragments.

Projectile point analyses included identification of manufacturing techniques, such as heat treatment, blank and preform preparation, edge grinding, edge reworking, and use wear analyses. Arrow and atlatl points were catalogued according to type.

The evaluation of miscellaneous lithics involved obsidian trace element analysis and the identification of various tool styles and manufacturing techniques.

Ceramics collected during the field survey were examined to determine manufacturing technique, paste and temper composition, and surface preparation. Sherds were later catalogued according to type and variety.

1.2.4 ARTIFACT INVENTORY AND ANALYSIS

Chronological evaluations of prehistoric sites were accomplished through artifact correlation with established types and varieties. The various projectile point types collected from the field were generally identifiable with

similar Great Basin, Eastern Great Basin, Colorado Plateau, and Western Plains types. Ceramics were evaluated for type and, thus, correlated with the types and varieties of local Utah wares.

Table IV-I.2 contains a list of sites and a description of artifacts collected during the various phases of the Sage Point-Dugout Canyon project. Only diagnostic artifacts were collected.

1.2.5 NATIONAL REGISTER OF HISTORIC PLACES

Each of the cultural resource sites was evaluated with respect to the criteria for listing on the National Register, according to the following criteria set forth in 30 CFR 60.6:

> The quality of significance in American history, architecture, archeology, and culture is present in districts, 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
>
> (d) that have yielded, or may be likely to yield, information important in prehistory or history.

Cultural sites are defined as sites whose significance lies wholly or partly in the archeological data they contain. These data are embodied in material remains, such as artifacts, structures, and refuse, which were utilized purposely or accidentally by human beings in history and prehistory. Where such sites contained artifacts potentially having archeological significance, diagnostic artifacts were collected for use in determining National Register eligibility. In order to distinguish these sites from archeological properties, determinations of National Register eligibility were made. Testing for this eligibility included a preliminary assessment of subsurface materials, of the nature of archeological materials present, and of the type of information that might be obtained from the sites. Only those sites eligible for and potentially eligible for listing on the National Register were defined as archeological properties.

Subsequent sub-sections of this section present the reasons why each particular site is not eligible for, is potentially eligible for, or is eligible for listing on the National Register.

The National Register of Historic Places was checked, and none of the 33 cultural resource sites was found on the Register.

Table IV-I.2

AERC No.	Permanent Site No.	Artifact
----	42Cb92	Not collected
292N/1	42Cb134	Not collected
292/N2	42Cb135	1 knife, 1 arrow point, 2 dart points
356A/1	42Cb167	Not collected
356A/2	42Cb168	Not collected
356N/1	42Cb170	1 unfinished arrow point
356N/2	42Cb171	Not collected
356N/3	42Cb172	Not collected
356N/4	42Cb173	1 tin can
356Y/5	42Cb174	1 cartridge casing - 50 caliber
356Y/6	42Cb175	1 dart point/knife, 2 sherds
356A/2	42Cb190	Not collected
356A/4	42Cb192	1 arrow point base
356A/5	42Cb193	Not collected
356A/6	42Cb194	1 obsidian flake
356A/7	42Cb195	Not collected
356A/8	42Cb196	Not collected
356A/9	42Cb197	1 arrow point
356A/10	42Cb198	1 dart point
356A/11	42Cb199	Not collected
356A/12	42Cb200	1 preform
356A/13	42Cb201	1 obsidian flake
356A/14	$2Cb202	1 arrow point
356N/1	42Cb183	2 metal forks, 1 shell button
356N/2	42Cb184	Not collected
356N/3	42Cb185	1 arrow point, 1 eccentric, 5 sherds, 1 scraper
356N/4	42Cb186	1 sherd

Table IV-I.2 (cont.)

AERC No.	Permanent Site No.	Artifact
356N/5	42Cb187	1 point preform, 2 arrow points
356N/6	42Cb188	1 tiger chert flake
456N/1	42Cb204	Not collected
456N/2	42Cb205	1 fragmented bottle
456N/3	42Cb206	Not collected
456N/4	42Cb207	2 projectile points

AERC No.	Isolated Artifact	Artifact
292N/X1	"	1 dart point
356A/X3	"	1 bottle neck
356A/X4	"	1 polished stone
356A/X10	"	1 dart point
356A/X12	"	1 dart point
356A/X13A	"	1 dart point fragment
356A/X13B	"	1 dart point
356A/X14	"	1 sherd
356A/X15	"	1 dart point fragment
356A/X21	"	1 dart point
356A/X23	"	1 scraper
356A/X26	"	1 dart point - reworked
356A/X27	"	1 metal comb
356A/X28	"	1 obsidian nodule
356N/X1	"	1 projectile point
356N/X2	"	1 projectile point

Fifty-two artifacts were collected in the permit area during the various surveys related to the Sage Point-Dugout Canyon Project. Of the 52 artifacts, 44

were of prehistoric origin, including 35 lithic articles and 9 ceramic sherds. Eight artifacts are of the historic period.

Figures IV-I.2 - IV-I.4 show the majority of diagnostic artifacts collected from the project area.

All artifacts came from the portal, central facilities area, and corridor surveys (AERC 292 and 356) except for the lithics from 42Cb207 and isolates 456N/X1 and 2. These lithics were collected during the sample survey of the potential subsidence zones upon the Book Cliffs.

1.3 CONTRIBUTORS

The material on cultural and historical resources was prepared by AERC. This consulting firm has prepared similar reports for other coal mines and similar projects. The principal investigator for the project was F. R. Hauck, Ph.D. The AERC personnel involved in the field work varied, but the following people contributed to the performance of the field inventory: Allan Carpenter, Jim Hampson, Tim McEneny, Bunny Melendez, Dan Schenck, Michael Sloan, Karen Wise and Denise Yearsley. Either Dennis Weder or V. Garth Norman was in charge of the field crew.

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2. CULTURAL AND HISTORICAL RESOURCES [783.12(b)]

Land-use techniques employed in the project area have ranged from hunting-gathering activities, which began during the Pleistocene, to primitive farming technology practiced along the river bottoms by the Fremont peoples as early as 1500 B.P. With the introduction of the Euro-American settlers in the 19th century, modern farming technology, including horticulture and livestock production, became established in the Price River Basin. During the historic period until the present, the general project area has been primarily utilized as rangeland for livestock grazing. Some horticulture related to the livestock industry has developed along the alluvial creek bottoms that extend between the cliffs and the Price River. In addition to agriculture, some coal mining has occurred during the 20th century in Dugout, Pace, and Soldier Canyons which are all situated in the project area (see Section IV-H, Land Use and Socio-economics).

2.1 PUBLIC PARKS [784.17]

There are no public parks within the permit and adjacent areas.

2.2 PREHISTORY AND HISTORY OF THE REGION

The prehistoric human activities in the Price River Basin-Book Cliffs region of east-central Utah consist of four main phases. The first phase was the Paleo-Indian

culture, which was characterized by a big game hunting subsistence base, augmented by gathering activities. This phase, which existed ca. 12,000 to 7000 B.P., has been sequentially divided into the Llano, Folsom, and Plano cultures based upon diagnostic projectile points recovered in the western United States. Clovis, Folsom, and Plano sites have been recorded in central and western Utah, but no Paleo-Indian sites or artifacts have been discovered in the project area. Isolated artifacts from the Plano sub-phase (ca. 9000 to 7000 B.P.) occur in a higher frequency in the Price River and Muddy Creek regions than artifacts related to the earlier subphases. This concentration indicates that population densities were probably increasing in central Utah during the Plano, which roughly corresponds with the gradual dying trend of Antev's Anathermal phase.

The reduction of large game herds in the West, possibly affected by the aridity of the Altithermal climatic phase, and the increase in population gradually shifted the subsistence base from big game exploitation to a gathering economy. This economy characterizes the Archaic cultural phase.

The Fremont culture of Utah extended over the greater part of the state from the Salt Lake and Uintah Basins on the north to the Henry Mountains and the Virgin River headwaters on the south. The Fremont variants of the Uintah Basin and the San Rafael-Price River regions have been dated between 1500 and 700 B.P. This culture utilized an economic

base including both hunting-gathering subsistence and horticulture. In addition to their dependence on the bow and arrow, these people maintained village settlements and developed technologies in ceramics and stone architecture, undoubtedly influenced by the Anasazi cultures of southern Utah. Movement between the Uintah Basin and the Price River Basin was accomplished through Nine Mile Canyon, where numerous Fremont sites have been recorded. Since Soldier Creek, which lies in the project area, leads east directly to the headwaters of Minnie Maud Creek in Nine Mile Canyon, there is a probability of Fremont activity along Soldier Creek.

The Shoshonean phase extended from ca. 650 B.P. into the Historic period. Their subsistence base was primarily oriented to seasonal hunting and gathering activities; however, there is ethnographic evidence of horticulture being practiced by Utes in the Fremont River valleys of southern Utah. Small Shoshonean familial bonds (Ute, Paiute, and Shoshone peoples) utilized the bow and arrow for hunting and warfare, constructed brush surface shelters, and manufactured distinctive gray to tan ceramic vessels. The Desert Side Notch point and thick sand-tempered grayware are distinctive artifacts from the Shoshonean phase in central Utah.

The Historic period in east-central Utah is divided into three phases: Early Historic, Agricultural Settlement, and Mining Developments.

The Early Historic period is characterized by the introduction of Euro-American trading, exploration, and fur trapping, which affected the aboriginal populations in Utah beginning in the 17th century. The Dominguez-Escalante expedition of 1776-1777 brought the first known Spanish contact in central Utah; however, their expedition map is quite accurate concerning the Price River Basin, suggesting previous Spanish activity in the basin. By the early 1800s, and until 1840, the fur trade was active in Utah. Trappers, traders, and explorers included the Arza-Garcian expedition of 1813, Antoine Robidoux, Jedediah Smith, William Ashley, and Peter Skeen Ogden. The fur trade began its decline after 1840 as a result of changes in European and eastern American fashions. In addition, the fur industry had a serious socio-economic impact on the Ute bands in Utah (Hauck, 1979).

The settlement of Utah by Mormon pioneers beginning in 1847 gradually brought widespread agricultural development into Utah. Mormon settlement of the Price River Basin was not accomplished initially, because hostile Ute Bands resided on the east of the Wasatch Range (O'Neill, 1973). The establishment of military control over the Utes and their relocation to the Uintah Reservation in 1877 brought the first settlements in Castle Valley. By 1880, Emery County, which included all of present-day Carbon County, was created by the Territorial Legislature (Lever, 1898).

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Coal mining in the area was first begun in 1853 with the Gunnison Expedition's discovery of coal deposits situated three miles east of the modern town of Emery. The first attempt to exploit the coal resources occurred in 1875 at Connellsville in Huntington Canyon on the east slopes of the Wasatch. Various mining activities were initiated along the Wasatch after that date, including Pleasant Valley, Winter Quarters Canyon, and the Mud Creek mine (from 1875 through 1882). By 1888, the Castle Gate Mine was operational and in 1899, a mine at Sunnyside, just east of the project area, had begun production (Hauck, 1979).

Prospecting in the Sage Point-Dugout Canyon area was well advanced by that date, resulting in some coal production out of the Dugout Canyon, Fish Creek Canyon, and Pace Canyon mines by 1906. Mines in these canyons were the Knight-Ideal, the Spring Canyon, and the Snow Mine, respectively. Their most active production periods were from 1920 until 1963 (Knight-Ideal Mine) and from 1932 until 1940 (the Snow Mine). The Spring Canyon Mine on Fish Creek apparently was active only from 1906 until 1910. Coal production in Soldier Creek Canyon, initiated by the Premium mine in 1931, has continued up to the present time (Doelling, 1972). With the exception of the Spring Canyon Mine, mining activity in the project area began in the Historic period but has been most active since 1930. Modern activity at those three mines during the intervening 50 years has resulted in extensive modification of the mines' historic structures.

2.3 CULTURAL RESOURCES

38 previously unrecorded cultural resource sites were located during the general inventory; 33 sites are situated in the permit area. A brief summary of the pertinent site characteristics is shown in Table IV-I.3. Not included in Table IV-I.3 are five sites situated outside the mine plan permit area (42Cb169, 182, 189, 191, and 203).

Table IV-I.3

Cultural Resource Site Summary

AERC Site No..	Permanent Site No.	Site Type	Culture	Land Ownership
---	42Cb92	Pictographs	Unknown Prehistoric	BLM
292N/1	42Cb134	Dugout	Euro-American	State
292N/2	42Cb135	Temporary camp	Middle Archaic & Post-Archaic	Private
356A/1	42Cb167	Petroglyphs	Euro-American	BLM
356A/2	42Cb168	Lithic scatter	Unknown	BLM
356N/1	42Cb170	Lithic scatter	Post-Archaic	Private
356N/2	42Cb171	Temporary camp	Fremont and Euro-American	Private
356N/3	42Cb172	Homestead	Euro-American	Private
356N/4	42Cb173	Homestead	Euro-American	Private
356Y/5	42Cb174	Homestead and historic scatter	Unknown Prehistoric and Euro-American	Private
356Y/6	42Cb175	Lithic and ceramic scatter	Fremont	BLM
356N/1	42Cb183	Homestead	Euro-American	Private
356N/2	42Cb184	Lithic scatter	Unknown	Private
356N/3	42Cb185	Lithic and ceramic scatter	Shoshonean and Fremont	Private
356N/4	42Cb186	Rock shelter	Fremont	Private
356N/5	42Cb187	Lithic scatter	Post-Archaic	Private
356N/6	42Cb188	Lithic scatter	Unknown	Private
356A/2	42Cb190	Lithic scatter	Unknown	BLM

Table IV-I.3 (cont.)

AERC Site No..	Permanent Site No.	Site Type	Culture	Land Ownership
356A/4	42Cb192	Lithic scatter	Post-Archaic	BLM
356A/5	42Cb193	Temporary camp	Unknown	BLM
356A/6	42Cb194	Temporary camp	Shoshonean	State
356A/7	42Cb195	Lithic scatter	Unknown	Private
356A/8	42Cb196	Homestead	Euro-American	Private
356A/9	42Cb197	Temporary camp	Fremont	Private
356A/10	42Cb198	Lithic scatter	Post-Archaic	Private
356A/11	42Cb199	Cist	Unknown	BLM
356A/12	42Cb200	Lithic scatter	Post-Archaic	BLM
356A/13	42Cb201	Lithic scatter	Post-Archaic	Private
356A/14	42Cb202	Lithic scatter	Fremont	BLM
456N/1	42Cb204	Mine service & portal area	Historic-Modern	BLM
456N/2	42Cb205	Mine service & portal area	Historic-Modern	Private
456N/3	42Cb206	Mine service & portal area	Historic-Modern	BLM
456N/4	42Cb207	Lithic scatter	Middle-Late Archaic Shoshonean?	Private

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Of the 33 sites situated in the permit area, five (15%) are habitation sites--all historic. Three sites (10%) are mine service portal sites, again all historic. An additional five sites (15%) are prehistoric temporary campsites. 13 sites (39%) are lithic scatters; two sites (6%) are petroglyph-pictograph sites; the petroglyphs on site 42Cb167 are historic. One rock shelter habitation site, one combination lithic-historic material scatter site, and one storage cist complete the analysis.

Nine of the sites (27%) are historic origin, while 23 sites (69%) are of prehistoric origin. The remaining one site (3%) has both historic and prehistoric components.

Cultural resource site density is highest along the creeks and tributaries in the project area. 22 (66%) of the 33 sites are situated adjacent to various streams and intermittent creek beds; seven sites (21%) are located more than .10 miles from a water source. Twelve sites (36%) are situated adjacent to Soldier Creek, with six sites (18%) on intermittent and secondary creeks. Four sites (12%) are on Dugout Creek, one site (3%) is on Fish Creek, and one site (3%) is on Pace Creek. These statistics demonstrate that prehistoric and historic activity and land utilization were heavily concentrated adjacent to presently active water resources. The site density on Soldier Creek and its tributaries demonstrate a definite prehistoric preference for that area.

There is also a definite clustering of prehistoric cultural resources within the Pinyon-Juniper ecozone of the lower foothills. Only two isolated projectile points and sites 42Cb92 and 42Cb207 were recorded in the Montane zone. The predominant clustering of sites between the 6000 and 7000-foot elevations further demonstrates the primary utilization of the foothills by prehistoric peoples.

Two sites demonstrate Archaic phase activity; they were identified through diagnostic artifacts. Post Archaic sites, all temporally distinguishable by surface remains, included seven sites. Fremont culture materials were recovered at six sites, while Shoshonean artifacts were found in association with two sites. Nine prehistoric sites were classified as unknown.

The cultural resource evaluations within the general area, and specifically within the permit area, substantiate the hypothesis that extensive movement between Nine Mile Canyon and Price River Basin occurred along Soldier Creek in the prehistoric period. Diagnostic artifacts demonstrate an Archaic through Shoshonean presence along this corridor. No Paleo-Indian activity has been identified to date.

Site types and densities show that prehistoric activity was of a limited, transitory nature, for no extended campsites or habitation sites were found. During the historic period, activity in the project area centered on occupation and agricultural activities along the creek bottoms and coal mining in the major canyons along the Book Cliffs. There is

no indication of early historic activity in the area, such as fur trapping, although site 42Cb134, a historic dugout, could have been constructed at that time.

Artifacts from various prehistoric sites demonstrate a movement of new materials through the corridor from areas as far apart as Wyoming, western Utah, and Colorado. Southwestern Wyoming is the source of the Tiger chert found at two sites, while western Utah materials were verified by trace element analysis of several obsidian samples. The source of a third obsidian sample could not be positively identified through trace element analysis, but similarities with Colorado obsidian sources suggest an origin in that state. Translucent brown chert found at one site (42Cb201) is very similar to a chert common around Rock Springs, Wyoming.

Projectile point types from the project area also demonstrate relationships between north-central Utah with the eastern Great Basin, the Colorado Plateau, and western Plains. Middle Plains Archaic Duncan points were recovered from one site, 42Cb135, and from an isolated position (356A/X25). A possible Wapiti point (292N/X1) also shows Plains influence.

Artifacts which show eastern Great Basin influence in the study area include the range of Rose Spring arrow points, the Elko styled points and the Gypsum point.

The majority of ceramic fragments collected from the project area is of the San Rafael variant of the Fremont culture, such as

Emery Gray wares. Site 42Cb185 demonstrated the greatest range of ceramic variation; it contains Emery Gray, Snake Valley Black-on-gray, and Sevier gray materials.

Table IV-I.4 summarizes the condition of the sites and indicates particular characteristics relating to the quality of the sites.

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Table IV-I.4

Site Significance

Site	Quality*	Condition
42Cb92	a	Good
42Cb134	c-f	Good
42Cb135	a-b-c-d-g	Good
42Cb167	a-e-g	Excellent
42Cb168	d	Good
42Cb170	g	Poor
42Cb171	c-d	Good
42Cb172	c-f-g	Poor
42Cb173	c-f-g	Good
42Cb174	g	Poor
42Cb175	g	Poor
42Cb183	g	Poór
42Cb184	---	Poor
42Cb185	a-c-d-f-g	Good
42Cb186	a-c-d-f-g	Good
42Cb187	g	Good
42Cb188	b-c-g	Good
42Cb190	---	Good
42Cb192	g	Good
42Cb193	c	Good
42Cb194	a-c-g	Good
42Cb195	d	Good
42Cb196	c-g	Poor
42Cb197	c-g	Good
42Cb198	b-g	Good
42Cb199	a	Fair
42Cb200	g	Good
42Cb201	g	Excellent
42Cb202	a-g	Good
42Cb204	---	Poor

Table IV-I.4 (cont.)

Site	Quality*	Condition
42Cb205	g	Poor
42Cb206	g	Good
42Cb207	a-b-d-g	Good

*Quality indicators are the following:

a) size or layout is unique

b) quantity or quality of artifacts is unique

c) indication of depth

d) environmental location is unique

e) existence of unique artifacts, architecture, art, or structure

f) condition is excellent for preservation of materials or data

g) site contains specific cultural data relevant to temporal and spatial identifications

h) site is scene of an important event

i) site is associated with an important person

2.4 NATIONAL REGISTER ELIGIBILITY

Application of the National Register Criteria of Eligibility, defined under 36 CFR 60.6, to each of the 33 sites that are situated in the permit area provides the following results:

a) Four of the 33 sites is associated with events that have made a significant contribution to the broad patterns of our history; or

b) Three of the 33 sites is associated with the lives of persons significant in our past; or

c) Four of the 33 sites embody the distinctive characteristics of a type, period, or method of construction, or represent the work of a master, or possess high artistic values, or represent a significant and distinguishable entity whose components may lack individual distinction; and,

d) Fourteen sites (42Cb134, 135, 172, 173, 183, 185, 186, 188, 194, 196, 197, 198, 202, and 207) have "yielded or may be likely to yield information important in the prehistory or history" of the region. Under this criterion, the sites do not warrant in-place preservation. However, potential impacts to these sites will be mitigated through other techniques, as described in sub-section 3.2.

Eleven sites (42Cb92, 168, 170, 175, 187, 192, 193,195, 199, 200, and 201) require additional field research before a determination of eligibility can be made. Seven of these sites (42Cb170, 175, 187, 193, 195, 200, and 201) will not be directly impacted by construction or other project-related activities (see Table IV-1.5). Consequently, no further evaluation will be performed for these sites. For the other four sites (42Cb92, 168, 192, and 199), eligibility will be determined through additional fieldwork. If any of these four sites proves eligible or potentially eligible for listing, an impact mitigaton plan for those sites will be submitted to DOGM for approval at least six months prior to any disturbance of those sites.

Sites 42Cb167, 171, 174, 184, 190, 204, 205, and 206 are not considered eligible for nomination to the National Register, since they do not meet criteria a, b, or c, and they do not have the potential to yield any information important to the understanding of the prehistory and history of the region.

The following site-specific analyses discuss the reasons behind each determination of non-eligibility, potential eligibility, and eligibility.

2.4.1 SITES THAT WILL NOT BE DIRECTLY IMPACTED BY CONSTRUCTION OR OTHER PROJECT-RELATED ACTIVITIES

42Cb134	42Cb194
42Cb170	42Cb195
42Cb175	42Cb198
42Cb183	42Cb200
42Cb187	42Cb201
42Cb193	42Cb207

Determinations of eligibility have not been made for all of the twelve sites listed above. Because these sites will not be directly impacted as a result of the project, the Applicant assumes no further obligation to conduct further research regarding these sites. As described in sub-section 3, Potential Impacts, the only impact potential for these sites is vandalism, and that potential is assessed as "low" by a professional archeologist. Further investigation of these sites is not cost-effective with respect to the goal of providing good protection to archeological resources in the permit area.

2.4.2 NON-ELIGIBLE SITES

42Cb167

Site 42Cb167 is a relatively simple petroglyph composed almost totally of names and dates that are of no particular value in terms of the four eligibility criteria.

42Cb171

Site 42Cb171 is a non-descript prehistoric-historic artifact scatter containing a few typical historic artifacts. Oral historical research with a former property owner, John Mahleres, indicates that no significant structures stood in the area. This information concurs with the observed historical remains; one tin bucket and a prehistoric or historic rock alignment were all that were found. The site has no significant historic period history and is not eligible for the Register under any of the listed criteria.

42Cb174

Site 42Cb174 is a prehistoric-historic artifact scatter of negligible depth potential and of typical artifact inventory. Material remains were not substantial.

42Cb174 was placed by field crews in the NE¼ NW¼ SW¼ of Section 30. Land records show that William Snooks of Emery owned a log house, attached shed, and a corral in the NE¼ of the SW¼ of Section 30, which he sold in 1884. Site 42Cb174 could be the remnants of Snooks' dwellings, or at least some of his trash, as no other archeological materials were found in this area of the section.

Unfortunately, the location of this early homestead cannot be definitely identified from historical sources. Furthermore, the material remains of 174 are too paltry to argue a firm relationship. Both field work and historic research indicate that the site does not qualify for the Register under any of the four criteria.

42Cb184

Site 42Cb184 is a small lithic scatter situated on the west terrace above Soldier Creek. The site has little research value and does not meet any of the criteria pertaining to National Register eligibility.

42Cb190

This site is a moderate size lithic scatter situated on the west of Soldier Creek on the east slope of a narrow bench which overlooks the drainage. The site contains both core reduction materials and biface manufacture flakes of a variety of chert types, but lacks diagnostic artifacts and depth potential. It does not appear to have been a locus for camping or habitation.

Site 42Cb190 has marginal research value and does not meet any of the four criteria related to eligibility for inclusion in the National Register.

42Cb204

Site 42Cb204 is a mine portal site located on BLM acreage. Basically, the portal constitutes the site. County land records recorded only oil, gas, and coal leases dating from 1972, so contained nothing which would suggest National Register significant. Similarly, a discussion with the Surface Protection Officer for the Price Resource Area and a review of their plats revealed no historically significant information. A search of the annual reports of the state mine inspector reveal no unusually important mine to be located in this area. Site 42Cb204 does not qualify for the Register under any of the four criteria.

42Cb205

42Cb205 is a privately owned mining camp and portals site which, at the time of the field evaluation, had several surface structures. Since that evaluation, work crews have removed those structures as part of a mine clean-up effort. Only a few concrete pad remnants remain. Historical sources indicate that the mine was not particularly important or a major producer as was the famous Sunnyside properties to the east.

In 1907, the state mine inspector reported that the Dugout Creek area had good coal equal to that of other Book Cliff fields, but he listed no mines by name (Coal Mine Inspector 1907:121). Important mines

were typically mentioned by name. Due to the present lack of physical remains and of no important historicity, the mine does not qualify as a Register property under any of the four criteria.

42Cb206

42Cb206 is also a privately owned mining camp portal site. The field crews found the physical remains of the site to be not as extensive as those of 42Cb205. Historical information gathered by field crews at the time of survey indicated that the mine had been active in 1906, with primary production occurring from 1932 to 1940 (unknown informant, June, 1980). Pertinent land records for the area begin in 1917, in which year J. C. Kakebeeke acquired the section and other land, totaling over 22,000 acres. While the acreage would have been used for grazing, no information relevant to the use of the mine was contained in land records until recently, when energy firms acquired the mineral leases.

Reports of the state mining inspector indicate that there was no major mine in this area, Rather, this mine, like the previous two, was probably a modest local producer.

The physical remains on the site consist of a timer coal chute and a collapse log cabin typical of the 1900s. Site 42Cb206 does not qualify as a Register property under any of the outlined criteria.

2.4.3 POTENTIALLY ELIGIBLE OR ELIGIBLE SITES

42Cb92

This site consists of several pictograph panels on the sandstone face of a cliff situated in the bottom of Dugout Canyon. The site is on the north side of the canyon and situated above the creek near the cliff point which is northeast of the junction in the creek. This site was recorded by Dale Berge of BYU in 1977, who states in the site report, "The pictographs depict outlined trapizoidal figures, dots, elongated figures, bird-like figures and some unknown objects. The largest figures are the trapizoidal figures which are about one foot tall." Colors used in the paintings include red, white, and blue-gray.

Site 42Cb92 requires a comparative study with other known pictographs and petroglyphs in Utah to determine its significance relative to National Register criteria c or d.

42Cb135

This large prehistoric site contains diagnostic projectile points and a hearth indicating its use as a temporary campsite. Both Early Archaic (Pinto) and Fremont (Rose Springs stemmed) points were found on the site as were three flat, sandstone metates. Detritus is quite dispersed within the site area.

Site 42Cb135 is situated along the west rim of the terrace above Soldier Creek.

This site has National Register potential under criteria d of 36 CFR 60.6. Its depth potential is limited, but careful excavation could provide important informaton on its various prehistoric occupations.

42Cb168

This site is small sparse lithic scatter situated on the first terrace directly to the east of Dugout Creek. The detritus indicates that biface manufacturing was conducted on the site although one awl was also observed. The devitage consists of a wide variety of lithic material types including two flakes of obsidian, a lithic material which is rarely found in the region.

This site requires additional research before determining its eligibility andu 36 CFR 60.6.

42Cb172

Site 42Cb172 is located on private land belonging to LaRue Layne et al. and was described by field crews as a homestead site. The site's cabin had burned to the ground, but a shed remained and an artifact scatter and depth were apparent.

Historically, the site appears in both the county land records and oral history. Record entries for this section of land begin in 1942 when Melvin Edwards sold a parcel to Harry Mahleres. As fire insurance was required, the presence of wood structures is indicated. Subsequently, the property changed hands. Probate records for one of the later owners, Neils Olsen, indicate that he used the land as grazing acreage.

John Mahleres, a son of Harry Mahleres, identified the site as having been Archie Edwards' homestead. Edwards was the son of an earlier homesteader of the region and, apparently, a brother to Melvin Edwards. The property was evidently really Melvin's homestead. As he was undoubtedly involved with it before the 1942 sale, the property is old enough for Register consideration.

The site is judged to have National Register potential under criteria a, c, and d. Being a homestead, the site was part of a significant, broad pattern in western history. As a late period homestead, the site offers information about the architecture, material culture, and other aspects of the period. As the site is a multi-component site with stratagraphic depth, it certainly can yield historical information.

42Cb173

Site 42Cb173 is located on private land belonging to LaRue Layne et al. AERC field crews described a cabin, root cellar, and outhouse and indicated the existence of another collapsed structure and woodpile. They concluded the site had Register potential. When the site was revisited, a series of photographs showing the important components of the site was taken.

Land records indicate that Caleb E. Edwards filed a 159-acre homestead action on June 16, 1916, for the E½ of the SE¼ of Section 25 (R11E.) and the W½ of the SW¼ of Section 30 (R12E.). This suggests that 42Cb173 was his homestead. Conversations with John Mahleres, whose father acquired the Section 25 ground in 1939, confirmed this hypothesis. While field crews placed the site in the NE¼ and land records located the homestead in the SE¼, in whichever quarter it might actually be, the informant and the available material remains both suggest this site as Caleb's 1916 homestead.

42Cb173 is judged to have National Register potential under all four criteria. Like 42Cb172, 42Cb173 is part of the homestead movement and of the agrarian development of Carbon County (criterion a). It represents a given period (criterion c), and it is a sizeable multi-component site with depth, the strata of which

offers historical information (criterion d). Additionally, Caleb Edwards is a significant person as one of the earliest settlers in the area (criterion b).

42Cb185

This site is a large lithic scatter and shallow rock shelter complex situated upon the terrace which flanks Soldier Creek on the west. It is a linking site between 42Cb135 to the north and 42Cb186 to the south. Ceramics and a diagnostic projectile point demonstrate the site's occupation by Fremont and Shoshonean peoples. Some of the shallow shelters on the site have been recently vandalized but can still yield important information concerning the prehistoric occupation of the site.

Site 42Cb185 has National Register potential based upon criteria d of 36 CFR 60.6.

42Cb186

Site 42Cb186 is situated upon the west terrace at the junction of Soldier Creek and an old, dry creek channel which extends to the northwest. The site contains two small rock shelters which have been vandalized, a lithic scatter, and a historic rock alignment. Its position, flanked by Soldier Creek on the east and an extinct creek channel on the west, could further

increase the research potential for this site. Emery Gray ware was found on the site indicating a Fremont occupation; however, the sandy soil in the center of the terrace and its topographic location suggest it was probably occupied during the Archaic period, a hypothesis which could be substantiated by careful excavation.

This site meets criteria d as eligible for nomination to the National Register based upon application of criteria outlined in 36 CFR 60.6.

42Cb188

This site consists of a limited detritus scatter situated in the flat juniper-pinyon zone. The site has some depth potential and consists of a core reduction center which also contains several lithic tools. Several tiger chert flakes were found on the site, demonstrating its inhabitants had some contact with a chert resource zone which is common in southwestern Wyoming.

Careful surface excavation of the site can provide the archeologist with cultural, temporal, and spatial information; hence, this site meets criteria d based upon 36 CFR 60.6.

42Cb192

This site is a moderate size prehistoric lithic scatter containing a sparse scatter of core reduction and biface manufacture flakes in association with a post-Archaic Cottonwood triangular point base. The site has marginal depth potential and its location on the edge of the terrace to the west of Soldier Creek indicates it has some research potential relative to criteria d of 36 CFR 60.6.

42Cb196

Site 42Cb196 is located in Section 31 (R12E.). County plats show that the property is owned by LaRue Layne et al. Field crews examining this homestead site identified the location of the cabin on the basis of remaining foundation stones and a chimney. A trash midden, historic scatter, and depth potential were noted.

Land records for the section show that Caleb Edwards patented Lots 1, 2, and 3 (W½ of the NW¼, the NW¼ of the SW¼, and the SE¼ of the NW¼) in 1921. The acreage then passed to Harry Mahleres in 1939. John Mahleres recalled that Archie Edwards had built the cabin before his father's purchase of the land. The erection of the cabin would probably have been associated with the homesteading action later patented in 1921.

42Cb196 is judged to have National Register potential under all four criteria for the same reasons site 42Cb173 was so judged. The fact that this land was patented by Caleb in 1921, a number of years after his 1916 patent, reflects his desire to strengthen his family's position in the area.

42Cb197

This site consists of a small prehistoric camp site which contains diagnostic Fremont ceramic and lithic artifacts in association with a hearth. The aolian deposits on the site may seal off a larger amount of site area than was observed during the survey. The site is situated on the east run of the western terrace overlooking Soldier Creek.

Careful surface excavation of the site could yield important scientific information of the Fremont occupation patterns of the region. This site is eligible for National Register inclusion under application of criteria d of 36 CFR 60.6.

42Cb199

Site 199 consists of a rectangular slab construction which could have been a prehistoric sandstone slab storage pit of the type frequently used by Archaic and Fremont peoples. The site is situated

on top of a low knoll overlooking the Soldier Creek flats, a location with excellent prehistoric occupational potential.

The site should be test excavated to determine its cultural significance before establishing its potential for National Register eligibility based upon 36 CFR 60.6.

42Cb202

Site 202 is a large, possible Fremont core reduction loci where biface manufacturing also occurred. A Rose Springs arrow point was collected from this site during the survey. The site has marginal depth potential and is a relatively sparse concentration of detritus; however, the range of cherts and the type of flakes available on the site demonstrates its potential for yielding some information important to the understanding of lithic technology being practiced in the Dugout Creek locality and Price River region. This site, therefore, under criteria d of 36 CFR 60.6, has the potential for yielding important information in the prehistoric occupation of the region.

3. PROTECTION OF CULTURAL AND HISTORICAL RESOURCES (784.17)

3.1 IMPACT POTENTIAL

Adverse impact potential was examined on two levels. Direct impact concerns adverse effects occurring as a direct consequence of project development and operation. Indirect impact stems from adverse effects relative to activities which are not part of the project design and planning.

The probability of adverse impact on the cultural resource sites of the permit area is presented in Table IV-I.5.

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Table IV-I.5. Cultural resource impact potential.

Site	Direct Impact	Indirect Impact	Impact Agent	National Register Eligibility*
42Cb92	Low	Low	Road Construction	1, 2
42Cb134	---	Low	Vandalism	4
42Cb135	High	---	Central Facilities Construction	1
42Cb167	Low	Low	Road Construction	3
42Cb168	Low	Low	Road Construction/ Vandalism	1, 2
42Cb170	---	Low	Vandalism	4
42Cb171	High	---	Railroad Construction	3
42Cb172	High	---	Road Construction	1
42Cb173	Moderate	High	Central Facilities Construction/Vandalism	1
42Cb174	High	---	Central Facilities Construction	3
42Cb175	---	Low	Vandalism	4
42Cb183	---	Low	Vandalism	4
42Cb184	Low	Low	Central Facilities Construction/Vandalism	3
42Cb185	High	---	Central Facilities Construction	1
42Cb186	High	---	Central Facilities Construction	1
42Cb187	---	Low	Vandalism	4
42Cb188	Low	High	Vandalism	1
42Cb190	Low	Low	Road Construction	3
42Cb192	Low	Low	Road Construction	1, 2
42Cb193	---	Low	Vandalism	4
42Cb194	---	Low	Vandalism	4
42Cb195	---	Low	Vandalism	4
42Cb196	High	---	Railroad Construction	1
42Cb197	Low	Low	Vandalism	1

Table IV-I.5. (cont.)

42Cb198	---	Low	Vandalism	4
42Cb199	Low	Low	Road Construction	1, 2
42Cb200	---	Low	Vandalism	4
42Cb201	---	Low	Vandalism	4
42Cb202	High	Low	Road Construction	1
42Cb204	High	---	Portal Area Construction	3
42Cb205	High	---	Portal Area Construction	3
42Cb206	High	---	Portal Area Construction	3
42Cb207	---	Low	Subsidence caused by mining	4

* - National Register Eligibility:

1. Potentially or definitely eligible for listing
2. Further research is required
3. Not eligible for listing
4. No direct impact, thus a determination of eligibility is unnecessary (see page II-500A(3))

In summary, a total of eight sites eligible for National Register listing situated in the mine plan permit area have a high potential for receiving adverse impact, either as a result of project development and operation (direct impact) or as a result of non-project related activities, usually vandalism (indirect impact). These sites include three historic habitations (42Cb172, 173, and 196), a prehistoric temporary campsite (42Cb135), three prehistoric lithic scatters (42Cb185, 188, and 202), and one prehistoric rock shelter site (42Cb186). The four sites for which additional fieldwork is required (42Cb92, 168, 192, and 199) all have a low potential for direct and indirect impact associated with road construction.

No sites have a moderate potential for receiving adverse impact of either a direct or indirect nature. The remaining sites have a low potential for receiving either direct or indirect adverse impact.

3.2 MITIGATION OF ADVERSE IMPACTS

A variety of archeological and historic techniques have been evaluated for use in avoiding or mitigating potential adverse impacts to those cultural resource sites eligible or potentially eligible for listing on the National Register.

Avoidance procedures are the most appropriate means of preserving those sites that will not be endangered by the development and operational phases of the project and that have a potential for disturbance through vandalism. These sites are 42Cb188 and 197.

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Site 42Cb188, a prehistoric lithic scatter, will be collected prior to construction, using both vertical and horizontal controls. This site contains Tiger chert fragments which originated in Wyoming, and buried artifacts on the site could provide valuable information on cultural movement between the western Plains and eastern Great Basin. The potential for vandalism on this site is high; collection through test excavation and screening will be conducted to mitigate the impacts of construction.

The remaining seven eligible sites all have high potential for disturbance during project initiation. Sites 42Cb135, 185, and 186 are prehistoric habitation sites with rock

shelters situated in 42Cb185 and 186. These three sites are associated with the central facilities area and all have potential for complete disruption either from construction or vandalism. All three sites also contain depth and could have buried artifact deposits of importance to understanding the prehistoric movement of peoples along the Soldier Creek corridor.

Each of these sites (42Cb135, 185, and 186) will be carefully collected utilizing appropriate surface controls prior to field staking for construction. Each site will be tested for subsurface depth utilizing a permanent datum on each location and appropriate vertical and horizontal controls. Hearth areas, depressions, soil accumulations, and rock shelters will be further evaluated through test excavations. Should subsurface artifact deposits or structures be uncovered, these remains will be salvaged, if possible, and if the value of the deposit or structure warrants salvage excavation.

Site 42Cb202 is a prehistoric lithic scatter. This site has high potential for destruction during construction. A collection of valuable artifacts should be conducted on the surface; several small test excavations should be conducted at appropriate places on these site to assess the presence of subsurface cultural remains. Should valuable subsurface structures or archeological deposits be uncovered, such materials should be salvaged by careful excavation.

Three historic homestead sites, 42Cb172, 173, and 196, all have moderate to high potential for disruption during the development period either from construction activities or from vandalism. Impacts for all three sites should be mitigated through photographic documentation of architectural details prior to disturbance. Valuable historic or prehistoric artifacts on these sites should be collected for preservation.

The mitigation and avoidance measures should provide a high level of protection to the 33 cultural resource sites which are situated within the permit area.

As indicated earlier in the Section, four sites (42Cb92, 168, 192, and 199) require additional fieldwork to determine National Register eligibility. These sites will be further examined and mitigation plans will be submitted to DOGM for any eligible sites of the four at least six months prior to construction.

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