TEST EXCAVATIONS AT SEVEN SITES
FOR THE SANDSTONE RESERVOIR PROJECT,
CARBON COUNTY, WYOMING
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CARBON COUNTY, WYOMING

Prepared for
Wyoming Water Development Commission
Cheyenne, Wyoming

By
Craig S. Smith
and
Thomas P. Reust

Under
Cultural Resource Use Permit No. 015-WY-C087

Mariah Associates, Inc.
Laramie, Wyoming

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1.0 INTRODUCTION

This report details the results of evaluative test excavations conducted by Mariah Associates, Inc. (Mariah) at seven prehistoric and historic sites located within the Wyoming Water Development Commission's proposed Sandstone Reservoir project area. The excavations were performed to determine whether these sites were eligible for the National Register of Historic Places (NRHP) and to obtain information for the development of a data recovery plan for eligible sites. To test these sites backhoe trenches and 1 x 1 m units were used.

1.1 PROJECT LOCATION

The proposed Sandstone Reservoir project area is located in southern Carbon County, Wyoming (Figure 1.1). The reservoir is situated along Savery Creek about 29 km (18 mi) northeast of Baggs, Wyoming and about 13 km (8 mi) north of Savery, Wyoming. The Sierra Madre Mountains occur along the eastern side of the reservoir area.

The seven tested sites are located within the Savery Creek valley (Figure 1.2). The Tullis, Wyoming United States Geological Survey 7.5 minute quadrangle map, 1961 (Photorevised 1983) encompasses the area containing the sites. Table 1.1 details the site number, legal location, landownership, and number of test units and backhoe trenches excavated for each of the seven sites. Except for Site 48CR4261, which is on land managed by the Rawlins District of the Bureau of Land Management (BLM), the sites are located on privately owned lands.

1.2 PROJECT BACKGROUND

A Class III cultural resource inventory of the proposed Sandstone Reservoir project area was conducted by personnel from the Office of the Wyoming State Archaeologist in August 1985 (Blatchley and Scott 1986). Five previously recorded sites, seven previously unrecorded sites, and five isolated finds were identified and recorded during the inventory. Six of the sites are historic, five are prehistoric, and one has a historic and pre-
Figure 1.1 County Map Showing Location of the Sandstone Reservoir Project Area, Carbon County, Wyoming, 1988.
Figure 1.2 Map Showing Location of the Seven Tested Sites, Sandstone Reservoir Testing Project, 1988.
Table 1.1 Legal Location, Landownership, and Number of Test Units and Backhoe Trenches Excavated for Seven Tested Sites, Sandstone Reservoir Testing Project, Wyoming, 1988.

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<td>BLM</td>
<td>2</td>
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<td>48CR4264</td>
<td>SESESWNESW, Sec. 24, T14N, R89W</td>
<td>Private</td>
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<td>48CR4265</td>
<td>CNWSENWW, Sec. 1, T13N, R89W</td>
<td>Private</td>
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historic component. As a result of the Class III inventory, all the prehistoric sites (48CR95, 48CR4260, 48CR4261, 42CR4264, and 48CR4265); one historic site (48CR4263); and the prehistoric and historic site (48CR4262) were recommended as eligible for the NRHP, and a testing program was proposed.

The Wyoming Water Development Commission contracted with Mariah in June 1988 to conduct the evaluative testing at the seven sites. Field work for the test excavations was performed between August 22 and 26, 1988. Craig Smith served as principal investigator, and Thomas Reust was crew chief. Field crew members included Darryl Newton, Scott White, Jennifer Cole, and Cynthia Webb. Skylar Scott was project historian. The test excavations were performed under Cultural Resource Use Permit Number 015-WY-C087.

1.3 RESEARCH ORIENTATION

The seven sites were evaluated according to the NRHP eligibility criteria as listed in 36CFR60.4. The portion of these criteria pertaining to the investigated sites is section (d), which states properties are eligible for inclusion in the NRHP "that have yielded, or may be likely to yield, information important in prehistory or history." Because section (d) is vague, a research design needs to be developed which guides the eligibility determinations.

The prehistoric sites investigated during this project were evaluated as to whether or not they could provide information concerning research questions in the following three problem domains:

- Chronology
- Settlement and subsistence
- Paleoenvironments

Information relative to each of these domains could assist in understanding how prehistoric hunters and gatherers adapted to the high desert of the Washakie Basin near the edge of the Sierra Madre Mountains and how this adaptation changed through time.

Among the research questions that can be included under the chronology problem domain are:
• To what periods in the prehistory of southern Wyoming do sites within the Savery Creek area date?
• Is there temporal variability in site location, feature types, raw material types, and artifact types?

Determining the periods to which the sites date is a fundamental line of research and needs to be addressed before other problems concerning the prehistory and history of southern Wyoming can be explored. Sites containing hearths with charcoal and temporally diagnostic artifacts will provide this information. Changes in site location, feature types, raw material types, and artifact types through time will provide clues concerning shifts in technologies, settlement patterns, and subsistence strategies. Previous research in the region has shown that several of these variables have changed through time. Information can be obtained from the excavation of sites dating to the various periods and recording the variables of interest.

Research questions within the settlement and subsistence problem domain include:
• What were the functions and season of occupation of the sites within the Savery Creek area?
• In what way did the subsistence of the prehistoric inhabitants change through time?
• Is there intersite or intrasite variability in past activities at the sites?
• Is there variability in raw material in association with lithic technology?

To obtain a complete understanding of the settlement and subsistence strategies of the prehistoric hunters and gatherers of southern Wyoming, the type and season of the activities performed at specific sites need to be established. Understanding the type of activities facilitates the determination of site function, which is necessary for developing subsistence and settlement models for the region. The examination of the spatial relationships of the features, fire-cracked rock, flaked stone tools, groundstone, and animal and plant remains at individual sites provides clues to the kind, time of year, and location of the prehistoric activities. Comparisons of these distributional patterns with results from ethnoarchaeological studies of
modern hunters and gatherers indicate the possible types of activities conducted at each site.

Paleoenvironmental problem domain questions include:

- What were the biotic and climatic conditions during the prehistoric human occupancy of southern Wyoming?
- If past environmental changes are detected, do these changes correlate with differences in the recovered cultural remains?

Before addressing problems concerning how the prehistoric inhabitants adapted to the environment of southern Wyoming, the biotic conditions during the past need to be reconstructed. Research in the region has shown that major changes in the environment have occurred during the past 10,000 years. These shifts in the climate and environment probably influenced how humans adapted to the area. Changes in the kind and quantity of animal and plant species may have forced the human populations to change their subsistence strategy, and such changes may be detected in the archaeological record.
2.0 BACKGROUND INFORMATION

The environment and the cultural history of the Sandstone Reservoir project area are outlined below. Such information provides a background for the interpretation of information resulting from the archaeological test excavations.

2.1 ENVIRONMENTAL SETTING

The Sandstone Reservoir project area is located along the northwestern edge of the Sierra Madre Mountains adjacent to the Washakie Basin. The Sierra Madre Mountains and the Washakie Basin are part of the Middle Rocky Mountains physiographic province (Fenneman 1931). The Sierra Madre Mountains are a northwest/southeast trending, anticlinal uplift that is an extension of the Colorado Park Range. These mountains form the eastern boundary of the Wyoming Basin, of which the Washakie Basin is a part.

Savery Creek, which flows through the project area, is one of the major drainages for the western slope of the Sierra Madre Mountains. The creek heads in the northern portion of the mountains and flows south to the Little Snake River, located about 15 km south of the project area. Savery Creek has formed narrow, well-defined, deep canyons and has exposed the sandstone layers of the Upper Cretaceous Mesaverde formation. In the project area, the canyon rises from 2100 m in elevation at the creek to over 2440 m along the surrounding ridges. Green Ridge, which has an elevation of 2550 m, is a major ridge to the east of Savery Creek.

Numerous small, intermittent tributaries dissect the canyon area. Big and Little Sandstone creeks are the major and only permanent tributaries to Savery Creek in the project area. Both flow from the mountains east of Savery Creek.

The climate of the Wyoming Basin, located west of the project area, is relatively cool and arid to semiarid. The winters are long and cold with temperatures in January, the coldest month, averaging -11° C. However, mean temperatures often drop to -20° C. Most winters are characterized by rapid
and frequent changes between mild and cold spells. July is the warmest month of the short, mild summers, and mean temperatures reach about 18° C. The period of maximum precipitation occurs in the spring and early summer, and the annual averages are from 20 to 30 cm. Because of early fall and late spring freezes, growing seasons are usually short (U.S. Department of Commerce, National Oceanic and Atmospheric Administration 1973).

Savery Creek occurs within the Transition life zone as described by Cary (1917). This zone is dominated by sagebrush (Artemisia tridentata) with some trees on the higher slopes. The Canadian zone is present in the higher elevations to the east of the project area and is composed of lodgepole pine (Pinus contorta) and aspen (Populus tremuloides) in the lower portion and Engelmann spruce (Picea engelmannii) in the higher areas. The Upper Sonoran zone covers most of the Washakie Basin. It is characterized by desert, mixed shrub vegetation.

Within the project area, the riparian vegetation communities include cottonwood (Populus angustifolia), willow (Salix sp.), and alder (Alnus tenuifolia). The marshy areas of the floodplain contain primarily grasses and other marsh herbaceous plants. Sagebrush dominates the drier, surrounding slopes.

A wide diversity of animal life occurs in the Transition and surrounding life zones. Large mammals common in the area are pronghorn (Antilocarpa americanus), mule deer (Odocoileus hemionus), and elk (Cervus elaphus). Bison (Bison sp.) and sheep (Ovis sp.) probably roamed the area in the past. Small mammals in the area include cottontail (Sylvilagus spp.), white-tailed jack-rabbit (Lepus townsendii), badger (Taxidea taxus), coyote (Canis latrans), red fox (Vulpes fulva), and several taxa of rodents (Long 1965). Birds, reptiles, and insects are also common in the area.

2.2 CULTURAL HISTORICAL BACKGROUND

The sequence of prehistoric occupations in southcentral Wyoming is poorly known and is usually treated as part of the broader scheme for the Northwestern Plains as defined by Frison (1978). This scheme is divided into the
PaleoIndian, Early Plains Archaic, Middle Plains Archaic, Late Plains Archaic, Late Prehistoric, and Protohistoric periods. Another cultural historical scheme which focuses specifically on southwest Wyoming and the Wyoming Basin has been devised by Zier et al. (1983). Based on the frequency distribution of radiocarbon dated components, the chronology of the area is divided in this scheme, from earliest to latest, into the PaleoIndian, Great Divide, Green River, Pine Spring, Deadman Wash, Uinta, and Firehole phases. Because Savery Creek flows along the eastern boundary of the Wyoming Basin, the cultural historical scheme for southwest Wyoming is pertinent and is outlined below.

Figure 2.1 details the scheme proposed by Zier et al. (1983) compared to Frison's (1978) periods and dating. Also shown is the radiocarbon age frequency curve for sites in southwest Wyoming used by Zier et al. (1983) in developing the sequence. The curve indicates the relative occurrence of available dates per 200-year time segment. It is assumed that the frequency of dates reflects the general trends in intensity of occupation.

The cultural historical scheme for the Wyoming Basin begins with the PaleoIndian period, which dates from about 12,000 to 7,000 years ago. The PaleoIndian period is often thought to be synonymous with "big-game hunters." PaleoIndian sites in the region include two with Folsom projectile points. One is the Mud Springs site, which is located in a series of sand dunes south of Rock Springs (Frison 1978). Located north of Rock Springs, the Morgan site contains Folsom points and manufacturing debris in sand dunes. Site 48CR3815, located on Sage Creek north of the project area, yielded features and flaked stone artifacts dating to the PaleoIndian period (Latady 1986).

According to Zier et al. (1983), the Great Divide phase dates from about 7,000 to 5,800 years ago. Component I at the Maxon Ranch site dating to 6,480 and 6,000 years ago probably provides the most detail presently available for the Great Divide phase (Harrell and McKern 1986). Other sites providing some information for the Great Divide phase are Component I at Site 48SW5019 with an age 6,150 years ago (Creasman et al. 1983); Component III at the Deadman Wash site (Armitage et al. 1982); and Site 48CR3815 with an age of 6,570 years ago, and Site 48UT372 dating to 6,870 years ago (Bleacher 1982). From the meager available information, the prehistoric inhabitants of southwest Wyoming
Figure 2.1 The Zier et al. (1983) Cultural Historical Scheme with Radiocarbon Age Curve for Sites in the Wyoming Basin Compared with Frison's (1978) Chronology for the Northwestern Plains, Sandstone Reservoir Testing Project, 1988.
During the Great Divide phase occupied house pits for at least part of the year, produced large side and corner-notched projectile points, and favored small mammals such as cottontail, jackrabbit, and ground squirrel. Mule deer is the only large mammal identified from the recovered bone. The only evidence of the use of plants comes from the presence of charred chokecherry seed fragments and groundstone implements; seeds from weedy species such as goosefoot were unimportant in the subsistence base. The small sample of cultural remains from the Great Divide phase is similar to those occurring at sites dating to the following Green River phase.

The next phase in the Zier et al. (1983) scheme is the Green River phase, which dates between 5,800 and 4,800-4,300 years ago. Among the excavated sites dating to this phase are Component I at the Taliferro site (Smith and Creasman 1988), Component II at the Maxon Ranch site (Harrell and McKern 1986), Component I at the Sweetwater Creek site (Newberry and Harrison 1986), Components 4 and 5 at the Deadman Wash site (Armitage et al. 1982), and Component I at Site 48CR3961 (O'Brien et al. 1983). Overall, sites belonging to the Green River phase have house pits, fire pits, other feature types, large side and corner-notched projectile points, large notched knives, retouched flakes, and groundstone. Identified animal remains are dominated by small animals such as cottontail, jackrabbit, and ground squirrel. The occasional large mammals are mule deer and pronghorn with mule deer possibly more common. Bison is rare at the sites and is present only at Site 48CR3961. The processing of plants was probably important as attested by the recovery of groundstone. Because most sites dating to this phase lack charred seeds, roots or greens were apparently the favored food plants. According to the pollen record, these plants include goosefoot, beeweed, prickly pear, and mint.

The Pine Spring phase dates from about 4,800-4,300 to 3,000 years ago and includes what is referred to as the McKean complex (Frison 1978). Sites dating to this period on the Northwestern Plains usually contain distinctive projectile point types such as McKean Lanceolate, Duncan, and Hanna which mark the McKean complex. Information concerning the Pine Spring phase in southwest Wyoming is meager, and the relationship of the McKean complex to the prehistory of the area is unclear. McKean complex point types are common throughout the area as surface finds or are often found in disturbed or mixed
deposits, such as those of the Taliaferro site (Smith and Creasman 1988). In contrast, the several dated components belonging to this phase have only large side and corner-notched projectile points. These sites include Sweetwater Creek (Newberry and Harrison 1986), Site 48SW2200 (Creasman et al. 1983), and Site 48SW1091 (O'Brien 1982). Little subsistence information has been obtained from excavated sites in southwest Wyoming, but the scant data indicates that small animals and plant foods other than seeds were important in the diet of the prehistoric inhabitants. In contrast, bison were extensively exploited at sites, such as the Scoggin site located on the eastern edge of the Wyoming Basin (Lodell 1973).

According to Zier et al. (1983), the Deadman Wash phase dates between about 2,800 and 1,800 years ago. Excavated sites in southwest Wyoming with components dating to this phase include the Taliaferro site (Smith and Creasman 1988), Site 48SW1242 (Hoefer 1986), Site 48SW1091 (O'Brien 1982), and the Deadman Wash site (Armitage et al. 1982). Side and corner-notched projectile point types occur at Deadman Wash phase sites in southwest Wyoming with corner-notched points being more common. Corner-notched points also characterize sites dating to this period in other areas of Wyoming including Mummy Cave (McCracken et al. 1978) and Spring Creek Cave (Frison 1965). Bison and pronghorn appear to be the favored animals, though smaller animals were exploited at some sites. Except for the recovery of groundstone implements at a few sites, little information exists concerning the use of plant foods at Deadman Wash phase sites in southwest Wyoming. The only site producing charred seeds is the Taliaferro site.

After a transition period from about 1,800 to 1,500 years ago, the Uinta phase continues to about 900 years ago in the Zier et al. (1983) scheme. The beginning of this phase in southwest Wyoming exhibits a switch from darts to the bow and arrow, a greater reliance on seeds from weedy species, a focus on a wide variety of large and small animals, and an increase in the number of sites. Among excavated sites belonging to this phase are the Taliaferro site (Smith and Creasman 1988), Site 48SW1242 (Hoefer 1986), the Cow Hollow Creek site (Schock et al. 1982), Site 48UT779 (Schroedl 1985), the Inman Bison site (Latady, Chronic, and Scott 1984), and the Paradox Ridge site (Gardner et al. 1982). Fremont influence also occurs in the area at this time as evidenced by
the occurrence of pottery sherds at some sites (Bower et al. 1986, Sharrock 1966). The extent of this influence is unknown. During the Uinta phase, communal hunting and processing of pronghorn appear to have been important activities. Excavated pronghorn processing sites include Austin Wash (Schroedl 1985) and Oyster Ridge (Zier 1982). Bison kill and butchering sites also date to this phase, but it is unclear how they relate to the other known sites in the area (Frison 1973).

The remaining prehistoric phase in the Zier et al. (1983) scheme is the Firehole phase, which dates from about 1,000-900 years ago to the protohistoric. This phase is distinguished from the Uinta phase by a decrease in radiocarbon dates, introduction of small, side-notched points resembling the Desert Side-notched type, and Intermountain Ware pottery. Little information is available for this phase. Evidence of the continuation of communal pronghorn procurement comes from the Firehole Basin 11 site (Zier et al. 1983). This site is a pronghorn processing area that produced small, side-notched projectile points and ceramic sherds, and dates to 645-625 years ago. The Eden-Farson site, with a radiocarbon age of 230 years ago, dates to the end of the Firehole phase or the beginning of protohistoric period (Frison 1971). Remains of over 200 pronghorn were recovered from 12 lodges. The site also produced many small Desert Side-notched projectile points. Another site probably dating to this phase is Skull Point (McGuire 1977). Testing at the site yielded small, side-notched projectile points, a bone awl, Intermountain Ware pottery, and bison and pronghorn remains.
3.0 METHODS

3.1 FIELD METHODS

The test excavations at the seven sites consisted of backhoe trenches and 1 x 1 m, hand dug units. The number of units and backhoe trenches excavated at each site is listed in Table 1.1. The test units and backhoe trenches were placed in areas that appeared to contain subsurface deposits with cultural material. The locations of the units and trenches were determined in part on the basis of surface indications, such as artifact densities, and were always in areas that appeared to be uneroded. The units and trenches were spaced so that entire site areas were tested. Generally, test units were excavated until a soil stratum change was noted or several 10-cm levels lacking cultural remains were excavated. In addition to the test excavations, cutbanks and other erosional areas were visually inspected for evidence of buried cultural deposits.

The backhoe trenches were dug first to obtain a general idea of the deposition at the sites. These trenches were placed across the entire site in areas that appeared to contain deposition. Based on information from the backhoe trenches, the 1 x 1 m test units were excavated adjacent to the trenches or at other nearby areas. With this testing method, information concerning the existence and extent of buried cultural remains was obtained for the seven sites.

The test excavations followed general archaeological field procedures. The test units were oriented to the north. Depth below the present ground surface of the highest corner of the test unit was used for vertical measurements. The test units were excavated in arbitrary 10-cm levels and screened through 1/4-inch hardware cloth. An Excavation Level Form was completed for each 10-cm level. The excavations of the backhoe trenches were monitored and examined for cultural remains by an archaeologist.

The recovered materials -- including flaked stone artifacts, debitage, and bone -- were recorded and bagged for each 10-cm level. Each bag of debit-
age and bone was given a separate field specimen (FS) number. This information was listed on a Field Specimen Record Form.

All pit features encountered in the test units were completely exposed horizontally and were recorded with a plan view map and photographs. After the delineation of the plan view, the features were cross sectioned, and half the fill was removed to determine if any internal stratification was present. Drawings and photographs were made of the resulting profile, and following this, the rest of the fill was excavated. Samples of the fill were taken for plant macrofossil and radiocarbon analyses. The excavated, empty pits were again mapped and photographed. All pertinent information was put on a Feature Record Form.

Stratigraphic profiles were drawn for the 1 x 1 m units and backhoe trenches. The color, particle size, and calcium carbonate content of the deposits for each stratum were included on the field drawings. The profile drawings for each backhoe trench and test unit are provided in Appendix A.

3.2 LABORATORY METHODS

After completion of field work, all materials -- including artifacts, debitage, bone, bulk sediment samples, and field records -- were brought to Mariah's office, Laramie, Wyoming for laboratory analysis. All materials were processed and cataloged for curation at the University of Wyoming. Each tool was assigned a separate catalog number. Debitage and bone recovered during screening were given numbers by lot for each excavation unit and 10-cm level. The FS numbers recorded in the field were cross-referenced with the University of Wyoming catalog numbers on Field Specimen Forms and catalog cards.

The features, artifacts, plant macrofossils, animal remains, and radiocarbon sample were described and analyzed according to the methods outlined below. The results of these analyses are detailed by site in Section 4.0.
3.2.1 Feature Analysis

Except for two possible floors at Site 48CR4265, no cultural features were recorded. The possible floors are described in Section 4.7.4.

3.2.2 Artifact Analysis

The flaked stone artifacts were analyzed within a technological scheme where artifacts are grouped according to their stage in the reduction continuum of stone tool manufacture. This continuum includes a series of sequential steps from the collection of raw materials to the completion of the final implement. Each stage in the sequence is considered as a separate artifact type which is defined by certain technological and morphological attributes. A technological approach allows the examination of activities conducted at a site. Previous research has shown that certain reduction sequences or portions characterize various site types (Smith and Creasman 1988).

Three reduction sequences resulting in different idealized end products are evident in the artifact assemblage from southern Wyoming: 1) the retouching or use of flakes that were removed from a nodule or core; 2) the expedient modification of cobbles or pebbles for tools; 3) the reduction of bifaces into implements.

The artifact classes included in the flake tool reduction sequence are the cores and the retouched and utilized flakes. Cores exhibit scars and prepared striking platforms resulting from the removal of flakes. Instead of being discarded, some cores may be further reduced in the biface tool production continuum. Flakes having intentional retouch along one or more edges are considered in the retouched flake category. Utilized flakes are unmodified flakes that display clear evidence of use wear. They are expedient tools in contrast to the more modified and formal retouched flakes.

Artifacts resulting from the expedient modification of cobbles or pebbles will be classified as modified cobbles. This artifact type exhibits bifacial flaking along one or more edges, and, in contrast to artifacts in the bifacial reduction sequence, flake scars extend less than halfway across the cobble.
face. Often these artifacts will exhibit evidence of chopping and battering along the modified edge.

The continuum of biface manufacture as illustrated by Holmes (1919:Figure 49) is divided from first to last stages into preblanks, blanks, preforms, and end products. Using morphological shape, the end products are classified further into projectile points and drills. Preblanks, representing the first reduction stage, are thick and blocky in cross section and display much of the shape and form of the original cobble and pebble. Blanks are generally shapeless and irregular in outline but are thinner and less blocky in cross section than are preblanks. Bifacially flaked stone artifacts that have regular outlines, generally thin cross sections, and little or no cortex are classified as preforms. End products containing notches or other modification for hafting are considered projectile points. Drills are end products with long, narrow distal ends.

Debitage, including flakes, shatter, and tested material, is the material detached from a piece of stone during the various stages of tool manufacture (Chapman 1977). Using their characteristics, flakes can be grouped to roughly correspond with the reduction stage in which they were produced. The initial flakes removed from a piece of raw material are quite different from those resulting from the later steps in the reduction sequence. In addition to being discarded waste material, flakes can be used as unmodified tools, be retouched to produce a suitable edge, or be further reduced in the bifacial reduction sequence.

Debitage containing a striking platform and bulb of force will be grouped as either primary, secondary, or tertiary flakes depending on the amount of cortex on the dorsal surface. Primary flakes have at least 90% cortex, secondary flakes have 1-90%, and tertiary flakes lack cortex. Using the amount of cortex as the attribute for flake classification will provide a rough estimate as to the place in the stone tool manufacture sequence; primary flakes generally are removed in the early stages of reduction while tertiary flakes are produced during the later thinning stages. This is only an estimation because even flakes resulting from the final stages can retain cortex depending on the shape and size of the raw material.
Bifacial thinning flakes are distinctive tertiary flakes that display a lipped, double-faceted platform and contain evidence of crossing at least halfway across the artifact face. Pieces of debitage that lack the attributes of the flakes and are chunky or blocky will be classified as shatter. Shatter is produced during most stages of tool manufacture. Debitage to be classed as tested material includes cobbles, pebbles, or chunks of raw material that exhibit three or fewer flake scars.

Stone artifacts were classified as to material type which included quartzite, opaque chert, and banded opaque chert.

3.2.3 Analysis of Animal Remains

Animal remains recovered from the excavations were analyzed at Mariah to obtain information regarding the kinds of animals consumed, processing methods, relative importance of hunting, and time of year of site occupation. Among the recorded attributes were weight, taxonomic classification, anatomical element, portion of element present, side of body, age, and cultural modification.

For taxonomic identification, the bone was classified to taxon whenever possible. Mammal bone unclassifiable to taxon was divided into large and medium mammal. Large mammal includes species larger than coyote, and medium animal refers to species from coyote to larger than jackrabbit. The bone was examined for cultural modifications including burning and cut marks. Degree of epiphyseal union and tooth eruption are typically used to determine age; however, due to the fragmentary nature of most of the collection for the project, this was not possible. Age determinations could provide information as to the season of occupation of the site.

3.2.4 Plant Macrofossil Analysis

The plant macrofossil analysis was conducted by Craig Smith of Mariah. A 1.5-liter sample from beneath the wooden post at Site 48CR4265 was floated and examined for charred plant remains. The bulk sample was processed using water flotation techniques as outlined by Bohrer and Adams (1977).
of pouring the bulk sample into a bucket of water, stirring to allow the organic material to float to the surface, and then skimming off the floating debris with a fine cotton cloth. This process was repeated several times to ensure complete recovery of macrofossils.

The residue from the sample was air dried and examined under a binocular dissecting microscope at 10x and 20x magnification. To avoid faulty interpretations due to contamination from the modern seed rain, only charred plant remains were considered prehistoric in this analysis. Seeds are produced in enormous quantities and are naturally deposited by such means as root holes, drying cracks, downwashing, and burrowing organisms (Keepax 1977). Under normal environmental conditions, these uncharred seeds will generally decompose in less than a century after deposition (Minnis 1981).

3.2.5 Radiocarbon Analysis

A wooden post from Site 48CR4265 was dated using the radiocarbon method. It was processed at the Radiocarbon Lab, University of Texas. Before dating, the post was pretreated and insect remains were carefully removed. The radiocarbon age estimate provides data for determining whether the site is eligible for the NRHP.
4.0 RESULTS

The results of test excavations at seven sites within the proposed Sandstone Reservoir area are detailed in the following subsections. For each site, the testing procedures, stratigraphy, features, artifacts, and evaluation and recommendations are discussed.

4.1 SITE 48CR95

Site 48CR95 consists of a sandstone overhang located about 65 m west of Savery Creek and occurs at 2091 m elevation (Figure 1.2). The overhang faces to the east and overlooks the floodplain of Savery Creek. It measures 7 m high, 20 m long, and 3 m wide. Much of the floor of the overhang is covered with large pieces of sandstone that have fallen from the roof. Shrubs such as chokecherry \((Prunus virginiana)\) and raspberry \((Rubus idaeus)\) grow along the front of the shelter. Marsh and creek grasses, and cottonwoods occur in the floodplain of Savery Creek. A small, spring-fed stream flows just in front of the overhang.

When the site was originally recorded in 1975, two chert flakes were found, and flecks of charcoal were recovered from rodent burrows. In 1986, the site was recommended as eligible for the NRHP because it appeared to contain buried cultural material and would likely yield additional significant information (Blatchley and Scott 1986).

4.1.1 Testing Procedures

Three 1 x 1 m, hand dug test units were used to investigate this small overhang (Figure 4.1). The units were placed in the few areas within the overhang that were free of sandstone boulders. The areas containing deposits were quite limited within the overhang. The units were placed so that all areas with potential for producing significant buried cultural remains were tested.

Test Unit 1 was placed in a small area behind some boulders at the northern end of the overhang. The unit was dug to a depth of 50 cm below the
Figure 4.1 Site Map, 48CR95, Sandstone Reservoir Testing Project, 1988.
surface when bedrock was encountered. Large pieces of sandstone were exposed throughout the unit, and one large piece crossed the unit in a north/south direction. Test Unit 2 was placed in the southern portion of the overhang in a small area free of roof fall. The unit was excavated to a depth of 130 cm below the ground surface when sandstone was encountered. Test Unit 3 was excavated on the talus slope just outside of the overhang. It was dug to a depth of 50 cm below the ground surface when sandstone bedrock was encountered.

4.1.2 Natural Stratigraphy

The deposits in the overhang consist of sandy silt and sandstone roof fall. In most areas of the overhang, the deposits are shallow and obstructed by large rocks and roof fall. The deepest deposits occur in the limited area in the south end of the overhang near Test Unit 2.

Large amounts of roof fall, roots, twigs, and other vegetal material were encountered in Test Unit 1 (Appendix A, Figure A.1). Much of the unit was covered with one large sandstone rock. In the vicinity of Test Unit 2, the sediment is a loose sandy silt overlying a more compacted sandy silt (Appendix A, Figure A.2). Pieces of sandstone roof fall were encountered throughout, and a large piece of sandstone covered most of the unit at 100 cm below the surface. Roots, grass, sticks, and twigs also occurred throughout the deposits. Test Unit 3, located on the talus slope just outside the overhang, contained a loose sandy silt overlying a more compacted sandy silt (Appendix A, Figure A.1). Pebbles and rocks occurred throughout.

4.1.3 Cultural Stratigraphy and Age

One flake each was found Levels 5, 9, and 10 of Test Unit 2. Bone fragments were recovered from Levels 1, 2, 7, and 11 of Test Unit 2. Charcoal flecking was observed throughout Test Unit 2, as well as small pieces of fire-cracked rock. Bone also was encountered in the first four levels of Test Unit 1. These bones were associated with the roots, twigs, and sticks that occurred throughout the unit and are probably of modern origin. Most likely, the
bones were brought in by animals. No fire-cracked rock, charcoal flecking, or artifacts were noted in Test Unit 3.

As evidenced by the test investigations, the only deposits containing buried cultural remains are located in the southern portion of the overhang in the vicinity of Test Unit 2. Though these deposits are over a meter in depth, no discrete and intact cultural layers exist, and the remains are quite sparse. Additionally, less than 10 m$^2$ of deposits occur in this area.

Charcoal samples were not collected for radiocarbon dating, because the charcoal occurred only as small flecks in insufficient quantities for analysis. No temporally or culturally diagnostic artifacts were recovered in the test unit or noted on the surface. Cultural affiliation of the site is unknown.

4.1.4 Cultural Features

During the testing of the site, no features were encountered. Only dispersed and scattered charcoal flecks were noted throughout Test Unit 2.

4.1.5 Artifacts

Three pieces of debitage were recovered from Test Unit 2. Two are pieces of quartzite shatter, and the other is a secondary flake of opaque chert.

4.1.6 Animal Remains

Eighteen pieces of bone were recovered from Site 48CR95. Four specimens were identified to deer (*Odocoileus hemionus*). The other specimens were unidentified fragments of large and medium mammals. The deer specimens are a right scapula and a thoracic vertebra from Level 1 of Test Unit 2; a left scapula from Level 7 of Test Unit 2; and a proximal portion of a phalange from Level 4 of Test Unit 1. An unidentified large mammal fragment was recovered from Level 1 of Test Unit 2. The remaining 13 specimens are unidentified medium-sized mammal fragments from Levels 1, 2, 3, and 4 of Test Unit 1 and Levels 2 and 11 of Test Unit 2. The two deer scapulas were chewed. None of the specimens were burned or displayed other cultural modifications.
4.1.7 Evaluation and Recommendations

Site 48CR95 is a small overhang containing over a meter of deposition in its southern portion. Most of the overhang area consists of large pieces of roof fall and has only minimal deposits. Some debitage, fire-cracked rock, and charcoal flecking occur throughout the deposits in the southern portion; however, the material is quite sparse and dispersed. No intact cultural layers were encountered in the test unit. The overhang appears to have been used only ephemerally in the past.

Further excavations within the overhang would probably not yield additional information for addressing the research topics posed for the project. The entire surface area in the southern portion of the overhang where the deposits are located is less than 10 m², so an extensive excavation block would not be feasible. The recording, mapping, and testing have produced all the information that a small, sparse site has to offer for understanding the prehistoric people of the Savery Creek valley. The site is recommended as not eligible for the NRHP, and no further work is warranted.

4.2 SITE 48CR4260

Site 48CR4260 consists of a sparse scatter of flaked stone artifacts and debitage covering an area approximately 100 x 65 m. A small scatter of solder dot cans also is present at the site. The site is located on a terrace above the west side of Savery Creek at an elevation of 2121 m (Figure 1.2). Cultural material is present on the lower slope of the ridge above the terrace. At the site location, Savery Creek meanders to the southwest and curves around. An intermittent drainage flows along the southwest side of the site. Terrace cobbles cover much of the site, and some alluvial deposits occur at the base of the ridge slope. The predominant shrub on the site is sagebrush, and the riparian community along Savery Creek and the intermittent drainage includes cottonwood, alder, and willow.

When the site was originally recorded, bifaces, projectile points, and a unifacial tool were noted on the surface. One McKean projectile point was collected. Charcoal stained sediment was observed in two rodent holes indi-
cating the presence of buried cultural remains. The prehistoric component was recommended as eligible for the NRHP because of the presence of buried cultural remains and the possibility that the site could yield additional scientific information (Blatchley and Scott 1986).

4.2.1 Testing Procedures

Two backhoe trenches, 40 and 20 m in length, and three hand dug, 1 x 1 m test units were used to investigate the site (Figure 4.2). The backhoe trenches and test units were placed at the base of the ridge slope in the northwestern portion of the site. In this area alluvium deposits were present and charcoal stained sediment was evident in rodent burrows. The remaining site area was covered with terrace cobbles and lacked deposition.

Backhoe Trench 1 was excavated downslope from the upslope edge of the site and was placed near a rodent burrow containing charcoal stained sediment. It was dug to a depth of 1 m where rocks and cobbles were encountered. This trench provided an excellent cross section of the deposits across the site. Backhoe Trench 2 was placed perpendicular to the other trench and was dug into cobbles at a maximum depth of 1.5 m.

Test Unit 1 was placed in the upslope portion of the site adjacent to a rodent burrow with charcoal stained sediment. The test unit was excavated to a depth of 60 cm below the surface where a compacted clayey silt was encountered. Test Unit 2 was excavated at the upper edge of the terrace where artifacts were present on the surface. The unit was dug to 20 cm below the surface where a layer of river cobbles was exposed. Test Unit 3 was placed at the base of the ridge slope where the backhoe trenches indicated the deepest deposits for the site. The unit was excavated to a silty clay at a depth of 50 cm without recovering artifacts.

4.2.2 Natural Stratigraphy

Generally, the deposits at the site consist of a silt or clayey silt overlying a stratum of silty clay with cobbles and rocks. As is evident in Backhoe Trench 1, the upper clayey silt stratum is thickest at the base of the
Figure 4.2 Site Map, 48CR4260, Sandstone Reservoir Testing Project, 1988.
ridge slope in the northwestern portion of the site (Appendix A, Figure A.3). This upper stratum becomes thinner and the cobbles are closer to the surface as the river terrace is approached in the southeastern part of the site. The cobble layer is exposed on the surface at the river terrace.

Backhoe Trench 2 indicates that some deposition is present along the tributary drainage. The deposition becomes thinner with distance from drainage (Appendix A, Figure A.3). Along the drainage a clayey silt and silt layer is present. Evidence from the backhoe trenches shows that deposition at the site is limited to the base of the ridge slope and along the upper reaches of the tributary drainage.

Test Unit 1, located at the base of the ridge slope, was excavated through a compacted silt and silty sand with rocks (Appendix A, Figure A.4). The presence of rocks increased with depth. Test Unit 2, placed downslope from the other units and near the terrace, consisted of compacted sandy silt to the base of Level 2 when a cobble stratum was encountered (Appendix A, Figure A.5). Test Unit 3 contained a silty clay that became more compacted near the base of the excavation (Appendix A, Figure A.5).

4.2.3 Cultural Stratigraphy and Age

No staining or charcoal indicative of a subsurface cultural horizon was noted in the two backhoe trenches or three test units. One flake was recovered from the upper level of Test Unit 1, and another was collected from Level 4. Test Unit 2 produced three flakes in Level 2. Test Unit 3 failed to yield artifacts. There appears to be a sparse artifact scatter in the levels just below the surface in the upslope portion of the site; however, the site lacks a discrete, intact cultural layer.

Charcoal was not obtained for radiocarbon dating, and no diagnostic artifacts were recovered during the testing. When the site was originally recorded, a Middle Archaic period McKean projectile point and a Late Archaic period dart point were observed on the surface suggesting these ages for the site (Blatchley and Scott 1986).
4.2.4 Cultural Features

No cultural features were encountered during the test excavations. Some charcoal stained sediment was observed in a rodent burrow adjacent to Test Unit 1; however, upon further investigation no discrete feature was present.

4.2.5 Artifacts

Five flakes were recovered from Test Units 1 and 2. Four are of quartzite, and one is of opaque chert. All are tertiary flakes.

4.2.6 Evaluation and Recommendations

Site 48CR4260 is a sparse scatter of flaked stone artifacts and debitage located on the surface of the ridge slope and upper terrace. Based on the excavation of the backhoe trenches and hand dug, 1 x 1 m units, deposition is limited to the base of the ridge slope, and the scant cultural remains occur just below the surface. The site lacks significant, intact buried cultural debris.

Further excavations at this site would probably not yield additional information for addressing the research topics posed for the project. The recording, mapping, and testing have produced all the information that a sparse artifact scatter lacking significant buried cultural remains has to offer for understanding the prehistoric use of the Savery Creek valley. The site is recommended as not eligible for the NRHP, and no further work is warranted.

4.3 SITE 48CR4261

Site 48CR4261 consists of a southeast facing rock-shelter located high on the ridge to the west of Savery Creek (Figure 1.2). It occurs within a sandstone rim along a small, intermittent, drainage valley at an elevation of 2315 m. The shelter is approximately 8-10 m high at the opening and about 4-5 m high at the back wall. It is about 15 m long and 8 m wide, and the floor slopes approximately 3 m from the southwest to the northeast. The surface of
the shelter consists of a loose, powdery silt with several rodent holes. The slope in front of the shelter is covered primarily with sagebrush.

A few charcoal flecks were observed near one of the rodent holes when the site was recorded. The site was recommended as eligible for the NRHP because of the potential for buried cultural deposits (Blatchley and Scott 1986).

4.3.1 Testing Procedures

Two adjoining 1 x 1 m, hand dug units were used to test this rock-shelter (Figure 4.3). One unit was excavated to 300 cm below the surface and the other to 130 cm. Roof fall obstructed further digging. The shelter was tested with a 1 x 2 m unit because of the deep deposits. The unit was placed in the area of the shelter that appeared to have the greatest deposition.

4.3.2 Natural Stratigraphy

The rock-shelter contains deposits approximately 3 m deep of silt mixed with some roof fall. The first four levels of the 1 x 2 m test unit were powdery silt that had cemented into hard chunks in places (Appendix A, Figure A.6). Cow manure, grass, and undecayed leaves were found in these levels indicating a recent deposit. Levels 4-9 consisted of a damp silt with small pockets of clay. The clay became more abundant at deeper levels. Levels 10-15 were a damp silt with pockets of clay and spots of carbonate from the walls and ceiling of the shelter. Levels 16-17 were more yellow and sandy. Levels 17-30 consisted of a damp sandy silt with bands of yellow sand representing deteriorated sandstone. Pockets of clay also were present. At Level 30 the unit was blocked in three corners by large sandstone rocks.

4.3.3 Cultural Stratigraphy and Age

One small piece of leather was recovered from Level 9; no flaked stone artifacts and debitage were found in the excavation. One piece of burned bone was recovered from each of Levels 16, 20, and 23. Unburned bone came from Levels 1, 9, 17, 20, and 22. Small charcoal flecks were noted in most levels below Level 4. No fire-cracked rock was encountered.
Figure 4.3 Site Map, 48CR4261, Sandstone Reservoir Testing Project, 1988.
Though the deposits in the rock-shelter are 3 m deep, no discrete and intact cultural layers were encountered. Cultural remains are quite sparse with only dispersed, small flecks of charcoal and three burned bone fragments present. Charcoal samples were not collected for radiocarbon dating, because the charcoal occurred only as small flecks in insufficient quantities for analysis. No temporally diagnostic artifacts were noted on the surface or in the test excavations. Cultural affiliation is unknown.

4.3.4 Cultural Features

No cultural features were encountered during the testing of the site. Charcoal occurred only as small, dispersed flecks.

4.3.5 Artifacts

Only one small piece of charred leather was recovered from the test units. The poor condition of the artifact prevents any assumptions on usage. No prehistoric flaked stone artifacts and debitage were found.

Several fairly recent historic artifacts were noted on the surface of the rock-shelter. Near the back wall was a stone bench constructed of a large slab of sandstone on two piles of six smaller rocks (Figure 4.4). It measures 2.5 m long and 8 cm high. Toward the southwest portion of the shelter was an arrangement of 14 sandstone rocks, which appeared to have been another bench at one time. A rusted, square-nose shovel with the handle cut off near its midpoint was found next to the first stone bench (Figure 4.4). Its rivet construction suggests an early date, perhaps 1920s or 1930s; the shovel's handle is stamped with "Union Pacific" and "Wyoming." Three rusted but full cans of food also were found near the stone bench.

4.3.6 Animal Remains

Twenty-one pieces of bone were recovered from Site 48CR4261. All were fragments unidentifiable to taxon but appear to be from large and medium mammals. Three proximal fragments and one distal fragment of phalanges of a large mammal (deer or pronghorn) were found in Level 9 of the test unit.
Figure 4.4 Shovel and Stone Bench Found on Surface, 48CR4261, Sandstone Reservoir Testing Project, 1988.
Large mammal fragments came from Levels 1 and 9, and medium mammal fragments were from Levels 16, 17, 20, 22, and 23. Burned fragments were recovered from Levels 16, 20, and 23. No other cultural modifications were noted on the specimens.

4.3.7 Petroglyphs

Three petroglyphs were observed on the west wall of the rock-shelter (Figure 4.5). All were created by rubbing with a sandstone rock. One appears to represent a sheep, and the others are unidentifiable. All appear to be of historic European origin.

4.3.8 Evaluation and Recommendations

Site 48CR4261 is a rock-shelter located high on the ridge above Savery Creek. It contains over 3 m of deposition with small and dispersed charcoal flecks throughout. A few pieces of bone also were recovered. Only one small piece of leather was found, and the test units failed to yield prehistoric artifacts. No intact cultural layers were encountered in the test units. The shelter appears to have been used only ephemerally in the past.

Further excavations within the rock-shelter would probably not yield additional information for addressing the research topics posed for the project. The recording, mapping, and testing have produced all the information that a small, sparse site has to offer for understanding the prehistoric people of the Savery Creek valley. The site is recommended as not eligible for the NRHP, and no further work is warranted.

4.4 SITE 48CR4262

Site 48CR4262 is a prehistoric scatter of flaked stone artifacts and a historic homestead located on a terrace on the east side of Savery Creek at an elevation of 2115 m (Figure 1.2). The scatter of prehistoric artifacts measures approximately 200 x 150 m and occurs on both sides of an eastern
Figure 4.5 Petroglyphs, 48CR4261, Sandstone Reservoir Testing Project, 1988.
tributary of Savery Creek. Historic remains including a cabin, outbuildings, foundation of river cobbles, corrals, and trash scatters cover an area measuring 360 x 480 m. Most of the terrace within the site boundaries consists of cobbles and lacks deposition. Some deposition is present just south of the tributary drainage. Sagebrush is the predominant shrub on the terrace flats, and riparian vegetation is present along the drainage.

When the site was originally recorded, prehistoric artifacts were observed primarily in eroded areas to the north of the drainage. Two projectile points, a McKean and a Late Archaic dart point, were collected. Among the historic trash noted were window glass fragments, bottle glass fragments, pieces of harness, axle parts, round wire nails, horseshoe nails, leather, cartridges, buttons, and regular seam tin cans. Some of the trash was thought to date as early as the 1890s. Both components were recommended as eligible for the NRHP because of the possibility of buried remains (Blatchley and Scott 1986).

4.4.1 Testing Procedures

Three backhoe trenches, 40 m, 10 m, and 10 m in length, and four 1 x 1 m, hand dug units were used to test the site (Figure 4.6). The trenches and units were spaced to test both the historic and prehistoric components. Because most of the site consisted of a cobble-covered terrace lacking deposition, the only area with potential for buried prehistoric remains was just south of the tributary drainage. Most of the testing efforts for the prehistoric component were concentrated in this area. Two test units were used to determine the presence of subsurface historic remains and were placed at architectural features.

Backhoe Trench 1 was excavated north/south along an area with some deposition just south of the tributary drainage. It was 40 m long with a maximum depth of 1.5 m and was excavated to expose bedrock and cobbles. Backhoe Trench 2 was dug perpendicular to Trench 1 and was 10 m in length. It was excavated from the terrace with exposed cobbles north to Trench 1 where some deposition was evident. Backhoe Trench 3 was placed east of Trench 1 to
Figure 4.6 Site Map, 48CR4262, Sandstone Reservoir Testing Project, 1988.
determine the extent of the deposition. It was 10 m in length and was excavated to cobbles and bedrock.

Test Units 3 and 4 were placed in the vicinity of the backhoe trenches to determine if buried prehistoric cultural remains were present in the area with deposition. Test Unit 3 was excavated just north of the cobble-covered terrace and south of Backhoe Trench 3. It was excavated to a depth of 60 cm below the surface where a compacted silty clay was encountered. Test Unit 4 was placed just south of Backhoe Trench 1 in an area containing deposition. It was dug to 80 cm below the surface and was terminated when a compacted clayey silt was exposed.

Test Units 1 and 2 were used to investigate the historic component. Test Unit 1 was placed next to the collapsed cabin in the northern portion of the site. The unit was excavated to a gravel stratum predating the historic remains at 30 cm below the surface. Test Unit 2 was dug within the rectangular foundation of river cobbles located north of the tributary drainage. The unit was terminated at 30 cm below the surface where a compacted silty loam was encountered.

4.4.2 Natural Stratigraphy

Backhoe trenches and test units were located on upper terraces east of Savery Creek, and similar natural deposits were noted in all tests (Appendix A, Figures A.7-A.9). An upper silty clay or loam stratum was noted in all units, which occurred above a consolidated loam or clayey loam. Deeper test units and backhoe trenches encountered a very compact clayey silt or silt which contained numerous small pebbles and larger stream-worn cobbles. This lower rock-laden stratum is exposed on the terrace surface in eroded areas and in the small ephemeral drainage channel that passes east/west through the site boundaries (Figure 4.6).

4.4.3 Cultural Stratigraphy and Age

Buried flaked stone artifacts (prehistoric) were encountered only in Test Unit 3, with two small pieces of debitage and one retouched flake collected
from Level 3 (20-30 cm below the surface). One unburned bone fragment was collected from Level 4 of this unit, and no other prehistoric artifacts, fire-cracked rocks, or staining was noted in Test Unit 3. Test Unit 3 is south of Backhoe Trench 1, and no cultural material was noted in this trench. No temporally diagnostic artifacts were collected during testing, although projectile points indicating possible Late Archaic and Middle Archaic period occupations (1,500-4,500 years ago) were collected during initial site recording.

Historic artifacts were collected from Test Unit 2, which was located on the southwest side of and within a stone foundation (Figure 4.6). Large amounts of butchered animal bone, cartridges, glass, metal, and other historic items were recovered from 0-25 cm below surface. Most artifacts appear to date from the late 1800s and early 1900s (1890-1920). Initial site recording included a title search which indicated historic settlement predated 1901. Most likely, the area within the stone foundation served as a trash dump when the area was a sheep camp.

4.4.4 Cultural Features

No discrete cultural features were encountered in backhoe trenches or test units excavated at 48CR4262. Historic structures including a stone foundation and a collapsed cabin were noted during initial site recording.

4.4.5 Artifacts

Three prehistoric artifacts were recorded from Level 3 of Test Unit 3: two small tertiary flake fragments of tan opaque chert and a retouched tertiary flake of banded opaque chert. This unifacially retouched flake is heavily utilized on all margins.

A total of 138 historic items was collected from Test Unit 2 (Table 4.1). Artifacts included metal, glass, several pieces of rubber, a cork stopper, a glass button, and decayed pieces of leather (probably tack items). Metal artifacts included 24 cartridge cases (45 caliber, 38 caliber, and two shotgun shells), nine wire nails, and 54 rusted fragments including two harness
Table 4.1 Summary of Historic Artifacts Collected From Test Unit 2, 48CR4262, Sandstone Reservoir Testing Project, 1988.

<table>
<thead>
<tr>
<th>Artifact Type</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Button</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
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<td>Metal</td>
<td>8</td>
<td>32</td>
<td>14</td>
<td>54</td>
</tr>
<tr>
<td>Cork Stopper</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Cartridges</td>
<td>9</td>
<td>6</td>
<td>9</td>
<td>24</td>
</tr>
<tr>
<td>Nails</td>
<td>4</td>
<td>5</td>
<td>0</td>
<td>9</td>
</tr>
<tr>
<td>Leather</td>
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<td>8</td>
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<td>14</td>
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<td>Rubber</td>
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<td>2</td>
</tr>
<tr>
<td>Glass</td>
<td>13</td>
<td>15</td>
<td>5</td>
<td>33</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>42</td>
<td>66</td>
<td>30</td>
<td>138</td>
</tr>
</tbody>
</table>
buckles, several bolts or screws, and small, unidentifiable, metal fragments. Glass color was predominantly clear or aqua -- with one purple glass fragment (part of a bottle neck) noted -- and included window and bottle glass. One complete medicine bottle was recovered (Figure 4.7).

### 4.4.6 Animal Remains

One unidentified bone fragment (unburned) was collected from Level 4 of Test Unit 3. For the historic component, Levels 1, 2, and 3 of Test Unit 2, placed in the cobble foundation, yielded 370 bone specimens representing at least eight sheep (*Ovis aries*).

Level 1 produced 134 specimens including five femur, five tibia, two humerus, 13 vertebra, four astragalus, four calcaneus, one first phalange, one second phalange, three second and third tarsal, two metacarpal, two metatarsal, one scapula, and five rib fragments. Additionally, 86 unidentified fragments came from Level 1. Level 2 had 140 specimens including six tibia, five humerus, three radius, one femur, two ulna, two metacarpal, two metatarsal, one metapodial, seven astragalus, three first phalange, 10 vertebra, two calcaneus, one scapula, and 11 rib fragments, as well as 84 unidentified fragments. Level 3 had 96 specimens including one humerus, three radius, one femur, two tibia, two metacarpal, one metapodial, five astragalus, five first phalange, five second phalange, and two calcaneus fragments. There also were 57 unidentified fragments.

Much of the bone exhibited cut and saw marks. Most of the epiphyseal unions on the bones were unfused indicating fairly young individuals. No cranial bones were noted in the collection. Apparently, the remains of several butchered sheep along with other historic trash were dumped within the cobble foundation. The recovery of sheep remains provides some evidence that the area in the vicinity of the cobble foundation served as a sheep camp, as noted by the present landowner.
Figure 4.7 Collected Bottle from Test Unit 2, 48CR4262, Sandstone Reservoir Testing Project, 1988.
4.4.7 Archival Research

When the site was initially recorded, Skylar Scott, Project Historian, performed a title search at Capitol Title, Cheyenne, Wyoming (Blatchley and Scott 1986). This search indicated that the site was part of the Doze Homestead which was patented in 1906. The homestead was used for stock raising. Skylar Scott also attempted oral interviews, but most of the original families who homesteaded the Savery Creek valley have long since left the area. Little additional information could be obtained.

During the test excavations, Skylar Scott could not obtain further archival information to facilitate the formation of specific research questions. The present landowner did indicate that the area in the vicinity near the cobble foundation served as a sheep camp. Due to the lack of data concerning the use and occupation of the homestead, the site will not contribute to the understanding of the gaps in the historic knowledge of the area.

4.4.8 Evaluation and Recommendations

Four 1 x 1 m test units and three backhoe trenches were excavated at 48CR4262, with prehistoric artifacts found only in Level 3 (20-30 cm below the surface) in Test Unit 3. Three artifacts were recovered, and no staining or other evidence of a preserved occupation floor was noted. Backhoe Trench 1 was excavated to the north of Test Unit 3, and no evidence of a buried cultural horizon associated with the materials in Test Unit 3 was encountered. Due to the small amount of cultural material recovered from Test Unit 3, and the lack of evidence of a preserved occupation floor (in Test Unit 3 or Backhoe Trench 1), the few prehistoric artifacts in Test Unit 3 do not appear to represent significant cultural remains. The shallow burial of the materials (20-30 cm below the surface) may account for the lack of an intact cultural level. The prehistoric component is recommended as not eligible for the NRHP, and no further work is warranted.

The historic component at Site 48CR4262 consists of a cabin, a corral, a cobble foundation, an outhouse, and several trash and tin can scatters. As is evident from the test excavations and visual observations, little deposition
occurs in the area containing the historic component. One exception is the area within the cobble foundation where Test Unit 2 was excavated. Test Unit 2 yielded numerous pieces of glass, rubber, leather, nails, cartridges, metal, and bone in the upper 30 cm of excavation. The area appears to have been a trash dump when the site was used as a sheep camp. Though some buried remains were encountered, little archival information for forming research questions is available for the homestead. Further excavations of the historic component would probably not yield additional information on gaps in the historic knowledge of the area. The historic component is recommended as not eligible for the NRHP, and no further work is warranted.

4.5 SITE 48CR4263

Site 48CR4263 consists of a small, east facing, log dugout excavated into an alluvial fan on the west side of Savery Creek at an elevation of 2121 m (Figure 1.2). The dugout depression measures approximately 4 x 6 m. The roof is collapsed, and some walls are slumped. The dugout has at least one roof support post, and its roof was constructed of logs laid east/west with at least one ridge log lying north/south. The logs are axe cut and nailed to the ridge log with square nails. Vegetation surrounding the dugout is mostly sagebrush and grasses.

Besides square cut nails and hand-hewn logs, no historic artifacts were noted as associated with the dugout when the site was originally recorded. The dugout was thought to predate 1890 due to the presence of square nails. The site was considered eligible for the NRHP because of its association with Site 48CR4262 (Blatchley and Scott 1986).

4.5.1 Testing Procedures

One 1 x 1 m, hand dug unit was used to test whether buried historic remains were associated with the dugout (Figure 4.8). The unit was placed within the small dugout near its south side where deposition potential existed. The unit was dug to a depth of 45 cm below the surface, well below the dugout floor.
Figure 4.8 Site Map, 48CR4263, Sandstone Reservoir Testing Project, 1998.
4.5.2 Natural Stratigraphy

The deposits in the vicinity of the dugout consist of a silty loam with a few roots to about 40 cm below the surface (Appendix A, Figure A.10). Pebbles occur near the base of the stratum. Below this stratum there is a compacted silty clay with a few large, stream-rolled cobbles.

4.5.3 Cultural Stratigraphy and Age

Two square cut nails each were recovered from Levels 2 and 3 of the test unit. The dugout floor was not discernible in the test unit but appears to have been between 20 and 30 cm below the present ground surface. All historic material should be limited to the upper 20 to 30 cm of deposits in the dugout.

Based on the presence of square cut nails, the dugout predates 1890. The dugout is part of the homestead patented by Moses Doze and was probably used prior to construction of his house at Site 48CR4262.

4.5.4 Cultural Features

Besides the dugout, no other cultural features were observed or encountered during the test investigations.

4.5.5 Artifacts

Four square cut nails were recovered from Levels 2 and 3 of the test unit. The largest measures 11.6 cm in length, and the other three are 7.6 cm long. They are complete and in good condition but oxidized.

4.5.6 Archival Research

When the site was initially recorded, Skylar Scott, Project Historian, performed a title search at Capitol Title, Cheyenne, Wyoming (Blatchley and Scott 1986). This search indicated that the dugout was part of the Doze Homestead which was patented in 1906. The homestead was used for stock raising. Skylar Scott also attempted oral interviews, but most of the original
families who homesteaded the Savery Creek valley have long since left the area. Little additional information could be obtained.

During the test excavations, Skylar Scott could not obtain further archival information to facilitate the formation of specific research questions. Due to the lack of data concerning the use and occupation of the dugout, the site will not contribute to the understanding of the gaps in the historic knowledge of the area.

4.5.7 Evaluation and Recommendations

Site 48CR4263 consists of a collapsed dugout lacking associated artifacts and features. The results from the test excavation indicate that few subsurface cultural remains are present in the vicinity of the dugout. Besides the title search, archival information concerning the use and occupation of the dugout is sparse.

Due to the lack of buried remains and archival data, further recordation and excavations at the site would not yield additional information on the history of stock raising in the region. The site is recommended as not eligible for the NRHP, and no further work is warranted.

4.6 SITE 48CR4264

Site 48CR4264 is located on the west bank of Savery Creek near an old meander cut at an elevation of 2121 m (Figure 1.2). Deposits in the site area consist of river cobbles and sediment. Over a meter of sediment is apparent in the river cutbank. Vegetation is primarily sagebrush and grasses.

When the site was originally recorded, a small (50 cm long) stain was observed about a meter below the surface in the cutbank. Two possible quartzite flakes were associated with the stain. The site was recommended as eligible for the NRHP because of the possibility of buried cultural remains (Blatchley and Scott 1986).
4.6.1 Testing Procedures

A 20 m long backhoe trench and two hand dug, 1 x 1 m units were used to test this site (Figure 4.9). Though the stain was not located during the testing, the backhoe trench was placed where the stain was originally noted. The trench was excavated perpendicular to the cutbank to a maximum depth of 2 m. Rocks and cobbles were exposed at the base of the trench.

The test units were placed in areas that appeared to have depositional potential and away from cobble-covered portions of the terrace. No evidence of artifacts or charcoal staining was observed in the cutbank. Test Unit 1 was dug to a depth of 50 cm below the surface and was located southwest of the backhoe trench. Test Unit 2 was placed southeast of the trench and was excavated to a depth of 50 cm.

4.6.2 Natural Stratigraphy

Generally, the deposits at Site 48CR4264 consist of clayey loam with rocks and cobbles. Areas of river cobbles also occur at the site. The backhoe trench, which was excavated perpendicular to the cutbank, exposed a 1.5 m thick layer of clayey loam near the cutbank (Appendix A, Figure A.11). Farther from the cutbank, a stratum of river cobbles overlies the clayey loam. In much of the trench, bedrock was encountered at about 2 m below the surface. Both test units were excavated through a compacted clayey loam containing numerous quartzite cobbles and rocks (Appendix A, Figure A.12).

4.6.3 Cultural Stratigraphy and Age

Only one flake was recovered from Level 3 of Test Unit 1. No staining or fire-cracked rocks were noted during the test investigations. The stain observed about a meter below the surface in the cutbank during the initial recordation of the site was not relocated. If a buried cultural layer exists at this site, it is limited and quite sparse. The site lacked pit features and charcoal for radiocarbon dating, and no temporally or culturally diagnostic artifacts were found during the excavations or on the surface. Cultural affiliation of the site is unknown.
Figure 4.9 Site Map, 48CR4264, Sandstone Reservoir Testing Project, 1988.
4.6.4 Cultural Features

During the test excavations, no features were observed. The dark stain recorded in the cutbank was not located.

4.6.5 Artifacts

Only one quartzite, secondary flake was recovered from Level 3 of Test Unit 1.

4.6.6 Evaluation and Recommendations

Cultural remains at Site 48CR4264 are quite sparse. Though a dark charcoal stain was observed in the cutbank during initial recordation, visual inspection of the cutbank during the test investigations failed to detect evidence of buried cultural remains. Only one flake and no charcoal staining or fire-cracked rocks were encountered during the subsurface testing. If subsurface cultural remains exist at the site, they are quite rare and limited.

Further excavations at this site would probably not yield additional information for addressing the research topics posed for the project. The recording and testing have produced all the information that a site with sparse cultural remains has to offer concerning the prehistoric inhabitants of the Savery Creek valley. The site is recommended as not eligible for the NRHP, and no further work is warranted.

4.7 SITE 48CR4265

Site 48CR4265 is located on a bench along a meander curve of Savery Creek at an elevation of 2121 m (Figure 1.2). Steep slopes continue above the bench. Over a meter of deposition is apparent in the cutbank along Savery Creek. Sediment is mostly a clayey silt mixed with gravels. Vegetation consists of sagebrush and a riparian community which includes cottonwoods and willows.
Several dark bands of stained sediment were observed in the cutbank when the site was originally recorded. Some burned bone fragments were found in association with the stains. The stains continued to about a meter below the ground surface. The site was recommended as eligible for the NRHP because of the presence of buried remains (Blatchley and Scott 1986).

4.7.1 Testing Procedures

Three 1 x 1 m, hand dug units were used to test this site (Figure 4.10). Because of the river and steep slopes that surround the site, a backhoe could not be driven into the area for excavating a trench; however, the cutbank of Savery Creek provided an excellent cross section of the site deposits. The three test units were placed in areas containing some of the dark bands of stained sediment as indicated by the cutbank. Test Unit 1 was excavated adjacent to the cutbank in the southern portion of the site. It was dug through two dark stains to a depth of 130 cm below the ground surface. Test Unit 2 was located near the cutbank to the east of Test Unit 1 and was continued to a depth of 110 cm. Test Unit 3 was dug on the bench in the northern portion of the site. The unit was excavated to a depth of 80 cm exposing three dark sediment bands.

4.7.2 Natural Stratigraphy

Site 48CR4265 is located on the south and west sides of a wide bend of Savery Creek. Description of the natural stratigraphy is based on observation of the stream cutbank and excavation of three test units. Inspection of the cutbank indicated greater than 3 m of deposits in the site area. A 1 m thick, cobble-laden stratum occurs immediately above the present stream channel, with a sandy clay stratum and numerous silt or silty loam strata extending to the ground surface (Figure 4.11).

Although the three test units were not excavated through all natural deposits (maximum excavation depth was 130 cm), a number of discrete natural levels were noted (Appendix A, Figures A.13-A.15). These strata were of
Figure 4.10 Site Map, 48CR4265, Sandstone Reservoir Testing Project, 1988.
Figure 4.11 Profile of South Cut Bank of Savery Creek, 48CR4265, Sandstone Reservoir Testing Project, 1988.
similar texture (silt or silty loam) and included a few small gravels. Strata were differentiated chiefly by color with a number of dark stained levels noted. Natural deposits appear to be mostly alluvial in origin, although the location of the site at the base of a steep slope probably indicates some slopewash deposition.

4.7.3 Cultural Stratigraphy and Age

Numerous discontinuous stained levels with some small areas of oxidation occur along the cutbank, and these were interpreted as possible cultural horizons during initial site recordation. Test excavations encountered three stained levels in Test Unit 3, four stained strata in Test Unit 2, and two stained strata in Test Unit 1. Generally, these stained levels were slightly coarser in texture with more gravels than the intervening unstained levels. No flaked stone artifacts were recovered from any level.

The lower two stained levels in Test Unit 2 (Appendix A, Figure A.14) consisted of fine silt or clay lenses heavily stained with scattered oxidation. When observed during excavation, these were interpreted to be occupation floors. A vertically set, decomposed, uncarbonized post was noted approximately 75 cm below the surface in the northeast corner of Test Unit 2 and is likely associated with one of the two lower stained strata or occupation floors. The post was radiocarbon dated to 1490±60 years ago (TX-6177). Although no flaked stone artifacts were associated, the recovery of a post suggests the remains of a Late Prehistoric period structure exist at Site 48CR4265.

4.7.4 Cultural Features

No cultural features were recorded during cutbank inspections or test unit excavation. During excavation of Test Unit 2, two possible occupation floors were noted (Appendix A, Figure A.14). These floors were identified by charcoal staining, soil oxidation, and textural and compaction differences. The upper floor was encountered at 94 cm below the ground surface, and the lower one was at 106 cm. Due to the limited area exposed (1 m²), definite identification of these occupation levels was not possible, although the re-
covery of the dated post suggests at least one occupation floor exists. The post is probably associated with the upper floor.

4.7.5 Artifacts

No flaked stone artifacts were recovered from the three test units, or from intensive inspection of the cutbank profile. A decomposed, uncarbonized wooden post was recovered from Test Unit 2. It is 28 cm long and 7 cm in diameter and was sharpened using an adze or ax into a point. The post was set vertically and was first encountered at 75 cm below the surface. It has a radiocarbon age of 1490 years ago.

4.7.6 Animal Remains

Archaeologists from the Office of the Wyoming State Archaeologist noted burned bone associated with staining in the cutbank during initial site recordation (Blatchley and Scott 1986). Unburned bone was observed during the test investigations in the cutbank profile (Figure 4.11) approximately 1.5 m below the surface. One bison (Bison sp.) thoracic vertebra was collected.

4.7.7 Plant Macrofossil Analysis

A 1.5-liter sample from beneath the wooden post in Test Unit 2 was floated and examined for charred plant remains. No charred plant macrofossils were recovered from the sample; however, some pieces of decayed wood were observed.

4.7.8 Evaluation and Recommendations

Site 48CR4265 lacks surface cultural material and is identified by numerous discontinuous stained levels in the Savery Creek cutbank. Based on the excavation of three 1 x 1 m test units and inspection of the cutbank profile, significant cultural deposits appear to exist at Site 48CR4265.

In Test Unit 2, two possible occupation floors were noted. The identification of these floors was based on staining, oxidation, and textural and
compaction differences, as no bone or flaked stone artifacts were found associated. One decomposed, wooden post was found associated with the upper floor, and the radiocarbon age of the post (1490 years ago) indicates these occupation floors belong to the Late Preshitoric period. Cutbank inspection noted bison bone approximately 1.5 m below surface, although no cultural association could be established.

Based on the presence of preserved Late Prehistoric period occupation floors, 48CR4265 is recommended as eligible for the NRHP. Preserved occupation floors (with intact posts) are seldom documented in the general project region. Future investigations should focus on the horizontal exposure of the entire floors. Further work also should investigate the possible cultural association of bone exposed in the south cutbank of Savery Creek (1.5 m below the surface), as test units for the current project did not reach this depth. This additional work is detailed more fully in Section 5.3.
5.0 SUMMARY AND RECOMMENDATIONS

The first portion of this section provides a summary of the results of test excavations at five prehistoric sites, one historic site, and one site with both historic and prehistoric components within the Sandstone Reservoir project area. Following this summary, the recommendations and evaluations for the sites are outlined, and the proposed data recovery for Site 48CR4265 is described.

5.1 SUMMARY OF RESULTS

No cultural features were encountered at any tested site, and no temporally diagnostic artifacts were collected from the prehistoric site components. Two possible Late Preshistoric period occupation floors were encountered at Site 48CR4265. The identification of these floors was based on charcoal staining, oxidation, and textural and compaction differences. The only radiocarbon date (1490 years ago) from the test investigations was obtained from an uncarbonized post associated with one of these occupation floors.

Only a few flaked stone artifacts were collected from four of the six prehistoric components investigated during this project. Artifacts collected were mostly debitage with only one tool, a retouched flake, recovered. One test unit at Site 48CR95 produced only three pieces of debitage, two quartzite shatters and one opaque chert secondary flake, from three excavation levels. Four quartzite tertiary flakes and one opaque tertiary flake were collected from two test units at Site 48CR4260. An opaque chert retouched flake and two opaque chert tertiary flakes were recovered from Test Unit 3 (Level 3) at Site 48CR4262. At Site 48CR4264, one quartzite secondary flake was collected from Test Unit 1.

Historic artifacts were collected from three sites. One decomposed leather fragment was found at Site 48CR4261, four square nails were recovered from within the dugout at Site 48CR4263, and numerous historic artifacts and bone were encountered at Site 48CR4262. These artifacts include a number of cartridge casings, wire nails, glass fragments, leather, and metal fragments.
These historic items from Site 48CR4262 appear to date to the late nineteenth-early twentieth century and are related to ranching and homestead activities. These artifacts were collected from a 1 x 1 m test unit excavated within a cobble foundation.

5.2 RECOMMENDATIONS AND EVALUATIONS

Investigations at Site 48CR4265 encountered evidence of significant prehistoric cultural deposits, and the site is recommended as eligible for the NRHP. Two possible occupation floors were encountered at Site 48CR4265. The identification of these floors was based on charcoal staining, oxidation, and textural and compaction differences. A wooden post associated with one of the occupation floors was radiocarbon dated at 1490 years ago. Preserved occupation floors (structures) with intact posts are seldom documented at prehistoric sites in the region, and block excavations could provide important information concerning past settlement patterns in the region. Inspection of the stream cutbank at this site indicated the possibility that additional, more deeply buried components exist.

The remaining five prehistoric sites lacked intact defined cultural levels and are recommended as not eligible for the NRHP. Cultural materials recovered in test units appear to represent diffuse or disturbed cultural levels, with no intact cultural features or layers associated. Further investigations at these sites would probably not yield significant new data.

The two historic sites or components (48CR4262 and 48CR4263) are recommended as not eligible to the NRHP. Skylar Scott, Project Historian, could not obtain further archival information to facilitate the formation of specific research questions. A title search was performed, and oral interviews were attempted when the sites were initially recorded. Due to lack of data concerning the use and occupation of the homestead and dugout, the sites will not further contribute to the understanding of the gaps in the historic knowledge of the area.

The historic component at Site 48CR4262 contains little deposition, except in the area within the cobble foundation. The test unit in this area
yielded numerous pieces of glass, rubber, leather, nails, cartridges, metal, and bone in the upper 30 cm of excavation. The area appears to have been a trash dump. The historic dugout at Site 48CR4263 has few associated artifacts and is in poor condition. Additional excavations at the historic sites would yield little new information.

5.3 PROPOSED DATA RECOVERY FOR SITE 48CR4265

Based on the presence of preserved Late Prehistoric period occupation floors, Site 48CR4265 is recommended as eligible for the NRHP. Future archaeological investigations at the site are necessary to expose the entire horizontal extent of the occupation floors. Additionally, excavations are required to examine the possible cultural association of the bison bone exposed in the cutbank about 1.5 m below the surface. The excavations also should be designed to obtain data pertinent to the research questions for the project outlined in Section 1.3.

A 36 m² block excavation in the area surrounding Test Unit 2, where the occupation floors were encountered, could enable the initial examination of these floors, as well as the spatial relationships of any features, fire-cracked rock, flaked stone tools, and other remains. The spatial relationships could provide clues to the kind, time of year, and location of the prehistoric activities. Understanding the types of activities in the vicinity of the occupation floors facilitates the determination of site function, which is necessary for developing subsistence and settlement models for the region. Information of this nature, which is a major focus of the research topics posed for the project.

If the initial excavation of the 36 m² block yields extensive occupation floors and other prehistoric remains, the block may need to be expanded. The Wyoming Water Development Commission and SHPO must be notified immediately if a block larger than 36 m² is required. Discussions between these parties will determine the size and extent of the additional block area.
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Sharrock, F.W.

Smith, C.S., and S.D. Creasman

United States Department of Commerce, National Oceanic and Atmospheric Administration

Zier, C.J.
Zier, C.J., D.P. Fallon, M.D. Metcalf, and K.P. Schweigert
APPENDIX A:

PROFILE DRAWINGS FOR BACKHOE TRENCHES
AND TEST UNITS
Figure A.1 South Wall Profile of Test Unit 1 (Top), and North Wall Profile of Test Unit 3 (Bottom), 48CR95, Sandstone Reservoir Testing Project, 1988.
Loose Sandy Silt With Pebbles and Sandstone Rocks
(10YR4/3) Dark Brown

More Compacted Sandy Silt With Pebbles and Sandstone Rocks
(10YR4/4) Dark Yellowish Brown

Sandstone Rock

Figure A.2 East Wall Profile of Test Unit 2, 48CR95, Sandstone Reservoir Testing Project, 1988.
Figure A.3 Northeast Wall Profile of Backhoe Trench 1 (Top), and Northwest Wall Profile of Backhoe Trench 2 (Bottom), 48CR4260, Sandstone Reservoir Testing Project, 1988.
Figure A.4 West Wall Profile of Test Unit 1, 48CR4260, Sandstone Reservoir Testing Project, 1988.
Figure A.5 East Wall Profile of Test Unit 2 (Top), and West Wall Profile of Test Unit 3 (Bottom), 48CR4260, Sandstone Reservoir Testing Project, 1988.
Figure A.6 North Wall Profile of Test Unit 2, 48CR4261, Sandstone Reservoir Testing Project, 1988.
Figure A.7 North Wall Profile of Trench 1, East Wall Profile of Trench 2, and North Wall Profile of Trench 3, 48CR4262, Sandstone Reservoir Testing Project, 1988.
Figure A.8 North Wall Profile of Test Unit 1 (Top), and South Wall Profile of Test Unit 2 (Bottom), 48CR4262, Sandstone Reservoir Testing Project, 1988.
Figure A.9 West Wall Profile of Test Unit 4, 48CR4262, Sandstone Reservoir Testing Project, 1988.
Friable Silty Loam With Roots (10YR5/3) Brown

Very Compacted Silty Clay With Large Stream Rolled Cobbles (10YR3/4) Dark Yellowish Brown

Figure A.10 West Wall Profile of Test Unit, 48CR4263, Sandstone Reservoir Testing Project, 1988.
Figure A.11  South Wall Profile of Backhoe Trench, 48CR4264, Sandstone Reservoir Testing Project, 1988.
Figure A.12 West Wall Profile of Test Unit 1 (Top), and East Wall Profile of Test Unit 2 (Bottom), 48CR4264, Sandstone Reservoir Testing Project, 1988.
Figure A.13 West Wall Profile of Test Unit 1, 48CR4265, Sandstone Reservoir Testing Project, 1988.
Figure A.14  South Wall Profile of Test Unit 2, 48CR4265, Sandstone Reservoir Testing Project, 1988.
Figure A.15  South Wall of Test Unit 3, 48CR4265, Sandstone Reservoir, Testing Project, 1988.