# The Collbran Pipeline Archaeological Monitoring and Data Recovery Project

October 2014

Grand River Institute

# ARCHAEOLOGICAL MONITORING AND DATA RETRIEVAL FOR THE COLLBRAN PIPELINE PROJECT IN GARFIELD AND MESA COUNTIES, COLORADO

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Bureau of Land Management
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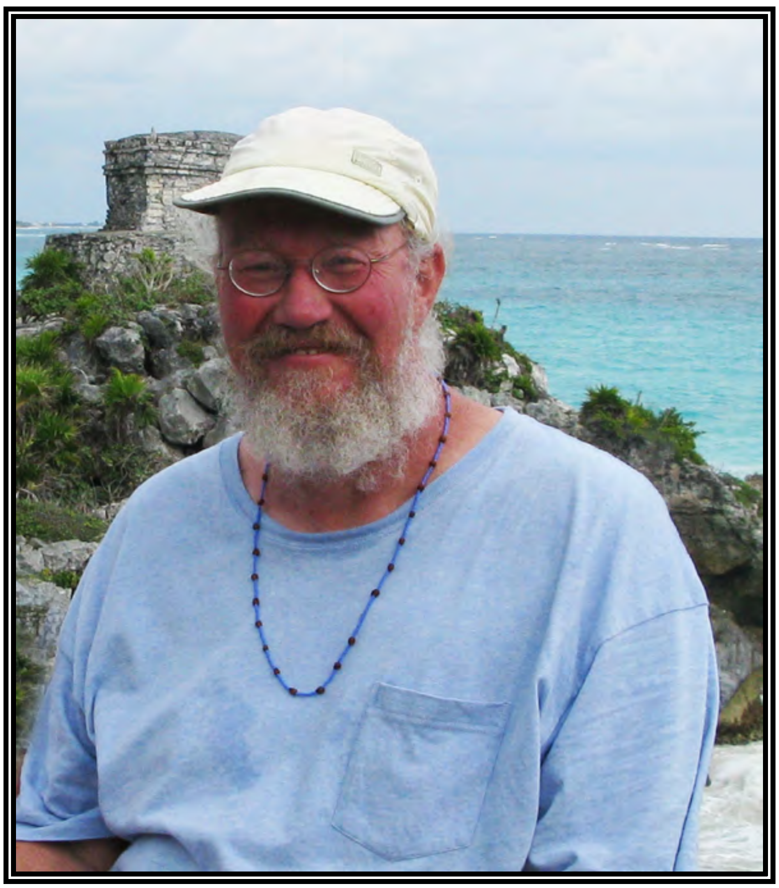
***This report is dedicated in memory of James C. Miller.***



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## Abstract

At the request of Enterprise Products Partners, the Bureau of Land Management (BLM), and the U.S. Forest Service (USFS), Grand River Institute (GRI) conducted a cultural resource monitor and data retrieval for the Collbran Pipeline Project in Garfield and Mesa Counties, Colorado. The project was supervised by Carl E. Conner (Principal Investigator). Fieldwork was conducted under BLM Antiquities Permit No. C-52775 and USFS Special Use Permit No. PAW89016. The cultural resource monitor began on the 9th of June 2009 and terminated on the 9th of September 2009. Archaeological excavations to supplement the data retrieved during the monitoring took place late in 2009 and throughout 2010.

Significant cultural resources were identified during the project. Excavations yielded radiocarbon dates that span occupations from the Early Archaic through the Historic Ute. Fifty-three dates were obtained from 22 sites, and their conventional radiocarbon ages range from 5990±40 BP (5ME16789.F3, Beta-263486) to 370 BP (5ME16097.F4, Beta-248418). Substantial pithouses were found dating to approximately 2800 and 4600 years ago. That of the more recent age is directly associated with a cultural phenomenon first identified in the early 1980's during excavations within the Battlement Mesa Community. It has subsequently been named by these authors the Battlement Mesa Complex, and is characterized by a particular style of pithouse and distinctive groundstone artifacts.

The BLM and USFS decision to require monitoring of the Collbran Pipeline construction due to the relatively high density of recorded cultural resources in its vicinity proved its soundness. Also, the construction monitoring and subsequent excavations have demonstrated that suspect areas (i.e. prime site locales based on surface water procurement – usually related to catchments in small drainages), but lacking in surficial cultural evidence, are likely to contain significant archaeological data in subsurface contexts.

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# CHAPTER 1: Introduction

At the request of Enterprise Products Partners (EPCO), the Bureau of Land Management (BLM), and the U.S. Forest Service (USFS), Grand River Institute (GRI) conducted a cultural resource monitor and data retrieval of the Collbran Pipeline Project in Garfield and Mesa Counties, Colorado. The project was supervised by Carl E. Conner (Principal Investigator), who was assisted by Michael Piontkowski (Monitor Project Lead), James C. Miller, Curtis Martin, Dakota Kramer, Courtney Groff, Lucas Piontkowski, Brian O'Neil, Jim Conner, Travis Archuleta, Dana Archuleta, Julie Campbell, and Michael Brown. Fieldwork was conducted under BLM Antiquities Permit No. C-52775 and USFS Special Use Permit No. PAW89016. The cultural resource monitor began on the 9$^{th}$ of June 2009 and terminated on the 9$^{th}$ of September 2009. Grand River Institute was then requested by the Bureau of Land Management, Grand Junction Field Office to conduct archaeological investigations to supplement data that was collected in 2009 upon the discovery of the sites during the monitor. This additional data retrieval work took place late in 2009 and into 2010. Carl Conner, along with Kramer, Groff, Martin, O'Neil, Cheryl Harrison, Nicole Darnell, Barbara Davenport, and Hannah Mills composed the final report.

The decision to monitor the entire length of the pipeline route was a direct result of the findings from the initial survey project of 2007 entitled "Class III Cultural Resources Inventory Report for the Proposed Collbran Pipeline Project in Garfield and Mesa Counties, Colorado, for EnCana Oil and Gas (USA), Inc. BLM-GJFO No. 1107-12." Additionally, resulting from that project was the decision to conduct mitigative excavation of five sites (5GF109, 5ME113, 5ME974, 5ME16097 and 5ME16102). Site 5ME16097, on Forest Service land was excavated in 2008 and a report submitted (January 2009) to that agency. The findings of that excavation are included in this report as well. The remaining four sites were mitigated during the summer of 2009. In 2009 and 2010, as a result of the monitor, data retrieval was conducted at the following sites: 5GF4337, 5ME16117, 5ME16782, 5ME16784, 5ME16786, 5ME16789, and 5ME16791.

The cultural resource monitor and data retrieval was conducted to meet requirements of the National Historic Preservation Act (NHPA) of 1966 (16 U.S.C. 470, as amended), the National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. 4321), Executive Order 11593 (36 F.R. 8921), the Archaeological and Historical Data-Preservation Act (AHPA) of 1974 (16 U.S.C. 469), the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1701), the Archaeological Resources Protection Act of 1979 (16 U.S.C. 470aa et seq., as amended), and Article 80.1, Colorado Revised Statutes. All work was performed according to guidelines set forth by the Secretary of the Interior's Standards and Guidelines for Archaeological Documentation (48 CFR 44734-37), and by the Office of Archaeology and Historic Preservation (OAHP) of the Colorado Historical Society.

Due to the nature of the monitor project the site results have been divided into two chapters within this document. Chapter 4 describes the sites as they were encountered at the time of the monitor. Chapter 5 includes the results from the data retrieval processes since several of the sites commanded a more comprehensive approach in the field to fully account for the exposed cultural manifestations and to ascertain, if possible, the depth of cultural deposits present.

### 1.1 Location of the Project Area

The project area is located in west-central Colorado roughly between Una crossing of the Colorado River on the north and following a circuitous route around to the west of the Battlement Mesa to a point near the town of Collbran. [redacted]

### 1.2 Project Background

During the late summer and fall of 2007, Grand River Institute conducted a Class III (intensive) cultural resource inventory for the proposed Collbran Pipeline Project in Garfield and Mesa Counties, Colorado, for EnCana Oil and Gas (USA), Inc. The files search and inventory identified and reevaluated seven sites (5GF109, 5GF364, 5ME113, 5ME974, 5ME12825, 5ME13959, and 5ME15674) as eligible for listing on the National Register of Historic Places. The intensive field inventory identified five sites (5ME644.3, 5ME16097, 5ME16098, 5ME16100, and 5ME16102) as eligible or potentially eligible (need data) for listing on the National Register of Historic Places.

Avoidance was recommended and achieved for the following sites: 5ME12825, 5ME13959. In the case of 5ME113 and 5ME16098, the pipeline construction area was reduced to the existing county road to minimize if not eliminate impact. For 5ME15674, the trench for the anticipated Collbran Pipeline Project through the site was previously monitored as part of another project and no further work was recommended (Conner and Davenport 2007). Site 5GF364 is the Una Bridge and it will not be adversely affected. It supports two other pipelines and will be used by EnCana to cross the Colorado River.

The remaining sites (5GF109, 5ME113, 5ME974, 5ME16097 (USFS), and 5ME16102) were selected for additional work and a mitigation/ treatment plan, designed to meet requirements of the BLM and State Historic Preservation Officer (SHPO), was administered by Grand River Institute. The mitigation/treatment plan consisted of three phases: 1) trench excavation monitoring, 2) avoidance of all sites, and 3) mitigative excavation for the five sites selected for additional work.

### 1.3 Justification and Objective of Monitor

A cultural resource monitor was conducted due to the profound density of cultural resources within or near the proposed Collbran Pipeline Project right-of-way. Monitoring had two purposes and provided two distinct data sets: it aided in the identification and recovery of previously unidentified subsurface cultural manifestations (primarily features); and, it allowed for the documentation of the sedimentary, geochemical and edaphic [anything to do with soil development] character of the natural deposits along the pipeline route through a series of stratigraphic profiles. Any cultural resources discovered were documented and the effect of the action on the resource mitigated (if necessary) at the time of pipeline construction. At the time of resource discovery, the monitor--after consultation with the controlling federal agency--could recommend that cultural deposits are substantial and will require data recovery.

### 1.4 Summary of Results

A total of 41 cultural resources were newly recorded or revisited with the present project. Of these, seven were previously recorded sites (5GF109, 5ME113, 5ME948, 5ME974, 5ME16097, 5ME16102, and 5ME16105). Importantly, six previously recorded isolated finds (5ME16114, 5ME16117, 5ME16129, 5ME16132, 5ME16133, and 5ME16134) were re-categorized as sites due to exposure of subsurface cultural features by bulldozing activity. Twenty-two sites (eight of which are isolated features) were newly recorded during the cultural resource monitor, including: 5GF4337, 5GF4351, 5GF4352, 5ME16548, 5ME16549, 5ME16691, 5ME16715, 5ME16716, 5ME16782 through 5ME16791, and 5ME16857 through 5ME16860. Additionally, six isolated finds (5GF4353, 5ME16711 through 5ME16714, and 5ME19795) were newly recorded.

Of the newly recorded and revisited resources, seven sites (5ME113, 5ME974, 5ME16102, 5ME16117, 5ME16133, 5ME16134, and 5ME16860) were determined to be eligible. Accordingly, protection and preservation is recommended. The remaining 34 resources, including the isolated finds, were field evaluated as not eligible for listing on the National Register of Historic Places, and no further work is recommended for these.

Twelve sites 5GF109, 5GF4337, 5ME113, 5ME974, 5ME16097, 5ME16102, 5ME16117, 5ME16782, 5ME16784, 5ME16786, 5ME16789, and 5ME16791 were identified that required additional testing or data recovery, including three sites (5ME16784, 5ME16786, 5ME16789) with possible pit-structures (pit-structures were confirmed at 5ME16786 and 5ME16789, but could not be confirmed at 5ME16784). Fifty-three dates were obtained from 22 sites, and their conventional radiocarbon ages range from 5990±40 BP (5ME16789.F3, Beta-263486) to 370 BP (5ME16097.F4, Beta-248418). The excavations and or testing, conducted during the summer and fall of 2009 and 2010, are discussed in detail in Chapters 4 and 5.

# CHAPTER 2: ENVIRONMENT

The project area is on the northeast margin of the Colorado Plateau physiographic province in west-central Colorado. It includes the Grand Valley and the surrounding mountainous terrain of the Uncompahgre Plateau to the south, the Book Cliffs and Roan Plateau to the north, and Grand Mesa to the east. This section provides discussions of the physiography, flora and fauna, modern climate, and paleoclimate of the study area.

## 2.1 Physiography

The project area is located at the southern margin of a large northwest-southeast trending structural downwarp known as the Piceance Basin. Subsidence of the basin began during the Laramide Orogeny somewhere between 70 to 80 million years ago and ended 35 to 50 million years ago (Young and Young 1977:46). During this period, the Piceance Basin received as much as 9000 feet of stream and lake deposits, all of which gently dip toward the center of the downwarp. Regional uplift occurred during the Late Tertiary, bounding the basin on the northwest by the Douglas Creek Arch and on the east by the Grand Hogback.

In general, the Collbran Pipeline is located within the physiographic division known as the Colorado Plateau province. Battlement Mesa is a prominent local topographic feature--a flat-topped, lava-capped erosional remnant of Late Tertiary Basalt flows rising more that 6000 feet above the Grand (Colorado River) Valley. Its name is thought to derive from its resemblance to the upper walls of a castle or fortress (Murray 1973:19). To the south lies Grand Mesa, sister of Battlement Mesa – slightly higher and more extensive, but sharing a common ancestry. Across the river valley to the north and west is the Roan Plateau, a broad upland surface separating the Grand Valley from the Piceance Basin. The rugged, towering Roan Cliffs visible from the north portion of the proposed pipeline demarcate the southern terminus of the plateau and are formed by the resistant sandy and marly beds of the Green River Formation.

The Piceance Basin comprises geologic formations from Cambrian to Holocene in age, but the thickest section is made up of rocks from the Cretaceous Period. The Cretaceous-age Mesa Verde Group comprises the majority of the deposits in the basin. It ranges in thickness from about 2,000 feet on the west to about 6,500 feet on the east (Johnson and Nuccio 1986). This geologic formation is underlain by Cretaceous-age Mancos Shale and overlain by the lower Tertiary-age Fort Union and Wasatch Formations which consist of fluvial sandstones and shales. The Wasatch Formation is the bedrock of the project area.

## 2.2 Modern Climate

Modern climate is important to cultural resource management because of conditions of preservation, erosion and redeposition. The climate of the Grand Valley is similar to that of most intermountain areas west of the Continental Divide in its aridity, wide range of daily temperatures, high percentage of bright sunny days, and high evaporation rate (U.S.D.A. Soil

Conservation Service 1955). In this semiarid, cool desert environment, winters tend to be mild and summers hot and dry and render the area an attractive place to live year round. Over the Colorado River watershed (east of the Grand Valley), precipitation is recorded on an average of nearly 60 percent of the days. However, 50 percent of the annual precipitation occurs on only 16 percent of the days having precipitation (wrcc.dri.edu). Winter precipitation is derived from stratus-type clouds associated with large-scale frontal systems, whereas localized cumulus-type clouds produce most summer precipitation. Table 2.1 summarizes the climatic averages in the Grand Valley between 1900 and 2010.

Aside from very local climatic variations within the valley, depending partly on elevation, aspect, and local exposure, climatic conditions at Grand Junction are probably representative of the area. This table shows the average temperature for monthly/seasonal/ annual periods from 1900-2010 reported by the Western Regional Climate Center. Grand Junction is situated at an elevation of 4,593 feet and, in general, is relatively warm during summer months and cold during winter months. As elevations increase in surrounding terrain,

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**Table 2.1** Monthly climate summary for the Grand Valley from AD 1900-2010 (Western Regional Climate Center 2010). [Period of Record : 1/ 1/1900 to 7/31/2010. Percent of possible observations for period of record: Max. Temp.: 99.9% Min. Temp.: 99.9% Precipitation: 99.9% Snowfall: 99.9% Snow Depth: 99.8%]

| Month | Max. Temp. (F) | Min. Temp. (F) | Total Precip. (in.) | Total SnowFall (in.) | Snow Depth (in.) |
|---|---|---|---|---|---|
| Jan | 36.5 | 15.9 | 0.60 | 6.0 | 1 |
| Feb | 44.6 | 23.3 | 0.57 | 3.8 | 1 |
| Mar | 55.1 | 31.2 | 0.82 | 3.0 | 0 |
| Apr | 65.2 | 39.2 | 0.79 | 0.9 | 0 |
| May | 75.6 | 48.2 | 0.79 | 0.1 | 0 |
| Jun | 86.9 | 57.2 | 0.45 | 0.0 | 0 |
| Jul | 92.9 | 64.1 | 0.60 | 0.0 | 0 |
| Aug | 89.5 | 62.0 | 0.99 | 0.0 | 0 |
| Sep | 80.6 | 53.0 | 0.96 | 0.0 | 0 |
| Oct | 67.3 | 41.0 | 0.91 | 0.4 | 0 |
| Nov | 51.3 | 28.3 | 0.63 | 2.3 | 0 |
| Dec | 38.8 | 18.5 | 0.59 | 5.1 | 1 |
| Annual | 65.3 | 40.2 | 8.70 | 21.6 | 0 |

temperatures tend to decrease and precipitation increases. The highest elevations may receive up to 24 inches of precipitation per year. Over the winter months, snow accumulates above 8,000 feet without completely melting until spring. The town of Collbran occurs in a mountain valley south of Battlement Mesa at an elevation of 6000 feet. The summary for its climatic conditions illustrates the increase in precipitation and snowfall, and the decrease average yearly temperatures as elevation increases to the east of the Grand Valley (Table 2.2).

**Table 2.2** Monthly climate summary for the town of Collbran from AD 1900-1999 (Western Regional Climate Center 2010). [Period of Record : 3/ 1/1900 to 12/31/1999. Percent of possible observations for period of record: Max. Temp.: 91.7% Min. Temp.: 91.4% Precipitation: 92.5% Snowfall: 91.1% Snow Depth: 41.4%.]

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Average Max. Temperature (F) | 36.3 | 42.1 | 50.2 | 60.8 | 70.8 | 80.7 | 86.8 | 84.3 | 76.6 | 64.8 | 49.2 | 38.0 | 61.7 |
| Average Min. Temperature (F) | 8.7 | 14.9 | 22.7 | 30.8 | 38.0 | 45.1 | 51.4 | 50.1 | 41.8 | 31.6 | 21.2 | 11.7 | 30.7 |
| Average Total Precipitation (in.) | 1.05 | 1.02 | 1.51 | 1.59 | 1.40 | 0.81 | 1.12 | 1.41 | 1.40 | 1.45 | 1.11 | 0.99 | 14.85 |
| Average Total SnowFall (in.) | 15.4 | 12.1 | 11.2 | 5.2 | 0.5 | 0.0 | 0.0 | 0.0 | 0.0 | 1.8 | 6.6 | 12.1 | 65.0 |
| Average Snow Depth (in.) | 5 | 5 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 1 |

The record for the monthly climatic summary available from the Western Regional Climate Center for the town of Parachute, elevation to 5100 feet, is for a much shorter time period (Table 2.3). Notable is the increase in average total precipitation and snowfall over that for Grand Junction. An official extended weather profile for Parachute was found recorded by the U.S. Weather Bureau, which has maintained temperature and precipitation records since 1965 (U.S. Dept of Commerce 1965-1980). During that time, winter and summer temperatures have averaged in the low 20s and upper 70s (°F), respectively, although extremes of 22°F and 107°F (both in 1979) are on record. December and January are typically the coldest months, July and August the hottest.

**Table 2.3** Monthly climate summary for the town of Parachute from AD 1981-1992 (Western Regional Climate Center 2010). [Period of Record : 3/ 1/1900 to 12/31/1999. Percent of possible observations for period of record: Max. Temp.: 62.9% Min. Temp.: 62.9% Precipitation: 65% Snowfall: 66.6% Snow Depth: 64.2% .]

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Average Max. Temperature (F) | 38.5 | 46.0 | 56.4 | 64.3 | 76.1 | 88.5 | 94.3 | 93.2 | 82.3 | 65.7 | 50.6 | 40.7 | 66.4 |
| Average Min. Temperature (F) | 11.4 | 19.5 | 29.5 | 33.2 | 42.6 | 50.3 | 57.6 | 57.2 | 48.0 | 35.4 | 26.7 | 18.7 | 35.8 |
| Average Total Precipitation (in.) | 0.73 | 0.67 | 1.77 | 1.66 | 1.18 | 0.96 | 1.52 | 0.90 | 1.45 | 1.95 | 1.74 | 1.23 | 15.76 |
| Average Total SnowFall (in.) | 9.8 | 2.4 | 3.0 | 1.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 | 6.6 | 10.7 | 33.8 |
| Average Snow Depth (in.) | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 |

Precipitation at the same weather station has averaged 12.48" per year, but actual annual measurements range from 7.65" (1977) to 20.18" (1969). In most years, Parachute receives slightly more than half of its precipitation as rainfall during the period from May through October. Local humidity is usually between 15 and 30 percent. Averaged over a 26 year period, a growing season of 150 days is reported by Brooks et al. (1933).

At nearby Battlement Mesa Community, which is situated south of the Colorado River, has climatic records for the benchland area, which extends as far west as a few miles southeast of De Beque. The community's north and west aspect, its exposure to wind, and its strong outgoing terrestrial radiation at night probably cause temperature to be slightly lower than what might be expected both in the daytime and at night, summer and winter (Conklin and Rossant 1973:25). However, the Mesa receives intense sunshine. The annual average potential solar radiation over most of that area is > 216 Kly (Marlatt 1973:56, Fig. 24). (One "ly," or langley, equals 3.6867 BTU's per square foot.) Additionally, air tends to stagnate in the valley bottom, as the cold air flows down Battlement Mesa's slopes and displaces the warm valley air. Thus, particularly in winter, the temperature differential probably favors the terraces rather than the valley floor.

During fair weather, a breeze blows continually at Battlement Mesa Community, controlled by topography and surface conditions. A short, intensive climatological study by Marlatt in 1973 recorded a daytime average wind speed of 7-12 mph and nighttime wind speed of 24 mph. Marlatt found that at night, above 5400 feet, the flow is from the southeast down the Mesa; below 5400 feet, the flow follows the Colorado River. Around noon, there is a reversal of wind direction as the flow becomes deeper and stronger and heads up the river valley. Sometime between 8 and 12 p.m., the flow again reverses itself and resumes its down valley course (Marlatt 1973:57).

Thunderstorms occur most frequently in the spring and early fall. Snowstorms are common in the winter months and, between 1965 and 1980, have annually dropped on Parachute an average of 4.34 inches of precipitation from December through March (U.S. Dept of Commerce 1965-1980). Longtime residents recall much heavier snowfall and more severe, extended winters in the early days that necessitated travel by sleigh and the fording of the river by walking ice jams (Mahaffey, personal communication 1980).

As elevations increase around the west side to the south side of Battlement Mesa there is a notable increase in precipitation largely due to snowfall, and a decrease in temperatures. However, it is notable that the south slopes of Battlement Mesa are called the "Sunnyside" and the increase snowfall of that elevation was melted much quicker than the Plateau Valley lowlands and north slopes. In general, while minor climatic differences occur as a result of local variations in slope, aspect, elevation, and vegetation, the climate of the study area is generally characterized by low precipitation and relative humidity and an abundance of sunshine. In this semiarid, cool desert environment, winters tend to be mild and summers warm and dry and render the area an attractive place to live year-round.

### 2.3 Flora

The landscape is host to a wide variety of plant species, which thrive at elevations of 5000 feet to 6150 feet. These elevations occur within the Upper Sonoran Zone, which is dominated by pinyon pine and juniper (Young and Young 1968:36). Three natural plant communities are identifiable: riparian, sagebrush/grassland, and pinyon/juniper.

The riparian community is found along some of the small drainage corridors, near seeps or springs, and bordering the Colorado River. Cottonwood, box elder, tamarisk, willow, skunkbush, rabbitbrush, and greasewood are present, as well as reed grass, sedges, rushes, and cattail. Besides offering a plethora of floral resources, the riparian habitat attracts animals seeking food, water, and cover. In terms of resource use, the riparian habitat is the most valuable habitat in the study area and most of the archaeological sites on the benchland south of the Colorado River cluster near the lushly vegetated spring areas.

The sagebrush/grassland community covers large portions of the benches and mesas crossed by the pipeline. It merges with greasewood and saltbush toward the river and with oakbrush and snowberry at upper elevations. Sagebrush can support a variety of grasses and herbaceous species, but much of the community has been reduced to sagebrush, prickly pear cactus, and cheatgrass. Other species present are galleta, Indian ricegrass, needle-and-thread, gilia, larkspur, and wild four o'clock.

A majority of the sites recorded in the study area occur in the pinyon-juniper community or along its border with sagebrush-grasslands. Pinyon-juniper woodlands occur throughout the Southwest on foothills, low mountains, mesas, and plateaus between elevations of 4,500 and 7,500 ft. Pinyon pines dominate at higher elevations and junipers at lower. This woodland type has communities that vary widely not only by dominant tree species by also by the makeup of their understories, which may either be sparse or occur with well-developed stands of shrubs and herbaceous vegetation. The determining factor in the composition of the woodland is elevation, although limitations are also imposed by aspect, slope, longitude, latitude, landform, geologic substrate and fire history. Their elevation distributions are usually dictated by negative temperature regimes on their upper and lower edges. When they border a western valley that experiences inversions, they are usually confined to a thermal belt above that valley's inversions and below the colder up-slope elevations (Evans 1988:2-3).

Openings in the pinyon/juniper canopy reveal an understory of sagebrush, saltbush, rabbitbrush, cheatgrass, and occasional native grasses including galleta, Indian ricegrass, needle-and-thread, and western wheat. The community is most developed at elevations above 5800 feet; below this, pinyon is almost absent. This zone’s upper reaches extend to elevations of 7500 feet, but generally occur ca. 5500-6500 feet, and has an annual precipitation range of 12 to 20 inches. Lower reaches of this zone (ca. 4350-5500 feet) are dominated by sagebrush, shadscale, rabbitbrush, cacti and yuccas, and grasses, and has an annual precipitation range of 8 to 14 inches.

To the souh, east and north of the various portions of the Collbran Pipeline is Battlement Mesa – mountains that rise to elevations in excess of 10,000 feet. The associated increase in moisture encourages the florescence of a variety of montane vegetation communities which, although they are not actually within the project area, would certainly have been accessible to aboriginal occupants. Three of the more prevalent are the mountain shrub, the aspen/spruce, and the mountain meadow communities. The mountain shrub community is found on the lower slopes of the Battlements and is dominated by oakbrush, mountain mahogany, and serviceberry. Aspen and spruce stands are generally present above 8000 feet, interspersed with open parks, or mountain meadows. Associated plants include shrubs (snowberry, serviceberry, chokecherry, rose, silver sagebrush, shrubby cinquefoil, etc.), forbs (cow parsnip, wild celery, sweet anise, columbine, larkspur, monkshood, fleabane, etc.), and grasses (bearded wheat, mountain brome, slender wheat, Parry oatgrass, fescue, blue wildrye, oniongrass, needlegrass, mountain muhly, etc.) (U.S.D.A. Soil Conservation Service 1975).

**2.4 Fauna**

The diversity of habitat within and surrounding the study area provides for a variety of wildlife inhabitants: large and small mammals, waterfowl and other birds, amphibians, reptiles, and fish. Use of the area is both year round and seasonal; large mammals and waterfowl tend to migrate to the grassland and riverine environments in the fall and winter, while other wildlife is present throughout the year.

Of the large mammals inhabiting the area, mule deer are the most numerous and most frequently seen. Grazing the high slopes and meadows of the Battlements in summer, these ungulates move to lower elevations when the temperatures drop. Nearly all of the lower slopes (those below 7300 feet) and terraces flanking the Colorado River provide suitable winter range – and often critical winter range (Burkhard and Lytle 1978:107). Although most of the mule deer population follows a migrational pattern, occasional small groups browse the area year-round.

Other large mammals present include elk, bighorn sheep, black bear, and mountain lion. Most of the elk are part of the Grand Mesa herd, which summers high in the thick spruce/fir forests atop Grand Mesa and winters on the lower slopes (generally below 9000 feet) bordering the river (Burkhard and Lytle 1978:117). It is probable that, prehistorically, both elk and deer summer range extended below that of present populations, but overgrazing by domestic livestock has depleted the native grasses such that sufficient lower elevation summer range no longer exists. Bighorn sheep are rarely, if ever, seen in the study area; they tend to remain at high elevations year round. In 1978, the Battlement Mesa sheep herd population was estimated at fewer than 60 animals, most of which summered and wintered along the hogback between Horsethief and Horse Mountains (Burkhard and Lytle 1978:137). The black bear population density in and around the study area is estimated to be 0.5 bear per square mile (ibid:128). Its range extends from the high peaks almost to the river. Historically, the grizzly bear has been recorded as well, but the black bear is the only bear species present in the area today (ibid.). Mountain lion territory is essentially coincident with that of the black bear, although its numbers in and around the study area are estimated to be considerably fewer. In summer, the lions are dispersed fairly evenly; in winter, they tend to concentrate around deer and elk wintering grounds (ibid:135).

Sufficient habitat exists in the Battlement Mesa vicinity for a wide range of small mammals, including insect-eaters (Insectivora), bats (Chiroptera), flesh-eaters (Carnivora), gnawing mammals (Rodentia), and hares and rabbits (Lagomorpha). Among the insect-eaters are the masked shrew, the wandering shrew, and the water shrew, all of which are generally found above 7000 feet. Both migratory and nonmigratory bats occur in the area and roost in old buildings, hollow trees, rock crevices, and caves. Carnivorous small mammals include the coyote and bobcat (both of which are found throughout the study area), the raccoon (which is common near water sources), and a variety of fur-bearers the ringtail, marten, ermine, longtail weasel, ferret, mink, badger, striped skunk, spotted skunk, and grey fox. Except for the marten, ermine, and mink, which tend to be high elevation dwellers, these furbearing mammals may be present in any of the vegetation communities, although they usually gravitate toward water sources. Rodents common at higher elevations include the golden-mantled squirrel, red squirrel, pocket gopher, bushytail woodrat, mountain and longtail vole, and the western jumping mouse. The prairie dog, Apache pocket mouse, and house mouse are more frequent at lower elevations where soils are sandier. Rodents found throughout the area are the marmot, rock squirrel, least chipmunk, Colorado chipmunk, harvest mouse, canyon mouse, deer mouse, pinyon mouse, and porcupine. The beaver and muskrat are inhabitants of riparian environments both along the river and along higher streams draining the Battlements.

Hares and rabbits constitute a large portion of the small mammal population of the study area. The whitetail jackrabbit and desert cottontail are commonly seen at the lower elevations, while the snowshoe hare and mountain cottontail are more prevalent above 6500 feet. The small rodents and lagomorphs of the area are important prey species for the diurnal predators of the area (Burkhard and Lytle 1978).

Avian species known in the Battlement Mesa are include waterfowl, raptors, upland game birds, and a variety of smaller birds. Along the river, harbored in its sloughs and marshes, are many resident and migrant waterfowl species, including the Canada goose and numerous ducklike birds: the mallard, gadwall, pintail, green-winged teal, bluewinged teal, cinnamon teal, American wigeon, northern shoveler, ringnecked, redhead, canvasback, lesser scaup, common goldeneye, Barrow's goldeneye, bufflehead, ruddy, common merganser, and redbreasted merganser (Burkhard and Lytle 1978). The most common of the resident waterfowl are the mallard and the greenwinged teal, while the most common of the migrant species is the common goldeneye which regularly winters between Glenwood Springs and Parachute. Raptors reported in the vicinity include the turkey vulture, the redtailed and other hawks, the golden eagle, the bald eagle, the prairie and peregrine falcons, the American kestrel (most common of the raptors), and several owl species. These birds prey on the abundant small mammals and aquatic resources available. The most common game birds identified locally by the Colorado Division of Wildlife are the bandtailed pigeon, mourning dove, blue grouse, turkey, ringnecked pheasant, and chukar. The last two are introduced species (ibid.). Numerous small, non-game birds occur in the area as well.

A plentiful source of aquatic animals – toads and frogs, snakes and lizards, and fish – is provided by the river and its tributaries. Species of fish include the humpback sucker, speckled dace, bluehead sucker, carp, mottled sculpin, and brown trout (Archer et al. 1985; U.S. Department of the Interior 1975).

## 2.5 Hydrology

Essentially three erosional effects are apparent in the study area; collectively, they result in the slow but steady degradation of the pediment surface. Running water removes sediment from the flanks of Battlement Mesa and carries it to the Colorado River. This is generally a slow process, however, as flash floods are rare (which is indicated by the stability of the numerous draws), and those recorded have all been contained within the 100-year floodplain (Conklin and Rossant 1973: 23). Although the study area is crossed by numerous drainages, most are intermittents and are dry except during spring runoff and after occasional cloudbursts. When flowing the drainages are characterized as “losing streams” in that they receive no groundwater contribution but rather lose water through seepage and ultimately recharge the groundwater system. Most stream discharge occurs in May, June, and July because of snowmelt.

Small-scale slumping occasionally occurs along the bluffs of the Colorado River, particularly at spring areas, although residents of the area report vertical cuts in excess of 20 feet that have stood since 1929 (Zeff et al. 1974:23). Finally, small mudflows have occurred periodically along all of the tributary drainages, one possibly since A.D. 1890 (Chen et al. 1975:15). Such mudflows are infrequent, however, and are not considered a major modern erosional force of the pediment surface.

## 2.6 Quaternary Geology

The study area is located at the south margin of a large, northwest-south-east-trending structural downwarp known as the Piceance Basin. Subsidence of the Basin probably began some 70 million years ago, with the onset of the Laramide Orogeny during Late Cretaceous times, and continued until the Late Eocene (Young and Young 1977:46). During this period of roughly 25 million years, the Basin received as much as 9000 feet of Tertiary stream and lake deposits, all of which gently dip toward the center of the down-warp. Subsequent uplift and erosion along the basin's margins have carved from these basin sediments such topographic highs as the Roan Plateau, Grand Mesa, and Battlement Mesa (ibid.).

The Collbran Pipeline generally courses over benches and through moderately dissected valleys on the south, west and north flanks of Battlement Mesa. Bedrock is chiefly Wasatch Formation (Eocene), although a short section of the line crosses exposures of Green River Formation (Eocene). Late Quaternary deposits exposed during the construction of the Collbran Pipeline include Late Pleistocene and Holocene aeolian and alluvial strata, and Pleistocene glacial outwash gravel. The major Pleistocene gravel deposits are best preserved in alluvial fans on the north facing slopes below Battlement Mesa.

Thick, colorful exposures of Tertiary basin sediments are visible on the slopes of Battlement Mesa and the Roan Cliffs to the north. The red, grey, and brown siltstones and red, grey, and green shales of the Wasatch Formation extend from the valley floor about a third of the way up the bordering hillsides and weather to appear as softly draped folds of reddishmaroon hue. Atop the Wasatch is the Eocene-age Green River Formation, which was deposited in a relatively shallow saline inland lake and which contains the lightcolored sandstones and shales of the Anvil Points Member, the overlying grey and brown sandstones, siltstones, limestones, and shales of the Douglas Creek and Garden Gulch Members, the cliff-forming oil shale and marlstone beds of the Parachute Creek Member, and the capping tan and brown sandstones, marlstones, siltstones, and tuff of the Evacuation Creek Member (Cashion 1973). These sediments are particularly striking at sunset, when the array of pastels colors is fully illuminated.

There are extensive pediment surfaces on the north side of the Battlements that are covered by alluvial fan gravel and mudflows of considerable depth. The Wasatch Formation lies more than 100 feet below ground surface in certain areas (Zeff et al. 1974:5). Deposition of the alluvial fans began in the late Quaternary when, as a result of the Bull Lake Glaciation (Mid-Upper Pleistocene), gravel-laden streams rushed down the flanks of Battlement Mesa and dumped their loads on the old pediment surface. The sediments thus deposited consist of detritus of the Green River and Wasatch Formations and Tertiary basalt (from the cap of the Mesa) bound by a matrix to form a competent, well-drained, but unlithified material (ibid:12).

Interspersed with the alluvial gravel deposits are large mudflows that originated in the upper reaches of the larger drainage heads (Chen et al. 1975:10). Deposition of these large mudflows probably began 75,000 years ago and ceased about 10,500-10,700 years ago, during the last Pleistocene glaciation (ibid.). Heavy surface runoff saturated the soil and bedrock, which caused slope failure and prompted great quantities of mud and rock debris to flow rapidly across the pediment surface. Established stream channels were filled with silt, clay, sand, and basalt gravels, cobbles, and boulders to a thickness often exceeding 40 feet. These deposits are most evident in the cutbanks and steep slopes of the mesas north, northwest and south of Battlement Mesa.

Since the end of the Pleistocene Epoch, these pediments have been relatively stable and have undergone stream erosion and minor, localized slope failure. Small mudflows have occurred frequently over the past 6500 years, scouring the lower gulches and forming small fans (ibid:14). Shallow landslides have happened occasionally as well, especially in spring areas along the escarpments bordering the river. However, evidence of a major geologic event in the study area during this period has not been found, and degradation seems to proceed at an ordinary rate.

Rock types present within the study area include sandstone, shale, and siltstone detritus of the Wasatch and Green River Formations and basalt float from the cap of Battlement Mesa. Basalt boulders and cobbles are frequently visible in roadcuts, intermixed with silt, clay, and sand. A variety of other materials can be found along the Colorado River and in the vicinity of the modern gravel pit – among them granite, greenstone, quartzite, and cryptocrystallines.

Deposits of Late Pleistocene and Holocene age are mainly aeolian and alluvial. Aeolian deposits consist of ubiquitous loess sheet and shadow deposits aged to the Late Pleistocene and the middle and late Holocene, and relic clay dune cores from the early Holocene. Alluvial deposits include channel deposits associated with the many ephemeral streams draining the mesa, older lag deposits related to former terraces of the Colorado River, coarse lag in outwash gravel, and as sheet flow or sheet wash alluvium mixed with aeolian deposits. Colluvial deposits occur regularly across the landscape at the base angle-of-repose or steeper slopes, but do not figure prominently in archaeology.

Deposit depth can be judged by the type of surface cover. Loess deposits more than a meter in depth and younger than 3000 radiocarbon years before present (RCYBP) are commonly covered with big sagebrush and grasses, while considerable deposits of loess older than 3000 RCYBP are alkaline and typically support dense stands of greasewood. Surface exposures of the alkaline, older deposits on many ephemeral drainages are sometimes barren or only have greasewood. Thinner deposits over rocky substrates are normally inhabited by juniper and pinyon pine which require deep fractures in bedrock for water. Thin deposits in pinyon-juniper forests normally have the complete loess sequence.

### 2.6.1 Aeolian Deposits

A number of investigations have been conducted on the flanks of Grand Mesa that discuss aeolian deposits in some detail (Conner et al. 2006a, 2006b; Martin et al. 2006; Miller and Smith 2010). The most common deposit is loess—wind blown silt—that is typically composed of several cycles of deposition followed by erosion. The individual sheets in the overall sequence are separated by unconformities formed by deflation. Deflation tends to concentrate coarser particle sizes on the deflated surfaces, similar to desert pavement or serir deposits, which in turn increase surface roughness and limits further deflation. In cross-section, the deflated surfaces are unconformities. In the absence of a coarse fraction, deflation is slowed when the B soil horizon is exposed; translocated clay and soluble mineral matter precipitate in the lower B (or eluvial) horizon and harden the deposit against rapid deflation. A combination of meteoric water and continued translocation gradually transforms the surface and leads to further, albeit much slower deflation.

The bottom sheet in the sequence is Late Pleistocene in age, but it is imperfectly preserved. Sometimes in excess of two meters at higher elevations, it is usually absent in more exposed areas at lower elevations. Few surface exposures are visible, but many excavations in the area invariably exposes the deposit. There is a lacuna—representing a major period of erosion—between the Late Pleistocene loess and following loess deposits which began deposition after 6500 RCYBP. In one location on the pipeline, remains of a camel were recovered between the latest Pleistocene loess and older Pleistocene loess deposits.

Four loess sheets comprise the upper series. About two-thirds of the column height is the middle Holocene loess, deposited between 6500 and 4500 RCYBP. Two late Holocene loess sheets were deposited between 2800 and 2200 RCYBP and 1800 and 1000 RCYBP, respectively. Deflation between the intervals of deposition severely degraded and in some places stripped the earliest of these two sheets. The upper sheet is loess deposited during the Little Ice Age, between about 600 and 150 RCYBP, and some recent additions. This latest sheet is presently being deflated in most areas.

The period of dune building in the American west took place between 10,000 and 6500 RCYBP, but is poorly represented locally. Clay dune cores have been identified in a few areas. One area is north of Loma, Colorado, east of East Salt Creek, on the flats below the Book Cliffs (Conner et al. 2006c). Others have been noted at Indian Creek in southern Mesa County, Colorado (unpublished field data in possession of the author).

### 2.6.2 Alluvial Deposits

The alluvial deposits exposed along the course of the Collbran Pipeline are Late Pleistocene and Holocene in age. A regular sequence of deposits is exposed in the Colorado

Plateau, including western Colorado (Miller and Nelson 2010), and throughout the Rocky Mountain basins and western Plains regions (Miller 2010). Deposition is associated to warm, concomitantly dry intervals and erosion is related to cool, concomitantly moist intervals.

There are three major Holocene deposits overlying Late Pleistocene gravel. Whether the sequence is stacked or inset is determined by the amount of sediment contributed to the systems by erosion in the headlands and the amount of water collected in the drainage basin that is available to rework that sediment or transport it downstream (e.g., Miller and Nelson 2010). Drainages of both types are present in the project area. The major drains display inset sequences, but lesser drainages unable to efficiently shift the sediment load normally exhibit stacked sequences.

Late Pleistocene alluvial deposits consist of coarse lag deposits, typically coarser than any sediment contributed since that time. The Pleistocene lag deposits are typically associated with reddened sediments and gleyed clay. The red coloration is the result of a higher oxidation state of iron in the deposits while gleying is a result of gibsite formation. These deposits are also associated with thin, centimeter-thick, soil A horizons contained in A-C soils and soft sediment deformation structures. These deposits are older than 10,000 RCYBP.

The first Holocene alluvial deposit is the result of a massive sediment release from highland areas. The sediment was formerly stored in the mantle of the Pleistocene soil and released as warming climates degraded vegetal communities and destabilized the slopes. While lower B (or E) and C horizons are more commonly preserved, the A and upper B horizons were stripped and redeposited in the valleys and rills where much of it has remained since. Braided or anastomosing in character and well cemented by secondary calcite and clay minerals, it comprises the bulk of the visible alluvial deposits presently.

Erosion in the middle Holocene amelioration incised these deposits, typically to the depth of the Late Pleistocene lag deposits. Erosion in the interval was not sufficient to remove or modify the Pleistocene gravel and once it was exposed, drainages started a cycle of valley widening, usually undercutting the braided alluvium and forming vertical walls. Cementation of these early alluvial deposits started with incision. Water tables lowered in response to the incision and calcite and other soluble mineral matter precipitated on lowering advection fronts. The mineralization and later syngenesis (i.e., in place weathering) has preserved the charater and the bulk of the deposits since the middle Holocene incision.

Around 4500 RCYBP (radiocarbon years before present), the middle Holocene amelioration subsided and a second period of alluvial deposition took place. The middle Holocene deposit occurred between 4500 and 2500 RCYBP. The second release of sediment from the highland came after about 2000 years of soil formation in the highlands, and with deteriorating climates, the sediment stored in the middle Holocene soil was stripped and redeposited in the upstream reaches of many drainages. The middle Holocene soil, unlike the Late Pleistocene soil, was stripped almost completely. Erosion in the highlands abated with the exposure of the middle Holocene mineralized zone, which was produced by syngenesis (or in place weathering) by stored pore or vadose waters. Weathering produced secondary calcite and clay minerals (chiefly smectites) which hardened the affected deposits and retarded further erosion.

Unlike the period of early Holocene alluviation, the volume of sediment available during the second period was much less, so the bulk of the middle Holocene deposits remained in the upper reaches and display a fan-like geometry overlying the early Holocene alluvium. In the downstream reaches, as far as it persists, it forms an inset terrace, and for drainages reaching the basin interiors (or is sediment starved system), it is absent altogether. Surface gradients on this deposit are characteristically steeper in the upstream reaches, hence the fan-like longitudinal geometry, compared to the early and late Holocene alluvial deposits.

Another period of incision occurred in the late Holocene. In many perennial streams, the incision took place sometime after 2800 but before about 1100 RCYBP. In many ephemeral streams where the second deposit is preserved, the second and third periods of alluviation are almost continuous. The evidence of incision in this period is fleeting since the incision followed the path of least resistance and re-excavated the arroyos formed in the middle Holocene.

Deposition of the third alluvial deposit started over 2000 RCYBP, was interrupted and partly incised during the Little Ice Age (ca. 600 to 150 years ago), and resumed deposition afterwards. Weathering of bedrock and soil formation in the interval was variable and the volume of sediment released was a fraction of the previous releases. Drainages are still adjusting to the sediment release, and down-cutting since the turn of the turn of the 19$^{th}$ and 20$^{th}$ centuries is more properly considered avulsion, the normal reworking of sediment in a drainage on the scale of hundreds of years, as opposed to incision in the middle and early late Holocene, and dissection in the Late Pleistocene. Incision occurs on the scale of thousands of years, and dissection, on the scale of tens of thousands of years. It should be stated clearly that the volume of sediment released from chemical weathering in the highlands is directly proportional to the duration of the preceding cool/ moist climates.

## 2.7 Paleoclimate

A graphic illustration of regional climatic studies by Petersen (1981) for the La Plata Mountains and by Chen and Associates for the Battlement Mesa area (Conner and Langdon 1987:3-17) is presented in Figure 2.1. As one can see, the two graphs are not in complete agreement, but they offer comparable assessments of the region's paleoclimate based on the present knowledge of the geomorphology. In addition, the following is a distillation of the discussion of general climatic shifts derived from geologic implications as reported in the Class I for the GJFO (Conner et al. 2011:2-8 through 2-50).

In the Southern Rocky Mountains, generally warm, moist conditions prevailed during the Early Holocene (ca. 11,700 BP). As the generalized warming trend continued, the warm/moist conditions began to change. At the lower elevations, dry/wet climatic

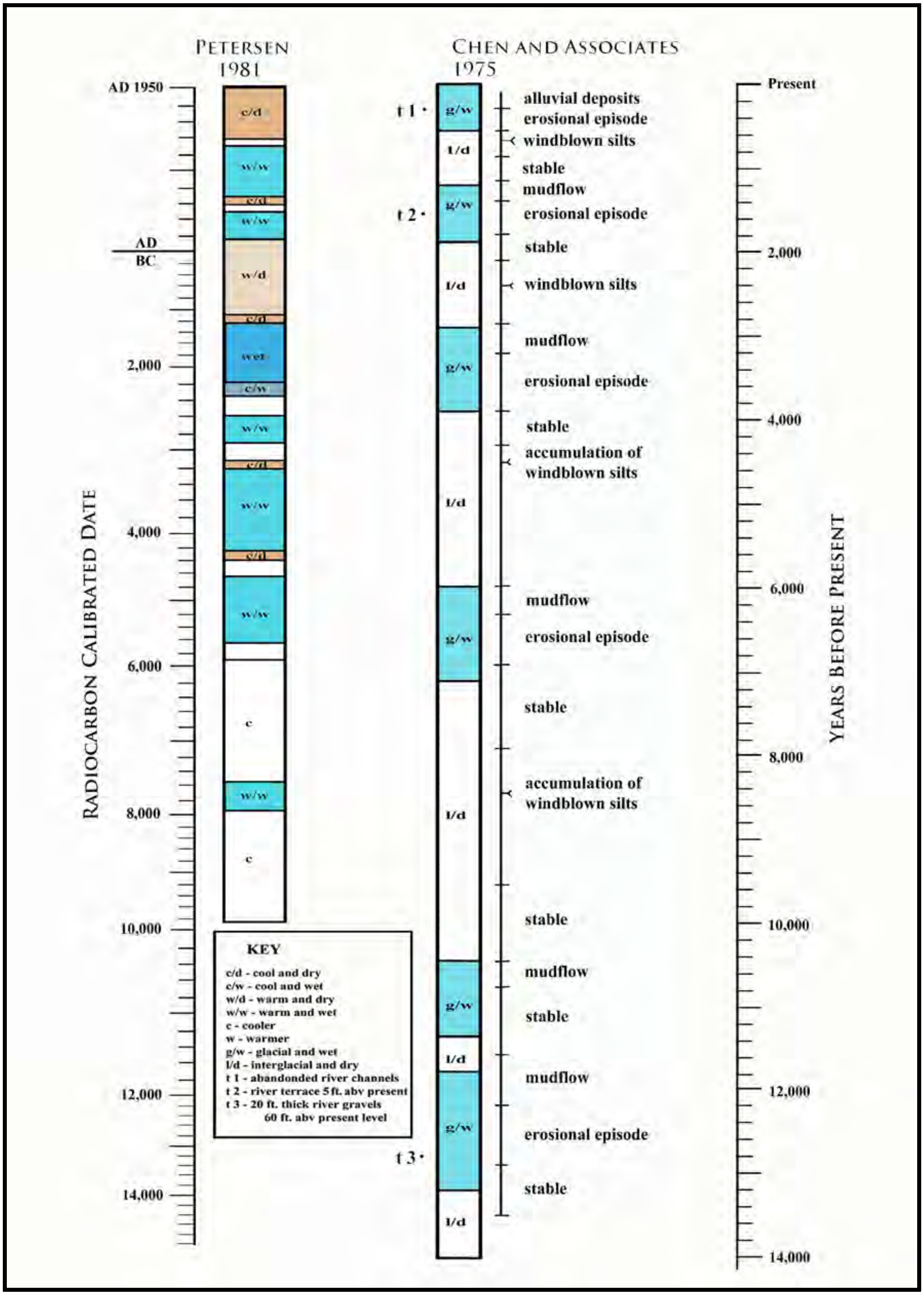


**Figure 2.1.** Illustration of regional climatic studies by Petersen (1981) for the La Plata Mountains and by Chen and Associates for Battlement Mesa Community (Conner and Langdon 1987:3-17).

fluctuations appear to have brought on drought conditions between 11,200 and 9500 BC in the San Juan and Wyoming Basins, lowering the water table and concentrating surface water into shrinking water holes. In other areas, especially the higher terrain with its orographic uplifts, increased effective precipitation would have produced a rise in the ground water tables, local lake levels, and the number of springs, as well as an expansion of tall and short grass forage regions (Eckerle 1992).

About 9200 BC, wetter environmental conditions again prevailed and timberline was lower in the La Plata Mountains. Dunal areas began to stabilize and the sage brush began to replace the desert shrub. However, around 9000 BC another change occurred and the environment became drier. Between then and about 4300 BC the timberline in the San Juan Mountains gradually retreated to higher elevations than at present. Somewhere around 8250 BC the monsoon pattern appears to have shifted southward.

The Paleoarchaic period (7500-5500 BC) witnessed a deterioration of regional climates accompanied by higher average temperatures and less effective moisture. The three following periods are defined by cultural changes and punctuated by climatic episodes: Early Archaic (ca. 5500-3750 BC), Middle Archaic (ca. 3750-1250 BC), and Late Archaic (ca. 1250 BC - AD 1300 ).

The Early Archaic (5500-3750 BC) exhibits a good deal of cultural continuity with the preceding period. This period marks the first half of the Middle Holocene and represents the harshest drought conditions experienced by the prehistoric population. Based on excavation data, evidence of occupation of northwest Colorado during the Middle Archaic Period, ca. 3750-1250 BC, greatly expands in comparison to the previous periods. This occurs in the second half of the Middle Holocene and roughly corresponds to the Neoglacial period, which exhibited an overall increase in effective moisture and cooler temperatures.

Climatic fluctuations occurred during this period and two distinct dry episodes are recorded by Petersen (1981) for the La Plata Mountains and by Chen and Associates for the Battlement Mesa area (Conner and Langdon 1987:3-17). The environmental model prepared for Battlement Mesa Community shows an accumulation of windblown silts ca. 3250 BC (at the end of an extended, increasingly dry episode of the Neoglacial period) and again ca. 600 BC. Between 2850 BC and 2550 BC, is a time of increased moisture which is evidenced int the stabilization of dune fields and reversion to sagebrush steppe of much of the area covered in desert shrub communities.

The Late Archaic (1250 BC - AD 1300) is a time of apparent stress on settlement systems. Drought-like conditions coupled with population packing caused adaptive strategies to reach a pinnacle of intensification. The initial portion of the Late Archaic Period appears to consist primarily of climatic conditions somewhat similar to the present with periodic fluctuations between cooler and wetter, cooler and drier, or hotter and drier conditions, depending upon geographic location.

In summary, the end of glacial conditions came around 13,400 BC* [* represents calibrated dates]. An early drought, called the Clovis drought by Haynes (1991), caused erosion and is associated with most of the Pleistocene extinctions. Glacial conditions returned in the Younger Dryas between 11,000 and about 9000 BC*. Severe drought in the early Holocene lasted from 9000 to 5500 BC*, interrupted once around 7450 BC*, which coincides with Pryor Stemmed occupations in the GJFO area. After 5500 BC*, climates ameliorated. Conditions between 5500 and 3100 BC* approached but did not exceed conditions during the Late Glacial; changing plant communities, frost heave, syngenetic (in-place) weathering, and changing lake levels all point to cooler conditions. Droughts interrupted the generally cooler-moister conditions after 5500 BC*, with major periods of drought identified between and 1850 to 950 BC*, 275 BC* to 165 AD*, 900 to 1350 AD*. After about 150 years ago, conditions have caused deflation and alluvial deposits have moved in fits and starts downstream, via avulsion.

Geologic evidence can identify changes in climate within a scale of hundreds of years, but lacks precision when compared to tree ring data, but the two compare nicely. The sequence of deposition and erosion is easy to see, but dating the sequence with radiocarbon determinations obtained mostly from cultural features presents its own challenges. Furthermore, although the changes due to climate change are visible in the stratigraphic record, the boundary conditions that favor deflation over deposition in loess deposits or trigger fine clastic deposition in alluvial valleys are not precisely known. Nevertheless, a coarse summary of climate based on alluvium and aeolian deposition can be suggested, and is generally supported by tree ring data for at least the last 2000 years.

The Holocene paleoclimatic data just adduced are of great value for exploring the general relationship between environment and prehistoric cultural occupation of the Western Slope. However the temporal resolution stemming from radiocarbon dated stratigraphic sequences is less than ideal for correlation with better known cultural events occurring within the past two millennia. The Palmer Drought Severity Index (PDSI) employs precipitation, temperature and the Available Water Content (AWC) of soil types to assess agricultural potential on an annualized basis (Palmer 1965; Alley 1984). When the modern instrumental record is calibrated with available tree-ring indices the PDSI for specific regions can be extended to prehistoric times. Edward R. Cook of the Lamont-Doherty Earth Observatory has recently recalibrated the PDSI for 1825 annually resolved grid points for North America (Cook, as presented in Berry and Benson 2008). The relevant node (Number 117) for northwestern Colorado is depicted in Figure 2.2, averaged to decadal means.

Drought conditions are indicated in red for negative departures greater than 1-sigma. Correlation with cultural events is straightforward in areas such as southwestern Colorado where cultural events are by and large also subject to tree-ring dating (see Chapter 5, this volume). However Western Slope archeological remains rely upon radiocarbon dating which typically lacks a similar level of resolution. The situation can be markedly improved in the future if the GJFO and other area offices set standards of radiocarbon sample selection to be employed by CRM contractors. A ten-year temporal granularity is achievable if enough dates

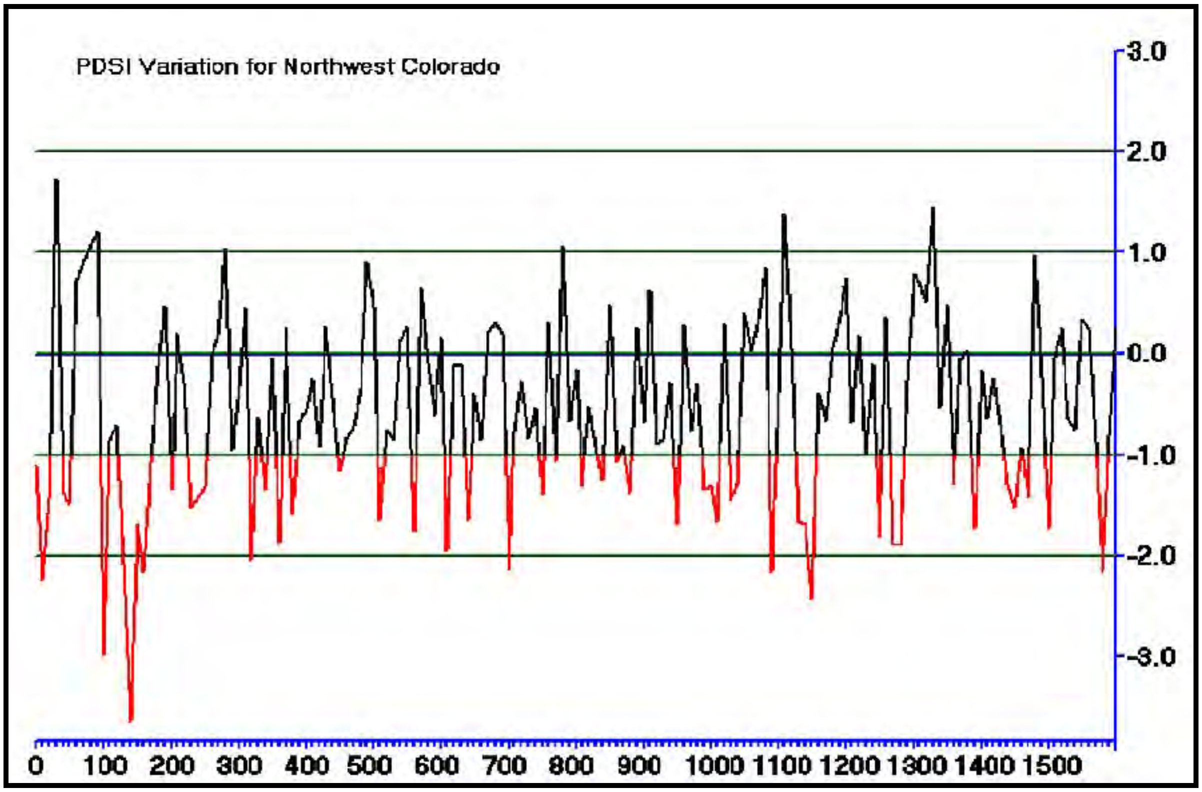


**Figure 2.2** PDSI for Northwestern Colorado from 1- 1600 AD. Annual data decadally averaged (Cook, as presented in Berry and Benson 2008).

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of credible materials from critical proveniences are recovered over time. Botanical annuals are the preferred materials and typically require Accelerator Mass Spectrometry (AMS) analyses. And multiple, same provenience sampling allows for date averaging with a consequent reduction, thus increased precision, in standard errors. Many of the questions regarding environment-cultural interaction (e.g., PDSI in relation to population movement or abandonment) cannot be addressed given the current state of the cultural radiocarbon record. This situation is ultimately resolvable and should be a high priority for BLM.

The time depth of the high resolution climate data is not as great as the geologic-climatic model, but the two are in agreement as far as they overlap. To reiterate, the PSDI data extend from 0 to 1600 AD which overlaps with the deposition of the second and third late Holocene loess deposits and Lightning equivalent alluvium. The periods of drought identified by radiocarbon ages from loess, represented by unconformities, correspond well to the periods of increased drought depicted on Figure 2.2, falling within a few decades of the predictions of the PSDI. The correlation of the predictions from both lines of evidence give a first indication of boundary conditions required to initiate wide scale deflation and the pattern of drought conditions that relate to the formation of lacunas in the stratigraphic record. The periods of erosion correspond to repeated drought cycles persisting for decades on the PSDI. During the deposition of the second late Holocene loess, the episodes of drought are represented by regularly spaced, negative spikes, suggesting an astronomical cause such as the solar cycle.

It is more difficult to assign parts of the Lightning equivalent alluvium to events reported in the PSDI data because the stages of deposition and erosion recorded in the stratigraphy of Lightning equivalent deposits are not well dated - Lightning equivalent deposits on Douglas Creek have seven terrace segments of different ages not to mention overbank deposits (Miller and Nelson 2010). However, periods of fill in alluvial valleys correspond to periods of deflation in loess and reworked loess stripped by sheet flow alluviation or deflated and redeposited in alluvial valleys is a significant part of the source material for Lightning equivalent deposits. This suggests the PSDI data can be employed to predict the probable ages of the different phases of deposition of Lightning equivalent alluvium.

# CHAPTER 3: LITERATURE OVERVIEW

The following sections provide additional context for the interpretation of the findings and documentation of the sites considered by this project. The first is a summary of the radiocarbon database for the region. The others provide summaries of the contexts for the prehistory, ethnohistorical, and historic Euro-American resources.

## 3.1 Summary of the Radiocarbon Database for the BLM-GJFO

The following discussion is condensed from the Class I Cultural Resource Overview for the BLM-GJFO (Conner et al. 2011). The discussion reveals pertinent cultural history information in terms of when and what elevations were exploited by aboriginals in an area referred to as the RMPPA (Resource Management Protection Project Area) – lands within the BLM-GJFO jurisdiction excluding the national conservation areas. In addition, the discussion demonstrates a relative method of determining increases in areal prehistoric populations.
A total of 172 radiocarbon dates, culled from 47 archaeological sites within the BLM Grand Junction RMPPA, were organized into "periods" reflecting obvious breaks or changes in the cultural history. It is important to note that these "periods" are fairly arbitrary temporal divisions that have no phase or stage implications.

When discussing radiocarbon dates, quality "refers to the potential for disparity" between the target date and the death of the material *or* the age of that portion of the sample material that is dated (Smiley 1998). By now, nearly all archaeologists are aware of the two most basic old wood problems. The first has to do with the lengthy period of time that wood can survive on the surface in a dry climate. The second has to do with the built-in bias due to the dating of heartwood, typically the charcoal submitted as a radiocarbon sample rather than the outer rings of a tree. The latter at least provide a date closer to the time when the tree died, but can still be much older than the target date. It is not just trees that can provide radiocarbon dates that are considerably older than the target date. Some shrubs found on the ground as deadwood are equally capable of giving anomalously old dates – sometimes longer than trees (Geib 2008). In contrast to the old wood problem, bulk soil samples, which comprise a relatively large number of samples from archaeological contexts, may provide measurements that are too recent. "Measured $^{14}$C ages of soil organic matter or its fractions are always younger than the true ages of soils due to continuous input of organic matter into soils" (Wang and Amundson 1996:1). Thus, bulk soil samples from archaeological features will invariably give dates that are more recent than the target event. Radiocarbon dates from bulk soil samples or from samples that appear to be bulk soil samples should be viewed as more recent than the target event, by an unknown number of years.

### 3.1.1 Period 1A: 7000 – 6700 BC

The two earliest dates in the RMPPA are both from Ladder Springs (5ME3789), situated at an elevation of 7500 feet. The provenance of these dates is unknown and, importantly, both have very large standard errors. Moreover, the site could not be relocated by the BLM archaeologist in 2003 (Michael Berry, personal communication). Another high elevation site, the Rapid Springs Site (5ME4971) at 7040 feet on Grand Mesa, also provides an early date for the study area, with a calibrated age range of ca. 6900 – 6800 BC. Associated artifacts included a Pinto and Elko Side-notched points. This date suggests that high elevation sites were exploited during this early period, but that the population was very small. The possibility always exists, however, that sampling error is the main reason why only one site can be used to date to this period.

### 3.1.2 Period 1B: 6000 – 5250 BC

The next solid radiocarbon evidence for human occupation begins ca. 750 years later with the appearance of cultural groups beginning at about 6000 – 5500 BC. These dates seem to reflect the same type of sparse, probably highly mobile populations as posited for Period 1A. However, the presence of a dated site during this early time period at an elevation of 5870 feet (5ME699) suggests exploitation over a wide range of elevations if the single date from Period 1a is also taken into account. Nevertheless, dates from only two sites are insufficient for model-building, and additional dates from Period 1 are required for building models of exploitation of a region that give any level of comfort.

The 750-year gap in the radiocarbon record is intriguing, but given the very small number of dates involved, it cannot be interpreted with any degree of certainty to indicate that populations were entirely absent. The near absence of radiocarbon dates at the end of Period 1B, from approximately 5750 BC* to 5250 BC*, (with the exception of the Rapid Creek Site, 5ME4971) is consistent with the first of Benedict's (1979) drought periods of climatic change, which strongly discouraged occupation of several regions in the West. Thus, this gap in the radiocarbon dates may not be the result of sampling error. Instead, it may reflect the fact that at least part of Benedict's "two-drought Altithermal" explains the absence or presence of populations in specific areas

### 3.1.3 Period 2: 5000 – 1750 BC

Period 2 appears to mark the beginning of what seems to be the presence of sporadic, moderately-low density populations who were highly mobile. This is an extremely long period of time, and with the exception of the high density of dates at about 3800 BC, and especially at 2500 to 2000 BC, appears to represent groups that may have exploited the region intermittently at all elevations. A single time frame within this period, at about 4200 to 4000 BC, may indicate a nearly complete abandonment of the RMPPA. However, this period is not congruent with Benedict's second drought, which lasted from approximately 4775 to 4300 BC. It may be that populations from the Rocky Mountains exploited the Western Slope during Benedict's second Altithermal drought, only to largely abandon this region, including the RMPPA, afterwards, perhaps shifting their range back to the Rocky Mountains. This hypothesis is based on the radiocarbon record alone and does not take other factors into consideration.

The majority of radiocarbon dates during Period 2 are derived from three sites: the Turkey Tailfeather Site (7110 ft), the Indian Creek Site (5300 ft) and De Beque Rock shelter (5097 ft). This may indicate that resources at lower elevations along major rivers at their juncture with substantial tributaries, such as Indian Creek and the De Beque Rock shelter, were favored locales. Relying on data from only three sites, however, may skew interpretation of the record. Furthermore, the extant radiocarbon record *alone* does not inform us as to whether the latter two low-elevation sites were heavily used because of their location along what must have been major travel routes, their proximity to resources that could be exploited year-round, their proximity to significant seasonally-available resources, or some combination thereof. These possibilities are explored in other sections of the report.

### 3.1.4 Period 3: 1750 – 1250 BC

The radiocarbon record shows a dramatic break at 2050 to 1750 BC from the previous moderately high number of radiocarbon dates in Period 2. Again, given the robust record of dated sites prior to and after this date, the discontinuity in the radiocarbon record is significant. It is here interpreted as a relatively brief, but important, abandonment of the RMPPA. The density of dated sites within Period 3, which occurs quite rapidly after this diminution in radiocarbon-dated events, suggests the possibility of a rapid movement of populations onto the Northern Uncompahgre Plateau, the lower valley to the east, and at least a portion of Grand Mesa. If the radiocarbon record truly reflects relative population density, then the population in Period 3 peaked around 1600 BC. Whether these populations migrated from the Southern Rocky Mountains, the Southwest, the Colorado Plateau, or the Wyoming Basin cannot be determined on the basis of the radiocarbon record alone from the RMPPA.

Watershed Rock shelter (5ME213, 7240 ft) was occupied for the first time during this period, as are other investigated sites such as the Bitter Antelope Site (5ME422, 4900 ft), the Whitewater Creek Site (5ME6731, 4900 ft), the Trapped Black Cat Site (5ME4645, 4940 ft), the Wagon Canyon Site (5GF620, 6320 ft), the Metal Arrow Point Site (5ME7089, 5050 ft), and the De Beque Cutoff Site (5ME625, 5490 ft). Occupations at the De Beque Rock shelter (5ME82, 5097 ft) and the Indian Creek Site (5ME1373, 5300 ft) continue during Period 3. With the exception of the Watershed Rock shelter, all of the radiocarbon-dated sites are at elevations between 6320 and 5050 feet. This suggests that this elevational zone was a particularly productive area during Period 3.

### 3.1.5 Period 4: 1250 BC – AD 1

The diminution of dates in the radiocarbon record that separates Periods 3 and 4 is just as dramatic as the separation between Periods 2 and 3. Radiocarbon-dated components, and perhaps populations, in Period 4 appear to have reached their highest level to date in the RMPPA, when compared to the number of radiocarbon-dated components prior to Period 4. This may reflect a trend in population increase throughout many areas in the Intermountain West. Dated features are found at a number of sites, including the Metal Arrow Point Site (5ME7089), the Whitewater Creek Site (5ME6731), the Watershed Rock shelter (5ME213), the Koch Site (5ME635) at 5640 feet, the De Beque Rock shelter (5ME82), the De Beque Cutoff Site (5ME625), and the Trapped Black Cat Site (5ME4646), among others. Sites during this period are found as high as Watershed Rock shelter (7240 feet), but mainly seem to cluster at lower elevations, below 6000 ft.

This pattern in elevations, however, may be a function of the artificial boundary around the RMPPA. The very large Lands End site (5ME1057), for example, extends from GJFO land at 6040 feet eastward into National Forest Service (NFS) land to an elevation of 6880 feet. The site is only 7 miles south of Watershed Rock shelter. It was only the part of the site on NFS land that was excavated and radiocarbon dated (Greubel 2000), revealing a component that dates to 1390 – 840 BC. Other higher elevation sites that are outside the RMPPA may have been occupied, as well, during Period 4, but are simply not considered here. If Watershed Rock shelter can be used as a proxy for the type of components found at high elevations during Period 4, it would appear that the same pattern of occupation occurs in Period 4 that was seen in Period 3; that is, favorable locations at higher elevations were used as "warm-season, short-term, residential base[s] for small groups, probably single households" (Greubel 2001:148). On the other hand, it is always chancy to hang an interpretation on a single site component, and additional data would be necessary to support any generalization. What does seem clear is that lower elevation sites, some quite large, appear to be the focus of the majority of components during the time frame encompassed by Period 4. Many of the lower elevation sites may have been used year-round or perhaps seasonally because of the rich resource base.

### 3.1.6 Period 5: AD 1 – 1250

Period 5 witnessed an explosion in the number of radiocarbon-dated components and sites, undoubtedly due to the movement of populations into the RMPPA. Somewhere on the order of 85 radiocarbon-dated components comprise Period 5, with the majority of these falling between, roughly, AD 200 and 1200. Although this entire period is referred to as Period 5, there is a significant break in the radiocarbon record within Period 5 at ca. AD 950, which appears to last for approximately 50 years. This break in the record is discussed below.

To the south of the RMPPA, this period saw rapid population increases when Formative-age populations moved onto the southern portion of the Colorado Plateau. These agricultural groups were possibly joined by former hunter-gatherers who already occupied the region or who moved into the RMPPA during the same time frame that Formative-age populations moved northward. During a portion of Period 5, agriculturalists, termed Gateway tradition populations (Reed 1997), moved onto the southern Uncompahgre Plateau. Other so-called Fremont groups, although widely scattered, also practiced agriculture to the west of the RMPPA. However, the evidence for agricultural settlements in the RMPPA is practically nonexistent, and no agricultural hamlets have been identified. Maize cobs, cupules, and fragments are reported from 5ME11334 in a sheltered area of the site (Sherman 2000). These cultigens may well be present due to trade with farmers to the south, or alternatively, may be from agricultural hamlets within the RMPPA that have not yet been identified. Although agricultural habitation sites and small granaries have been reported anecdotally within the RMPPA, none have been investigated. This leads to the conclusion that the northern Uncompahgre Plateau, the Grand/Gunnison/Uncompahgre valleys, as well as Grand Mesa were home to a dense population of hunter-gatherers, not agriculturalists. This interpretation may be subject to change. Many of the sites during Period 5 would be ascribed to the Aspen tradition, if one employs Reed's model (1997).

With the exception of three sites (Watershed Rock shelter [5ME213], the Rapid Creek Site [5ME4971] and 5ME6141 at 7,640 feet), all of the radiocarbon-dated sites within Period 5 are found below 6650 feet, with the majority situated below 5600 feet. Dated components from the upper elevations are undoubtedly underestimated, given the number of components in Watershed Rock shelter that fall within Period 5. It would appear, based on interpretations from the three sites above 6,650 feet, that higher elevations were used seasonally, most likely as temporary encampments during the summer or fall to take advantage of specific resources (Kalasz and Sherman 2001). As for the preceding occupations, Greubel interprets the component(s) during Period 5 as "the residues of multiple episodes of occupation" left by small groups who used the shelter on short-term bases as a residential camp (Greubel 2001:114). Although there was little change in site function, Greubel notes the apparent increase in the intensity and frequency of use of the site. This interpretation is consistent with the radiocarbon record for the RMPPA, which indicates a much larger population.

As previously noted there is a significant break in the radiocarbon record within Period 5 that occurs at ca. AD 950 to 1000. In Figure 3.1, this break in the record appears as a very narrow "line," with dates to the right and left of it in the chart. At this scale the very narrow gap might be interpreted at first glance as an artifact of the algorithm used to produce the graph. However, if one views the radiocarbon record at a different time scale—the past 2500 years—and in smaller 10-year increments rather than 25-year increments, it becomes clear that the discontinuity in the record is "real," and that the number of radiocarbon-dated events falls to a very small number (Figure 3.2). This is interpreted as an abrupt, short-lived demographic change that witnessed movement out of the RMPPA for a period of perhaps 50 to 75 years. The significance of this discontinuity is that it is just as dramatic as the discontinuity that separates Periods 5 and 6 at approximately AD 1250 to 1300, although it is of shorter duration. This narrow break in the record may reflect the same drought conditions seen farther south in the northern Anasazi region, although the impact farther north in the RMPPA probably was not the same on hunter-gatherers in the area as it was on agriculturalists further south.

Berry and Benson (2010), when discussing climatic changes in the Southwest, note that the period from AD 900 to 1000 shows a diminution of construction activity during a period marked by a declining moisture regimen. They further note that there is no evidence for the onset of severe drought conditions at AD 900, instead "the tenth century is marked by a high degree of variability, with decadal-scale oscillations between" wet and dry conditions. Berry and Benson (2010) based their conclusions on the juxtaposition of tree-ring dates for the greater Southwest with corresponding fluctuations in the Palmer Drought Sensitivity Index.

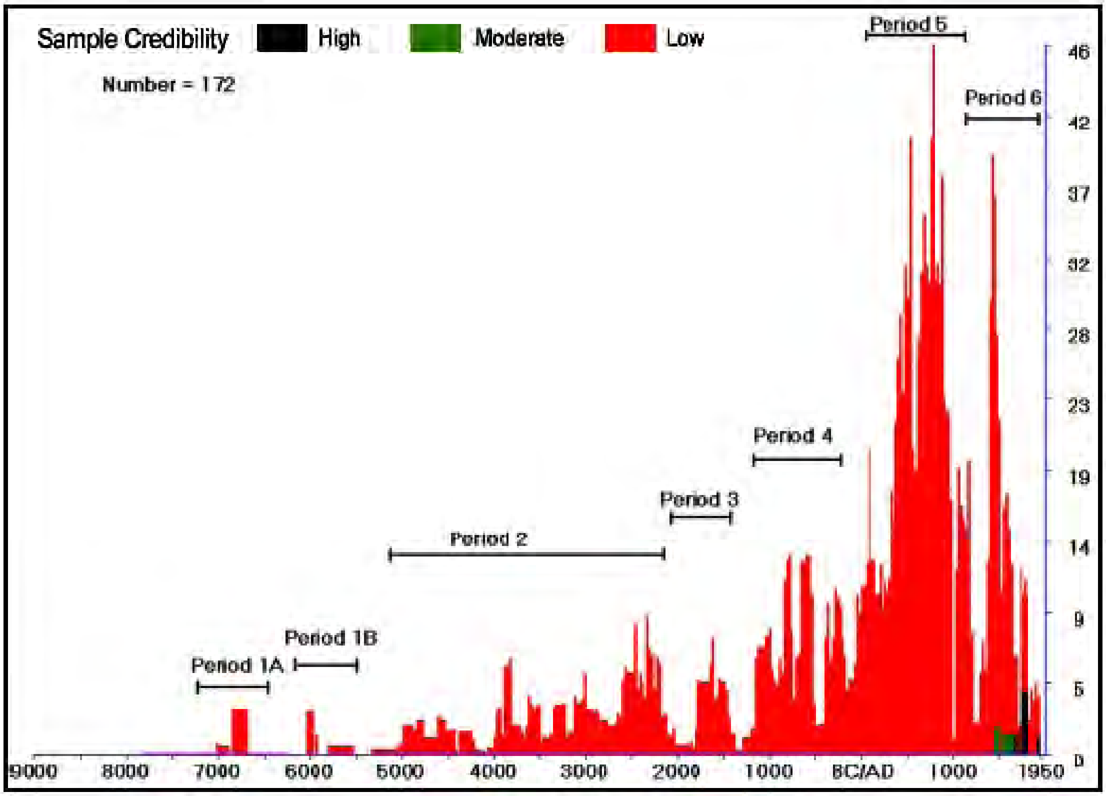
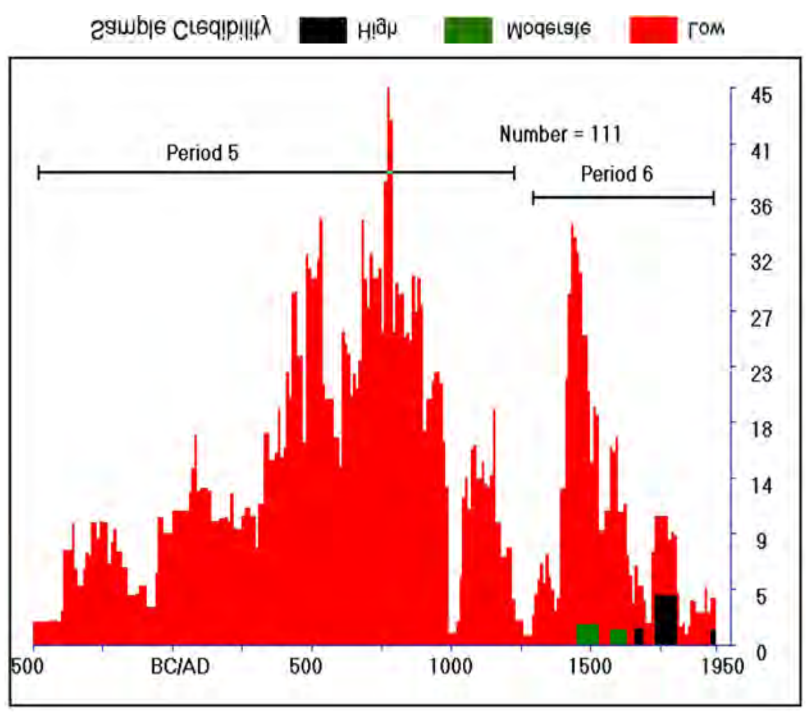



**Figure 3.1.** Bar chart of radiocarbon dates from sites within the RMPPA (1 sigma; calibrated using Calib.exe, version 5.0.1; displayed in 25-year increments). Does not include dates that have been given a credibility level of "None."

**Figure 3.2.** Bar Chart of Radiocarbon Dates from Sites within the RMPPA, with Dates in BC/AD, from the Past 2500 Years (1 sigma; calibrated using Calib.exe, version 5.0.1; displayed in 10-year increments). Does not include dates that have been given a credibility level of "None."



These same oscillating conditions appear to be reflected in the radiocarbon record for the last part of Period 5. After the apparent depopulation between AD 950 – 1000, the number of radiocarbon-dated components never reached the previous high number of dated events between AD 300 and 900.

### 3.1.7 Period 6: AD 1300 – Present

The beginning of Period 6 follows a dramatic discontinuity in the number of radiocarbon-dated components—a break in the record that separates Period 6 from Period 5. This near lack of radiocarbon-dated components in the RMPPA at ca. AD 1250-1300 is interpreted as a major depopulation of the region. This reduction of radiocarbon-dated components also marks the abandonment of the Northern Anasazi area during the tree-ring dated period from approximately AD 1270 – 1300. This period appears to mark a general, simultaneous displacement of populations throughout much of the Southwest, and it corresponds to what Benson and Berry (2009) refer to as a "multi-decadal megadrought." This period appears to mark a general, simultaneous displacement of populations throughout much of the Southwest, and it corresponds to what Benson and Berry (2009) refer to as a "multi-decadal megadrought." Thus, the radiocarbon record for the RMPPA during this period again mirrors the record to the south in southwestern Colorado—an unexpected and important finding. It is not clear, however, where populations who inhabited the RMPPA during the later part of Period 5 may have moved during this depopulation of the RMPPA. One possibility is the southern Rocky Mountains to the east.

Within several decades after the depopulation of the RMPPA, populations again moved into the area, and the number of radiocarbon dates quickly rises to high levels, but not as high as the peaks seen in Period 5, the latter of which is interpreted as the period having the largest population in the RMPPA. Within Period 6, the greatest number of radiocarbon-dated components falls between approximately AD 1400 and AD 1550. The pattern of radiocarbon-dated components during this latter period is remarkably consistent with Reed's (1994:189-191) model for the Numic influx and occupation of western Colorado and eastern Utah. Reed postulates that Numic-speaking groups appeared in the RMPPA as a post-Formative stage phenomenon after Formative-age groups had abandoned the region by AD 1300. This is reflected in the radiocarbon record for the RMPPA. Reed also suggests a continuous occupation of what is now the RMPPA until approximately AD 1550. He further hypothesizes that the decline in population between AD 1550 and AD 1650 is due to European-introduced diseases (Reed 1994:190). As noted previously, Figures 15 and 16 demonstrate a peak in the number of radiocarbon dates prior to a precipitous drop at approximately AD 1550 – 1740. Thus, the radiocarbon record for the RMPPA largely reflects Reed's reconstruction for the much larger area that encompassed eastern Utah and western Colorado and supports his conclusions regarding population trends during what is referred to here as Period 6. The only difference is that the RMPPA radiocarbon record may indicate the greatest decline in radiocarbon dates (and perhaps populations) slightly later than Reed's interpretation by perhaps 100 years.

In sum, the radiocarbon record tends to support the hypothesis that Numic speakers, a branch of the Uto-Aztecan language family, may have been late arrivals in the RMPPA, following the near abandonment of the area by hunter-gatherer groups who were displaced at the same time as contemporaneous farming groups in southwestern Colorado. Whether the hunter-gatherers who appeared to have left the RMPPA at approximately AD 1250 – 1300 were also Uto-Aztecan speakers cannot be determined solely by the radiocarbon data set.

After the significant declines in Native American populations, a decline that Reed attributes to introduced diseases, populations again began to rise within the RMPPA based upon the number or radiocarbon-dated events. Nevertheless, compared to the number of radiocarbon dated components in previous periods, the number of radiocarbon dates during this later period is relatively small. This probably reflects, in large part, the use of other dating tools such as peeled trees and the presence of historic artifacts, both of which typically provide more precise dating than radiocarbon dating.

### 3.1.8 Summary

The chronology of the BLM-GJFO is similar to that of many regions of the Colorado Plateau, reflecting a multi-millennial, intermittent occupation by hunter-gatherers followed by a dramatic increase in cultural activity at around 500 BC. This increase was coeval with the introduction of village farming on the southern Colorado Plateau but, as yet, no evidence exists for reliance on agriculture during that time within the area managed by the BLM-GJFO.

## 3.2 PREHISTORIC BACKGROUND

The following provides a brief discussion of each of the major prehistoric cultural/ temporal eras occurring during the past 12,000 years. Local and regional archaeological studies suggest nearly continuous human occupation of northwest Colorado for the past 12,000 years. Manifestations of the Paleoindian Era, big-game hunting peoples (ca. 11,500 - 6400 BC); the Archaic Era hunter/gatherer groups (ca. 6500 - 400 BC); the Formative Era horticulturalist/forager cultures (ca. 400 BC- AD 1300); the Protohistoric Era [Late Prehistoric] pre-horse hunter/gatherers (Early Numic [Ute, Shoshone, Comanche], ca. AD 1300 - AD 1650) and historic horse-riding nomads (Late Numic, ca. AD 1650 - AD 1881) have been documented. An overview of the prehistory of the region is provided in a document published by the Colorado Council of Professional Archaeologists entitled *Colorado Prehistory: A Context for the Northern Colorado River Basin* (Reed and Metcalf 1999).

A temporal illustration emphasizing the overlap of the subsistence strategies employed by the diverse cultural groups over the past 16,500 years is presented in Figure 3.3. It acknowledges the potential of the extension of the Late Archaic hunter-gather occupation coeval with Formative Era cultures. [Notably, dates of occupation are presented in **AD-BC** and **BP** (Before Present) contexts, which is important in the understanding of tables and data presented in BP dates.]

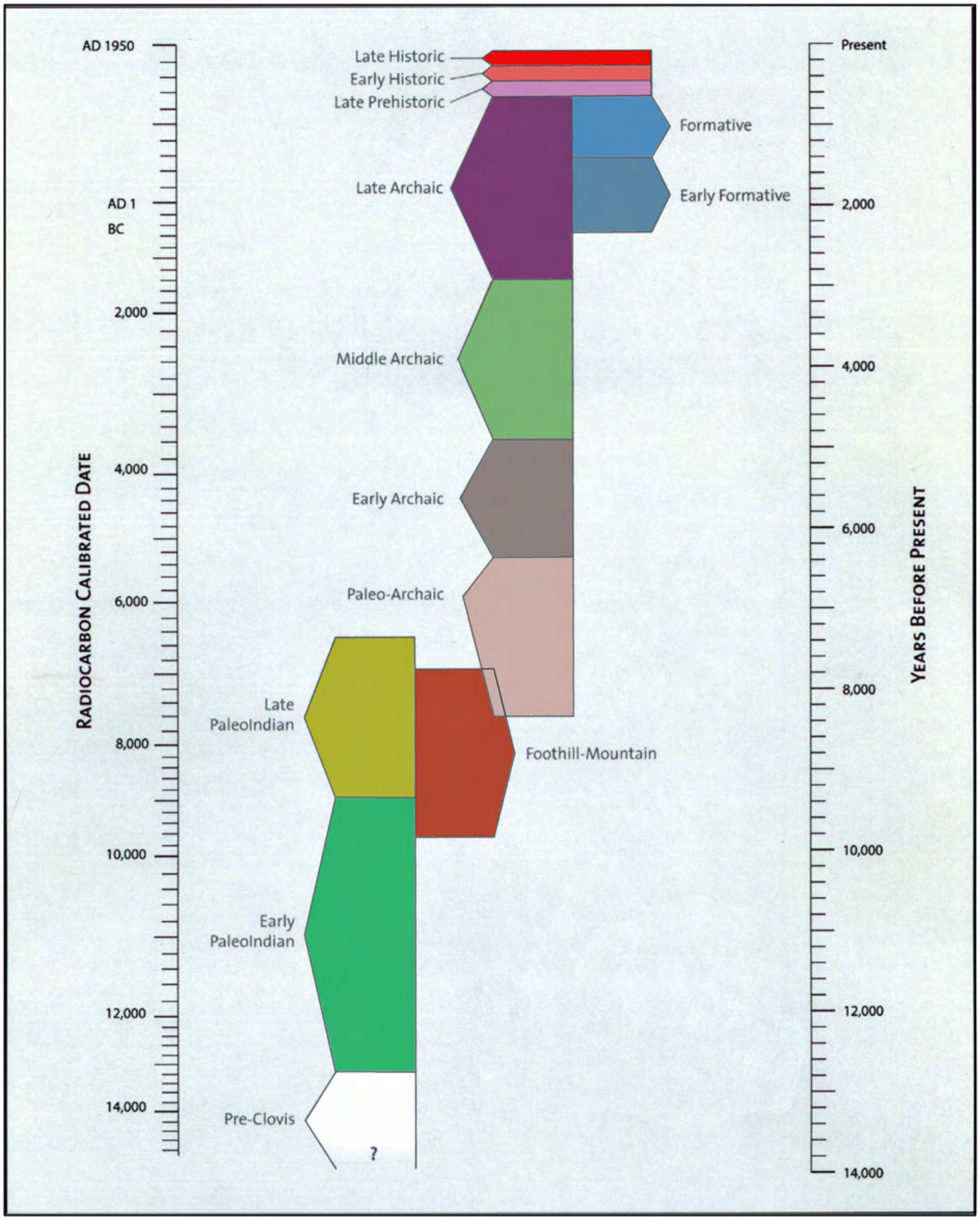



**Figure 3.3.** Temporal chart emphasizing the overlap of the subsistence strategies employed by diverse cultural groups over the past 16,500 years.

### 3.2.1 Paleoindian Era

North America's first human explorers arrived near the close of the Pleistocene as early as 18,000 years ago traveling by passage along Beringia the continental land bridge between what is now Siberia and Alaska. As craniometric evidence has indicated, the immigrants were diverse in origin, identified as belonging to various populations found in Asia and along the Pacific Rim. Specifically, northern and central Asians, people who later occupied the Polynesian islands, and the Ainu who later resided on the islands of northern Japan have been identified as the earliest ancestors of the Native Americans. The number of these colonists was apparently small because evidence of the first incursions is scant. However, the fact that they rapidly spread across the continents of North and South America is found in excavations at Meadowcroft Rockshelter Pennsylvania (Adovasio et al. 1990) and at Monte Verde in Chile (Dillehay 1984), sites which date to about 18,000 and 14,000 years ago respectively. Consensus has emerged that the dating of Monte Verde is valid; however, the dating of Meadowcroft continues to be the subject of debate (Haynes 1980, 1991). Such finds suggest a pre-Clovis colonization of the Americas.

The better documented later colonists to the Americas are termed Paleoindians. They were highly mobile groups of hunter-gatherers that traversed broad territorial ranges. Evidence of their mobility is found in their provisioning of high quality lithic materials from distant quarries, production of portable tool-kits emphasizing wood and lithic processing while having low numbers of grinding tools, construction of short-term residences (occupied for a few weeks to a few months) with little evidence of food storage, and an economic focus on the hunting of Pleistocene megafauna.

The Paleoindian period spanned 6,000 years from 13,500 - 6500 BC. They were hunters and gatherers who exploited seasonally available plant resources and hunted the last remnants of the herds of Pleistocene megafauna such as mammoth and Bison antiquus. Surface evidence in the form of diagnostic projectile points indicates five technological adaptations are present: Clovis Complex (ca. 11,200-10,900 BC), the Folsom Complex (ca. 10,900 -10,000 BC), and the Cody Complex or Plano Tradition (ca. 9000 - 6300 BC). Overlapping the Folsom and Cody periods is the Foothill-Mountain Complex, dating ca. 9500-7000 BC (Frison 1991:67-71, 75, 80). Currently, data from the early Paleoindian period is limited in Northwest Colorado, and excavation data is nearly non-existent. Based upon surface finds representing the late Paleoindian period, three co-traditions appear to be operating in the region: the Plano Tradition of the Great Plains; the Foothill-Mountain Complex of Southern Rocky Mountains; and, a Paleoarchaic Tradition with links to the Great Basin Stemmed Point Complex. It is not until ca. 7000 BC that stronger indications appear for this period with a few radiocarbon dates.

#### Clovis Tradition

With the close of the Wisconsin Ice Age and the retreat of the mountain glaciers in the Southern Rocky Mountains, generally warm, moist conditions prevailed. As the generalized warming trend continued, the warm/moist conditions began to change. At the lower elevations, dry/wet climatic fluctuations appear to have brought on drought conditions between 11,200 and 9500 BC in the San Juan and Wyoming Basins, lowering the water table and concentrating surface water into shrinking water holes. In other areas, especially the higher terrain with its orographic uplifts, increased effective precipitation would have produced a rise in the ground water tables, local lake levels, and the number of springs, as well as an expansion of tall and short grass forage regions (Eckerle 1992). It follows that where there was increased moisture and grass forage, game animals would increase and prehistoric hunters would follow. This movement of animals probably brought the first Paleoindian groups into the region.

The occupation of the region by the Clovis Tradition hunters appears to have been rather ephemeral. The rugged, dissected, canyon environment of the area probably never supported large, extensive herds of megafauna such as could be found on the Great Plains. However, work by Agenbroad (1991), and Agenbroad and Mead (1987) indicate population distributions of Pleistocene megafauna did exist, particularly around the confluences of the Colorado and Green Rivers in southeast Utah. Whether such a population distribution may have existed here in the valleys of the White and Yampa Rivers and their tributaries is unknown. Species identified in southeastern Utah include mammoth, mylodont sloth, Shasta ground sloth, horse, camel, bison, and such present day fauna as big horn sheep, deer and bear (Agenbroad 1991). As a result, the Clovis Tradition occupation of the area was probably by small groups exploiting a rather limited population of large mammals in lush environments within the larger local canyons. However, to date there is no evidence of large kill sites of megafauna in northwest Colorado, though such sites may be deeply buried in the alluviums of the canyons and valleys.

## Folsom Tradition

Evidence of the Folsom Tradition in the region is inconsequential. Data are lacking for this tradition and except for an isolated Bison antiquus skull reportedly found near the confluence of the Colorado and Gunnison Rivers, there are no recorded megafauna kill sites (personal communication, Harley Armstrong 1992). Folsom projectile points are rare; there are a few finds reported from private collections (with uncertain provenance), and regionally there are no well documented sites. The extent to which megafauna may have contributed to the overall subsistence pattern of local groups is still an open question. As with the Clovis Tradition, cultural materials from the Folsom Tradition are also probably deeply buried.

Three Midland points are also reported in the region. In Mesa County, they have been reported at two sites and as one isolated find (5ME281, 5ME1313, and 5ME5327). These projectile points very much resemble unfluted Folsom points and may possibly represent groups which lost, or never acquired, the fluting technology, or they may represent an intermediate step in the manufacturing sequence. They generally overlap, but make their initial appearance later than the Folsom points, and range in age from approximately 10,000 BC to 9000 BC. The three resource elevations range from 5,600 feet to 8,700 feet. It appears that the gradually drying climatic conditions may possibly have forced the megafauna and the people to concentrate around and near the more permanent water sources in the lowlands, followed by a dispersed migration to refugia at the higher elevations. As Pitblado (1993) observes, the Clovis and Folsom Tradition peoples occupying the region may have followed a more generalist approach to hunting and gathering rather than specifically focusing on the hunting of megafauna.

Notably, the fluted point tradition was coincident with the Western Stemmed Point Complex in the Great Basin and northwest Colorado Plateau, and paralleled its occurrence in the greater Southwest and High Plains regions. The Clovis and Folsom Traditions are followed by a variety of stemmed and/or shouldered Plano Tradition projectile points which may have been contemporaneous with Archaic Stage occupations in the Great Basin.

### Plano Tradition

About 9200 BC, wetter environmental conditions again prevailed and timberline was lower in the La Plata Mountains located to the south of the RMPPA. Dunal areas began to stabilize and the sage brush began to replace the desert shrub. However, around 9000 BC another change occurred and the environment became drier. Between then and about 4300 BC the timberline in the San Juan Mountains gradually retreated to higher elevations than at present. Somewhere around 8250 BC the monsoon pattern appears to have shifted southward. As a result, the drying climatic conditions in the more northerly lowlands caused forage production to drop and affected the distribution of the faunal populations in the eastern Great Basin and Wyoming Basin. However, such conditions would have increased the occurrence of cool season tubers. By about 6900 BC, pinyon trees were well established in northwestern New Mexico (Eckerle 1992). These changing forage conditions may have helped spur a shift toward an increase in gathering in the lower elevations, along with a movement of animals and people to the relatively moister and higher elevations of the foothills and mountains.

The Plano Tradition, which includes the Foothill-Mountain Complex of the Middle and Southern Rocky Mountains and the Cody Complex of the Plains and Mountains, is generally coeval with the early Western Stemmed Pluvial Lakes Complexes of the Western Great Basin. Within the GJFO, projectile points representing the Plains complexes of Agate Basin, Hell Gap, Scottsbluff/Eden, James Allen, and Cody have been recovered from surface contexts of about 30 sites. The Plano sites' elevations in the GJFO again mirror the general upland approach identified with the fluted points.

### Foothill-Mountain Tradition

In recent years, the majority of artifacts recovered from sites and as isolated finds dating to the Paleoindian Period in west central Colorado have been ones comparable to the Foothill-Mountain complex, dating ca. 9500-7000 BC (Frison 1991:67-71, 75, 80). Sites containing evidence of this complex in the RMPPA are 5ME13828, 5ME16351 and 5ME16669. The defining characteristics of the Foothill-Mountain complex derive largely from deep, stratified rockshelters – evincing long periods of human habitation – in Wyoming and Montana. The Foothill-Mountain construct is less well known in Colorado and many unanswered research questions remain. Nonetheless, sufficient data exist supporting the concept of a dichotomy in subsistence strategies between plains and foothill-mountain ecosystems.

Frison differentiates the Foothill Mountain from the Late Paleoindian mainly by evidence of differences in their subsistence strategies based on differences in their contact environment and resource base: "The Foothill-Mountain construct is an ecological model used to explain a complex of technology representative of a mode of subsistence specific to the highlands of the central Rocky Mountains" (Frison 1992:323). This strategy is one comparable to the later Archaic groups that would seasonally and annually shift both their subsistence foci and locations (ibid.:336-339). Open camps were established in moderately high parks and montane zones during warmer months; protective settings such as caves and rock shelters were sought in the foothills and transitional zone during colder months. Short term occupations at high altitudes represent specialized logistical endeavors.

Foothill-Mountain groups relied heavily on small to medium-sized animals. For example, Foothill-Mountain components in Mummy Cave (Wedel et al. 1968; McCracken 1971; and, Husted and Edgar 2002) contained faunal assemblages dominated by the remains of mountain sheep, thus attesting to the existence of cultural groups with different subsistence strategies than those living on the open plains and interior intermontane basins (Frison 1991:69). Bighorn sheep, pronghorn, deer, rabbits, rodents and reptiles constitute some of the most common faunal resources at Foothill-Mountain sites. Foothill-Mountain groups "...also relied heavily on plant resources, including seeds, berries, roots, leaves, and bulbs" (Reed et al. 2008). Ground stone provides additional evidence that floral resources were consumed.

Large communal endeavors such as communal kills are atypical of Foothill- Mountain groups and, therefore, large numbers of diagnostic projectile points are also absent. Known Foothill-Mountain projectile points display considerable regional variation (Frison 1992:329; Gilmore et al. 1999:80; and, Reed and Metcalf 1999:66). Stylistic/functional attributes include lanceolate forms exhibiting parallel-oblique flaking, slightly concave and ground bases as well as thick cross-sections and rough craftsmanship (Reed et al. 2008:41). Pryor Stemmed and Lovell Constricted are well known points of Foothill-Mountain groups.

Also similar to what is found for the Archaic period, Foothill-Mountain sites are characterized by few lithic raw material types; the majority of which derive from local sources (Reed et al. 2008). The highly localized lithic raw material assemblages suggest an insular quality of Foothill/Mountain groups.

## Paleoindian Architecture

Regionally, Paleoindian architecture is known from excavated sites in Wyoming. At three sites, structures were evidenced by holes indicating circular arrangements of poles or hard-packed living surfaces indicating circular lodge structures. Two of the oldest habitations were found in the Hell Gap valley. Dating 9750-9325 BC, they were apparent wickiup-like log structures with diameters of 2-4m (Irwin-Williams 1973). At the same site, but dating slightly later in age (ca. 9550-9000 BC) were three more with similar arcs and circles of post holes in a component with Agate Basin complex affiliation. Evidence of a sixth structure was found at Hell Gap having a Frederick complex affiliation and dating to ca. 7650 BC. With characteristics of the Late Prehistoric period, it consisted of a stone circle roughly 2m in diameter considered to have functioned as weights for holding down the edges of a hide tipi. Similar to floors of these structures, a Folsom complex camp at the Hanson site in northern Wyoming, which dated 9750-9100 BC, yielded three hard-packed living surfaces "believed to represent some sort of circular lodge structures" (Frison and Bradley 1980:9). Frison (1978:115-146) notes that indications from the associated artifacts and the nature of the "lodge" floors were that these were probably utilized for no more than a few days at a time. Similar evidence of structural remains was found at the Agate Basin site in southwest Wyoming. In the Folsom component there, two bison ribs were uncovered in a position suggesting they held down the edge of a lodge covering (Frison and Stanford 1982:39-41). All these examples are evidence of temporary structures – not unexpected in a nomadic hunting-gathering culture. It is possible that more substantial habitations similar to late Pleistocene Paleoindian pit structures previously found in Russia were constructed in the intermountain region of the Untied States during the cold seasons.

### 3.2.2 Archaic Era

Empirical data for plant and animal use during the Late Pleistocene and early Holocene periods are exiguous. However, during this time span the last extinctions of the megafauna were occurring and vegetation communities were radically changing across the North American landscape in response to climatic changes. It marks the beginning of a technological and economical transition from a hunting/mobile subsistence pattern to a hunting-gathering/ semi-sedentary one. The primary technological changes were the transition from twined basketry to coiled and the increased use of a variety of grinding tools that were utilized for the processing of roots, tubers and seeds collected from the expanding forests and grasslands. In general, this conversion resulted in a broader diet based on the increased emphasis on lower ranked plants and small animals. Also, evidence of the technological change is seen in the lithic tool kits used to hunt large game animals, as the large fluted and unfluted lanceolate projectile points gave way to smaller types, many of which were notched.

Important for understanding the Archaic Tradition in western Colorado is the fact that 1) three climatic zones were exploited: the cool desert, the temperate, and the boreal; and, 2) multiple biotic zones were utilized: the desert shrub (<4,600 ft.), the pinyon-juniper belt (4,600 - 6,500 ft.), the pine-oak belt (6,500 - 8,000 ft.), the fir-aspen belt (8,000 - 9,500 ft.), and the spruce-fir belt (9,500 - 10,500 ft.). Most sites occur in the pinyon-juniper zone but quantitative differentiation between it and the other zones is difficult to assess given the current state of the data. Clearly, at various times, ecological niches in these areas provided conditions stable enough for maintenance of a sedentary or semi-sedentary lifestyle. As continental environmental changes occurred throughout the Holocene, regional fluctuations were also felt, and the details of various cultural adaptations shifted as well.

A cultural-ecological model is posited and termed the Archaic lifeway, which incorporated broad spectrum hunting and gathering and the concept that co-traditions of diverse ethnic groups occupied and utilized different ecological facets of the same broad geographical area in differing ways. The socio-economic organization was conceptualized as consisting of band level societies focused on the household unit, with mobility as the adaptive strategy, and operating along an annual, seasonally based continuum from forager to collector, with subsistence and settlement strategies logistically organized on ecological economic zones that radiated out from the household residential base. Seasonal movements were primarily elevationally determined, based upon the availability and fruition of floral resources in concert with movements of large mammal herbivores (family Cervidae, Bos, Orvis and/or Antilocapridae) from winter to summer ranges and back again.

As expressed by Binford (1982, 2001) and Kelly (1992, 1995), mobility patterns among human foragers often take one or two basic forms: central place foraging characterized by a residential base from which foragers venture to collect foods and to which they return to consume them; and sequential foraging, characterized by movement from one location to another where food is both collected and consumed. There are of course many variants to the basic patterns: foraging groups may follow a central place strategy for part of the year and a sequential strategy for the remainder based on particular climatic conditions; or, a group may move its residential base two or three times a year, following a central place strategy from each new location. Alternatively, groups may split and reform, with part operating as central place foragers throughout the year and another part leaving to act as sequential foragers for part of the year before returning (Madsen and Schmitt 2005:124).

Central place foraging theory predicts that foragers established residential base camps in areas where a mixture of plants and animals were present, which would have maximized foraging returns within the vicinity of the camp (ecotones, wetlands, springs, sand dunes, etc.). It is assumed that long distance forays from these camps were conducted to hunt or collect special resources and usually resulted in establishment of a procurement camp. These camps were used to acquire and process raw materials before transport back to the residential camp in ways that maximized the net delivery rates to the centralized base camps. Because of climatic variations and seasonal availability of resources, the Archaic people of the Plateau were required to be collectors, the characteristics of which include: 1) storage of food for at least part of the year; and 2) organization of food procurement groups. Limitations to this orientation would be that long-term stays at residential camps would result in predation pressure on the higher ranked flora and fauna in adjacent areas, which would have increased the number of species being exploited, increased the travel distance for procurement, and lead to the expansion of a dietary regime to include lower-ranked plants and animals (Kennett et al. 2006a:135). Such a situation would have also opened Archaic populations to the acceptance of domesticated plants.

## Archaic Chronology

Evidence of the Paleoarchaic transition period (ca. 7500-5500 BC) is found in the surface finds of diagnostic artifacts that indicate three traditions appear to be operating in the region: the Plano Tradition of the Late Paleoindian Period with links to the Great Plains, a Stemmed Point Complex with links to the Great Basin, and the Foothill-Mountain Complex--possible precursor to the Mountain Tradition extant in the southern Rocky Mountains. Three periods follow that are defined by cultural changes and punctuated by climatic episodes: Early Archaic (ca. 5500-3750 BC), Middle Archaic (ca. 3750-1250 BC), and Late Archaic (ca. 1250 BC - AD 1300).

The Paleoarchaic period (7500-5500 BC) witnessed a deterioration of regional climates accompanied by higher average temperatures and less effective moisture. Climatic warming caused a reorganization of the resource base. Biota retreated to the more conducive climates of high altitudes and low altitudes adapted to desert-like conditions. The volatility of the environment initiated cultural change which resulted in the transformation of a highly mobile, big-game hunting lifestyle into a semi-sedentary hunting and gathering lifestyle.

This subsistence pattern reflected a combination of considerations regarding resource availability, predictability, and productivity. The Archaic foragers focused their subsistence activities on species with higher caloric return rates when available and, when unavailable, shifted to resources with lower rates. Intra-regional differences in the distribution, density, and seasonal availability of significant dietary plants and animal species would have affected settlement strategies. Some high priority resources were more abundant in or restricted to certain areas, for example, pinyon pine in the Colorado Plateau uplands. In northwest Colorado, the lowland deserts and grasslands and the upland forests occur in relative close proximity and were likely exploited via base camps along their ecotones.

Based on the dry climatic conditions, this period was one when the early Uto-Aztecan speaking foraging bands of the west-central Great Basin migrated to its southwestern edge. Decreasing effective moisture in subsequent centuries probably motivated these hunter-gatherers to abandon the lowlands of this region in favor of better-watered middle Holocene refuges. Migration destinations likely included areas east of the Colorado River with movement onto the Colorado Plateau and also southward to the northern Sierra Madre Occidental. Climatological factors may also have encouraged some bands to continue migrating southward (Merrill et al. 2009).

The Early Archaic (5500-3750 BC) exhibits a good deal of cultural continuity with the preceding period. Semi-sedentary hunting and gathering remained the most effective adaptive strategy. Procurement efforts centered on a broad spectrum of biotic zones that were exploited through a central-place foraging strategy. The intensification in procurement efforts is manifested in the burgeoning visibility of processing features as well as pit (pithouse) and basin (house-pit) structures. This period marks the first half of the Middle Holocene and represents the harshest drought conditions experienced by the prehistoric population. Again, much of the data derives from surface finds of projectile points which cross-date from other regions to this period. Radiocarbon dates from this period from multi-component sites tentatively argue in favor of subsistence and settlement strategies logistically organized on ecological economic zones that radiated out from a household residential base. Evidence of decreased mobility and longer-term, seasonal residency in the form of pithouses has been found in the mountain areas, but subsistence data are sparse.

Evidence of occupation of northwest Colorado in the Middle Archaic Period, ca. 3750-1250 BC, from excavation data greatly expands in comparison to the previous periods. This cool moist period in the second half of the Middle Holocene is evidenced by a wide variety of projectile point styles covering large regions of the Intermountain West, with the greatest influences coming from the Great Basin and the Wyoming Basin, with some minor contacts from the Southwest. The number of radiocarbon dates increases dramatically over previous periods. The occurrence of radiocarbon dates at several multi-component sites from this period suggests that subsistence and settlement strategies were indeed logistically organized on ecological economic zones that radiated out from a household residential base. In fact, this adaptation had become so well established that what may have once been simple, highly ephemeral, household residential bases had now become true “base camps,” which later metamorphosed into “localities” that were repeatedly and systematically re-occupied.

The Middle Archaic roughly corresponds with the Neoglacial period, which exhibited an overall increase in effective moisture and cooler temperatures. On the Colorado Plateau, these conditions were conducive to the expansion of the pinyon pine forest northward from New Mexico into central Colorado and eastern Utah by around 2750 BC (Berry and Berry 1986). With the advent of these more favorable environmental conditions, a shift by the aboriginal populations down to the middle and lower elevation levels would have been comfortably feasible. As the radiocarbon data reveal, there is an overall drop in the date frequencies for the Colorado mountains along with a corresponding rise in the date frequencies of the northern Colorado Plateau. By about 1700 BC, the pinyon forest again expands northward with pinyon and juniper trees present in the canyon bottoms and washes.

Climatic fluctuations occurred during this period and two distinct dry episodes are recorded by Petersen (1981) for the La Plata Mountains and by Chen and Associates for the Battlement Mesa area (Conner and Langdon 1987:3-17). Data supporting the first dry episode is derived from excavations conducted in the Alkali Creek Basin (located just north of the Gunnison Basin) and reported by Markgraf and Scott (1981). Their study indicates the presence of a montane pine forest at an elevation of 9,000 feet until ca. 3250 BC. The environmental model prepared for the Battlement Mesa Community shows an accumulation of windblown silts ca. 3250 BC (at the end of an extended, increasingly dry episode of the Neoglacial period) and again ca. 600 BC.

Between 2850 BC and 2550 BC, the increased moisture allowed the pinyon pine to expand northward from New Mexico into central Colorado and eastern Utah, and it became a major component of the La Plata Mountains in southwestern Colorado. By about 1700 BC, pinyon/juniper forest is present in the canyon bottoms and washes of the Colorado Plateau. This period exhibits stabilization of dune fields and reversion to sagebrush steppe of much of the area covered in desert shrub communities. Consequently, increased game populations and a wider variety of edible plants were available to the human populations at lower elevations.

The Middle Archaic is distinguished on the basis of increased variability in material culture. Reed and Metcalf (1999:79) also suggest that this period is characterized by less sedentisim in settlement patterns and perhaps greater seasonality in the use of higher elevations. Archaeological evidence for this patterned seasonal transhumance is found in the remains of shallow basin structures and their associated artifacts identified from this period at the Indian Creek Site near Whitewater (Horn et al. 1987) and in the Gunnison Basin at Curecanti Reservoir (Euler and Stiger 1981; Jones 1986).

There also appears to have been sporadic contact with Middle Plains Archaic groups as defined by Frison (1978) and evidenced by diagnostic artifacts associated with the McKean Techno-complex. Again, such finds indicate that there was frontier contact in northwest Colorado between highly mobile bands of hunters and gatherers during the Middle Archaic Period due to improved climatic conditions, which provided opportunities for exploration. It may well be that there are no fixed or well-defined boundaries present and that all the groups are generally operating in an open, free interaction zone within the region.

The Late Archaic (1250 BC - AD 1300) is a time of apparent stress on settlement systems. Drought-like conditions coupled with population packing caused adaptive strategies to reach a pinnacle of intensification. Such intensification is reflected in heightened processing of seeds and other lower rate-of-return resources, cultigen manipulation, and evidence of a shift to the bow and arrow. The Archaic lifeway likely continued as a survival strategy for hunter-gatherer groups through the end of the Formative period.

The initial portion of the Late Archaic Period appears to consist primarily of climatic conditions somewhat similar to the present with periodic fluctuations between cooler and wetter, cooler and drier, or hotter and drier conditions, depending upon geographic location. The same seasonal patterns of floral and faunal exploitation probably continued much as they had during the Middle Archaic Period. However, uncertainty caused by the fluctuating environmental conditions, coupled with increasing population densities, may have led to changes in social organization and a greater necessity to define group territories and home ranges. This may have been due to pressures from outside groups trying to relocate as a result of adverse environmental conditions in other areas.

One final aspect of importance during this critical period concerns the introduction or development of the bow and arrow, a major technological innovation over the preceding atlatl and dart. Exactly when this change occurred is controversial, but the majority of the available data indicate ca. AD 300.

### Projectile Points

The primary technological marker of the Archaic era is the atlatl dart point. The atlatl dart point is significantly smaller than the lanceolate point of the Paleoindian era, and manufacture appears to have employed less specialized technologies (Frison 1991:395). Furthermore, a diversity of haft element forms becomes visible; they are generally categorized into four broad groups: lanceolate, stemmed, side-notched and corner-notched.

"Lanceolate styles that seem to be restricted to the Archaic era include a series of largely unnamed points that are relatively thin in cross section and generally less than 1.5 cm wide and 8 cm in length" (Reed and Metcalf 1999:85). A variety of forms is evident and includes morphological attributes such as concave, convex, or straight basal edges as well as straight or convex blade edges. Also, there may be a hint of constriction or of notches on the lateral margins near the base (Reed and Metcalf 1999:85). Ground bases and blade edges are generally rare and specimens demonstrate a less careful manufacture technology. Contexts for lanceolate styles typically range from about 7000 to 4500 BC. A common Archaic lanceolate style is the McKean Lanceolate, of the McKean Complex, dating from after 3800 BC to as late as 1200 BC (Frison 1991:89). Actually, four projectile point types are diagnostic of the McKean: McKean Lanceolate, Mallory, Duncan and Hanna. Although there is data to support the co-occurrence of these points and therefor that of a *techno-complex*, there is also ample evidence that the former two often appear in tandem and the latter two generally replace them near the end of the period. Frison makes this case using the Signal Butte site in western Nebraska, which had McKean Lanceolate points in association with Mallory-type side-notched points in dated levels from 4550-4170 BP [~3200- 3000 BC] (ibid.). Frison (1991:24) refers to sites that indicate the stemmed indented base points such as the Duncan and Hanna of the McKean Complex roughly date from 2550 to 1200 BC; however, Reed and Metcalf (1999:85) obtained dates of 3250 to 1500 BC for the Duncan and Hanna points in the Yampa Valley of Colorado.

Other stemmed points include a variety of styles ranging from contracting stem points generally subsumed under Gypsum, Elko Contracting Stem, and Gatecliff Contracting Stem categories; and a wide range of unnamed points with straight to convex to distinctly rounded bases" (Reed and Metcalf 1999:85). Contracting stem points from the Great Basin and northern Colorado Plateau evince temporal distributions from about 3800 BC to AD 500 (Holmer 1986:105). It is clear that stemmed points grade into corner-notched points, obscuring the boundaries between these two broad categories.

Side-notched points exhibit variable morphological attributes ranging from straight to convex to concave basal edges and/or straight to convex blade edges. Notches vary from shallow to deep and can either be situated near the base of the point (low notches) or higher on the blade (high notches). Pronounced basal indentations or basal notching of side-notched points in the area is rare; however, basally indented, slightly side-notched points are well recognized on the Northern Plains and constitute a cultural complex known as Oxbow (Frison 1991:88). In general, side-notched points tend to predate 1800 BC. Examples of side-notched points indicative of the Archaic include: Elko Side-notched, Bitteroot, Northern Side-notched, Hawken, Mallory and Mt. Albion.

Corner-notched points evince an even broader range of size and basal diversity than do side-notched points. Generally, corner-notched points are subsumed under the Elko Corner-notched classification. Dates for Elko Corner-notched points are noted by Holmer (1986:102) to range from 7000 BC to AD 1000, with three date clusters (7000-3750 BC, 3750-1250 BC, and AD 1-1000). A series of distinctive corner-notched points have been stratigraphically dated for the Uncompahgre Plateau by Buckles (1971:1220), which have provided a baseline that is of greater utility than those lumped by Holmer into the Elko Corner-notched type.

The proliferation in projectile point styles after the late Paleoindian era is not well understood. It is possible that this phenomenon is simply a byproduct of time. In other words, "the Archaic lasted a very long time and, thus; there was time for this variability to occur" (Reed and Metcalf 1999:83). Alternatively, the multitude of point styles may be a result of decreased mobility. Decreased mobility inhibits the exchange of ideas- relative isolation would allow point forms to diverge. The fact that these divergent styles co-occur within temporally defined archaeological components is more difficult to explain. Reed and Metcalf (ibid.) go on to suggest one possible explanation: "Divergence in styles occurred during the stable periods of relative isolation; sharing of styles occurred during periods of settlement adjustment." On a more finite scale, variation in styles may reflect functional differences or differences in raw materials. It is also necessary to consider the variation that results from individual manufacture. A less optimistic possibility is that projectile point styles simply do not carry the kinds of cultural or social identity that archaeologists ascribe to them; thus, attempts to explain variation are futile.

"At one time, investigators thought that the multitude of styles indicative of the Archaic would eventually sort themselves into chronological and geographic patterns that would make specific point forms diagnostic of temporal periods, and perhaps areas" (ibid.)- but evidence continually arises suggesting a lack of temporal and spatial patterning. For example, Metcalf (1998) attempted to generate a typology for the Uinta Basin Lateral project by sorting points according to overall size, outline, and haft element characteristics. The typology was refined according to details of point form and it was hoped that this would reveal some temporal patterning within these broad categories. The study proved futile in that no such patterning could be detected. According to Reed and Metcalf (1999:83): "It would appear that the diversity and lack of chronological and spatial patterning is real, and that it is time to move beyond wishful thinking about obtaining an orderly projectile point chronology for the area."

### Archaic Era Adaptive Periods for Northwest Colorado

A recent publication documenting the "Synthesis of Archaeological Data Compiled for the Piceance Basin Expansion [WIC], Rockies Express Pipeline [REX], and Uinta Basin

Lateral [UBL] Projects in Moffat and Rio Blanco Counties, Colorado, and Sweetwater County, Wyoming" (Metcalf and Reed, ed. 2011) provides the best summary of Archaic Era adaptive periods for Northwest Colorado. Figure 3.4 shows the distribution of Archaic Era charcoal dates derived from the WIC, REX, and UBL projects for the Paleoarchaic [Pioneer], Early [Settled], Middle [Transitional] and Late [Terminal] (Metcalf and Reed, ed. 2011:125). [Dates of occupation are presented in Before Present (BP) contexts, which can be transcribed into AD-BC contexts by use of Chart 1.]

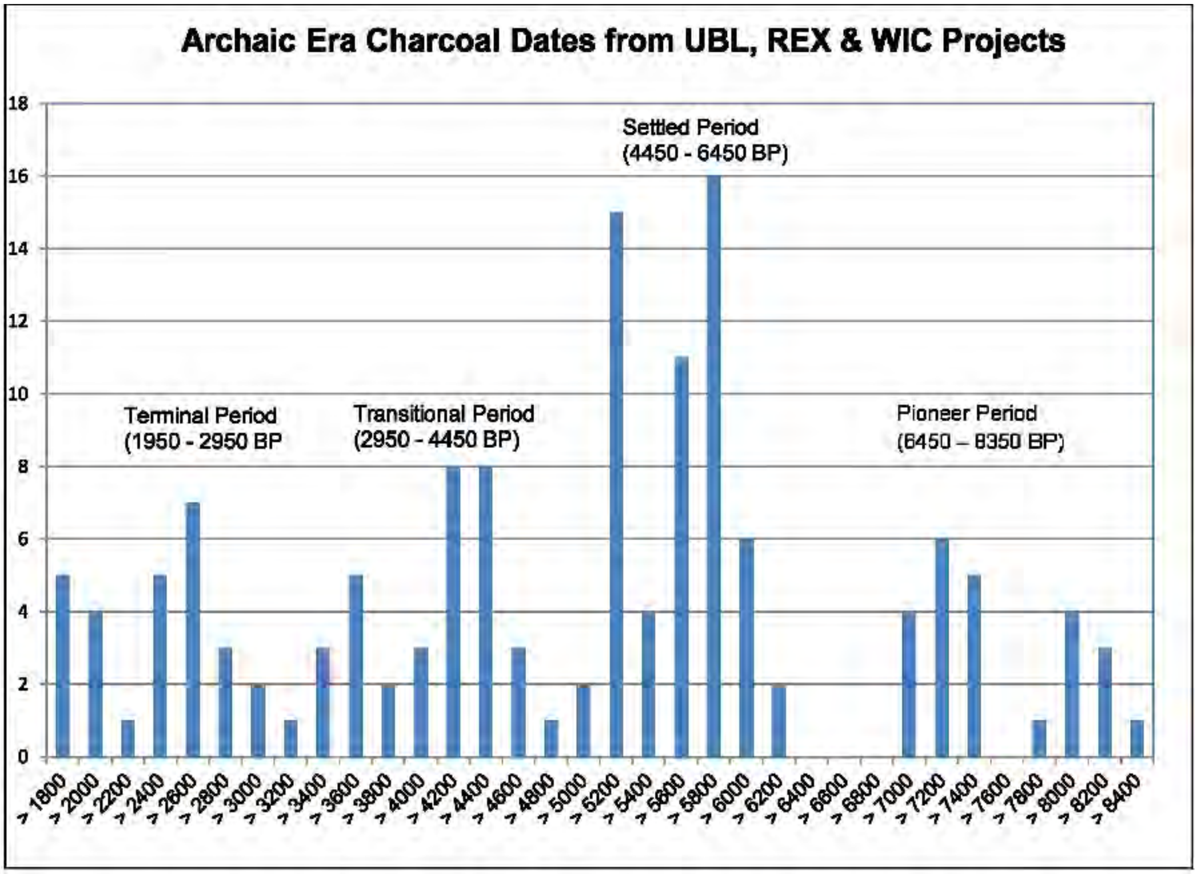



**Figure 3.4.** Archaic Era charcoal date frequency for the UBL/WIC/REX projects co-opted from Metcalf and Reed, ed 2011:125, Fig. 50).

Based on the frequency dips of dates in Chart 2, Metcalf and Reed indicate that division of the Archaic Era into the four periods seems to be supported by the data, and are suggestive of some kind of shift in use patterns. The dips in occupation were potentially due to climate change, migrations of new people into the region, and/or new cultural developments. Their findings are qualified by these factors: "...the large number of radiocarbon ages between 5200 BP and 6200 BP reflects the presence of basin house sites with numerous dated features, and the relative paucity of charcoal dates between 4500–5000 BP reflects the difficulty in obtaining charcoal samples from cultural features within the dark cultural deposits common in the Spring Creek Paleosol. When the data are adjusted to account for multiple dates from individual components, the apparent frequency of occupation appears to have been relatively constant between 3500 BP and 6000 BP" (Metcalf and Reed, ed. 2011:126).

A revision of the Northern Colorado River Basin Archaic Era chronology and characteristics of each of the adaptive periods is presented in Tables 3.1 and 3.2 – information co-opted from the original text (ibid.:160 and 161).

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**Table 3.1.** Proposed Revision of the Northern Colorado River Basin Archaic Era Chronology (Metcalf and Reed, ed. 2011:160, Table 41).

| Northern CO Periods | Age BP | Age cal BP | Northwest CO Adaptive Periods | Age BP | Age cal BP |
|---|---|---|---|---|---|
| Paleoarchaic | 8350 -6450 | 9350-7350 | AP 1 | 8500-8100 | 9500-9000 |
| Early Archaic | 6450-5000 | 7350-5750 | AP 2 | 7800-7000 | 8400-7900 |
| Middle Archaic | 5000-3000 | 5750-3200 | AP 3<br>AP 4 | 6300-5100<br>4500-3500 | 7200-5800<br>5200-3900 |
| Late Archaic | 3000-1800 | 3200-1700 | AP 5<br>AP 6 | 3300-2500<br>2200-1800 | 3600-2500<br>2200-1700 |

**Table 3.2.** Summary of Archaic Era Adaptive Periods for Northwestern Colorado (Metcalf and Reed, ed. 2011:161, Table 42).

| Adaptive Period | Age cal BP | Characteristics |
|---|---|---|
| AP 1 | 9500-9000 | Deception Creek points, medium artiodactyl hunting, simple hearth features, short-term occupations, predictable resources. |
| Anomaly | 9000-8400 | Warming/drying with some evidence of erosion. |
| AP 2 | 8400-7900 | First use of house pits, introduction of large corner-notched projectile points and slab-lined fire pits, rabbit-focused, increase in long-term occupations, and less predictability in resources. |
| Anomaly | 7900-7200 | Resumption of drying; widespread erosional event. |

| Adaptive Period | Age cal BP | Characteristics |
|---|---|---|
| AP 3 | 7200-5800 | Widespread use of house pits, introduction of side-notched projectile point series; balanced use of pit feature types; medium artiodactyls emphasized in subsistence; first period of intensive use of the area, increase in long-term occupations; resources relatively predictable. |
| Anomaly | 5800-5200 | Few occupations, but possible house use, a few deep roasting pits; rabbits in subsistence, fewest long-term occupations, within period of least resource predictability, sediments aggrading, inferred warm/dry. |
| AP 4 | 5200-3900 | House use at beginning and end of interval, houses absent ca. 4800-4100 cal BP? Introduction of McKean complex projectile points; medium and some large artiodactyl use; rabbits gain importance after 4500 cal BP. Cool climate interval; "Spring Creek" paleosol develops. |
| Anomaly | 3900-3600 | Few occupations with last dated house pit; no archaeofaunas; warmer/dryer interval; major erosional episode. |
| AP 5 | 3600-2500 | No houses; increased diversity of unclassified projectile points; smallest pit feature sizes; increased use of large artiodactyls, high incidence of long term occupations with some evidence of winter camps based on fetal material in archaeofaunas. Relatively predictable resources. |
| Anomaly | 2500-2200 | Few occupations, no obvious climate indicators; sediment record complex and variable depending on setting. |
| AP 6 | 2200-1700 | Roasting pit use declines; low incidence of ground stone; rabbits increase in importance; fewer long term occupations; decreasing resource predictability. |

Metcalf and Reed (ed. 2011:131-133) identified diagnostic points found in association with the Paleoarchaic, Early and Middle Archaic period sites, which are listed in Table 3.3. Importantly, they have identified a new type called "Narrow Series Points" that are characterized by broad, shallow side-notches, sometimes grading into a stemmed appearance, and are narrow, convex-to-triangular in overall shape. They also have a subset defined by shallow notches and a basal shape ranging from convex to very slightly concave. These have been dated ca. 7100–5900 cal BP (ibid.:132).

**Table 3.3.** Acceptable Early-dated Occurrences of Project Area Archaic Era Projectile Point Styles (Metcalf and Reed ed. 2011:131, Table 38).

| Point Type | Earliest Consistent Project Occurrences |
|---|---|
| Deception Creek | 9490 cal BP |
| Elko Corner-notched | 8000 cal BP |
| Elko Side-notched | 7245 cal BP |
| Northern Side-notched | 7100 cal BP |
| Narrow Series Points* | 7100 cal BP |
| Duncan-Hanna | 5000 cal BP |
| Mallory | 4860 cal BP |
| McKean Lanceolate | 4790 cal BP |

*narrow series points are not a regionally named type.

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### Archaic Era Architecture of Northwest Colorado

The most basic typology organizes the multifarious record of Archaic architecture into two general types: formal and informal. The key distinguishing feature between formal and informal is the amount of labor invested in the construction. Formal structures exhibit heightened investment of labor and evince a proclivity toward prolonged or repeated occupation. Semi-subterranean structures are typical manifestations of formal structures. Informal structures are characterized by expedient construction and a short term occupation.

A more finite classification of Archaic architecture is represented in the work of Thompson and Pastor (1995). Three different structure types (i.e., pithouses, house pits and temporary shelters) were identified in the Wyoming Basin on the basis of "associated features (internal or external), density and diversity of material remains (e.g., tools, bone, fire-cracked rock, debitage), and the patterning and interrelationships of those remains" (Thompson and Pastor 1996:90). Pithouses were identified as deep, round subterranean depressions containing interior features and internal architectural features (niches, walls), and that have midden refuse areas away from the structure. Examples include structures at the Medicine House site (McGuire et al. 1984) and possibly the Shoreline site (Walker and Ziemens 1976). House pits were identified according to smaller dimensions in diameter and depth. These structures were also noted to lack internal architecture, such as prepared floors and ventilator shafts. Examples include structures at Maxon Ranch (Harrell and McKern 1986), Sweetwater Creek (Newberry and Harrison 1986), and Split Rock Ranch (Eakin 1987). Temporary structures were described primarily as sun/wind breaks manufactured out of brush or wood. Remnants of four post molds encircling several small hearths at 48SW4492 (Creasman et al. 1983) appear to be temporary structures that were constructed to provide relief from the wind or the summer sun. Evidence for this structure type is extremely limited due to its ephemeral nature.

The ultimate goal of "typing" architecture is to unveil and discern the behavioral implications it carries for interpreting hunter-gatherer settlement and subsistence. For example, the presence of substantial structures carries implications concerning group mobility. Significant investment of labor suggests a strong tether to place and the importance of seasonal sedentism – both of which have been ethnographically documented (Gilman 1987). In the Rocky Mountains, evidence of substantial structures has stimulated speculation of a unique Archaic adaptation (i.e. the Mountain Tradition) to upland terrain – contesting the original idea that the mountains were exploited on a transitory seasonal basis (Black 1991). Despite criticism, the concept of a Mountain Tradition has directed "attention toward the existence of a rich prehistoric record that stands independent of broader culture areas like the Great Basin or Plains" (Reed and Metcalf 1999:79).

The occurrence of storage and habitation structures in this region has only in recent years been documented, primarily due to cultural resource management projects. The recent study by Metcalf and Reed (ed. 2011:139) detailed data from a sample of 65 house pits with occupations spanning nearly the entire Archaic Era (Figure 3.5).

House pit ages ranged from the oldest at 8170 to 8022 cal BP (5MF6255) to the youngest at 3970 to 3560 cal BP (5MF2990). Their best documented/dated houses in the sample have ages between 4835 and 8170 cal BP, and the majority of houses date between 5600 and 7100 cal BP. Notably, the use of house pits was not observed for the period 3600-2500 BP in northwest Colorado during the UBL/WIC/REX projects, but such is known to occur in the Grand Valley area (near De Beque and Parachute) during the period ca. 3000-2700 BP (Berry et al. 2013).

Prior to their study, two of the oldest pithouses in Colorado were found in the Yarmony site near Kremmling and dated between 5380 and 4800 BC (cf. calibrations in Metcalf and Black 1991:57-58). Also, at altitudes of 8,000 feet or more in Colorado, what were apparently wattle and daub structures have been found in the Curecanti National Recreation Area near Gunnison (Cassells 1997) and at the Hill Horn and Granby sites near the town of Granby (Wheeler and Martin 1982). The Curecanti structures date between 3400 and 1500 BC (Cassells 1997:106-108). The Granby structures date to 2500 BC and the Hill Horn structures may date as early as 7000 and as late as 2500 BC (Wheeler and Martin 1982:24).

Interestingly, recent excavations at the McClane Rockshelter, 5GF741, located in the Roan Plateau, provided evidence that Middle Archaic McKean Complex groups were creating structures within rockshelters by constructing brush and/or pole walls around the perimeter of the overhang – essentially making sheltered houses. The interior exhibited a centrally located thermal feature, and lined and unlined storage pits. The evidence of these houses occurred in the two lowest stratigraphic units, which contained three occupation levels dating between ca. 4200-3000 BP. Winter occupation is surmised for these three habitations (Berry et al. 2013).

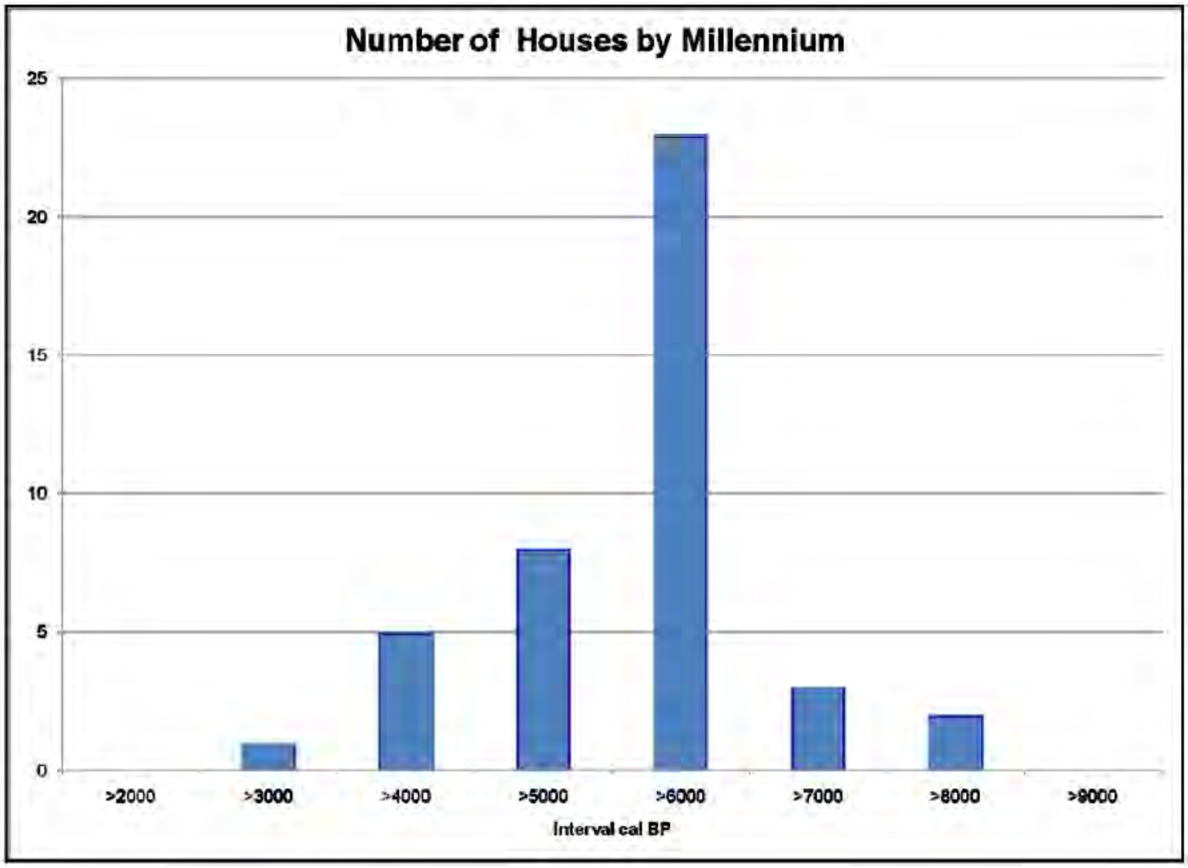


**Figure 3.5.** Number of dated UBL/ WIC/REX projects house pits by cal BP millennia (Metcalf and Reed ed. 2011:131, Figure 59).

### Thermal Features

A wide variety of features such as simple ash stains, basin hearths, rock-filled pits, rock-lined pits, slab-lined pits, and fire-cracked rock concentrations occur throughout the Archaic. Undoubtedly, most of these features were constructed for cooking food; however, some without thermal characteristics may have also been used for storage.

Relatively little research has been devoted toward understanding the function of such features. However, "archaeologists are beginning to do more with ethnographic descriptions and with experimentation" (Reed and Metcalf 1999:81, 82). For instance, Stiger (1998:65) experimented with the heat-output of four feature types at the Tenderfoot site and Francis (2000:5) went so far as to calculate the potential volume of camas and biscuitroot that could be processed in a large cobble filled feature at 48SU1002 in the Upper Green River Basin of Wyoming. Thompson and Pastor (1995:91) also experimented with volume calculations for slab-lined features in southwest Wyoming and determined that the vast majority ranged from 40 to 60 liters. This 40 to 60 liter subset contained features dating from the Great Divide (7750-5600 BC) through the Uinta (AD 1-1400) phases. A second cluster of features had calculated volumes ranging from 80-150 liters; the majority of these featured dated to the Opal phase (5600-3400 BC). Two extremely large (268.6 and 285.6 liters) features were noted and both date to the Pine Spring phase (3400-1450 BC).

Features are also one aspect of technological organization used to look at temporal changes. Reed and Metcalf (1999) organized 450 dated features, with origins in the Northern Colorado Basin, into 500-year increments. Originally, there were more than 50 descriptive labels for the 450 dated features. For the analysis, Reed and Metcalf decided on seven basic categories: simple ash stains, simple hearths, basin hearths, rock-filled pits, rock-lined pits, slab-lined pits, and fire-cracked rock features. Results from the analysis indicate:

> Simple stains and basin hearths appear earliest in time, and along with simple hearths, are important in all time periods. Rock- and slab-lined pits attain importance early in the Archaic, and also show increased frequency of use around 2000 to 2500 BC and again in the Formative era. Rock-filled features have generally the same temporal distribution as rock- and slab-lined features. Features that are primarily clusters of fire-cracked rock occur in the latter half of the prehistoric record (Reed and Metcalf 1999:82).

In the Gunnison Basin, a similar temporal distribution is evinced. Stiger (1998: Figure 7-2) indicates that unlined firepits occur in all periods. Specialized boiling pits occur from about 7500-4650 BC, and slab-lined pits occur from about 7000-1200 BC. Large fire-cracked rock features occur from 4650-1200 BC. Smaller fire-cracked rock features are more abundant later in time.

Several avenues of research are proposed to promote a better understanding of the associations between feature morphology, function and site activity. For instance, experiments with the heat out-put of different feature types may lend insight into the intensity of activities at a site and/or the length of occupancy. The temporal distribution of features or, more correctly stated, the frequencies of radiocarbon dates through time, has often served as a tool for estimating population. Finally, the temporal distribution of different feature types may carry implications concerning social organization (Stiger 1998).

### 3.2.3 Formative Era

The Formative Era from 400 BC – AD 1300 (as defined by Reed and Metcalf 1999:6) is represented in western Colorado by the Fremont, Anasazi/Ancestral Puebloan, Gateway, and Aspen Traditions. The Fremont Tradition people are likely the most represented in Northwest Colorado and may have occupied it from ca. AD 200-1500; but there remain many unanswered questions concerning the Fremont. It is generally agreed, however, that various horticulturalist (Formative) groups – possibly of diverse origins and languages, but sharing similar material traits and subsistence strategies – occupied selected areas in Utah and western Colorado during that time.

The first real attempt to provide a regional synthesis of the Formative Period appeared in the West Central Colorado Prehistoric Context (Reed 1984). At that time, the archaeologists working in the area were operating under the Formative Stage concept as defined by Willey and Phillips (1958:146) wherein the Formative Stage was defined as "the presence of agriculture, or any other subsistence economy of comparable effectiveness, and by the integration of such an economy into well established sedentary village life." No temporal contemporaneity was implied. Very little work had been done, and much of the previous research had operated under the assumption that the sites were representative of the Fremont or Anasazi Traditions, with little consideration given the possibility that another, undefined tradition might be represented. However, one proposition put forward within this first Context was that these sites represented an in-situ development from an Archaic technocomplex wherein people practicing an Archaic tradition lifestyle adopted a Formative Stage lifestyle as the need to intensify food production arose. Cultigens may have been perceived as relatively unimportant to the hunting and collection of wild foods, which were still able to meet most of the economic needs.

The Formative Era is inextricably linked to the domestication of plants and the development of ceramics. The origins of the defined Anasazi and Fremont cultures that occupied the region are deeply rooted in the Archaic-possibly as early as 3000 BC. The principal events that link the Formative and the Archaic are the expansions of populations and transmittal of corn horticulture from Mexico. Expansion into the southwest from Uto-Aztecan speaking horticulturalists is noted as early as 1000 BC, but earlier evidence of the adoption of corn is found in the general region and suggests multiple incursions by horticulturalists into the Southwest from Mexico.

Production of the three principal domesticates-maize, beans and squash-in Mesoamerica was widespread by 2000 BC. Reliance on this triumvirate was preceded by varying subsistence strategies including mixed foraging, horticulture, and ultimately low level food production. These stages are characterized as prefarming, transition to farming, and dependence on farming. It is in this last stage that dispersal or expansion from homeland regions likely occurred. Regional adoption of corn horticulture results from a decision to minimize subsistence risk (Gremillion 1996:199). In contrast, for a horticultural society, examples of risk minimization shifts would be in diversification to fall-back wild plant resources or in the dispersal of growing plots (Kennett et al. 2006a:197). For a hunter-gatherer group to adopt horticulture meant a change in the fabric of their culture in order to organize planting, harvesting, storage, protection, and distribution of food. The rewards in adoption of agriculture are found in abundance of selected resources and by the resultant increase in population. The risk is found in the variability of climate causing shortfalls and the occurrence of boom and bust cycles. Bust cycles would result in a substantial decrease in population and force the remaining people to aggregate in environmentally favorable niches.

The best known of the early domesticates is maize. Some microfossil data suggest that the oldest surviving maize came from the highlands of Mexico and dates to ca. 8000 BC (Matsuoka et al. 2002). This early date is somewhat in question, however. Some researchers believe that Zea mays emerged as a separate species from its wild progenitor teosinte in the lowlands of Central America rather than the highlands of Mexico because dates from archaeological sites in the lowlands of Tobasco and Panama are as early as 5000 BC.

The pollen from the early maize is nearly indistinguishable from that of teosinte, but in samples just a couple of hundred years later the phytoliths and pollen assemblages from Panama and Tobasco are recognizably similar to those of modern maize. This sequence of transition in the pollen is not noted in the highlands of Mexico, but fully domesticated cobs have been found there that date to 5000 BC, which suggests that the origin of maize indeed occurred in the tropical lowlands. Distinct varieties of maize were developed to meet the needs of people living at various elevations and to meet various environmental threats, and adjustments are continuing today. Although much larger cobs are found in both lowland and highland sites in Mexico and Central America after 5200 BC, pollen evidence indicates that the smaller Zea persisted until about 3200 BC (Kennett et al. 2006b:122). Full-sized cobs may not have developed until about 1250 BC (Benz and Long 2000).

In any case, the representatives of this early group would not be recognizable as “corn on the cob,” but are best characterized as large grass heads. Importantly, the kernels were enclosed in a hard glume that was resistant to insect infestations and fungal diseases, which was likely the reason for their selection for storage and manipulation. In Archaic subsistence strategies, storability was a critical factor in the selection of some foods. Many seed types often yield lower immediate returns because they require more processing but are ideal for storage. In contrast, berries are an example of a food resource that yields higher immediate return because they are best consumed fresh.

The earliest evidence for corn in the Southwest was provided by Dick's (1965) excavations at Bat Cave in central New Mexico, which yielded dates of ca. 4500 BC. These dates were later disputed by Woodbury and Zubrow (1979) and Berry (1982). Dates from Bat Cave of ca. 2000 BC are now believed to be more accurate, although investigations at the site by Wills et al. (1982) have questioned the reliability of these as well. However, Haury's (1957) indication that maize was in use by ca. 2550 BC at Cienega Creek, a Cochise Culture site, and Irwin-Williams' (1973:9) assessment of maize use by the Oshara Tradition during the Armijo Phase (ca. 2250-900 BC) support the evidence for early maize in the Southwest.

Similarly, the oldest squash seeds were identified at the Sheep Camp Shelter located in northwest New Mexico, and dated ca. 1100 BC (Simmons 1986:77).

In addition, Merrill et al. (2009) reference fifteen radiocarbon dates on maize macrofossils recovered from five sites located in New Mexico and Arizona. The dates cluster at ca. 2650 BC and raise the likelihood that maize arrived in the southwestern United States prior to that date. Importantly, the earliest dates for maize at three of these sites are consistent with dates derived from associated materials and features.

Recent finds in western Colorado, southern Wyoming and northern New Mexico have added to the case for the early dissemination of maize into the region. In Rangely, site 5RB4748 contained three Middle Archaic-age house-pits that each yielded corn pollen that dated ca. 3000-2450 BC (Rohman and Fetterman 2007:45). Rohman and Fetterman also report that corn microfossils have been collected in recent years from two northern New Mexico sites; the samples date 2900-2350 BC (Huber 2005) and 1700-1250 BC (Vierra and Ford 2005), indicating that corn has been present in the Southwest much longer than previously believed.

These dates for the earliest corn pollen indicate a potential migration of farmers into the Southwest from the Mexican highlands ca. 4800-3000 BC - a migration that was most likely motivated by climatological factors. As stated earlier in the Paleoenvironmental section, Miller (1992; in prep) reports that pollen from dated archaeological sites indicate the climate was coolest and wettest in the middle Holocene from about 5500 to about 3200 BC. It is during this time that the climate of highland central Mexico was characterized by decreased effective moisture, while after 5600 BC, the southwestern United States and northwestern Mexico experienced an increase in effective moisture (Merrill et al. 2009). As a result, farmers living in the transitional zone between these two regions may have been drawn northward by the relatively greater effective moisture available there.

The how, why, and when corn horticulture arrived from the Tehuacan Valley of Mexico and was adopted into the subsistence strategies of the Archaic populations in the American Southwest is a continually evolving research question. The routes by which corn traveled from the highlands of Central Mexico to the Southwest are unclear, and include possible movements through the lower elevations of the Pacific coasts of Mexico, through northwestern Mexico, and then into the Southwest, or it could have traveled along the eastern flanks of the Sierra Madre occidental through Chihuahua and then into the Southwest, though Adams (1994) suggests that both routes are possible depending upon the strains or races of maize involved. By whatever means, the principle questions revolve around adaptation to the environmental conditions present in both the Basin and Range and Colorado Plateau provinces of the Southwest.

As to why corn horticulture was adopted, Wills (1988; 1995) endorses an enhanced resource predictability model in which cultigens were transferred to the uplands from lowland economic systems utilizing seasonal sedentism, and that the initial use of maize in the Southwest was not a casual occurrence. Minnis (1992) basically agrees with an enhanced resource predictability model, but suggests that early agriculture in the southwest was small scale and dispersed, and was an opportunity which caused little conflict in the scheduling activities within the general context of mobile hunting and gathering. However, Matson (1991) argues that it is first necessary to create a developmental model of the environmental adaptations necessary for the transference of maize from the lowlands to the uplands, as viewed through the evolutionary history of maize and its technological history of cultivation. All three proposals are probably correct, depending to one degree or another upon one's position in space/time on the Colorado Plateau or in the Basin and Range provinces of the Southwest.

As to when, the earliest undisputed date in the Southwest is around ca.1900 BC, and the indications are that the transition to corn horticulture was probably well underway by ca. 800 BC (Cordell 1997:140 - Table 3.1). For those peoples living near the northern end of the Colorado Plateau in west-central Colorado, the transition took a while longer, and it was not until late in the Basketmaker II period, ca. 400 BC, that the corn started popping.

Agricultural hamlets have not yet been identified in west central Colorado. However, agricultural habitation sites and small granaries have been reported anecdotally. For example, Huscher and Huscher (1943) reported small, circular, dry-laid stone structures along the lower Gunnison River at the extreme southern end of Mesa County. In addition, a couple of granaries with corn have been reported for Toms Canyon in the Glade Park area. Unfortunately, both of these have not been formally investigated or dated.

The best evidence for horticultural activities from excavated contexts in Mesa County is the occurrence of corn macrofossils from six sites: Roth Cave (5ME449); two charred corn cobs from 5ME453 (Arroyo Site C2-2); a tentatively identified cupule fragment from 5ME4971; charred cupules from 5ME11334; kernels and cucurbita seeds from 5ME11368; and charred cupules from 5ME11374. In addition, two corn pollen samples have been reported, one from 5ME4828 and another from 5ME6144.

Radiocarbon dates ranging from AD 660 - 1155 were derived from charcoal from five of the six sites (5ME4828, 5ME6144, 54ME11334, 5ME11368, and 5ME11374). However, the contexts of the carbon samples are somewhat debatable. For example, the corn pollen sample from 5ME6144 has conflicting dates, as the sample was recovered from the soil matrix beneath a shallow storage feature. Charcoal from the soil matrix in front of the storage feature returned a calibrated radiocarbon date of AD 850 - 900. However, a date taken from a grass bundle which lined the bottom of the storage feature returned a calibrated radiocarbon date of AD 1680 - 1810. Since the storage feature was intrusively dug into the matrix from which the corn pollen was recovered, the author(s) feel that the earlier AD 850 - 900 date is the most tenable. Also, the tentative identification of a deformed corn cupule fragment from 5ME4971 is problematic in that it was associated with a hearth which returned a charcoal derived radiocarbon date with a calibrated date range of AD 1335 - 1435. Whether these late dates from 5ME4871 and 5ME6144 have any bearing on Reed and Metcalf's (1999) conjectural Texas Creek Overlook period (AD 1300 - 1600) for the Fremont of the Douglas Creek/

Dinosaur area, or the use of corn by atypical Utes would be totally speculative at this time. The reader is advised to use the data from these two sites with some skepticism. One of the most reliable dates is for the corn pollen sample taken from the uppermost cultural level of 5ME4828, which dated from AD 900 - 1100.

Six additional sites within Mesa County have been reported to contain maize; however, these have not been subjected to thorough investigation. These sites as well as the aforementioned excavated sites are listed in Table 3.4.

**Table 3.4.** Sites within the GJFO that contain evidence of maize.

| Site Number | Comments |
|---|---|
| 5ME449 (Roth Cave) | Kernels and cobs. Corn sample should be $^{14}$C dated. Curated at University of Colorado Museum. |
| 5ME468 (Alva Site) | Cobs. Recorded as intrusive. If the samples can be found, they should be $^{14}$C dated |
| 5ME1545 | Three granary remnants plus 3 corn kernels. Survey data only. No site map, no photos. Corn is curated at Museum of Western Colorado (MWC). |
| 5ME3908 | One corn cob, found and collected on survey. |
| 5ME3693 | One corn cob, initially identified as maize de ocho, but this is tentative. Found on survey within 3 cm of surface. Possible historic feed corn. See site form. |
| 5ME4828 | Zea mays pollen |
| 5ME4971 | Deformed kernel - tentative identification - Radiocarbon date from associated hearth is Late Prehistoric, 510 ± 70 BP ([Beta-14323] cal AD 1290 – 1510) |
| 5ME 6144 | Zea mays pollen |
| 5ME11334 | Charred cupules |
| 5ME11368 | Kernels and cobs, plus cucurbit seeds. Coprolite analysis also shows uncharred Cheno-am and Helianthus seeds. Curated at the Museum of Western Colorado. |
| 5ME11374 | Charred cupules |
| 5ME1545 | Survey data only. Three corn kernels associated with remnants of 3 granaries, ground stone, & lithics. Kernels should be typed as to species and AMS $^{14}$C dated. Samples are at MWC. |

Agricultural hamlets have been reported for the southern Colorado Plateau. Many of these have been investigated, although the investigations are somewhat dated (1940s and 1970s). A fairly recent Class I cultural resource study conducted by Reed and Gebauer (2004) reported on ten sites in Montrose and Ouray Counties that have yielded reasonably well-dated specimens of corn and/or squash (Table 3.5).

Radiocarbon data for these sites indicate that corn appears to have been restricted to two periods which date ca. 200 BC to AD 500 and ca. AD 900 to 1100 (Reed and Gebauer 2004: 83). The first period is roughly coeval with the Basketmaker II period of southwestern Colorado. The 400-year-long hiatus in corn use between the two periods may reflect an abandonment of horticultural practices in the area (Reed and Gebauer 2004:83).

**Table 3.5.** Ten sites in Montrose and Ouray Counties with reasonably well-dated specimens of corn and/or squash.

| Site Age or Estimate | Site Number | Site Name |
|---|---|---|
| 235 BC to AD 120 | 5MN4253 | Schmidt Site |
| 200 BC to AD 75 | 5OR243 | -- |
| 160 BC to AD 220 | 5MN519 | Cottonwood Cave |
| AD 1 to 100 | 5MN868 | Tabeguache Cave |
| AD 1 to 500 | 5MN3876 | Transfer Road Hamlet |
| AD 460 to 650 | 5MN890 | Tabeguache Cave II |
| AD 900 to 1150 | 5MN368 | Weimer Ranch IV |
| AD 900 to 1150 | 5MN653 | Wagon Bend |
| AD 900 to 1150 | 5MN654 | Cottonwood Pueblo |
| AD 900 to 1150 | 5MN517 | Hill I |

Reed and Gebauer (2004: 83) suggest the dates for maize on the Uncompahgre Plateau that indicate it was restricted to two periods, which date ca. 200 BC to AD 500 and ca. AD 900 to 1100. The first period of use posed by those authors is roughly coeval with the Basketmaker II period of southwestern Colorado. However, at site 5ME17922 a radiocarbon data of ca. AD 650 secured from corn cobs indicate that the date extension to that time as indicate by the corn from Tabaguache Cave II may be a better demarcation for the early period of maize grown on the Uncompahgre Plateau (Conner et al. 2011). That date firmly places the maize-growing occupants in Basketmaker III times. There may yet be proof of a hiatus in corn use on the Plateau as proposed by Reed and Gebauer (ibid.), but not as long as previously estimated.

## Defining the Formative Expression in Northwest Colorado

The local Formative Era groups adopted many of the Anasazi traits, yet remained distinct in several characteristics including a one-rod-and-bundle basketry construction style, a moccasin style, trapezoidal shaped clay figurines and rock art figures, as well as a gray coiled pottery (Madsen 1989:9-11). The Fremont apparently retained many Archaic subsistence strategies, such as relying more on the gathering of wild plants and having less dependence than the Anasazi on domesticated ones--corn, beans, and squash. However, maize horticulture was practiced by the Fremont in selected areas throughout the region, as indicated by excavations in east central Utah and west-central Colorado (Barlow 2002; Hauck 1993; Madsen 1979; Wormington and Lister 1956).

A significant concentration of the Fremont Era sites has been identified in the Douglas Creek area of northwestern Colorado. Characteristics of this group include dry and wet-laid masonry structures on promontories, granaries in overhangs, and slab-lined pithouses. In recognition of the significance of the Douglas Creek's archaeological sites a National Historic District was established in 1973 that includes a 1.0 mile wide corridor that stretches roughly from where East and West Douglas Creeks divide north to the White River. The district was largely established in recognition of the highly visible rock art panels from whence it drew its name "Canyon Pintado" [Painted Canyon] from the journals of the Dominguez-Escalante Expedition. Several definitive inventories have been completed in the district including those by Gilbert Wenger (1956) of the University of Colorado, and by the Laboratory of Public Archaeology at Colorado State University in 1976, 1977, 1978, and 1979 (Creasman 1981a,b).

Hauck (1993:250) identifies several early Formative Era occupations of the Douglas Creek area that range in date from ca AD 300 to AD 950. The early period dates derived from sites 5RB3498 and 5RB454 (Hanging Hearth) include AD 320 ± 90 (Feature C 5RB3498) and AD 390 ± 70, respectively. Importantly, these features were found to have significant amounts of pollen and macro-flora that indicated the inhabitants were actively processing chenopod-amaranth (Cheno-Ams) seeds. Since Cheno-Ams thrive in disturbed soils, Hauck concludes that these plants were being manipulated, if not outright cultivated, in a growing patch. At 5RB3498, dates from six separate short-term occupations were acquired that ranged up to AD 970 ± 40, and all the thermal features contained evidence of Cheno-Am processing. Hearth features and strata in sites 5RB2828 and 5RB2829 had a much tighter range of dates which fall within the more traditional range of sites classified as "early Fremont" by Hauck. Those sites yielded 12 radiocarbon dates between AD 560 ± 80 and AD 810 ± 50; some of which had associated diagnostic artifacts including Rose Spring points and sand tempered gray ware. This ceramic type has been named Douglas Creek Gray ware by Hauck, and has associated dates of AD 570±40 and AD 790±60 (Hauck 1993:252). Comparable dates and ceramics were obtained from 5RB2958 (Baker 1990). Other Fremont ceramics known in the area include Uinta Gray Ware and Emery Gray Ware.

Hauck (1993:251) indicates that the resurgence of Anasazi artifact associations (both in lithics and pottery) in this general region evidently had “a Late Formative cultural phase similar to the Bull Creek phase of the San Rafael region to the southwest.” This late Fremont period appears to extend from AD 950 and 1150, a range which is contemporaneous with the late Pueblo II and Pueblo III occupation on the southern Colorado Plateau. Two types of Anasazi ceramics often found in the Douglas Creek area are Tusayan and Mancos Corrugated gray wares. Similar intrusions of Anasazi ceramics have been identified in the Uinta Basin. Hauck also notes there is a distinct similarity between the dry-laid surface masonry structures, promontory sites above the canyon floor, and absence of free-standing storage units of the Uinta Basin and Douglas Creek areas with those found at the Turner- Look Site located in the Book Cliffs area (roughly north of Cisco, Utah). Accordingly, he states that the Book Cliffs phase as originally postulated by Schroedl and Hogan (1975:54-55) is probably the most appropriate designation for this late Formative development in the Uinta Basin and Douglas Creek localities.

Reed and Metcalf (1999:118) have proposed a sequence for the Fremont occupation of northwest Colorado that includes conclusions based on several of the previous inventory projects. They postulate four periods founded on the presence or absence of ceramics, corn horticulture, and structural features:

Early Fremont period: AD 1-550; characterized by the semi permanent structures, use of the bow and arrow, the presence of corn horticulture, but the absence of ceramics–a Basketmaker II-like adaption.

Uintah (or Scroggin) Fremont period: AD 550-1050; the “classic” period characterized by substantial residential architecture, gray ware ceramics, the presence of corn horticulture, and human aggregation into small hamlets.

Late (or Wenger) Fremont period: AD 1050-1300; characterized by the probable return to hunting and gathering; however, the lack of dated sites makes this period hypothetical.

Texas Overlook Site period: AD 1300-1600; due to the lack of data, this is a classification that is tentative at best and subject to further review.

Finds in west-central Colorado suggest a regional Fremont variant that is characterized by distinctive stylistic rock art, a reliance on overhangs and rock outcrops for shelter, an absence of surface storage structures, and a possible figurine complex. Maize was apparently grown throughout the area, but the level of dependence on this resource and other domesticates has not been established. The most common type of Fremont projectile point found here is the Rose Spring Corner-notched; others include the Uinta Side-notched, Cottonwood Triangular, Bull Creek, Desert Side-notched, and East-gate Expanding Stem. As in Utah, Puebloan trade wares are commonly found at Fremont sites, sometimes in association with Fremont pottery types (Madsen 1977:vi; Jennings and Sammons-Lohse 1981:75-94).

From their excavations of cave and arroyo sites on Glade Park, Lister and Dick (1952) documented the presence of "Fremont-Basketmakers" as they uncovered unbaked molded clay figurines as well as evidence of maize horticulture. In the same area on Glade Park and also along the Colorado River, Conner and Ott (1978) recorded several Fremont petroglyph and pictograph panels. Again on Glade Park, a radiocarbon date of 950 BP (AD 1100) and a Rose Spring Corner-notched point were obtained from excavations at the Gore Site, known for its splendid Fremont (Classic Sieber Canyon) rock art (Clifton Wignall, personal communication).

In the De Beque area, a previous study for Chevron Shale Oil Company identified Turner Grey pottery at site 5GF656 and artifacts associated with the Fremont period at three other sites (LaPoint et al. 1981:4-57). Southwest of De Beque, a Classic Sieber Canyon Style rock art panel occurs in a side canyon of the Colorado River. South of the Colorado River near the town of Mesa, excavations by Grand River Institute at Jerry Creek Reservoir #2 produced radiocarbon dates, associated projectile points, and ceramics from the Fremont Period (Martin et al. 1981:92, 135). Again, in the Mesa/Collbran area, local collectors have recovered a number of southwestern pottery types. The Young collection was analyzed and found to contain seven identifiable types of decorated Puebloan wares and several corrugated wares comparatively dating between AD 1000-1300 (Annand 1967:57). Groups I and II of the analysis are not assigned as to cultural affiliation but, from the descriptions given, are very likely Fremont types.

Excavations at Battlement Mesa in the early 1980's produced an interesting continuum of diagnostic artifacts and radiocarbon dates related to the Formative Era occupation. Table 3.6 summarizes the findings.

**Table 3.6.** Summary of Formative Era chronology indicators resulting from inventory and excavation for the Battlement Mesa Community Cultural Resources Study (Conner and Langdon 1987). [RADIOCARBON DERIVED DATES ARE BOLDED]

| Site No. | C-14 data/Diagnostic artifact comparative date | Diagnostic Artifacts/Features |
|---|---|---|
| 5GF133 | diagnostics:<br>ca. AD 1225-1300;<br>ca. AD 1100-1300 | Uinta Side-notched points;<br>Tusayan B/W ceramic sherd;<br>Tusayan Corrugated sherds |
| 5GF123 | diagnostics:<br>ca. AD 700-1300 | Uncompahgre Complex Coal Creek Phase points |
| 5GF134 | **AD 1030-1140** | Rose Spring Corner-notched point; [clay on hearth] |
| 5GF129 | **AD 715-895** | Rose Spring Corner-notched point |

| Site No. | C-14 data/Diagnostic artifact comparative date | Diagnostic Artifacts/Features |
|---|---|---|
| 5GF134 | **AD 615-765** | Rose Spring Corner-notched point; and pit structure |
| 5GF132 | diagnostic:<br>ca AD 500-1100 | Rose Spring base |
| 5GF128 | **AD 565-665**<br>**AD 420-550**<br>**AD 295-425** | Rose Spring Corner-notched point;<br>clay balls; pendant |
| 5GF122 | **AD 225-395** | Slab-lined floor |
| 5GF127 | **AD 65-245** | Dated thermal feature |

Following the Basketmaker II phenomenon on the southwestern portion of the Uncompahgre Plateau is a culture identified by Reed and Metcalf (1999) as the Gateway tradition. Its present boundary is along the lower San Miguel and Dolores River drainages in western Montrose County–just east of the present project area. The distribution of this cultural phenomenon was delimited upon the presence of structural remains, cultigens, ceramics, two-handed manos, and rock art localities.

Reed and Metcalf (1999) expand upon Reed's (1984; 1997) original articles regarding the Gateway Tradition as an indigenous group. Admitting that the database is meager and of generally poor quality due to poor reporting, lack of field supervision, and loss of associated literature and collections, they never the less attempted to move forward and model the Gateway tradition in terms of space/time systematics, settlement/subsistence patterns, technology, social organization, and ideology. Space/time systematics consisted primarily of cross-dating ceramics based upon the work of Crane (1977), Hurst (1946; 1948), and a single dendrochronological date of AD 1024 from the Paradox Valley (Woodbury and Woodbury 1932). The ceramic cross dates all fell between AD 1 and 1064, with middle range dates in the early 6th to mid 7th centuries and mid 9th to mid 10th centuries, which included a single radiocarbon date with a range of AD 845 - 955. The ceramics identified were classified as: Moccasin Gray; Mancos Gray; Chapin B/w; Cortez B/w; Mancos B/w; Gallup B/w; Deadmans B/r, Wingate B/r, and an indeterminate corrugated. Taken altogether the limited data appeared to indicate a relatively long, if rather sporadic series of occupations, primarily related to the Northern San Juan Anasazi. The Roc Creek site in the Paradox Valley is problematic in that the ceramics collected have been tentatively identified as Fremont, composed of Emery Gray, Emery Corrugated, and Uinta Gray (but Reed and Metcalf feel that these ceramic classifications are in error).

The Gateway tradition as initially proposed was characterized by the following attributes:

- limited reliance upon corn horticulture, with less corn production than either the Anasazi or the Fremont;
- manufacture of small arrow points, including the Rosegate variety;
- procurement through trade of small quantities of Anasazi, and much less frequently Fremont ceramics, with the Anasazi trade occurring primarily between AD 900 and 1050;
- an apparent lack of ceramic production;
- late habitation of noncontiguous circular masonry structures with low walls, the structures occurring singly or in small hamlets;
- possible habitation of pit structures, late in the tradition;
- relatively short-term use of the habitation structures, as evidenced by shallow midden deposits;
- construction of granaries and storage cists in rockshelters;
- rock art that evidences both Anasazi and Fremont influence;
- tentatively dated between 500 BC and AD 1250.

Understanding the Gateway Tradition in it entirety will involve more excavations. It may ultimately prove to be an exercise in assessing the interactions of the two more clearly defined Formative cultures in this region. Important in interpreting those interactions is a study of the transitions of the Anasazi Culture based on an assessment of climate change and cultural response that was conducted by Benson and Berry (2009) and Berry and Benson (2010). They base their study on the juxtaposition of Southwestern megadroughts, as measured by the Palmer Drought Severity Index (PDSI) (Cook 2007, personal communication), and periods of near cessation of Anasazi construction activity during the 12th and 13th centuries AD (Pueblo II and Pueblo III respectively). In an earlier study, Berry and Benson (2008) considered the relationship of PDSI and Anasazi construction between AD 500 and 1500 - Basketmaker III through Pueblo IV in terms of the Pecos classification. They noted that each of the stages of the Pecos classification during the era considered was separated from the preceding and successive stage by a major drought episode. This relationship is depicted in Figure 3.6, which relies on Anasazi tree-ring cutting and 'v' dates to the exclusion of less reliable 'vv’ dates.

Notably, the cutting dates and ‘v’ dates indicate a discontinuous, punctuated pattern of peaks and troughs, which represent a sequence of increased and reduced construction activities/populations. This stands in marked contrast to the original theory of the continuous, gradual evolutionary development of the Anasazi culture in all subregions of the Southwest, wherein following the adoption of maize agriculture from southern benefactors, population density increased steadily through time until catastrophic social and/or environmental factors near the end of the thirteenth-century led to the abandonment of the southern Colorado Plateau by agriculturalists.

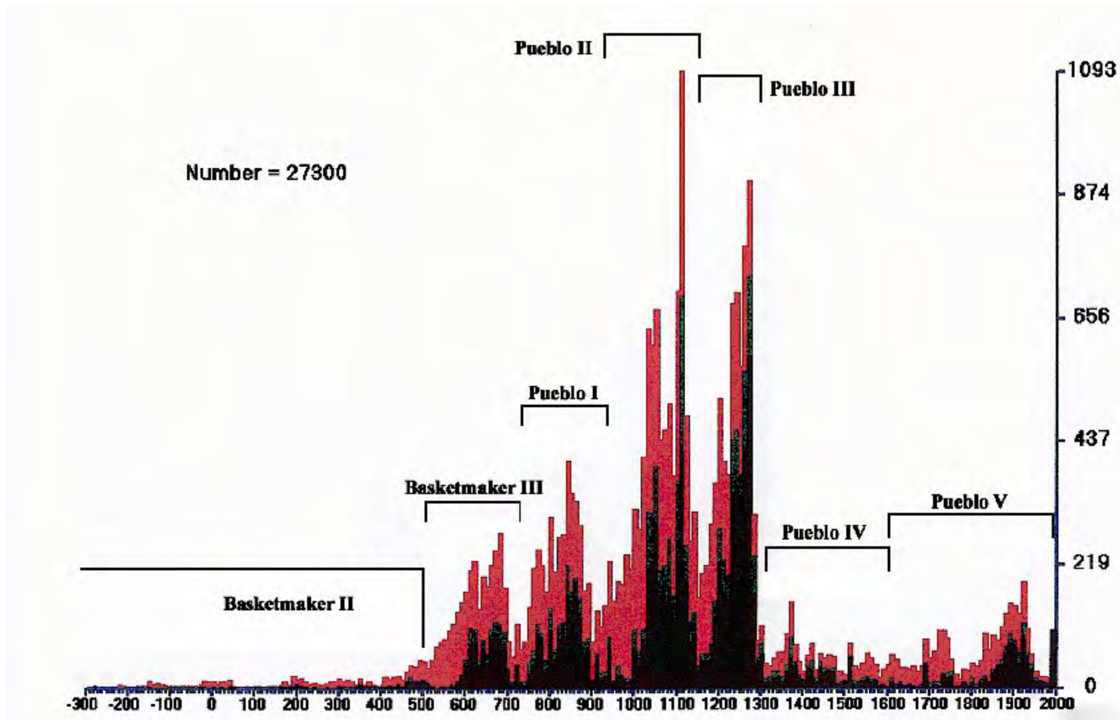


**Figure 3.6.** Histogram of Southwestern tree-ring dates in ten-year increments (after Berry and Benson 2008: Slide 3) Black = cutting dates, Green = 'v', Red = 'vv'

Berry and Benson's study indicates that this gradualist perspective does not fit the currently available information, and the tree-ring data strongly suggest a "punctuated" rather than a gradual evolutionary trajectory. Droughts bracket the major cultural periods of the Anasazi sequence, and favorable climatic episodes enabled development within the major stages. Importantly, in a comparison of the results of this study with radiocarbon dates from west central Colorado, the $^{14}C$ records of this region's sites at lower elevations are very similar.

For instance, the end of the Pueblo I period is defined by a severe drought and drop off of construction, and in the Uncompahgre area there is a distinct flattening of the number of radiocarbon dates. Interestingly, during this episode there is an increase in dates in the higher elevations of the Gunnison Basin. This distinct pattern of low elevation vs. high elevation occupation is repeated for the late 13th century drought as well.

### 3.2.4 Late Prehistoric Era

The dissipation of the Fremont Culture is roughly coincident with the drought of AD 1275 to 1300 and the influx of new people from the western and central Great Basin. Their appearance in Fremont territory ca. AD 1200 is indicated by finds of Shoshone pottery mixed with the upper strata of Fremont artifacts in numerous cave sites (Jennings 1978:235). The newcomers are referred to as the Numic speakers (Numa) of the Uto-Aztecan language phylum (Smith 1974:10). The Utes, or "Nuuciyu" (Goss 1999:79), are a "culturally self-identifying group" (Lewis 1994:22) of people affiliated by shared language, lifeways, and history. The Ute language, a member of the Numic branch of the Uto-Aztecan language family, is "affiliated most closely with the Southern Paiute in the Colorado River drainage to the west, less closely with the Comanche and Northern Shoshone in the Plains and Plains-Plateau to the east and north respectively, and least closely to the Northern Paiute in the Great Basin area of western Nevada and Oregon" (Jorgensen 1965:9). Although there is disagreement regarding the earliest prehistory of Numic speakers, it is generally agreed that during the last thousand years they expanded from the southwest Great Basin to reach their historically known territory in Utah and western Colorado (Madsen and Rhode 1994).

Aikens and Witherspoon (1986) have proposed a model that includes an environmentally induced extinction of non-Numic inhabitants and an expansion of Numic foragers that occupied the Great Basin for at least 5000 years. They contend that the Numic were coexisting with non-Numic foragers and horticultralists during the Formative period when the regional climates were relatively warm and wet. During times of aridity, non-Numic farmers and wetlands foragers would have abandoned optimal areas, which, in turn, would be re-occupied by Central Numic foragers. Similarly, Simms' (1986; 1990) suggests that Numic speaking foragers may have coexisted with Fremont farmer-foragers throughout the Formative Stage, and Jorgensen (1994:85) using linguistic and ethnographic data placed the Numic spread at about 2000 years ago.

The Numic Speakers brought to the Great Basin and Colorado Plateau a change in subsistence pattern. According to Bettinger and Baumhoff (1982:496-500), the Numic Speakers concentrated more heavily on small seed gathering and the hunting of large game over shorter distances, and thus exploited a smaller catchment. The technology for small seed gathering and processing was more advanced than was known to pre-Numic peoples and allowed support of larger populations. This strategy brought economic pressure to bear upon groups who did not practice it. Thus, the subsistence pattern that had been followed throughout the Archaic Period and altered slightly by the Fremont horticulturalists was supplanted entirely by the Numic scheme of procurement. Such a strategy was probably born of the needs created by changing climatic conditions and/or by increased population densities in the southwestern Great Basin (Bettinger and Baumhoff 1982:496-500). The broad spectrum hunting and gathering of the Numic maintained itself as a successful adaptation.

A variety of floral and faunal items were used by the Numa. Textiles (basketry and other woven items) were made from squaw-bush, willow, and juniper bark (Smith 1974:91).

Seeds and pinyon nuts were processed for food using grinding and milling stones. Other floral resources collected seasonally were serviceberry, chokecherry, currant, raspberry, elderberry, wild rose, sego lily, wild onion, and wild carrot. The hunting and trapping of rodents, deer, mountain sheep, elk, and bison are illustrated in the rock art (Conner and Ott 1978).

Based on diagnostic artifacts and radiocarbon dates, Reed and Metcalf (1999) propose dividing the Protohistoric era into two phases; the Canella (early Numic) and the Antero (late Numic). In the archaeological record for the period after AD 1300, Desert side-notched and Cottonwood Triangular projectile points predominate. Though once thought to date back into the Formative Period, post ca. AD 1350 marks the appearance of Uncompahgre Brown Ware ceramics. Sites with Uncompahgre Brown Ware in Mesa, Garfield and Rio Blanco Counties have been luminescent dated: 5ME4970, AD 1508 - 1644; 5ME16097, AD 1400 - 1520 ; 5GF620, AD 1450 - 1528; 5RB144, AD 1510 - 1590. Also in the Northwest Piceance Basin, site 5RB2929 was radiocarbon dated AD 1350±85 (580±80 BP, Beta-37819). Further south in Western Colorado, at the Pioneer Point site located in the Curecanti National Recreation Area, over seven hundred sherds of Uncompahgre Brown Ware ceramics (micaceous and non-micaceous tempered) were also recovered. These were associated with features dating ca. AD 1476 (474±70 BP) and AD 1466 (484±80 BP) (Dial 1989:19).

Toward the end of the Canella Phase, European trade goods appear in limited quantities. The Antero phase dates from about AD 1650 to 1881 and represents the shift to a fully equestrian lifestyle and the addition of Euro-American trade goods such as metal knives and axes, metal projectile points, glass beads, cone tinklers, guns and cartridges, tin cans, and horse tack. Desert Side-notched and Cottonwood Triangular projectile points continued to be used, but were increasingly replaced by metal projectile points and firearms and were likely subsumed by ca. AD 1840.

Steve Baker's multiphase model of Ute culture history for the Eastern Ute bands of western Colorado (Baker et al. 2007:38-41) provides useful temporal resolution for the contact period. An abbreviated summary of Baker's taxonomic model is presented in Table 3.7.

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**Table 3.7.** The Baker Model of Ute Culture History for Western Colorado: Artifactual Hallmarks [Adapted from Baker, Carrillo, and Späth in *Colorado History: A Context for Historical Archaeology* 2007, p.41 (synthesis and additions by Curtis Martin)]

| ARCHAEOLOGICAL PHASES | DATES | SUGGESTED ARTIFACTUAL HALLMARKS |
|---|---|---|
| **Phase "V-B": Recent Contact** (Emergent Reintegration Phase) | ca. 1924-present | Reappearance of native arts and crafts |
| **Phase "V-A": Recent Contact** ("Ungacochoop Phase") | ca. 1900-1924 | Post-1900 axe-cut dendro dates |

| ARCHAEOLOGICAL PHASES | DATES | SUGGESTED ARTIFACTUAL HALLMARKS |
|---|---|---|
| **Phase "IV-B": Late Contact Post-Removal** (Fort Duchesne Phase) | 1881-ca. 1900 | – Tobacco tins appear<br>– Sheep and goats<br>– Wagons<br>– Post-1881 axe-cut d endro dates |
| **Phase "IV-A": Late Contact Pre-Removal** (Chief Ouray, Chief Douglas, & Chief Ignacio Phases) | ca. 1860-1881 | – Metal axes ("ubiquitous")<br>– White-man's clothing<br>– Canvas tipi covers<br>– Bottle glass (common post 1870)<br>– Tin objects<br>– Iron stoves and wall tents<br>– Fixed ammunition guns/cartridges (common post 1870)<br>– Hole-in-top food cans (round cans common post 1870)<br>– Seed beads *very* common (small specimens late in phase)<br>– Wickiups much better preserved and recognizable<br>– Adobe, log, and jacal structures |
| **Phase III: Middle Contact** (Robideau Phase) | ca. 1820-1860 (Fur trade) | – Metal arrow points begin to replace lithic points<br>– Horse tack<br>– Metal axes, cutting and chopping tools<br>– Tipis<br>– Metal cooking vessels<br>– Seed beads (post 1840)<br>– "Little China" Prosser buttons (post 1840)<br>– Percussion caps<br>– Ceramic pipes (bore diameter important)<br>– Tinkler cones<br>– Wickiups better preserved/more recognizable |
| **Phase II: Early Contact** (Rivera Phase) | ca. 1540-1820 | – First appearance of horse equipage (increases late in phase)<br>– Tipis (*late* in phase)<br>– Metal knives (but *few* axes apparently)<br>– Trade beads (but only those *larger* than seed beads)<br>– Gun flints, musket balls, gun parts (post 1800 or even later)<br>– Brass/copper objects (as early as 1540!)<br>– Shell buttons (post 1800)<br>– Uncompahgre ware pottery still in vouge |
| **Phase I: Late Pre-Contact** (Canalla Phase) | ca. 1500 -1540 | – Uncompahgre ware pottery<br>– Desert Side-notched projectile points<br>– Cottonwood Triangular projectile points |

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One of the most prominent and temporally diagnostic features of Historic Ute sites is the wickiup. There exists evidence from numerous archaeological investigations that have taken place in Colorado and elsewhere that habitations and shelters have been manufactured for thousands of years with wooden superstructures incorporated into their construction (Stiger

2005: personal communication; Metcalf and Black 1991; Conner and Langdon 1987; Cassells 2003). It is likely that a significant percentage of prehistoric campsites included temporary shelters. This is based on the premise that, in all temperate and harsh-weather regions of the world shelters were necessary for human survival, or at minimum highly desirable. Binford (1990) surveyed housing among the world's foragers (hunters and gatherers) and found that some form of shelter is constructed whenever a foraging group stops, even for a short time.

> There are no known cases among modern hunter-gatherers where shelter is not fabricated in residential sites (or anywhere hunter-gatherers plan to sleep), regardless of the expected occupational duration, and only in rare instances are sites of any kind produced by hunter-gatherers where no shelter is provided for the occupants (Binford 1990).

Although many of the sites categorized as aboriginal “open architectural” in the OAHP database contain wickiups or brush shelters, all forms of extant wooden and brush features are of interest in terms of categorizing sites as being of Historic Ute affiliation. It is from the early historic and ethnographic records of the then-living native peoples, the photographs and illustrations that accompany them, and the archaeological documentation of the abandoned habitations and camp sites in the times since, that provide us with much of the data from which to formulate definitions and descriptions of wickiups and other forms of ephemeral architecture and perishable features, as found within the western United States.

Aboriginal Utes were highly mobile, migrating seasonally across diverse environments in small groups of 10 or 15 extended family members. Their material culture was for the most part lightweight, portable, and ephemeral, allowing for only what they could cache or carry (Duncan 2003; Smith 1974; Fowler and Fowler 1971; Fowler 2000; Burns 2004). It might be said that life was movement for the Utes; Powell's 1868-1880 survey manuscripts included the Northern Ute word pa-ant-ni, meaning to “walk about; to live” (Fowler and Fowler 1971:189). The Utes inhabited “a broad landscape ecology” (Burns 2004) that integrated their seasonal subsistence patterns into a spiritual and social framework, as summarized below by James Goss (2003) and Richard Lewis (1994):

“They had a diversified economy of meat, pinyon, and lots of roots and berries. So they had a very balanced diet just off of nature. They were able to maintain themselves as their ancestors did for thousands years by big game hunting and then exploiting these plant resources. So the unique thing about the Utes is that they had such a rich environment… this mountain environment with its diversity, and the abundance of game back in those days” (Goss 2003). In the Early Contact period, Ute social and political organization continued to be shaped largely by the successful foraging patterns that had supported their migration into the northern regions of the Colorado Plateau in the Late Prehistoric; predominantly large game hunting and small seed gathering.

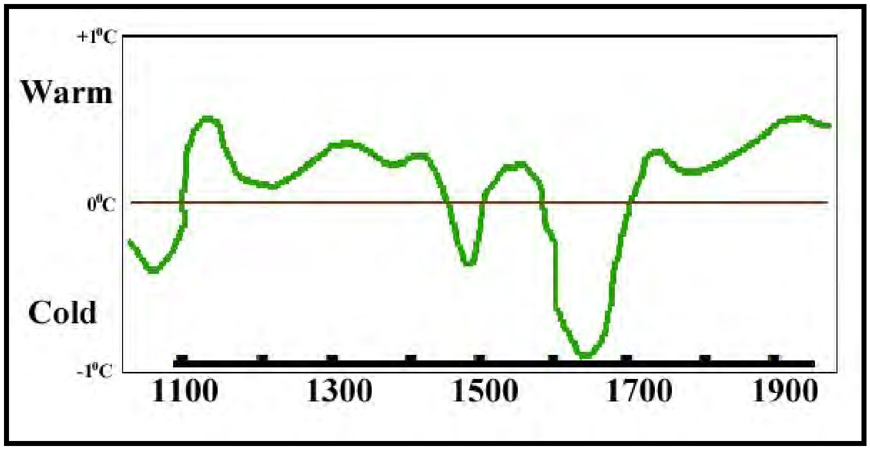
“Movement was a basic value (for the Utes). That is, you could say they had a sacred mandate, passed on to them by tradition from deity, that they were supposed to do this. They were supposed to have these ceremonies at different times of the year in different environments: That is, their Bear Dance in the pinyon, juniper and oak woodlands. Their summer ceremonies, which evolved into the Sun Dance, in the high mountain meadows, where they hunted. And that would have been at the summer solstice, at the first of summer. And then in the fall, they were supposed to be down out of the mountains by the beginning, the 21st or so of September. Subsequently, they had their fall pinyon harvest, and were not supposed to go up in the mountains again until spring. But after the pinyon harvest, they were supposed to be in their winter camp. And that was a pattern that wasn't just economic, but it was sacred. (They) had a sacred mandate to do it" (Goss 2003).

Ute society centered around the extended bilateral family, and periodic congregation of related or affinal kindreds to form local residence groups of from twenty to one hundred persons. These groups frequently traced relations through the matriline and resided matrilocally, but membership was fluid and flexible enough to adjust to personal and local environmental realities. Local leaders were older men who, through persuasion, influence, and proven ability, achieved a level of consensus for their plans. Most groups recognized specialized leaders who directed specific activities (hunting, moving camp, dances, or raiding) and had little or no authority over the group in other matters (Lewis 1994:30).

Larger "band" organization was limited to periodic congregations for defense, for spring Bear dances, or for summer hunting or fishing camps. Bands consisted of local residence groups linked by bilateral kinship networks and their common territorial range – specific features usually reflected in their band name. Local groups and even extended family groups remained relatively autonomous, because most bands lacked formal political organization. Local leaders in band councils (which could include women) decided necessary matters subject to community approval. Dominant groups often provided the most influential leaders – leaders who ultimately came to the attention of white officials looking to negotiate with a single "chief." Ute bands recognized their larger group identity in custom, language, and territory, and remained united through kinship, trade, and defense against common enemies, but there was no larger Ute "nation" with long-lasting political allegiances or tribal councils (Lewis 1994:191).

The Numic expansion began in with the onset of the Little Ice Age (Petersen 1981). It was the defining climatic episode of the Late Prehistoric and Historic periods, spanning the period from AD 1300 to 1870 (Figure 3.7). During this time, Europe and North America were subjected to bitterly cold and prolonged winters that reduced the growing season by several weeks. Two colder phases have also been identified. The first began around AD 1300 and continued until the late 1400s. It was followed by a slightly warmer period in the 1500s. Then, a marked decline in temperatures occurred between AD 1600 and 1800, which was the height of the Little Ice Age. The cause is unknown, but the coldest part, ca. AD 1645 to 1715, was coincident with an episode of low sunspot activity, and solar cooling, called the Maunder Minimum 2 (Eddy 1976). During that time, the Northern Hemisphere was about 1° Celsius (1.8° F) colder than present.

**Figure 3.7.** Fluctuations in temperatures during the Little Ice Age. (After Lamb 1969 and Schneider and Mass 1975.)




The environmental effects of prolonged periods of cold temperatures creates significant impacts on growing seasons of domesticated plants and would have lowered elevation levels of primary floral resources. It can also have devastating effects on trees; and, although cooler and moister temperatures are generally good for the spread and growth of pinyons, the cold extremes of the 17th century would likely have reduced pine nut production and affected the growing cycle of new trees. These temperature levels coupled with deep snows would have produced significant die-off of large mammal populations, as well. Because of these factors, the approximate 100 year dip in temperatures between ca. AD 1600 to 1700 – with a low mark about 1640 to 1650 – may have driven aboriginal Numic populations south and west to warmer climates in New Mexico, Arizona and Utah.

A migration to the south would have brought the Numic groups into close contact with Europeans, and perhaps fostered new alliances with Apaches, Navajos, and Pueblos. Horses were likely acquired during that time. New trading relationships were forged and new technologies acquired. With the acquisition of the horse came the reduction and ultimately the demise of the production of Uncompahgre Brown Ware. If this is truly a parallel occurrence, then a record of thermoluminescent dates for this ceramic should reflect the transition to a horse-riding culture.

Prehistorically, Utes had traveled on foot and used domesticated canines to help with light transport of their material goods (Callaway et al. 1986; Simmons 2011). But their way of life changed dramatically during the eighteenth century as they acquired increasing numbers of horses, metal tools, and other trade goods from the Europeans (Simmons 2000:29; Smith 1974; Blackhawk 2006; Sanchez 1997). Equestrian mobility significantly expanded the Utes' regional presence (Lewis 1994; Blackhawk 2006), and they became “fine horsemen with vast herds” living “parts of the springs and summers in large encampments of 200 or more lodges” (Jorgensen 1972). Many of the Colorado Utes were successful in the intertribal horse trade which spread throughout the Colorado Rockies and the surrounding plains to the north, east and south during the eighteenth century; and they were prominent participants in the widespread raiding and warfare that swept through Colorado and surrounding regions – continually fueled by Spanish demand for captive human labor and Indian demand for horses (Blackhawk 2006).

In the decades following the Dominguez- Escalante expedition, until the 1820s, there were few direct incursions into west-central and northwestern Colorado by Euro-American interests. The Early Contact lifeway of the Eastern Utes, however, was increasingly transformed by the acquisition of horses and trade items introduced by the Spanish (Baker et al. 2007; Simmons 2000; Lewis 1994), and by the 1820s the Eastern Utes were widely enjoying an equestrian lifeway. Jorgensen (1972) describes them as "fine horsemen with vast herds of horses" living "parts of the springs and summers in large encampments of 200 or more lodges." In his description of changes in Ute society sparked by the appearance of horses, Lewis (1994:30) notes their "accumulation of more material goods and ... an elaboration of Ute material culture", adoption of certain Plains cultural traits, expansion of their territory as "noted [horse] raiders", and their role as "important middlemen in the intertribal horse trade."

The Ute, however, were not the only indigenous people in the region who were adopting equestrian lifeways during this period. The Eastern Shoshone, mounted on horses, occupied lands north of the Ute in western Colorado and appear in the regional ethnohistories of the Yampa and Green Rivers (Jorgensen 1972; Baker et al. 2007). The Comanche held similar status on the east, along with other plains groups – namely the Cheyenne, Arapaho, and Lakota. The Shoshone and Comanche, even though they share language affinities with the Ute, have distinct ethnographic profiles, and their presence in northwestern Colorado is pointed to by both archaeological and ethnohistorical evidence. In northwestern Colorado, in historic periods, local ethnic groups appear to have shifted repeatedly in the Yampa and White River drainages. As shown in Figure 3.8, the northern boundary of Ute occupation in west central Colorado late in the eighteenth century probably did not reach beyond the local northern extent of the Colorado River drainage (Baker et al. 2007:46-49). This supposition, based largely on the Dominguez and Escalante journal from 1776 (Chavez and Warner 1976), is supported to some degree by several rock art panels – located in Canyon Pintado south of Rangely and in West Salt Creek Canyon north of Grand Junction – which exhibit characteristics of the "Plains Biographic Style." Cole (1987:222-224) attributes this style of rock art – described as developing ca. AD 1750 (Keyser 1975, 1977, 1984) – to either Shoshone or Comanche groups.

Early historical records contain a multiplicity of names and spellings for regional Ute groups or "bands" (Jorgensen 1964; Callaway et al. 1986:338), and early maps of the period are typically little more than sketches of major geographic and ethnographic features. Nevertheless, most early region-scale maps of western Colorado provide relatively reliable coordinate references and scale (Francaviglia 2005; Carter 1999) by which topographic and topological features can be correlated with later historical records. Numerous examples of maps produced in the early to mid-nineteenth century by Humboldt (Figure 3.9), Pike, Fremont, Gunnison, and other explorers and cartographers have helped trace the lineage of the


**Figure 3.8.** Map showing the "distribution of Native American peoples in the late eighteenth century and end of regional protohistory" (Baker et al. 2007:47).

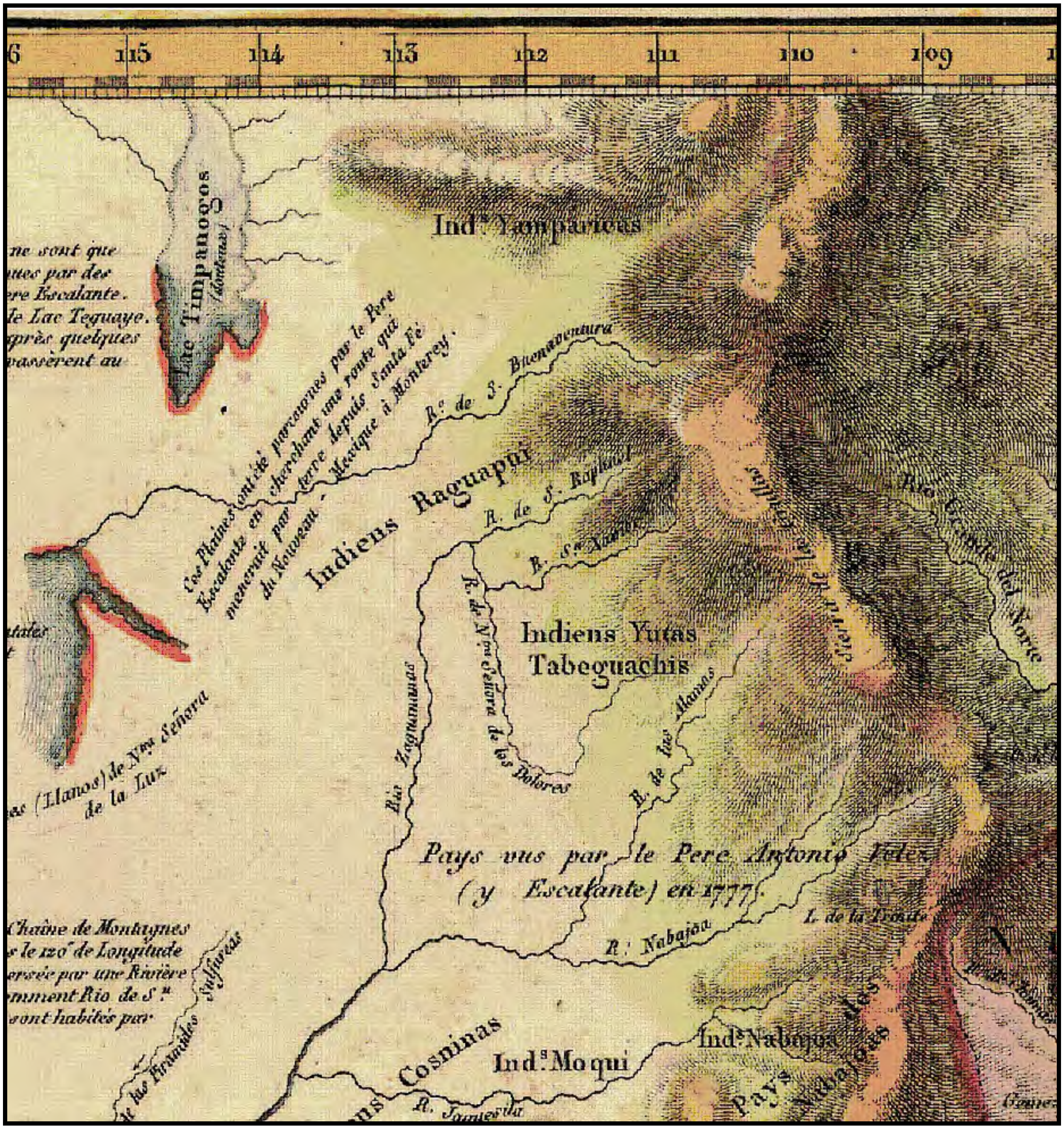



**Figure 3.9.** Detail of Alexander von Humboldt's Map of the Kingdom of New Spain first published in 1809 (Humboldt 1811). The Great Basin at that time was the "least explored and most poorly understood" region of Spain's northern frontier (Francaviglia 2005:41), and Humboldt's map included numerous geographic errors. Nevertheless, this detail identifies the "Yamparica" and "Tabeguachi" Ute bands, which can be traced forward to the present day White River and Uncompahgre Bands of the Northern Utes, respectively. The "Raguapui" are probably antecedent to the "Sabuaganas," who later merged with the other northern Colorado Ute bands (Baker et al. 2007; Simmons 2000).

Utes who inhabited areas surrounding the White and Colorado River drainages during the period, as well as other Numic-speakers who periodically visited the region for hunting, trading, and raiding (Chavez and Warner 1995; Baker et al. 2007:46-49; Hämäläinen 2008).

Utes groups inhabiting areas north of the Colorado River and west of the Continental Divide in the nineteenth century were variously described in historical records as the Parusanuch (Parianuche), Grand River, Yampa, and Uintah subgroups (Callaway et al. 1986:339; Baker 2005). The original core territory of the Uintahs is generally thought to have ranged from Utah Lake east through the Uinta Basin to the Tavaputs Plateau in the Green and Colorado River systems (Callaway et al. 1986:339). However, Baker (2005) posits that some Uintahs may have affiliated with the White Rivers during the Late Contact agency years, and Smith (1938) stated that "their hunting parties frequently followed the White River into Colorado." Synonymies for names given by Europeans to early historic Ute groups and other indigenous occupants of the region are ambiguous in some cases; particularly for groups identified as "Comanche" and/or "Yamparica" and variations thereof. Both terms appear in the earliest maps and journals of the region and may in fact refer to other (non-Ute) Numic-speakers.

Indigenous occupants of the Yampa River region were variously identified in different times and records as "Yamparica Comanches," "Yamparica Indians" and "Yampatika Utes." They were the northernmost of the Eastern Ute bands, inhabiting areas north of the White River, ranging from the Yampa River drainage into southern Wyoming on the Little Snake River, eastward into Colorado's Middle and North Parks, and westward into the Uintah Basin (Simmons 2000:20). The Yampa name is reflective of a Numic propensity for referencing local resources and customs to describe the inhabitants of an area – referring in this case to the Yampa plant, an important food resource in the region. The term "Comanche" is thought to have evolved from the Ute word "Komantsi," described by linguist James Goss (1999:74-84) as fundamentally meaning "other" people or relatives. Spaniards first recorded the word "Comanche" as the name some southern Utes had used to identify a particular population of indigenous people who had migrated to the southeastern plains of Colorado around 1700 – after splitting off from the Wind River Shoshones in Wyoming (Hämäläinen 2008). With historical usage the term came to be ubiquitously linked to the Comanches on the southeastern plains, but, as Goss points out, in other contexts the Utes used also used the word "Komantsi" to describe many other aboriginal groups – some linguistically-related (i.e. Numic-speakers) and some not (Goss 1999:74-84).

The "exact relationships of the Parusanuch and Grand Rivers are not well understood at all and the ethnohistories of these subgroups have not been well summarized anywhere" (Baker 2005:2.9). Simmons (2000:20-21) suggests that the Parasanuch (Parianuche, Parianuc, Pahdteeahnooch) – the "elk people" – were the same group identified in early records as the Sabuaganas, and were "later called the Grand River Utes...[whose] territory extended into eastern Utah and up the Colorado River (formerly called the Grand River) to their winter resort at Glenwood Springs, onto Grand Mesa and the Flattops, up the Roaring Fork... and into the mountains to the headwaters." The views of Simmons and Baker with regard to the

Sabuaganas' eventual Late Contact phase affiliations are obviously at odds, and the discrepancy serves to illustrate the difficulty of parsing discontinuous ethnohistorical records in the search for a seamless, fine-grained culture history of the Utes.

The full geographic extent of Ute territory at its apex is generally accepted as having reached from western Utah to the eastern slope of the Rocky Mountains in Colorado, and from northern New Mexico to the northernmost reaches of western Colorado (Figure 3.10). Population estimates for the Utes during the early historic period vary widely, but it is broadly agreed that the entire population of all Colorado Ute bands probably never exceeded 10,000 (Simmons 2011:16).

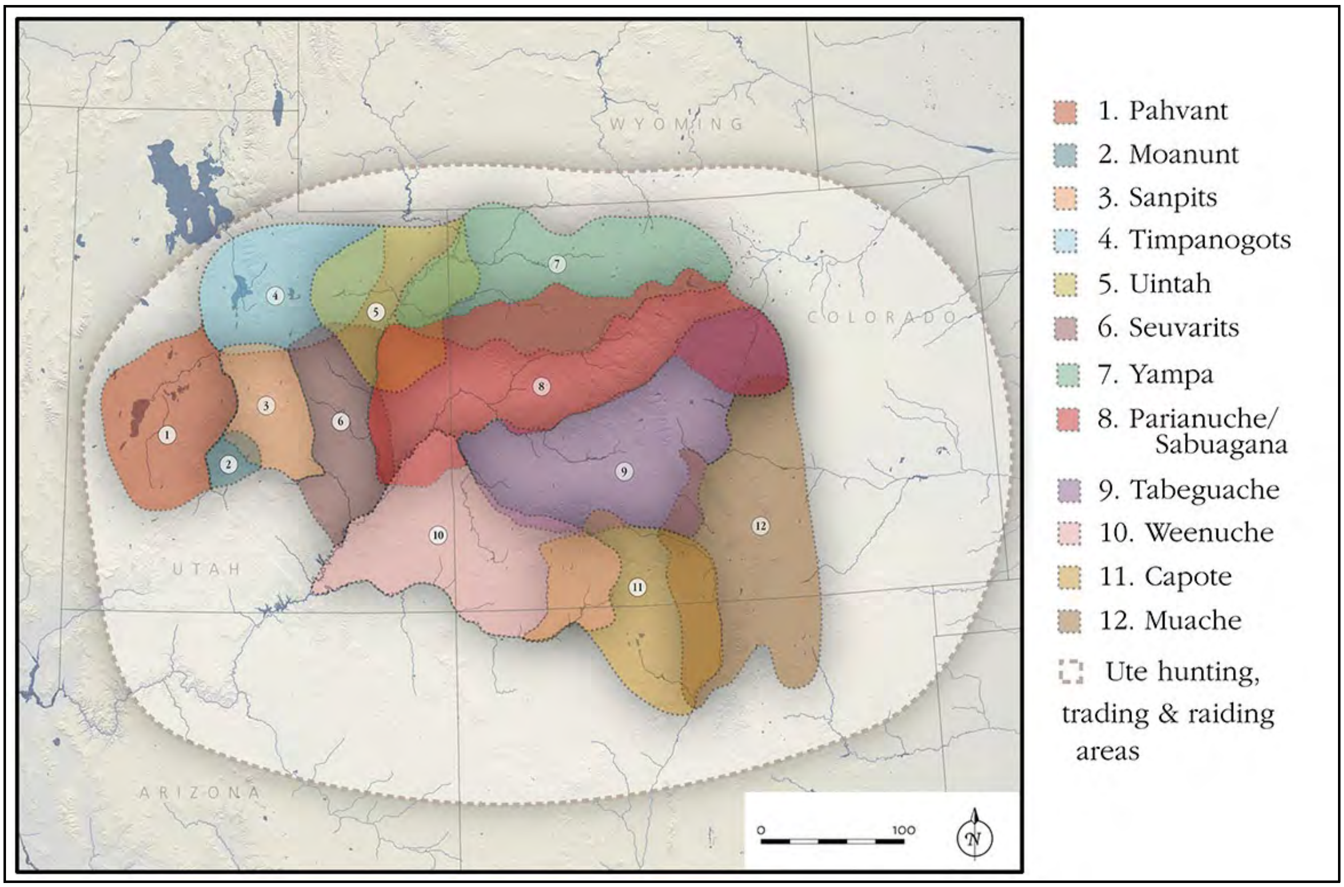



**Figure 3.10.** Approximate extent of aboriginal Ute territory and distribution of generally recognized historic Ute bands, ca. AD1600-1861 (after Simmons 2011:18).

Systematic ethnographic study of Ute lifeways began during John Wesley Powell's surveys of the Colorado Plateau and Great Basin between 1868 and 1880. His work comprised the "first systematic survey of Great Basin Indian demography and political organization" and continues to be a "baseline document for Great Basin aboriginal demography" (Fowler and Fowler 1971:97-119). Powell's surveys focused predominantly on Numic-speaking groups in western and southern areas of the Great Basin, but he also met some of the Northern Utes, first on the White River in Colorado and later in Utah on the Uintah Reservation. He recorded vocabularies from Ute-speaking groups he identified as Tabuats, Yampaats, and Uintah (Fowler and Fowler 1971), and his records include perhaps some of the first photographs taken of Utes in their aboriginal territory (Plate 3.1).

As Ute territories shrank, they were subsumed first by Utah Territory in 1851, then Colorado Territory in 1861, and finally by the State of Colorado in 1876. Western Ute groups were constrained to the Uintah Reservation in Utah in 1861, and Utes in southern Colorado were pushed into the Southern Ute Reservation beginning in 1873. Ultimately, in 1881, the White River and Uncompahgre Utes were forcibly removed from Colorado to lands alongside the Uintahs in eastern Utah. The three groups subsequently organized as the Ute Indian Tribe of the Uintah and Ouray Reservation in 1937, each with equal representation in their Tribal Business Council (Ute Indian Tribe of the Uintah and Ouray Reservation 1937), and their joint lands are now known by that name (Figure 3.11).

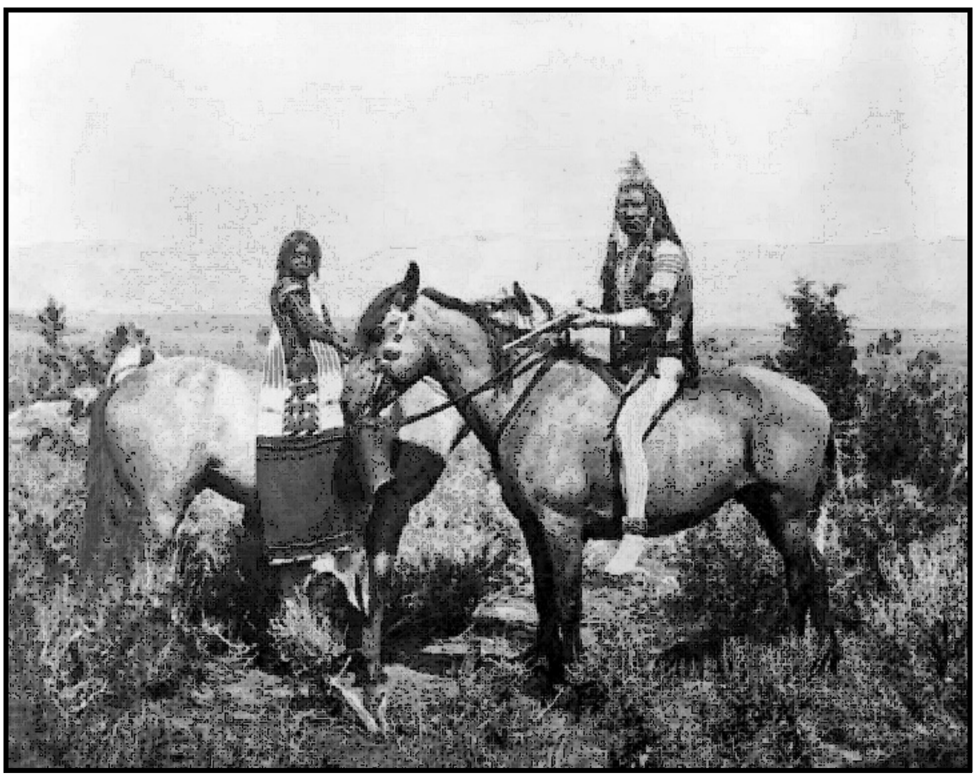


**Plate 3.1.** Utes in the Uintah Valley, photographed by J.K. Hillers during the Powell Expedition of 1873 or 1874 (Hillers 1873).

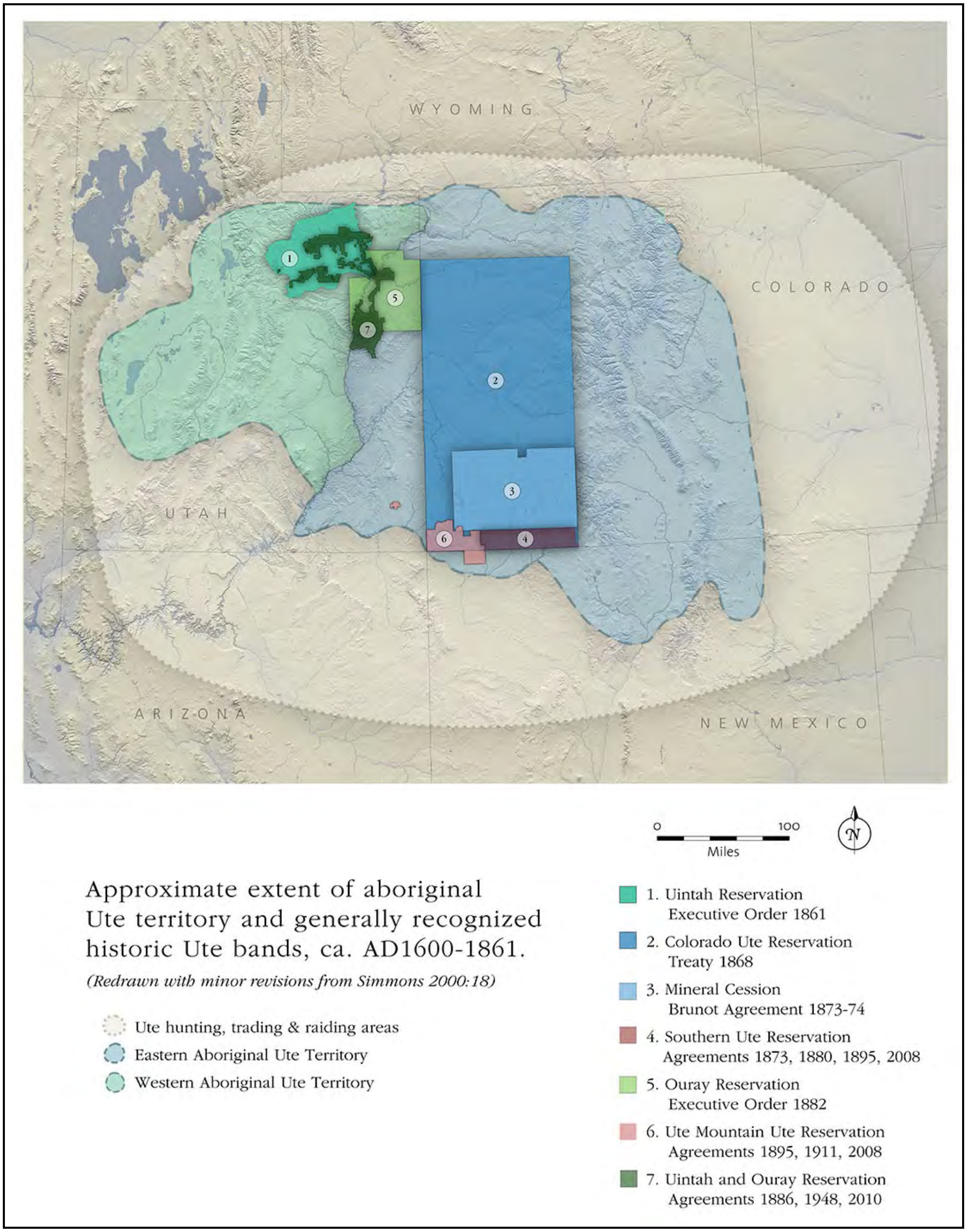



**Figure 3.11.** Chronology of historic Ute territory, reservations and land cessions, ca. AD 1861 - 2010 (Wroth 2000:2; Simmons 2000:18).

## 3.3 HISTORIC BACKGROUND

Historic records suggest occupation or use by Tribal groups, EuroAmerican trappers, settlers, miners, and ranchers as well. Overviews of the historical record is found in the Colorado Historical Society entitled *Colorado Plateau Country Historic Context* (Husband 1984) and in the Bureau of Land Management's publication *Frontier in Transition* (O'Rourke 1980). Significantly, a new historical context has been published by the Colorado Council of Professional Archaeologists entitled *Colorado History: A Context for Historical Archaeology* (Church et al. 2007), which was used as the primary guide for this project in the evaluation of historic sites.

### 3.3.1 Ethnohistory

Early contact between Utes and Europeans began late in the sixteenth century when Spanish colonists pushed northward into New Mexico along the Rio Grand River, eventually establishing Santa Fe as the capital of their New Mexico province in 1610. At that time Utes from Colorado were already engaged in regular trade with northern New Mexico Puebloans (Tyler 1954:345; Schroeder 1965:54), and "Yutas," as the Spanish came to call them, were repeatedly mentioned in Spanish administrative records from Santa Fe, Abiquiu and other northern New Mexico settlements beginning as early as 1626 (Blackhawk 2006:22). Horses and metal tools, traded and often stolen from Spanish colonists in New Mexico, began to spread northward to the Utes in Colorado as early as 1640 (Simmons 2000:29; Smith 1974; Blackhawk 2006; Sánchez 1997), but direct contact between the New Mexicans and the Utes was largely confined to the southern boundaries of Ute territory until late in the eighteenth century.

During the eighteenth century, western Colorado Utes joined the widespread raiding and trading economy that swept through the Rockies and surrounding plains. Commerce in the region boomed, fueled by the Spanish colonists' need for hides and meat from deer and bison; and human labor from captives taken in inter-tribal raiding and warfare. "The Utes, in turn, wanted horses above all else, in addition to corn, flour, tobacco, blankets, horse trappings, metal utensils, and tools" (Simmons 2011). The same can be said for virtually every other indigenous tribe throughout the entire region.

When the Comanches migrated to Colorado around 1700, they allied for a time with some southern Utes, probably the Muache, for trading and raiding with the Spanish. By that time the southern Utes had been in direct contact with the Spaniards in New Mexico for a century or longer, and they were thoroughly integrated into the emergent trading and raiding economy of post-Pueblo Revolt northern New Mexico. The Comanches soon settled on the plains around the upper Arkansas River basin, learned to be highly successful horse breeders, and largely transformed themselves into nomadic pastoralists. With bountiful surpluses of horses and access to seemingly limitless bison herds, they became "distinctly businesslike" in their approach to raiding seeing it as an "act of production" (Hämäläinen 2008); and by mid-century they would become "lords of the plains" (Simmons 2011), eventually to the point of threatening Spanish stability in the New Mexico colonies.

An easing of Spanish slave trading restrictions early in the eighteenth century stimulated a rush of raiding activity seeking captives that could be sold for horses (Simmons 2011:749), and inter-tribal relationships throughout the region started to shift. The Ute-Comanche alliance persisted for a time and was re-directed to include Jicarilla Apaches and northern New Mexico Puebloans, as well as the Spanish. The Spanish, in turn, forged alliances with the Apaches and other New Mexico tribes to protect against Ute and Comanche raiders. Inter-tribal allegiances and Spanish alliances shifted repeatedly during the following decades, and by mid-century the Ute-Comanche alliance had begun to dissolve.

Trade in firearms was officially banned by the Spanish from the beginning, but French traders reached the southeastern plains in 1744 and began to trade guns to Comanches inhabiting areas around the headwaters of the Canadian River (Simmons 2011). Leveraging their competitive advantage, the Comanches effectively blocked the Utes and the northern New Mexico tribes from access to the French firearms, and they began to militarily dominate the region, pressing "Utes, Apaches, Navajos, Pueblos, and Spaniards" into an "unpredictable mix" (Simmons 2011).

Like the Comanches, many of the Colorado Utes also prospered during this period. They acquired large numbers of horses in continual raiding and trading forays into northern New Mexico, and ranged into the eastern plains for seasonal bison hunts. Independent parties of Capotes, Sabuaganas, and Muaches took part in raids on Spanish settlements in northern New Mexico during the 1730s and 1740s, and began to attack Jicarilla Apaches, Navajos, and northern Puebloans for horses and captives to trade. By mid-century, however, as the Ute-Comanche alliance was breaking down, the Utes began to collaborate with Jicarilla Apaches in hit-and-run raids on settlements around Taos, against Navajos to the west on the San Juan River, and against the Comanches wherever they found them. During the nearly constant turmoil in the region, the Utes continued to trade regularly with northern New Mexico colonists, and "had become so intimidating" that the Spaniards repeatedly sought alliances with them to help "keep the Comanches in check." Muache Utes captured about three hundred Comanche women near Taos in 1760, and Comanches visiting Santa Fe the following year felt threatened enough to request a Spanish escort for their return to Taos. A short time later, Comanches attacked Taos and four hundred of them were killed, while opportunistic Utes made off with a thousand horses from the Comanches and settlers (Simmons 2011:807-815).

Meanwhile, Comanche dominance continued to grow throughout the region and by the early 1780s their population had reached an estimated high of forty-thousand people, "more than the Spanish colonies in New Mexico and Texas had combined" (Hämäläinen 2008:102). Supported by their ability to produce surpluses of horses, and as experienced and well-armed horsemen, they expanded their trading and raiding network in all directions from the southern prairies in the upper Arkansas River basin into west Texas, and north to the central plains inhabited by Pawnees, Cheyennes, and Kiowas. They also pushed up the Arkansas River into the Colorado mountains and beyond, reaching as far west as the White and Green Rivers (Hämäläinen 2008:79).

Sporadic unsanctioned forays into western Colorado by Spanish venturers from New Mexico are thought to have occurred throughout the eighteenth century (Blackhawk 2006), but the region remained the “least explored and most poorly understood” on Spain's northern frontier (Francaviglia 2005:41). The first official Spanish expedition to reach west central Colorado was led in 1765 by Juan María Antonio Rivera, who traveled as far north as the Gunnison and Colorado Rivers (Sánchez, 1997:37). He was followed in 1776 by the Dominguez-Escalante expedition which retraced portions of Rivera's earlier route before eventually circumnavigating much of the Utes' Colorado and Utah territories. The expedition produced the first known map of the region (Figure 7) and recorded a number of encounters with Utes, including a group of eighty Sabuaganas mounted on horseback on eastern Grand Mesa (Chavez and Warner 1995; Bolton 1950). The expedition was informed by the Sabuguana Utes encountered near Grand Mesa that Comanches raiders had been in areas to the north and advised against further travel in that direction. The expedition nevertheless pushed northward, and encountered more Sabuagans in three camps scattered between the Colorado River and the foothills of the Roan Plateau. A small party of Utes visited the Spaniards' camp on Roan Creek on September 7, 1776 (Figure 3.12) and said that some other Utes “had just returned from *Yamparica Comanche* territory to the north, where they had intended to steal horses, but the Comanches had left the area headed southeast for the Arkansas River” (Chavez and Warner 1995:47). Comanche activity in the region apparently waned along with Spanish exploration; as both the Spanish and the Comanches became more deeply engaged in their increasingly tumultuous rivalry in the southeastern plains.

Other Europeans began to explore the Colorado Rockies in the early 1800's. Pike pushed into the central mountains and the San Luis Valley in 1806-07 and American trappers soon began to penetrate even the most remote areas in the region. Commercial traffic rapidly increased on the Santa Fe trail across the eastern plains, and by 1828 “pack trains were crossing Ute country, en route between Santa Fe and California, on the old Ute trail (north from Santa Fe) that became known as the Old Spanish Trail” (Simmons 2011). The primary trail route followed the Chama River out of New Mexico, through southwestern Colorado and on through Moab, Utah to the Green River and points westward. A northern branch also became established, with its route leading through the San Luis Valley, across Cochetopa Pass to the Gunnison and Colorado Rivers, and beyond to the Green River in Utah, where it reconnected with the main trail.

Spanish claims on Ute territory had passed to Mexico, following their independence in 1821, with little direct effect on the Utes. Fremont had scouted and mapped routes along the Yampah and White River regions in 1843, as part of a surreptitious survey of Mexican held territory in northwestern Colorado.

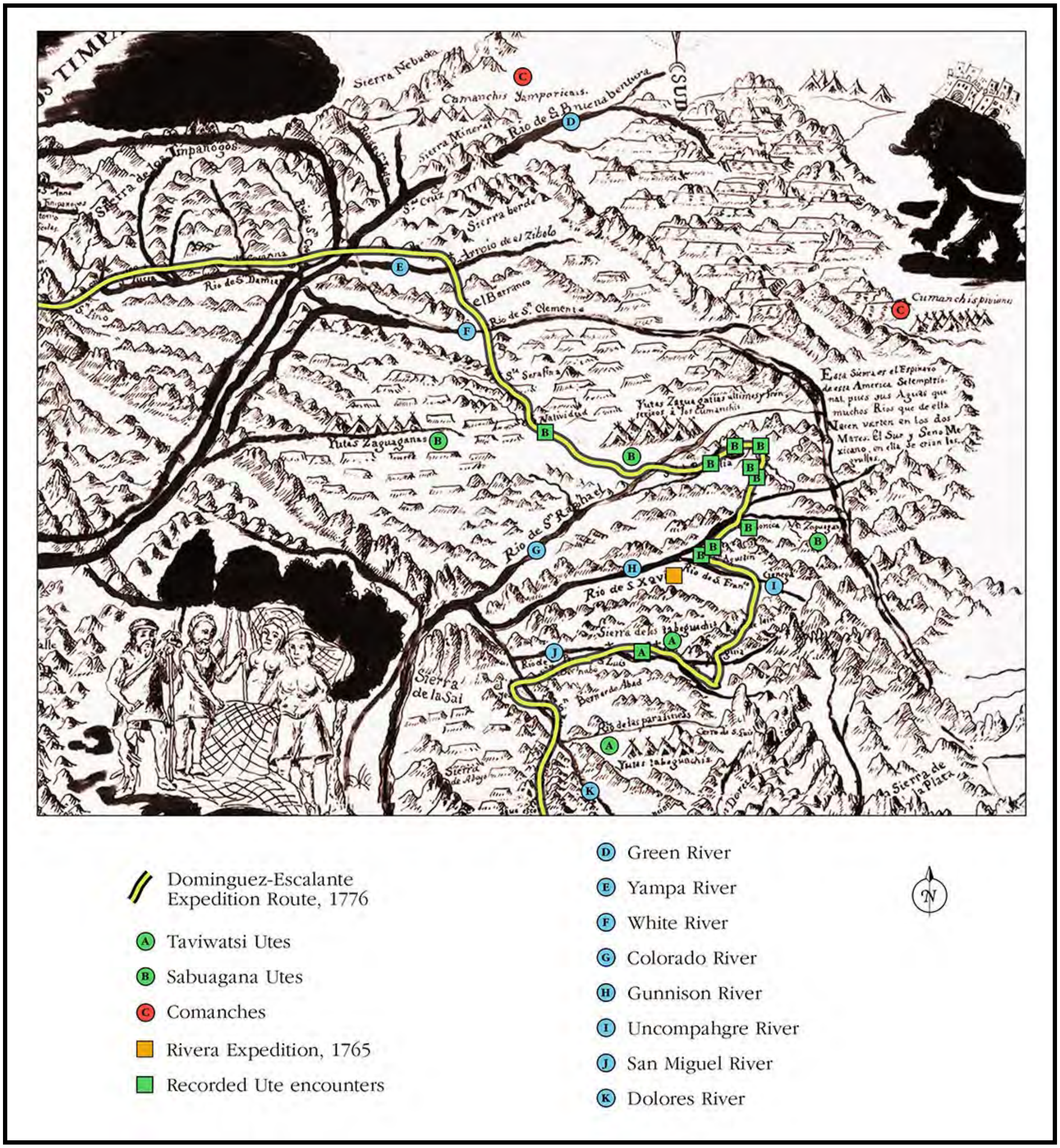



**Figure 3.12**. Annotated detail of one of the earliest known maps of western Colorado, drawn by Miera y Pacheco with the Dominguez and Escalante expedition in 1776 (Bolton 1950). Several Ute and Comanche encampments were recorded on Miera's map and the expedi-tion's journal described a number of encounters with Utes, including a group of eighty Sabuaganas mounted on horseback on eastern Grand Mesa.

Nineteenth century American explorers into the Colorado Rockies reported encounters with (non-numic-speaking) plains groups in the central mountain valleys, including Arapahos, Cheyennes, Lakotas and others who pushed from the northeast plains into the mountains as far south as the Arkansas River. Kiowas and Pawnees coming from the plains to the east were also reported in the central Colorado mountains from time to time (Simmons 2011; Farnham 1841; Fremont 1887). The Utes nevertheless persisted as the dominant indigenous inhabitants of the western slope until late in the nineteenth century when their ultimate removal to reservations in eastern Utah and southern Colorado cleared the way for American settlers.

The fur trade rush during the early decades of the 1800s heralded even more "revolutionary transformation" of Ute life (Husband 1984:IV-12). Trading posts began to appear in northern Ute country, first in Uintah territory in 1828 at the confluence of the Whiterocks and Uintah Rivers in eastern Utah, then around 1830 near the confluence of the Uncompahgre and Gunnison Rivers near Delta (Figure 3.13). Fort Davy Crockett, often referred to as "Fort Misery," was built in 1837 in Brown's Park. It was constructed by Phillip Thompson and William Craig because so many trappers wintered in the sheltered Brown's Park country where feed for the horses was plentiful and game was abundant (History of the Routt National Forest [revised H.R.N.F]) 1975:10).

Due to the trading posts, Euro- American trade goods became an everyday part of the Ute landscape. But the advancing American expansion pushed tribes from the northern plains – Sioux, Arapahos, and Cheyennes – into the region. They began to hunt and raid in the game-rich central and northern valleys of Colorado, and in the decades that followed the Arapahos became the Northern Utes' fiercest enemies (Simmons 2011:1040).

In 1848, the American victory in the War with Mexico marked the "beginning of the end for Ute sovereignty in the region" (Husband 1984:IV-12). With the signing of the Calhoun Treaty by seven Ute bands in 1849, the Utes irretrievably entered the sweep of American expansion into the West. By mid-century the Utes began to experience directly the full force of American expansion into the West.

Exploration efforts intensified in the 1850s, in large part because of the United States' acquisition of the southwest part of the country at the close of the Mexican War in 1848. Upon consolidation of the nation, a transcontinental railroad now seemed more possible. Lieutenant Edward Beale, Captain John Gunnison, and the diehard Fremont all led expeditions into west central Colorado in 1853. They followed essentially the same route--over Cochetopa Pass, into the Gunnison and Uncompahgre River valleys, past the confluence of the Grand and Gunnison Rivers at present day Grand Junction, and westward.

More American surveys, by Beale, Fremont, Gunnison and others, soon followed. Beale's party made it to Los Angeles without event and Fremont's trek to Utah was successful, but Gunnison and seven of his men were killed and mutilated by the Paiute in southwest Utah (Vandenbusche and Smith 1981:28).

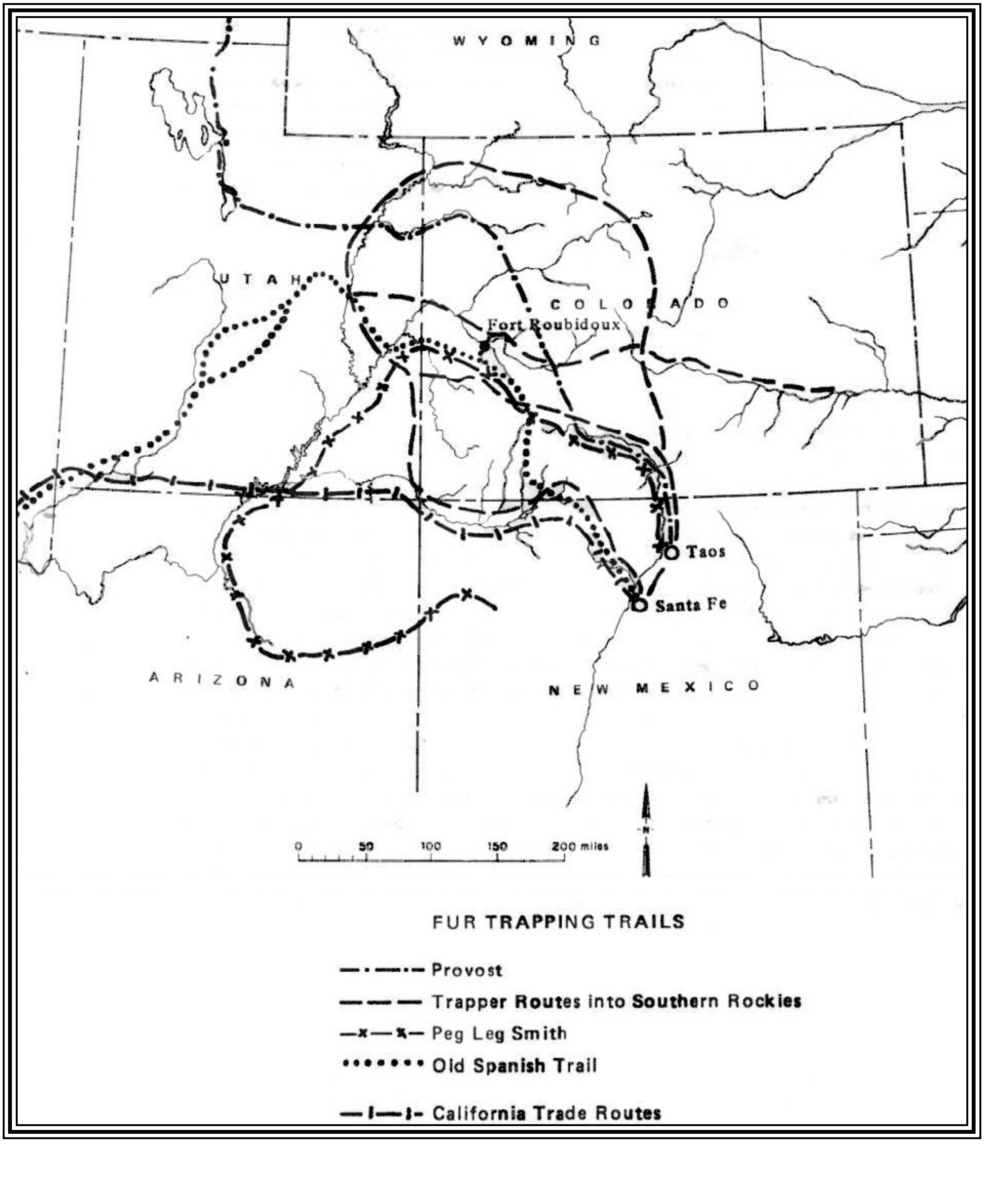



**Figure 3.13.** Fur trapping trails in western Colorado (O'Rourke 1980).

Some of the major Ute trails through the central mountains were first charted just in time for the discovery of gold at Cherry Creek, within present Denver, in the fall of 1858. The next year thousands of gold seekers began flooding into the Colorado mountains, and by 1860 nearly 35,000 people were living in scattered mining camps and towns that had sprung up throughout the central Rockies and the San Juans (Simmons 2011:2014-2015). During the next few decades, “as a strong surge of settlement, based on mining, ranching, timbering, and railroading directly intruded into the lands and restricted the mobility upon which the culture and life ways of the Utes depended” (Burns 2004).

Subsequent treaties, agreements and land cessions constrained the Utes into ever smaller territories during the next few decades, “as a strong surge of settlement, based on mining, ranching, timbering, and railroading directly intruded into the lands and the mobility upon which the culture and life ways of the Utes depended” (Burns 2004). Under the Kit Carson Treaty of March 2, 1868, the first White River Agency was established on the White River east of the present town of Meeker. For the negotiations for the treaty, the Ute delegation was transported to Washington, D.C. where the earliest of all known photographs of Utes were taken (Plate 3.2).

In 1879 newly assigned agent Nathan Meeker moved the agency to Powell Park about 15 miles down the river from its original location. Meeker's tenure was brief; and disastrous for the Utes. In a vain attempt to coerce the Utes into abandoning their horses and settling down as farmers – which was official U.S. Indian policy at the time – Meeker succeeded only in provoking them into increasingly hostile attitudes. Tensions escalated to such a point that Meeker, in the fall of 1879, called for U.S. troops from Fort Fred Steele in Wyoming to protect the agency (Simmons 2011:3380-3385).

On September 27 a small delegation of Utes, learning of the approaching troops, intercepted Major Thomas T. Thornburgh and his four companies of the Fourth Cavalry at the reservation border on Milk Creek, where they were camped. The Utes attempted to persuade Thornburgh to visit the agency without his troops. Instead, on September 29, Thornburgh's troops crossed into the Ute Reservation, and were immediately attacked by Utes hidden on the surrounding hills and ridges. The ensuing battle kept the troops pinned down for six days, before a second contingent from Wyoming arrived to end the fighting. Thornburgh and ten other soldiers were killed during the siege, along with thirty-seven Utes. On the first day of the battle at Milk Creek, Utes also attacked the White River Agency, killing Meeker and nine agency employees. Several women and children at the agency, including Meeker's wife and daughter, were taken captive and moved south across the Colorado River where they camped on Plateau Creek near present Mesa, Colorado (Simmons 2011:3396-3399). A small contingent of Uncompahgre Utes in the company of specially appointed agent Charles Adams persuaded the White Rivers to release the captives on October 21, and they were taken on south to an agency near Montrose.

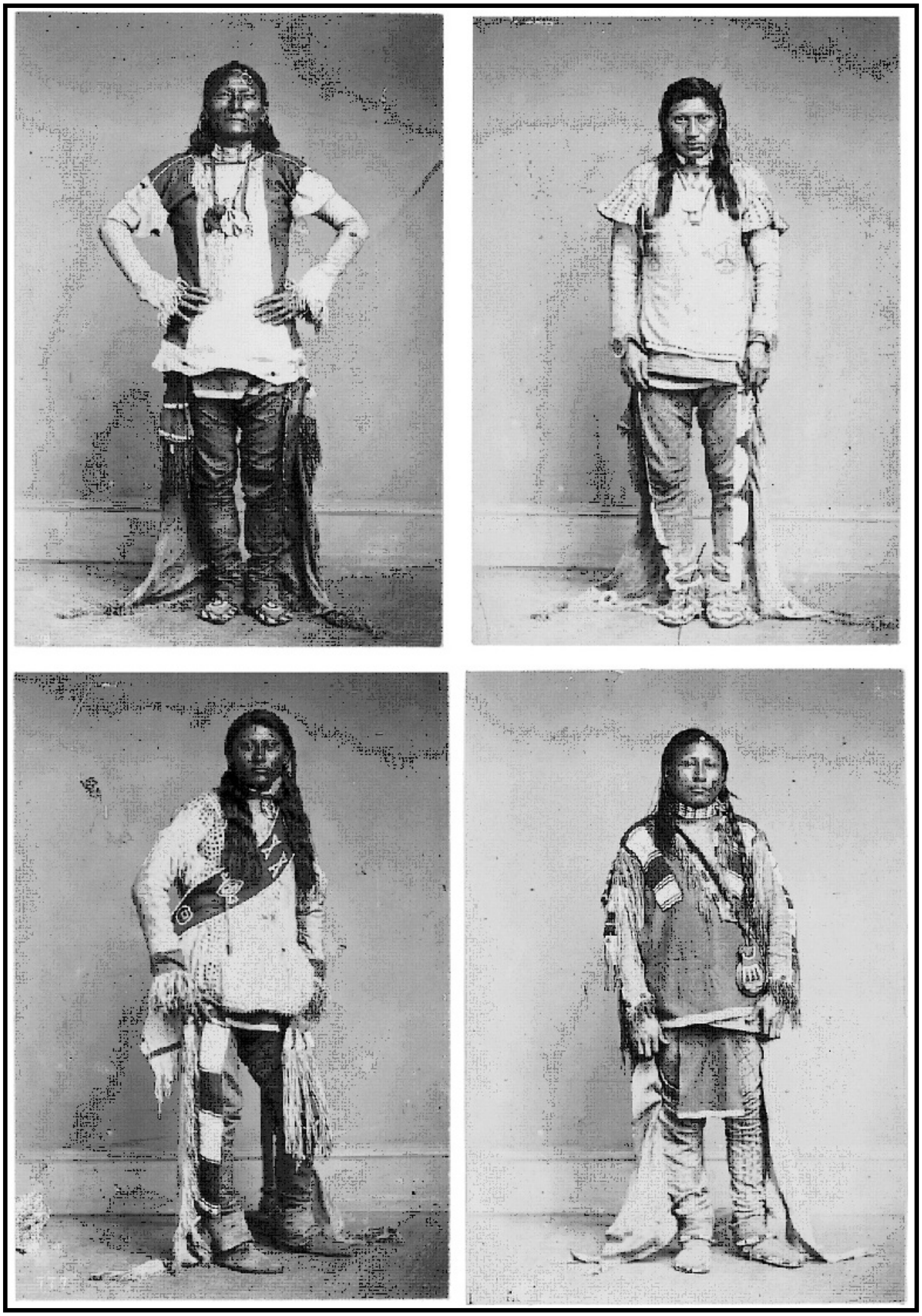


**Plate 3.2.** Members of the Ute delegation in Washington, D.C. March 2, 1868, for the infamous Kit Carson Treaty (Shindler 1868). Left to right, top to bottom: Chippin (Always Riding); Nicka-a-god (Green Leaf), White River (Yampa) Ute; Suriap, White River (Yampa) Ute; and Pe-ah (Black Tail Deer), Grand River Ute.

“Hysteria gripped Colorado as word of the events at Milk Creek and the White River Agency became public” and “troops proceeded to Colorado from all directions” (Simmons 2011: 3410-3418). Pressure from Colorado settlers and business interests had already reached fever pitch by that time, and the unfortunate events on the White River proved to be the catalyst that ended Ute sovereignty in western Colorado. Under the terms of an agreement signed on March 6, 1880 it was stipulated that:

White River Utes would move to Utah and settle on farms within the Uintah Reservation. Although they had not participated in the events at White River. the Uncompahgre Utes were to move to allotted “agricultural lands on Grand [Colorado] River, near the mouth of the Gunnison River, in Colorado, if a sufficient quantity of agricultural land shall be found there; if not there upon such unoccupied agricultural lands as may be found in that vicinity and in the Territory of Utah.” The Southern Utes, so recently settled on their own reservation and in no way involved at White River, were to move to allotted farms on unoccupied land on the La Plata River in Colorado or, if not possible there, along the same river in New Mexico (Simmons 2011:3478-3485).

Throughout 1880 and into 1881 the White River Utes – many of whom had scattered after the Battle at Milk Creek – continued to roam the area despite drastically increased military deployments at cantonments near the Ute agencies, and elsewhere around the state. Nevertheless, in the summer and fall of 1881 some six hundred White Rivers and nearly fifteen hundred Uncompahgres were deported to Utah under separate military escort.

Although exiled from their traditional homelands, the White Rivers and Uncompahgres continued to exert a physical presence in western Colorado well into the twentieth century. According to a Rocky Mountain News account dated November 28, 1881, as many as two hundred White Rivers may have eluded deportation to Utah in 1881 (Simmons 2011:3485). Other historical newspaper accounts describe almost annual Ute hunting forays (Plate 3.3) into many areas of northwestern Colorado from 1881 to as late as 1909 (Martin et al. 2009).

Ute history and ethnohistory for the Late Contact period have been enhanced in recent years by historic archaeological evidence from throughout western Colorado. The Colorado Wickiup Project (Martin et al. 2005a,b, 2006, 2009) has documented nearly fifty aboriginal wooden feature sites in central and northwestern Colorado — including sites located in the Yellow Creek and the Douglas Creek drainages which are reliably dated to as late as 1915 (Figure 3.14). Despite the official “removal” of the Utes from their traditional northern Colorado homelands, they clearly continued to exert a presence in western Colorado well into the twentieth century. Some northern Utes may have remained in western Colorado (Stewart, unpublished comments at the Symposium of the Archaeology of the Eastern Ute, Grand Junction, Colorado, 1988), off reservation, after the 1881 expulsion. Utes are known to have been counted in the census records of various communities in the area (for example Collbran, Colorado) as late as the 1920s. Historical newspaper accounts describe the nearly annual Ute hunting forays into many areas of northwestern Colorado between 1881 and 1909.

**Plate 3.3.** Utes traveling west on the White River ca. 1900, near the place where Dominguez and Escalante, guided by a Ute, turned west on the same trail in 1776. Their pack horses were probably carrying deer hides harvested up-river, possibly in the Yellow Creek area. The photograph was taken near the location of the present Rangely Airport (DARG n.d.).

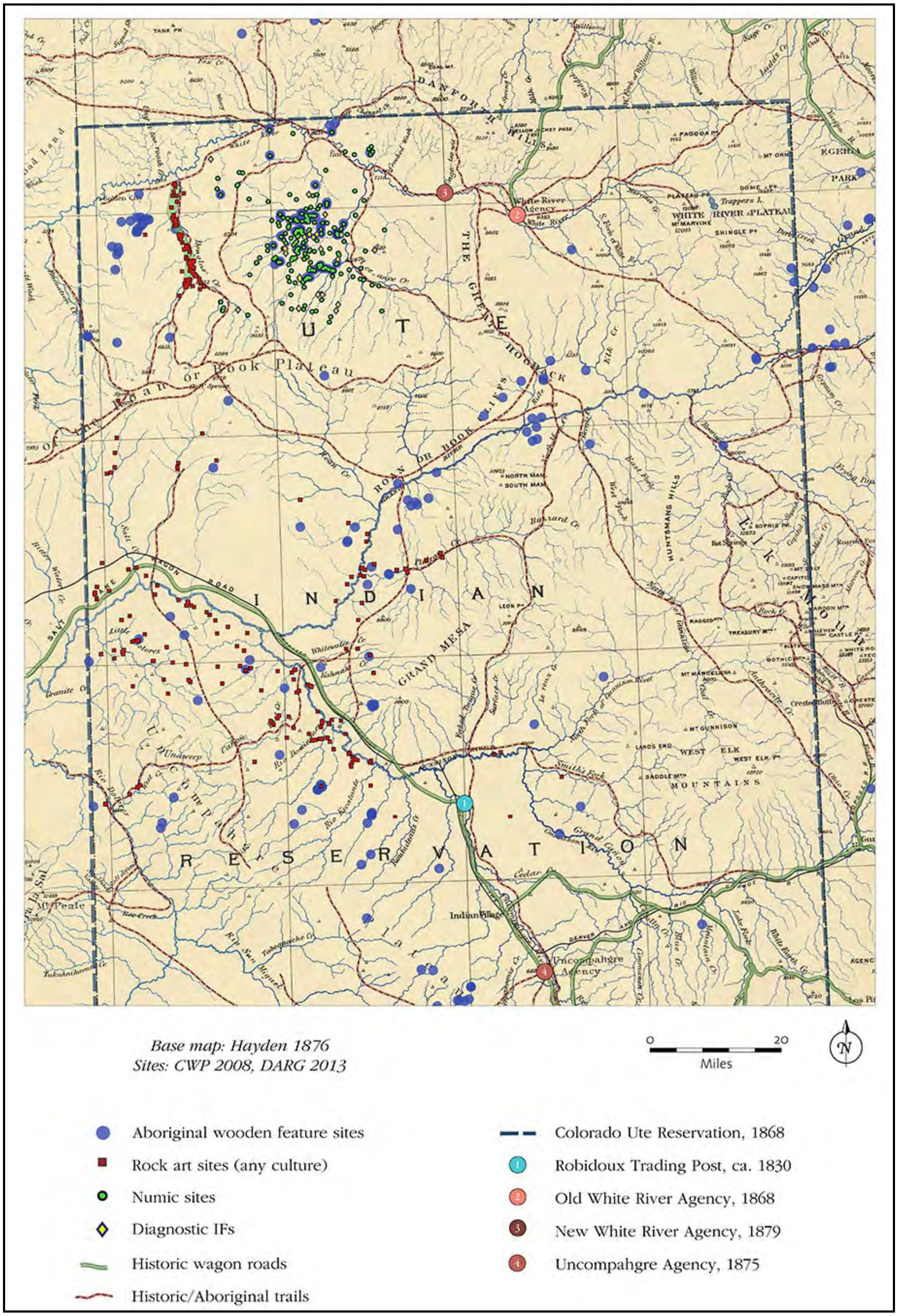



**Figure 3.14.** Distribution of selected ethnohistorical and historical archaeology features in the project region (basemap is Hayden 1877).

### 3.3.2 Early EuroAmerican Exploration

Official expeditions into Western Colorado began in 1765 when Governor Tomás Vélez Cachupin of New Mexico sent the first of two into Colorado and Utah to foil the expansion of other European powers and to search for gold and silver. Interestingly, those expeditions were prompted by the sale of an ingot of silver by a Ute to a blacksmith in Abiquiu, a small settlement northwest of Santa Fe (Alexander 2013).

Both expeditions were led by Juan Maria Antonio Rivera (also spelled Ribera). He and a small group of Spaniards followed the La Plata drainage as far as present day Durango, then crossed the Uncompahgre Plateau to the confluence of the Uncompahgre and Gunnison Rivers (Vandenbusche and Smith 1981:15). He collected and returned to Santa Fe with ore samples from his discoveries of gold in the Colorado mountains. Those samples prompted the Governor to require Rivera's immediately return to the Colorado-Utah area to learn the extent of Indian settlements in the northern periphery, to determine if other Europeans had yet arrived on the scene, and to find the location of Lake Copala Gran Teguayo – the reputed seat of the wealthy civilization sought by Coronado (Alexander 2013).

Rivera's second expedition followed his previous route as far as present day Dove Creek, Colorado, then skirted to the west of the canyons of the Dolores River drainage and crossed into Utah. Traveling through Lisbon Valley, the expedition rounded the southwestern base of the La Sal Mountains, pushed through Spanish Valley at the present site of Moab, and discovered an excellent ford of the Colorado River (then called the Rio del Tizon [roughly translated as the "stained river"]. They then trekked northwest along the north side of the Colorado River into western Colorado, and found an excellent crossing east of its confluence with the Gunnison River. They then followed along the northeast side of the Gunnison River to its confluence with the Uncompahgre River at Delta, and followed it south – ultimately returning along their known route into New Mexico. Although Rivera had found neither Lake Copala Gran Teguayo nor European villages on his second trip, he had documented a portion of the route that was followed eleven years later by the Dominguez and Escalante Expedition (ibid).

Over the next decade, other expeditions followed Rivera's route into the Gunnison River country, charged by the Spanish government with identifying prospective mining grounds and establishing communication routes. Many came seeking gold, which reputedly lay in immense deposits on the Western Slope, just awaiting discovery. Some came to trap on the many streams emanating from the Rockies, seeking to get rich in the traffic of beaver pelts. Still others came as members of Spanish raiding parties whose purpose was to weaken their increasingly aggressive Ute neighbors to the north. Documentation of these precursory (and usually illegal) Spanish infiltrations is lacking, but it is probable that the study area was visited by at least some of these parties (Vandenbusche and Smith 1981:15).

Then in 1776, a small party of travelers descended the northwestern flank of Battlement Mesa, threading its way through the evergreen and aspen, the oakbrush and chokecherry, and finally the sagebrush covering the low terraces bordering the river. Behind the group rose the jagged basalt ramparts of Housetop and Horse Mountains, their slopes striped by narrow, verdant stream valleys. To the north, across the river "which our own call San Rafael and the Yutas, Red River", lay the Roan Cliffs--"a chain of high mesas, which are of white earth from the top down to the middle and from the middle down evenly striated with yellow, white, and not too deeply tinged with red ochre" (Chavez and Warner 1976:37).

So was the arrival of the Dominguez-Escalante expedition at the Colorado River crossing near Una chronicled by Fray Francisco Silvestre Velez de Escalante. The date was 5 September 1776. Led by Fray Francisco Antanasio Dominguez and his junior partner Escalante, the expedition was into day thirty-nine of its one hundred fifty-nine-day trek. Its purpose: to find an overland route from Santa Fe to the recently established missions in California. Reaching the Delta area, the ten-member party had ascended the North Fork of the Gunnison River Valley, followed the Muddy and Cow Creek drainages to the top of Grand Mesa, skirted Bronco Knob on the south side, descended Plateau Creek to Jerry Gulch via which they surmounted Battlement Mesa, and followed Alkali Creek down to the Colorado River. Fording the river near Una Crossing, five miles downstream from Battlement Mesa, they spent the night on the "northern edge on a meadow of good pastures and a middling poplar grove" (ibid.:65). The following day, the group abandoned the Colorado River Valley, turned northwest up Roan Creek, and made their way over the Roan Plateau into the White River drainage. They traveled west as far as central Utah, but were soon forced homeward by inclement weather. The Dominguez-Escalante Expedition returned to Santa Fe on 2 January 1777, having failed to reach California but having explored much of the Colorado Plateau and generating interest in the area for years to come.

For a variety of reasons--increasingly intense encounters with the Utes, an apparent dearth of gold, and a harsh geography and climate--Spanish interest in Western Colorado waned after the major expeditions of Rivera and Dominguez and Escalante in the 1760s and 1770s. From that time until the 1820s, there were few incursions into the area, and its native inhabitants enjoyed a relatively undisturbed existence.

### 3.3.3 Fur Trapping

The third decade of the 19th century brought the mountain man and the fur trapping era to Western Colorado. Prior to 1821, the year of the Mexican Revolution, only a few individuals had dared to venture into the area to trap the then-plentiful beaver. However, when Spain's control of the area was terminated by Mexico's separation, men of French, Spanish, and Anglo-American blood descended upon the rivers and streams of Western Colorado to make their fortunes in the fur trade. From the San Juan River, which was worked in the 1820s, the trappers moved northward (Figure 3.3). By 1830, the Eagle, Roaring Fork, and Colorado Rivers had been actively trapped; and by 1837, most rivers of Colorado and Wyoming had been worked (Vandenbusche and Smith 1981:20). Fort Robidoux (Fort Uncompahgre), established on the Gunnison River near Delta in 1828 by Antoine Robidoux, and Brown's Hole (Fort Davy Crockett), located on the Green River in Northwestern Colorado by William Ashley in 1826, were the two busiest supply and trading centers on the Western Slope.

The fur boom in Western Colorado lasted approximately a quarter of a century, until the 1840s. By then, silk was replacing beaver as the fashionable material in the European hat market (the price of pelts had dropped to less than a dollar apiece), the streams and rivers had been badly over-trapped, and the Utes were becoming increasingly hostile with respect to Euro-American encroachment upon their hunting grounds. Thus, the era of the mountain man/trapper drew to an end. The pursuit of the brown, paddle-tailed beaver soon occupied only a scattered few individuals whose trapping was confined mainly to the smaller tributary streams. Two such fellows were the Kimball brothers, who worked Parachute and Roan Creeks (just across the Colorado River from Battlement Mesa) during the winter of 1882-1883 and reportedly reaped $3500 for their efforts (Murray 1973:12).

### 3.3.4 Government Exploration

Despite the incursions of the early trappers and traders, Colorado's Western Slope remained, in 1840, essentially uncharted and unknown, still the uncontested domain of the Ute Indians. However, flamed by tales of the men of buckskin, interest in the land beyond the Rockies was growing among both westward-bound emigrants seeking a place to settle and those visionaries who foresaw the commercial potential of a transcontinental railway. Pressured by these interests, the U.S. government dispatched numerous exploration and survey parties to the West between 1840 and 1880.

The first of the expeditions to pass through west-central Colorado was that led in 1843-1844 by John C. Fremont, who was en route from Missouri to California and back to South Park. The following year, 1845, Fremont again set out from Independence, Missouri, and, with Kit Carson as a guide, led his party west to California via the Arkansas, Eagle, Grand (Colorado), White, and Green River valleys. It is unclear just where the group left the Grand Valley and headed north to enter the White River Valley, but it was probably in the vicinity of Rifle or farther downstream. In 1848, Fremont once more entered west-central Colorado, this time trying to evaluate the 38th parallel as an all-weather, year-round railroad route to the Pacific. However, extreme winter temperatures and heavy snowfall immobilized the group in the San Juans and many perished, which disparaged somewhat the reputation of the "Pathfinder of the West" (Vandenbusche and Smith 1981:26; Mehls 1982:22-23).

Exploration efforts intensified in the 1850s, in large part because of the United States' acquisition of the southwest part of the country at the close of the Mexican War in 1848. Upon consolidation of the nation, a transcontinental railroad now seemed more possible. Lieutenant Edward Beale, Captain John Gunnison, and the diehard Fremont all led expeditions into west central Colorado in 1853. They followed essentially the same route--over Cochetopa Pass, into the Gunnison and Uncompahgre River valleys, past the confluence of the Grand and Gunnison Rivers at present day Grand Junction, and westward. While Beale's party made it to Los Angeles without event and Fremont's trek to Utah was successful, Gunnison and seven of his men were killed and mutilated by the Paiute in southwest Utah (Vandenbusche and Smith 1981:28). Enthusiasm over a transcontinental railroad slackened somewhat in the wake of Gunnison's demise and even more so in anticipation of the Civil War, the North and South being unable to agree on a railroad route, each demanding that it run through its territory. Federal exploration of the Western Slope came to a halt.

Into the late 1860s and early 70s, west central Colorado, including the Grand Valley, remained largely unknown, suspected to harbor great riches but unexplored, undeveloped, and still the province of Uintah (White River Basin), the Uncompahgre (Gunnison and Uncompahgre River Basins), and the Parianuc (Grand River Valley) Ute Indians (Fishell 1982:9-A). However, at the termination of the Civil War, attention turned once more to the West, and efforts to catalogue the lands beyond the Rockies were renewed. Both the U.S. Army and the U.S. Geologic Survey dispatched exploration parties, the Army searching for post sites and possible roads, the USGS locating agricultural and mining lands.

The first of the post-war expeditions to investigate the Grand Valley was led by Major John Wesley Powell in 1868. His group assembled in Middle Park and spent the summer working its way down the Grand River (past Battlement Mesa) to the confluence with the Green River. Much environmental information was gathered about the upper drainage of the Grand River by Powell's expedition (Mehls 1988:26).

Several other expeditions touched on west central Colorado, but the most noteworthy were those led by Ferdinand Vandeveer Hayden between 1873 and 1876. Sponsored by the USGS, Hayden's yearly expeditions involved topographers, surveyors, geologists, botanists, and photographers, who together mapped and reported on almost every mountain and valley of Colorado's western slope. In 1873, one of Hayden's parties, consisting of J.T. Gardner, Henry Gannet, A.C. Peale and others, surveyed the Grand Valley between Glenwood Springs and Grand Junction. The local flora and fauna and soils were noted and assessments as to the arability of the Valley's lands were developed; on Battlement Mesa, in particular, the volcanic ash was judged to be quite suitable for farming (ibid:27).

Lured by the trappers' tales of the Rocky Mountain wilderness and further encouraged by the reports of the government surveys, many westward-bound settlers set their sights on western Colorado. However, this territory had been the domain of the Ute for centuries, and was not simply "up for grabs." A Ute-Euro-American struggle was inevitable--it promised farms and ranches and prosperity for the winners, unimaginable defeat and tragedy for the losers.

### 3.3.5 Historic Euro-American Settlement

The Ute people occupied large areas of Western Colorado until about 1881. Due to the White River Utes' discontent that led to the "Meeker Massacre," as the incident became known, a congressional investigation led to the Treaty of 1880 that stipulated the removal of the White River bands to the Uintah Reservation in northeastern Utah. The Uncompahgre band was to be given a small reservation in the vicinity of the confluence of the Colorado and Gunnison Rivers. Aware of the value of these agricultural lands, however, the commission charged with enforcing the terms of the treaty, under the direction of Otto Mears, manipulated the location process using a loophole in the treaty language, and the Uncompahgres were given lands in Utah near the Uintah Reservation. The Southern Ute bands were left on the small reservation in southwestern Colorado that had been given them by the Treaty of 1873. On 1 September 1881, western Colorado was completely opened to the whites.

Interest in the potential agricultural lands of western Colorado (namely the Uncompahgre, Gunnison, Colorado, Dolores, San Miguel, White, and La Plata River valleys) had been growing for some time prior to the Utes' banishment, and by the spring of 1881 frontier towns closest to the Ute lands were "crowded with people, anxious to enter the Reservation and take possession of the most desirable locations (Haskell 1886:2)." Only days after the last of the Utes had been expelled, settlers began rushing onto the old reservation lands. Settlement activity spread quickly--during the autumn months of 1881 land claims were staked, townsites were chosen, and railroad routes were surveyed (Haskell 1886, Borland 1952, Rait 1932). However, because the former reservation lands were not officially declared public lands until August 1882, the first year of settlement activity was marked by a degree of uncertainty regarding the legality of land claims. When finally announced, the 1882 declaration did not allow homestead entries on the newly opened lands, but only preemptions, or cash entries, at the rate of $1.25 per acre for agricultural land, $5.00 per acre for mineral land (Borland 1952:75).

As described in the *History of Roan Creek and De Beque* (Prather 1984), the first to file homestead claims were Robert Eaton, L.T. Stewart and George Gibson along Dry Fork. Brothers Harve and John Van Cleave filed claim to Roan Creek property and in 1883 established a cattle business that became well known in Western Colorado. Other creeks in the area are named for the early ranchers who often brought cattle and cowboys with them. Kimball Creek is named for Gayton and William Kimball. Con [now Conn] Creek is named for C.H. Conwell. Tom Wallace set up his outfit on Wallace Creek, and John Carr on Carr Creek. George and Frank Newton settled on Clear Creek--apparently named before they arrived. The importance of water--and water rights--to the settlers was acknowledged not only by naming the creeks after them but also by so naming the ditches. Accordingly, one will also find the familiar names of Charles Creek, Joe Newman, A.S. Himebaugh, Henderson Frashier, Tom King, George P. Anderson, George Hayes, and W.A. DeLaMatyr on ditches and ranches of the surrounding area. By 1888, at least 31 ranches were in active operation, and a total of 140 cubic feet of water had been filed on (ibid.:3-4).

The town of De Beque is named for Dr. W.A.E. de Beque, who arrived with three companions (Fred Webster, John Boudin and Dick Smith) in the spring of 1884. He established a ranch on the banks of the Grand River near its confluence with Roan Creek. The first post office was within a log building built by Dr. de Beque, which served as his office, a drug store and a general store. Marie de Beque was the first Postmistress, officially named so in 1888. During this year, the town site of De Beque was established outside the boundary of the de Beques' ranch on what was originally the H.L. Spencer homestead. It was platted by surveyor John Walzl and given the name of De Beque in February of 1888. Shortly thereafter, Dr. de Beque built the first residence in the town (Prather 1984:3-4).

By 1895, most of the land in the area had been claimed, mostly under Cash Entry patents. The settlers raised their own food and availed themselves of the plentiful game in the area. Gardens, hay fields, and orchards were planted, and irrigation ditches were dug to divert the creek's water to cultivated fields. Large herds of cattle and sheep were accumulating, grazing the valley floor and the vast open range above, driven to the uplands via trails leading up the various gulches.

Adjacent to Ravensbeque (Dr. de Beque's ranch), the first school was started in 1886 by Mrs. Joseph McMillen, who initially began teaching her own children, but soon took in others from the surrounding homesteads. About that same time, a public school was opened on Con [Conn] Creek. Later, county schools were opened on Brush Creek, Kimball Creek, Dry Fork and main Roan Creek. The school started by Mrs. McMillen was moved to town where various buildings served as classrooms until a stone school house was built in 1892. Grades through high school were added as were new buildings to the school grounds, and in 1912, the first class was graduated from the high school (Prather 1984:6).

The town grew steadily during the late 1800's and early 1900's, due in part to the coming of the railroad in May of 1890. It quickly became an areal center serving not only the Roan Creek ranches north of the Grand River, but also the Blue Stone Valley farms and ranches south of the river after a bridge was built in 1891. Over the years, many people came and left, but the town's population rarely exceeded 400 persons (ibid.:7-9).

### 3.3.6 Early Transportation: Toll roads and the Railroads

By the mid 1800s, a few wagon roads had been constructed into the upper Colorado River basin, the Grand Valley. The Government Road, a Federal project, was one of the first; it ran north-south between Meeker and Rifle and connected the White and Grand River valleys. An east-west toll road between Glenwood Springs and Grand Junction was completed in 1885; spearheaded by H.R. Rhone, Edwin Price, D.P. Kingsley, and W.A.E. de Beque, the Roan Creek Toll Road was built in about a year at a cost of $12,000 to $18,000. It followed the Colorado River and shortened considerably the journey from Parachute to points westward. Prior to the road's construction through De Beque Canyon, the trek to Grand Junction to trade hides or pick up supplies had taken two weeks by packtrain "...through the Cedar Hills, up Kimball Creek...down the Sawtooth Range to Fruita and then back to Grand Junction" (Murray 1973:5). The new toll road enabled a traveler to get from Glenwood Springs to Grand Junction via stage in two days, with an overnight stop at the Hurlburts' in Parachute (Wright 1977:6). Use of this route continued until 1899 when it was purchased by the Denver & Rio Grande for roadbed. After that time, there being no way through De Beque Canyon, it was necessary to follow the road through Plateau Canyon and down what is now the De Beque Cutoff.  Not until 1929 was a highway built along the river through De Beque Canyon.

Although the new stage and wagon roads did lessen somewhat the isolation of the Grand Valley communities, their overall effect was minor compared with that of the coming of the railroad.  With the first settlement occurred in De Beque in 1882, the narrow gauge Denver & Rio Grande had been extended to nearly all the mining districts in Colorado and had reached Grand Junction via Marshall Pass, Gunnison, and Montrose.  However, the line that would eventually penetrate the Grand Valley went only as far west as Red Cliff, located on the Eagle River approximately 20 miles north of Leadville.  The interior of west-central Colorado remained apart from the rest of the country.

In the late 1880s, spurred by the silver discoveries in Aspen, both the narrow gauge Denver & Rio Grande railway and the standard gauge Colorado Midland railway began laying tracks westward--the Denver & Rio Grande  from Red Cliff down the Eagle River to Glenwood and back up the Roaring Fork, the Colorado Midland from Leadville west over Hagerman Pass, down the Frying Pan River to Basalt, and back up the Roaring Fork.  The two railways arrived in Aspen within three months of each other, sparking fierce competition for the freight and passenger traffic between Denver and Aspen.  Rate wars ensued as the two companies struggled for business.

The road-building race had nearly exhausted the finances of both railways and, with the threat of yet another competitor building across Colorado, the Denver & Rio Grande and the Colorado Midland entered into a joint agreement to build a single line from Glenwood Springs to Grand Junction.  The two companies formed the Rio Grande Junction Railway in 1886; by 1888, track had reached New Castle, by 1889, Rifle, and by the fall of 1890, Parachute.  Many local farmers and ranchers worked on the line, helping to build the roadbed or cutting and hewing ties.  The “tie-hacks” cut pinyon from Starkey Gulch on Parachute Creek and red spruce from the head of Dry Creek and sent the latter down the Old Tie Chute to the base of Battlement Mesa (Murray 1973:67).  On 14 November 1890, the standard gauge line reached Grand Junction and the long-awaited Denver-to-Salt-Lake route was completed.  Both the Colorado Midland and the Denver & Rio Grande used the line and provided excellent passenger and freight service to the Grand Valley for many years.  The railroad brought settlers, speculators, and tourists to western Colorado, carried men and supplies to her mining towns, and hauled timber, coal, and agricultural produce from Colorado's interior to markets east and west.  In the Parachute/Battlement Mesa area, the railroad's role in the cattle and sheep business was of paramount importance.

With the coming of the D&RG railroad new pressures were brought to the area.  More and more settlers arrived, competing not only for arable land but also for grazing privileges on the unpatented public domain of the surrounding uplands. Increasing numbers of cattle and sheep were imported, some being run as commission cattle for outside investors (ibid:84). Open warfare between cattle and sheep ranchers ensued, resulting in the slaughter of thousands of animals. Four thousand sheep belonging to Messrs.  Starkey and Charlie Brown were killed by masked men who tried to drive the animals over cliffs at the head of a Clear Creek tributary and above the Granlee Schoolhouse (LaPoint et al. 1981:3-51). Another 4000 sheep belonging to J.B. Hurlburt were driven to their deaths above Ben Good Creek, a tributary of East Fork (Davis 1975). The animosity between cattlemen and sheepmen continued into the 1900s. Finally, Congress passed the Taylor Grazing Act in 1934, bringing to an end to the free range by providing for regulated grazing and an end to the Sheep-Cattle Wars.

Cash Entry, Desert Land, and Homestead patents continued to be granted into the 1920s and 30. Ranching and farming were still the most important economic activities in the area and remained so until the 1960s and 1970s when many of the farms and ranches were bought up by large companies interested in the large-scale extraction of shale oil.

### 3.3.7 Oil Shale Development

Early land surveys from the 1860s and 1870s completed by F. V. Hayden reported Western Colorado to be underlain by Cretaceous shales (Gulliford 1989:20). Extraction of fossil fuels began soon after the area was settled, because the earliest of settlers had recognized the potential value of “the rock that burns” or “rubberrock” (Murray 1973:141). Seizing the initiative, T. C. Bailey formed the Parachute Mining District (PMD) in the 1890s for the sole purpose of building a shale retort and to sell stock. Under the PMD, an individual could claim only 20 acres, and oil shale claims of 160 acres could be held by groups of eight shareholders. These were staked under the Oil Placer Act of 1872 (Murray 1973:143). The Land Leasing Act of 1920 terminated the staking for oil shale claims (Beilke 1984); however, prior to that time, thousands of acres of claims were filed and speculation over oil shale may have generated more money than the oil shale itself. In the Rocky Mountain region over 100 companies were organized to develop and sell oil shale stock in 1919 (Gulliford 1983:41), and most of these companies had filed claims in Garfield County. By 1928, 62,000 or so acres had been filed on in the Parachute Mining District (PMD)--50,000 patented, 12,000 unpatented. Unfortunately, due to the deaths of several of the District's original members and the decline in the interest in oil shale during the late 1920s and early 1930s, no development was ever undertaken by the PMD.

In the interim, the onset of World War One created an immense demand for refined oil, and development was undertaken elsewhere in Garfield County. The United States was experiencing shortages of oil and began to entice private companies into mining areas of the country known to have oil shale. A report for the years 1915 and 1916 by the Bureau of Mines stated that “At the present time the large beds of oil shales that occur on Roan Creek and its tributaries in Mesa and Garfield Counties...are attracting much attention and it is thought will prove to be of great commercial value” (Bureau of Mines 1916:69). In an attempt to attract miners to Western Colorado, the U.S. government published a bulletin in 1916 stating that 20 billion barrels worth of oil was available for mining in the state of Colorado. A combination of a guaranteed market and the reported vast amounts of oil shale locked away in Western Colorado caused the slow-growing oil shale market in Colorado to explode. As a result, 150 companies filed over 30,000 oil shale claims on four million acres of Colorado land (Gulliford 1989:49). The government also filed its "claim" in 1916 by creating the Navel Oil Shale Reserve (NOSR-1), which held in trust 45,444 acres. Just a few years later, in 1924, they reserved 23,000 additional acres as the NOSR-3.

By 1921, Bureau of Mines report cited nineteen oil shale properties in operation within Garfield County – ten of which were located in or nearby the present area of study (Bureau of Mines 1921: 45). In the De Beque area, the earliest oil shale related construction was started in 1918 for a plant facility on Dry Fork by Harry Flynn, founder of the Mt. Logan Oil Shale Company. A tramway (shown on the 1926 GLO map) was built in order to transport shale from the company mine on Mt. Logan to the processing plant (Prather 1984:17).

Another mine of note in the De Beque area was operated by the Index Shale Oil Company, incorporated in Colorado in 1920. Harry L. Brown (1877-1956) was its founder and principal investor (Frazier et al. 2003:18). His company owned 1360 acres of land during this time, 80 of which were patented (Bureau of Mines 1926). The mine and plant facility occur within the present project area.

The Index Shale Oil Plant facility was constructed with funding raised by Brown, and was unique to oil shale production at that time because of his retort oven design. The plant construction was based on Brown's invention of a method to retort caked oil shale, which involved a revolving cylinder with heat applied to the outside (Savage 1967:44-45). Built in 1921, the original Index Plant was located approximately two miles northwest of the confluence of Roan Creek and Clear Creek (GLO Map). It was one of the largest and most well known of the oil shale plants in the region.

A 1921 report submitted to the Commissioner of Mines by State Mine Inspector R.J. Murray stated that the Index Shale Oil Company employed ten men – two more were added in 1923 – and all were housed in a company bunk house. The 1921 report indicated the plant was still in construction. When finished by 1923, it championed a 100 ton retort, a 280 horse power boiler, one 90 horse power steam engine, one 13x24 Blake Crusher, three Buffalo blowers, a blacksmith shop, and a carpenter shop. It reportedly only produced a small amount of gasoline that was later sold in De Beque (Bureau of Mines 1923).

In 1926, another petroleum shortage revived interest in oil shale. Brown secured new capital and created the Indexoline Company to distill gasoline from oil shale. The Indexoline Plant was reported by inspector Murry to be "in connection with the Index Shale Oil Plant, and will catch the vapors from their operations." At this time, four men were employed by the Index Shale Oil company, while twelve were employed by the Indexoline Plant, and all had worker's compensation insurance. The Indexoline Plant was the "first one of this type in this section." Murray described the process in which the plant produced gasoline as:

> "gas is caught in an accumulating tank from retorts with vacuum by compressor and pumped to 250-pound pressure, and then discharged through

> absorbers containing mineral seal oil, which absorbs the gasoline from the vapor gas. Then to vapor tanks, and then to a residue line for fuel (Bureau of Mines 1926)."

Though the years 1915 through 1930 have been coined "the first oil shale boom," the era did not resemble the type of economic boom like those involving other types of mining, such as the Gold Rush of 1849. The process of refining oil shale into liquid crude oil requires a large amount of money and equipment, and average citizens were not able to simply "strike it rich" as with the gold rushes. Consequently, the majority of oil shale mining during this era was performed by large companies from the east. The lack of population migrations to Western Colorado did not allow for large economic growth (Gulliford 1989: 62-65, 76). Historian Andrew Gulliford argues that:

> "...the first oil shale boom had come and gone without enriching Garfield County citizens, whose farm income continued to decline from World War I highs. Despite numerous projections for a burgeoning shale industry, the area remained intact largely because of limited transportation arteries, and few serviceable roads in Garfield County (Gulliford 1989: 65)."

The industry steadily declined until the Great Depression of the 1930s, when it virtually died out (Gulliford 1989: 45-76). However, private investors who realized the value of this non-renewable resource continued to purchase lands in Colorado and Utah for oil shale development during the 1930s and 1940s (Gulliford 1989: 59-62). Land patent records reveal that numerous mineral patents were filed throughout the present project area in the interest of oil shale development during this time period (General Land Office patents).

From 1930 to the present day, the counties of northwest Colorado have experienced waves of renewed interest in oil shale development, which gradually became the prerogative of the government and large oil companies. With the onset of World War II, Union Oil Company in conjunction with a division of the Bureau of Mines, called the Laramie Energy Research Center (LERC), built an experimental plant at Anvil Points in 1944. This facility was run by the LERC until 1956, and used only periodically thereafter until 1978 (Hoefer 2004:9).

Fears of crude oil shortages caused an oil shale boom in the 1950s. Large companies, the most notable being Union Oil, once again purchased private land and began mining oil shale. Early company efforts centered around Union Oil's semi-works retort, built in 1956 near the confluence of the East, West, and Middle Forks of Parachute Creek. As much as 1200 tons of ore were processed per day, producing up to 800 barrels of crude oil. Further development of the project was postponed in the 1950s and 1960s because of low world oil prices, but interest was renewed in the 1970s. A number of government contracts were regenerated (Anvil's Point Naval Reserve, Department of the Interior land leases, and the Colony Development Operation), allowing private companies to once again develop oil shale in Garfield County. The market for oil came to a halt in 1976 when the U.S. government declined to guarantee loans to private companies, and the oil shale development projects of the 1970s were suspended.

In the early 1980s, Exxon began an extensive oil shale operation at the Anvil Points Facility (APF) and built a new community on Battlement Mesa. However, this effort was also short lived because Exxon pulled out by 1982 due to the poor economics of oil shale processing, and sent the local economy into a nose dive (Bureau of Land Management Glenwood Springs Field Office 2004). Shortly after, the APF was decommissioned and demolished between 1984 and 1986 (Hoefer 2004:9).

Recent renewed interest in oil shale has led to experimental development north of the Roan Plateau. Also, new drilling and extraction technologies for natural gas have encouraged energy companies to increase drilling activity along the base of the Roan as well as on top of the Plateau.

# CHAPTER 4: FIELD METHODS AND FINDINGS FOR THE MONITORING PHASE

This section describes the methods used in the monitoring of the pipeline construction, recovery of the data of encountered cultural resources, and the laboratory methods for their analyses. This section also summarizes the findings and evaluations for each site encountered during the monitoring phase. The sites that required additional data recovery are further discussed in Chapter 5. Detailed information for the resources is provided in Appendix D: Location Data and OAHP Forms (available at the BLM and OAHP).

## 4.1 General Methodology for the Monitoring Phase

A cultural resource monitor was conducted throughout all phases of pipeline construction. These phases consisted of: 1) right-of-way preparation, 2) right-of-way clearing, 3) trench excavation, and 4) reclamation.

Right-of-way clearing entailed the removal and setting aside of topsoil as well as subsoil. Bulldozers, road graders and trackhoes were utilized during this phase. The versatility of the bulldozer allowed for its use in all types of terrain, whereas road graders were constrained to level areas. Trackhoes were used in steep and/ or narrow areas. Approximately four to six inches of soil was removed by the bulldozers and graders during each pass. The loose soil was pushed to the edge of the right-of-way creating windrows.

Hydrovacing, stream-crossing construction, and vegetation removal were also undertaken during right-of-way preparation. Hydrovacing is a process using pressurized water to detect existing pipelines and the process was observed in proximity to known sites. All stream crossing construction, regardless of proximity to known cultural resources, was monitored. The removal of vegetation was a progressive endeavor. Shrubs and related understory were removed by a brushhog. Trees were removed by trackhoes and placed in large mulching machines.

Reclamation consisted of replacing the topsoil, re-contouring the right-of-way, and re-seeding. In the areas of the salvaged features, monitors ensured the area was carefully padded with four to six inches of soil. This was accomplished primarily by a trackhoe with a smooth blade attachment, or on occasion, a road grader was used. After the features were adequately padded a bulldozer then pushed the remaining soil in place.

Grand River Institute assigned one monitor per machine or to two or three machines working in the same area (bulldozers often worked side-by-side clearing the right-of-way). Archaeological monitors were positioned well back of the heavy equipment enabling them to safely maneuver around the equipment. This was especially true when observing brushhog and mulching machine operations since they tend to propel a larger amount of debris. The low probability of finding cultural resources on steep terrain permitted flexibility during monitoring, thus allowing a monitor to cease observing a piece of equipment in one area in order to monitor equipment working in a more archaeologically sensitive area. This became important since four to six trackhoes were used to excavate the pipeline trench at any given time and were dispersed approximately 0.5 to 1.0 mile apart. Elsewhere monitors were assigned a stretch of the trench related to a single trackhoe. The monitor observed the trench walls as well as the backdirt for cultural remains. When trackhoe excavation reached the vicinity of a known site or cultural resource, trench width was constricted to minimize disturbance to possible subsurface cultural deposits.

The monitors followed a specific protocol upon discovery of cultural resources. Upon discovery, the monitor notified the operator and requested a cessation of ground disturbing activity; then, a buffer zone measuring 100 feet in diameter was established around the find to prevent further disturbance. At that time the monitor would determine whether the cultural find was an apparent isolated event that could be salvaged as part of the monitor or substantial and would require additional data recovery beyond the scope of the monitoring phase.

Upon discovery each exposed artifact and/or feature(s) was intensively mapped using a Trimble Geo XT unit. Trimble data was later downloaded and detailed site maps were created. Site boundaries were then applied to 7.5 minute quadrangle maps as well. The 7.5 minute maps show cultural resource locations in relation to the project area while site maps (attached to the OAHP Forms) depict the visible extent of artifacts and features in relation to topography as well as the pipeline right-of-way or trench.

Cultural features which could be salvaged were excavated in their entirety through the use of $1m^2$ test units. These features were typically encountered within the top 20 to 30cm of deposition. Ancillary samples were recovered for analysis to determine cultural/temporal affiliation, subsistence, and the paleo-environment. The features were photographed and plan/profile views were drawn. When possible, features exposed by trenching were also excavated in their entirety and ancillary samples were collected. Stratigraphic profiles documenting the character and context of the feature(s) as well as the sedimentary, geochemical and edaphic character of the natural deposits were drawn. Artifacts exposed in the right-of-way or via mechanical stripping and trenching were collected for analysis. A complete list of collected artifacts is detailed in Appendix C.

Photographs were taken at each site and include site overviews as well as specific artifacts and features when warranted. Field notes were taken and include descriptions of the cultural manifestations, vegetation, and soils. Photographs and site forms will be on file with the Bureau of Land Management. Collected artifacts from BLM land are to be curated at the Museum of Western Colorado and artifacts collected on private land will be returned to the landowner.

### 4.2 Laboratory Methods for Recovered Artifacts and Ancillary Samples

In the laboratory, artifacts were sorted according to a classificatory scheme. Chipped stone categories include projectile points, bifaces, unifaces, flakes, blade tools, hammerstones, cores, and debitage (primary, secondary, interior, and shatter). Ground stone categories include manos (grinding stones), metates (nether milling stones), and other ground stone. No perishables were found. Collected artifacts recovered from BLM administered land will be curated at the Museum of Western Colorado in Grand Junction except for artifacts collected on private land which will be returned to the land owner.

Lithics were categorized according to morphological similarities. Resultant classes include: artifacts subsumed under debitage, chipped stone (i.e., tools), and ground stone. Debitage was examined for percent of dorsal cortex and classified as primary (>50% cortex), secondary (<50% cortex) or tertiary (no cortex). Debitage characterized by indiscernible platforms or bulbs of percussion, regardless of percent of dorsal cortex, were classified as shatter. Size grades were determined by processing debitage through a series of nested screens ranging in size from 2 inches to $1/16^{th}$ inch. Chipped-stone tools were further subdivided into informal and formal types based on core reduction techniques. Finally, lithic material classes, subtypes and geologic formations were identified for all specimens.

Limitations of lithic debris or flake analysis are dependent upon an understanding of the limitations posed by surface assemblages. The most important limitation is that surface remains have been cast off, cached, or lost by the aboriginal occupants. Meaning that all the formal and transportable tools in good condition were taken by the occupants when they left. Therefore, detritus from the construction or refurbishing of tools is not always a true representation of all the lithic material types employed by a particular group. For example, if a particular chert cobble was reduced on site, one might be inclined to conclude that this was the material type of preference for a tool kit, when in actuality the tool kit might have included quartzite, obsidian and other chert(s) represented by the tools that were removed (carried off). Therefore, the lithic surface assemblage is most likely not representative of materials that made up the occupant's tool kit nor does it provide an accurate accounting of the materials that were utilized. A better assessment of those materials would be an analysis of the percentages exhibited by cast off tools.

Flakes that exhibit some attrition or retouch were characterized as utilized, although such characterization must be tempered with the understanding that flakes in surface contexts that have been stepped on by animals or humans, or redistributed by sheet wash or other post-depositional processes can exhibit similar characteristics as those that are categorized as "utilized." Documentation of such discrepancies is found in the analysis of flakes derived from excavations at Cedar Siding Shelter in Emery County, Utah. The results of that analysis documented that of the "92 utilized flakes collected, 43 flakes (47%) came from the surface collections, although only 3.6% of the debitage was from the surface." It was concluded that domestic sheep sheltering in the overhang had created the "utilized" flakes in surface contexts (Martin et al. 1983:106).

Accurate description and identification of lithic materials adds significant data to site interpretations by providing information concerning routes traveled or whether these lithic materials were obtained through trade. In some instances, prehistoric lithic material preferences may indicate the manufacture of certain artifact types. Misidentifications can seriously skew the interpretations. For example, non-volcanic glass, formed in burning coal seams is usually identified as obsidian; while the former is local, the latter is exotic. Accordingly, lithic material categories considered during this inventory include the following: opalitic chert (semi-translucent and non-translucent), quartzite, porcellanite (siltstone and claystone), basalt, crystalline quartz, obsidian, and non-volcanic glass. Color is also an important consideration. On lithic scatters where flakes are the only artifact type the combination of material type, size, and color may prove to be "diagnostic" of a particular culture or temporal period (notably Numic). A better approach to lithic material identification is based on geological features and fossil inclusions, and can frequently identify bedrock (primary) sources, and with an understanding of bedrock and Quaternary geology, define materials from diamictites and gravel sources (Miller 1992, 1996, 2010).

Faunal remains were categorized as vertebrate or invertebrate. The specimens were further subdivided according to species when possible, and examined for evidence and degree of processing.

Radiocarbon samples were analyzed by Beta Analytic of Miami, Florida using accelerated mass spectrometric (AMS) methods when necessary. In some cases, the dates were compared to the archaeologist's and geologist's knowledge of cultural trends and depositional processes at the site to reveal more exact temporal information when discussing the results. Furthermore, pragmatic statistical methods such as averaging were conducted to address questions regarding coevalness, and/or to better understand a series of dates obtained from the same stratigraphic unit or feature.

When a feature was identified it was cross-sectioned by removing and bagging half of the fill to identify strata and find living floors. Once complete, the remaining half of the feature fill was collected and brought back to the lab for flotation analysis. Feature fill was processed by adding the fill to a plastic tub filled with tap water and slowly stirring to transport lighter materials to the top and out through a tube at the top of the tub. The materials were run through a 1/16$^{th}$ inch mesh net, rinsed and the remaining particles were then air dried, and sorted for further analysis.

Pollen and sediment samples were collected within every stratum. Sample boundaries were based on unconformities, which represent drought, and ranged from 2-5cm in height. Pollen samples were processed by Shawn D. Blissett, M.S., and Kenneth L. Petersen, Ph.D. of the RED Lab, Department of Geography at the University of Utah, Salt Lake City (Appendix B).

Obsidian samples were recovered from several of the sites. These samples were sourced using X-ray fluorescence (XRF) trace element characterization at the Northwest Research Obsidian Studies Laboratory, Corvallis, Oregon. Their method of analyses is nondestructive, accurately measures trace element concentrations in obsidian, and has been shown to have the greatest overall success in "fingerprinting" obsidian sources (Harbottle 1982; Rapp 1985; Williams-Thorpe 1995; Glascock et al. 1998; Herz and Garrison 1998).

## 4.3 Summary of Findings for the Monitoring Phase

Site **5GF109** is a prehistoric open camp that was originally recorded by John Gooding in July of 1974. It is located on the river terrace south of the Colorado River and approximately 110 meters east of Wallace Creek. The vegetation is sagebrush and greasewood with sparse native grass and the soils are light brown loam with small pebbles. The elevation is 5080 feet. The site was originally described as follows:

> The site is a chipping site resembling those described by Sharrock (1966:64). The site is composed of chipping debris, a few implements broken during manufacture, and two metates. The material remains of the site were predominantly chert, chalcedony, and quartzite. Sub-surface testing was not attempted. The site has been visited regularly by local arrowhead hunters. Consequently, no diagnostic artifacts were located during the surface collection. Artifacts in private collections contain not only prehistoric artifacts but also some evidence of early Spanish occupation. Local informants believe that the Una Bridge vicinity was utilized by the Dominguez-Escalante expedition on the northern Colorado leg of their journey.

In 2007, Grand River Institute revisited the site during the Class III cultural resource inventory for the proposed Collbran Pipeline Project (Conner and Davenport 2007). Chipped and ground stone artifacts were found scattered in an area 80m in diameter. Several river cobbles were also recorded. No thermal or architectural features were observed. The soils within the site boundary were noted to be deep and the probability of subsurface cultural material was determined to be good; thus, the site was evaluated as eligible to the NRHP. Accordingly, avoidance was recommended. It was proposed that the pipeline follow an existing road to the south of the site; however, use of that route was denied by the landowner. As a result, Grand River Institute returned to the site on the 14th of August 2008 to: 1) determine and/or delineate the area of impact that would result from the construction of the original route, and 2) to propose a data recovery plan that would mitigate adverse impacts to the site. Additional mapping took place and new artifacts were observed within a larger area measuring 235 meters NW-SE by 130 meters NE-SW. The following artifacts were recorded: 79 flakes, two biface fragments, two tested cobbles, two hammerstones, five manos, one non-diagnostic projectile point fragment, and a Uinta Side-notched projectile point (later designated 5GF109.s97; Plate 5.1-2) dating ca. AD 1100 to 1300 (Holmer 1986:107). A collector's pile was also observed.

Subsequent archaeological investigations were conducted at the site. Efforts were made to establish the vertical and horizontal extent of cultural deposits. These efforts aided in ascertaining whether the site could contribute additional significant information after testing. Data recovery results along with the evaluation and management recommendations are presented in Chapter 5.

Site **5GF4337**, a large prehistoric open camp, is situated at an elevation of 5240 feet on a terrace south of the Colorado River and slightly east of Alkali Creek. Vegetation consists primarily of sagebrush, rabbitbrush, and grasses. Pinyon and juniper occur to the south on the mesa's north-facing slope. Soils consist of a fine to coarse, light brown loess/silt.

The site boundary measures approximately 100m E-W by 75m N-S. The following artifacts were recorded on the surface: one non-diagnostic projectile point, one mano, and two flakes. No thermal features were observed on the surface; however, at least 15 (Features 1 through 15) were exposed subsurface during mechanical stripping. In addition, several concentrations of fire-cracked rock were observed. These concentrations are products of secondary deposition and lack characteristics indicative of *in situ* thermal features.

Subsequent data recovery focused on the excavation of the features. A limited assessment of the vertical and horizontal extent of cultural material was achieved through random excavation outside of the staked pipeline right-of-way. Data recovery results along with the evaluation and management recommendations are presented in Chapter 5.

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Site **5GF4351**, an isolated thermal feature, is located west of Wallace Creek and south of the Colorado River at an elevation of 5200 feet. The native vegetation has been cleared for agricultural use, but once likely consisted of open sagebrush and native grass. Soils consist of a fine to coarse, light brown loess/silt.

The site measures 1m in diameter and contained an isolated thermal feature. The feature, exposed during mechanical stripping, consisted of a concentration of 21 pieces of fire-cracked rock (four medium sized, two small, and 15 very small), ashy soil and charcoal fragments. The feature was photographed, mapped, and one bag of feature fill was collected and sent to Beta Analytic for processing. A radiocarbon age of 1990 ± 40 BP (conventional), Cal BC 60 to AD 80 (Beta #267634) was obtained. This placed the occupation during Reed and Metcalf's (1999: 6) Terminal Period of the Late Archaic Era and their Aspen Tradition of the Formative Era.

Evaluation and Management Recommendations

The site has been significantly impacted by pipeline construction and the only cultural manifestation present was salvaged in its entirety. In addition, no other cultural material was observed in the vicinity of the isolated feature. The current research potential of the site has been exhausted. Accordingly, the site is field evaluated as not eligible for inclusion on the NRHP. No further work is recommended.

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Site **5GF4352**, an isolated thermal feature, is located approximately 225 meters west of Little Alkali Creek and 2.2 kilometers east of the Colorado River at an elevation of 5200 feet. Vegetation is presently agricultural lands, but was likely open sagebrush and native grasses prior to development. Soils are light brown loess/silt with small rocks and pebbles.

The site measures 1m in diameter and contained an isolated thermal feature. The feature, exposed during mechanical stripping, consisted of a 40cm diameter concentration of ashy soil. The feature was photographed, mapped, and two bags of feature fill were collected; however, the samples lacked sufficient charcoal necessary for radiocarbon analysis. No architectural features or artifacts were observed in the immediate area.

Evaluation and Management Recommendations

The site has been significantly impacted by pipeline construction and was salvaged in its entirety. In addition, no other cultural manifestations were observed in the vicinity. The current research potential of the site has been exhausted. Accordingly, the site is field evaluated as not eligible for inclusion on the NRHP. No further work is recommended.

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Site **5ME113,** a large prehistoric open camp, is located on the west edge of Place Mesa between Atwell Gulch and Jerry Gulch at an elevation of 6040 feet. It was originally recorded by the Historical Museum and Institute (HM & I) in December 1975 and then again the same month by R.E. Hurlbutt. The vegetation is a mix of sagebrush flats and scattered pinyon/juniper forest. Soils consist of a fine to coarse, light brown loess/silt with few rocks.

The site was originally described as follows:

> Site overlooks northeast extension of Atwell Gulch to the south; well protected by sandstone outcropping along the northern perimeter...The site may extend to surface of outcropping but no cultural evidence was found there. The cultural material taken and observed consists of five flakes and two mano fragments. The site is disturbed by Sunnyside Road, fence line, historic camping and Rocky Mountain Natural Gas Company survey operations.

In 2007, personnel from Grand River Institute mapped and photographed the site in conjunction with the proposed Collbran Pipeline Project (Conner and Davenport 2007). At that time, its boundary was enlarged to encompass previously recorded isolated finds 5ME960, 5ME967 and 5ME968. The following is an excerpt from the 2007 description:

> Presently, artifacts are widely distributed in an area measuring 185m east-west by 100m north-south. These include two projectile point fragments, one scraper... [and lithic debitage]. One projectile point [is] a mid-section of opalitic chert, non-diagnostic and was not collected. The collected projectile point (5ME113.s1; Plate 5.3-2) is a base fragment of opalitic chert that appears to have been reworked and reused as a knife. This point compares well with Elko Side-notched types which date approximately 5500 to 2400 BC (Holmer 1986: 104). The end scraper [is] of a blue/green/gray porcellanite with cortical flaking... The lithic debitage is of opalitic chert, porcellanite, and orthoquartzite, in a wide variety of colors. Two small concentrations of possible fire-cracked rock (FCR) with faint ashy soil were noted on the south side of the

road near the center of the site. Soils on the bench appear to vary in depth with shallow areas in the pinyon/juniper and deeper accumulation within the sage flats– coincidently where the FCR concentrations are located. The site has been disturbed by the existing Sunnyside Road which bisects the site northwest to southeast.

During the monitor, one new thermal feature was observed. The feature, which was designated Feature 4, was exposed during the removal of topsoil from the pipeline right-of-way. It consisted of diffuse ash concentrated in an area measuring 75cm in diameter. The eastern edge of the feature was destroyed during mechanical stripping, but excavation revealed a shallow basin about 5-10cm deep. The feature was salvaged and fill was screened through an 1/8th-inch mesh. Two medium-sized tertiary flakes and five microflakes were recovered from the fill. In addition, one medium-sized tertiary flake was found *in situ* on the basin floor of the feature. One bag of feature fill was collected; it yielded a conventional radiocarbon age of 1720 +/- 40 BP, Cal AD 230 to 410 (Beta-267635) which places occupation during Reed and Metcalf's (1999: 6) Aspen Tradition of the Formative Era.

Subsurface archaeological investigations were conducted to further investigate the vertical and horizontal extent of cultural deposits at the site. These efforts aided in ascertaining whether the site could contribute additional significant information after testing. Data recovery results and the evaluation and management recommendations are presented in Chapter 5.

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Site **5ME948** was originally recorded by Gail Firebaugh in May of 1979 and described as consisting of a prehistoric open camp and a historic isolated find. In April of 1981, the site was revisited by Tom Babcock who monitored the construction of a pipeline through the site. The monitor did not reveal any subsurface deposits. The site is located on a bench above a tributary of Shire Gulch at an elevation of 6000 feet. The vegetation within the site consists of pinyon/juniper forest, sagebrush and rabbitbrush. Soils are tan to light brown sandy silt with shaley pebbles.

Site 5ME948 was originally described as follows:

> [The] site consists of a light scatter of chipped stone flakes and tools on a fairly level northwest-facing bench overlooking a steep canyon drainage. Lots of frost heave action and some slope wash is visible in the soil and this seems to have brought up the artifacts from sub-surface. Sandstone bedrock outcrops on site and in cliffs below the site. Approximately 30 flakes of mottled chert, gray chert, reddish chert, brown chalcedony and white chalcedony, 90% interior. One serrated corner-notched white chalcedony projectile point was found, and one serrated corner-notched red chert point (both collected). One historic wooden pipe bowl was observed. Points similar to those found on the site were classified by Buckles as being manufactured in the Roubideau Phase (3,000 - 500 B.C.) (Buckles 1971:1220).

The site was relocated, mapped, and photographed by personnel from Grand River Institute in 2007 in conjunction with the proposed Collbran Pipeline Project (Conner and Davenport 2007). At that time, a total of 15 artifacts were recorded in an area measuring 107m NE-SW by 30m NW-SE. These items included a fragment of an end scraper, one leaf-shaped uniface (5ME948.s1; Plate 4.3-1), and 13 flakes. Unifaces with similar leaf-shaped morphology have been found on local Protohistoric sites. Thermal or architectural features were not observed.

**Plate 4.3-1.** Collected leaf-shaped uniface from 2007 survey. The image represents the actual size of the artifact.

During the monitor, two manos and one thermal feature (Feature 1) were newly recorded within the site's previous boundary. The manos are both bifacially ground and pecked and display areas of calcification from soil contact. Feature 1 was exposed west of the pipeline right-of-way during mechanical stripping. Due to its disturbed nature, measurements could not be obtained. Excavation revealed a shallow basin filled with ash, fire-cracked rock and small pieces of charcoal. A carbon sample was collected from within the feature and sent to Beta Analytic for processing. A radiocarbon age of 2060 ± 60 BP (conventional), Cal BC 340 to AD 60 (Beta #267636) was obtained, placing occupation within Reed and Metcalf's (1999:6) Terminal Period of the Archaic Era and also within their Aspen Tradition of the Formative Era.

Evaluation and Management Recommendations

The site was originally field evaluated as eligible in 1979 and reevaluated as officially not eligible in 2008 based on data from the 2007 survey project. During pipeline construction monitoring, two additional artifacts and one thermal feature were recovered. Inspection of the pipeline trench walls failed to yield any indication of additional depth of cultural fill, and the site does not appear to possess the potential to yield additional information important to the prehistory of the area. Accordingly, the site should remain not eligible for listing on the NRHP. No further work is recommended.

Site **5ME974** is a multi-component site containing the remains of a prehistoric open architectural site and several historic artifacts. The site was originally recorded as an isolated find by Sally Crum and Carl Conner in April of 1979. The site is located on a ridge southeast of Shire Gulch at an elevation of 6080 feet. The vegetation consists of pinyon/juniper forest with sagebrush and little other understory. Soils consist of light brown loess.

In 2007, personnel from Grand River Institute revisited the site during the Class III cultural resource inventory that was conducted for the Collbran Pipeline Project (Conner and

Davenport 2007). Additional cultural material was recorded, including chipped and ground stone artifacts as well as three deflated concentrations of fire-cracked rock. Historic artifacts were also observed. Collected artifacts included one biface fragment, one eclectic double side-notched projectile point with a basal notch and an .32-40 caliber ammunition cartridge with a protected primer that was used in a Winchester Model 94 lever-action rifle (Plate 5.4-2). This particular cartridge was in production from 1895 until ca. 1904 (Phil Born, personal communication). The lithics and the historic artifacts were interpreted to represent a Ute occupation during the early 1900s.

The site was monitored during pipeline construction in 2009. No new cultural material was observed during the monitor.

As a result of the 2007 recording, the site was field reevaluated as eligible for inclusion on the NRHP due to the potential for intact buried cultural components. Accordingly, Grand River Institute recommended mitigation in the form of data recovery as well as restricting the area of impact (i.e., staked centerline) to the existing road. Efforts were made to establish the vertical and horizontal extent of cultural deposits at the site. These efforts aided in ascertaining whether the site could contribute additional significant information after testing. Data recovery results and evaluation and management recommendations are presented in Chapter 5.

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Site **5ME16097** is an open camp located on land under the jurisdiction of the United States Forest Service's White River National Forest Office (USFS) southeast of DeBeque, Colorado. The site is on a low, northwest-southeast trending ridge at an elevation of 5700 feet. It is situated between two northwest-flowing intermittent drainages: Horsethief Creek to the southwest and Little Horsethief Creek to the northeast. The vegetation is a mix of pinyon and juniper, sagebrush, prickly pear cactus and native grass.

The site was originally recorded by Grand River Institute in 2007 during the Class III cultural resource inventory that was conducted for the Collbran Pipeline Project (Conner and Davenport 2007). It was described as follows:

> Site 5ME16097 is a small prehistoric open camp...in an area measuring roughly 30m northwest to southeast by a maximum of 10m northeast to southwest...a collection of lithic debris and two features. Feature 1 is a rock filled hearth that measures about 1m in diameter and contains 10+ pieces of basalt rock, ashy soil and small bits of charcoal. At the opposite end is a small concentration of twelve fire-reddened river cobbles and a few heat fractured cobble chunks. This was designated Feature 2 and may represent the location of a possible sweat lodge. Eleven flakes make up the total lithic artifact count and these are dispersed between the two features.

During the monitor, a supposed thermal feature was observed. The feature was exposed during the removal of topsoil. It was photographed, mapped and salvaged. The feature measured less than 1m in diameter and consisted of a lense of clay, ash and charcoal. One bag of feature fill was collected and a charcoal sample was sent to Beta Analytic for processing. The sample yielded a conventional radiocarbon age of 3680 ± 40 BP (conventional), Cal BC 2190 to 1950 (Beta #267637). Further investigation of the feature determined it to not be of cultural origin, but rather a natural deposition of clay mixed with surface charcoal and ash (likely from a wildfire) by a heavy rainfall event.

Subsurface archaeological investigations were conducted to further investigate the vertical and horizontal extent of cultural deposits recorded at the site in 2007. These efforts aided in ascertaining whether the site could contribute additional significant information after testing. Data recovery results along with the evaluation and management recommendations are presented in Chapter 5.

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Site **5ME16102** is a large prehistoric open camp located west of Shire Gulch and south of the present Sunnyside Road at an elevation of 6160 feet. Vegetation is open sagebrush with cheatgrass. The soils are tan and gray, rocky silty sand. It was originally recorded by GRI in 2007 as part of the Class III cultural resource inventory of the proposed Collbran Pipeline Project (Conner and Davenport 2007).

The site was originally described as a 180m (N-S) by 90m (E-W) concentration of chipped and ground stone artifacts as well as thermal features. The following is an excerpt from the original description describing the recorded features as well as the artifacts collected from the site:

> Feature 1 is located at the north end of the site and consists of a concentration of 12 pieces of fire-cracked rock (FCR) within a 50 x 50cm area. Feature 2, located just 5 meters south of Feature 1, contains a similar collection of FCR and has a basalt mano fragment (3 x 3cm) associated with it. Feature 3 is yet another concentration of FCR in a 1m diameter area located 30m southeast of Feature 2. Finally, Feature 4 is a possible roasting midden of a concentration of 60+ medium sized rocks (some displaying evidence of thermal alteration) that measures 2.5 meters in diameter and is located in the southwest quadrant of the site.
>
> Four artifacts were collected from the site: .s1) a gray opalitic chert graver, .s2) a white porcellanite biface tip-midsection fragment, .s3) an historic ammunition cartridge, and .s4) a porcellanite thumbnail scraper. None of the lithic artifacts are diagnostic, however the prehistoric items are indicative of faunal processing activities. Along with the five manos (or fragments thereof), it appears that floral and/or faunal processing was a prominent activity at this locality. The cartridge is a .40-65 Winchester used in a model 1876 lever action rifle. This cartridge appears to be from an early production manufactured in 1879 because it has no head stamp and it has a recessed percussion cap (Phil Born, personal communication).

Prior to the monitor, limited testing was conducted to investigate the vertical and horizontal deposits at the site. The tests yielded negative results. Thus, additional data recovery was deemed unnecessary. In addition, potential adverse threats to the resource were considered to be minimal due to the site's location outside of the proposed area of impact.

Mechanical stripping of the topsoil exposed eleven new thermal features (Features 5 through 15). In addition, two new artifacts (i.e., one flake and one biface) were exposed. The flake was collected (5ME16102.s1). These findings prompted a revision of the site boundary which was enlarged by approximately 95 meters to the west and north (203m x 119m).

Subsequent data recovery focused on the excavation of the features. In addition, a limited assessment of the vertical and horizontal extent of cultural material at the site was achieved through random excavation. Data recovery results along with the evaluation and management recommendations are presented in Chapter 5.

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Site **5ME16105** is a prehistoric open camp located along the Sunnyside Road, midway between Hayes Mesa and Little Anderson Gulch, at an elevation of 6000 feet. Predominant vegetation consists of cheatgrass and forbs. The residual soils are a fine to coarse, tan loess/silt.

The site was originally recorded in 2007 as a prehistoric open lithic scatter by Grand River Institute during the original Class III cultural resource inventory for the Collbran pipeline in Garfield and Mesa Counties, Colorado for Encana Oil and Gas (USA), Inc. (Conner and Davenport 2007). The original site description is as follows:

> The few lithic artifacts which make up the site are dispersed in an area measuring 55 meters north-south by 35 meters east-west. A total of one core and seven flakes were recorded. The core measures 3.5cm in diameter and is of gray basalt. The lithic material of the debitage includes basalt, porcellanite and opalitic chert. Six of the flakes are tertiary and one is secondary. No thermal or architectural features were found.

Monitoring during pipeline construction resulted in the identification of nine new thermal features (Features 1 through 9) within the pipeline right-of-way. Features 1 through 7 and 9 were exposed as a result of mechanical stripping. Feature 8 was exposed in the pipeline trench wall at 80cm below the graded surface. As a result of these new findings, the site boundary was amended to encompass an area measuring 88m northwest-southeast by 55m northeast-southwest.

Immediate adverse threats were mitigated through excavation and documentation of the nine features. The features were mapped, excavated in cross-section, profiled, and appropriate samples were collected.

Feature 1 consisted of a concentration of ashy soil and fire-cracked rock. The feature was too disturbed to discern the shape and size. A sample of the fill was collected; however, due to the disturbed nature of the feature, it was not sent for analysis.

Feature 2 was initially exposed as a concentration of ash with a few small fragments of charcoal. The feature measured roughly 30cm in diameter at the time of exposure and 80cm in diameter after the removal of the loose overburden. Continued excavation revealed a large rock-filled basin or roasting pit with roughly 40-45cm of fill. Approximately 40 medium to large-sized (10-35cm) fire-cracked rocks filled the basin. The feature fill was collected and sent to Beta Analytic for processing; the fill produced a conventional date of 2220 ± 60 BP, Cal BC 400 to 110 (Beta #267641). Additionally, a small flake was recovered from the fill (5ME16105.fs1).

Feature 3 consisted of a large (100cm diameter) ashy concentration and an adjacent smaller ashy concentration (30cm diameter). Approximately 30 pieces of fire-cracked rock were removed from the feature. Feature fill was collected and sent to Beta Analytic for processing; it produced a conventional date of 2240 ± 50 BP, Cal BC 400 to 180 (Beta #267642).

Feature 4 consisted of a concentration of dark ashy soil and fire-cracked rock measuring 65cm east-west by 50cm north-south. Approximately 16 pieces of large to medium sized rocks were removed from the feature's interior. Feature fill was collected, but it was not sent for analysis.

Feature 5 consisted of a fairly faint, widely dispersed concentration of ashy soil and a few charcoal fragments. The depth of the feature measured less than 3cm and fire-cracked rock was not observed. A sample of the feature fill was collected, but it was not sent for analysis.

Features 6 and 7 consisted of concentrations of ashy soil. Charcoal and fire-cracked rock were not observed. These features had no meaningful shape or depth to describe. In addition, the integrity of the feature fill was too compromised to collect.

Feature 8, exposed in the trench wall at a depth of 80cm below the graded surface, consisted of a concentration of dark ash. The feature measured 35cm in diameter and 20cm in depth. The feature fill was collected, but proved to be insufficient for dating. In addition, one flake was collected from the feature fill.

Feature 9 consisted of a faint ash stain measuring 60cm in diameter. Charcoal was not observed. Although the fill was collected, it was not sent for analysis.

Evaluation and Management Recommendations

In 2007, the site was officially evaluated as not eligible for listing on the NRHP. Even though monitoring identified several new features and produced two radiocarbon dates, the remainder of the site appears severely deflated and disturbed, with little potential for additional *in situ* cultural data. Due to the limited potential for this resource to yield important information regarding the area's prehistory, it is field evaluated as not eligible for listing on the NRHP. Accordingly, no further work is recommended.

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Site **5ME16114**, a prehistoric isolated thermal feature, is located at an elevation of 5610 feet at the base of a low ridge between two intermittent tributaries of Horsethief Creek. Predominant vegetation consists of sagebrush, rabbitbrush, and native grass. Soils consist of reddish-tan sandy loam.

The site was originally recorded as an isolated find during the Class III cultural resource inventory for the Collbran Pipeline Project (Conner and Davenport 2007). The isolated find was described as consisting of a large utilized flake of porcellanite. As an isolated find it was considered not eligible for the NRHP.

The site boundary measures 24m in diameter and the feature consisted of fire-cracked rock and diffuse ash. It measured approximately 1.4m by 0.7m. The feature was salvaged; however, no radiocarbon date was obtained due to insufficient charcoal.

Evaluation and Management Recommendations

In 2007, the site was officially evaluated as not eligible for listing on the NRHP. Even though monitoring identified a hearth feature, no radiocarbon date could be determined. In addition, excavation has completely destroyed the feature. The area surrounding the feature appears severely deflated and disturbed, with little potential for additional *in situ* significant data. Due to the limited potential for this resource to yield important information regarding the area's prehistory, no change to the previous official determination is recommended. No further work is warranted.

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Site **5ME16117**, a prehistoric sheltered camp and historic trash scatter, was originally recorded as an isolated find in 2007 during the Class III cultural resource inventory for the Collbran Pipeline in Garfield and Mesa Counties, Colorado, for Encana Oil and Gas (USA), Inc. (Conner and Davenport 2007). The site is located on the south side of a prominent sandstone outcrop of the Shire Member of the Wasatch Formation, near the head of a small tributary drainage of Little Horsetheif Creek. The elevation is 5760ft. Vegetation is a mosaic of juniper dominated pinyon-juniper forest with open areas of sagebrush, forbs, and native grass. Soils consist of a reddish-tan loess.

Artifacts and features were found within an area measuring approximately 68m northwest-southeast by 25m northeast-southwest. The site's most distinguishing feature is a large (12.5m by 10m) amorphous ash satin (Feature 2) which contained a prodigious amount of fire-cracked rock. While no other artifacts were observed in the ashy deposits, a small flake was recorded approximately 8.5 meters to the southeast. Additional recorded artifacts included clear bottle glass and tin can.

The site was selected for inclusion in the mitigation plan stipulating methods of a data recovery for twelve sites along the pipeline corridor (see Conner 2009). The Mitigation plan called for the: 1) intensive mapping of all artifacts and features visible on the surface, 2) collection of selected surface artifacts and subsurface artifacts from destroyed contexts, and 3) the manual excavation of selected grid units. The above methods are discussed in detail in Volume II.

Two 1m² test units (TU1 and TU2) were excavated. Excavation yielded a total of 44 pieces of lithic debitage, two Cottonwood Triangular projectile points, one biface fragment, and 19 bone fragments. Two features - one newly identified - yielded conventional radiocarbon ages of 1550±60BP, Cal AD 390 to 640 (Beta #303001), and 1720±70 BP, Cal AD 130 to 440, Cal AD 490 to 52 (Beta #303002). The Former was obtained from the newly identified hearth feature (Feature 1). The latter date was obtained from Level 2-A within the large, fire-cracked rock midden (Feature 2). A more detailed discussion of the results is presented in Chapter 5.

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Site **5ME16129**, a prehistoric open camp, was originally recorded in 2007 as an isolated find by Grand River Institute during the original Class III cultural resource inventory for the Collbran pipeline in Garfield and Mesa Counties, Colorado (Conner and Davenport 2007). The site is located in a sagebrush steppe between Jerry Gulch and Lugans Basin at an elevation of 5960 feet. Predominant vegetation consists of sagebrush, prickly pear cactus, grasses and juniper. Soils are a reddish-tan, sandy loam.

Site boundaries were estimated to cover an area measuring 103 meters (NE-SW) by 30 meters (N-S). Seven thermal features (Features 1-7) and a single mano fragment were discovered in subsurface deposits following mechanical stripping. Five of the thermal features (Features 1, 2 and 4-6) were salvaged, and two radiocarbon samples (Features 1 and 5) were sent to Beta Analytic for radiocarbon processing.

Feature 1 consisted of a well-defined, semi-circular concentration of dark ashy deposits. It measured approximately 43cm in diameter and 6.5cm in depth (Plate 4). Fire-cracked rock was not observed in the feature fill. The feature fill was collected and sent to Beta Analytic for processing; it returned a conventional date of 1630 ± 70 BP, Cal AD 250 to 580 (Beta #267643) placing occupation during Reed and Metcalf's (1999:6) Aspen Tradition of the Formative Era.

Feature 2 consisted of a few oxidized sandstone fragments within a diffuse ash stain measuring roughly 100cm in diameter. The integrity of the feature was too disturbed to give an accurate measurement of depth.

Feature 3 consisted of a deflated concentration of ashy soil within an area measuring 70cm in diameter by 6cm in depth. No charcoal was present and the feature was too deflated to collect any fill.

Feature 4 consisted of a semi-circular concentration of dark ash and fire-cracked rock. The stained area measured approximately 50cm in diameter. Excavation of the feature revealed a distinct basin measuring 35cm in diameter and 7cm in depth

Feature 5, initially, consisted of an amorphous ash stain 100cm in diameter. The excavation of the feature revealed a dense, but shallow concentration of dark ashy deposits with a few oxidized sandstone fragments. Feature fill was collected and sent to Beta Analytic for processing; it produced a date of 1530 ± 60 BP (conventional), Cal AD 410 to 640 (Beta #267644) placing occupation during Reed and Metcalf's Aspen Tradition of the Formative Era.

Feature 6 was a circular concentration of ashy deposits and oxidized rock. The feature measured 50cm in diameter and was of shallow depth. No charcoal was observed and no fill was collected.

Feature 7 was a small, less than 40cm in diameter, concentration of ashy soil. No charcoal or fire-cracked rock was observed and no fill was collected.

Evaluation and Management Recommendations

Monitoring exposed seven features, changing the previous resource classification from an isolated find to a prehistoric open camp for the present project. All of the features, except for one, were salvaged and two yielded radiocarbon dates. Inspection of the trench walls suggests that additional, underlying cultural components are unlikely. Based on these findings, the site appears to possess poor potential to yield additional significant data regarding the prehistory of the region. Therefore, no change is recommended to the previous evaluation of not eligible. No further work is warranted.

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Site **5ME16132**, a prehistoric open camp, was originally recorded as an isolated find in 2007 during the Class III cultural resource inventory for the Collbran Pipeline Project (Conner and Davenport 2007). The site is located at the base of a northwest-southeast trending ridge in Lugans Basin at an elevation of 5960 feet. The vegetation consists predominantly of sagebrush, rabbitbrush, and native grass. Soils are a reddish-tan, sandy loam.

Mechanical stripping exposed remnants of two features (Features 1 and 2), five flakes and one piece of angular shatter. Two additional features (Features 3 and 4) were discovered during trench inspection. As a result, the site boundary was revised to encompass an area approximately 215m northeast-southwest by 60m northwest-southeast. Features were excavated, cross-sectioned, profiled and described. In most cases, feature fill was collected for potential radiocarbon analysis. In addition, stratigraphic profiles were drawn to document the sedimentary, geochemical and edaphic character of the natural deposits.

Feature 1 consisted of faint ash concentrated in an area measuring less than 1m in diameter. The feature was severely impacted so the exact size and shape of the feature could not be discerned. No charcoal was observed which precluded the collection of a radiocarbon sample.

Feature 2 consisted of a 15cm diameter area of diffuse ash. Again, the feature was too compromised to collect a radiocarbon sample.

Feature 3, exposed in the northwest pipeline trench wall, consisted of a few oxidized sandstone fragments within a faint, basin-shaped ash stain approximately 50cm in diameter and 38cm in depth. A single small porcellanite flake was collected; however, charcoal was not observed and therefore radiocarbon analysis was not achieved.

Feature 4 was identified approximately 10m to the northeast of Feature 3 and was exposed just below the graded surface in the northwest pipeline trench wall. The feature consisted of a lenticular concentration of ash measuring approximately 36cm in diameter and 10cm in depth. No oxidized rocks or charcoal were observed. Feature fill was collected, but was not sent for analysis.

Evaluation and Management Recommendations

All features were exposed during pipeline monitoring and were salvaged. They were found during blading at or slightly below the bladed level or in the pipeline trench wall. Additional subsurface cultural deposits were not apparent. Even though monitoring identified several new features, no radiocarbon dates could be obtained and the remainder of the site is severely disturbed. Based on trench inspection, additional subsurface cultural components are unlikely. Furthermore, the site abuts a sloped area where the likelihood of subsurface cultural material is poor due to the inclination of the slope, shallow deposition, and low chance for site preservation. Based on these findings, the site possesses poor potential to yield additional significant data. No change to the previous field evaluation of not eligible is warranted. Accordingly, no further work is recommended.

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Site **5ME16133**, a prehistoric open camp and historic trash scatter, was originally recorded as an isolated find in 2007 during the Class III cultural resource inventory for the Collbran Pipeline Project in Garfield and Mesa Counties, Colorado (Conner and Davenport 2007). The site is located at the base of a northwest-southeast trending ridge in Lugans Basin at an elevation of 5960 feet. The vegetation consists predominantly of sagebrush, rabbitbrush, and native grass. The soils are a reddish-tan, sandy loam.

During the monitor, three thermal features (Feature 1-3), one fire-cracked rock concentration, and fifteen pieces of lithic debitage were exposed subsurface within the top 30 to

40cm of deposits.  The thermal features were at least 40 percent intact.  They were photographed, mapped, excavated and described as follows:

> Features 1 and 2 consisted of small concentrations of ash lacking charcoal and/or fire-cracked rock.  Both were less than a meter in diameter.  Feature fill was collected, but proved to be insufficient for dating due to the lack of charcoal.
>
> Feature 3 consisted of an 80cm diameter area of diffuse ash.  A small quantity of fire-cracked rock was observed within the feature.  Only a few centimeters of *in situ* feature fill was salvaged.

The relatively large manifestation of subsurface cultural material suggested a high probability of additional artifacts and features; thus, the surrounding area outside of the staked pipeline right-of-way was intensively surveyed and the site boundary was revised to encompass a prodigious, surficial manifestation of newly observed artifacts (240m N-S by 160m E-W).  An additional 213 flakes, two mano fragments, one butchering tool, and one biface were found. The majority of the artifacts were recorded near a sandstone outcrop to the south of the pipeline right-of-way.  None of these artifacts were collected.  In addition, four ash stains (Features 4 through 7) were also newly recorded.  These were photographed and mapped, but were not excavated.  The features were described as follows:

> Features 4 through 6 consisted of small concentrations of ash measuring less than 2m in diameter.  Both were identified south of the rock outcrop located within the south-half of the site.
>
> Feature 7 consisted of a large ash stain measuring roughly 10 by 2m.  It was located down slope of Feature 6.  The feature may represent the eroded remains of Feature 6 or it may represent a midden.

The historic component of the site consists of two deteriorated tin cans found adjacent to the rock outcrop within the north-half of the site.  No period of occupation could be ascertained.

Evaluation and Management Recommendations

The site has been impacted by the present pipeline project which bisects the site's center. All the exposed cultural features in the right-of-way were excavated and evidence of their existence has been eradicated.  In addition, a second pipeline constructed prior to the present project also truncates the site's center.  Natural processes have also affected site preservation and visibility.  However, given the presence of intact subsurface cultural features and the abundance of artifacts observed, it is likely that additional intact subsurface cultural features are possible.  Accordingly, this site is field evaluated as eligible under Criterion D for listing on the NRHP.  Protection and preservation are recommended.

Site **5ME16134**, a prehistoric open camp, was originally recorded as an isolated find by Grand River Institute in 2007 during the original Class III cultural resource survey for the Collbran Pipeline Project (Conner and Davenport 2007). The site is located at the base of a northwest-southeast trending ridge in Lugans Basin at an elevation of 5990 feet. Predominant vegetation consists of sagebrush, rabbitbrush, snakeweed and grasses. Soils are reddish-tan, sandy loams.

During the monitor, mechanical stripping exposed the remains of nine thermal features (Feature 1-9) within an area measuring 113 meters (E-W) by 27 meters (N-S). Features 1 through 6 were exposed subsurface during mechanical stripping and Features 7 through 9 were exposed in the trench walls. One small chert flake was collected from the trench. Eight of the nine features (Features 2-9) were salvaged and one radiocarbon sample from Feature 6 was sent to Beta Analytic for radiocarbon processing. The features were described as follows:

> Feature 1 consisted of a diffuse ash stain eroding from a small wash outside of the staked right-of-way. Its location (i.e., outside of the right-of-way) precluded it from being salvaged; however, a large primary flake of black porcellanite was collected from the feature fill.
>
> Feature 2 consisted of a dark ash stain and oxidized fragments of sandstone. It measured approximately 100cm in diameter. The depth of the feature was determined to be shallow despite compromised integrity.
>
> Feature 3 consisted of a diffuse ash stain measuring approximately 50cm in diameter. Oxidized fragments of sandstone were found in association with the feature as well as a large secondary flake of black porcellanite.
>
> Feature 4 consisted of a concentration of ash measuring 30cm in diameter. The depth of the feature was determined to be shallow. Feature fill was collected; however, it was not sent for analysis.
>
> Feature 5 consisted of a semi-circular ash stain measuring approximately 40cm in diameter and 6cm in depth. Feature fill was collected; however, it was not sent for analysis.
>
> Feature 6 consisted of a well-defined cluster of oxidized rock amidst dark ashy deposits. The feature measured approximately 80cm in diameter and was determined to be of shallow depth. The feature fill was collected and sent to Beta Analytic for processing, resulting in a conventional age of 2200 ± 40 BP, Cal BC 380 to 170 (Beta #267645), and placing occupation during Reed and Metcalf's (1999:6) Terminal period of the Archaic Era.

Feature 7, exposed in the north trench wall immediately below the bladed surface, consisted of faint ashy deposits measuring 40cm in diameter and 30cm in depth. A few fragments of oxidized sandstone as well as a large flake were found in association.

Feature 8 was exposed approximately 40cm to the west of Feature 7; both features were part of the same cultural level. Feature 8 consisted of light ashy deposits without any oxidized sandstone. It measured approximately 46cm in diameter and 40cm in depth.

Feature 9, exposed one meter below the recently graded surface in the south trench wall, consisted of a well-defined concentration of dark ashy deposits measuring 48cm in diameter and 28cm in depth.

Evaluation and Management Recommendations

The site has been impacted by the present pipeline project which bisects the site's center. In addition, road and ground disturbance related to the construction of a previous pipeline have affected the site's very southern tip. The exposure of features at varying depths within the right-of-way during the pipeline monitor indicates the potential for additional buried cultural components which could yield valuable information regarding prehistory. Therefore, this site is considered field eligible under Criterion D of the NRHP. Accordingly, protection and preservation are recommended.

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Site **5ME16548** an isolated thermal feature is located on a sagebrush steppe in Lugans Basin at an elevation of 5990 feet. Predominant vegetation consists of sagebrush, rabbitbrush, prickly pear cactus and grasses. Soils are tan sandy loams.

Mechanical stripping exposed the remnants of a thermal feature within an area measuring roughly 1m in diameter. The feature consisted of 50cm diameter ash stain of shallow depth. Fire-cracked rock was not observed. *In situ* fill was salvaged despite compromised integrity; however there was an inadequate amount of charcoal to obtain a date. No artifacts were observed or recovered.

Evaluation and Management Recommendations

The site has been significantly impacted by the present pipeline project. The feature, exposed in the right-of-way, was almost entirely destroyed by a bulldozer during ground clearing. Despite the compromised integrity of the feature, fill was collected for potential radiocarbon analysis; however, it proved insufficient for obtaining a radiocarbon date. The pipeline lies approximately 6m to the south of the feature. In addition, natural processes have affected site preservation and visibility. Due to the limited potential for this resource to yield important information regarding the area's prehistory, it is field evaluated as not eligible for listing on the NRHP. According no further work is recommended.

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Site **5ME16549** is an isolated thermal feature which lies along Anderson Gulch at an elevation of 5860 feet. Predominant vegetation consists of sagebrush, prickly-pear cactus, grasses and scattered juniper. Soils consist of a reddish-tan, sandy loam of aeolian and alluvial origin. The nearest source of water is an unnamed tributary of Little Anderson Gulch approximately 250m west.

The site measures 1m in diameter. Grading exposed the remains of a shallow thermal feature consisting of disseminated charcoal and small quantities of fire-cracked rock. Despite the compromised integrity of the feature, a sample was collected for radiocarbon analysis and sent to Beta Analytic for processing. It yielded a date of 1980 ± 40 BP (conventional), Cal BC 50 to AD 90 (Beta #267646) placing it within Reed and Metcalf's (1999:6) Terminal Period of the Late Archaic Era and their Aspen Tradition of the Formative Era.

Evaluation and Management Recommendations

The site has been significantly impacted by the present pipeline project. The feature, exposed in the right-of-way, was almost entirely destroyed by a bulldozer during ground clearing. Furthermore, excavation has completely destroyed it. No other features or artifacts were observed and additional significant cultural manifestations are not likely. Due to the limited potential for this resource to yield important information regarding the area's prehistory, it is field evaluated as not eligible for listing on the NRHP. Accordingly, no further work is recommended.

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Site **5ME16691** is an isolated thermal feature located at the edge of a sagebrush steppe in Lugans Basin at an elevation of 5970 feet. Predominant vegetation consists of sagebrush, prickly-pear cactus and grasses. The soils are a tan sandy loam of aeolian and alluvial origin. The cultural feature was exposed within the top 30cm of deposition.

The isolated thermal feature is located within an area measuring 1m in diameter. The feature consisted of a well-defined, although shallow, semicircular ash stain approximately 24cm in diameter. Feature fill was collected but not submitted for analysis due to insufficient charcoal. No other cultural material or features were observed.

Evaluation and Management Recommendations

The site has been significantly impacted by the present pipeline project. The feature, exposed in the right-of-way, was almost entirely destroyed by a bulldozer during ground clearing, and excavation has completely destroyed it. No other features or artifacts were observed and additional significant cultural manifestations are not likely. Due to the limited potential for this resource to yield important information regarding the area's prehistory, it is field evaluated as not eligible for listing on the NRHP. No further work is recommended.

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Site **5ME16715**, a prehistoric open camp, is located near Little Anderson Gulch at the base of a northwest-southeast trending ridge in Lugans Basin. The elevation is 5860 feet. Predominant vegetation consists of sagebrush, rabbitbrush, and grasses. Soils consist of tan sandy loam.

Two flakes and one thermal feature were exposed during mechanical stripping within an area measuring 49m E-W by 9m N-S. The feature consisted of a diffuse ash stain approximately 70cm in diameter. The depth of the feature could not be ascertained due to its disturbed context. Despite the compromised integrity of the feature, a sample of the fill was collected and sent to Beta Analytic for processing. It yielded a conventional date of 2790 ± 40 BP, Cal BC 1360 to 1050 (Beta #267649) placing occupation during Reed and Metcalf's (1999:6) Terminal Period of the Late Archaic Era.

<u>Evaluation and Management Recommendations</u>

The site has been significantly impacted by the present pipeline project. The feature, exposed in the right-of-way, was almost entirely destroyed by a bulldozer during ground clearing and excavation has completely destroyed it. No other features or artifacts were observed and additional significant cultural manifestations are not likely. Due to the limited potential for this resource to yield important information regarding the area's prehistory, it is field evaluated as not eligible for listing on the NRHP. Accordingly, no further work is recommended.

Site **5ME16716**, a prehistoric open camp, is located at the base of Samson Mesa at an elevation of 5350 feet. The vegetation consists of juniper woodland with a sparse understory of sagebrush and grasses. Soils are a tan sandy loam. The nearest source of water, an unnamed intermittent tributary, is located approximately 425ft west.

Archaeological monitoring of surface disturbing activity (i.e., mechanical stripping) led to the discovery of a single feature and a few artifacts within an area measuring approximately 7m in diameter. The feature consisted of a faint ash stain measuring approximately 50cm in diameter. The depth of the feature was determined to be shallow, however is inconclusive due to disturbance. A sample of the feature fill was collected and sent to Beta Analytic for processing. The fill produced a conventional date of 2970 ± 40 BP, cal BC 1360 to 1350, cal BC 1310 to 1050 (Beta #267656). Artifacts collected include a unifacial scraper (n=1), a utilized flake (n=1), and debitage (n=5). Additionally, a small quantity (<5.75 oz.) of jacal from a possible posthole, located approximately 50cm north of the feature, was also collected. The presence of a possible posthole indicates that this may have been the remains of a pit-structure, however any additional evidence may have been compromised by construction activity.

<u>Evaluation and Management Recommendations</u>

The feature exposed during monitoring was salvaged. The lack of additional features or artifacts in the exposed deposits suggests that this site is a limited cultural manifestation unlikely to add additional information. In addition, data recovery has exhausted the current research potential of the site. The site lacks integrity under: Criterion A, since it could not be associated with an event making a significant contribution to the broad pattern of our history, Criterion B, since it could not be associated with the lives of persons significant in our past; Criterion C, since its construction is not unique or of high artistic value; or Criterion D, as it not likely to yield information important in history. Data recovery has exhausted the current research potential of the site. Therefore, the site is field evaluated as not eligible for listing on the NRHP. Accordingly, no further work is recommended.

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Site **5ME16782**, a prehistoric open camp, is located on a ridge west of Horsethief Mountain at an elevation of 5840 feet. The vegetation consists of juniper woodland which is host to an understory of sagebrush and grasses. Soils consist of fine to coarse, tan loess/silt.

Archaeological monitoring of surface disturbing activity (i.e., mechanical stripping) led to the discovery and salvage of a thermal feature (later designated Feature 2) measuring 60cm in diameter and 10cm in depth. The feature was exposed approximately 1 meter below the bladed surface. Excavation determined the feature to be the remnants of a fire-cracked, rock-filled basin with ash staining and very diffuse charcoal flecking.

In order to establish a site boundary, the surrounding area outside of the pipeline right-of-way was surveyed for additional cultural material. Cultural materials were found in an area measuring 120m (NW-SE) by 60m (NE-SW). Artifacts and features observed include a diagnostic projectile point (Plate 5.8-4), a drill midsection, two multi-directional cores, lithic debitage (n=36), two pieces of angular shatter, and a slab-lined feature (Feature 1) measuring 60cm in diameter.

The projectile point (5ME16782.s1) is corner-notched and was manufactured from a porcellanite toolstone. The point has sustained a tip fracture. Under current taxonomic standards, the projectile point is classified as a generic Archaic corner-notched point, though it could also be considered an Elko Corner-notched or a point from the Ironstone Phase of the Uncompahgre Complex (Buckles, 1971: 1220).

Subsequent archaeological investigations were conducted at the site. Efforts were focused on the excavation of the slab-lined thermal feature. These efforts aided in ascertaining whether the site could contribute additional significant information after testing. Data recovery results along with the evaluation and management recommendations are presented in Chapter 5.

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Site **5ME16783** was an isolated thermal feature located on a ridge east of Shire Gulch at an elevation of 6040 feet. The vegetation consists of a pinyon and juniper woodland with a sparse understory of sagebrush and grasses. Soils consist of tan/gray, sandy loam with small rocks. The nearest water source is an unnamed intermittent tributary approximately 100feet west.

The feature was observed eroding from the shoulder of Sunnyside Road within an area approximately 10m in diameter. As the feature's provenance was within an area of direct impact from the Collbran pipeline; the feature prompted immediate excavation. A 1 x 2 meter grid was established over the feature. Two pieces of lithic debitage were collected from the surface prior to excavation. Excavation revealed an amorphous ash stain with dimensions of 2m by 1m. A few fragments of oxidized sandstone were observed within the diffuse ashy deposit. Thirteen thinning flakes made from basalt and opalitic chert were discovered in the screened feature fill from 20 to 30cm below present ground surface. A radiocarbon sample was collected and sent to Beta Analytic for processing; it produced a date of 2130 ± 90 BP (conventional), Cal BC 390 to AD 60 (Beta #267650) placing it within Reed and Metcalf's (1999:6) Terminal Period of the Late Archaic Era and their Aspen Tradition of the Formative Era.

Evaluation and Management Recommendations

Due to the limited potential for this resource to yield important information regarding the area's prehistory, it is field evaluated as not eligible for listing on the NRHP. Excavation confirmed that the site is limited to the surface. It is unlikely that additional subsurface cultural components are present. In addition, excavation has exhausted the research potential of the site. Accordingly, no further work is recommended.

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Site **5ME16784,** a prehistoric open camp, is located on the eastern side of a small basin formed by the headwaters of Smith Gulch and Horsethief Creek. The elevation is approximately 5675ft. Pinyon-juniper with sage and native grass is the predominant vegetation community. Soils are a fine to coarse, tan loess/silt.

The site, discovered in the trench walls during pipeline construction monitoring, was estimated to measure roughly 25m E-W by 18m N-S. Remnants of two features (Features 1 and 2) were exposed in the east trench wall approximately 1m below the recently bladed surface on top of Pleistocene deposits. At that time, Feature 1 was interpreted to be a possible roasting pit and Feature 2 was believed to be a storage feature. Both features were contained within a larger charcoal stain that measured approximately 3m in diameter and 10cm to 20cm in depth. That staining was believed to be a potential pit-house structure (Figure 7).

The cultural manifestations were mapped in cross-section. Feature fill was collected from Feature 1, the roasting pit. A charcoal sample was sent to Beta Analytic for processing. The sample produced a conventional radiocarbon age of 2340 ± 60 BP, Cal BC 720 to BC 700, BC 540 to BC 360 and BC 290 to BC 240 (Beta #263483) placing occupation during Reed and Metcalf's (1999:6) Terminal Period of the Archaic Era.

Subsequent archaeological investigations were conducted at the site in 2010 following the installation of the pipeline. Unfortunately, a delay in getting the consultations accomplished resulted in the installation of an additional pipeline adjacent and parallel to the Collbran pipeline. Data recovery efforts were focused on the excavation of the features identified in the trench wall during the monitor. These efforts aided in ascertaining whether the site could contribute additional significant information after testing. Data recovery results along with the evaluation and management recommendations are presented in Chapter 5.

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Site **5ME 16785**, a prehistoric open camp, is located in a sagebrush flat south of Samson Mesa at an elevation of 5740 feet. Predominant vegetation consists of sagebrush, rabbitbrush, and grasses. Soils consist of a tan, sandy loess/silt.

Site boundaries were estimated to cover an area approximately 22m east-west by 20m north-south. Two thermal features (Features 1 and 2), resting nearly on top of one another, were exposed subsurface in the pipeline trench during monitoring. Both features were salvaged and described as follows:

> Feature 1 consisted of a few fragments of oxidized sandstone associated with a faint ash stain approximately 60cm in diameter and 10cm deep. Feature fill was collected and sent to Beta Analytic for processing; yielding a conventional date of 2480 ± 60 BP, Cal BC 790 to 400 (Beta #267647) placing occupation during Reed and Metcalf's (1999:6) Terminal Period of the Late Archaic Era.

Feature 2 was a well-defined charcoal stain 100cm in diameter and 20cm in depth with numerous fragments of oxidized sandstone and large chunks of charcoal. Feature fill was collected and sent to Beta Analytic for processing; it produced a conventional date of 2400 ± 40 BP, cal BC 740 to 390 (Beta #267648) placing occupation during Reed and Metcalf's (1999:6) Terminal period of the Late Archaic Era.

Evaluation and Management Recommendations

This site appears to be a single short term occupation in which excavation has exhausted the research potential; therefore, the site's ability to yield additional significant information is low. The probability of additional, *in-situ* subsurface cultural material is unlikely since the majority of the site has been destroyed by pipeline construction. Due to the limited potential for this resource to yield important information regarding the area's prehistory, it is field evaluated as not eligible for listing on the NRHP. Accordingly no further work is recommended.

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Site **5ME16786**, a multi-component prehistoric architectural site, is located at an elevation of 5680 feet in a sagebrush flat south of Samson Mesa. The vegetation consists of sagebrush, rabbitbrush, biscuitroot, and native grass. The surrounding slopes are covered with pinyon and juniper. Soils are fine to coarse, tan loess/silt.

The site, initially observed during monitoring operations, was identified by the bisection of a pit-structure (Feature 2), hearth (Feature 1), and two prominent charcoal lenses (Features 4 and 5) (Figures 9 and 10). These were exposed at different depths in the trench walls within an area measuring approximately 20m (E-W) by 17m (N-S).

The pit-structure was identified approximately 1.5m below the bladed surface in the northwest and southeast walls of the trench. It consisted of a faint, lenticular ash stain that measured roughly 3.8m in diameter and 20cm to 40cm in depth. The possibility of interior features was evinced by a faint, basin-shaped anomaly along the floor of the structure. This anomaly was speculated to be the central hearth, and a charcoal sample was collected and sent to Beta Analytic for processing. The sample yielded a conventional radiocarbon age of 2760 ± 70 BP, cal BC 1080 to BC 800 (Beta #263484) which places occupation during Reed and Metcalf's (1999:6) Transitional and Terminal Periods of the Late Archaic Era. This date concurs with the speculated antiquity of the pit-structure which was obtained through relative dating techniques (i.e., stratigraphy). In addition, an area of oxidized sediment below the floor, on the up-slope plain of the pit-structure, was interpreted to be indicative of either a winter or spring occupation.

The hearth was identified in the northwest wall of the trench at a depth of 84cm below the bladed surface. It measured approximately 1m in diameter and consisted of 5cm to 10cm of ashy deposits, fire-cracked rock, and chunks of charcoal. A charcoal sample was collected, but proved to be insufficient for dating.

The two charcoal lenses were exposed in the southeast wall of the trench. Both lenses, occurring higher in the stratigraphic sequence, were observed to be within 20cm of the pit-structure.

Subsequent archaeological investigations were conducted at the site in 2010 following the installation of the pipeline. Unfortunately, a delay in getting the consultations accomplished resulted in the installation of an additional pipeline adjacent and parallel to the Collbran pipeline. Data recovery efforts were focused on the excavation of the features identified in the trench wall during the monitor. These efforts aided in ascertaining whether the site could contribute additional significant information after testing. Data recovery results along with the evaluation and management recommendations are presented in Chapter 5.

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Site **5ME16787** is an isolated thermal feature located at the base of a low ridge between two intermittent tributaries of Horsethief Creek at an elevation of 5600 feet. Pinyon/juniper woodland and sagebrush grassland are the extant vegetation communities. Soils consist of a fine to coarse, tan loess/silt. The nearest water source is an intermittent tributary of Horsethief Creek 200 feet south.

Within an area measuring two meters in diameter, mechanical stripping exposed the remnants of a single thermal feature. The feature consisted of a circular ash stain roughly 65cm in diameter and 11cm deep. It contained 24 medium to large pieces of fire-cracked rock as well as charcoal flecks. Although a radiocarbon sample was collected, the charcoal content was inadequate for analysis.

Evaluation and Management Recommendations

The feature was exposed and salvaged during the pipeline construction monitoring. No additional features or artifacts were observed and the likelihood of additional cultural manifestations is low. Due to the limited potential for this resource to yield important information regarding the area's prehistory, it is field evaluated as not eligible for listing on the NRHP. Accordingly, no further work is recommended.

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Site **5ME16788** is a prehistoric open camp located on a slight ridge west of Horsethief Mountain at an elevation of 5700 feet. Vegetation consists of a juniper and pinyon woodland with a sparse understory of sagebrush and grasses. Soils are a fine to coarse, tan loess/silt. An unnamed intermittent tributary lies approximately 100 feet east.

Within an area 20m in diameter, pipeline trench excavation exposed the remnants of two thermal features (Features 1 and 2) located approximately 15 meters apart. No artifacts were observed or collected. The features were described as follows:

Feature 1 was identified approximately one meter below the recently graded ground surface. It consisted of a concentration of ash less than one meter in diameter within the trench wall. Unfortunately, flooding destroyed the feature before it could be salvaged.

Feature 2 was located two meters below the surface. It consisted of a concentration of ash less than one meter in diameter within the trench wall. Unfortunately, flooding destroyed the feature before it could be salvaged.

Evaluation and Management Recommendations

Unfortunately, extremely rainy weather and subsequent flooding destroyed all of the site's features and integrity prior to the features being salvaged or even adequately recorded. No further work was conducted. The likelihood of additional significant cultural manifestations are not good. Therefore, the site is field evaluated as not eligible for listing on the NRHP. Accordingly no further work is recommended.

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Site **5ME16789** is a multi-component prehistoric architectural site that is located at the head of a dry tributary of Sand Wash at an elevation of 6000 feet. Pinyon/juniper woodland and sagebrush grassland are the extant vegetation communities. Soils consist of fine to coarse, tan loess/silt.

The site was estimated to encompass an area measuring 180m NW-SE by 90m NE-SW. The remnants of at least two pit-structures and seven thermal features were exposed at variable depths (0 to 1.5m below the bladed surface) in the trench walls. Numerous charcoal lenses were also observed; however, the majority were determined to be non-cultural. In addition, a low density of prehistoric surface artifacts, one suspected thermal feature, three large rock piles and one cairn were recorded. The exact purpose or function of the three large rock piles is unknown; however, it is assumed that they are waste or refuse associated with ground clearing and may be related to the construction of the road. The cairn– as the name implies– is a purposeful stone marker. It consists of three medium to large rocks 50cm in diameter.

The surface artifacts include two collected projectile point fragments (5ME16789.s1 and .s2; Plate 5.11-2), one mano, a utilized core, one piece of burnt bone and over thirty flakes. The .s1 projectile point is a medium-sized, low corner-notched (nearly stemmed) type that compares well with Uncompahgre Complex Horse Fly Phase Type 26 points that roughly date ca. 500-1 BC, roughly 2500-2000 BP (Buckles 1971:1220). A similar point was found on the surface of 5ME635 and designated as Type II within that site's classificatory system. Dates for features excavated at that site averaged ca. 2700 BP and ranged between 1480-800 BC (Alexander and Martin 1980:1,23,26).

The 5ME16789.s2 point fragment is deeply corner-notched and compares well with the Pelican Lake type. This is a Late Plains Archaic variety that replaced McKean Complex points by ca. 3100 BP (Frison 1991:101). The date range for this point terminates about 2700 BP, and they have been identified in sites in the Rocky Mountains and western Great Plains region from as far north as south-central Saskatchewan Canada through Wyoming and into northern Colorado. Grand River Institute reports documenting these points during inventories on the Uncompahgre Plateau (Conner and Davenport 2002a; and, Conner and Davenport 2002b). At site 48CA1391 on the Belle Fourche River in Wyoming, the faunal assemblage associated with these points indicated Pronghorn hunting was dominant as part of a hunting-gathering orientation for this cultural group (Frison 1991:105). Notably, a Pelican Lake cremation burial was excavated in the Wind River Canyon of the Bighorn Basin in Wyoming (ibid.:103). Accordingly, based on the associated dates from the two surface collected points, one of the cultural horizons at the site was considered likely to date ca. 2700 BP or 850 BC.

The two pit-structures (Features 10 and 2) were discovered approximately 30m apart in the trench walls. Feature 10 was exposed in both walls of the trench at a depth of 1m below the bladed surface. In cross-section, it appeared as a large, lenticular charcoal stain containing interior hearths or possible storage cysts (Figure 11). It measured 6m in diameter and 20cm to 40cm in depth. The approximate size of the pit-structure suggested a Paleo-Archaic cultural affiliation; however, the charcoal sample processed by Beta Analytic produced a conventional radiocarbon date of 4600 ± 40 BP, Cal BC 3500 to BC 3430, BC 3380 to BC 3340, and BC 3210 to BC 3190 (Beta #263487) placing occupation during Reed and Metcalf's (1999:6) Settlement period of the Archaic Era.

Feature 2 was exposed 15cm to 20cm below the bladed surface in the northeast wall of the trench. It consisted of a smaller, lenticular charcoal stain (2.5m diameter and 10-40cm depth) containing a possible interior hearth (Feature 3) (Figure 12). A slab-lined storage pit (Feature 1), constructed by a subsequent cultural occupation, truncated the structure. The stratigraphic position of the pit-structure suggested a Late Archaic cultural affiliation; however, the charcoal sample processed by Beta Analytic produced a conventional radiocarbon date of 5810 ± 40 BP, Cal BC 4770 to BC 4550 (Beta #263485). The suspected interior hearth (Feature

3) produced a conventional date of 5990 ± 40 BP, Cal BC 4990 to BC 4790 (Beta #263486). Both of these dates place occupation during Reed and Metcalf's (1999:6) Pioneer Period of the Archaic Era.

The seven thermal features that were exposed in the trench walls at variable depths consisted of faint ash stains measuring less than 1m in diameter. Some of the features contained oxidized sandstone fragments. Disseminated flecks of charcoal were observed in all seven of the thermal features.

Subsequent archaeological investigations were conducted at the site in 2010 following the installation of the pipeline. Data recovery efforts were focused on the excavation of the of the two pit structures identified in the trench walls during the monitor. These efforts aided in ascertaining whether the site could contribute additional significant information after testing. Data recovery results along with the evaluation and management recommendations are presented in Chapter 5.

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Site **5ME16790** is a multi-component site consisting of a prehistoric open lithic scatter and a few historic artifacts. The site is located on a ridge west of Atwell Gulch at an elevation of 6040 feet. Vegetation consists of juniper and pinyon woodland with a sparse understory of sagebrush and grasses. Soils consist of fine to coarse, tan loess/silt.

Artifacts were found within an area measuring approximately 75m (E-W) by 50m (N-S). Prehistoric artifacts include 13 flakes, one piece of angular shatter, and one mano. The mano is of basalt and has been shaped. In addition, several micro-flakes were observed in an anthill. Historic artifacts include two greenish-blue glass shards, three tin cans, one wheelbarrow, three axe-cut fence posts, four metal posts (cemented into rock outcrop), and barbed wire. The color of the glass suggests a date of ca. 1860s to present for the purpose of fence construction activity.

Evaluation and Management Recommendations

Cultural deposits were apparently limited to the surface since no other cultural material was observed in the road cutbank or during archaeological monitoring. Due to the lack of diagnostic artifacts or features and the apparent lack of depth of cultural fill which could yield additional information, the site does not meet any of the criteria for listing on the NRHP. Therefore, the site is field evaluated as not eligible and no further work is recommended.

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Site **5ME16791**, a prehistoric open camp, is located on a bench at the southwest corner of Lugans Basin near the head of Jerry Gulch. The elevation is 5980 feet. The vegetation consists of a sparse scattering of junipers intermixed with sagebrush, rabbitbrush, snakeweed and native grass. Soils consist of a fine to coarse, tan loess/silt.

Mechanical stripping exposed the remnants of two thermal features (Features 1 and 2) and four flakes within an area measuring approximately 19m N-S by 12m E-W. Feature 1 was exposed at the base of a bedrock outcrop. It consisted of a large (10m x 12m), compact ash stain. Feature 2 consisted of a smaller, more defined ash stain that measured approximately 50cm in diameter.

Subsequent archaeological investigations were conducted at the site. Efforts were made to establish the vertical and horizontal extent of cultural deposits. These efforts aided in ascertaining whether the site could contribute additional significant information after testing. Data recovery results along with the evaluation and management recommendations are presented in Chapter 5.

Site **5ME16857**, an isolated thermal feature, is located in a sagebrush flat east of Jerry Gulch at an elevation of 5980 feet. Predominant vegetative species include sagebrush, rabbitbrush and grasses. Soils consist of fine to coarse, tan loess/silt.

Feature 1 was exposed during mechanical stripping operations within an area measuring approximately 1m in diameter, and within the top 30-40cm. The feature consisted of a 30cm diameter area of fire-cracked rock and compact ashy deposits. No architectural features or artifacts were observed within the immediate area. The feature was salvaged; however, a radiocarbon date was not obtained.

Evaluation and Management Recommendations

The feature exposed during monitoring was salvaged and the site's potential to yield additional significant information has been exhausted. No architectural features or artifacts were observed and no cultural/ temporal affiliation could be assigned. It is unlikely that any additional intact buried cultural components are present. The site does not meet any of the NRHP criteria; therefore, it is field evaluated as not eligible. Accordingly, no further work is recommended.

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Site **5ME16858**, a prehistoric open camp, is located on a sagebrush flat east of Jerry Gulch at an elevation of 5980 feet. Predominant vegetative species include sagebrush, rabbitbrush and grasses. Soils consist of a fine to coarse, tan loess/silt of alluvial and aeolian processes. The nearest water source is an unnamed intermittent tributary 500ft west.

Archaeological monitoring led to the discovery of five thermal features (Features 1-5) in an area measuring 30m NW-SE by 20m NE-SW (site boundary). Unfortunately, this stripping compromised the integrity of the features. The features were photographed, mapped and described as follows:

> Features 1, 2 and 4 were deemed to be hearths due to the presence of fire-cracked rock, ashy soil and charcoal. All were less than one meter in diameter. A radiocarbon sample was collected from each of these; however, only the sample from Feature 2 was sent to Beta Analytic for processing. The sample yielded an age of 2620 ± 70 BP (conventional), Cal BC 910 to 740, Cal BC 690 to 660, Cal BC 640 to 550 (Beta #267653)

placing occupation during Reed and Metcalf's (1999:6) Terminal Period of the Late Archaic Era.

Features 3 and 5 were believed to be re-deposited fill from the other features; a result of grading operations. Feature 3 measured 80cm in diameter, while Feature 5 measured 70cm in diameter. No radiocarbon samples were collected from these features due to their lack of integrity.

Evaluation and Management Recommendations

Cultural deposits were exposed within the first 30 to 40cm of deposition. No cultural material was observed in the pipeline trench walls. Evidence garnered from mitigation suggests that additional subsurface cultural material is not likely. In addition, the site's research potential has been fully exhausted and the features destroyed. Therefore, the site is evaluated as not eligible for inclusion on the NRHP since it does not meet any of the criteria for inclusion. Accordingly, no further work is recommended.

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Site **5ME16859**, a prehistoric open camp is located at the base of a low northwest-southeast trending ridge in Lugans Basin at an elevation of 5980 feet. Predominant vegetative species include sagebrush, rabbitbrush and grasses. Soils consist of a fine to coarse, tan loess/silt.

Mechanical stripping exposed the remnants of two thermal features (Features 1 and 2) within an area measuring 15m E-W by 5m N-S. Both features were excavated and radiocarbon samples were collected. The features were described as follows:

Feature 1 was a dark, semicircular charcoal stain measuring 80cm in diameter. Several medium to small fragments of oxidized sandstone were extracted from the south half of the feature. The northern half was not salvaged due to compromised integrity from grading operations. The feature produced an age of 2190 ± 40 BP (conventional), Cal BC 380 to 160 (Beta #267654) which places occupation during Reed and Metcalf's Terminal Period of the Late Archaic Era.

Feature 2 was a faint ash stain measuring approximately 100cm in diameter. This feature revealed a prodigious quantity of large to medium-sized oxidized sandstone fragments, suggesting possible use as a roasting pit.

Evaluation and Management Recommendations

Cultural deposits were exposed within the first 30 to 40cm of deposition. No cultural material was observed in the pipeline trench walls. Evidence garnered from mitigation suggests that additional subsurface cultural material is not likely. In addition, the site's research potential has been fully exhausted and the features destroyed. Therefore, the site is evaluated as not eligible for inclusion on the NRHP since it does not meet any of the criteria for inclusion. Accordingly, no further work is recommended.

Site **5ME16860**, a prehistoric open camp is located on Hayes Mesa at an elevation of 5880 feet. The vegetation consists of a pinyon and juniper woodland with a sparse understory of sagebrush, rabbitbrush, snakeweed, and grasses. Soils consist of fine to coarse, tan loess/silt of aeolian/ alluvial origin. An unnamed intermittent tributary of Little Anderson Gulch is on-site.

Archaeological monitoring of surface disturbing activity led to the discovery of two subsurface ash stains (Features 1 and 2) and a biface (5ME16860.s1) within an area of 130m N-S by 127m E-W. Both features were determined to lack integrity; therefore, they were not salvaged and no radiocarbon sample was obtained or processed. The features were described as follows:

> Feature 1 was exposed within the top 30cm to 40cm of deposits, and it is believed to be redeposited feature fill. The feature consisted of an 80cm diameter concentration of ash and fire-cracked rock. It was not salvaged due to its compromised integrity.
>
> Feature 2 was also exposed within the top 30cm to 40cm of deposits. The feature was also believed to be redeposited feature fill. It was described as being very similar to Feature 1, but slightly larger in diameter (1m diameter). Its compromised integrity precluded salvage.

The presence of subsurface cultural material suggested a high probability of additional artifacts and features; thus, the surrounding area was intensively surveyed. The following artifacts were newly recorded on the surface: 89 flakes, two bifaces, one mano and a piece of angular shatter. Artifact provenance (i.e., outside of the pipeline right-of-way) and lack of diagnostics precluded collection.

Evaluation and Management Recommendations

The site produced evidence of subsurface cultural deposits in the form of two ash stained features. While the site has been impacted by the pipeline, the majority of the site remains intact. The cultural features were exposed within the top 30 to 40cm of deposition and artifacts were recorded on the surface outside of the pipeline right-of-way.. The features and the artifacts suggest a campsite likely used over time which suggest the potential for addition subsurface cultural deposits. Thus, the site possesses the potential to yield additional important information and it is field evaluated as eligible for inclusion on the NRHP under Criterion D. Accordingly, protection and preservation are recommended.

## CHAPTER 5: DATA RECOVERY RESULTS

Twelve sites were selected on BLM, USFS and private lands for data recovery: 5GF109, 5GF4337, 5ME113, 5ME974, 5ME16097, 5ME16102, 5ME16117, 5ME16782, 5ME16784, 5ME16786, 5ME16789, and 5ME16791. The following describes these mitigative endeavors.

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### 5.1 5GF109

#### 5.1.1 Introduction

Site **5GF109** is located on private land [redacted]. It is a prehistoric open camp situated on the south terrace of the Colorado River at an elevation of 5080 feet. Vegetation is a mix of greasewood and grasses (Plate 5.1-1). Soils are light brown loam with small pebbles.

**Plate 5.1-1** Overview of site area.

The site was originally recorded by John Gooding in July of 1974 and described as consisting of chipping debris, a few broken implements and two metates (Gooding 1974). The material remains were predominantly chert, chalcedony, and quartzite. According to Gooding, the site had been visited regularly by local arrowhead hunters. Consequently, no diagnostic artifacts were found; however, artifacts in private collections contained some evidence of the Dominguez-Escalante expedition (ibid. 1974).

In 2007, Grand River Institute revisited the site during the Class III cultural resource inventory for the proposed Collbran Pipeline Project (Conner and Davenport 2007). Chipped and ground stone artifacts were found scattered in an area 80m in diameter. Several river cobbles were also recorded. No thermal or architectural features were noted, but soils appeared to be deep as evidenced by the cutbank along the slope at the terrace edge. Therefore, the site appeared to have potential for intact cultural deposits. A reroute of the pipeline was proposed; however, the reroute proved to be unsatisfactory. As a result, Grand River Institute returned to the site on the 14th of August 2008 to: 1) determine and/or delineate the area of impact that would result from the construction of the original route, and 2) to propose a data recovery plan that would mitigate adverse impacts to the site. Additional mapping took place and new artifacts were observed within a larger area measuring 235m NW-SE by 130m NE-SW. The following artifacts were recorded: 79 flakes, two biface fragments, two tested cobbles, two hammerstones, five manos, one non-diagnostic projectile point fragment, and a Uinta Side-notched projectile point (later designated 5GF109.s97; Plate 5.1-2) dating ca. AD 1100 to 1300 (Holmer 1986:107). A collector's pile was also observed.

### 5.1.2 Field and Analytic Methodology

Data recovery was conducted between September 23rd and October 2nd of 2008. Prior to excavation, the surface of the site was re-mapped using a BLM certified Trimble Geo XT GPS unit (Figure 5.1-1). All surface artifacts within the proposed area of disturbance were collected and assigned an "s" number (Figure 5.1-2 and Appendix C).

A permanent datum point was established on the ridge near the center of the site at [redacted] The datum point was plotted on the map with the Trimble GPS unit and marked with a metal pin in the ground. A total of six 1m² units (Test Pits 1-6), referenced by the coordinates of their southwest corner, were established in relation to this datum and oriented to true north. Some of the test pits (Test Pits 1, 2, 3, and 6) were randomly established and others (Test Pits 4 and 5) were placed in areas demonstrating potential for subsurface cultural fill. In addition, seven backhoe trenches (Test Trenches 1-7) were selected for the purposes of stratigraphic profiling and to further investigate the horizontal and vertical extent of cultural deposits at the site. Sediment grain-size, sorting, edaphic factors (soil structure and caliche), and the geochemical character of the deposits were crucial to discerning these relationships. Figure 5.1-3 shows the locations of the test units, backhoe trenches and stratigraphy blocks.

Trowels, brushes, and whisk brooms were primarily used to excavate the test pits. Excavation proceeded in arbitrary 5cm levels as measured from present ground surface at the test pit corner stake highest in elevation. Additional testing into the underlying, culturally sterile substrate was completed using shovels and picks. Final depth of excavation ranged from a minimum of 5cm to a maximum of 17cm below present ground surface.

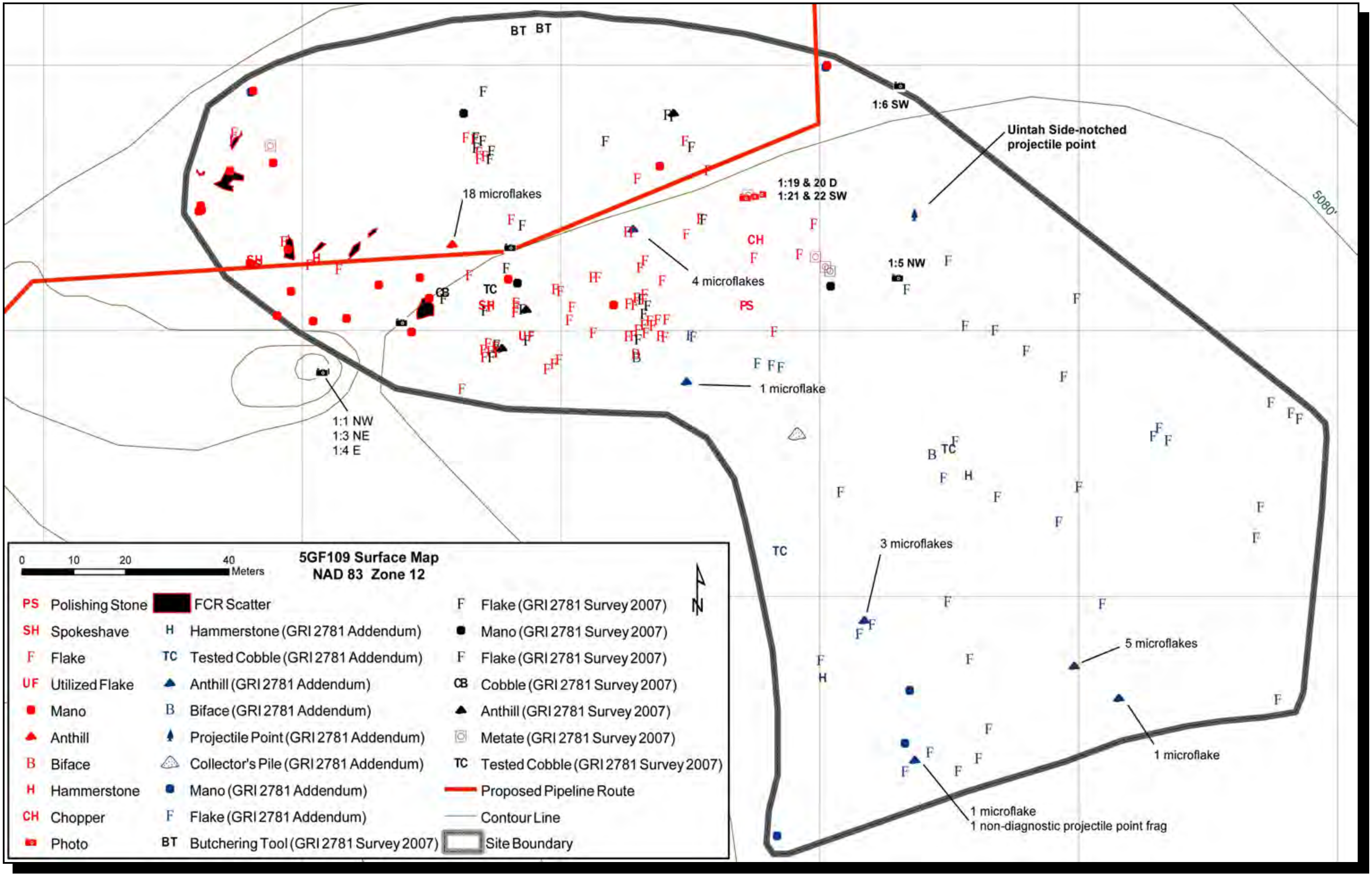



**Figure 5.1-1.** Map showing the location of previously recorded and newly recorded cultural material at 5GF109.

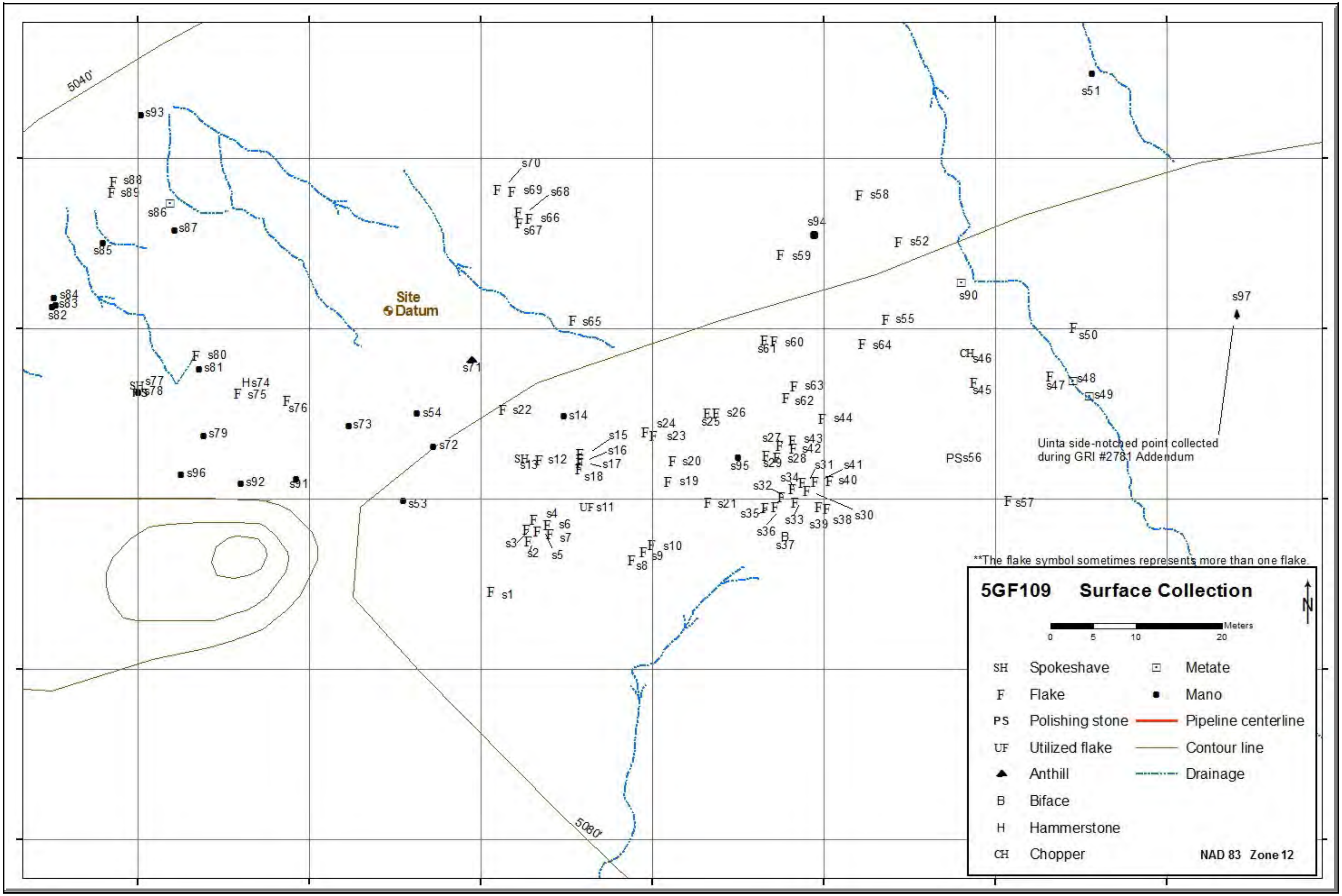



**Figure 5.1-2.** Map showing the location of artifacts collected from the surface of the site.

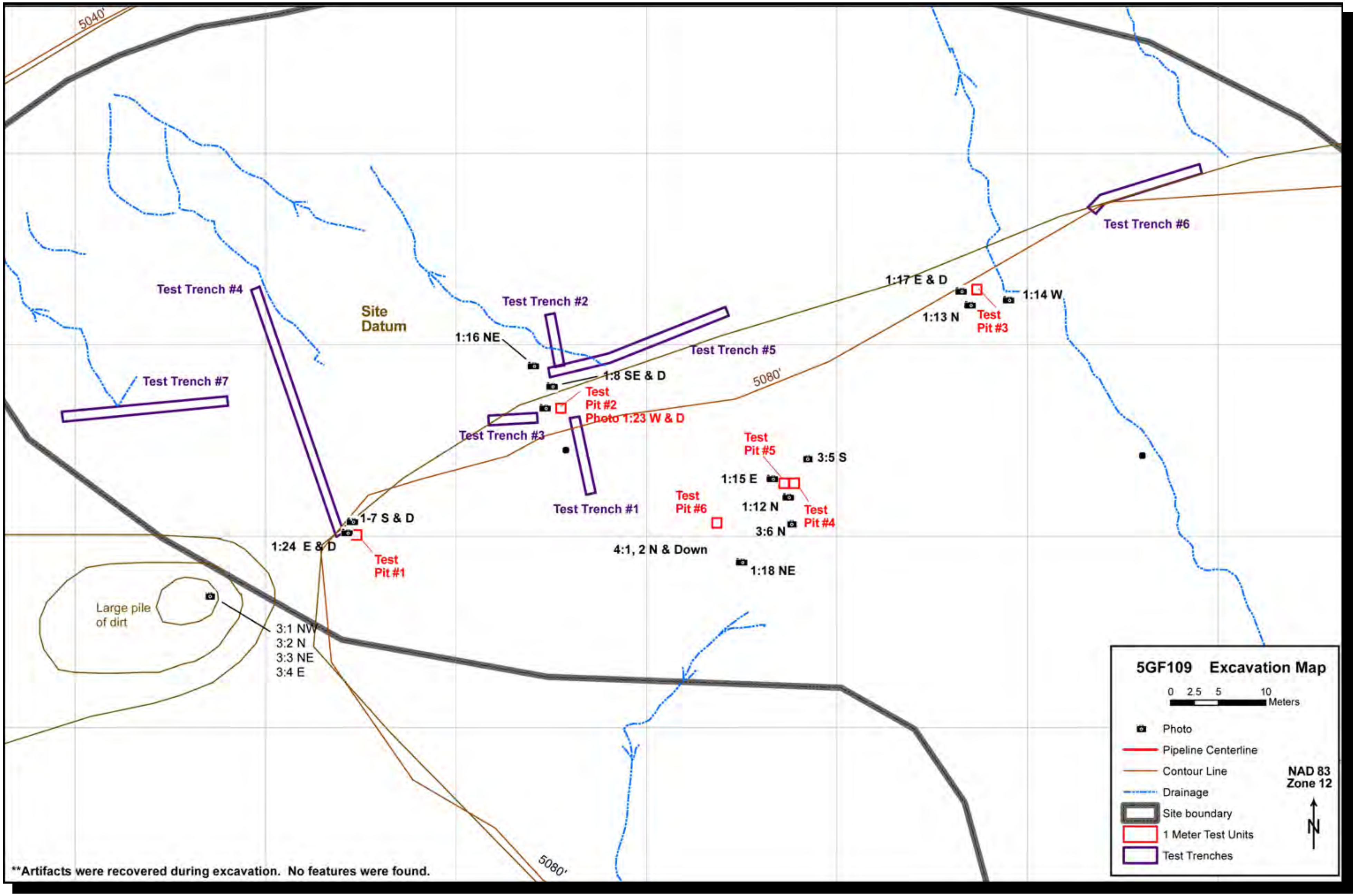



**Figure 5.1-3.** Map showing the location of Test Pits 1-6, Test Trenches 1-7.

In search of cultural materials, all excavated sediment was sifted through either 1/8-inch mesh hanging rocker screens or a series of soil sieves with mesh sizes 4.75mm (0.187in), 2mm (0.0787in), and 1mm (0.0394in). Data was recorded as to which screening system was utilized for each level of each unit in order to document differential results. In the deeper portions of the stratigraphic trench tests, a 1/4" mesh was employed in order to force the highly compacted soil through the screen.

All artifacts recovered from subsurface contexts were designated an "fs" number. Artifacts found *in situ* were documented on plan and/or profile maps, recorded by depth below present ground surface (BPGS), and bagged as individual field specimens. Other artifacts and ancillary specimens were bagged in aggregate, and labeled by unit and level or feature number. Soil, flotation, pollen, and carbon samples were to be collected as warranted.

Following excavation, all recovered cultural material was transported back to Grand River Institute for processing and analysis. Lithic artifacts were categorized according to morphological similarities. Resultant classes include artifacts subsumed under chipped (i.e., flake debris and tools) and ground stone. All collected artifacts will be returned to the land owner and the written records will be filed with the BLM.

### 5.1.3 Results of Fieldwork

#### 5.1.3.1 Artifacts

Upon reinspection of the site's surface, 134 artifacts were recorded and collected (Figures 5.1-1 and 5.1-2, Appendix C). These included 19 manos, two possible polishing stones, four metates (one uncollected), 103 flakes, one utilized flake, one chopper, two spokeshaves, one biface, and one hammerstone. Additionally, 20 clusters of fire-cracked rock were recorded, but were not designated feature numbers as they were determined to be the byproducts of secondary deposition.

A total of 6m² were excavated, leading to the recovery of additional cultural material. Two hundred and forty-two flakes, three manos, and one cobble were recovered and collected from shallow subsurface contexts (0-15cm BPGS) (Appendix C). The majority of these artifacts were recovered from Test Pits 4 through 6 which were established in the same general area south of the proposed pipeline right-of-way. The least amount of cultural material was recovered from Test Pit 3 located along the edge of a drainage traversing the northeastern portion of the site.

#### 5.1.3.2 Features

A concentration of fire-cracked rock was noted on the surface, and Test Pits 4 and 5 were established in its vicinity. The fire-cracked rock, lacking characteristics indicative of an *in-situ* thermal feature, was determined to be the byproduct of secondary deposition.

5.1.3.3 Stratigraphy

Stratigraphy of the site consists chiefly of loess deposited during ameliorating conditions. The most complete stratigraphic profile was found in Test Pit 3 (Figure 5.1-4), which was located northeast of Test Pit 1 (Figure 5.1-5) at the same elevation and near an ephemeral drainage. Five deposits were noted here. The basal unit is defined by a massive loess exhibiting extreme calcification and sulfide mineral accumulation (Qp). This unit is overlain by a massive and extremely calcified loess (Qhme) with an A2 soil horizon relic located near the contact of this unit with the first Qhl deposit. An A2 horizon is indicative of a cool/wet period in which rainfall exceeds evaporation, leaching soil constituents out to accumulate in the underlying horizon. Two thin, Qhl deposits exhibit blocky to weak prism structures and are very calcified; however, the younger of the two exhibits mixing with sheet flow alluvium. The uppermost unit is a moderately calcified loess with a platy to crumb structure (LIA/Qhl). Four test pits (1, 2, 4 and 6), were dug to depths revealing the upper portion of Qhme. The A2 horizon relic was present at all of the contacts with Qhl, however only one or two Qhl deposits were identifiable at these test pits. It may be that one or two of the Qhl deposits was eroded prior to deposition of the next, or the change in structure may have been too slight to be observed. Notably, a second A2 horizon relic was identified in the Qhl deposit at the contact with LIA/Qhl in Test Pit 1. No other evidence of this soil horizon was found in any of the other test pits. Test Pit 5 was only dug to a depth revealing two of the Qhl deposits. In every instance, calcification of the deposits lessens upwards in stratigraphic context.

Cultural deposits were located in adjacent Units 4 and 5. Cultural level 1 manifested at approximately 4cm below present ground surface (bpgs) within the LIA/Qhl deposit. A metate fragment visible on the surface at Test Unit 5, rested on the 4cm bpgs level. A second cultural level manifested in Test Unit 5, atop the contact of Qhme with LIA/Qhl at approximately 15cm bpgs.

### 5.1.4 Discussion of Artifacts

The following section briefly describes the artifacts that were collected during the investigations at site 5GF109. A complete list of collected artifacts is provided in Appendix C.

5.1.4.1 Chipped Stone

*Projectile Point*

A Uinta Side-notched projectile point (designated 5GF109.s97; Plate 5.1-2) was recovered from the surface of this site. This type represents the late Fremont Culture and is characteristic of the Uinta Fremont variant of northeastern Utah, and has associated dates ca. AD 1100-1300 (Holmer 1986:107).


**Plate 5.1-2.** Uinta Side-notched point recovered from 5GF109 (.s97).

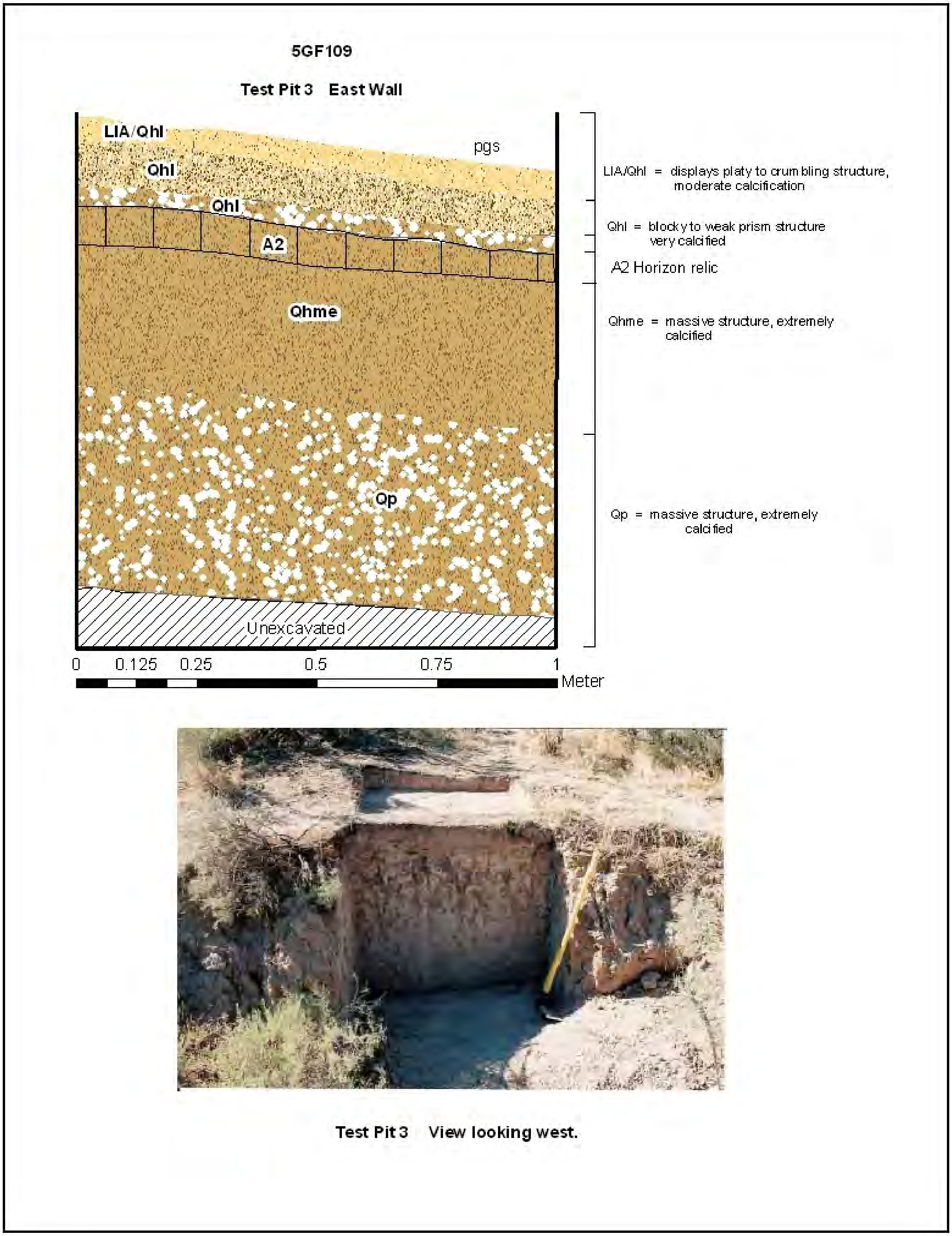
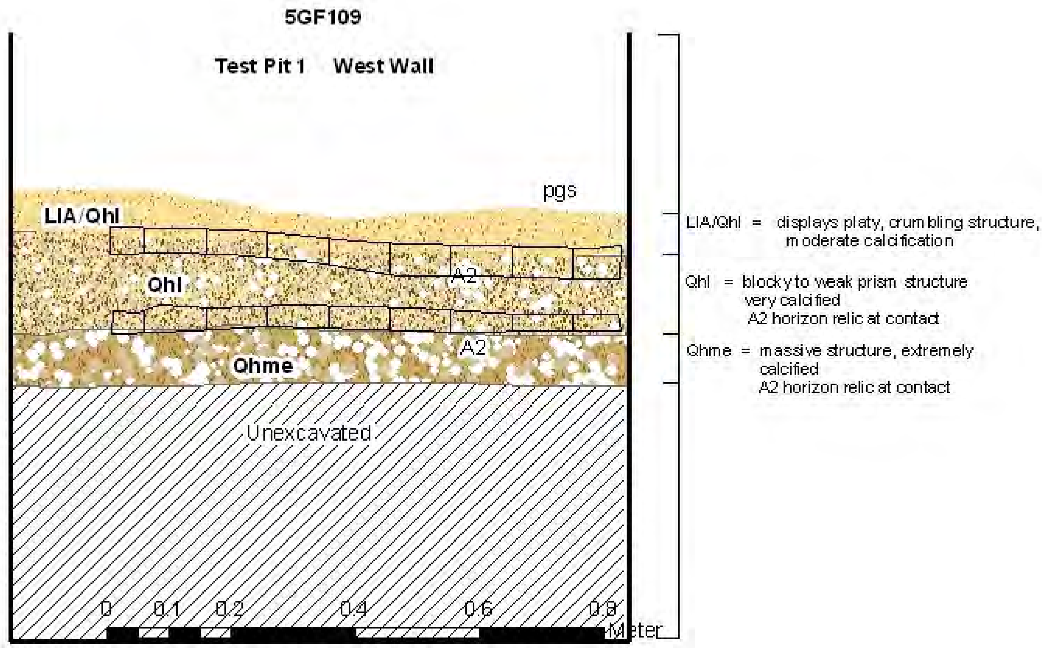



**Figure 5.1-4**. Stratigraphy of Test Pit 3.




Test Pit 1 View looking east.

**Figure 5.1-5.** Stratigraphy of Test Pit 1.

This point type was recorded at site 5GF133 (Battlement Mesa area) in association with a Tusayan Black-on-White ceramic sherd from the Tsegi area of northern Arizona, and comparatively dated AD 1225-1300 (Conner and Langdon 1987). Interestingly, this Fremont point is made of chert derived from the Morgan Formation found along the Yampa River of Northwest Colorado.

*Bifacial Tool*

Specimen .s37 is a biface of white opalitic chert. It exhibits an amygdaloid shape and has sustained a snap fracture at its proximal end and another fracture on one side of its distal end. Some of the flake scars exhibit patination. The artifact has the appearance of a Shoshonean Knife (Frison 1991:132) dating to the early Numic occupation of the region ca. AD 1300-1650 [Canella Phase per Reed and Metcalf 1999]. Plate 5.1-3 shows the artifact with line drawings estimating the perimeters of the missing parts.

**Plate 5.1-3.** Shoshonean Knife fragment recovered from 5GF109 (.s37).

*Unifacial Tools*

Specimen .s11 is a small utilized flake of greenish-gray porcellanite. It is retouched on one edge of its ventral side. The flaked edge exhibits a number of small step-fractures which resulted from forceful use.

Specimen .s13 is a spokeshave of tan porcellanite. It has a retouched lunate notch on one edge of its dorsal surface.

Specimen .s77 is a spokeshave of a fine-grained basalt. It has a retouched lunate notch on one edge of its ventral side.

*Chopper and Cobble*

Specimen .s46 is a medium-sized bifacial chopper from an amorphous cobble of tan orthoquartzite. Heavy battering is evident along its chopping edge.

Specimen .fs18 is an opalitic chert cobble fragment recovered from a depth of 5-10cm below present ground surface during the excavation of Test Pit 6.

*Hammerstone*

Specimen .s74, a hammerstone, is a heat-altered cobble of reddish-brown porcellanite. It is battered on nearly all the exposed edges that were created when the cobble fractured during heat-treatment.

*Debitage*

Debitage analysis involved assigning flakes to a reduction stage sequence (early, middle, and late) based on the amount of dorsal cortex. In this study, complete dorsal cortical coverage was considered indicative of early stage manufacture, whereas some cortical coverage was considered indicative of middle stage manufacture. Late stage manufacture was evinced by the absence of dorsal cortex. Primary (complete cortex), secondary (some cortex), and tertiary (no cortex) were utilized herein to describe cortical coverage.

Out of the 345 pieces of lithic debitage (103 surface and 242 subsurface), the majority were described as small tertiary flakes. Two hundred and thirty-two flakes (95 percent) were categorized as tertiary, nine (4 percent) were categorized as secondary, and only one (1 percent) was classified as primary. The prevalence of tertiary flakes appears to indicate emphasis towards final-stage tool manufacture as well as retouch and re-sharpening. This type of activity is frequently noted on prehistoric camp sites in the vicinity of hearths, habitation structures, and other indications of domestic camp activities.

Lithic material classes were also identified during the analysis. These included opalitic chert, quartzite, porcellanite, and basalt. Opalitic chert was the most prevalent lithic material class, constituting 87 percent of the total assemblage. Basalt comprised approximately 9 percent while quartzite and porcellanite comprised less than 5 percent of the total assemblage.

### 5.1.4.2 Ground Stone

*Manos*

A total of 22 manos were recovered. Nineteen of these were collected from the surface and three were recovered during excavation. Of these, 17 were complete enough to be sorted by type. Representatives of these mano types are shown in Plate 5.1-4.

Mano Type I, ovoid to subrectangular and bifacially ground, includes 10 of the handstones which have been shaped by slight to heavy pecking and/or grinding of the edges. Both broad surfaces have been moderately to heavily ground to form faces of relatively uniform convexity. Most specimens have transverse striations on the grinding surface; this suggests that they were used on metates having flat to slightly concave grinding surfaces, using even pressure in a back-and-forth "rocker" motion (Irwin-Williams and Irwin 1966:139-140). Secondary use as pounding stones is suggested by moderate to heavy battering on the ends of several. Of the Type I manos, three were made of granite, one of porcellanite, one of andesite, one of basalt, one of orthoquartzite, and three of quartzitic-sandstone.

Mano Type II, ovoid to subrectangular and unifacially ground, accounts for only two of the specimens recovered during investigations at the site. One of the manos is composed of andesite and the other is composed of granitic gneiss. These manos are similar in all respects to the Type I manos except that only one face was utilized.

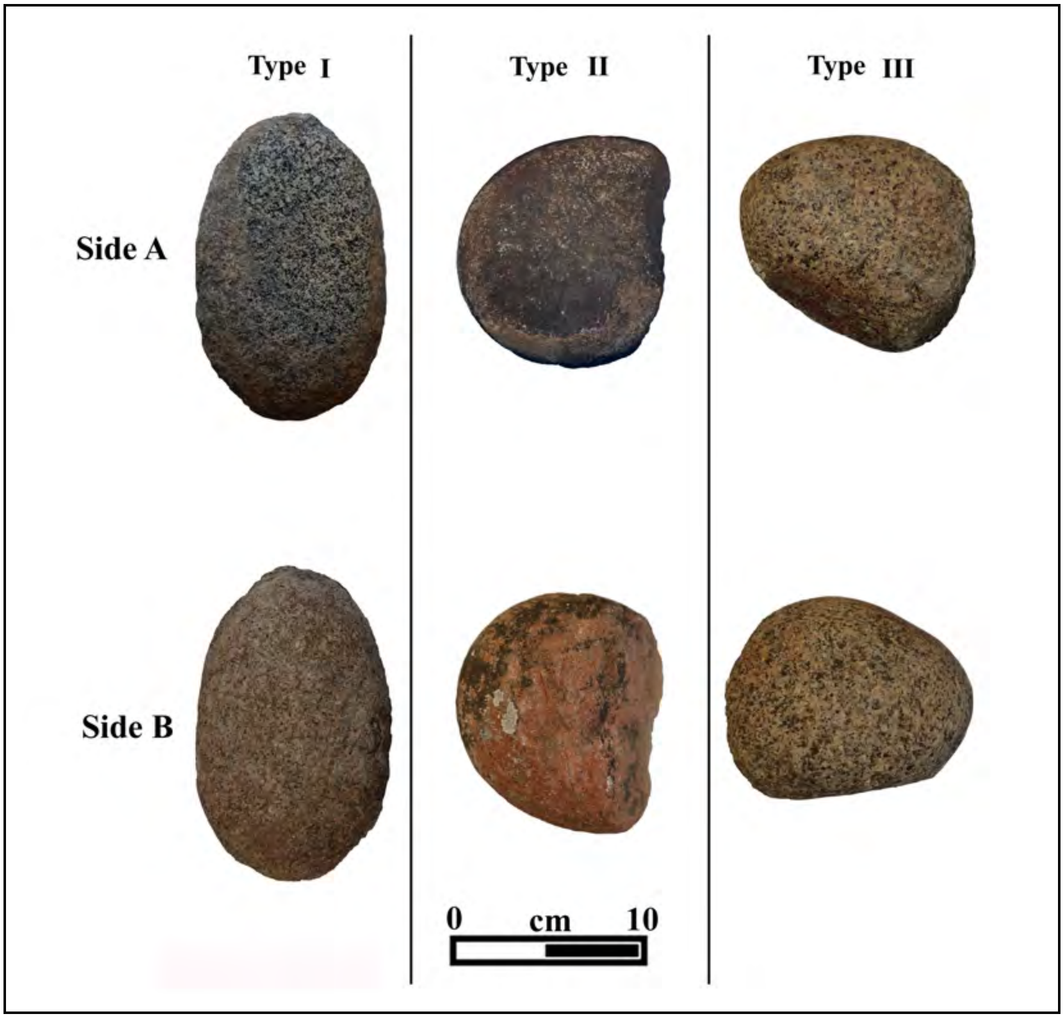



**Plate 5.1-4.** Representatives of the three mano types found on site 5GF109.

Mano Type III, amorphous bifacially used handstones, are unshaped river cobbles which have been ground on two faces. This category includes four manos. Similar to Type I, these exhibit grinding surfaces of relatively uniform convexity and light to moderate wear. Transversely oriented striations are visible on many of the specimens which suggests a rocker motion on flat to slightly concave metates. Material types for the manos are as follows: volcanic porcellanite (n=1), basalt (n=1), granite (n=1) and arkose (n=1).

*Polishing Stones*

Two possible polishing stones were collected (5GF109.s56 and 5GF109.s78). The former is an irregularly-shaped quartzite cobble. The latter is an elongated, unifacial cobble composed of granitic gneiss. Both exhibit fine surface texture, minute striations and some spots suggesting application as a smoothing or polishing stone (Adams 2002: 77).

*Metates*

A total of eight metates or fragments thereof (5 surface and 3 subsurface) were recorded. Collection was only feasible for three; the uncollected metate was fashioned from a large, non-portable basalt boulder. Five of the metates were complete enough to be classified by type.

Metate Type I accounts for two of the collected specimens (5GF109.s48 and 5GF109.s49). This metate type is characterized by slabs having flat to slightly concave grinding surfaces. The typical specimen is formed on one face of a sandstone slab, which in some cases has been roughly shaped. Most have grinding surfaces which have been pecked and are within 2cm to 5cm of the edge. One specimen is composed of sandstone and the other is of quartz-sandstone.

Metate Type II is a shallow basin type represented by one specimen: 5GF109.s90. This specimen is distinguishable from Metate Type I in that it exhibits intentional notching along its lateral edges (Plate 5.2-5). These notches are located 15cm from the ends and are approximately 18cm apart. The notches probably aided in securing the metate during travel.

Metate Type III consists of one non-portable basalt boulder with a concave ground surface. Similar metates have been found in the general area at site 5GF133. Nine non-portable basalt boulders with ground surfaces were found at this site and were considered to be the dominant type. Most of these were found in direct association with diagnostic Protohistoric and Historic Ute artifacts (Conner and Langdon 1987).

### 5.1.5 Evaluation of Research

Archaeological investigations were conducted at the site to evaluate its potential to yield additional significant information. These investigations were guided by a framework of research questions drawn from the known cultural background. Research domains that were to be addressed by the investigations include cultural affiliation and age, site function, seasonality, subsistence, social organization, technology, extra-regional relationships, site formation and transformation, and paleo-environment. The results of the excavations have met many of these objectives.


**Plate 5.1-5.** Type II metate with side notches for transportation.

5.1.5.1 Cultural Affiliation

Cultural affiliation was derived from the comparative analysis of recovered diagnostics, which in this case includes only one artifact – 5GF109.s97 (Plate 5.1-2). The artifact is a Uinta Side-notched point that was collected in 2008 prior to the mitigation of adverse impacts to the site. The point is rather crude and exhibits some asymmetry. It is relatively small, and it is characterized by shallow and low side-notches, convex blade edges and a slightly concave basal edge. This point type, Uinta Side-notched, is largely affiliated with the late Fremont culture. Holmer (1986: 107) attributes a date of AD 1100 to 1300 to these points which, accordingly to Reed and Metcalf (1999:6), places occupation during the Aspen Tradition of the Formative Era.

Unfortunately, the site has been visited frequently by local arrowhead hunters who likely collected most of the diagnostics from the surface. It has been reported that artifacts in private collections contain some evidence of the Dominguez-Escalante expedition (Gooding 1974).

**5.1.6 Evaluation and Management Recommendation**

Based on data recovery results, the current field evaluation is in discordance with the 2008 official determination of eligible. The site apparently lacks the potential to yield additional important information based on the lack of artifacts and features, and the shallow character of cultural deposits at the site. As a result, the site is field re-evaluated as not eligible for inclusion on the NRHP. Accordingly, no further work is recommended.

**5.2 5GF4337**

**5.2.1 Introduction**

Site **5GF4337** is a prehistoric open camp located on a terrace south of the Colorado River and slightly east of Alkali Creek at an elevation of 5240 feet. Vegetation consists primarily of sagebrush, rabbitbrush, and grasses. Pinyon and juniper occur to the south on the mesa's north-facing slope (Plate 5.2-1). Soils consist of a fine to coarse, light brown loess/silt.

The site was discovered within an area measuring 100m E-W by 75m N-S during the monitor for the Collbran Pipeline Project. One non-diagnostic projectile point, one mano and two flakes were observed on the surface south of the proposed pipeline corridor. No thermal features were observed on the surface; however, mechanical stripping exposed at least 15 subsurface. In addition, several concentrations of fire-cracked rock were observed. These concentrations, lacking characteristics indicative of *in situ* thermal features, were not assigned feature numbers as they were determined to be the byproducts of secondary deposition. Figure 5.2-1 is a detailed map showing the location of surface artifacts, subsurface features, areas of disturbance and topographic features.

**Plate 5.2-1.** Overview of site area.

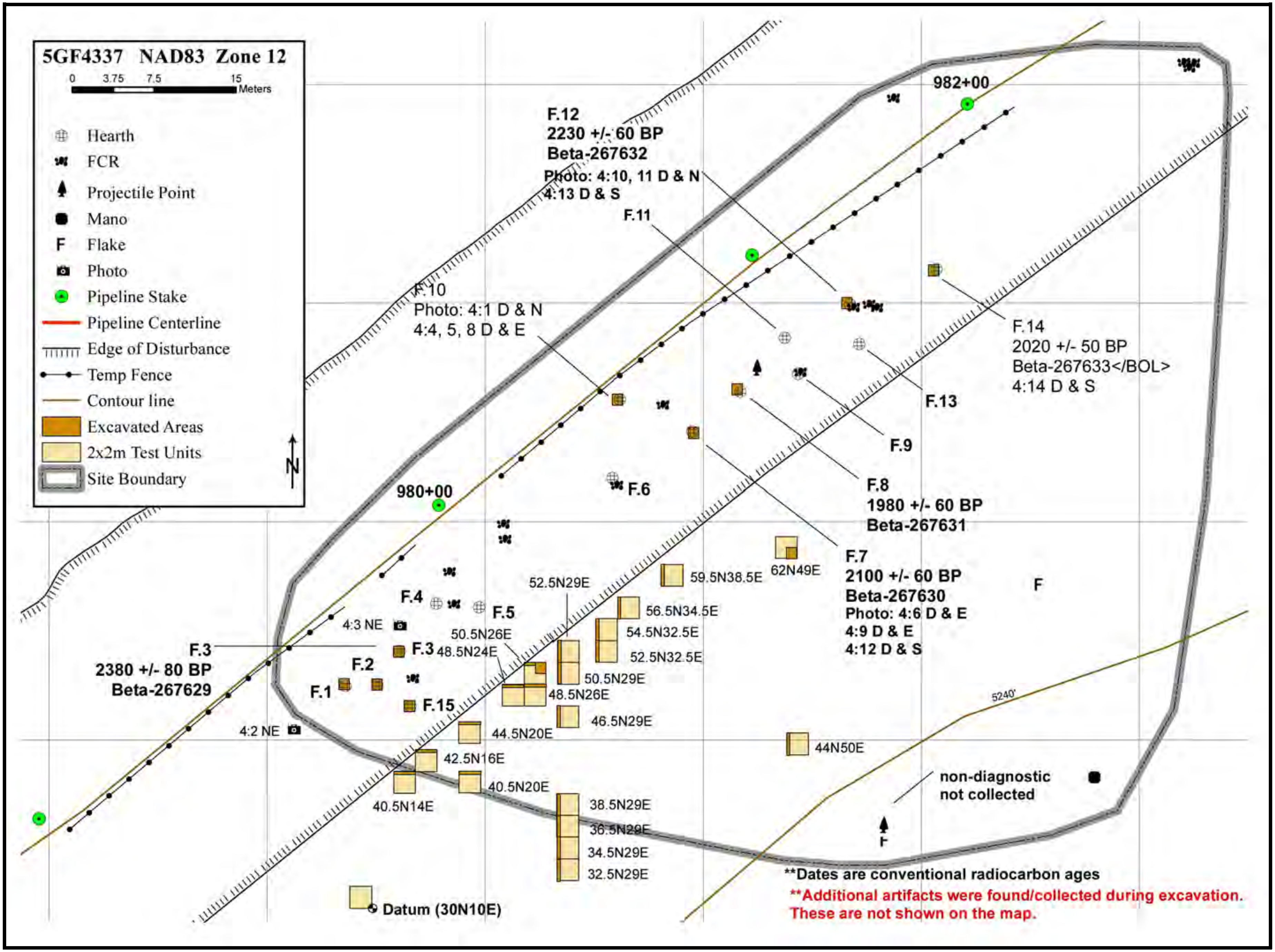



**Figure 5.2-1.** Map showing the location of areas of disturbance, features exposed by blading, and excavation blocks at 5GF4337.

### 5.2.2 Field and Analytic Methodology

The field work was done in order to locate, identify, describe, and evaluate the significance of the cultural resources at the site, both on and below the present ground surface. The method, scope, and reporting context of the excavations were designed to meet the requirements of the Bureau of Land Management and the State Historic Preservation Officer (SHPO).

Data recovery commenced on the 14th of September 2009 and terminated on the 25th of September 2009. Efforts were largely focused on salvaging nine of the 15 thermal features; however, a limited assessment of additional subsurface cultural material was achieved through random excavation outside of the staked pipeline right-of-way. The excavated areas are shown in Figure 5.2-1.

An excavation datum was established outside of the area of impact. A total of nine $1m^2$ units and 20 $2m^2$ units were established in relationship to this datum, oriented to true north, and referenced by the coordinates of their southeast corner. Within these units, 25cm wide transects were hand excavated. Initially, these transects were oriented north-south, but were later aligned east-west along the edge of the right-of-way. In addition, the northeast-quarter of Unit 50.5N 26E and the southeast-quarter of Unit 62N 49E were excavated.

Trowels, brushes, and whisk brooms were primarily used during excavation. Excavation proceeded in arbitrary 5cm or 10cm levels as measured from present ground surface at the unit corner stake highest in elevation. Additional testing into the underlying, culturally sterile substrate was completed using shovels and picks. Final depth of excavation varied; a minimum depth of 5cm to a maximum depth of 50cm was reported.

Excavated deposits were screened through 1/8-inch hardware cloth. Flotation samples were processed through a 1/16-inch mesh window screen. These samples were processed concurrent with excavation in-order to aid in the identification of cultural levels.

All artifacts recovered from subsurface contexts were designated an “fs” number. Artifacts found *in situ* were documented on plan and/or profile maps, recorded by depth below present ground surface (BPGS), and bagged as individual field specimens. Artifacts and ancillary specimens recovered from screened sediment were bagged in aggregate and labeled by unit and level. Features or potential features were also mapped as well as cross-sectioned, profiled, and described. Feature fill removed during cross-section was bagged in aluminum foil and placed in a plastic bag for reinforcement. If charcoal was present, it was bagged separately. Special precaution was taken to prevent contamination of collected charcoal; charcoal was handled with tweezers and trowels. Additional ancillary samples (i.e., floatation samples) were also collected as warranted.

Stratigraphic profiles were drawn to document relationships between the natural and cultural deposits at the site. Sediment grain-size, sorting, edaphic factors (soil structure and caliche), and the geochemical character of the deposits were crucial to discerning these relationships.

Following excavation, all recovered cultural material was transported back to Grand River Institute for processing and analysis. Lithic artifacts were categorized according to morphological similarities. Resultant classes include artifacts subsumed under chipped (i.e., flake debris and tools) and ground stone. Collected artifacts will be returned to the land owners, written records will be submitted to the Bureau of Land Management.

### 5.2.3 Results of Fieldwork

#### 5.2.3.1 Stratigraphy

In addition to transect trenches, a 1 x 1 meter unit (62N49E) was excavated. This unit was established in proximity to the edge of the pipeline right-of-way as well as the northeastern site boundary. Its purpose was to study the interrelationship between the stratigraphic deposits and the cultural deposits (Figure 5.2-2). It was excavated in 10cm levels to a final depth of 50cm.

On-site stratigraphy consists of five loess deposits indicative of ameliorating conditions, underlain by a Pleistocene age fan deposit. The fan deposit (Qp) consists of basalt and sandstone gravels intermixed with a matrix of sand, silt and clay. This Pleistocene deposit creates a shadow depositional environment for the loess to the east, which is where the loess is best identified and where the cultural materials are located. Calcium carbonate content lessens as the loess deposits move up in stratigraphy. Units Qhe and Qhm overly Qp. In the stratigraphic profile for unit 62N 49E, units Qhm and Qhe are undifferentiated to Qhme; however, it should be noted that Qhe is older than Qhm and underlies it. In addition to the high amount of calcite accumulation, sulfites, limonite and goethite were noted in unit Qhme. A lense of charcoal flecks was observed within this unit at approximately 40cm below present ground surface. Since no artifacts were found in that level, the charcoal's presence is likely due to redeposition from a wild fire occurrence.

The Qhm/Qhl contact is identified by a small pebble unconformity exhibiting frost heave and the undulating surface of the Qhm deposit. The undulating surface is likely the result of coppice mounds formed during an ameliorating condition. The oldest Qhl deposit overlies Qhm and is extremely calcified and exhibits a blocky structure and sulfite minerals, and is in turn overlain by a second, weak blocky, slightly calcified Qhl deposit. Most– if not all–of the features excavated from this site are within the oldest Qhl deposit, and many were excavated into the Qhm/Qhme deposit. During excavation of the features, this Qhm/Qhme deposit was referenced as a $CaCO_3$ deposit.

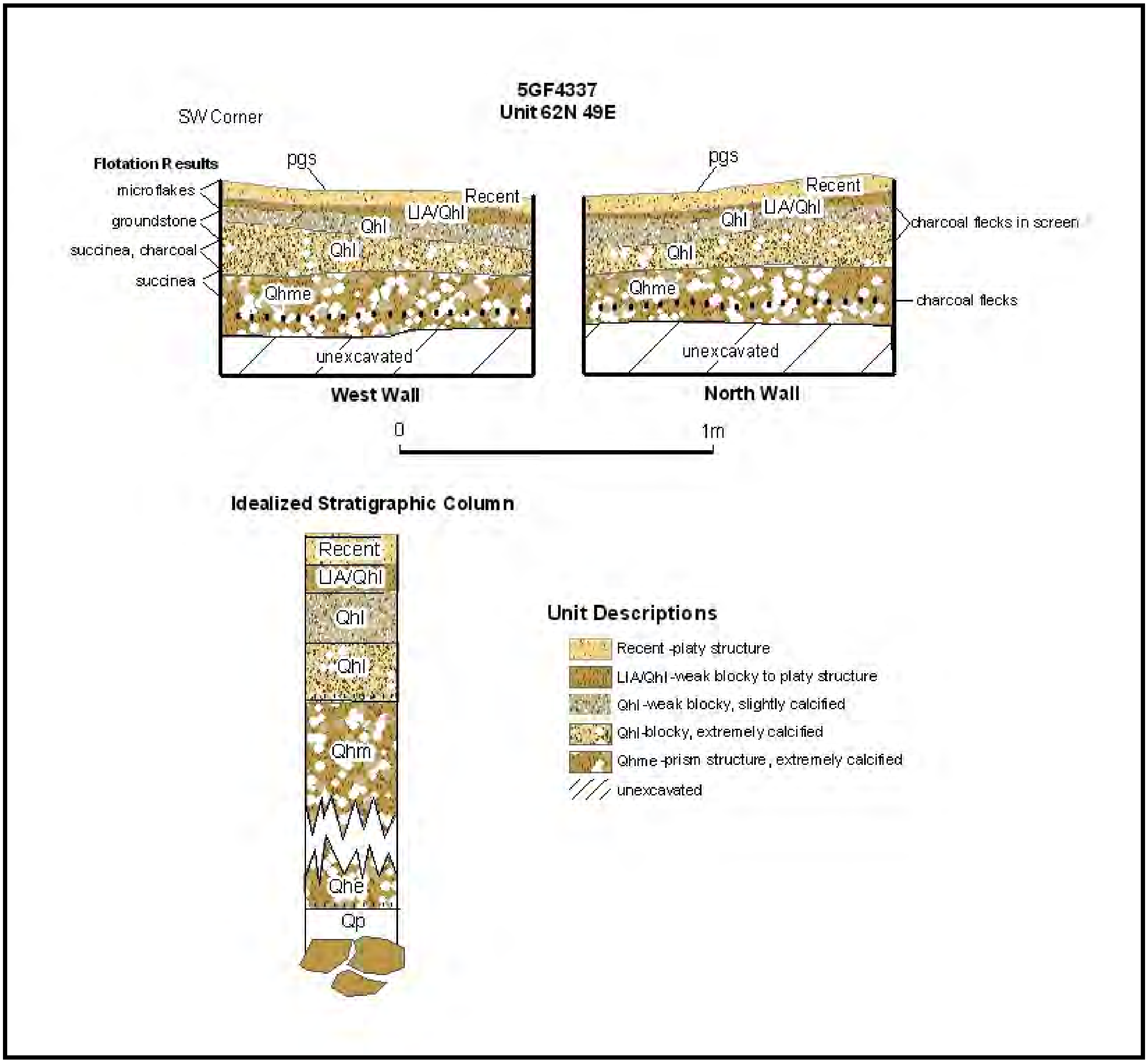



**Figure 5.2-2.** Profile of test unit 62N49E (1x1m) that was established in proximity to the edge of the pipeline right-of-way on the northeastern site boundary to examine the stratigraphic deposits of 5GF4337. An idealized stratigraphic column was constructed for the site area based on findings from the test unit and the pipeline trench wall.

Upon excavation of unit 62N 49E, charcoal was observed in the screen from one of the two older Qhl deposits at a depth of 10-20cm below present ground surface. The third and youngest Qhl deposit represents the Little Ice Age and is weak blocky and only slightly calcified. The surface is defined by a recently deposited loess with a platy structure. The deposition of this loess in the vicinity of the site is likely due to its proximity of the Pleistocene fan.

Flotation samples were collected from each 10cm level in the southwest corner of the unit. Artifacts recovered from the float consisted of micro-flakes (0-10cm level) and ground stone (10-20cm level). *Succinea* shell fragments, an unidentified tooth enamel fragment, and charcoal were recovered from the 20-30cm level. Only *Succinea* shells were recovered from the 30-40cm level. The presence of *Succinea* within the early Qhl and Qhme deposits is further evidence of wet, ameliorating conditions during their deposition.

Based on the $^{14}C$ results, the deposits in the 20-30cm level probably date no earlier than 2380±80 BP, Cal BC 770 to 240 (Beta #267629) and the 10cm level no later than 1980±60 BP, Cal BC 150 to AD 130 (Beta #267631). All of the radiocarbon dates were obtained from features within the earliest Qhl deposit, and many of these features were excavated into the contact of Qhl with Qhme.

5.2.3.2 Features

Fifteen identifiable thermal features were exposed within the top 30cm of deposition that were exposed during mechanical stripping. Nine of those (Features 1-3, 7, 8, 10, 12, 14, 15) were salvageable and are described below. In most cases, radiocarbon samples were collected and sent to Beta Analytic for processing.

Feature 1 was a faint ash stain approximately 50cm in diameter with fire-cracked rock. It appeared to be at least 40 percent intact. Excavation revealed it to be of shallow depth. Charcoal was observed and collected along with the feature fill but was insufficient for radiocarbon analysis.

Feature 2 was nearly destroyed by the bulldozer. A portion of the basin and the east wall of the thermal feature were left intact. Small quantities of disseminated charcoal and fire-cracked-rock were observed. A radiocarbon sample, weighing less than 5 grams, was collected. Due to the size of the sample, it was not sent for radiocarbon analysis.

Feature 3 was a basin hearth observed to be at least 20 to 30 percent intact. The bottom of the basin and roughly 20cm of the east wall were left intact. A considerable amount of charcoal was observed and a radiocarbon sample was collected. It yielded a conventional radiocarbon age of 2380±80 BP, Cal BC 770 to 240 (Beta #267629) placing it in the Late Archaic Era, Terminal Period.

Feature 7 was a rock-filled basin 40cm in diameter and 20cm deep. It was observed to be at least 50 to 60 percent intact. The bottom of the basin contained a thin layer of dark ash and charcoal overlain by rock. Above this was a second layer of ash and charcoal followed by another concentration of rock resting near the surface of the feature. A radiocarbon sample was sent for analysis, yielding a conventional radiocarbon age of 2100 ± 60 BP, Cal BC 360 to AD 20 (Beta #267630) placing occupation during Reed and Metcalf's (1999: 6) Late Archaic Era Terminal Period.

Feature 8 was a faint ash stain 50cm in diameter and 15 to 20cm in depth with a small amount of fire-cracked rock. The relative dearth of ash, fire-cracked rock and charcoal may suggest expedient construction and/or lack of repeated use. Medium-sized charcoal specimens were collected and sent for processing. A conventional radiocarbon age of 1980±60 BP, Cal BC 150 to AD 130 (Beta #267631) was obtained. Both the radiocarbon data and the projectile point placeindicate a Late Archaic Era (Terminal Period) into Formative Era (Aspen Tradition) occupation.

Feature 10 was a well-defined, rock-filled basin approximately 50cm in diameter and 12cm in depth. The initial subsurface exposure revealed a dense cluster of fire-cracked rock. A lens of dark ash was exposed below the rock and the bottom of the basin revealed evidence of repeated use and subsequent clean-out.

Feature 12 was a basin hearth measuring roughly 62cm in diameter. Approximately 5cm of fill was removed before the bottom of the basin was exposed; apparently, the bulldozer destroyed a large portion of this feature. However, significant quantities of fire-cracked rock and charcoal were observed and a radiocarbon sample was collected for processing. A conventional radiocarbon age of 2230±60 BP, Cal BC 400 to 160 (Beta #267632) was obtained placing occupation during Reed and Metcalf's (1999:6) Late Archaic Era Terminal Period.

Feature 14 was a rock-filled basin approximately 50cm in diameter and 6cm in depth. Stratified deposits were not observed. A radiocarbon sample was collected and sent for processing; it returned a conventional radiocarbon age of 2020± 50 BP, Cal BC 170 to AD 80 (Beta #267633) indicating occupation during Reed and Metcalf's (1999:6) Late Archaic Era Terminal Period.

Feature 15 was an ash lens approximately 60cm in diameter and 6cm in depth. A few fragments of fire-cracked rock were observed. The edge of the basin was difficult to delineate suggesting the feature may have been the clean-out of another feature and/ or subjected to deflation prior to being buried.

### 5.2.4 Discussion of Artifacts

The following section briefly describes the artifacts that were collected during the investigations at site 5GF4337. A complete list of all the collected artifacts is provided in Appendix C.

5.2.4.1 Projectile Point

Reinspection of the site's undisturbed surface generally failed to identify additional cultural material; however, one projectile point fragment (5GF4337.fs1, Plate 5.2-2) was discovered near Feature 8. The artifact is a crudely-worked midsection. The workmanship and relative size of the artifact suggests an Archaic affiliation. In fact, the point was likely stemmed and closely resembles (by size and width of the remaining blade) the Uncompahgre Complex Dry Creek Phase Type 31 (Buckles 1971:1220). Buckles dates this Phase between ca. AD 1-500, which fits the $^{14}C$ results derived from Feature 8, as discussed above.


**Plate 5.2-2.** 5GF4337.fs1, projectile point blade fragment.

5.2.4.2 Debitage

Excavation resulted in the recovery of 42 flakes, two pieces of angular shatter, three pieces of ground stone, one oxidized cobble fragment, three bone fragments with no evidence of processing, charcoal, *Succinea* shell fragments, and tooth enamel (Appendix C). Lithics comprised 92 percent of the overall cultural assemblage. Ground stone comprised six percent and the oxidized cobble comprised two percent of the overall cultural assemblage.

The majority of the artifacts were recovered from screened sediment at depths of 0 to 20cm below present ground surface. At 20 to 30cm below present ground surface, very small pieces of charcoal were recovered from a floatation sample in unit 62N 49E. No cultural material was recovered below 30cm.

Debitage analysis involved assigning flakes to a reduction stage sequence (early, middle, and late) based on the amount of dorsal cortex. In this study, complete dorsal cortical coverage was considered indicative of early stage manufacture, whereas some cortical coverage was considered indicative of middle stage manufacture. Late stage manufacture was evinced by the absence of dorsal cortex. Primary (complete cortex), secondary (some cortex), and tertiary (no cortex) were utilized herein to describe cortical coverage.

Thirty-seven (88 percent) of the 42 pieces of lithic debitage were classified as tertiary flakes. Two flakes (5 percent) were classified as secondary and three (7 percent) were classified as primary. The prevalence of tertiary flakes appears to indicate emphasis towards final-stage tool manufacture as well as retouch and re-sharpening. This type of activity is frequently noted on prehistoric camp sites in the vicinity of hearths, habitation structures, and other indications of domestic camp activities.

Lithic material classes were also identified during the analysis. These included opalitic chert, quartzite, and porcellanite. Porcellanite was the most prevalent lithic material class. Opalitic chert was the next most prevalent and quartzite was the least prevalent.

5.2.4.3 Ground Stone

A total of three pieces of ground stone (5GF4337.s17, 5GF4337.s19, and 5GF4337.s22) were recovered during excavations, but were too fragmentary to be classified by type. Specimen 5GF4337.s17 is composed of rhyolite, fragment 5GF4337.s19 is made of gneiss, and the remaining specimen (.s22) is composed of orthoquartzite.

5.2.4.4 Oxidized Cobble

One oxidized cobble (5GF.fs11) fragment of rhyolite was recovered from screened sediment within unit 50.5N 26E.

### 5.2.5 Evaluation of Research

Archaeological investigations were conducted at the site to evaluate its potential to yield additional significant information. These investigations were guided by a framework of research questions drawn from the known cultural background. Research domains that were to be addressed by the investigations include cultural affiliation and age, site function, seasonality, subsistence, social organization, technology, extra-regional relationships, site formation and transformation, and paleo-environment. The results of the excavations have met many of these objectives.

5.2.5.1 Cultural Affiliation

Cultural affiliation and age were derived from the radiometric analysis of carbon samples collected from Features 3, 7, 8, 12 and 14. Four of the features (Features 3, 7, 12, and 14) yielded conventional radiocarbon ages falling solely within Reed and Metcalf's (1999:6) Terminal Period of the Late Archaic Era. Analysis of carbon collected from Feature 8 yielded a conventional age also falling within the Terminal Period of the Archaic Era and into the Aspen Tradition of the Formative Era. Results of the radiometric analysis are presented in Table 5.2-1.

5.2.5.2 Site Function

Artifacts recorded at regional sites indicate activities related to lithic processing, hunting and gathering of foodstuffs, faunal and floral processing, and camping. The artifactual remains at 5GF4337 conform to this pattern as reflected in: the lithic debitage (a result of tool manufacture and maintenance), the projectile points (indicative of hunting), the grinding tools (suggesting floral processing and possibly hide treatment), and the thermal features (indicative of floral and faunal processing as well as short-term habitation.

**Table 5.2-1.** Results of radiometric analysis form 5GF4337.

| Sample Data | Measured Radiocarbon Age | 13C/12C Ratio | Conventional Radiocarbon Age | Calibrated AD/BC Date |
|---|---|---|---|---|
| 5GF4337. F3 Beta-267629 | 2320±80 BP | -21.1 o/oo | 2380±80 BP | Cal BC 770 to BC 240 |
| 5GF4337. F7 Beta-267630 | 2040±60 BP | -21.1 o/oo | 2100±60 BP | Cal BC 360 to AD 20 |
| 5GF4337. F8 Beta-267631 | 1930±60 BP | -22.1 o/oo | 1980±60 BP | Cal BC 150 to AD 130 |
| 5GF4337. F12 Beta-267632 | 2150±60 BP | -20.2 o/oo | 2230±60 BP | Cal BC 400 to BC 160 |
| 5GF4337. F14 Beta-267633 | 1960±50 BP | -21.1 o/oo | 2020±50 BP | Cal BC 170 to AD 80 |

#### 5.2.5.3 Settlement/Subsistence and Seasonality

The site contained no evidence of formal structures that were utilized for an extended period. It appears the site was revisited over several hundred years during the Late Archaic/Early Formative period as part of a seasonal migration. No materials were found that would provide information about the season of occupation.

### 5.2.6 Evaluation and Management Recommendation

The site was evaluated as officially eligible in 2009 when a mitigation plan was submitted for the retrieval of data at the site. Based on the testing regime and the monitoring of the pipeline trench, wherein no additional subsurface features or artifacts were identified, the site's research potential has apparently been exhausted. Accordingly, the site is field evaluated as not eligible to the NRHP, and no further work is recommended.

## 5.3 Site 5ME113

### 5.3.1 Introduction

Site **5ME113** is located on BLM land administered by the Grand Junction Field Office. The site is a prehistoric open camp located on Place Mesa between Atwell Gulch and Jerry Gulch at an elevation of 6040 feet. Vegetation is a mix of sagebrush and pinyon and juniper (Plate 5.3-1). Soils consist of fine to coarse, light brown loam and contain fragments of decomposing sandstone.

**Plate 5.3-1.** Overview of the site area.

The site was originally recorded by the Historical Museum and Institute in 1975 (Baldi et al. 1976) and again in that same month by R.E. Hurlbutt. In 2007, Grand River Institute revisited the site during the cultural resource inventory for the Collbran Pipeline Project (Conner and Davenport 2007). The site boundary was enlarged to measure roughly 185m E-W by 100m N-S, encompassing previously recorded isolated finds 5ME960, 5ME967, and 5ME968. The following artifacts were recorded: one non-diagnostic projectile point, one Elko Corner-notched projectile point (Plate 5.3-2) dating approximately 5500 to 2400 BC (Holmer 1986: 104), one scraper and lithic debitage. In addition, two small concentrations of fire-cracked rock and ashy soil were recorded south of the road.


**Plate 5.3-2.** Elko Corner-notched point collected 2007.

### 5.3.2 Field and Analytic Methodology

Data recovery commenced on the 13th of May and terminated on the 9th of June 2009. Prior to excavation, an intensive surface map was drawn, documenting previously recorded cultural material as well as newly recorded cultural material (Figure 5.3-1). Cultural features that were exposed by erosion (on the south side of the site) and one exposed in the road cut (on the north side of the road) were recovered. A trench was dug on the north side of the road to establish depth and character of the stratigraphy. In addition the disturbance of the pipeline corridor was restricted to the county road, and the pipeline trench was monitored but no additional resources were identified. The locations of all cultural resources, both new and previously recorded, were accurately mapped utilizing a Trimble Geo XT GPS unit.

An excavation datum was established outside of the area of impact. A total of 10 $1m^2$ units were established in relationship to this datum, oriented to true north, and referenced by the coordinates of their southwest corner. Units 0N 9E, 0N 10E, 1N 9E and 1N 10E (Test Block 1) and units 12N 0E, 12N 1E, 13N 0E and 13N 1E (Test Block 2) were established in areas demonstrating potential for subsurface cultural fill such as in the vicinity of the two fire-cracked rock concentrations previously recorded in 2007. Units 4.5N 57E (Unit 1) and 30N 67E (Unit 2) were established in random areas north of the road. In addition, a single backhoe trench (Test Trench 1) was excavated (Figure 5.3-1).

Deposits were excavated from natural stratigraphic layers using trowels, brushes and whisk brooms and processed through 1/4-inch hardware cloth. Additional testing into the underlying, culturally sterile substrate was completed using shovels and picks. Excavation proceeded to an average depth of 20cm below present ground surface within Test Blocks 1 and 2, and Unit 1. At Unit 2, excavation proceeded to an approximate depth of 1.5m below present ground surface.

Artifacts found *in situ* were documented on plan and/or profile maps, recorded by depth below present ground surface (BPGS), and bagged as individual field specimens. Artifacts and ancillary specimens recovered from screened sediment were bagged in aggregate and labeled by unit and level. Features or potential features were also mapped as well as cross-sectioned, profiled, and described. Feature fill removed during cross-section was bagged in aluminum foil and placed in a plastic bag for reinforcement. If charcoal was present, it was bagged separately. Special precaution was taken to prevent contamination of collected charcoal; charcoal was handled with tweezers and trowels.

Stratigraphic profiles were drawn to document relationships between the natural and cultural deposits at the site. Sediment grain-size, sorting, edaphic factors (soil structure and caliche), and the geochemical character of the deposits were crucial to discerning these relationships. Following excavation, all recovered cultural material was processed and analyzed at Grand River Institute. Lithic artifacts were categorized according to morphological similarities. Collected artifacts will be curated at the Museum of Western Colorado in Grand Junction and written records will be submitted to the Bureau of Land Management.

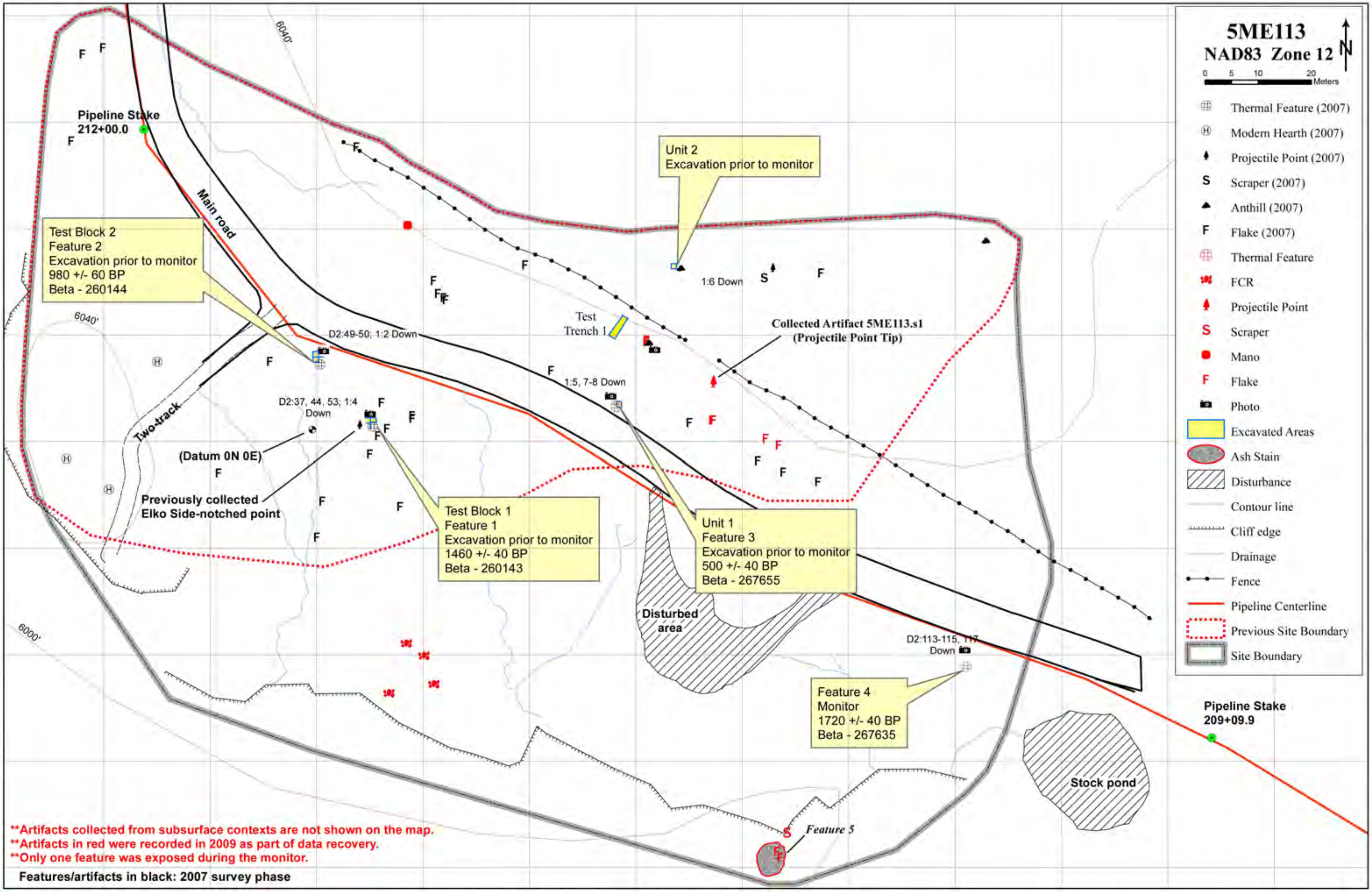



**Figure 5.3-1.** Site map showing surface artifacts and features recorded during the 2007 and 2009 investigations. It also shows locations of the 2x2m test blocks, 1x1m test units, and the test trench.

### 5.3.3 Results of Fieldwork

Upon reinspection of the site's surface, a small number of artifacts were newly recorded within a larger area measuring 223m NW-SE by 110m NE-SW. The following artifacts were documented: nine flakes, one scraper, one non-diagnostic projectile point tip which was collected (5ME113.s1), and one mano (Appendix C). The majority of the artifacts were recovered from the upper 4cm of unconsolidated clay loam comprising Level 1. A small number of artifacts were recovered from Levels 2 (4cm to 20cm) and 3 (20cm to 35cm). No cultural material was recovered below 35cm. In addition, four concentrations of fire-cracked rock were recorded, but were not designated feature numbers as they were determined to be the byproducts of secondary deposition.

#### 5.3.3.1 Features

The two small fire-cracked rock concentrations previously recorded in 2007 were relocated and designated Features 1 and 2. These were excavated at Test Blocks 1 and 2. Two new thermal features were also recorded on the surface (Features 3 and 5). Feature 3 was recorded along the north shoulder of the road and was excavated at Test Unit 1. Feature 5 was discovered near the southeastern periphery of the site. The feature was not excavated as it lies well outside the area of impact.

Feature 1, a semi-circular concentration of ash and fire-cracked rock, measured approximately 60cm in diameter and 10 to 15cm in depth. Feature fill was collected and carbon was sent for analysis. The feature yielded a date of 1460 ± 40 BP (conventional), Cal AD 540 to 650 (Beta #260143) placing occupation during Reed and Metcalf's (1999: 6) Formative Era Aspen Tradition.

Feature 2, a concentration of diffuse ash, charcoal and fire-cracked rock, measured roughly 50cm in diameter. Excavation revealed an irregular-shaped basin of shallow depth about 10cm deep. Feature fill was collected and carbon was sent for analysis. The feature yielded a date of 980 ± 60 BP (conventional), Cal AD 970 to 1200 (Beta #260144) placing occupation during Reed and Metcalf's (1999: 6) Formative Era Aspen Tradition.

Feature 3 consisted of faint ash and a few pieces of fire-cracked rock concentrated in a 50cm diameter area. Excavation revealed the edges of a semi-circular, shallow basin about 20cm deep. The feature produced a radiocarbon date of 500 ± 40 BP (conventional), Cal AD 1400 to 1450 (Beta #267655) placing occupation during Reed and Metcalf's (1999: 6) Protohistoric Era.

Feature 5 consisted of a 6m by 4.5m concentration of ash. Two flakes were noted to be spatially associated with the feature. The feature was not tested or excavated as it lies well outside of the area of impact.

5.3.3.2 Artifacts

One non-diagnostic projectile point tip fragment (5ME113.s1) was collected from the surface. The artifact is composed of a white translucent chert. Excavation resulted in the collection of thirty-two flakes and three pieces of possible worked glass. Of the flakes, 24 were recovered from Unit 2. Eight flakes were recovered from Test Block 1 and Test Block 2 yielded the three pieces of possible worked glass. No artifacts were recovered from Unit 1. The following section briefly describes the artifacts that were collected during the investigations at site 5ME113. A complete list of the collected artifacts is provided in Appendix C.

Debitage analysis involved assigning flakes to a reduction stage sequence (early, middle, and late) based on the amount of dorsal cortex. In this study, complete dorsal cortical coverage was considered indicative of early stage manufacture, whereas some cortical coverage was considered indicative of middle stage manufacture. Late stage manufacture was evinced by the absence of dorsal cortex. Primary (complete cortex), secondary (some cortex), and tertiary (no cortex) were utilized herein to describe cortical coverage.

All thirty-two of the flakes (100 percent of the assemblage) were classified as tertiary and were described as small or micro in size. The predominance of tertiary flakes is noteworthy as it indicates emphasis towards final-stage tool manufacture as well as retouch and re-sharpening. This type of activity is frequently noted on prehistoric camp sites in the vicinity of hearths, habitation structures, and other indications of domestic camp activities.

Only two lithic material classes were identified during the analysis. These included opalitic chert and porcellanite. Opalitic chert was the most prevalent lithic material class, constituting 84 percent of the total assemblage.

5.3.3.3 Stratigraphy

A single backhoe trench was excavated to further investigate the vertical distribution of cultural deposits as well as the character of the natural deposits at the site. While no cultural components or levels were observed in relation to features observed during monitor or data recovery phases, several diffuse lenses of charcoal were observed.

Subsurface stratigraphy consists of five Holocene and one Pleistocene age deposits, a lense of decomposing bedrock, and mudstones of the Debeque Formation (Figure 5.3-2). The deepest and oldest unit is a mixed deposit of Pleistocene and early Holocene origin and is extremely calcified (Qp/Qhe). A lense of charcoal found in association with calcium carbonate stringers disseminates upwards. The contact of this deposit with the overlying deposit (Qhm) is marked by disseminated charcoal overlain by a pebble unconformity. The Qhm unit is heavily calcified and also contains a diffuse lense of charcoal in the deeper part of the unit. The top of the unit, and the contact of the overlying loess (Qhl) is defined by a relic of an A2 Horizon. Three Qhl deposits define the last 2800 years of deposition.

Calcification lessens upward from moderate to none as structure decreases from massive to platy to crumb.  The four excavated features were found in association with the second and third (middle and upper) Qhl deposits.

Inspection of the stratigraphic column (within the backhoe trench) confirmed the shallow character of the cultural deposits. Two hearth features (Features 3 and 4) were discovered during the monitor and were salvaged.

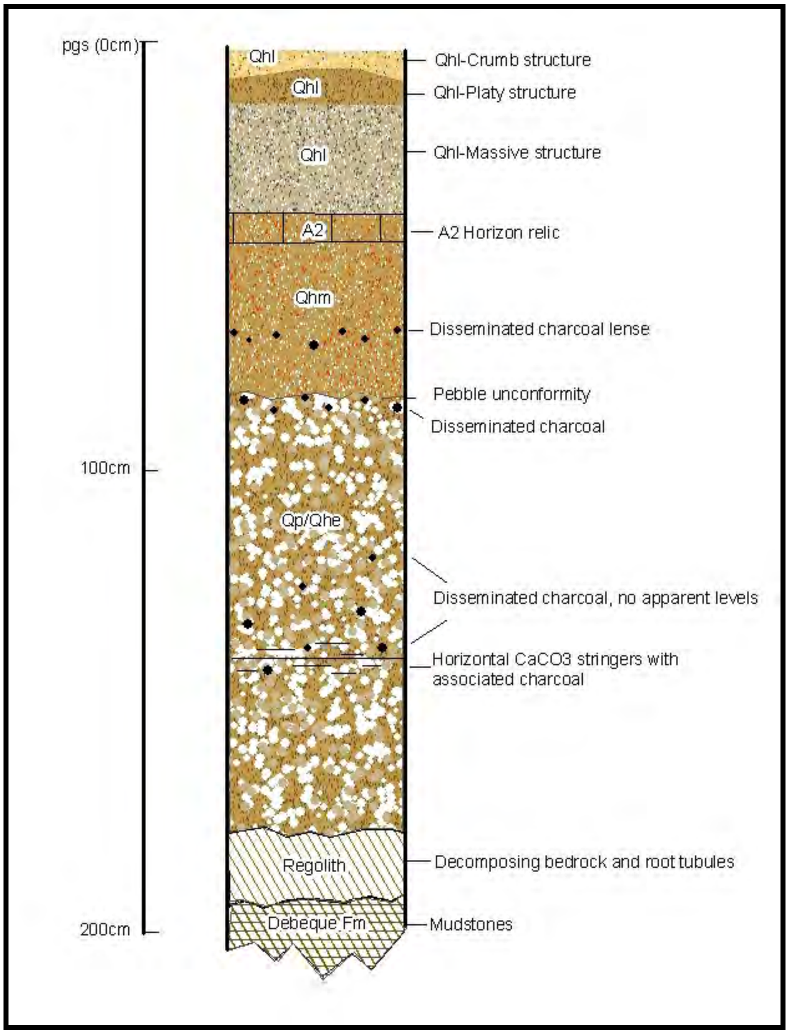



**Figure 5.3-2.** Profile of the east wall of the test trench.

### 5.3.4 Evaluation of Research

Archaeological investigations were conducted at the site to evaluate its potential to yield additional significant information.  These investigations were guided by a framework of research questions drawn from the known cultural background.  Research domains that were to be addressed by the investigations include cultural affiliation and age, site function, seasonality, subsistence, social organization, technology, extra-regional relationships, site formation and transformation, and paleo-environment.  The results of the excavations have met many of these objectives.

5.3.4.1 Cultural Affiliation

Cultural affiliation and age were largely derived from the radiometric analysis of carbon samples collected from Features 1-3.  Two of the features (Features 1 and 2) yielded conventional radiocarbon ages falling within Reed and Metcalf's (1999:6) Aspen Tradition of the Formative Era.  Analysis of carbon collected from Feature 3 yielded a conventional age falling within Reed and Metcalf's (ibid) Protohistoric Era.  Results of the radiometric analysis are presented in Table 5.3-1, and the Beta Analytic forms are presented in Appendix A.

**Table 5.3-1.** Results of radiometric analysis form 5GF4337.

| Sample Data | Measured Radiocarbon Age | 13/C/12C Ratio | Conventional Radiocarbon Age | Calibrated AD/BC Date |
|---|---|---|---|---|
| 5ME113.F3 Beta-267655 | 410 ± 40 BP | -19.2 o/oo | 500 ± 40 BP | AD 1400 to 1450 |
| 5ME113.F2 Beta-260144 | 930 ± 60 BP | -22.2 o/oo | 980 ± 60 BP | AD 970 to 1200 |
| 5ME113.F1 Beta-260143 | 1400 ± 40 BP | -21.1 o/oo | 1460 ± 40 BP | AD 540 to 650 |
| 5ME113.F4 Beta-267635 | 1650 ± 40 BP | -20.9 o/oo | 1720 ± 40 BP | AD 230 to 410 |

The comparative analysis of a single diagnostic artifact suggested a substantially older site occupation. The artifact, an Elko corner-notched point (Plate 5.3.2) collected in 2007, indicates the potential of Early to Middle Archaic cultural occupation, although the artifact could have been curated and utilized by a later group.

5.3.4.2 Site Function and Technology

The archaeological remains at the site indicate activities centered around tool manufacture and/or maintenance, hunting, and faunal and floral processing. Tool manufacture and/or maintenance were perhaps the most important activities conducted at the site – lithic debris constitutes 93 percent of the overall lithic assemblage (surface artifacts recorded in 2007 and artifacts recorded prior to data recovery were included in this calculation). The latter three activities (i.e., hunting and faunal and floral processing) are represented by a limited number of projectile points, scrapers, and manos.

Interestingly, the lack of cores, tested cobbles and angular shatter at the site suggests lithic procurement was not important. It is possible that the inhabitants “tooled-up” at other quarries or procurement areas before moving into the camp, or perhaps metal trade goods– points and knives– were already in use. The latter scenario is quite plausible considering the presence of possible worked glass on the site.

### 5.3.5 Evaluation and Management Recommendation

Based on overall site size, the results of the test excavations, and the monitoring data, the previous NRHP recommendation of officially eligible (2008) remains unchanged. Because of the potential for additional subsurface cultural materials, the site remains qualified for listing under Criterion D. Accordingly, protection and preservation is recommended.

## 5.4 5ME974

### 5.4.1 Introduction

Site **5ME974** is located on BLM land under the jurisdiction of the Grand Junction Field Office. It is a multi-component site containing the remains of a prehistoric open architectural site and several historic artifacts. The site is located on a ridge southeast of Shire Gulch at an elevation of 6080 feet. The vegetation consists of pinyon and juniper forest with sagebrush and little other understory (Plate 5.4-1). Soils are light brown loess.

**Plate 5.4.1.** Google Earth image of site location (black outline); view northwest.

The site was originally recorded as an isolated find in April of 1979. In 2007, Grand River Institute revisited the site and recorded a significant amount of new cultural material. Chipped and ground stone artifacts, three deflated concentrations of fire-cracked rock, 15 pieces of glass, and one .32-40 caliber ammunition cartridge were recorded within an area measuring 65m E-W by 20m N-S (Conner and Davenport 2007). Three of the artifacts were collected. These included the following: one biface fragment, one eclectic double side-notched projectile point with a basal notch, and the .32-40 caliber ammunition cartridge which was manufactured for the Winchester Model 94 lever-action rifle (Plate 5.4-2). This particular cartridge was in production from 1895 until ca. 1904 (Phil Born, personal communication 2007). The lithics and the historic artifacts were interpreted to represent multiple occupations by Late Prehistoric and Historic aboriginal groups.

### 5.4.2 Field and Analytic Methodology

**Plate 5.4-2.** Artifacts collected during 2007 survey from 5ME974: (from left) 5ME974.s2, biface; 5ME974.s1, eclectic side-notched point; and, 5ME974.s3, .32-40 ca. Cartridge. The image represents actual sizes of artifacts.

Data recovery was conducted over a period of several days beginning in late April of 2009 and terminating in early July of 2009. Prior to excavation, the surface of the site was reinspected and previously recorded cultural material was relocated. In addition, new cultural material was identified and three distinct areas of cultural activity (Loci 1-3) were delineated according to natural and man-made breaks in the topography. The newly recorded artifacts and features were accurately mapped utilizing a BLM-certified Trimble Geo XT GPS unit within an area measuring roughly 160m NW-SE by 105m NE-SW(Figure 5.4-1).

Test excavations were conducted at all cultural loci (Loci 1-3). At Locus 1, three test blocks (Test Blocks 1-3), comprised of multiple 1m² units were established in areas demonstrating potential for subsurface cultural fill. A total of two 1m² units were excavated at Test Blocks 1 and 2, but only the southwest-quarter of the southern unit and the northeast-quarter of the northern unit were excavated at Test Block 3. Additional areas of interest within Locus 1 were further investigated through the excavation of Test Trench 4.

Test Block 4 was established north of the road within Locus 2. A total of two 1m² units and a 10.0m by 0.5m trench (Test Trenches 1-3) were excavated. Subsurface investigations were also conducted at the JM Test Unit. South of the road, within Locus 3, data recovery efforts were focused on the excavation of three 1m² test units (Test Units 1-3). Figure 5.4-2 shows the excavated areas at the site.

Hand tools (i.e., whisk brooms, trowels, hoes, picks, shovels, etc.) were used to excavate the 1m² units. Excavation proceeded in arbitrary 5cm and 10cm levels or by natural stratigraphic layers. The excavated deposits were sifted through either an 1/8-inch mesh screen or a series of soil sieves with mesh sizes of 4.75mm, 2mm, and 1mm. Contact with bedrock and/or sterile deposits dictated the final depth of excavation at each test area. Sterile sediment, that without cultural manifestations, was established by the excavation of an additional 10cm to 50cm of soil below the deepest indication of cultural remains.

Artifacts found *in situ* were documented on plan and/or profile maps, recorded by depth below present ground surface (bpgs), and bagged as individual field specimens. Artifacts and ancillary specimens recovered from screened sediment were bagged in aggregate and labeled by unit and level. Features or potential features were mapped as well as cross-sectioned, profiled, and described.

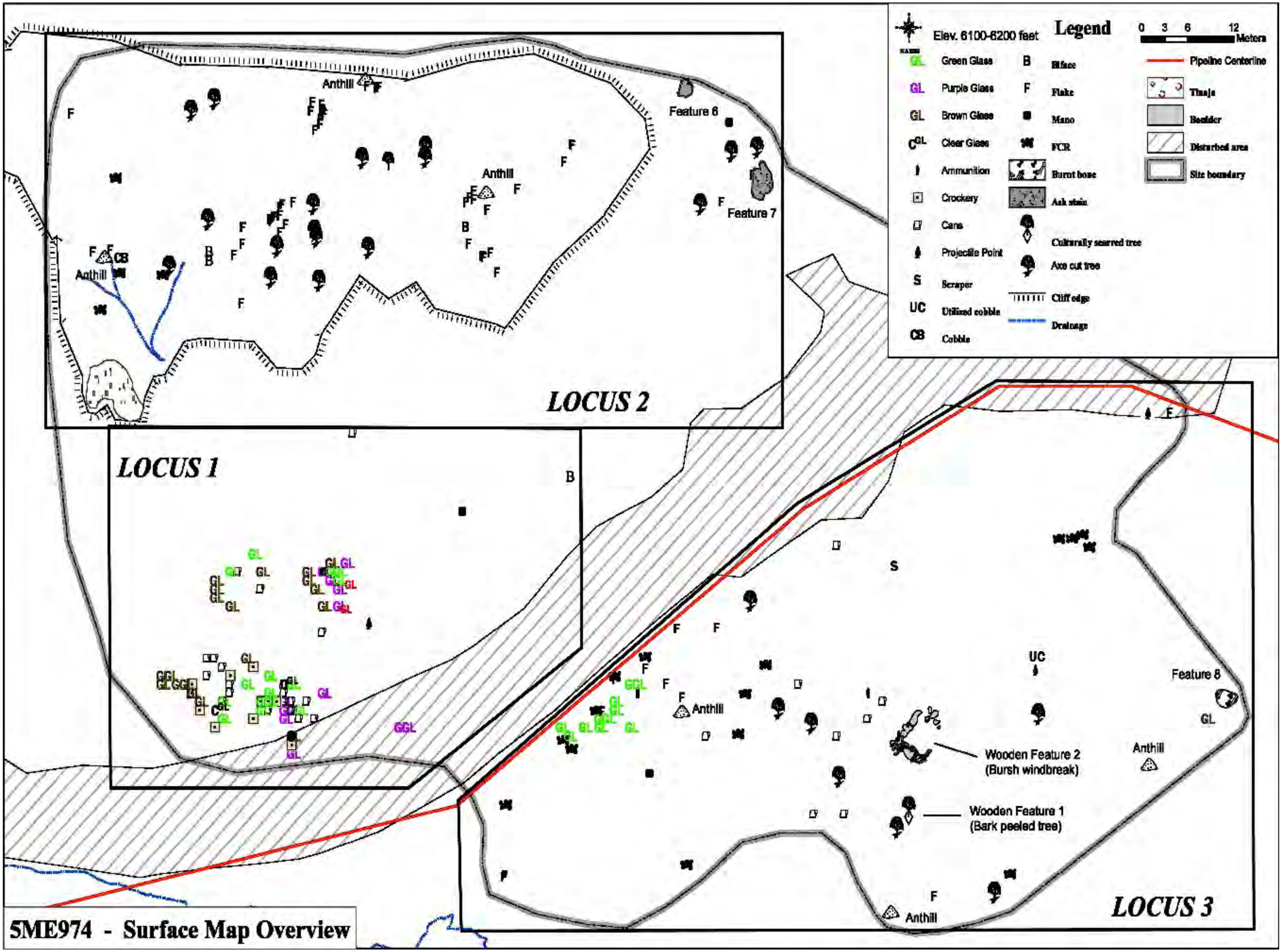



**Figure 5.4-1.** Map showing the newly recorded cultural material at 5ME974. Symbols may represent more than one artifact.

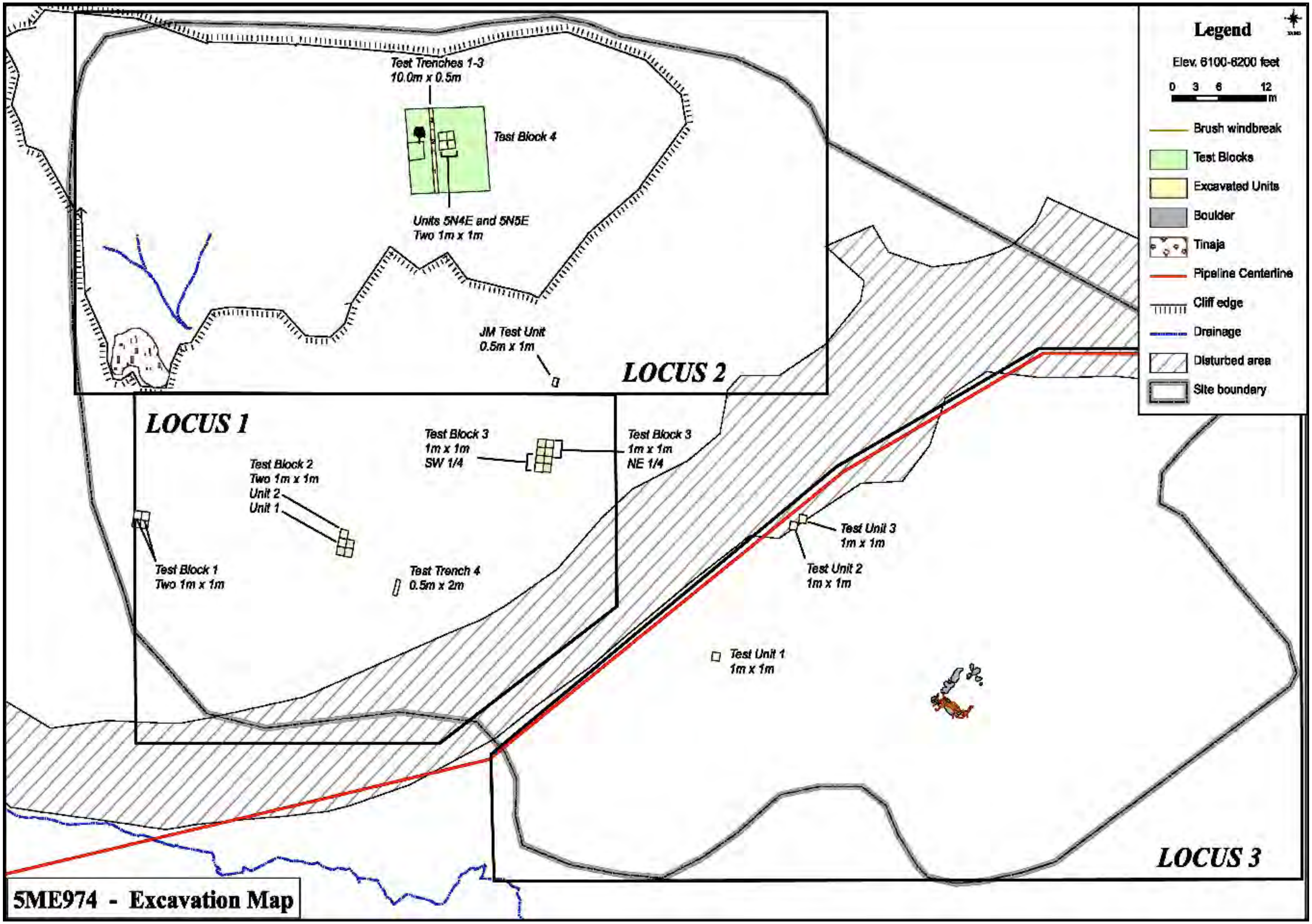



**Figure 5.4-2.** Map showing the areas excavated at 5ME974.

Feature fill removed during cross-section was bagged in aluminum foil and placed in a plastic bag for reinforcement. If charcoal was present, it was bagged separately. Special precaution was taken to prevent contamination of collected charcoal; charcoal was handled with tweezers and trowels.

Stratigraphic profiles were drawn to document relationships between the natural and cultural deposits at the site. Sediment grain-size, sorting, edaphic factors (soil structure and caliche), and the geochemical character of the deposits were crucial to discerning these relationships.

Following excavation, all recovered cultural material was transported back to Grand River Institute for processing and analysis. Lithic artifacts were categorized according to morphological similarities. Resultant classes include artifacts subsumed under chipped (i.e., flake debris and tools) and ground stone. The collected artifacts will be curated at the Museum of Western Colorado in Grand Junction and written records will be on file with the BLM.

### 5.4.3 Results of Fieldwork

#### 5.4.3.1 Locus 1 (Original Site Area)

Locus 1, the original site area, lies north of the road (Figure 5.4-3). A small elevated bench to the north forms the topographic break between it and Locus 2. In general, the terrain slopes to the south and is dissected by several small rills which have added to its undulating character and exposed relatively thick sections of deposits.

*Artifacts*

Several new artifacts were observed on the surface at Locus 1. The majority of these artifacts were contained in a trash dump near the north shoulder of the road. Artifacts associated with the dump include crockery (n=14), cans and miscellaneous pieces of metal (n=23), and various hues of glass including purple (n=37), green (n=26), amber (n=37) and clear (n=3). In addition, a few lithic artifacts (two manos, one biface, and one Agate Basin projectile point) were recorded. Of the 144 recorded surface artifacts, 142 were collected (Appendix C).

A total of 60 flakes, two cores, one biface, nine mano fragments, two metate fragments, three pieces of burned bone, one charred seed, three shards of amber glass, and one shard of purple glass were recovered during the excavation of Test Blocks 1-3 and Test Trench 4. Of the flakes, the majority were recovered from Test Block 2. Test Block 3 yielded the highest percentage of ground stone and Test Trench 4 yielded the least amount of cultural material.

All of the cultural material was recovered from shallow contexts (0-20cm bpgs). The majority of the cultural material was confined within the upper 10cm of deposition.

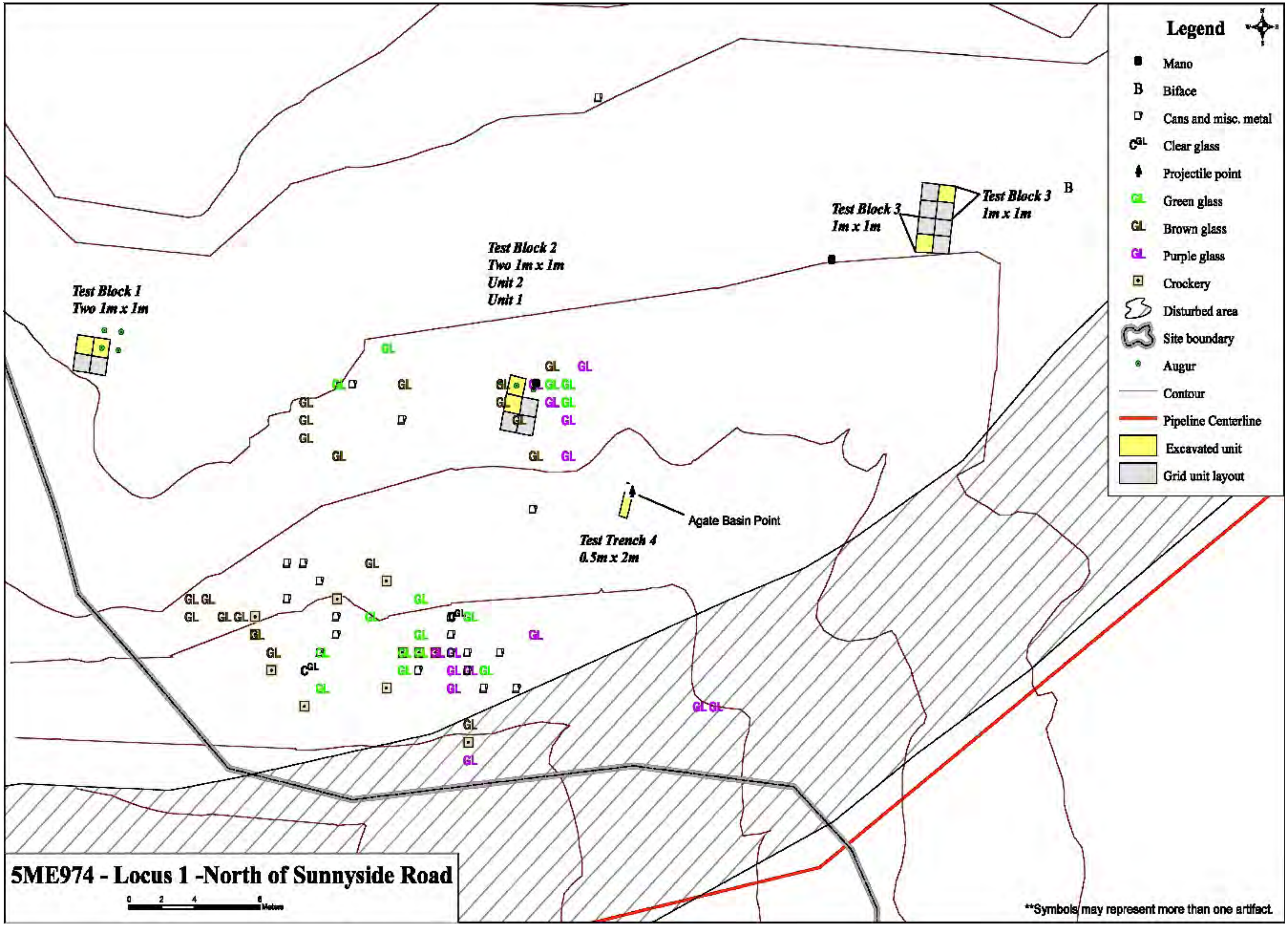



**Figure 5.4-3.** Locus 1 map showing newly recorded cultural material. All the artifacts except for two manos were collected.

*Features*

Upon reinspection of the site's surface within Locus 1, surface indications of two possible thermal features were newly identified. These features were investigated through the excavation of Test Blocks 1 and 2. The features are referred to herein as Features 4 and 5 and are described
below.

Feature 4 consisted of a 40cm diameter concentration of ash and fire-cracked rock. Excavation revealed a shallow basin approximately 10cm in depth. One charred juniper berry and five pieces of burned bone were recovered from the feature. Charcoal was collected, but the quantity proved to be insufficient for dating.

Feature 5 was determined to be the remnants of a severely deflated hearth. Remnants include diffuse ash and a few pieces of fire-cracked rock. The bottom of the basin was defined by a circular area, 20cm in diameter, of hard-packed ash. Charcoal was collected, but the quantity proved to be insufficient for dating.

5.4.3.2 Locus 2

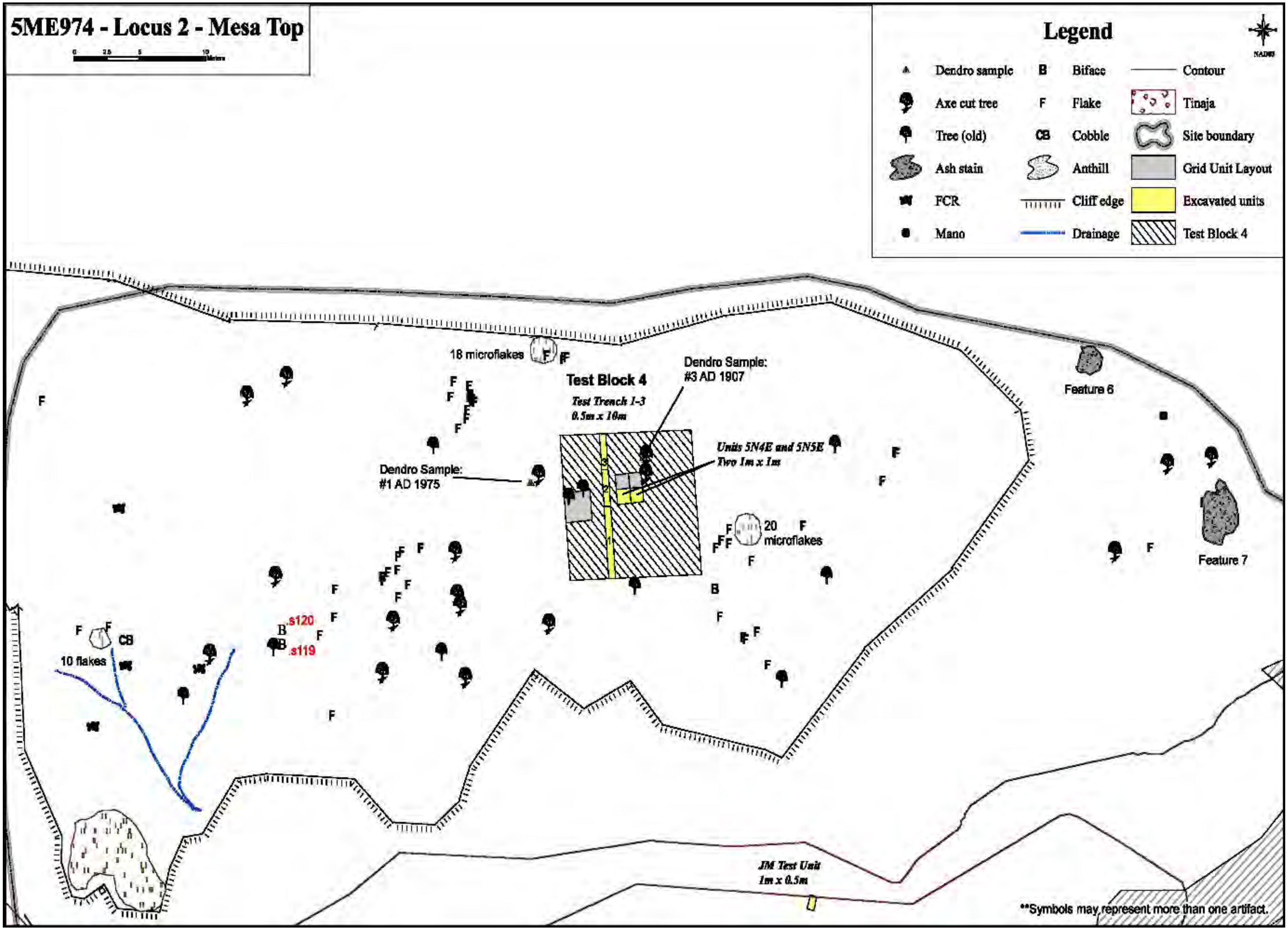
Locus 2 lies north of Locus 1 on a small elevated bench (Figure 5.4-4). The terrain is relatively flat and bedrock is exposed in a few areas.

*Artifacts*

Locus 2 contained the highest concentration of surficial lithic artifacts. At least 98 flakes were observed on the surface. Forty-eight of these were recorded as microflakes and were observed in anthills. In addition to lithic debris, three biface fragments, one unmodified cobble, one mano and four fire-cracked rock concentrations were recorded. Of the artifacts recorded, only two were collected (Appendix C).

Excavation of two units (4E5N and 5E5N) and the 10.0m by 0.5m test trench (Test Trenches 1-3) within Test Block 4 yielded 186 flakes, two biface fragments, and six pieces of burned bone. The majority of the flakes were recovered from the excavation of the 10.0m by 0.5m test trench, particularly the southern part of the trench or Test Trench 1. Test Trench 1 also contained the six pieces of burned bone and one biface fragment. No artifacts were recovered from the JM Test Unit.

Again, all of the excavated artifacts were recovered from shallow contexts (0-25cm bpgs). The majority of the cultural material was confined within the upper 10cm of deposition. At Test Block 4, excavation terminated upon contact with bedrock which was encountered at an approximate depth of 37cm below present ground surface. At the JM Test Unit, excavation terminated at a depth of 45cm below present ground surface.




**5.4-4.** Locus 2 map showing cultural material recorded on the surface at 5ME974. Two bifaces (5ME974.s119 and .s120) were collected.

*Features*

At Locus 2, surface indications of two possible thermal features were newly identified. These features were designated Features 6 and 7. The features were not tested nor excavated, and feature fill was not collected. The features are briefly described below.

<u>Feature 6</u> consisted of a 2m diameter ash concentration. Artifacts were not observed in direct association with this feature; however, one mano fragment was recorded 6m southeast.

<u>Feature 7</u>, located approximately 12m southeast of Feature 6, also consisted of a large ash stain measuring 4.5m by 2.5m. A small flake was located along the northwestern edge of the feature. In addition, two axe-cut trees were recorded within 5m of this cultural manifestation.

No other features, except for 17 axe-cut trees, were recorded on the surface at Locus 2. Lichen was observed on several of the axe-cut surfaces. Five dendrochronological samples (.s1 and .s3 through .s6) were collected, but only two provided dates. Dendrochronological sample .s1 retained bark and a complete terminal ring indicating that the timber was cut after the end of that year's growing season, but prior to the initiation of the next growing season. The sample yielded a date of AD 1975. Dendrochronological sample .s3 retained bark, but an incomplete terminal ring indicating that it was cut during the growing season. The sample yielded a date of AD 1907.

One thermal feature was discovered during excavation. The feature, designated Feature 9, was exposed at an approximate depth of 14cm below present ground surface at the JM Test Unit. The feature, excavated into a mixed deposit of sheet flow alluvium, colluvium and loess, measured roughly 25cm in diameter and 18cm in depth. Ash, charcoal and fire-cracked rock were observed. A charcoal sample was collected, but the quantity proved insufficient for dating.

<u>5.4.3.3 Locus 3</u>

Locus 3 lies southeast of Locus 1 and south of the road (Figure 5.4-5). It occupies a gentle, southwest sloping terrace. Bedrock outcrops are exposed in a few areas.

*Artifacts*

A large variety of artifacts were observed on the surface at Locus 3. These included 15 flakes, one utilized cobble, one scraper, two non-diagnostic projectile point fragments, one mano, nine cans or fragments thereof, four gun cartridges, one spent bullet, 15 shards of light green glass, and one shard of amber glass. Flake scars were observed on two of the glass shards. In addition, 15 clusters of fire-cracked rock were recorded, but were not designated feature numbers as they were determined to be the byproducts of secondary deposition. Of the artifacts recorded on the surface, a total of 30 were collected (Appendix C).

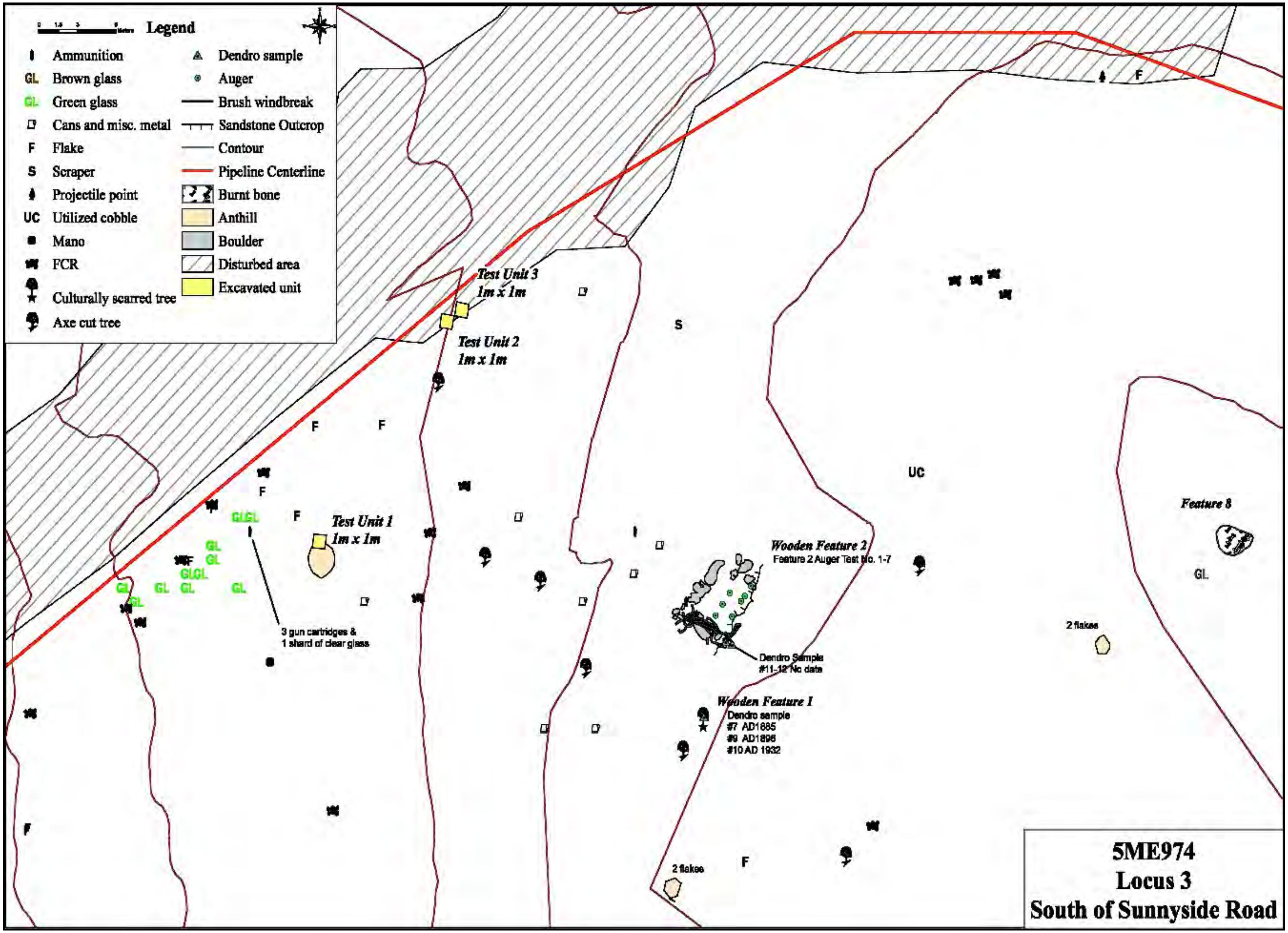



**Figure 5.4-5.** Locus 3 map showing cultural material recorded on the surface at 5ME974. A total of 30 artifacts were collected.

Excavation of Test Units 1 through 3 led to the recovery of additional cultural material. A total of seven flakes, one fragmented cobble, one shard of amber glass, one shard of worked light green glass, and four shards of clear glass were recovered. Notably, all of the glass shards were recovered from Test Units 2 and 3.

The excavated cultural material was recovered from shallow contexts (0-15cm bpgs). The majority of the artifacts were confined within the upper 5cm of deposits. Excavation ceased at 15cm below present ground surface.

*Features*

One bark peeled pinyon tree (Wooden Feature 1; Plate 5.4-3), one brush windbreak (Wooden Feature 2; Plate 5.4-3), and one concentration of burned bone (Feature 8) were observed at Locus 3. No other features, except for seven axe-cut trees, were observed.

**Plate 5.4-3.** View of bark peeled pinyon tree (Wooden Feature 1). Lowest scar consists of two peels (WFe1-A and WFe1-B). Upper peel is WFe1-C.

Wooden Feature 1 was described as consisting of three bark peels (WFe1-A through WFe1-C) and an axe-cut root. The three bark peels were observed on the west-northwest side of the trunk and are briefly described below.

> Bark peel WFe1-A is the largest and lowest of the bark peels. It measured 31cm wide at the base and 20cm wide at the top where it blends into WFe1-B. WFe1-A is 36cm tall where it meshes with WFe1-B. Approximately 10 to 12 cut marks, which have created a shelf (10cm deep), are present at the base. Two dendrochronological samples (.s7 and .s9) were collected from this scar. The samples were missing exterior rings and lacked terminal ring attributes such as bark. They yielded dates of AD 1885 and 1896.
>
> Bark peel WFe1-B was created by additional horizontal axe-cuts at the upper end of WFe1-A. It measured 20cm wide at the base and tapered to a point at the top. A length

of 35cm was reported for the peel. The sample taken for dating lacked exterior rings and terminal ring attributes. It yielded a date of AD 1932.

Bark peel WFe1-C was also created by horizontal and vertical axe-cuts (7 to 10 scars) which resulted in a 7cm-deep shelf. Unlike WFe1-A and WFe1-B, an area of peeled bark was observed below the shelf at WFe1-C. This area extended approximately 6.5cm below the scar. The entire scar measured 29.5cm tall by 17cm wide at the shelf.

Wooden Feature 2 is a linear brush alignment that was constructed to block southwest winds from a potential camp area (Figure 5.4-6). A total of 17 main branches were observed in the construction of the feature. Several smaller twigs and branches were either intentionally incorporated into the construction, or have since fallen and/or broken off of the main branches. Two dendrochronological samples were collected from the feature, but the results were inconclusive.

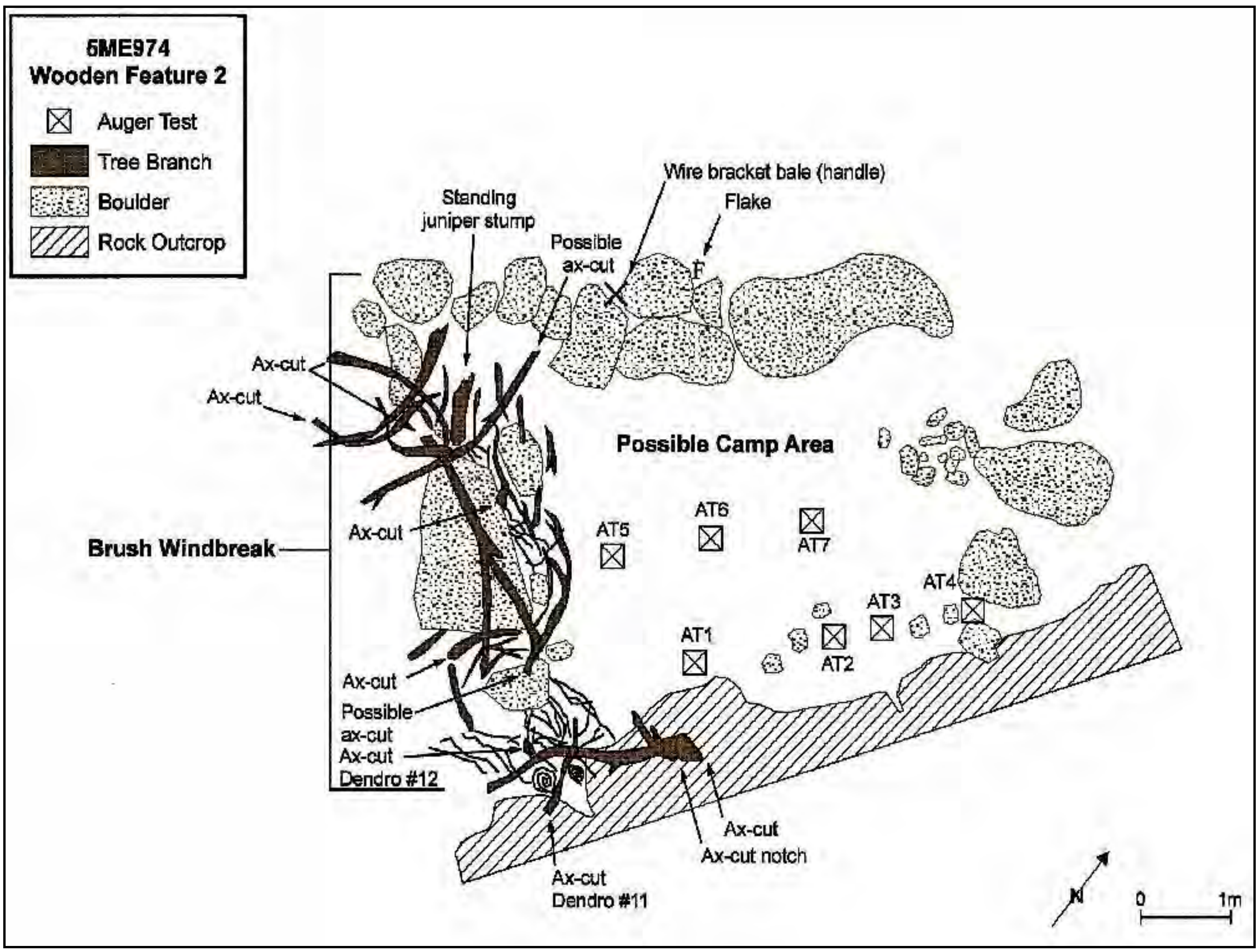



**Figure 5.4-6.** Plan view of brush windbreak (Wooden Feature 2).

Feature 8, the burned bone concentration, measured roughly 3.5m by 2m. No artifacts were observed within the confines of this feature; however, one piece of worked glass was observed roughly 1.5m southwest. The feature was not tested nor excavated.

5.4.3.4 Stratigraphy

Profiles were drawn for several trenches and units at Loci 1, 2 and 3 to further investigate the vertical distribution of cultural deposits and the character of the natural deposits at the site. Generally, the site's subsurface stratigraphy consists of mixed Qp/Qhe deposits, Qhm, three late Holocene (Qhl) loess deposits and a modern sheet deposit, all of which are underlain by the Debeque Formation. An exception to this generalized stratigraphy is observed in a profile of the JM Test Unit located beneath a boulder overhang.

Subsurface stratigraphy observed at Loci 1 and 3 consists of two shallow loess deposits separated by granule unconformities and a sheet deposit of modern origin (Figures 5.4-7 and 5.4-8). The lower loess is extremely calcified while the upper loess is weak to moderately calcified. The modern sheet deposit is only centimeters thick and discontinuous, and it is intermixed with sheet flow alluvium at Locus 3. Road construction has left a thick, surface deposit of spoil dirt in some places at Locus 1. Feature 4 at Locus 1 was found in relation to the youngest loess deposit, just centimeters below the modern sheet deposit.

At Locus 2, soil depth is varied due to the underlying Debeque Formation, which is nearly visible on the surface in some places (Figures 5.4-9 and 5.4-10). The lowermost unit is undifferentiated between a mix of the two oldest, extremely calcified deposits noted in the area (Qp/Qhe) and a moderate to highly calcified middle loess deposit (Qhm). An alluvial rill was noted within this unit in Test Unit 5N4E. Three loess deposits of varied sorting and granule content overlie the latter deposit. The first or oldest loess deposit is a poorly sorted mix of coarse silt to granule size grains. This deposit is fairly uniform in deposition except where bedrock is nearest to the surface, and only the youngest deposit is present. Several cobble sized oxidized rocks were observed within this unit in Test Unit 5N4E. The second loess is a moderately sorted mix of coarse sand and silt with only some granule size grains. This loess pinches out in places where the first and third loess deposits unconformably overlie one-another. The third and youngest loess is well sorted, medium-sized sand to coarse silt with few granule size grains. This deposit is uniformly present throughout the area.

An aberration was observed in the stratigraphy at the JM Test Unit which was excavated beneath a boulder overhang within Locus 2 (Figure 5.4-11). The dripline of the boulder was noted to be 48cm above present ground surface. The lowest stratigraphic unit (40cm bpgs) is a regolith of the Debeque Formation. A moderately sorted and calcified mixed deposit of sheet flow alluvium, colluvium and loess overlies the regolith and is approximately 20cm thick. A thin loess deposit overlies the mixed deposit which is overlain by a fine, uncalcified exfoliation deposit. The loess is slightly calcareous and is intermixed with disseminated charcoal from Feature 9 located beneath the overhang.

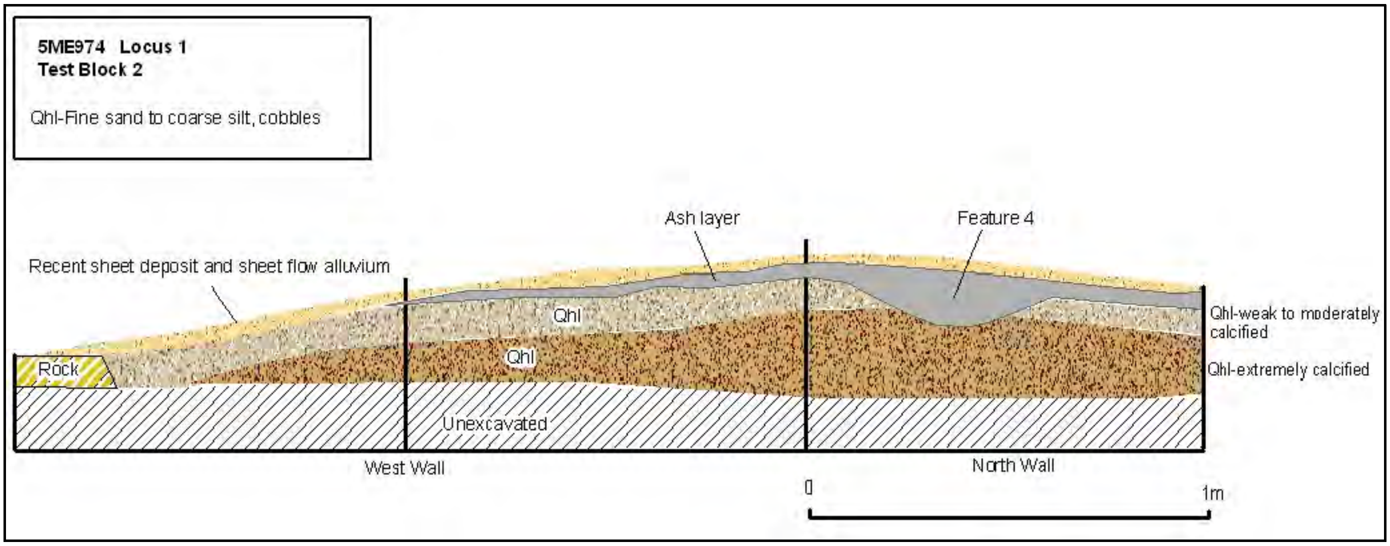



**Figure 5.4-7.** Profile of stratigraphy at Test Block 2 within Locus 1.

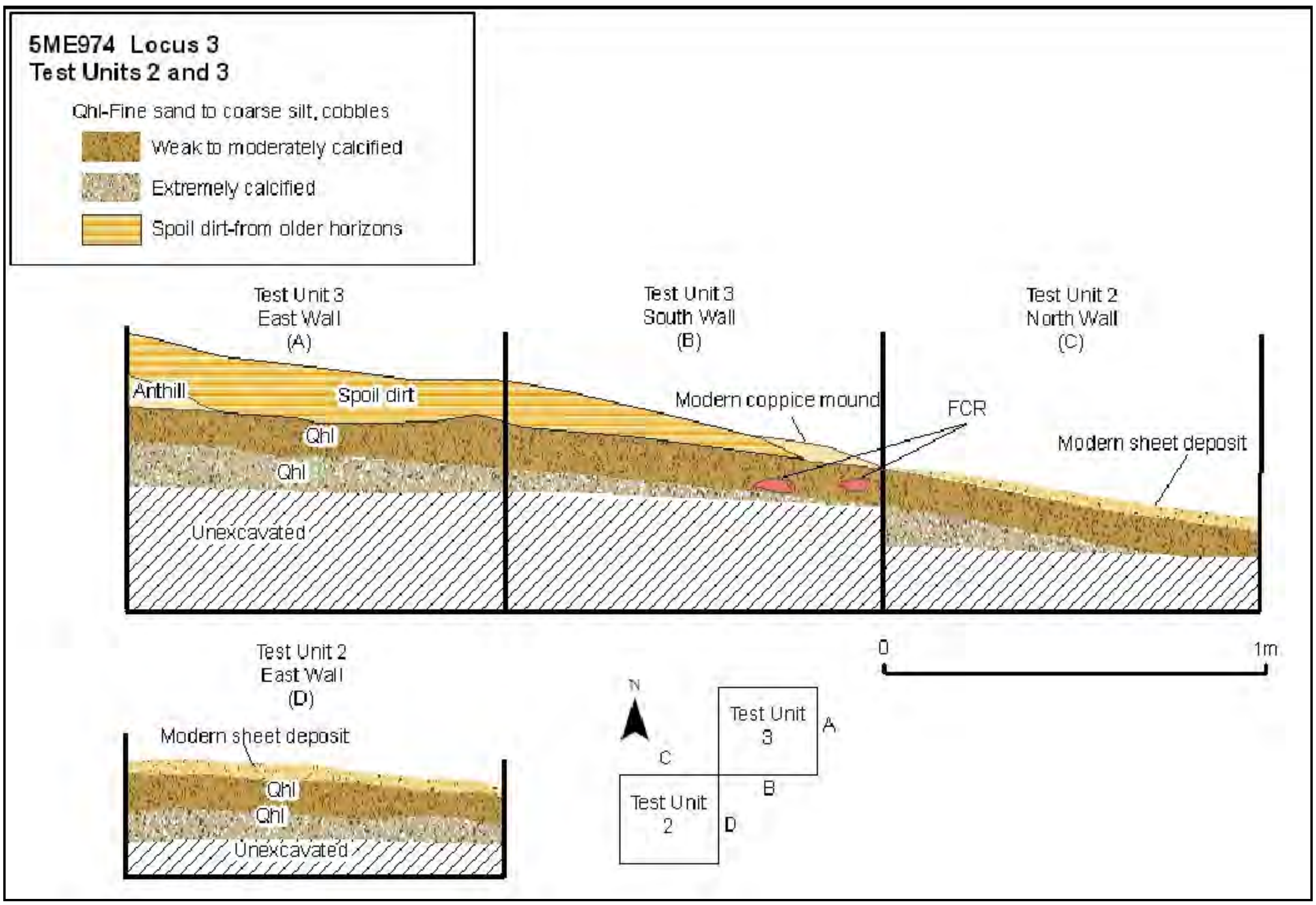



**Figure 5.4-8.** Profile of stratigraphy at Test Units 2 and 3 within Locus 3.

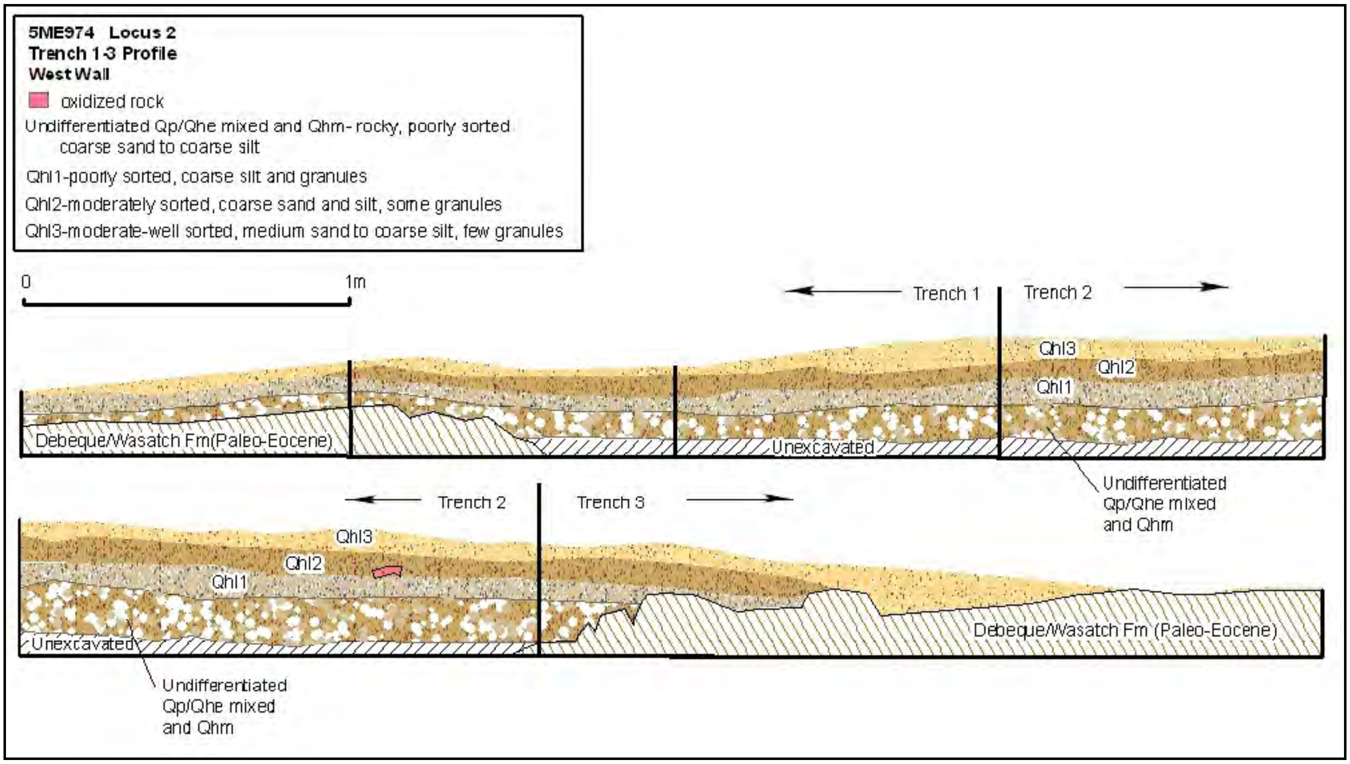



**Figure 5.4-9.** Profile of stratigraphy at Test Trenches 1 through 3 within Locus 2.

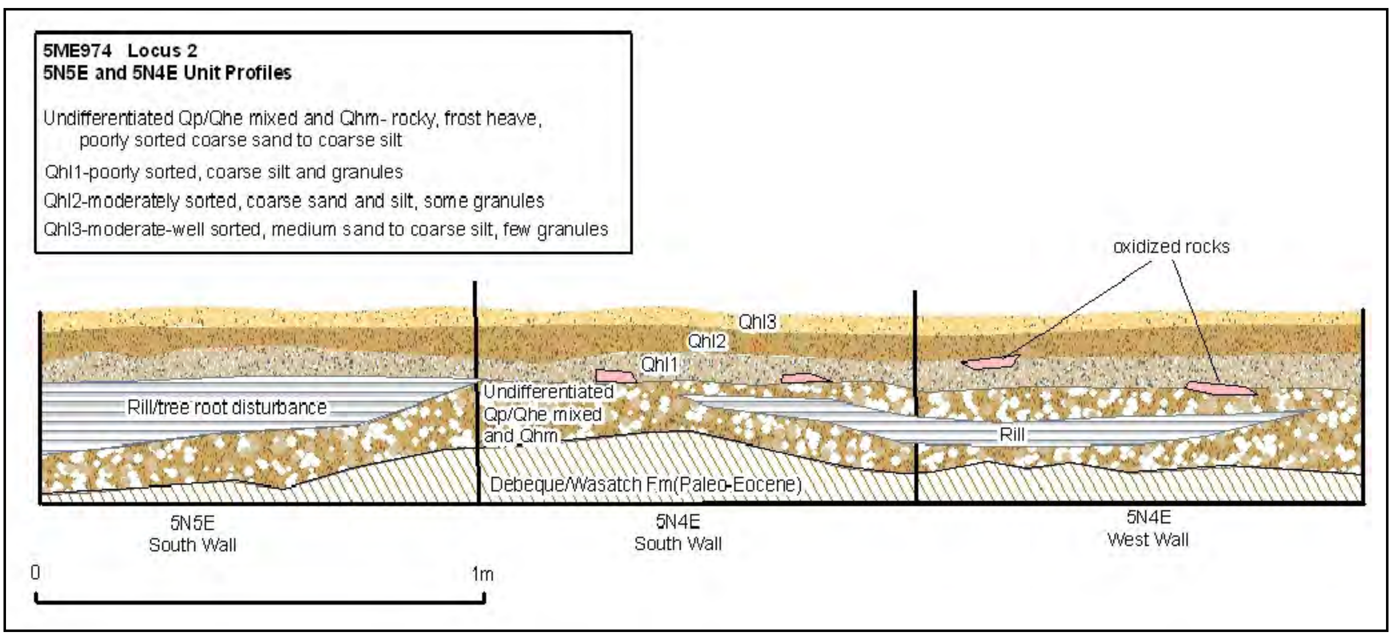



**Figure 5.4-10.** Profile of stratigraphy at Units 5N5E and 5N4E within Locus 2.

### 5.4.4 Discussion of Prehistoric Artifacts

Prehistoric artifacts comprise approximately 29 percent of the collected artifact assemblage. Sixty-eight field specimens–some of which represent more than one artifact– were recovered from surface and subsurface contexts. The artifacts are described under traditional categories such as chipped and ground stone as well as faunal remains.

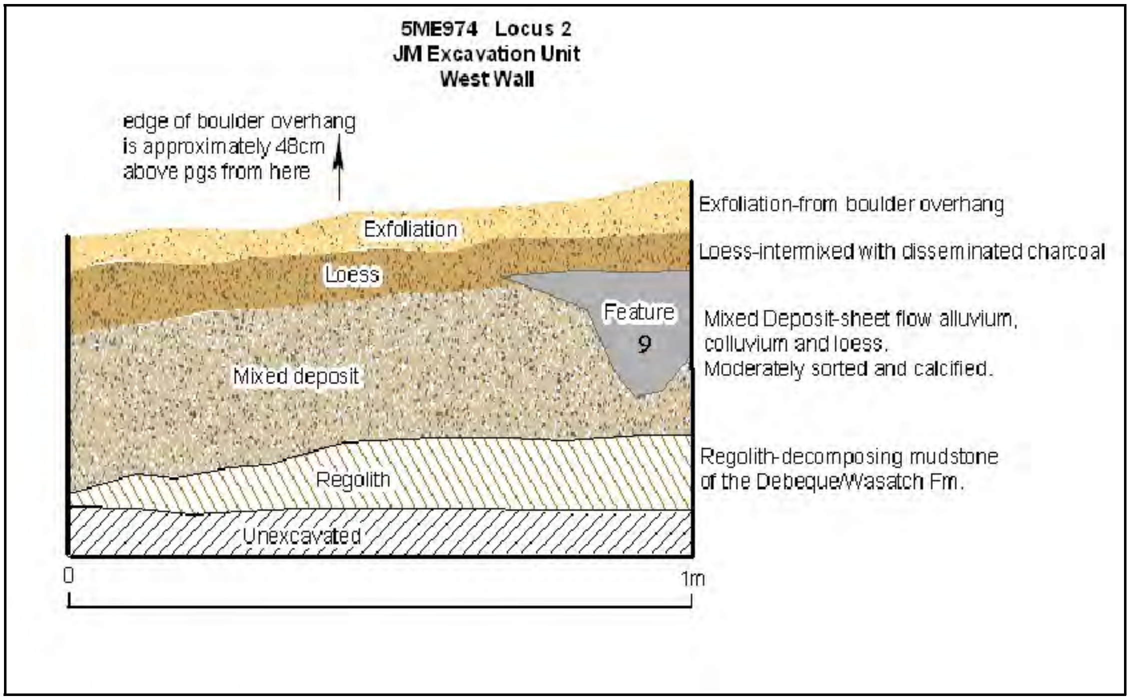



**Figure 5.4-11.** Profile of stratigraphy at the JM Test Unit within Locus 2.

<u>5.4.4.1 Chipped Stone</u>

Chipped stone comprises the largest percentage of the collected lithic assemblage. Notably, Locus 2 contained the most chipped stone artifacts. The artifacts were subsumed and described under the following categories: projectile points, bifacial tools, cores and lithic debitage.

*Projectile Points*

One projectile point (5ME974.s88; Plate 5.4-4), a Paleoindian projectile point tip and midsection of Green River Formation quartzite, was recovered from the surface at Test Trench 4. The artifact was found on the surface and is a possible Agate Basin point, dating roughly 10,000 to 10,500 years BP (Frison 1991:57). The proximal end of the point and one blade edge are missing. The remaining blade edge is straight and the flaking pattern is parallel oblique; however, marked dissimilarity in flaking


**Plate 5.4-4.** Artifact 5ME974.s88

is visible on the distal portion of the artifact. This abrupt change in flaking is indicative of retouch and, notably, Agate Basin points were often subject to such endeavors.

The retouch observed on the point most likely indicates curation by the site's Historic Ute occupants. Importantly, several Agate Basin points have been found on Historic Ute sites throughout western Colorado; these points were apparently being curated and used as knives (Conner et al. 2011). Most recently, Grand River Institute recovered an Agate Basin point at site 5RB7746 which contained a collapsed wickiup feature (Conner et al. 2013).

*Bifacial Tools*

Six chipped stone bifaces or fragments thereof were recovered. Three of these fragments were recovered from the surface. The remaining three tools were recovered during the excavation of Test Blocks 1 and 4. The artifacts were divided into two groups for descriptive purposes: 1) small, well-worked fragments and 2) small, crudely manufactured tools.

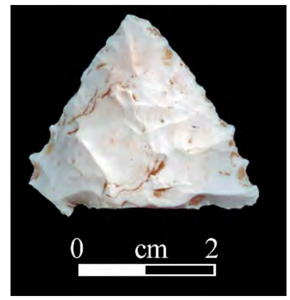


**Plate 5.4-5.** Artifact 5ME974.s120

Only one small, well-worked biface fragment (5ME974.s120; Plate 5.4-5) was identified. The artifact is characterized by a short, wide and relatively thick triangular blade. Traces of a haft element are present– the base is snapped at the neck and a portion of one shoulder is missing. The artifact's size, fine flaking and evidence of a haft element suggest use as a projectile point, particularly an Archaic dart point, or a hafted knife. In addition, the artifact is heavily patinated which also suggests an antiquity of at least 3000 years or older (Kornfeld 2010 and Jim Miller, personal communication 2010).

Of the five more crudely worked bifaces, three are mid-sections, one is a tip fragment, and one is the remnant of a blade edge. In general, the majority exhibit slightly convex blade edges and lenticular cross-sections. A pot-lid fracture is present on one of the specimens; the artifact may have been discarded into a fire or subjected to heat to improve the knapping quality of the lithic material. Another fragment exhibits wear in the form of crushed edges.

Lithic material classes identified for the specimens above include chert, quartzite and basalt. Chert is the predominant lithic material. Basalt is the least prevalent. The majority of the lithic material is of local origin, supplied by the Madison and Morrison Formations. Only one possible exotic is present– the material is a quartzite similar to that found in the Brule Formation in western South Dakota.

*Cores*

Two cores were recovered during the excavation of Test Blocks 1 and 2. One core is bifacially reduced– the most efficient and common means of core reduction– and the other is unifacially reduced. Both specimens are of a fossiliferous chert from the Debeque Formation.

*Debitage*

Debitage analysis involved assigning flakes to a reduction stage sequence (early, middle, and late) based on the amount of dorsal cortex. In this study, complete dorsal cortical coverage was considered indicative of early stage manufacture, whereas some cortical coverage was considered indicative of middle stage manufacture. Late stage manufacture was evinced by the absence of dorsal cortex. Primary (complete cortex), secondary (some cortex), and tertiary (no cortex) were utilized herein to describe cortical coverage. Results of the analysis are summarized in Table 5.4-1.

Chert was the most prominent lithic material by a vast majority (91 percent), with quartzite, porcellanite and basalt accounting for the remaining nine percent. The majority of the flakes were tertiary (94%) and micro in size (60%), indicating a prevalence of late stage tool manufacture and maintenance.

5.4.4.2 Ground Stone

All of the ground stone collected from the site was recovered from subsurface investigations conducted at Locus 1– the locus that contained a low to moderate density of prehistoric artifacts and a high density of historic artifacts. These artifacts are discussed according to the categories (i.e., manos and metates) in which they were analyzed.

*Manos*

A total of nine basalt mano fragments were collected, but were too fragmented to be sorted by type. Most retain two ground surfaces. These artifacts exhibit sharp, jagged breaks which are reminiscent of hackley fractures. Such fractures occur as a result of deliberate heating, possibly suggesting secondary use as boiling stones.

*Metates*

Only two sandstone metate fragments were recovered. Again, these were too fragmented to be sorted by type. The artifacts have flat to slightly concave grinding surfaces. Pecking is apparent on the larger of the two specimens.

5.4.4.3 Faunal Remains

Several faunal specimens were recovered during the excavation of Test Blocks 2 and 4. The remains are burned long bone fragments and range in size from small to very small. The fragmentary nature of the bone may indicate intensive processing efforts such as the pulverization of bone for marrow. Unfortunately, species identification was not possible, but it is likely that the specimens are from small game.

**Table 5.4-1.** Debitage summary from test excavation at 5ME974.

| | Site Zone / Attribute | T.B.1 | T.B.2 | T.B.3 | T.B.4 | T.T.4 | TOTALS |
|---|---|---|---|---|---|---|---|
| **Flake Material** | Chert | 5 | 30 | 18 | 73 | 5 | **131 (91%)** |
| | Chalcedony | 0 | 0 | 0 | 0 | 0 | **0** |
| | Quartzite | 0 | 0 | 0 | 3 | 1 | **4 (3%)** |
| | Porcellanite (Siltstone) | 2 | 0 | 1 | 1 | 0 | **4 (3%)** |
| | Basalt | 2 | 1 | 0 | 1 | 0 | **4 (3%)** |
| | Quartz Crystal | 0 | 0 | 0 | 0 | 0 | **0** |
| | Obsidian | 0 | 0 | 0 | 0 | 0 | **0** |
| | **TOTALS** | **9** | **31** | **19** | **78** | **6** | **143** |
| **Flake Characteristics** | Size | 2 micro<br>3 small<br>2 medium<br>1 large<br>1 v large | 14 micro<br>14 small<br>1 medium<br>2 large<br>0 v large | 5 micro<br>11 small<br>2 medium<br>1 large<br>0 v large | 65 micro<br>9 small<br>3 medium<br>1 large<br>0 v large | 0 micro<br>1 small<br>4 medium<br>1 large<br>0 v large | **86 micro (60%)<br>38 small (27%)<br>12 medium (8%)<br>6 large (4%)<br>1 v large (1%)** |
| | Cortex | 6 tertiary<br>2 secondary<br>1 primary | 31 tertiary<br>0 secondary<br>0 primary | 17 tertiary<br>2 secondary<br>0 primary | 76 tertiary<br>2 secondary<br>0 primary | 5 tertiary<br>1 secondary<br>0 primary | **135 tertiary (94%)<br>7 secondary (5%)<br>1 primary (1%)** |
| | Angular Shatter | 0 | 0 | 2 | 0 | 0 | **2** |
| | Retouched Edges | 1 | 0 | 1 | 0 | 1 | **3** |
| | Biface Thinning Flakes | 0 | 2 | 0 | 1 | 1 | **4** |
| | **TOTALS** | **9 (6%)** | **31 (22%)** | **19 (13%)** | **78 (55%)** | **6 (4%)** | **143** |

### 5.4.5 Discussion of Historic Artifacts

The majority of the artifacts collected from the site are historic in nature and were recovered from the surface as well as the subsurface. One hundred and sixty-eight field specimens– some of which represent more than one artifact– represent roughly 71 percent of the total collected artifact assemblage at the site. The artifacts are described below under the following categories: glass, crockery, cans and miscellaneous metal, and ammunition.

*Glass*

Glass shards comprise the largest percentage of the recorded and collected historic artifacts. One hundred and forty-eight shards of glass were recovered. The majority are body fragments, but there are a few diagnostic finish and base remnants (Plate 5.4-6).

Two finish remnants, a brandy or wine finish and a crown finish, were recovered (5ME974.s4a & 5ME974.s92). The brandy or wine finish was a common style on many bottles manufactured in the 1860s and the 1920s. It was also a common finish on all shapes and sizes of liquor bottles and flasks and many types of medicinal bottles. The crown finish was also a popular finish on liquor bottles as well as soda and mineral water bottles. This finish can be found on mouth-blown bottles dating from the mid- 1890s to 1915 and machine-made bottles beginning around 1910 or 1912 to the present (Lindsey 2014).

Two base remnants (5ME974.s4b and 5ME974.s73) with makers marks were recovered, but only one was identifiable. The mark “SB &...” on specimen 5ME974.s4 stands for Streator Bottle and Glass Company which was operational between 1881 and 1905.


**Plate 5.4-6.** Diagnostic bottle pieces: a) 5ME974.s92a, crown finish; b) 5ME974.s92b, bottle base with maker’s mark; and c) 5ME974.s4, brandy or wine finish.

The glass artifact assemblage contains a variety of different hues. Shades of green and amber were determined to be the most prevalent. Purple glass was observed to be the next most prevalent and clear glass was determined to be the least common.

Of the various hues, purple glass (i.e., manganese dioxide decolorized glass) is one of the best historic temporal markers on archaeological sites. Manganese dioxide was used as a de-colorizer to offset the iron impurities present in virtually all sands used during manufacture. This colorless glass invariably turns purple upon long term exposure to sunlight, and it may date as early as the 1820s or as late as the 1930s (Lindsey 2014). The vast majority of purple glass was manufactured between about 1890 and 1920 (ibid).

Importantly, flake scars are present on three glass shards indicating curation by the site's Historic Ute occupants (Plate 5.4-7). These artifacts are described below.

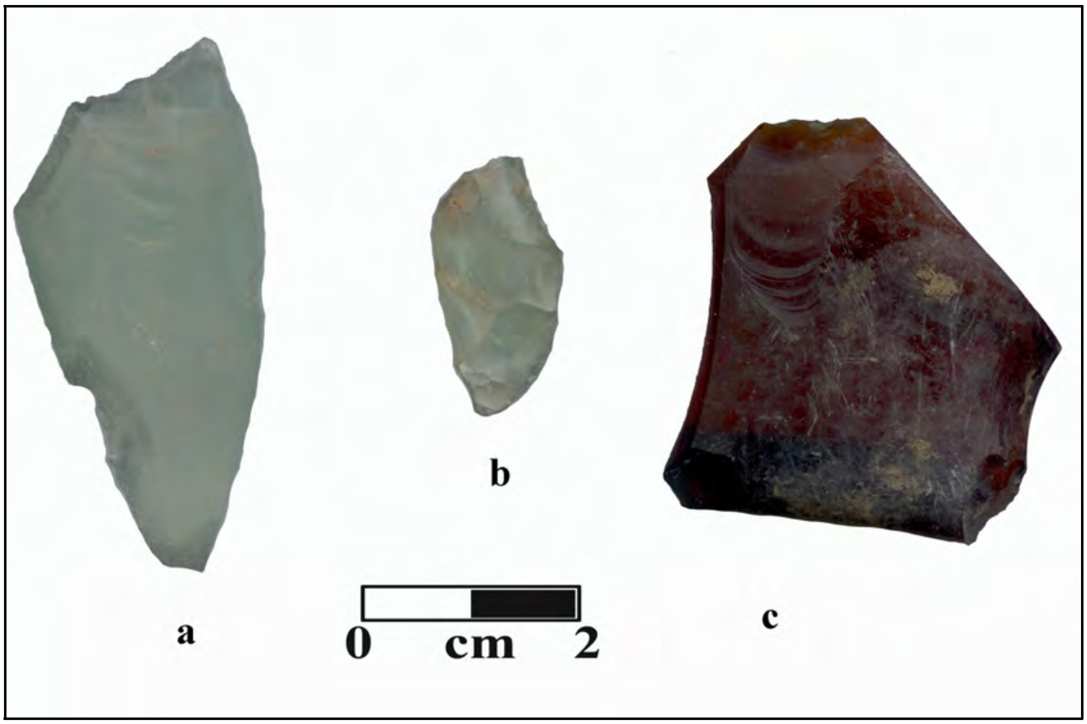



**Plate 5.4-7.** Worked glass from 5ME974: a) 5ME974.fs1, b) 5ME974.s9, and c) 5ME974.s7.

5ME974.fs1 (Test Unit 2 at Locus 3) is a triangular shard of light green glass from the body of a bottle. The artifact is flaked on all three edges. The proximal end exhibits a convex worked edge suggesting utility as a scraping or cutting tool. In addition, two small lunate notches along the lateral edges may indicate that the artifact was hafted. These notches could also indicate use as a spokeshave.

5ME974.s9 (Surface at Locus 3) is a very small shard of light green glass. It is a fragment of a larger tool. Only one side is worked. The convex worked edge suggests application as a scraper.

5ME974.s7 (Surface at Locus 3) is a shard of amber glass from the base and body of a bottle. The proximal and lateral edges of the artifact are worked. Based on the convexity of the proximal worked edge, the artifact was likely used as a scraper.

*Crockery*

Fourteen pieces of brown glazed stoneware were collected from the surface of the site. Dating was not feasible as none of the pieces retained makers marks.

*Cans and Miscellaneous Metal*

Cans and miscellaneous metal comprise a smaller percentage of the collected historic artifact assemblage. Twenty-seven cans or fragments thereof, three pieces of metal with punched holes, two connected pieces of wire, and one wire nail were recorded. All of these artifacts were recovered from the surface, the majority were collected from the trash dump within Locus 1.

Of the cans, only seven were intact enough to be grouped by can lid type or closure. Three basic types were identified: hole-in-cap, hole-in-top and key-wind. The different can lids and closures helped to identify when the can was manufactured and, in some cases, what it may have contained.

Four hole-in-cap cans were identified and were grouped into early and late categories. The two smaller hole-in-cap cans probably date to the early 1880s based on the amount of solder applied to the filler cap, pin hole vent and the side seam. The remaining cans have smaller filler holes with minimal amounts of solder and a barely noticeable pin hole vent. In general, hole-in-cap cans indicate a date of occupation prior to 1914 (Horn 2005:13). The absence of sanitary cans suggests a even earlier occupation of pre-1904 (ibid).

The three hole-in-top cans have stamped lids mimicking filler holes. These cans also have pin hole vents sealed with solder. Small and slender punctures on the two smaller can lids indicate liquid contents. The third can was opened with a knife and based on the size of the opening, the can probably contained solids. Hole-in-top cans were introduced in 1900 by Carnation for evaporated milk and were still in use until the early 1990s (Horn 2005:14).

One potted meat can with a key-wind opening was observed and collected. Key-winds were introduced in 1866 (Horn 2005:14). In 1895, the closure mechanism was refined, incorporating a scored strip, for use on meat cans (ibid). This was the mechanism that was used on coffee and sardine cans until very recently.

*Ammunition*

Four cartridges were recovered from the site. Three of these are centerfire cartridges and the fourth is a rimfire cartridge. The centerfire cartridges were identified as .32 Winchester Special cartridges (Plate 5.4-8). These cartridges, created in 1901 for use in the Winchester Model 94 lever-action rifle, were modeled after the .30-30 Winchester cartridge of 1895 (Wikipedia 2013). The rimfire cartridge has an impressed "P" headstamp indicating that it was manufactured by the Peters Cartridge Company which was operational from 1887 to 1934 (IMACS 1990) (Plate 5.4-8).

In addition to the cartridges found at the site, one spent bullet was also recovered. The diameter of the bullet is the same as that used in the .32 Winchester Special and the .32-40 Winchester cartridges.

**Plate 5.4-8.** Collected cartridges:
a) 5ME974.s132 and
b) 5ME974.s126.

## 5.4.6 Evaluation of Research

Archaeological investigations were conducted at the site to evaluate its potential to yield additional significant information. These investigations were guided by a framework of research questions drawn from the known cultural background. Research domains that were to be addressed by the investigations include cultural affiliation and age, site function, seasonality, subsistence, social organization, technology, extra-regional relationships, site formation and transformation, and the paleo-environment. The excavation results have met many of these objectives.

### 5.4.6.1 Cultural Affiliation

Temporal diagnostics and dendrochronological analysis were used to determine cultural affiliation. These indicate at least three distinct occupations: an unknown, possibly early Historic Ute occupation; a late Historic Ute occupation; and a Euro-American occupation.

*Unknown: Possibly Early Historic Ute*

Evidence of a lifeway prior to the introduction of Euro-American trade goods is evinced by the abundance of lithics at the site; however, temporal diagnostics are limited. During the present recording, only one temporal diagnostic artifact, an Agate Basin point, was observed. The artifact exhibits marked dissimilarity in flaking along its distal end. This abrupt change in flaking is indicative of retouch, and it is believed that the artifact was curated by the site's early Historic Ute occupants. Importantly, several Agate Basin points have been found on Historic Ute sites throughout western Colorado; these points were apparently being reworked and used as knives (Conner et al. 2011).

*Late Historic Ute*

The presence of Euro-American trade goods and tree-ring dated wooden features indicate a late Historic Ute occupation. The diagnostic trade goods identified include three shards of worked glass. Undoubtedly, additional artifacts at the site may represent a late Historic Ute occupation; however, the evidence is inconclusive.

A post-1860 date is speculated for this component, considering the presence of light green and amber worked glass and the fact that trade goods were not commonplace until about 1828. The site may have been occupied as early as the 1820s– an early reference for the manufacture of purple glass (Lindsey 2014). Importantly though, the largest volume of purple glass was manufactured between 1890 to 1920 (ibid).

Tree-ring data also suggests a late 1800s occupation. Two dates of 1885 and 1896 were obtained from a sample collected from the lowest scar (WFe1-A) of a bark peeled pinyon tree (Wooden Feature 1). A third date of 1907 was obtained from a sample collected from an axed stump. A "post-removal" date (i.e., after 1881) is not surprising considering that some Utes remained in western Colorado for decades after their expulsion from Colorado.

*Euro-American*

Importantly, many of the historic artifacts at the site have relative dates that are compatible with the late Historic Ute component; however, it is impossible to differentiate between these and the other early artifacts at the site indicative of a Euro-American occupation.

The most substantial evidence for a Euro-American occupation is the presence of older artifacts such as screw-top lids and the refined, key-wind potted meat can. In addition, a tree-ring sample secured from the second scar (WFe1-B) of the bark peeled tree (Wooden Feature 1) yielded a date of 1932.

5.4.6.2 Site Function

Lithics at the site indicate activities centered around late stage tool manufacture and/or maintenance, hunting, and faunal and floral processing. Tool manufacture and/or maintenance were perhaps the most important activities conducted at the site. The latter three activities (i.e., hunting and faunal and floral processing) are represented by a limited number of bifacial and unifacial tools as well as ground stone and faunal remains.

Interestingly, the lack of cores, tested cobbles and angular shatter at the site suggests lithic procurement was not important. It is possible that the inhabitants "tooled-up" at other quarries or procurement areas before moving into the camp. It is also possible that metal trade goods– points and knives– were already in use considering the presence of other trade goods on the site.

The Euro-American component was likely a short term camp, possibly utilized during hunting activities.

### 5.4.7 Evaluation and Management Recommendation

This site was considered officially eligible in 2008 for inclusion on the NRHP by the State Historic Preservation Officer. It was largely avoided by the construction due to narrowing of the corridor to that of the disturbance of the existing county road. Importantly, the data recovery efforts yielded significant new cultural information and identified areas such as that south of Sunnyside Road where soils are deep and may contain additional subsurface cultural materials. Thereby, increasing the expected potential for additional intact buried cultural deposits substantiating the NRHP evaluation under Criterion D. Accordingly, protection and preservation is recommended.

## 5.5 Site 5ME16097

### 5.5.1 Introduction

Site 5ME16097 was originally recorded in 2007 by Grand River Institute (Conner and Davenport 2007) as part of a Class III cultural resource inventory for the proposed Collbran Pipeline Project for Encana Oil and Gas (USA), Inc. The following is the description presented in that report (ibid):

> Site 5ME16097 is a small prehistoric open camp...in an area measuring roughly 30m northwest to southeast by a maximum of 10m northeast to southwest...a collection of lithic debris and two features. Feature 1 is a rock filled hearth that measures about 1m in diameter and contains 10+ pieces of basalt rock, ashy soil and small bits of charcoal. At the opposite end is a small concentration of twelve fire-reddened river cobbles and a few heat fractured cobble chunks. This was designated Feature 2 and may represent the location of a possible sweat lodge. Eleven flakes make up the total lithic artifact count and these are dispersed between the two features.

The site is on a low, northwest-southeast trending ridge at an elevation of 5700 feet (Plate 5.5-1). [redacted] he site occurs within the Upper Sonoran zone. Within a 10 km radius, the local vegetation communities include the Riparian, Transitional, and Montane Zones.

[redacted]

**Plate 5.5-1.** View northeast of 5ME16097. Site is located to the right of the road in the open sage flat and tree-covered ridge beyond (from left through the center portion of the photo).

### 5.5.2 Field and Analytic Methodology

Base mapping of the entirety of the site fine-tuned the site boundary, relocated previously reported artifacts and cultural features, and recorded new ones. Four excavation loci were designated: Feature 1, the Sherd Locus, Feature 2, and Feature 3. Plate 5.5-2 shows the relationship of the Sherd Locus and Feature 2 Locus to the datum, and a detailed map of the site is provided as Figure 5.5-1, which shows the location of surface artifacts, cultural and topographic features, and excavation units. The locations of these surface manifestations were mapped using a Trimble GeoXT GPS unit in conjunction with a USGS quadrangle map. Selected artifacts were collected from the surface of the site during mapping procedures and recorded as individual field specimens (FSs).

**Plate 5.5-2.** View south-southeast of 5ME16097. The middle arrow is near datum, figure in white (lower arrow) is at the Shard Locus, and the top arrow indicates the location of the Feature 2 Locus. Note an apparent old 2-track road extending through left side of photo.

A permanent datum point was established on the ridge top near the center of the site. Utilizing a Brunton pocket transit and metric tapes, a metric grid system oriented to true north was constructed off the datum to establish the excavation units. True north was established using a declination of 12° west of magnetic north. Individual 1m² excavation grids are referenced in the notes and report according to the grid coordinates of their southwest corner. The datum point was plotted on the map with the Trimble GPS unit, and marked with a metal pin and aluminum write-on tag. Additional mapping points were established throughout the site that were also marked with metal pins. Several of these pins, including selected ones immediately adjacent to the various excavation locales, were left in place for future orientation in the field if necessary (Figure 5.5-1).

As established by the goals and orientation of the research design, the placement of excavation units was based upon surface indications of potential subsurface cultural fill, including a concentration of apparent fire-cracked rock, a cluster of oxidized river cobbles, and two upright stone slabs. One unit (25N11W, the Stratigraphic Test Unit) was placed immediately off site to the north to investigate the nature and relationship of the buried aeolian sediments that formed on the leeward side of the ridge top. Accordingly, four excavation loci were established at the surface indications of cultural features: Features 1, 2, and 3 (Figure 5.5-1), and, in the case of the excavations at the "Sherd Locus," units were selected based upon the finding of a single ceramic sherd on the surface. No other systematic or randomizing strategy was employed in the selection of the excavation units.

With the exception of sub-sterile tests, excavations were carried out with trowels, brushes, and whisk brooms. These were conducted primarily within the shallow, upper, unconsolidated clay loam and silty clay that comprised Levels 1 and 2; the only deposits at the site that produced cultural remains. Additional testing into the underlying, more densely-packed silty clay and clay, was completed using trowels and, when necessary, shovels and picks. This layer was found to be culturally sterile.

Site testing was completed through the excavation of 50cm wide trenches, 1m x 1m grid unit provenances or fractions thereof, and when identified, by natural stratigraphic levels; specifically, Levels 1 and 2, the shallow, unconsolidated upper fill in which all cultural materials were located. Within the underlying sterile Level 3, both the "Upper" and "Lower" fill were excavated by arbitrary 10cm level, as measured from the grid unit corner stake highest in elevation, in order to maintain vertical control. Fill within distinct cultural features was to be excavated and recorded as separate units, however, due to the lack of such intact features, the only incidence of such was in the case of the charcoal sample from Feature 4, the deflated base of a thermal feature.

A total of 34 square meters and one trowel test was excavated (including the stratigraphic soil test, 25N11W, which is slightly outside of the site boundary). A series of soil auger tests were conducted within the Feature 2 Locus as excavation progressed, in search of thermal features, however none were found utilizing this technique. The grid square excavations ranged in depth from a minimum of 4cm to a maximum of 55cm.

In addition, a series of soil auger tests were conducted within Feature 2 Locus using a hand-operated soil auger with a 3-foot extension arm and a 3-inch diameter bucket. The resultant holes measured approximately 8.5cm in diameter. All auger holes were dug through the entire depth of Levels 1 and 2 and several centimeters into Level 3 in search of ash and/or charcoal to aid in the determination of the position of subsequent excavations. No indications of cultural ash or charcoal were found by this technique; however, excavation was completed at the location of all auger tests.

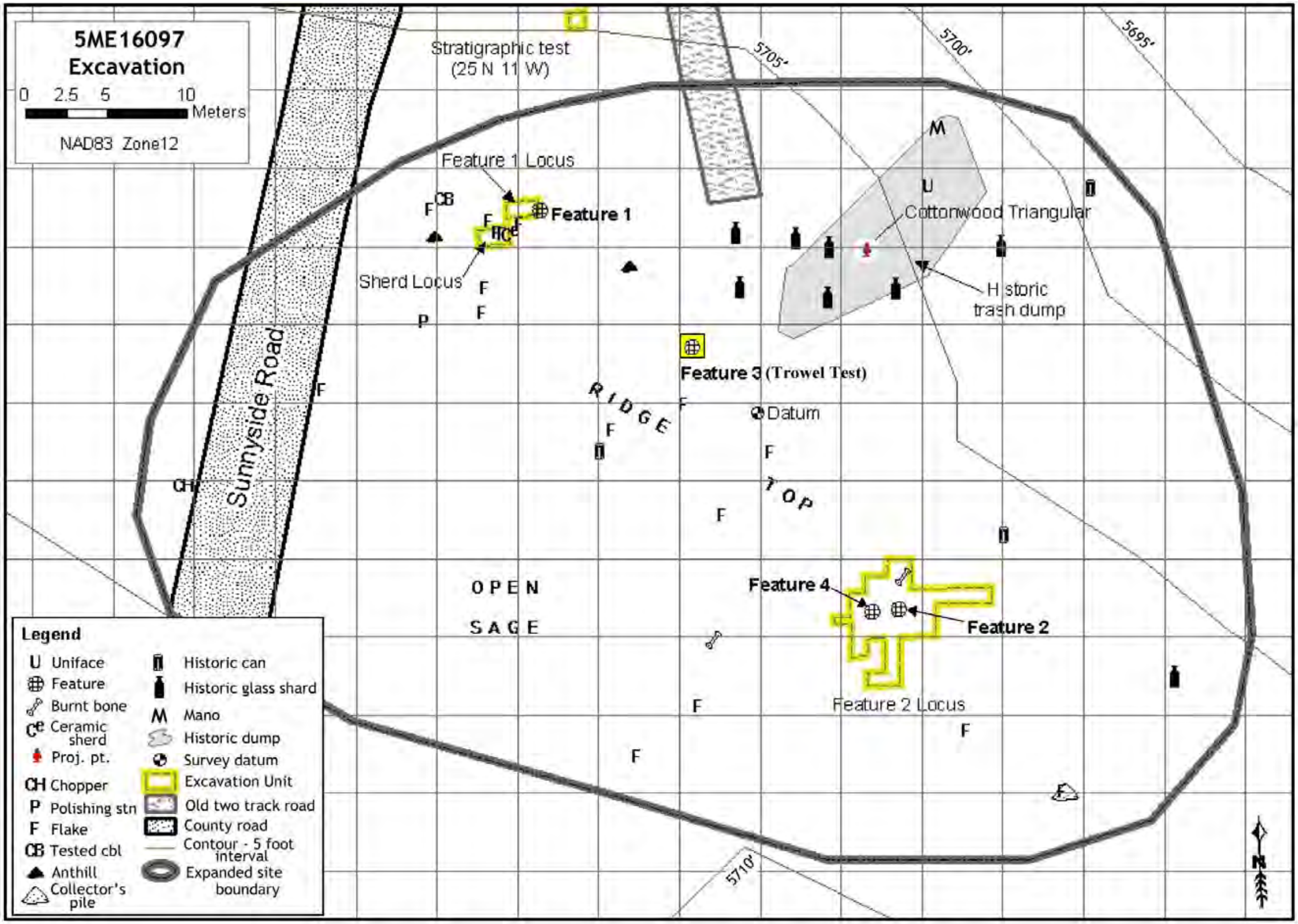



**Figure 5.5-1.** Site map of 5ME16097.

In the search for cultural materials, all excavated sediment was sifted through either 1/8" mesh hanging rocker screens or a series of soil sieves with mesh sizes 4.75mm (0.187"), 2mm (0.0787"), and 1mm (0.0394"). Data was recorded as to which screening system was utilized for each level of each unit in order to document differential results, if any. In the deeper portions of the stratigraphic soil tests conducted both at the Feature 2 Locus and in grid unit 25N11W a 1/4" mesh was employed, by necessity, in order to force the highly compacted soil through the screen. Sterile sediment, that without cultural manifestations, was established by the excavation of an additional 10 to 50cm of soil below the deepest indication of cultural remains.

All artifacts found *in situ* were indicated on plan and/or profile maps, recorded by depth below present ground surface (pgs), and bagged as individual field specimens (FSs). Other artifacts and ancillary specimens were bagged in aggregate, and labeled by unit and level, or feature number. Occasionally, as warranted, artifacts were bagged and labeled as portions of excavation units, such as "14S8E, North ½." Soil, flotation, pollen, and carbon samples were to be collected as warranted. Finally, all excavation units and features were digitally photographed, and plan and profile views were created.

In the laboratory, artifacts were sorted according to morphological category and material type. Chipped stone debitage was examined for use wear, intentional retouch, evidence to indicate core rejuvenation or biface thinning/re-sharpening, and then grouped and tabulated according to size and lithic material type (Appendix C).

### 5.5.3 Results of Fieldwork

Surface inspection of the site relocated Features 1 and 2 as noted on the original site map (a concentration of possibly heat-fractured basalt cobbles and a concentration of heat-altered river cobbles respectively). In addition, Feature 3, an apparently cultural pair of partially upright sandstone slabs, was identified and the historic trash dump was recorded. The excavations at the site unearthed one additional thermal feature, Feature 4, within the Feature 2 Locus, and numerous specimens of lithic debitage, chipped and ground stone tools, and ceramic sherds. What follows is a discussion of the investigations and descriptions of the findings.

From among the general surface artifacts, 32 field specimens (FSs) were collected – some of which represent more than one artifact – that represent 100% of the prehistoric artifacts and a sampling of temporally diagnostic historic specimens (Appendix C). Further analysis of these artifacts is presented in the Discussion of Artifacts section.

During the intensive mapping portion of the investigations 35 flakes, a projectile point fragment, a ceramic sherd, a chopper, a polishing stone, a uniface, and a tested cobble were recorded and collected (Figure 5.5-1 and Table A-1).

5.5.3.1 Subsurface Findings

In addition to the general surface artifacts, 104 pieces of lithic debitage, two projectile point fragments, a biface tip, a uniface, a chopper, three hammerstones, and three ceramic sherds were recovered from Levels 1 and 2 during the excavation phase of the project, bringing the total *prehistoric* artifact count for the site to 156. The debitage and tools are discussed in detail in the Discussion of Artifacts section. No historic artifacts were encountered in subsurface contexts.

5.5.3.2 Stratigraphy

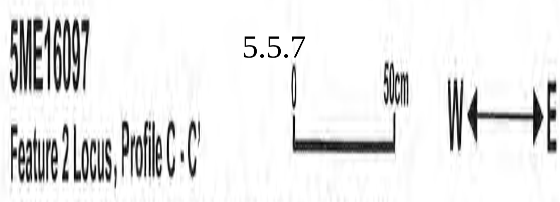
The sediments that make up the deposits at the site are aeolian in nature and are notable regarding the absence of sand, gravel, or rocks. Level 1, the upper fill throughout the entirety of all excavated units, consisted of loose, unconsolidated pale brown (10YR 6/3) clay loam (Munsell Soil Color Charts 1975). Level 1 ranged in depth from one to eight centimeters and rested atop a more compact layer of clay loam – Level 2 – that was very slightly darker in color (10YR 5/3 brown) but otherwise of an identical nature to Level 1 (Figure 5.5-2). Although the contact between these two layers was readily definable and easily discernable in the field, there existed no definite evidence of a living surface at this contact zone. Level 1 was defined, in the field, as that portion of the upper fill that could be easily removed with a whisk broom and dust pan; the somewhat uneven but basically level surface that remained behind served as the upper contact with the more consolidated Level 2.

There was a very low percentage of the recovered artifacts at the primary excavation locale, the Feature 2 Locus, where only two flakes were visible on the present ground surface. This was partially due to the small size of a majority of the flakes, and not until they were isolated from the sediment in a shaker screen or soil sieve did they become visible. Only nine of the 93 flakes from the Feature 2 Locus were cataloged as “medium” in size (from 1 to 5cm in diameter), and none were larger. The remainder were categorized as “small-medium” (between 5mm and 1cm in diameter), “small” (less than 5mm in diameter), or “micro” (pressure or retouch flakes no wider than 2mm and no longer than 5mm). Four of the nine medium-sized flakes are quite obviously the result of a single-core reduction of reddish-orange chert found to the south of Feature 4; two of them actually conjoin.

The remainder of the Feature 2 Locus debitage was dispersed within Levels 1 and 2: 68 flakes or 75% in Level 1 and 23 flakes or 25% in Level 2. Despite this variance in flake count, there is no evidence to support an interpretation of archaeological stratigraphic differentiation between Levels 1 and 2. It is the opinion of these researchers that a single occupation is represented by the cultural resources at the site; an interpretation that is borne out by the results of the diagnostic artifact analysis and the radiocarbon date from Feature 4.

No concentration of artifacts, or even non-artifactual pebbles or cobbles, existed at the contact with the harder-packed upper contact with Level 2. Environmental factors such as frost heave, weathering, and, most significantly, agitation by animal hooves, have obviously played a

**Figure 5.5-2.** Stratigraphy of Profile C - C', Feature 2 Locus.



substantial role in the distribution of the materials within the upper levels, and indeed it is these factors that are responsible for maintaining the unconsolidated nature of the upper few centimeters of soil described as Level 1. Therefore, with the exception of the slight variances in color and consolidation, these two levels are considered as one, archaeologically.

Likewise, there is also no evidence that the aboriginal living surface at the time of the occupation was significantly *higher* than the present ground surface (PGS). Indeed, the cobbles that make up Feature 2 were primarily visible on the surface, prior to excavation, and their bases rested at various levels within Levels 1 and 2; some at the contact with sterile Level 3.

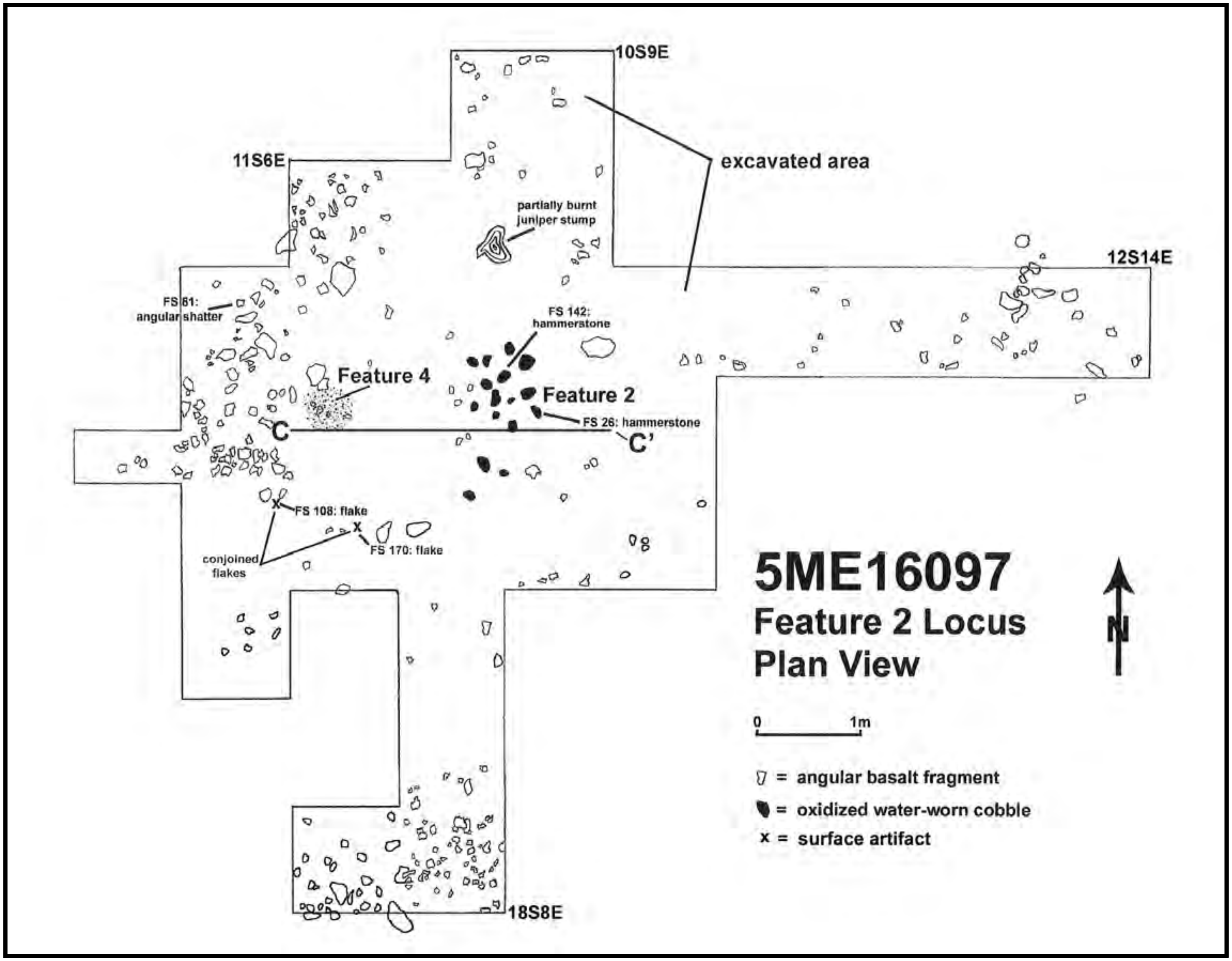
Level 3, which was contacted at depths ranging from three to eleven centimeters below the present ground surface (pgs), consisted of light brownish gray (10YR 6/2) silty clay (Figure 5.5-2). Again, the contact between the darker Level 2 and the lighter and significantly more consolidated Level 3/Upper Fill was readily discernable and easily delineated with trowels. Level 3 was tested to a total depth of 50cm below pgs in both the soil stratigraphy test unit (25N11W) and in an east-west trench within the Feature 2 Locus as illustrated by Profile C - C' (Figures 5.5-2 and 5.5-3). No flakes, charcoal, ash, or other cultural evidence was found below Level 2 in either the soil test unit or in the sub-sterile test at the Feature 2 Locus (in Test Trench 2 and grid units 14S7E, E½ and 14S8E, S½).

In the eastern half of the sub-sterile test at the Feature 2 Locus a white (10YR 8/1) clay layer was contacted at depths of 36 to 40cm, which has been designated as Level 3/Lower Fill, and, in the extreme western portion of the trench, friable, decomposing sandstone bedrock was contacted at 19 to 33cm (Figure 5.5-2). The white clay of Level 3/Lower Fill represents the upper surface of Late Pleistocene age loess deposits dating approximately 13,000 to 18,000 years before present, and a disconformity of similar age was noted near the base of the profile exposed in stratigraphic test unit 25N11W.

<u>5.5.3.3 Features</u>

During the initial recording of the site three surface manifestations were identified. Two were given feature numbers during the original recording of the site and a third during the current project. A fourth feature was discovered during the excavations within the Feature 2 Locus. All four features were investigated, and their descriptions and analyses follow.

<u>Feature 1</u> was described in the original site description as "a rock filled hearth that measures about 1m in diameter and contains 10+ pieces of basalt rock, ashy soil and small bits of charcoal at the northeast end of the site." This feature was relocated during the surface mapping activities of the current project and was investigated by the excavation of Levels 1 and 2 in grid units 13N14W and 13N15W (Figure 5.5-1). The cluster of angular basalt fragments was determined to be fire-cracked in nature, but no evidence of associated ash, charcoal, or heat-altered soil was found.


10S9E
11S6E
excavated area
partially burnt juniper stump
12S14E
FS 61: angular shatter
FS 142: hammerstone
Feature 4
Feature 2
C
FS 26: hammerstone
C'
FS 108: flake
FS 170: flake
conjoined flakes
5ME16097
Feature 2 Locus
Plan View
N
0
1m
= angular basalt fragment
= oxidized water-worn cobble
x = surface artifact
18S8E

[illegible]

However, the excavations proved valuable in that two flakes, two sherds, and a basal fragment of a side-notched projectile point were recovered from the sub-surface deposits. The sherds are presumably from the same vessel as those from the Sherd Locus a few meters to the southwest. A full description and analysis of the projectile point (FS168-A) is presented in the Discussion of Artifacts section.

Feature 2 was originally described as "a small concentration of twelve fire-reddened river cobbles and a few heat fractured cobble chunks [that]...may represent the location of a possible sweat lodge." Twenty-nine contiguous square meters were excavated at the location in the southeast corner of the site; approximately 37 meters southwest of Feature 1. These excavations are referred to herein as the Feature 2 Locus (Figure 5.5-3 and Plate 5.5-3).

**Plate 5.5-3.** The Feature 2 Locus, partially excavated. Several cobbles of Feature 2 remain *in situ* to left of center. Feature 4, hearth, remains unexcavated beneath fill at large arrow.

Feature 2 itself, upon excavation, was found to consist of a total of 17 porcellanite (siltstone), heat-reddened river cobbles and cobble fragments concentrated in an area measuring 1.45m north-south by 70cm east-west. The cobbles are clearly water worn and have been transported to the ridge top, and their current location, by humans. The bases of the stones rested at various levels from the present ground surface to 4 or 5cm below pgs within Levels 1 and 2. There was no ash, charcoal, or evidence of *in situ* thermal activity such as reddened sediment in direct association with the Feature 2 rocks, and it is apparent that they had been heated in a fire elsewhere (quite likely at nearby Feature 4) and subsequently concentrated at their current location. It is undoubtedly this aspect of the feature that led the original site recorders to theorize that the stones represented rocks that were heated outside of a sweatlodge, and then brought within to provide a heat source. This theory remains a possibility, however other interpretations for the cultural manifestations at the locus are discussed below.

One of the Feature 2 cobbles (FS142) exhibited battering marks on one end and along two edges and has been cataloged as a hammerstone. Another cobble fragment, from the southeast edge of Feature 2, differs in that it is of gray quartzite, rather than porcellanite, and, although not heat-reddened or oxidized, is fire-cracked and potlidded. This specimen (FS26) has also been cataloged as a hammerstone in that there are battering marks and three impact flake scars at one end of the tool. Additional tools and lithic debitage were encountered throughout the locus and are discussed elsewhere.

Another intriguing cultural manifestation at the Feature 2 Locus consists of a notably rock-free area that encircles Feature 2, nearby thermal Feature 4, and the partially burnt trunk of a juniper tree. The entire ridge top, and the area in general, is characterized by a dense scattering of naturally occurring cobble-to-boulder sized basalt fragments. A roughly circular area measuring approximately 6m in diameter appears to have been cleared of these sharply angular and shattered fragments. Concentrations of these, apparently “thrown aside” rocks are particularly in evidence to the west and south of the two features. It is the opinion of these researchers that this area probably represents one that was cleared to provide space for the floor of a wooden structure such as a wickiup, but it could have been cleared simply to provide a rock-free campsite. Similar “structural clearings” or “sleeping circles have been described, both ethnographically on Apache wickiup sites, and in contexts by Seymour (2009).

Figures 5.5-3 through 5.5-5 provide several plan views of the locus highlighting various aspects of the rock arrangements. Figure 5.5-4 is a plan view of the Feature 2 Locus with the captioning text removed to allow a clearer view of the possible cleared house floor/campsite, and Figure 5.5-5 is a similar plan with all large rocks (greater than 25cm in diameter) removed from the map to further emphasize the clearing. Figure 5.5-6, on the other hand, shows *only* the larger rocks, representing the possible anchor stones for the hypothesized wickiup.

It is possible that the juniper tree whose burnt trunk remained *in situ* approximately 1m to the north of Feature 2 served as a support tree for the poles of a “leaner style” wickiup; a style common on Numic sites throughout the mountains and western portions of the state

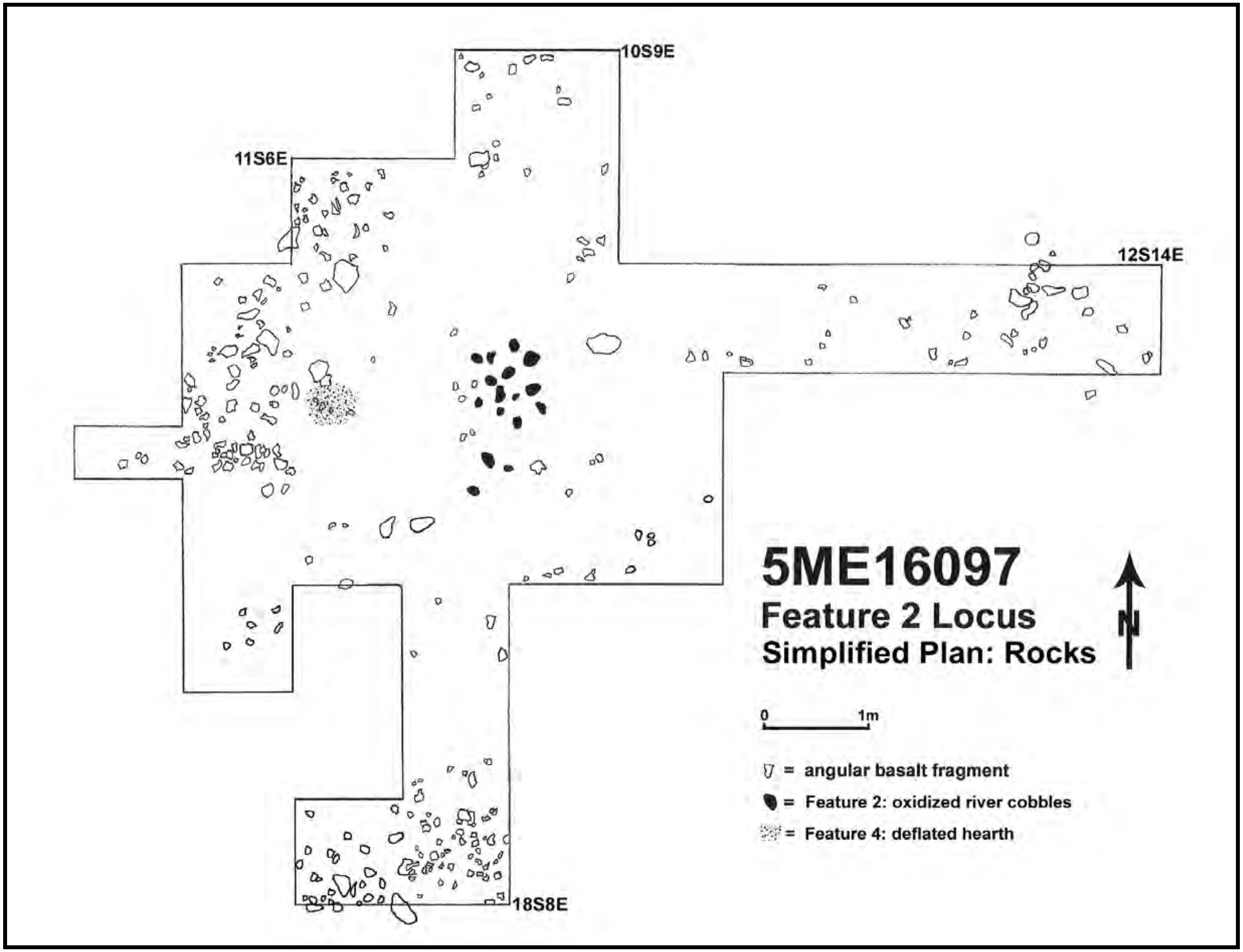



**Figure 5.5-4.** Plan view of the Feature 2 Locus without captions to aid in visualizing the area cleared of basalt fragments.

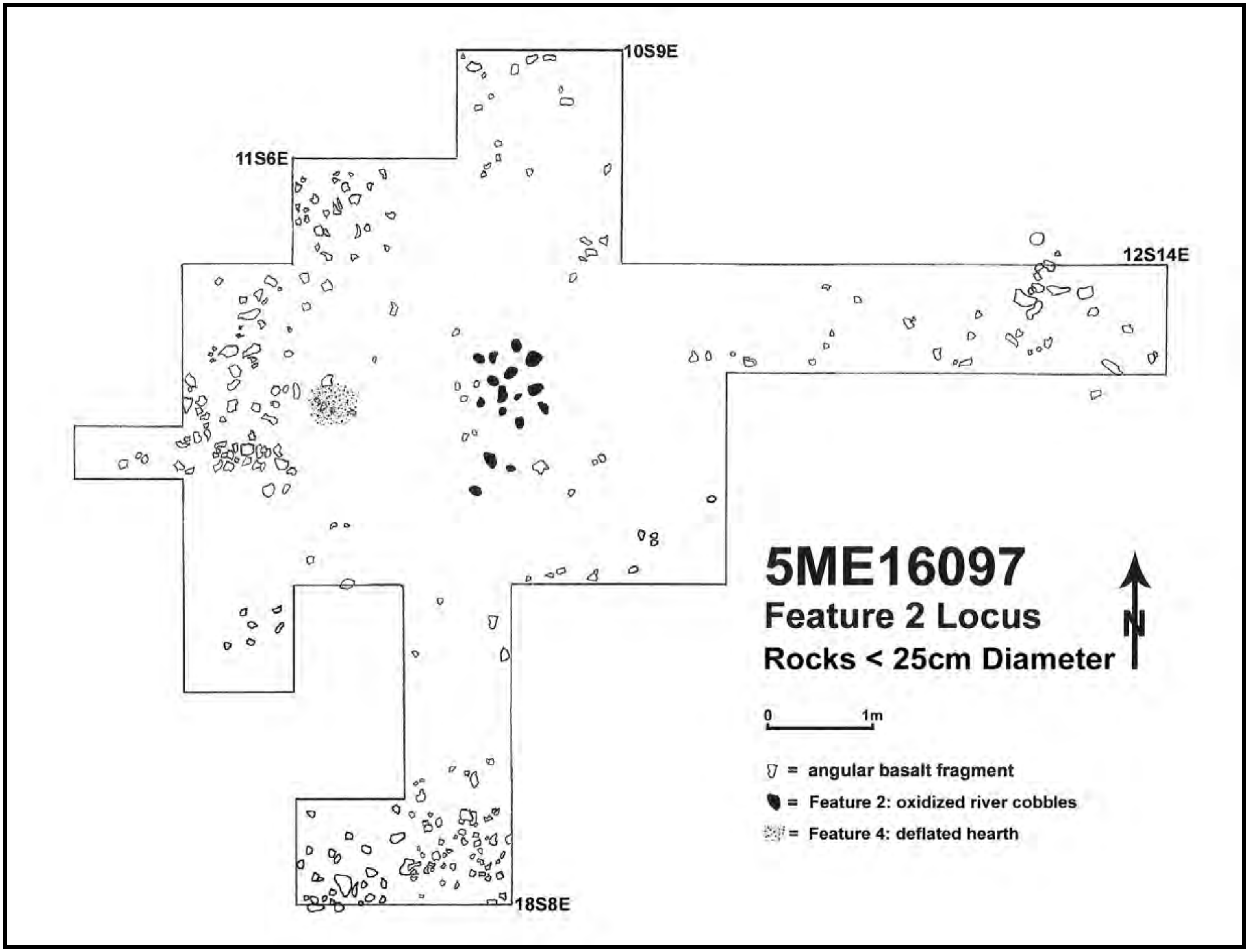



**Figure 5.5-5.** Plan view of the Feature 2 Locus showing only those basalt rocks *under* 25cm in diameter.

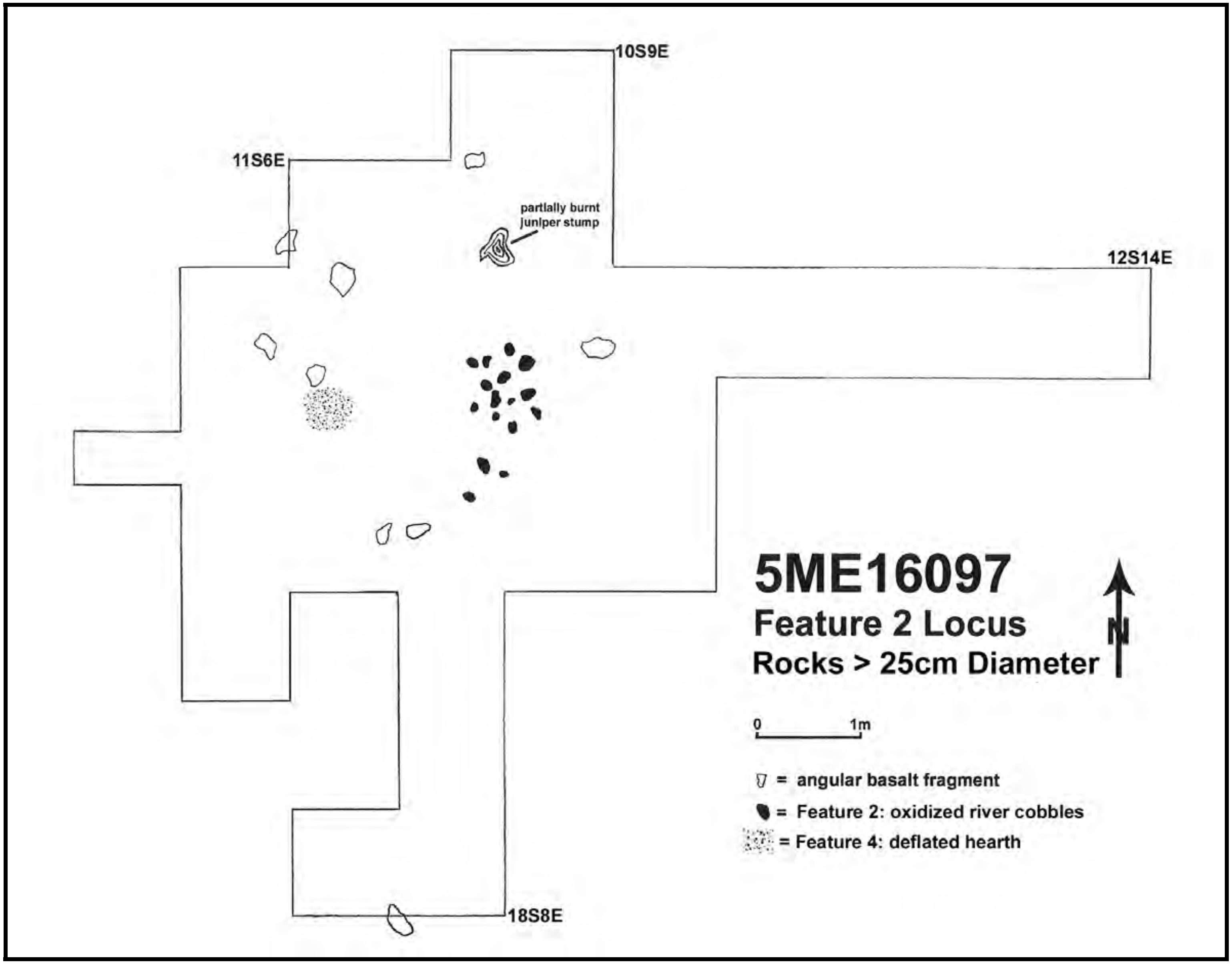



**Figure 5.5-6.** Plan view of the Feature 2 Locus showing only those basalt rocks *over* 25cm in diameter (possible anchor stones for the poles or cover of hypothesized wickiup – note stump of possible support tree).

(Martin et al. 2005a, b); however, this hypothesis remains unproven. A tree ring sample from this trunk was submitted for dendrochronological analysis. This sample, with the outer ring and bark intact, produced a date span of AD 1340±40 for its inception and AD 1846 for its demise by burning (possible lightning strike).

Also, it was noted that, of the nine basalt cobbles at the locus that were over 25cm in diameter (an arbitrary number), eight of them formed an approximately 3m in diameter, roughly circular arrangement surrounding the two cultural features and the tree stump (Figure 5.5-5). It is highly likely that these stones represent artifacts associated with a conical wooden shelter, and were used either to hold down the edges of the structure's covering or to heat its interior.

Numerous small fragments of wood charcoal and burnt bone were found dispersed throughout the excavated fill at the Feature 2 Locus; however, both of these notably decreased in number the further away the excavation unit was from the burnt tree stump and its associated burnt roots. Accordingly, a majority, or all, of these charred materials have been attributed to the burning of the tree in AD 1846. The small bone fragments, mostly rodent and unidentifiable, were likely part of the contents of a rodent nest or nests within the trunk or branches of this tree when it was destroyed by fire. It is possible that some of the charcoal represents the remains of a burnt habitation structure or cultural thermal features, however, no direct evidence of this remained and this is purely speculative.

The lithic debitage and tools recovered from this locus were also not random in distribution, as discussed in the Debitage section, and appear to indicate one or more apparent work stations associated with the cleared camp area and the Feature 4 hearth.

Feature 3: This newly discovered element was visible on the surface near the center of the site and consisted, prior to excavation, of two partially upright sandstone slabs, parallel to each other and angling outward. A trowel test was conducted at the slabs (at grid stake 4N4W) to investigate the nature of the feature. It was ascertained that the two stones were actually two halves of a single sandstone slab that had broken roughly in half along a north-south axis. The inner, broken edge of the slab fragments rested against each other, and the outer edges, to the east and west, angled upwards. It was these outer edges that had been visible above the present ground surface.

The trowel test exposed a second sandstone slab immediately to the south of the first, broken, and beneath approximately 2cm of sediment. A corner of this second slab had also been broken off, yet remained in place in the fill. Although these stones had apparently been intentionally placed side-by-side, no function for the feature has been ascertained, nor was any evidence found to suggest an age for the stone arrangement.

The unmodified slabs, prior to breakage, measured 24 x 20 x 3cm and 23 x 20 x 3cm and were roughly rectangular in shape. The entire feature, comprised of the two stones, measured 42cm north-south by 25cm east-west.

Feature 4 was newly discovered beneath the sediment within the Feature 2 Locus, situated 1.5m to the west of Feature 2 itself. The feature was first noted as a thin lens of ash and charcoal flecks in the north wall of Test Trench 2 at a depth of 1 to 4cm below pgs, within cultural Level 2 and resting atop the upper surface of Level 3 (Figure 5.5-2). Level 1 and Level 2 sediment was removed from Test Trench 7, exposing Feature 4 as an indistinct, roughly circular, 30cm in diameter, very light ash stain (Figures 5.5-2 through 5.5-6). Within an area measuring 30cm to the east, north, and west of the ash stain, a concentrated (relative to the rest of the fill at the locus) scatter of charcoal fragments was discovered. Although there was no distinct evidence of a formal feature, such as a basin-shaped hearth or *in situ* oxidation of the surrounding sediment, Feature 4 has been interpreted as the apparent base of a completely deflated hearth.

A sample of the charcoal from Feature 4 was sent to Beta Analytic, Inc., which produced a conventional radiocarbon date of 370 ± 40 BP (Cal BP 470 and Cal AD 1480; Beta-248418); a date consistent with two of the three projectile point fragments from the site, as well as the Numic-manufactured ceramics. Appendix A presents the full radiocarbon report for the sample as supplied by Beta Analytic.

### 5.5.4 Discussion of Artifacts

This section provides description and analysis of the projectile points and other artifact classes recovered from the excavations and surface collections at 5ME16097. A complete list of all the collected artifacts is provided in Appendix C.

#### 5.5.4.1 Projectile Points

Three projectile point fragments were recovered from the investigations at the site; FS4 from the surface collections, and FS151 and FS168-A from excavated contexts. One additional biface tip, FS69, is most likely another fragment of a projectile point, however, it is not considered temporally or culturally diagnostic and it is described in the section on bifaces.

Field Specimen 4 is a proximal fragment of a small, very well made, unnotched triangular projectile point with a concave basal edge. It is made of light gray opalitic chert (Plate 5.5-4). It measures 1.3+cm in length x 1.7cm in width and x 0.3cm in thickness. It was found on the surface within the historic trash concentration.

Points of this style have been referred to as Cottonwood Triangular arrow points of the Late Prehistoric and Protohistoric Ute, AD 850-1880s (Holmer 1986:106-8 and O'Neil 1993:309); Formative/Protohistoric Era points (Reed and Metcalf 1999:114); and Uncompahgre Complex Type 10 points from the Escalante Phase (Ute), AD 1500-1880 (Buckles 1971:1185, 1220). A Cottonwood Triangular point has also been found in association with Protohistoric or Early Historic trade goods on site 5RB509, The Perforated Can Site (Martin et al. 2009b), and 5RB18, the Two Tall Pole Wickiup Village (Martin et al. 2009a). This latter site has produced Protohistoric age dendrochronological dates on wooden structural elements of AD 1844 and AD

1915/1916. Points of this style have also been analyzed as preforms for Desert Side-notched arrow points.

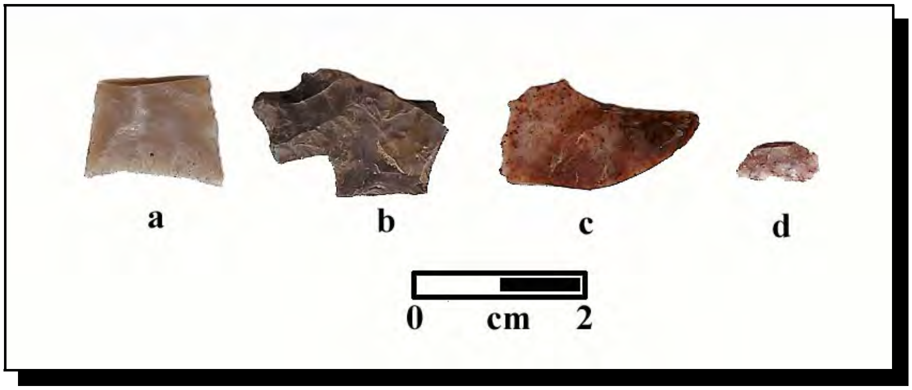



**Plate 5.5-4.** Selected Artifacts from Site 5ME16097:a) FS4: Cottonwood Triangular projectile point fragment; b) FS151: stemmed knife fragment, or reused Archaic point; c) FS154-A: spokeshave fragment; d) FS168-A: Desert Side-notched projectile point base.

Field Specimen 151 is a basal fragment of a stemmed knife, or corner-notched projectile point. It appears that the base may have been intentionally indented. It is made of gray chert and measures 2.3+cm in length by 1.5+cm in width by 0.5cm in thickness (Plate 5.5-4). It was recovered from Level 2 in grid 18S7E at the southern end of the Feature 2 Locus.

Although too fragmentary for definitive identification, the hafting element and overall workmanship of the artifact suggests an Archaic Era origin for the point. Based upon the nature of the other diagnostic artifacts at 5ME16097, the results of the radiocarbon analysis, and the fragmentary and probably reworked nature of the point itself, it is considered to represent a case of re-use of an older, curated artifact by the site's occupants, and probably utilized as a knife.

Field Specimen 168-A consists of the extreme basal edge of a small, side-notched projectile point with a slightly convex base. It is made of mottled red and gray chert and measures 0.5+cm in length by 1.0+cm in width by 0.1cm in thickness (Plate 5.5-4). This specimen was excavated from Levels 1/2 of grid square 13N15W in the Feature 1 Locus.

Although all that is left of the fragment is the basal edge and the proximal edges of the two side notches, small, side-notched points found in western Colorado are typically analyzed as Desert Side-notched points attributed to Late Prehistoric and Protohistoric Numic (Ute and Shoshone) manufacture (or possibly Formative Era: Reed and Metcalf 1999:114) dating from approximately AD 1150-1800s (Holmer 1986:106-8 and O'Neil 1993:309, 310) or Uncompahgre Complex Type 2, Coal Creek and Escalante Phase (Ute), AD 700-1300 and AD 1500-1880 respectively (Buckles 1971:1185, 1220).

Desert Side-notched points have also been found in association with Protohistoric or Early Historic trade goods on sites 5RB509, The Perforated Can Site (Martin et al. 2009b), 5RB18, the Two Tall Pole Wickiup Village (Martin et al. 2009a), and 5RB2624, Rader's Wickiup Village (Martin et al. 2006). These latter two sites have produced dendrochronological dates on wooden structural elements of AD 1844, AD 1915/1916, and AD 1883/1884.

5.5.4.2 Ceramics

Four ceramic sherds were recovered at the site, all presumably from the same vessel. A single specimen (FS18) was found on the surface of grid unit 11N16W. No additional sherds were found during the excavation of this unit or adjacent unit 11N17W (the "Sherd Locus"); however, three additional sherds were found two to three meters to the northeast in the upper 5cm of Level 1/2 in units 13N14W (FS166/171) and 13N15W (FS169) during the investigations at the Feature 1 Locus. A thermoluminescence sample of a ceramic sherd and its associated soil (FS171) was collected and sent to the Luminescence Dating Laboratory (University of Washington, Seattle). This sample produced an uncorrected TL-OSL date of AD 1460±60.

The sherds compare well with descriptions of those common to the area and is attributed to Ute manufacture. These ceramics appeared in the region as early as AD 1100 (Reed and Metcalf 1999:155) and continued to be made by the Utes throughout the Protohistoric and into Early Historic times. Similarities between ceramics made by the Ute, the Southern Paiute, Apache, Navajo, and Yavapai make them nearly indistinguishable (Buckles 1971:505). During the 1600s, the Navajo were victims of a Ute-dominated slave trade which provided slaves to trade for Spanish horses and possibly provided pottery-making wives to Ute warriors as well. By the late 1700s, the Utes had established friendly relations with the Apache and Navajo, and developed additional Athapascan ceramic characteristics (ibid:533). Perhaps by the 1800s, the Utes were doing more trading than manufacturing; however, northern Utes are recorded as both making and trading pottery (Smith 1974:83-89, 252).

Two general types of this ware, Plain and Fingertip-impressed, have been recognized. Initial investigations appear to suggest that the Plain type is more typical in the eastern and southern portions of the Ute homeland in Colorado, and the Fingertip-impressed type dominates in the northwest part of the state (Reed and Metcalf 1999:156), although additional research will be needed to confirm this. The sherds from this site range in diameter from 2.1cm x 1.5cm up to 3.9cm x 2.9cm and from 0.36cm to 0.79cm in thickness. All are plain (no surface treatment in the form of fingertip or fingernail impressions or other forms of manipulation) and none of the recovered specimens are rim sherds. The sherds are smooth on the exteriors and scraped on the interiors. Surface color varies from black to gray to pale reddish-brown. Temper consists of quartz sand and angular fragments of black rock.

5.5.4.3 Bifacial Tool

Field Specimen 69. One additional biface tip was collected from Level 2 in grid unit 15S6E in the Feature 2 Locus. It is most likely a projectile point fragment, however, it is not considered temporally or culturally diagnostic. It is made of gray chert and measures 2.4+cm in length by 1.7+cm in width by 0.4cm in thickness.

5.5.4.4 Unifacial Tools

Field Specimen 6 consists of a longitudinally-split fragment of an end scraper found on the surface within the historic trash dump (shown as a "U" in Figure 5.5-1). It is made of translucent, light pinkish-gray chert. The portion of the distal end of the flake that remains, exhibits steep, unifacial retouch along the entirety of the straight edge with use wear in the form of moderate-to-heavy edge rounding. The small specimen measures 2.2 x 1.3 x 0.4cm.

Field Specimen 154-A is a small spokeshave fragment found within Levels 1/2 of unit 11N17W within the Sherd Locus. It is made of mottled red and gray chert and measures 2.4+ x 1.3+ x 0.3cm (Plate 5.5-4). It consists of a flake that has unifacial retouch along the entirety of one concave edge. There are several small, bifacial attrition scars on the same edge.

5.5.4.5 Choppers

Field Specimen 24 is an unshaped, amorphous river cobble of grayish-brown diorite that has been unifacially flaked along one edge. Four large and numerous small flakes have been removed. The rounded, water-worn cortical surface provides a smooth "back" for apparent use of the tool as a hand-held chopper. The flaked edge exhibits a number of large step-fractures, apparently as a result of forceful use. The artifact was found on the surface at the western end of the site–the only artifact retrieved from the west side of the road (it is shown on the site plan map as a "CH," Figure 5.5-1). The chopper measures 11.5 x 7.8 x 4.1cm.

Field Specimen 178 is a bifacially flaked core tool, apparently for use as a scraper or very small chopper, made of translucent light gray chert. There is a notable polish throughout the faces and flake scars of the specimen, quite possibly from wind scour, however, possibly as a result of heavy use on a pliable material such as hide or grasses. Edge rounding and step fractures are also present on the edges of the tool. It was found in Levels 1/2 of grid square 18S7E in the Feature 2 Locus. This tool measures 4.8 x 3.8 x 1.9cm.

5.5.4.6 Hammerstones

Three battered river cobbles were recovered from the surface of the Feature 2 Locus. Two (FS47 and FS142) of these are reddish-brown siltstone cobbles that were elements of Feature 2 itself–the heat-altered cobble concentration. The third specimen (FS26) is of gray quartzite, however it too was found within Feature 2, and is considered one of its constituents. With the exception of FS142, the battering, or impact, marks are few in number, localized, and appear somewhat fortuitous. It is possible that some or all of the pit marks on these stones are inadvertent, and simply the result of non-utilitarian impacts. However, the artifactual nature of the battering seems unquestionable, and these stones were most likely used as hammerstones or anvils for bone-breaking to extract marrow.

Field Specimen 26 is a fragment of an unshaped, irregular, heat-fractured and pot-lidded gray quartzite cobble. One end of the stone exhibits battering and three impact flake scars. It measures 10.5+ x 6.1 x 4.8cm and was found in grid square 14S8E within Feature 2.

Field Specimen 47 is a fragment of an unshaped, irregular, heat-altered cobble of reddish-brown siltstone (porcellanite). There are several minute peck marks in three separate, localized areas on one face of the rock, indicating that it possibly served as an anvil, or nether stone, rather than a hand-held hammer or pounding stone. It also appears to have been possibly fire-cracked. It measures 9.0+ x 5.5+ x 3.1+cm and was found in grid square 15S7E within Feature 2.

Field Specimen 142 is an unshaped, irregular, heat-altered cobble of reddish-brown siltstone (porcellanite). It is battered on one end and along two edges, but not on the flat faces. It measures 15.0 x 8.3 x 5.8cm and was found at the location of grid corner 13S8E within Feature 2.

5.5.4.7 Ground Stone

Field Specimen 22 is the only ground stone artifact found at the site. Shown in Figure 5.5-1 as an "M," it was located at the northern end of the historic trash concentration. It consists of an unshaped, water worn cobble of grayish-brown quartzite with slight grinding and heavy polishing on one slightly convex surface; suggesting that the tool was utilized in the processing of hides or pliable vegetable materials rather than in combination with a metate. It has, therefore, been categorized as a polishing stone rather than a mano. It measures 12.5 x 10.7 x 7.2cm.

5.5.4.8 Debitage

In addition to the tools described above, a total of 138 pieces of lithic debitage (flakes and angular shatter) was recovered during the investigations at 5ME16097. Thirty-four of these were found on the general surface of the site and an additional 104 were recovered from subsurface contexts. Table 5.5-1 presents a summary of the debitage findings. For comparative purposes and to ascertain whether horizontal stratification exists on the site (regarding lithic materials, flake types, and so forth), the debitage analysis has been divided into three areas, or loci: General Surface, the Feature 1/Sherd Loci, and the Feature 2 Locus. No cores or tested cobbles were recorded.

The most readily noticeable aspects about the debitage from this site, upon reviewing Table 2, are, initially, that 93% of the flakes are totally without cortical surface, secondly there

| | Site Zone / Attribute | General Surface | Feature 1/ Sherd Loci | Feature 2 Locus | TOTALS |
|---|---|---|---|---|---|
| **Flake Material** | Chert | 22 | 11 | 85 | **118 (86%)** |
| | Chalcedony | 2 | 0 | 3 | **5 (4%)** |
| | Quartzite | 5 | 0 | 0 | **5 (4%)** |
| | Porcellanite (Siltstone) | 4 | 0 | 2 | **6 (4%)** |
| | Basalt | 1 | 0 | 1 | **2 (1%)** |
| | Quartz Crystal | 0 | 0 | 1 | **1 (<1%)** |
| | Obsidian | 0 | 0 | 1 | **1 (<1%)** |
| | **TOTALS** | **34 (25%)** | **11 (8%)** | **93 (67%)** | **138** |
| **Flake Characteristics** | Size | 0.micro<br>9 small<br>0 small/med<br>25 medium<br>0 large | 2.micro<br>4 small<br>2 small/med<br>3 medium<br>0 large | 21.micro<br>55 small<br>8 small/med<br>9 medium<br>0 large | **23 micro (17%)**<br>**68 small (49%)**<br>**10 small/med (7%)**<br>**37 medium (27%)**<br>**0 large (0%)** |
| | Cortex | 2 primary<br>3 secondary<br>29 interior | 0 primary<br>0 secondary<br>11 interior | 0 primary<br>4 secondary<br>89 interior | **2 primary (1%)**<br>**7 secondary (5%)**<br>**129 interior (93%)** |
| | Angular Shatter | 2 | 0 | 2 | **4** |
| | Retouched Edges | 0 | 0 | 1 | **1** |
| | Biface Thinning Flakes | 2 | 1 | 17 | **20** |
| | **TOTALS** | **34 (25%)** | **11 (8%)** | **93 (67%)** | **138** |

**Table 5.5-1.** Summary of debitage analysis.

are no large flakes and very few medium-sized flakes (typically the largest class on a lithic scatter), and thirdly, that cherts are significantly more prevalent at the Feature 2 Locus than on the rest of the site.

Over 73% (101 flakes) are considered to be smaller than "normal" (or medium). Within the Feature 2 Locus this percentage is even higher: 90% (84 out of 93 flakes). Seventy-six of the flakes from this locus are diminutive; less than 5mm in diameter (82%). Also, within this locus, there is a notably high amount of biface thinning, or re-sharpening, flakes – 17 out the 93 flakes recovered (18%). Here, over 91% of the debitage is chert, while elsewhere on the site this figure is only 73%.

Several considerations must be taken into account when considering these statistics. Primarily it should be noted that a vast majority of the debitage from the Feature 2 Locus was found in the screens and soil sieves – not so, of course, for the General Surface findings. This undoubtedly contributed to the finding of the numerous small and micro (retouch) flakes, as they are extremely difficult to find by a simple visual inspection of a site surface. Therefore, no real comparisons can be made with the site as a whole, however the extremely high percentage of these flake at this locale, relative to larger specimens, is nonetheless noteworthy.

It should be mentioned that a significant percentage of the flakes at this locus would have been missed had ¼-inch or larger mesh sizes been utilized in the screening process, rather than ⅛-inch. A few micro flake specimens were found to have even passed through the second finest soil sieve (2mm, 0.0787 inch).

As evidenced by the lack of cortex, cores, and source-stone cobbles, it can be concluded that the occupants at the site were not involved in primary reduction or decortication of lithic resources, possibly implying that the source materials were not from the immediate vicinity, or at least that they were not transporting large amounts of raw material with them at the time of residency. What was occurring is the final stages of tool manufacture, and/or restoration as evidenced by the number of small flakes (including retouch or micro flakes and biface thinning flakes), particularly at the Feature 2 Locus.

This type of activity is frequently noted on prehistoric camp sites in the vicinity of hearths, habitation structures, and other indications of domestic camp activities, which substantiates the interpretation of the Feature 2 locality as a dwelling location, as discussed in the description of the locus in the Feature Description section. Figure 5.5-7, provides an illustration of where, within, the Feature 2 Locus, the lithic debitage and tools were recovered. The densest concentration of materials, which included one of the hammerstones, one of the projectile points, and all of the larger single-core reduction flakes of reddish-orange chert, is situated around, and to the southwest of Feature 4, the deflated thermal feature. Seventy-one of the 99 flakes and tools from the locus (72%) were found within 7.5 square meters of this hearth (26% of the excavated area). Over half of those at the locus, were recovered from within 2m to the south and west of the hearth. Another concentration of 12 flakes was noted in grid units 13S10E and 13S11E, to the northeast of Feature 1.

### 5.5.5 Evaluation of Research

During the intensive mapping stage of this project, site 5ME16097 was found to contain a dispersed scatter of lithic debitage and chipped and ground stone tools along with several surface indications of possible thermal features. The subsequent archaeological investigations at the site were guided by a framework of research questions that were drawn from the known cultural background. Research domains that were to be addressed by the investigations include cultural affiliation and age, site function, seasonality, subsistence, social organization, technology, extra-regional relationships, site formation and transformation, and paleo-environment. The results of the excavations have met many of these objectives. Notably, subsurface investigations were conducted both in areas containing apparent features and surface artifacts, and outside of these areas, in order to evaluate the site's potential depth of cultural fill, and to assess its likelihood of yielding additional significant information. Also, the evidence recovered by these investigations indicates that the cultural resources at the site are extremely limited in terms of vertical distribution; all of the artifacts recovered were found within the upper 3 to 11cm of fill, within Levels 1 and 2.

5.5.5.1 Cultural Affiliation

Cultural affiliation and age were derived from radiometric analysis from the thermal feature (Feature 4) and a comparative analysis of the recovered diagnostic artifacts. The sole cultural radiometric result from the site of 370±40 BP (Cal BP 470 and Cal AD 1480; Beta-248418) was produced by Feature 4. The ceramic sherds and two of the projectile points, FS4, a Cottonwood Triangular style and FS168-A, a Desert Side-Notched point, corroborate the interpretation of what appears to have been a single component occupation: that of a Numic campsite likely dating to the Canalla Phase occupation of western Colorado.

Although the $^{14}C$ date and collected diagnostics apparently provide a likely and reliable estimate of the time of occupation of the site, the date may be skewed by the "old wood problem," which has important ramifications for dating Numic sites and in estimating their arrival in western Colorado. To that end, additional dating methods were tapped for comparison. A thermoluminescence sample of a ceramic sherd and its associated soil (FS171) was collected and sent to the Luminescence Dating Laboratory (University of Washington, Seattle). It produced an uncorrected TL-OSL date of AD 1460±60 – a date comparative to that of the $^{14}C$ date, and one that essentially negates the "old wood problem" from the determination of the period of occupation of this site.

Notably, post ca. AD 1350 marks the appearance of Uncompahgre Brown Ware ceramics in the region. Though once thought to date back into the Formative Period, luminescence dates on sherds from sites within the GJFO study area and adjacent regions indicate the appearance of Uncompahgre Brown Ware generally postdates that time [5GF620, AD 1450 - 1528; 5RB2929, AD 1470 - 1530; 5ME4970, AD 1508 - 1644; and 5RB144, AD 1510 - 1590] (Conner et al. 2011:5-53, 54). Reed et al. (2001:41-9) provide additional luminescence dates that generally support this observation, though an early date of AD 1300 cannot be ruled out.

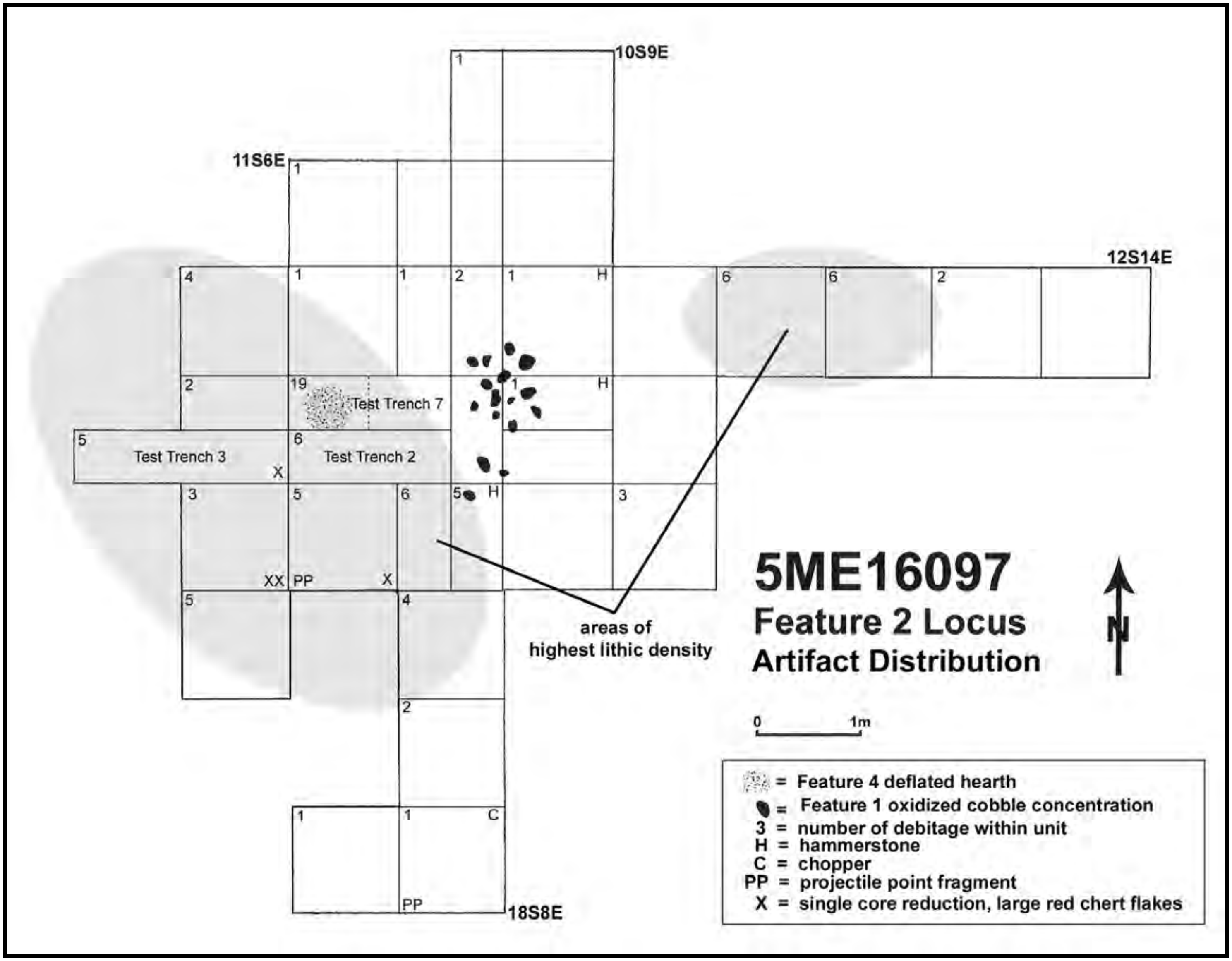



Figure 5.5-7. Plan view of the Feature 2 Locus showing debitage and tool locations.

Additionally, a dendrochronological sample (FS131) was secured from the possible host leaner (juniper) tree whose burnt trunk remained *in situ* approximately 1m to the north of Feature 2. It was sent to the Laboratory of Tree-Ring Research (University of Arizona, Tucson). This tree ring sample, with the outer ring and bark intact, produced a date span of AD 1340±40 for its inception and AD 1846 for its demise by burning (possible lightning strike). Its relationship to the interpretation of the locus remains ambiguous; however, its presence is well within the realm of the site's occupation. The life-span of the tree is easily associated with two of the three recovered projectile points (Field Specimens 4 and 168-A), the radiocarbon date and the luminescence date.

5.5.5.2 Site Function

Artifacts recorded at regional sites indicate activities related to lithic processing, hunting and gathering of foodstuffs, faunal and floral processing, and camping. The artifactual remains at 5ME16097 conform to this pattern as reflected in: the lithic debitage (a result of tool manufacture and maintenance), the projectile points (indicative of hunting), the chopping, grinding, and polishing tools (suggesting floral processing and possibly hide treatment), and the thermal features and apparent house floor or domestic area. A discussion of the documented features follows.

Feature 1 was identified during the original recording and classified as a possible feature because it consisted of a cluster of angular basalt fragments (fire-cracked). During excavations no evidence of associated ash, charcoal, or heat-altered soil was found. However, the fire-cracked rock may represent a clean-out of a thermal feature or its deflation, because in its vicinity two flakes, two sherds, and a basal fragment of a Desert Side-notched projectile point were recovered from sub-surface deposits. Also, the surface in its immediate vicinity was used as an historic camp, so it was subject to disturbance by churning and flattening by trampling, and by erosional deflation. Since most of the cultural deposits in the site were encountered within the upper 5cm, even minimal surface disturbance would be a defining factor as a post-deposition process.

Feature 2 was found to consist of 17 porcellanite, heat-reddened, river cobbles and cobble fragments concentrated in an area measuring 1.45m north-south by 70cm east-west. The cobbles roughly averaged 10cm in diameter. They were all water worn, had been selected by material type and size and transported by the occupants to the ridge. Similar sized cobbles have a documented use as boiling stones by Smith (1974: 64, 66, 87):

> "Cooking was done by roasting over the coals or by stone boiling in baskets or pottery vessels either procured by trade or home-made.
>
> Clay pots were used for boiling meat, sometimes with seed or yampa flour added. The pot was placed near the fire, and hot ashes were heaped around it. Sometimes hot stones were placed in with the food to make it boil faster.

Pots used for cooking were usually taller than broad, and had one, or occasionally two, handles attached near the rim. Bottoms were more often rounded than flat. Cooking pots were not decorated...."

The transportation of the cobbles from a remote area, an investment in labor, and the caching of them within an apparent structure, represents an investment in a place with the intent to return. This is indicative of the " planning depth" of a particular hunter-gatherer group as described by Binford (1987), and is also a measure of the site's duration of occupation.

Originally, the cluster of stones was interpreted as potentially used for heating a sweat lodge, but it seems most likely–because of their size and their location within the suspected structure – that they were used for cooking. In fact, besides their use in boiling meat, several show indications of use as either hammerstones or anvils for breaking bones to extract marrow.

The initial assessment of their potential use in a sweat lodge is not unwarranted because Smith (1974:43) also describes use of heated stones in sweat lodges:

"The sweat lodge was about 8 to 10 feet [2.6-3.3m] in diameter, and not quite tall enough to stand up in, that is, usually between 4 and 5 feet [1.6m] high. It could accommodate four to five people. A hole 1 foot [30cm] deep and 1½ feet [45cm] in diameter was dug in the center to hold the hot stones. A fire was made outside the lodge, near the doorway, in which three or four stones were heated. When they were considered sufficiently hot, they were pushed with sticks into the pit in the lodge, and the men would enter."

In addition, large cobbles, over 15cm, that exhibit heat discoloration, have been found in wickiups without interior thermal features. Conner (personal communication 2008) specifically noted having found large cobbles within a wickiup under one end of a juniper mat.

Feature 3 consisted of partially upright sandstone slabs, parallel to each other and angling outward. The inner, broken edge of the slab fragments rested against each other, and the outer edges, to the east and west, angled upwards. It was these outer edges that had been visible above the present ground surface. Although these stones had apparently been intentionally placed side-by-side, no function for the feature could be ascertained, nor was any evidence found to suggest an age for the stone arrangement.

Feature 4 was a thermal feature first noted as a thin lens of ash and charcoal flecks in the north wall of Test Trench 2 at a depth of 1 to 4cm below pgs. It was an indistinct, roughly circular, 30cm in diameter, very light ash stain that was interpreted as the apparent base of a completely deflated hearth. A $^{14}C$ sample recovered from this feature resulted in a conventional radiocarbon date of 370±40 BP (Cal AD 1480 [Cal BP 470] ; Beta-248418). The hearth contents were completely burned inhibiting collection and analysis of pollen and macro-botanical remains.

Importantly, in the area surrounding Features 1 and 4, was a roughly circular area measuring approximately 6m in diameter that apparently had been cleared of sharply angular and shattered fragments of basalt that were common on the low ridge of the site location. Concentrations of these, apparently "thrown aside" rocks were evident to the west and south of the two features. Within the 6m diameter area were eight large basalt cobbles over 25cm in diameter that formed an approximately 3m diameter, roughly circular arrangement surrounding the two cultural features and the remains of a burnt tree. These stones may have served as anchor supports for the pole bases of a wickiup's conical wooden structure, or as weights to hold down the bottom of a cover. Whether or not the structure was free-standing or if indeed, a leaner-style wickiup that had been constructed on the southwest side of a presumptive support tree, these rocks would be in a plausible arrangement for either of these purposes, with the hearth and heat-providing river cobbles within the interior of the shelter. At least, processing of the dendrochronology sample taken from the base of the burnt tree confirmed its presence during the occupation of the wickiup (see page 5.5.15).

Numerous similar wickiup structures of this size and type are well documented in the Northern Colorado Plateau (O'Neal et al. 2004, Martin et al. 2005a, b, Martin et al. 2006, and Martin et al. 2009a), and in the Great Basin (Simms 1989). O'Neil et al. (2004:57) indicates:

> "The vast majority, 44 of the structural features identified at 5GF308, are multi-pole, lean-to wickiups. As noted previously, there is little ethnographic data available regarding the construction of these lean-to structural features, although Scott (1988:47) provides a general description based upon the Huschers' (1939) work. These structures are made of 4 to 10 irregularly shaped and variably sized branches or limbs which have been cut or gathered. These "poles" are laid up against and around one side of a standing tree, rarely encompassing more than one-half of the tree. The door is usually to the northeast. Presumably, the structures were then covered with brush, hide, or both.....Based on our survey results and the limited excavation data available, 19 (43 percent) of the multi-pole lean-to structures have hearths associated with them. Seven (16 percent) were judged as having interior hearths, nine (20 percent) were judged to have exterior hearths, and three (7 percent) were judged as having both an interior and exterior hearths. Based on these data, it seems that interior hearths are not as rare as hypothesized by Scott (1988)."

### 5.5.5.3 Technology

In its surface and subsurface deposits, this site exhibited a density of artifacts similar to other wickiup and tipi ring sites, which frequently is well below 0.1 item per square meter. Importantly, the site displayed a pattern of low-density but high assemblage diversity. Activities represented by the artifact assemblage are typical of those associated with a residence. Cooking and tool refurbishing are evident in the vicinity of Feature 4 (Feature 2 Locus), and the area of the ceramic scatter (apparent pot-drop) in the west portion of the site.

In order to examine the distribution of debitage and lithic material types, the site was divided into three areas as discussed in the Debitage section of this report. The flakes were analyzed to determine if nonrandom patterning existed. The only obvious indication of non-random distribution of debitage consists of the notably higher percentages of chert and small flakes that occur at the Feature 2 Locus compared to the site as a whole. Again, these deviations are based on an extremely small population of materials; because, the comparisons are being made between surface finds from the general surface of the site, and excavated and screened fill at the Feature 2 Locus.

The lithic tools are made of materials not common in the local formations, and are composed primarily of chert. The variety of material types, albeit sparse, is a diversity that can be found in river gravel deposits. The exception is the recovery of an obsidian flake, which indicates extra-regional trading activities. The absence of debitage from the earlier stages of tool manufacture indicate that the occupants were arriving with an already prepared tool kit. Even the aforementioned porcellanite cobbles were transported to the site.

5.5.5.4 Settlement, Subsistence and Seasonality

In general, the overall pattern of prehistoric sites identified previously in this elevation range of west central Colorado include numerous sheltered and open camps that were occupied seasonally during the late fall to early spring. Tributary creeks of the Colorado River, both permanent and ephemeral, similar to those found near this site, were the focal points of these occupations. Their migrations to and from the river and the higher elevations is attested to by the surface archaeological materials located on the ridges above these drainages–such as 5ME16097 – and the terraces within their canyons.

Although there are no obvious indications as to why the particular ridge top at the site was selected by its occupants, such locales were popular for camping throughout much of prehistory, as evidenced by the number of ridge and prominence localities in the archaeological record. One obvious factor contributing to the selection of such topographic situations is the vista offered of the surrounding lowlands and open sage lands. Also, this site is situated at the edge-environment of two separate and important plant communities – the pinyon/juniper forest and the open sage flats – from which to harvest wood for fuel and shelters: roots, nuts, berries, and grasses for food, and an assortment of medicinal plants.

Importantly, the site is located along a documented trail route: 5ME644, the Sunnyside or V Road (Conner and Davenport 2007). Numerous prehistoric sites have been recorded along the same route and it is likely that prior to development as a road by EuroAmericans the route was used by the Native Americans. In fact, historical records from the 1880's noted that, “Other settlers followed the Ute trail, coming over Sunnyside...” (McCreanor 2002). Simms (1989:24) differentiates between those sites situated in protected and unprotected areas near trails and their relative period of occupation and reuse. He cites Loendorf and Weston (1983) who found that regardless of site size, those in unprotected locations along known trails have fewer artifacts than those in protected locations in which the aboriginals apparently had longer stays.

Smith (1974:34-36) indicates, the diameter (and floor area) of structures is relative to the length of time and season during which it was occupied and/or the size of the resident group. Winter shelters tended to be larger (4-5m in diameter) and could sleep up to 12 people. Accordingly, if the cleared area around Features 2 and 4 represents the floor of a ~3m diameter wickiup structure with an interior hearth, it likely served as a cold weather period habitation.

Models used to predict the general locations of archaeological sites in this region of western Colorado have suggested the importance of several geographic and environmental variables (Burgess et al. 1980; Lutz et al. 1979). In general, they have pointed to strong correlations between site locations and/or site types and vegetational communities, elevation, distance to water, and topographic setting such as site slope and aspect.

One of the first predictive models in the region and one pertinent to this project was developed by Grady (1980). His study, conducted in the Piceance Basin, emphasized an ecological approach that focused on the spatial relationships between human occupations, plant communities, and mule deer populations. Grady set up a series of ten testable hypotheses that correlated distance to water, slope, aspect, distribution of soils, and the nature and distribution of the vegetation communities to the subsistence requirements of both humans and mule deer. The variables were then examined on three levels: a point-pattern analysis, an analysis of the correlation between site location and specific factors within the immediate environment, and a site catchment analysis.

An upland study area and a lowland study area were identified. In the upland area the majority of sites were found in the big sage-grassland vegetation community, followed by the grassland and the mixed mountain shrubland communities, respectively. In the lowland area of the Piceance Basin, the majority of the sites were found in the pinyon-juniper vegetation community followed by the big sage-grasslands and the riparian communities, respectively. The site catchment analysis in the upland area indicated that sites were located to maximize access to the summer range of the mule deer, while a similar analysis in the lowland area indicated that sites were located to maximize access to the pinyon nuts and berry resources while still maintaining contact with the mule deer during the fall and winter. Both of these analyses underscore the importance of a knowledge of the behavioral habits and migration routes of the mule deer population.

In short, Grady found that variables such as water, slope, and aspect are important predictive variables in the upland settings, while pinyon-juniper, water, slope and aspect are important predictive variables in lowland situations. The upland catchment analysis indicates a 2:1 site location preference for areas with high mule deer forage values (which further suggests the presence of prehistoric hunting and processing sites), while the lowland catchment analysis suggests that site locations are predicted by foodstuffs that are directly exploitable by humans (which further predicts the presence of gathering and processing sites). Soils did not appear to be a factor in either the upland or lowland situations.

Grady then compared his data to ethnographic accounts (e.g. Smith 1974) of hunting situations, hunting techniques, butchering and meat processing techniques, and pinyon nut harvest and preparation. According to Grady (1980:242), camp placement decisions were based upon the catchment area of the most profitable resources at a given time of the year, proximity to water and neighbors, and site characteristics including slope, aspect and topography.

This study's findings provide support for the upland-lowland economic strategy identified by Grady (1980) in the Piceance Basin for Archaic, Fremont, and Ute groups. Because the pinyon-juniper zone is located between the high altitude summer occupation areas and the lowland winter occupation areas it is thought to have been used: 1) as a spring and fall gathering location for a variety of plant foods from the mixed mountain shrub communities; and 2) as a travel corridor between summer and winter habitations.

Another model posited by Horn et al. (1987) demonstrated that the location of sites was influenced by features of the natural environment and provided some baseline data on both a synchronic and diachronic level. Their investigations involved an examination of site function, cultural affiliation and chronology, and settlement/subsistence shifts relative to elevation, proximity to water, and vegetation zone. Their results for the Archaic lifeway generally parallel those of Grady (1980) and, importantly, they suggest that ecotones (edges between pinyon-juniper, sagebrush/ grassland communities and drainage basins, and other micro-environments within larger vegetative communities) be modeled. The overwhelming majority of the Archaic sites were associated with the pinyon-juniper community followed by the mountain shrub community and then by conifer/aspen or saltbush/greasewood communities, respectively.

Camps located at lower elevations near the corridors of the main drainages were supported by the exploitation of a variety of environmental zones and the diverse biotopes within the surrounding ten or more kilometers. The riparian in canyons along the main creeks and the Colorado River, the sagebrush grasslands, the pinyon-juniper forest, and the berry-producing shrub communities situated on the slopes of the higher elevations would have provided a wide range of seasonal and year-round resources.

A study by O'Neil (1993:241) showed that the highest frequency of prehistoric/ protohistoric open camps in the region occurs in the pinyon-juniper zone. During the winter months, their establishment at the lowest extent of the forest but above valley bottoms may have been to alleviate the effects of winter cold air inversions. The strongest expression of this phenomenon occurs from mid-December through January, although the frequency of temperature inversions is dynamic and highly variable based on yearly snow and cloud cover. Importantly, when the cold air gets trapped in valleys, there is a layer above it that can be several hundred feet thick where air temperatures can be up to 30° F warmer. During the Little Ice Age, this factor was likely an important consideration of the Utes in their settlement pattern.

O'Neil also reports that the lower elevation camps show a strong tendency to locate around the edges of the elk and mule deer winter ranges. In support of this, Grady's (1980) assessment of the settlement patterns in the Piceance Basin appears to be applicable to the subsistence patterns of a majority of the mountain-oriented cultures of the region. In the lowland area of the Piceance Basin, the majority of the sites are situated in the pinyon-juniper vegetation community, followed by the big sage-grasslands and the riparian communities respectively, and were located to maintain contact with congregating herds of large mammals during the fall and winter. Wickiup villages (apparent clustered populations of protohistoric Utes) have been recorded in the lower elevations in areas of large mammal critical winter habitat (O'Neil et al. 2004, Conner1988). The summer camps were established to maximize access to the summer range of the large mammals that were spreading out across the higher terrain and likely the reason for the dispersal of the bands into nuclear and extended family groups. Results from previous studies at the Rifle Wickiup Village (O'Neil et al. 2004), Simpson Wickiup Site (Greubel 2001), and at the Schmidt Site (Greubel and Cater 2001), have suggested a heavy dietary reliance on fauna.

Jorgensen (1965a:16-17) supports this by stating:

> "The Ute, since their earliest contacts, were, presumably, generally located in the area in which they resided just prior to being located upon reservations. Roughly their boundaries encompassed an area which extended from a point which is now about 100 miles east of Pueblo, Colorado, to Sevier Lake in western Utah; and from what is now the northern border of Colorado to the San Juan River in New Mexico. Much of this territory, particularly much of the territory in Utah, is an alkaline desert. The latter areas were only periodically traversed and hunted in by the Ute. The bulk of the population was distributed throughout the valleys and parks in and adjacent to the Rocky and Wasatch Mountains. The Ute bands were rather closely associated with the distribution of the coniferous forests, and the large game animals and horses which these forested areas supported."

Unfortunately, no pollen or macrobotanical samples were obtained from the features to make a direct determination for the vegetal-based subsistence of the site's occupants. Despite this, and founded on archaeological evidence from Protohistoric Era sites throughout the Basin/Plateau, the availability of floral resources including grass and forb seeds, berries, and pinyon nuts, also influenced the establishment of short-term camps (Simms 1989). The types of plants exploited by the Utes are listed by Lewis (1994:28-29):

> "Ute women gathered and utilized many edible seeds, plants, and roots in their physical environment. Pine nuts were a staple, parched in baskets with hot coals and stored whole or as ground meal for winter use. The women mixed the meal with water to form small meal balls or boiled it into mush. Women gathered wheat grass (Agropyron), bentgrass (Agrostis), bluegrass (Poa), needle grass (Stipa), and June grass (Koeleria), and seeds from lamb's-quarter (Chenopodium), sunflowers, and amaranth, among others, which they stored whole or parched and ground into flour. The people ate raspberries, strawberries, gooseberries, serviceberries, currants, buffalo berries, rose and juniper berries in season or dried and cached them in baskets underground. Chokecherries (Prunus), molded and dried into round cakes for winter use, were a particularly

> important fruit resource. Women gathered numerous roots, including yampa (Perideridia), camas (Camassia), sego lily (Calochortus), tule, valerian, and yucca, as well as seasonal greens and thistles, cactus leaves and fruit, and some acorns. Women also collected and processed vegetal fibers for baskets, cordage, and clothing. Ute men gathered native tobacco (Nicotiana) and numerous other plants valued for their medicinal or ceremonial power."

That the Utes were exploiting these plant resources in this portion of the Northern Colorado Plateau is attested to by the 4 September 1776 record of the Dominguez-Escalante Expedition. While traveling near the present day town of Plateau City located on Plateau Creek (south of the Sunnyside area, about 2.0 miles west of Collbran), the group:

> "...passed through a section of piñon growth, and came upon a sagebrush stretch where three Yuta women with a child were preparing the small fruits they had picked for their sustenance in the arroyos and rivulets hereabouts. We went over to talk to them, and right away they offered us their fruits, which were chokecherry, gooseberry, lemita, and some of this year's piñon nuts. The gooseberry which grows in these parts is very sour on the bush, but when already exposed to the sun, as these Yuta women had it, it has a very delicious sweet-sour taste" (Chavez and Warner 1976:43-44).

#### 5.5.5.5 Site Formation and Transformation

The site is set on a ridge top covered with a base layer of relatively shallow loess that was deposited during the late Pinedale glacial period of 13000-18000ya. Loess grains are angular, composed of crystals of quartz, feldspar, mica and other minerals that will often stand in banks for many years without slumping. This deposit was identified as a white clay layer 36-40cm below pgs at the Feature 2 Locus. Holocene deposits (about 25-30cm thick) occur above that and below the 3-11cm deep deposits of that locus containing the cultural manifestations that were dated between 360 and 560 years old. In general, deposits on the low ridge are relatively shallow due to wind and sheet wash erosion.

The surface of the site in its southeast portion was relatively undisturbed. That in the northwest portion, around Feature 1, was used as an historic camp, so it was subjected to disturbance by trampling, and subsequently by erosional deflation. Since most of the cultural deposits encountered in the site were within the upper 5cm, even minimal surface disturbance would be a defining factor as a post-deposition process.

### 5.5.6 Historic Component

The majority of the historic artifacts on 5ME16097 were contained in a trash dump near the terminus of an abandoned 2-track road in the northeast portion of the site (Figure 5.5-1). This concentration of artifacts, which measures 60 feet northeast-southwest by 20 feet northwest-southeast, contained numerous rusted food cans; coffee cans; hole-in-top condensed milk cans; baking soda, potted meat and sardine cans; spice tins and a screw-top fluids can (of a type used for automobile fluids such as brake fluid). Other than the solder-sealed condensed milk cans all specimens were seam-sealed and included specimens that had been opened with church keys, can openers, pry-off lids, and key-opening collar bands. Also, a Kerr canning jar flat seal was noted.

Also in the dump were fragments of brown, clear, and purple (manganese) bottle glass, and several pieces of a broken china pitcher. One unbroken bottle was noted, which was a brown glass, screw-top bottle, with the metal cap in place, and it measured 5½" tall x 2-3/8" in diameter. Several glass fragments and a food can were scattered up to 26 feet to the west, east, and northeast of the main concentration, and a single bottle glass fragment was found at the extreme southeast boundary of the site.

From the trash dump locus a total of seven specimens were collected – as six Field Specimens (Appendix C). These include three fragments of purple bottle glass, three fragments of a ceramic pitcher, and a single fragment of a ceramic plate with a blue painted floral pattern and the words “MADE IN JAPAN” printed on the bottom exterior. The latter two artifacts exhibit fine-grained paste cores with high-gloss white glazes. The pitcher’s surface treatment includes molded relief and hand-applied blue paint on the raised designs and on the handle and rim.

The materials represented by the historic artifacts indicate an age for the manufacture of the items ranging from the 1910s and possibly earlier (for the purple bottle glass), to the 1930s (the triangular can tapper or “church key” was introduced in 1935). Items such as key-opening cans and screw-top bottles became common in the 1920s (IMACS 1990).

### 5.5.7 Evaluation and Management Recommendation

As a result of the excavations, four features were identified: a fire-altered cobble concentration, a cluster of basalt fire-cracked rock, upright slabs, and a thermal feature within the upper 3 to 11cm of fill of Levels 1 and 2. Surrounding the cobble concentration and thermal feature was an area cleared of basalt rocks indicating an activity area or floor of a wickiup structure. A $^{14}C$ sample recovered from the thermal feature within the suspected structure’s floor produced a conventional radiocarbon date of 370±40 BP (Cal AD 1480 [Cal BP 470] ; Beta-248418). A comparable luminescent date of AD 1460±60 suggests there is no appreciable old wood problem, and that the period of occupation was ca. AD 1480.

This date, along with recovered diagnostic projectile point fragments and a concentration of sherds, suggests a single-component, prehistoric Numic occupation of the site that occurred during the Late Pre-Contact period (Canalla Phase). Additionally, an apparent historic Euro-American component to the site exists in the form of a trash dump. The negative results of excavations deeper than Levels 1 and 2 suggest that no cultural materials underlie those recorded.

This site has contributed significant information concerning the prehistoric occupation of the Colorado River valley area of west central Colorado; however, the scientific potential of the site has been exhausted and is therefore recommended not eligible for listing on the NRHP. The proposed pipeline route avoided this site by not exceeding the east boundary of the existing road, and monitoring was conducted in the vicinity of the site during pipeline construction to ensure its protection and to inspect for undiscovered cultural manifestations. None were found and no further work is recommended for this site.

## 5.6 5ME16102

### 5.6.1 Introduction

Site **5ME16102** is a large prehistoric open camp located on BLM administered land, west of Shire Gulch, and south of the present Sunnyside Road at an elevation of 6160 feet. Vegetation is open sagebrush with cheatgrass (Plate 5.6-1). The soils are tan and gray, rocky silty sand.

**Plate 5.6-1.** Google Earth image of site area showing path of pipeline corridor, county road, and approximate site boundary (black outline).

The site was originally recorded by GRI in 2007 as part of the Class III cultural resource inventory of the proposed Collbran Pipeline Project (Conner and Davenport 2007). It was originally described as a 180m (N-S) by 90m (E-W) concentration of chipped and ground stone artifacts as well as thermal features and an historic ammunition cartridge (5ME16102.s43). The following is an excerpt from the original description describing the recorded features as well as the artifacts collected from the site:

> Feature 1 is located at the north end of the site and consists of a concentration of 12 pieces of fire-cracked rock (FCR) within a 50 x 50cm area. Feature 2, located just 5 meters south of Feature 1, contains a similar collection of FCR and has a basalt mano fragment (3 x 3cm) associated with it. Feature 3 is yet another concentration of FCR in a 1m diameter area located 30m southeast of Feature 2. Finally, Feature 4 is a possible roasting midden of a concentration of 60+ medium sized rocks (some displaying evidence of thermal alteration) that measures 2.5 meters in diameter and is located in the southwest quadrant of the site.

### 5.6.2 Field and Analytic Methodology

The aforementioned artifacts and features recorded in 2007 were found on the site surface outside of the right-of -way for the proposed disturbance. Thus, potential adverse threats to the cultural resource were considered minimal and immediate mitigation was deemed unnecessary. However, during pipeline construction monitoring in 2009, eleven new subsurface thermal features were exposed (Features 5 through 15). Of these, each individual feature was located with a Trimble GPS unit, plan-mapped and photographed as exposed by the earth-moving equipment, and excavated in halves. Trowels, brushes, and whisk brooms were primarily used to excavate the features.

As warranted by the results of each individual feature excavation, those which produced additional subsurface evidence regarding the nature of the hearths were profiled, re-mapped and re-photographed at the completion of excavation. Appropriate radiocarbon and bulk samples were taken as warranted. In search of cultural materials, all excavated sediment was sifted through either 1/8-inch mesh hanging rocker screens or a series of soil sieves with mesh sizes 4.75mm (0.187in), 2mm (0.0787in), and 1mm (0.0394in).

Following excavation, all recovered cultural material was transported back to Grand River Institute for processing and analysis. All artifacts recovered from subsurface contexts were designated an “fs” number. Lithic artifacts were categorized according to morphological similarities. Resultant classes include artifacts subsumed under chipped stone (i.e., flake debris and biface). Field notes, photographs, and written records will be filed with the BLM. All collected artifacts will be curated at the Museum of Western Colorado.

### 5.6.3 Results of Fieldwork

Features were excavated to determine extent of subsurface manifestation. In certain cases, upon excavation, features were found to consist of thin ash stains or concentrations of fire-cracked rock (FCR) on the exposed surface of the bladed roadway or pipeline route, and produced nothing in the way of formal subsurface features or other cultural materials. These deflated or destroyed thermal features were re-photographed and measured after completion of the exploratory excavations.

Carbon samples were collected from seven of the features–Features 5-A, 5-B, 6, 9, 11, 12, 14. Upon excavation, it was discovered that Features 5-A and 5-B were scattered remains of a single thermal feature–Feature 5. One sample each from Features 5, 9, and 14 were submitted for radiocarbon processing. The results of the analyses are presented in the descriptions of these three features.

Additionally, a biface and flake were newly recorded. The site boundary was expanded to the northwest to include the newly recorded cultural resources (Figure 5.6-1). The new site boundary measures 203m northwest-southeast by 119m northeast-southwest. Ground disturbing pipeline construction activities at the site were temporarily curtailed and feature

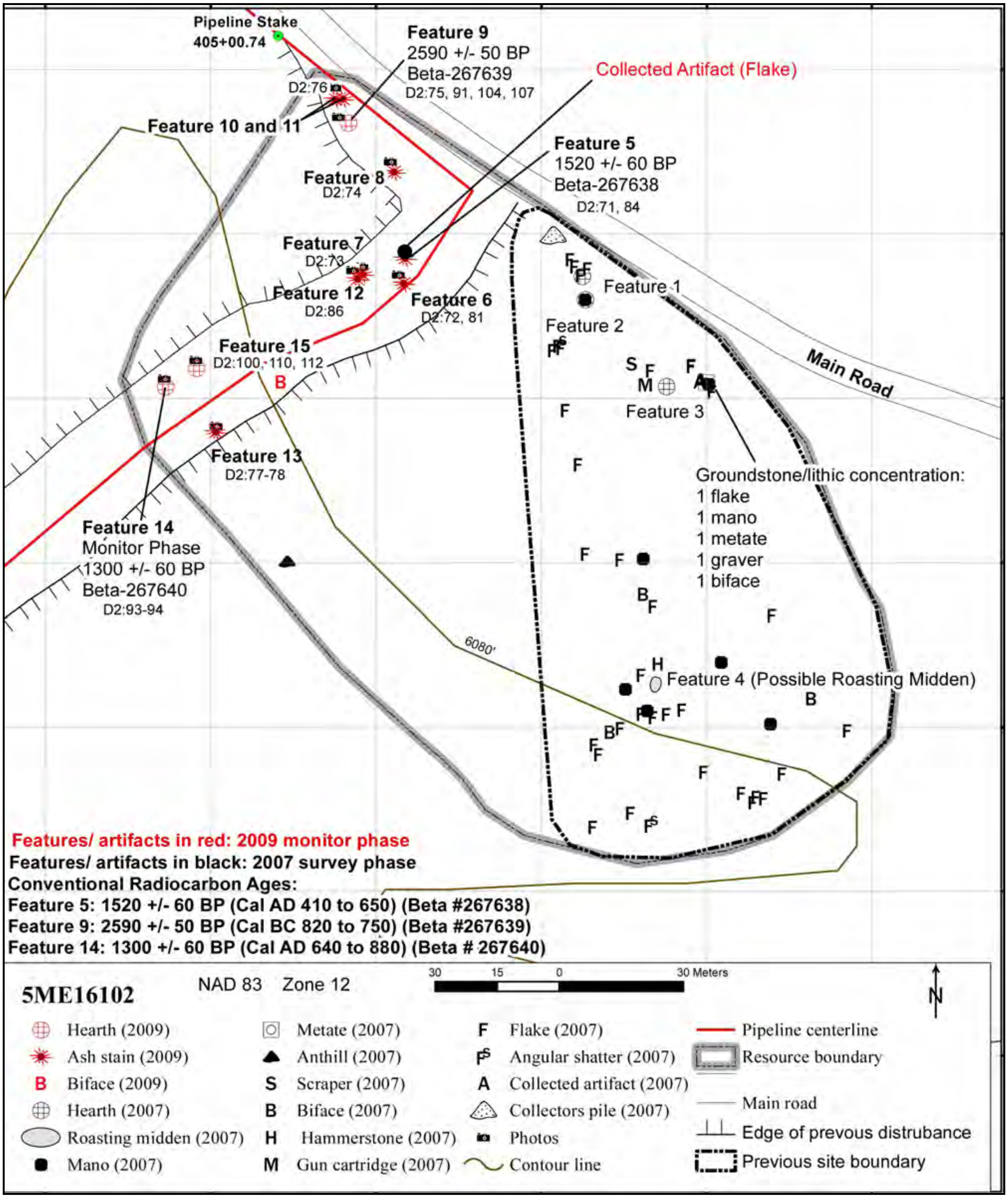



**Figure 5.6-1.** Map of site 5ME16102.

excavations ensued, as described below.

The soils are a relatively unstratified, blocky, brown to light brown, aeolian and residual clay loam of at least three meters in depth as noted in nearby pipeline trenches and road cuts. Occasional pockets of gray to grayish-brown clay are exposed in the disturbed areas.

5.6.3.1 Features

Thermal Features 1 through 4 were found during the initial 2007 surface survey and remained outside of the area of impact from the construction activities as being carried out in 2009. These features, therefore, were not tested, excavated, or further documented by the current project.

Eleven features (Features 5-15) were newly identified during the 2009 monitoring activities. Of these, each individual feature was located with a Trimble GPS unit, plan-mapped and photographed as exposed by the earth-moving equipment and excavated in halves. In certain cases, upon excavation, features were found to consist of thin ash stains or concentrations of fire-cracked rock (FCR) on the exposed surface of the bladed roadway or pipeline route, and produced nothing in the way of formal subsurface features or other cultural materials. These deflated or destroyed thermal features were re-photographed and measured after completion of the exploratory excavations.

As warranted by the results of each individual feature excavation, those which produced additional subsurface evidence regarding the nature of the hearths were profiled, re-mapped and re-photographed at the completion of excavation. Appropriate radiocarbon and bulk samples were taken as warranted. Carbon samples were collected from seven of the features–Features 5-A, 5-B, 6, 9, 11, 12, 14. Upon excavation, it was discovered that Features 5-A and 5-B were scattered remains of a single thermal feature–Feature 5. One sample each from Features 5, 9, and 14 were submitted for radiocarbon processing. The results of the analyses are presented in the descriptions of these three features and in table 5.6-1.

Feature 1, at the northeast edge of the site, was described in 2007 as a surface concentration of 12 pieces of fire-cracked rock within an area measuring 50cm in diameter. A concentration of chert and basalt flakes were recorded on the surface immediately to the northwest of the FCR and a collector's pile of ten flakes were also noted 10m to the northwest of these.

Feature 2, approximately 5m south of Feature 1, consisted in 2007 of a fire-cracked rock concentration with an associated basalt mano fragment.

Feature 3, 30m to the southeast of Feature 2, consisted in 2007 of a concentration of fire-cracked rock approximately 1m in diameter. It was thought, at the time, to represent the shallow remains of a cultural thermal feature.

Feature 4, in the southern portion of the site, was described in 2007 as a possible roasting midden consisting of a concentration of over 60 medium-sized rocks, some of which displayed evidence of thermal alteration. The concentration measured 2.5m across, and, again, was considered to be a shallow cultural manifestation.

Features 5 through 15 were newly discovered after having been exposed by bulldozer blading during the construction of the pipeline in 2009. Feature 5 consisted, when unearthed, of a highly disturbed area of ash-stained soil exposed in the dozer's grouser tracks that measured approximately 60 to 70cm in diameter. Upon clearing the loosened soil two separate but adjacent amorphous grayish-brown stains were visible on the undisturbed soil surface and were numbered Features 5-A and 5-B. Excavation of the two sub-features revealed that Feature 5-B was a thin ash stain with no evidence (remaining) of cultural origins or formal hearth attributes–suggesting the possibility of a burned sagebrush or other natural fire. Feature 5-A, however, consists of a 4cm deep basin-shaped ash lens measuring 50cm diameter and containing occasional flecks and small fragments of charcoal, a few very small fire-cracked rock fragments, and a single chert flake found in the 1/8" mesh shaker screen (5ME16102.fs1). A charcoal sample from the fill yielded a conventional radiocarbon age of 1520 ± 60BP, Cal AD410 to 650 (Beta #267638) placing occupation during the Formative period–likely associated with an occupation of prehistoric hunter/gatherers.

Feature 6, when discovered on the surface of the bladed surface, was a highly faint concentration of ash-stained soil that measured 19 to 29cm in diameter. Upon excavation the feature appears to be the base of a naturally-deflated hearth. The remnant that remains consisted of a very shallow basin of ashy fill with small amounts of charcoal. What was left of the hearth basin was irregular in shape and measured 46cm in diameter and up to 4cm in depth. The entirety of the hearth fill was collected in aggregate, however no radiocarbon analysis was performed for Feature 6. The basal floor of the feature consisted of hard-packed, cracked gray native soil.

Feature 7, when unearthed, was an amorphous, gray ash stain approximately 20cm in diameter. Excavation revealed a thin, irregular area of ash-stained soil with no evidence of a cultural origin with the possible exception of a single, 6cm diameter, crushed fragment of possibly heat-reddened sandstone. The ash stain measured 19cm by 25cm.

Feature 8, similar on the exposed surface to Feature 7, produced another thin, amorphous, 40cm diameter ash stain containing seven fragments of fire-cracked rock that ranged from 2cm to 6cm in diameter and a single 5cm diameter crushed fragment of orange–oxidized–sandstone. Again, there was no direct evidence of a cultural origin for the feature with the possible exception of the heat-altered rocks.

Feature 9, when discovered on the bladed surface approximately 20-25cm below the present ground surface, was a 50cm by 70cm concentration of five fragments of heat-reddened sandstone in the northwest end of the site. Excavation at the location produced a rock-filled, basin-shaped hearth (Plate 5.6-2). The fill consisted of ashy soil and charcoal with a total of 27 fragments of the thermally-altered sandstone.  A majority of the hearth stones, and the larger fragments of charcoal, were resting on or near the floor of the excavated basin.  The basin measured 85cm in diameter and 15cm in depth.  Based on the overall large size of the *in situ* rocks, and the relatively large size of the basin, the feature is possibly best referred to as a roasting pit.  The position of the hearth stones suggests that several had been removed from the south half of the basin and piled atop those in the north half by the site's occupants, presumably for the purpose of accessing foodstuff roasting in the bottom of the pit.

A charcoal sample from Feature 9 produced a conventional radiocarbon age of 2590 ± 50 BP, Cal BC 820 to 590, BC 690 to 660, and BC 640 to 590  (Beta #267639) placing occupation during the Late Archaic Era.

**Plate 5.6-2.**  Feature 9, post-excavation.

Feature 10 was a single crushed fragment of oxidized sandstone–brown exterior and black interior–measuring 5cm in diameter found within the dozer-bladed right-of-way.  Test excavation at the locus failed to produce any evidence of a cultural origin for the fragment.

Feature 11 when unearthed, was an indistinct, gray ash stain approximately 25cm in diameter.  Excavation revealed a thin, irregular area of ash-stained soil with no evidence of a cultural origin with the possible exception of a few flecks and small fragments of charcoal, which were collected but not submitted for analysis.

Feature 12, noted on the bladed surface as a faint area of ash-stained soil and several fragments of FCR, was determined to be the base remnants of a deflated hearth consisting of a lens of concentrated ashy soil with dispersed fire-cracked rock extending throughout an area measuring 1.2m in diameter.

Thermal Features 13 through 15 are somewhat isolated from the other features at the eastern extent of the site.  Feature 13, near the top of a ridge and just inside of the south side of the bladed pipeline right-of-way, appeared as a discontinuous area of grayish soil with two cobble-sized fragments of sandstone.  The western half of the stain, and the underlaying deposits, were removed in an attempt to create a profile, revealing a thin 40cm diameter stain of gray clay with a few minute flecks of charcoal and, possibly, some ash content.  No evidence of a cultural origin for the feature could be found.

Feature 14 was newly discovered by the archaeological monitors after the initial pass of the bulldozer near the crest of the same ridge on which Feature 13 was located.  A vast majority of what was indisputably a large, rock-filled thermal feature was removed by the dozer blade, as evidenced by charcoal and the scores of 6cm to 9cm diameter fragments of FCR that ended up in the ridge of bladed soil after the dozer had passed. Approximately 3 to 3½ gallons of feature fill–FCR and charcoal–was visible in the spoils pile, and an undetermined amount of similar material likely remained buried in the disturbed soil.

All that remained in situ at Feature 14 was a 42cm diameter, round concentration of very dense charcoal with a few associated fragments of FCR resting on what had been the interior base of the feature. The 1cm to 2cm of charcoal rested atop a heavily oxidized contact with native clay. Two crushed and blackened fragments of sandstone also remained in situ. Approximately 90-95% of the thermal feature was destroyed by the pass of the bulldozer blade. A sample from the charcoal that had been left in place produced a conventional radiocarbon date of 1300 ± 60 BP, Cal AD640 to 880 (Beta-267640), again placing occupation during the Aspen Tradition Phase of the Formative era.

**Table 5.6-1** Results of radiometric analysis for site 5ME16102.

| Sample Data | Measured Radiocarbon Age | 13/C/12C Ratio | Conventional Radiocarbon Age | Calibrated AD/BC Date |
|---|---|---|---|---|
| 5ME16102.F5 Beta-267638 | 1500 ± 60 BP | -23.8 o/oo | 1520 ± 60 BP | AD 410 to 650 |
| 5ME16102.F9 Beta-267639 | 2530 ± 50 BP | -21.0 o/oo | 2590 ± 50 BP | BC 820 to 590 |
| 5ME16102.F14 Beta-267640 | 1240 ± 60 BP | -21..4 o/oo | 1300 ± 60 BP | AD 640 to 880 |

Feature 15 was again recognized as a rock-filled hearth upon the initial pass of the bulldozer along the right-of-way route. Notably similar to Feature 9 in size and form, excavation of Feature 15 produced a rock-filled, basin-shaped hearth; intact with the exception of the upper portion of the southeast side that was partially removed by the earth-moving equipment. The fill consisted of ashy soil and 32 relatively large fragments of thermally-altered sandstone within a shallow basin. The basin measured 82cm north-south by 69cm east-west and up to 7cm in depth. As at Feature 9, the position of the hearth stones suggests that several had been removed from roughly half of the basin–in this case, the eastern half, presumably for the purpose of accessing foodstuff from within the basin.

5.6.3.2 Artifacts

The artifact assemblage noted during excavation of the site consists of only two artifacts: a small, tertiary chert flake (5ME16102.fs1; Appendix C), and a crudely worked, chert biface fragment (not collected). The subsurface artifact count should not be assumed to reflect the potential for subsurface cultural material as subsurface excavation was restricted only to thermal features and feature fill, not the surrounding sediments. Further test excavations-not in the context of features-should be conducted within the site to analyze subsurface artifact density.

The cartridge identified in 2007 is a .40-65 Winchester used in a model 1876 lever action rifle. It appears to be from an early production manufactured in 1879 because it has no head stamp and it has a recessed percussion cap (Phil Born, personal communication 2007). This data points to a possible Ute occupation during the late 1800's or early 1900's.

### 5.6.4 Evaluation of Research

#### 5.6.4.1 Cultural Affiliation

Radiocarbon and temporal artifact analysis were used to determine cultural affiliation and suggest at least four cultural occupations; a Late Archaic occupation, two Formative occupations and one possible late Historic Ute occupation. Feature density within the site suggests the possibility of many other occupations between these dates as well as the possibility of additional subsurface artifacts that may be of temporal importance.

#### 5.6.4.2 Site Function and Technology

The small subsurface artifact assemblage precludes speculation of site function and technology; however, the expedient nature of the majority of the thermal features, and the lack of evidence of living surfaces and/or structures, suggests short-term occupations. However, an absence or lack of feature preservation can easily be attributed to deflation and erosion of the site.

### 5.6.5 Evaluation and Management Recommendation

This site appears to represent cultural occupations from the Late Archaic into in the early Formative period of hunter/gatherer groups. The NRHP 2008 evaluation was officially eligible for inclusion based upon Criterion D. This evaluation was substantiated by data recovery excavation along the pipeline right-of-way. The discovery of eleven new features and artifacts suggests that additional intact buried cultural materials are likely outside of the bladed right-of-way which could add important information about the prehistory of the area. Therefore, the evaluation as eligible under Criterion D should be retained. Protection and preservation is recommended.

## 5.7 Site 5ME16117

### 5.7.1 Introduction

Site 5ME16117 was originally recorded as an isolated find consisting of a mano, two tested river cobbles and three flakes. During the initial clearing of the pipeline right-of-way, an ash-stained soil midden was exposed on the northeast side and adjacent to the county road. The site area was fenced for its protection in 2009. At that point, the site was determined to be a sheltered camp consisting of the ledge of a rock outcrop and a charcoal/ash/fire-cracked-rock midden (Plate 5.7-1, Figure 5.7-1). A site test was undertaken to determine the depth of the cultural deposits. This testing was conducted between the 6$^{th}$ and 9$^{th}$ of July 2010 by Brian O'Neil and Greg Batchelder.

The cultural deposits are situated on the south side of a prominent sandstone outcrop of the Shire Member of the Wasatch Formation, near the head of a small tributary drainage to Little Horsethief Creek, at an elevation of 5760 feet. Subangular to subrounded basalt cobbles are present on the surface approximately 25 meters to the southeast of the site. The strati-graphically lower Molina Member of the Wasatch Formation is exposed approximately 50 meters to the northwest of the site. Soils are predominately a tan eolian silt overlaying residual soils derived from the Shire Member of the Wasatch Formation.

**Plate 5.7-1.** Overview north of site area. Ash midden exposed by ROW clearing is visible in photo forefront; and, rock outcrop is site's northern periphery.

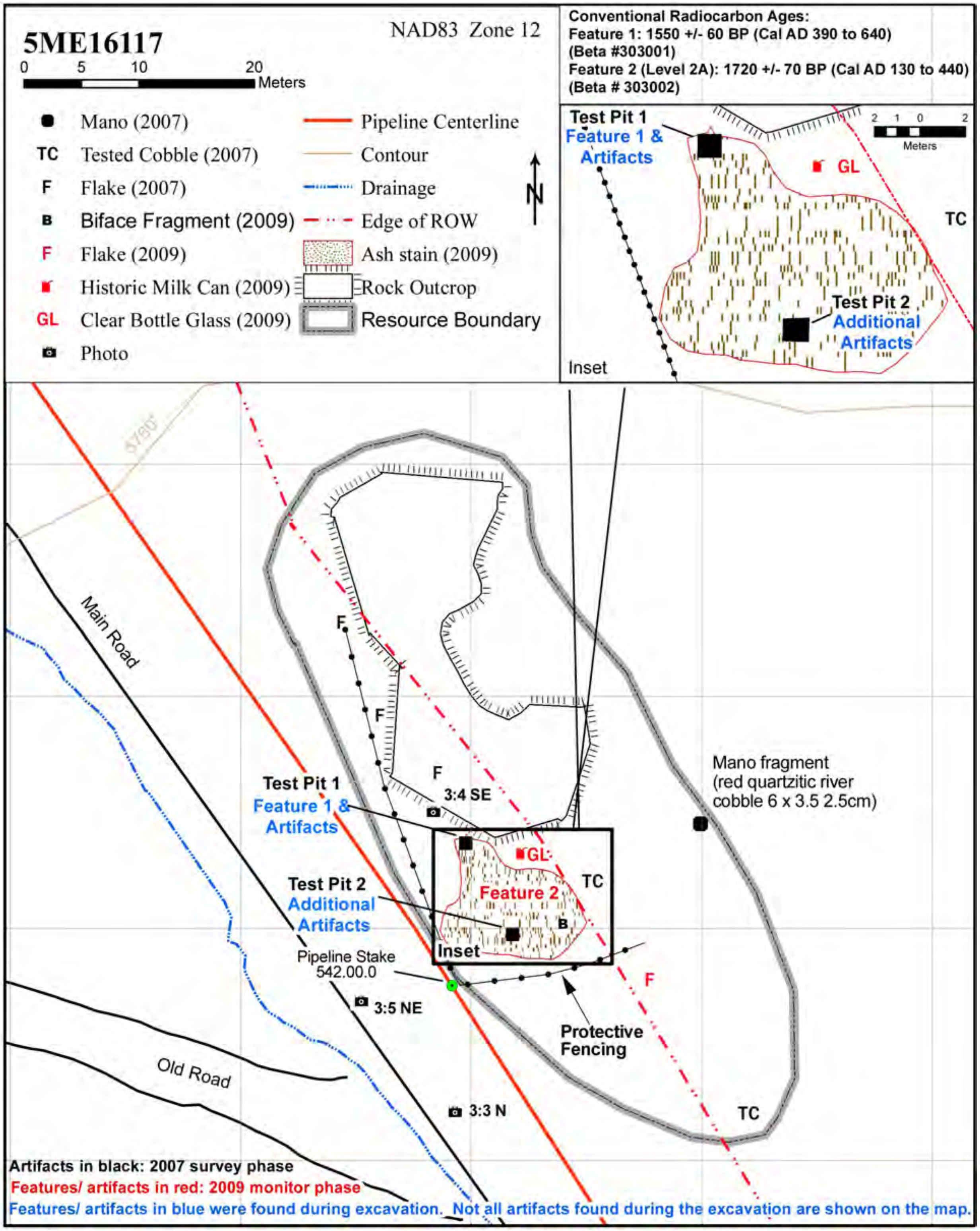



**Figure 5.7-1.** Site map for 5ME16117 showing original artifact distribution recorded in 2007, distribution of midden deposit discovered during monitoring in 2009, and evaluative test units excavated in 2010.

Vegetation is a mosaic of juniper dominated pinyon-juniper forest with open areas of sagebrush, native grasses and forbs. Occasional mountain mahogany and bitterbrush are mixed within the pinyon-juniper forest. Notably, the site is located in an area designated as a winter concentration range for mule deer and elk (O'Neil 1993:143,144).

### 5.7.2 Field and Analytic Methodology

Two 1x1m test pits were established on the site, for a total excavation area of two square meters, within FLPMA permit restrictions. Test Pit #1 was located near the base of the sandstone outcrop on the northern edge of a surface ash stain in an area which exhibited a small concentration of fire-cracked-rock and a possible hearth feature. Test Pit #2 was located about eight meters down slope to the south-southeast near the center of the primary ash and fire-cracked-rock midden. Both test pits were laid out on a true north-south axis, and the northeast corner of the unit was designated as the unit datum. Both test units were on south to west sloping ground which dropped an average of about 25° over 1.4 m. The northeast corner unit datum nails were left in place for future reference after the two excavation units were backfilled.

Excavation was by hand and consisted of the removal of all loose duff and surface soil. This was followed by excavation in arbitrary 10cm levels, unless or until natural soil levels could be identified. All dirt was screened through a 1/8 inch wire mesh screen. Charcoal samples were taken from both test units and sent to Beta Analytic, Inc. for analysis. Plan and profile maps along with photographs were taken of the excavations. A lithic materials inventory was conducted by geologist Michele Nelson. Written records will be filed with the BLM and collected artifacts will be curated at the Museum of Western Colorado.

### 5.7.3 Results of Fieldwork

Surface inspection of the site relocated Features 1 and 2 as noted on the initial site map (a concentration of possibly heat-fractured basalt cobbles and a concentration of heat-altered river cobbles respectively). Additional lithic debitage, and chipped and ground stone tools were found newly exposed and were mapped and recorded. What follows is a discussion of the investigations and descriptions of the findings.

#### <u>5.7.3.1 Test Pit #1</u>

Test Pit #1 revealed the remnants of a deflated hearth with scattered fire-cracked-rock, designated as Feature 1. The remnants of Feature 1 were situated within a matrix of medium to coarse grained alluvial sand and fine grained eolian sands weathered from the adjacent sandstone outcrop of the Shire Member of the Wasatch Formation.

The hearth (Feature 1) consisted of an ash stain marked by patchy areas of charcoal stains and scattered fire-cracked-rock throughout the entire unit. A total of 122 pieces of fire-cracked-rock were associated with Feature 1. They were composed of 59% sandstone and 41%

basalt. Sizes ranged from 2x2x2cm to as large as 15x10x8cm. The greatest concentration of charcoal/ash stained soil occurred in the northeast corner of the test unit, where it was mounded to a height of four to five centimeters, rapidly thinning after a radius of 25cm from the unit datum in the northeast corner. No clear thermal oxidation perimeter or basin could be defined (Figure 5.7-2). The bottom of the charcoal/ash stained soil rested upon the red/maroon weathered clay of the Shire Member of the Wasatch Formation, at a depth of 10cm below the unit datum. There was a shallow rodent hole (krotovenia) present along the east wall of the test unit, in the southeast quadrant. The fill in this depression was soft and disturbed with no charcoal or ash staining.

Charcoal fragments were collected from the feature and throughout the excavation unit and sent for dating which produced a conventional radiocarbon date of 1550±60 BP, with a calibrated intercept of AD 540 (Beta-303001) .

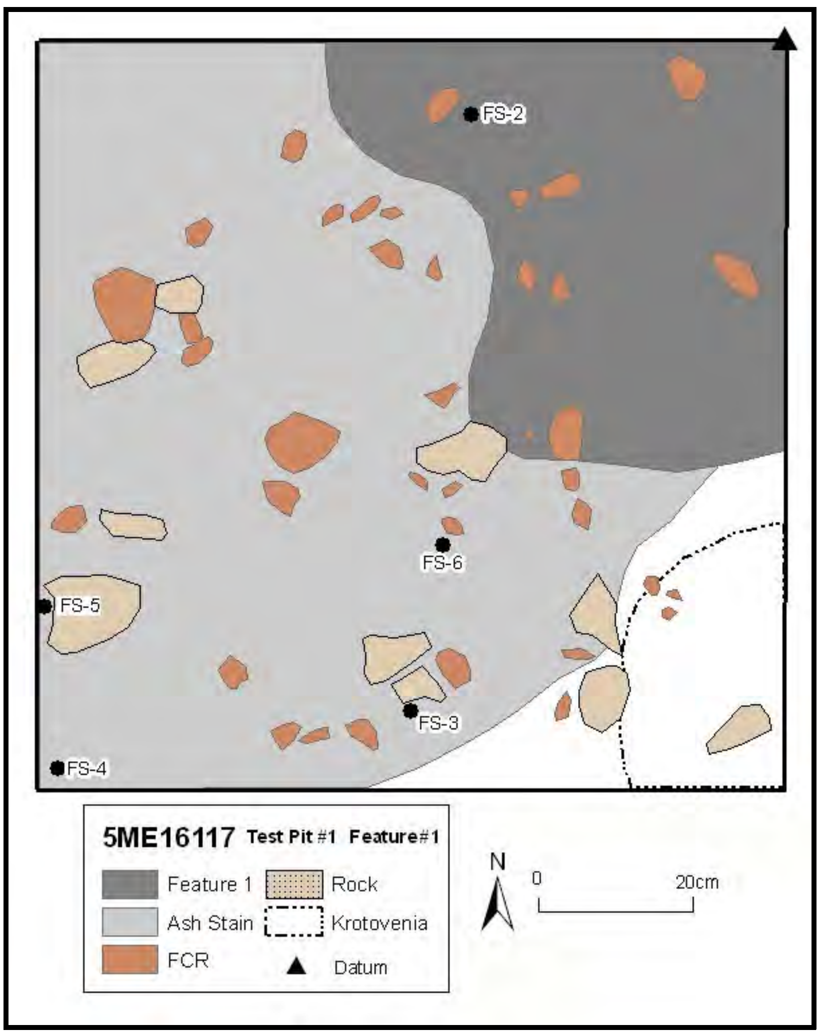



**Figure 5.7-2.** Plan view of Feature 1 located with the top 10cm of Test Pit #1. Charcoal from this level was dated Cal AD 540. A projectile point fragment (FS-2) was recovered from the surface.

Lithic materials recovered from Test Pit #1 include a projectile point fragment and 17 pieces of debitage. These were found on the surface near the northwestern end of Feature 1. The projectile point (5ME16117.fs2) is made from a medium to dark gray fossiliferous chert. It is the blade portion of a small projectile point that has been slightly reworked along one edge and its remaining base – potentially for reuse. The blade is similar to Uncompahgre Complex Coal Creek Phase Type 4 (corner-notched) projectile points, dating ca. AD 700-1300 (Buckles 1971:1220).

The debitage consists of four primary (cortical) flakes, eight secondary (general reduction) flakes, four tertiary (thinning) flakes, and one thermal shatter flake with pot lidding on the ventral side. Lithic material types consisted of 39% algalitic chert, 28% opaline chert, 22% fossiliferous chert, and 11% porcellanites.

In addition, 18 bone fragments were recovered from within the test unit and Feature 1. All but two of the specimens are long bone fragments from a medium sized mammal. Surface weathering was evident on four of the specimens, which consisted of a rib fragment and a portion of the epiphysis of a long bone. The remaining two specimens were unidentifiable. Eight of the fragments exhibited cortical darkening from scorching, but only one had evidence of charring. All the scorched specimens are sharply angular. Five fragments were partially calcined, including one specimen, 5ME16117.6, which is the proximal end of a phalange. The average size of the bone fragments is about one centimeter square. The breakage patterns and small sizes indicate that the bones had been smashed, probably for the production of bone grease.

5.7.3.2 Test Pit #2

Test Pit #2 was placed in the large ash and fire-cracked-rock midden, in the area least disturbed by surface evidence of rodent bioturbation. Six stratigraphic levels were identified within the excavation unit (Figure 5.7-3). The surface level of the soil matrix consisted of loose juniper duff/berries and herbaceous organic materials mixed with charcoal/ash stained eolian sands and alluvial sheet flow composed of sandy silt with small weathered pieces of sandstone talus. It ranged from approximately one to four centimeters below the present ground surface (bpgs). One calcined bone fragment was recovered from this level.

This was underlain by Level 1-A (Qh1). It is a charcoal/ash stained, slightly compacted, silty sandy sheet flow alluvium mixed with 41 small pieces of fire-cracked-rock, composed of 70% basalt and 30% sandstone. Charcoal fragments were scarce and small ($\leq$3). The level ranged from approximately 4-10cm bpgs.

Seven pieces of debitage were recovered from Level 1-A, composed of one primary flake, three secondary flakes, and three shatter flakes. Lithic material types consisted of 43% porcellanites, 43% fossiliferous chert, and 14% algalitic chert.

At the base of Level 1-A there is a distinct unconformity in the soil profile within the

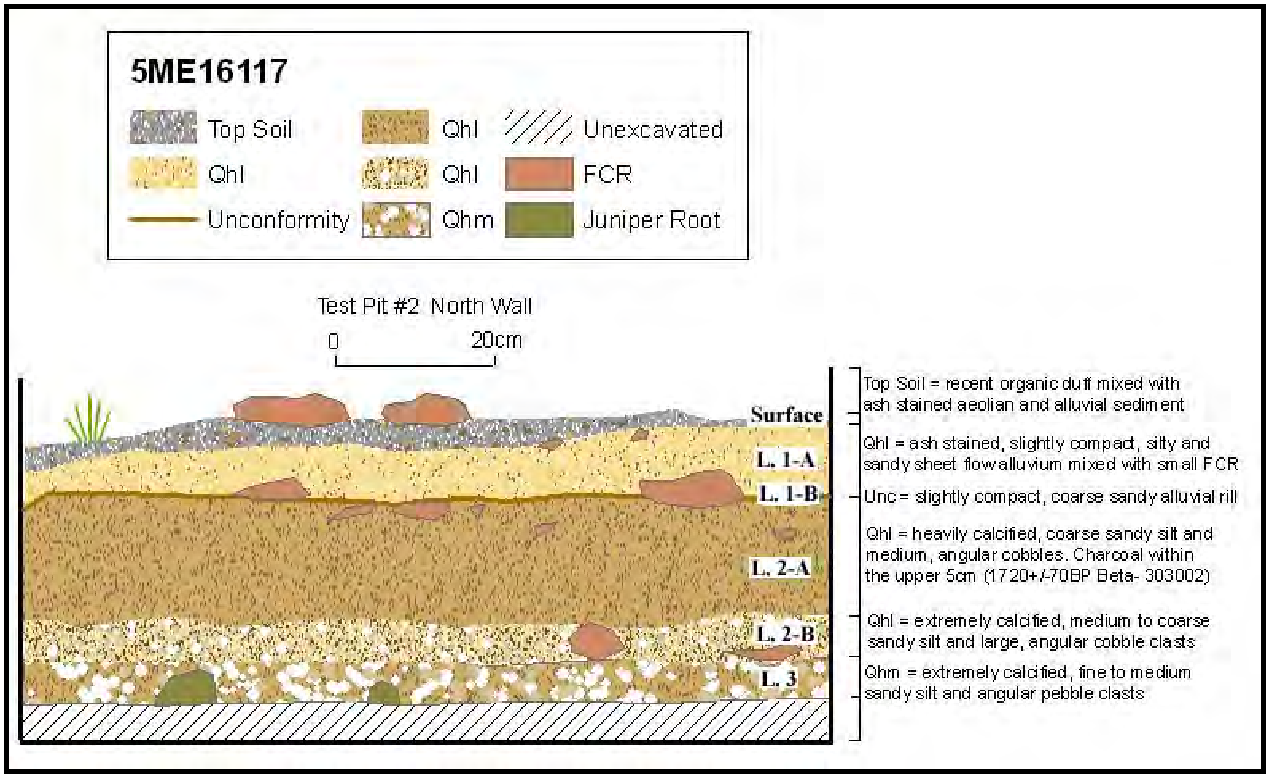



**Figure 5.7-3.** Profile of north wall of Test Pit #2. Six soil levels were recorded. The fourth level (still within Qh1) was radiocarbon dated Cal AD 330).

Qh1 context. Designated as Level 1-B, it is a tan colored, slightly compacted, coarse sandy alluvium approximately 2mm thick. There is a notable absence of charcoal/ash staining within this micro-level, though the tops of several large pieces of fire-cracked-rock protrude from below this level into the bottom of Level 1-A. Consequently, Level 1-B probably represents a low volume sheet flow event, but it may also indicate, and separate, two different occupational events on the site.

Level 2-A, another Qh1 deposit, is composed of a moderately compacted medium-to-coarse sandy silt, mixed with subangular to subrounded sands and poorly sorted talus clasts with medium to large sandstone talus cobbles. Strong $CaCO_3$ cementation is present. The level ranges from approximately 10.2 to 25cm bpgs. The size and frequency of the talus clasts increases with depth, especially between 20-25cm bpgs. Charcoal/ash staining is present, but lighter and more diffuse than in Level 1-A. However, the charcoal fragments are larger (5-10cm), but they are generally confined to the upper five centimeters of the level. Charcoal fragments collected from throughout Level 2-A were sent for dating to Beta Analytic, Inc. and produced a conventional radiocarbon date of 1720±70 BP, with a calibrated intercept date of AD 330 (Beta- 303002).

A total of 134 pieces of fire-cracked-rock were removed from Level 2-A and are composed of 74% sandstone and 26% basalt. The sandstone fire-cracked-rock appears to have been collected from the larger talus spalls weathered off of the nearby sandstone outcrop of the Shire Member of the Wasatch Formation. They were generally fire blackened, with partial thermal oxidization, on only one side.

A Sinbad Side-notched projectile point (5ME16117.fs11), which has been comparatively dated to between 800 BC - AD 500 (Conner et al. 2011), was recovered from screened soil taken from within the top 2cm of Level 2-A. It is made from a flake blank of a banded light gray and light blue algalitic chert, possibly from the Green River Formation. A total of 20 flakes were recovered from this level, as well. They are generally larger in size than those recovered from Level 1-A. Flake types consisted of eight primary flakes, eight secondary flakes, three tertiary flakes, and one shatter flake. Lithic material types consisted of 35% porcellanite, 30% algalitic chert, 15% orthoquartzite, 10% fossiliferous chert, and 10% opaline chert.

Level 2-B, the lowest level of Qh1, is a well defined late Holocene alluvial deposit. This level ranges from approximately 25 to 30cm bpgs. It is more compacted than Level 2-A with an even stronger $CaCO_3$ cementation. It is medium gray to tan in color and consists of medium to coarse sandy silt, mixed with subangular to subrounded sands and poorly sorted talus clasts, though the talus clasts are slightly larger and are more easily visible in the soil profile. Some ash staining from water percolation is evident in the top 1-2cm of this level, below the contact with Level 2-A. There is also a notable decrease in the presence of larger sandstone talus cobbles from the preceding level. Bioturbation by large juniper tree roots is present. No cultural materials were recovered from this level.

Level 3 is a well defined middle Holocene alluvial deposit (Qhm). It is light gray to tan in color, with a very hard $CaCO_3$ cementation. It consists of fine to medium sandy silt, mixed with subrounded sands and small poorly sorted talus clasts. The level begins at approximately 30cm bpgs and continues to an undetermined depth. No cultural materials were recovered from this level and excavation was terminated at a depth of 35cm bpgs at the unit datum in the northeast corner of the unit.

#### 5.7.3.3 Stratigraphy

In summary, the structure and composition of the soil in the surface deposit, as well as subsurface stratigraphic Levels 1-A, 1-B, and 2-A in Test Unit #2, indicate that three episodic alluvial sheet flows occurred during the site formation process and had an impact on the fire-cracked-rock midden. As noted previously, Level 1-B is a coarse sandy alluvial sheet flow approximately 2mm thick with no charcoal or ash stain present, which separated Levels 1-A and 2-A. What is noteworthy is the difference in the artifact assemblages between these two separated levels. In Level 1-A, the fire-cracked-rock is composed of 70 basalt and 30 sandstone, with lithic material types consisting of 43% porcellanites, 43% fossiliferous chert, and 14% algalitic chert. In Level 2-A, the fire-cracked-rock is composed of 74% sandstone and 26% basalt, with lithic material types consisting of 35% porcellanites, 10% fossiliferous chert, 30% algalitic chert, plus 15% orthoquartzite, and 10% opaline chert.

### 5.7.4 Discussion of Artifacts

5.7.4.1 Lithic Material Types

A survey of surface lithic materials present on the site was conducted by geologist Michele Nelson. Half of the 28 sampled material types consisted of porcellanites and fossiliferous-opalitic cherts derived from the Green River Formation, which is exposed about 2 km to the southeast of the site. More local materials of a similar nature might be obtained from the Molina Member of the Wasatch Formation which is exposed about 50m to the northwest of the site. There is a wide color range including light green, light gray, white, and dark gray to black. The other half of the surface sample was composed of orthoquartzite probably from river cobbles transported by the Colorado River. Possible sources include the Dakota Formation, or other formations located upstream such as the Paleozoic Devonian age Chaffee Group and the Paleozoic Cambrian age Sawatch Quartzite. In addition, three cores of white to light gray porcellanite were recorded, probably from the nearby Green River Formation. Also present were a fire blackened sandstone metate fragment, and a broken river cobble of red sandstone from the Maroon Formation. The lithic material of the projectile point from Test Pit #1 is made from Belden Formation chert likely secured from a locality near the town of Gilman, or from Colorado River gravels.

5.7.4.2 Diagnostics and Patterned Tools

One biface fragment (5ME16117.fs1) and two projectile points (5ME16117.fs2 and 5ME16117.fs11) were recovered during the project (Plate 5.7-2, Appendix C) .

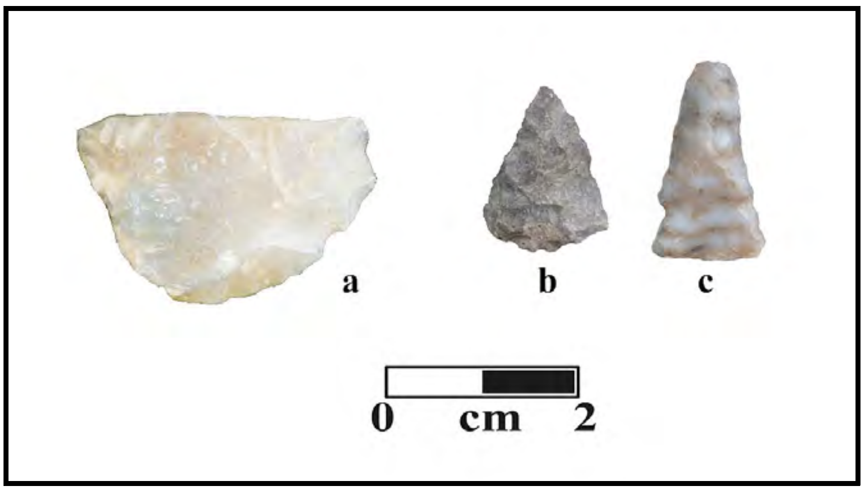



**Plate 5.7-2.** Recovered tool and diagnostics from test units:
a) 5ME16117.fs1, biface base; b) 5ME16117.fs2, blade fragment of UC Coal Creek Phase Type 4; and, c) 5ME16117.fs11, Sinbad Side-notched point.

Specimen, 5ME16117.fs1, is an early Stage 4 biface fragment recovered from the surface (Plate 5.7-2a) . It is made of light gray, opaque to translucent opaline chert, identified as Morgan Formation chert, which is derived from quarries found along the Yampa River in the Blue Mountain area. The specimen is a basal fragment, with a transverse hinged snap fracture present on the distal end. The specimen is estimated to be approximately 30% of the original biface. The primary flaking pattern is random, with smaller edge straightening flake scars around the perimeter. The lateral cross section is biconvex. The specimen has a maximum length of 21mm, a maximum width of 33.2mm, and a maximum thickness of 6.2mm. The edge angles are highly variable and range between 40° to 60°.

Specimen 5ME16117.fs2, was recovered from the surface of Test Pit #1. It is the blade portion of a small projectile point (Plate 5.7-2b). The base is missing and the blade portion that remains appears to have been reworked and potentially re-utilized. The blade is similar to Uncompahgre Complex Coal Creek Phase Type 4 (corner-notched) projectile points dating ca. AD 700-1300 (Buckles 1971:1220). The associated date for this point of Cal AD 540 is derived from Feature 1.

Approximately 50% of the broken edge of the tip has been basally thinned by pressure flaking. The remaining 50% exhibits evidence of a snap fracture. The flaking pattern is collateral with pressure edge retouch sharpening. The lateral cross section is biconvex. The longitudinal cross section is asymmetrically biconvex, with a bias towards the base. The specimen has a maximum length of 19.6mm, a maximum width of 15mm, and a maximum thickness of 4mm. The edge angles vary between 35° to 45°. It is made from a medium to dark gray fossiliferous chert, probably from the Pennsylvanian-age Belden Formation, which overlies the Leadville Limestone. Its type locality (area first identified) occurs along old US 24 in Eagle County, north of the town of Gilman. This material likely occurs in the Colorado River gravels, as the type locality is situated above the Eagle River.

The third specimen, 5ME16117.fs11, is a 98% complete projectile point (Plate 5.7-2c). It closely resembles a Sinbad Side-notched projectile point, which dates approximately 800 BC - AD 500 (Conner et al 2011). It is made from a flake blank of banded light blue and medium gray algalitic chert, possibly from the Green River Formation. There is a small impact fracture at the tip of the blade. The flaking pattern is collateral with pressure edge retouch sharpening. The base is straight and has been thinned by pressure flaking. The lateral cross section is biconvex. The longitudinal cross section is asymmetrically biconvex, with a bias towards the tip and the proximal end of the flake blank. The specimen has a maximum length of 23.5mm, a maximum width of 13.6mm at the base, and a maximum thickness of 9.8mm. The edge angles vary between 30° to 65°. It was recovered from the top two centimeters of Level 2-A in Test Pit #2. The stratigraphically associated radiocarbon date for this point is Cal AD 330.

#### 5.7.4.3 Debitage

A total of 44 pieces of debitage were recovered from the two excavation units (Appendix C). All stages of the lithic reduction process are represented within this assemblage. Though the sample size is extremely small, it appears to be primarily weighted toward the earlier stages of tool production. There are 13 primary flakes (30%), 19 secondary flakes (42%), 7 tertiary flakes (16%), and 5 shatter flakes (11%). No expediency flake tools were present within the assemblage. Only one flake exhibited evidence of pot-lidding on the ventral side, suggesting some heat treating of the raw lithic materials may have occurred. The material types are variable with 27% porcellanites, 23% algalitic chert, 23% opaline chert, 20% fossiliferous chert, and 7% orthoquartzite.

Notably, Nelsons' analysis of the surface lithic materials considers all algalitic chert, opaline chert, and fossiliferous chert to be porcellanites, and also covers a considerably larger area than the two square meters excavated in association with the two thermal features. She also identified a higher percentage of orthoquartzite. Consequently, sampling error places a considerable restraint on this analysis. Excavation in other areas of the site, with different activity sets, is likely to produce different results.

5.7.4.4 Faunal Materials

A total of 19 bone fragments were recovered from the excavations (Appendix C). Eighteen are from Test Pit #1/Feature 1 and one is from Test Pit #2. All but two of the specimens are long bone fragments from a medium sized mammal. Four of the specimens exhibit surface weathering. One weathered specimen is a rib fragment and another fragment is a portion of the epiphysis of a long bone. The remaining two specimens are unidentifiable fragments.

Eight of the fragments exhibit some degree of cortical darkening from scorching, but only one exhibits evidence of charring. Six fragments have been partially calcined. All the charred specimens are sharply angular. Fragment sizes are variable with a range of between 12 to $348^2$, with 58 being $\leq 100^2$, 26 being $\geq 100^2$, and 16 being $\geq 200^2$.

One specimen, 5ME16117.6, was identifiable as the proximal end of a phalange. The medial shaft has been broken and the distal end of the shaft is heavily calcined. It was found in association with Feature 1 in Test Pit #1. However, the overall small sizes and breakage patterns indicate that the bones had been smashed, probably for the production of bone grease.

### 5.7.5 Evaluation of Research

Test excavations at 5ME16117 encompassed a total excavation area of two square meters. Both test units were on south to west sloping ground which dropped an average of about 25° over 1.4 meters.

Test Pit #1 was located near the base of the sandstone outcrop on the northern edge of a surface ash stain in an area which exhibited a concentration of fire-cracked rock and a possible hearth feature. Excavation revealed the remnants of a deflated hearth with ash stain marked by patchy areas of charcoal and scattered fire-cracked-rock, which was designated Feature 1. No clear thermal oxidation perimeter or basin could be defined. The bottom of the charcoal/ash stained soil rested upon culturally sterile bedrock consisting of weathered clay from the red/maroon shale of the Shire Member of the Wasatch Formation, at a depth of 10 below the unit datum. Charcoal from this deflated feature dated 1550±60 BP, Cal AD 540 (Beta-303001).

A blade fragment of UC Coal Creek Phase Type 4 projectile point was found on the surface near the northwestern edge of Feature 1.

Eighteen bone fragments were recovered from within the test unit and Feature 1. All but two of the specimens are long bone fragments from a medium-sized mammal. Four of the fragments exhibited surface weathering, eight exhibited cortical darkening from scorching, but only one had evidence of charring. Five fragments were partially calcined. Identifiable fragments consisted of a rib fragment, a portion of the epiphysis of a long bone, and a proximal end of a phalange. The remaining specimens were unidentifiable. All the charred specimens are sharply angular, with the average size of the bone fragments being about one centimeter square. These breakage patterns and small sizes indicate the processing of medium-sized mammal, such as a mule deer, for marrow and bone grease.

Test Pit #2 was located about eight meters down slope to the south-southeast near the center of the primary ash and fire-cracked-rock midden. Test Pit #2 was placed in the primary ash and fire-cracked-rock midden. Six stratigraphic levels were identified within the excavation unit. The second level 4-10cm bpgs, designated Level 1-A, exhibited cultural deposits including a few flakes and charcoal and ash staining, but did not yield a datable $^{14}C$ sample. The third level, Level 1-B, is a distinct unconformity in the soil profile, a level of only about 0.2cm. It consists of a tan colored, slightly compacted, coarse sandy alluvium. There is a notable absence of charcoal/ash staining within this micro-level, though the tops of several large pieces of fire-cracked-rock protrude into this level from below. Consequently, Level 1-B likely represents a low volume sheet flow event, and apparently separates two occupational events at the site.

The fourth level, Level 2-A, ranges from approximately 10.2 to 25cm bpgs. Cultural deposits occurred in the upper 5cm of this level including a Sinbad Side-notched projectile point, debitage and charcoal/ash staining. Radiocarbon analysis of charcoal fragments collected from throughout the unit at this level produced a conventional radiocarbon date of 1720±70 BP, Cal AD 330.

The stratigraphy in Test Pit #2, indicates that episodic alluvial sheet flows during the site formation process has had an impact on the fire-cracked-rock midden. Level 1-B, likely indicates two different occupational events on the site, one in Level 1-A dating ca. AD 540 and another in Level 2-A dating ca. AD 330. This possibility is also supported by the different percentages of thermally altered sandstone and basalt between these two levels, with Level 1-A containing 70% basalt and 30% sandstone, and Level 2-A containing 74% sandstone and 26% basalt.

Data from the large charcoal/ash fire-cracked-rock midden is generally inconclusive. One piece of calcined bone was found in the loose surface deposit and could have been washed in from upslope. No faunal material was recovered from Level 2-A which contained the highest frequency of fire-cracked-rock. The function of this thermal feature is currently elusive. It may have functioned as a surface roasting platform, a drying and/or smoking area for preservation of meat, a smoking area for hides, a heat treatment area for raw lithic materials, or a combination of any or all of these things. It is also possible that this large thermal feature is horizontally stratified with secondary reuse of the larger pieces of fire-cracked-rock until they became too small to be thermally efficient. Further research into the function of these large thermal features is necessary.

Data from the limited lithic assemblage indicates primary material acquisition from local sources and from cobble deposits along the Colorado River. However, materials imported from other locations within the occupants annual seasonal transhumance cannot be ruled out. The debitage assemblage is heavily weighted to the earlier stages of the lithic production sequence, which also supports local acquisition of the lithic materials. However, sampling error due to the small excavated sample size, and the constrained location of the sampling units to thermal features, places a considerable restraint on this observation. Utilized and/or retouched flakes from butchering are present within the exposed surface assemblage. Excavation in other areas of the site, with different activity sets, is likely to produce different results.

In conclusion then, given the sheltered southern exposure of the site, its low elevation (5760 feet) and location in an area designated as a winter concentration range for mule deer and elk, 5ME16117 is interpreted as a late fall or winter hunting camp. The site suffers from deflation and slope wash, but may also have horizontally and vertically stratified occupations. Furthermore, the small sample size and limited data recovered from just two excavation units, relative to the larger area of the site, places significant constraints on an accurate interpretation of chronology, taxonomic classification, technology, activity sets, and placement within settlement and subsistence transhumance regimes, which may be linked to cultural affiliations. In short, are these sheltered camps with fire-cracked-rock middens associated with: 1) early agricultural Formative Era, aceramic hunting/gathering activities; 2) non-agricultural Formative Era; or 3) later Protohistoric hunter/gatherers possibly associated with the ancestral Eastern Ute as postulated by Buckles (1971). Further excavation on this site, or others like it, is necessary in order to solve the above problem, or at least redefine it.

### 5.7.6 Evaluation and Management Recommendation

This site has contributed information concerning the prehistoric occupation of the Colorado River valley area of west central Colorado. Due to the possibility of horizontally and vertically stratified deposits, the most recent evaluation is in discordance with the site's previous evaluation of not eligible for inclusion on the National Register of Historic Places (NRHP). As the site may yield additional information pertinent to the prehistory of the region, the site is field evaluated as eligible for inclusion on the NRHP. Protection and preservation are recommended.

## 5.8 Site 5ME16782

### 5.8.1 Introduction

The site is an open camp with multiple hearth features. It is located near the head of Little Horsethief Creek, about 1.5 miles west-northwest of Horsethief Mountain, and situated on the east side of a low aeolian dune deposit next to a small ephemeral drainage, at an elevation of 5850 feet. Soils are predominately a light reddish tan eolian silt overlaying alluvial fan and residually developed soils derived from the Wasatch Formation. Vegetation is a mosaic of juniper dominated pinyon-juniper forest with large open areas of sagebrush, native grasses and forbs. Mountain mahogany, serviceberry, and bitterbrush are mixed within the pinyon-juniper forest. The site is also located in an area designated as winter range and winter concentration range for mule deer and elk (O'Neil, 1993:143,144).

**Plate 5.8-1.** Site overview.

Site 5ME16782 was initially identified in 2009 during pipeline monitoring operations of slope grading activities, when an ash stain with large fragments of fire-cracked-rock was uncovered at a depth of approximately one meter below the horizontal plane of the upper surface of the dune deposit. In order to establish a site boundary, additional survey outside the pipeline right-of-way was initiated (Plate 5.8-1). This led to the discovery of the main body of the site in the aeolian deposits to the east of the pipeline right-of-way and the identification of a diffuse lithic scatter composed of 36 flakes, 2 pieces of angular shatter, two cores, a drill midsection, a Late Archaic Era corner-notched projectile point, and an upright slab-lined feature near the northeastern boundary of the site (Figure 5.8-1).

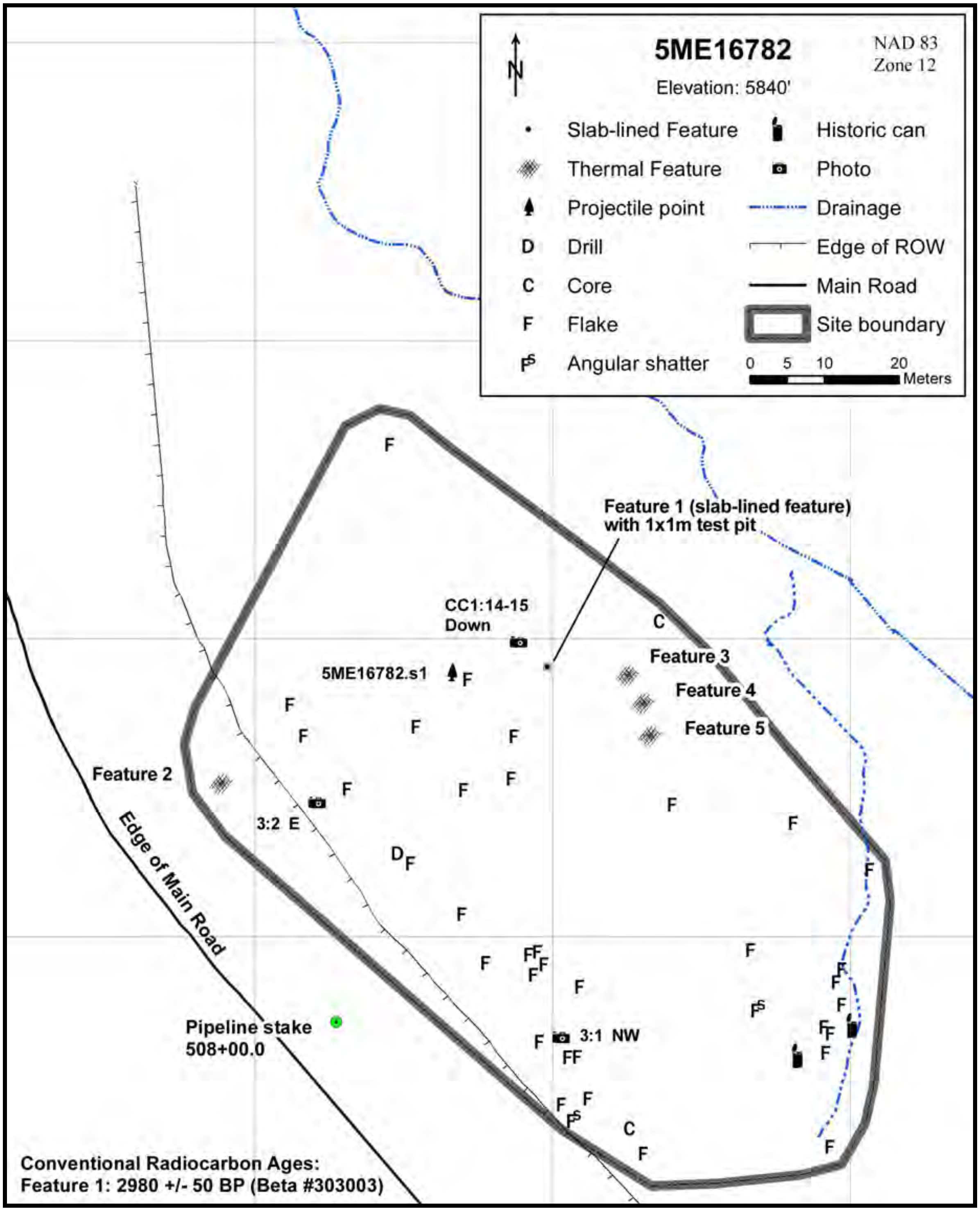



**Figure 5.8-1.** Site map from surface survey.

The upright slab-lined feature was later designated as Feature 1, and the ash stain with fire-cracked-rock in the slope graded area was designated as Feature 2. Feature 2 was then salvaged during the pipeline monitoring phase of the project and consisted of the remnants of a fire-cracked-rock filled basin hearth with ash staining and very diffuse charcoal flecking. It was approximately 60cm in diameter and 10cm in depth. Due to the presence of indications for subsurface depth of cultural fill and the undisturbed slab-lined feature, the site was field evaluated as need data and scheduled for testing in 2010. Test excavations were conducted at 5ME16782 on September 15, 16, 24, 27, 2010 by Brian O'Neil, MA of Grand River Institute.

At the start of the 2010 testing operations, the site area was again re-examined for any new surface manifestations. Three heavily eroded clusters of fire-cracked sandstone cobbles, in association with diffuse charcoal/ash stains (Features 3, 4, 5) were identified along the eastern boundary of the site on the eroded dune slope leading down toward the ephemeral drainage. As with Feature 2 on the west side of the site, Features 3, 4, and 5 are approximately one meter below the horizontal plane of the upper surface of the dune deposit. The surface distribution of the majority of the fire-cracked-rock downslope from the charcoal/ash stains indicated that an estimated 80% of all three of the features had been eroded. Consequently no further work was considered necessary.

However, the central portion of the site (around the edges of the dune deposit) appears to be 90% intact and has excellent potential for *in situ* subsurface cultural manifestations that may possibly include architectural features such as house basins (Plate 5.8-2). The diffuse

**Plate 5.8-2.** View of slab-lined feature with loose soil removed.

nature of the dispersed surface lithic scatter and the occasional appearance of additional pieces of fire-cracked-rock across the center of the site support this observation.

### 5.8.2 Field and Analytic Methodology

A 1 x 1m test pit was established around Feature 1, laid out on a true north-south axis, using large half inch diameter steel nails, with the southwest corner of the unit designated as the unit datum. The test unit was on north to northeast sloping ground which dropped an average of about 10cm over 1.4m. The southwest corner unit datum nail was left in place for future reference after the excavation unit was backfilled.

Excavation was by hand and consisted of the removal of all duff and loose surface soil around the exterior of the slab-lined feature, to a depth of approximately five centimeters below the present ground surface (pgs). This was followed by excavation of the interior of the feature by natural soil levels. All dirt was screened through an 1/8 inch wire mesh screen. Charcoal samples were taken from within Feature 1, and sent to Beta Analytic Inc. for analysis. Plan and profile maps along with photographs were taken of the excavation. All documents are on file at the BLM, and the collected artifact will be curated at the Museum of Western Colorado.

### 5.8.3 Results of Fieldwork

Feature 1 was originally identified as a slab-lined pit, or storage cist, on the basis of five widely spaced upright slabs, in a roughly circular arrangement, about 60cm in diameter. Initial clearing of the loose surface soil and juniper duff debris revealed a large sandstone slab cover, or capstone, near the southwest edge of the feature. In addition, there were four smaller horizontal sandstone slabs on the surface to the northeast, and an oval charcoal/ash stain between two of the upright slabs along the northwest edge of the feature, thus indicating that it was a thermal feature (Figure 5.8-2).

#### 5.8.3.1 Feature Fill

Removal of the large capstone revealed an upper hearth fill of light reddish tan loess beneath the slab. Ant trails were visible in the soil immediately beneath the slab, but did not extend more than 4mm down into the lower fill matrix. The large capstone was unmodified, and measured 33cm long, 26cm wide, and 10cm thick. No carbon blackening or thermal oxidation was present on the underside of the capstone. The capstone was aligned along a north-northwest to south-southeast axis and tilted downward to the north, with the south end resting atop another upright slab protruding upward and extending inward toward the center of the feature, and perpendicular to an upright slab along the southern perimeter of the feature. Two other pieces of broken sandstone slabs protruded upward into the light reddish tan loess beneath the slab. This dip to the north of the capstone created a wedge shaped natural deposit of light reddish tan loess with silty alluvium and patchy ash staining that was five centimeters thick on the south end of the feature, and zero to two centimeters thick near the north end.

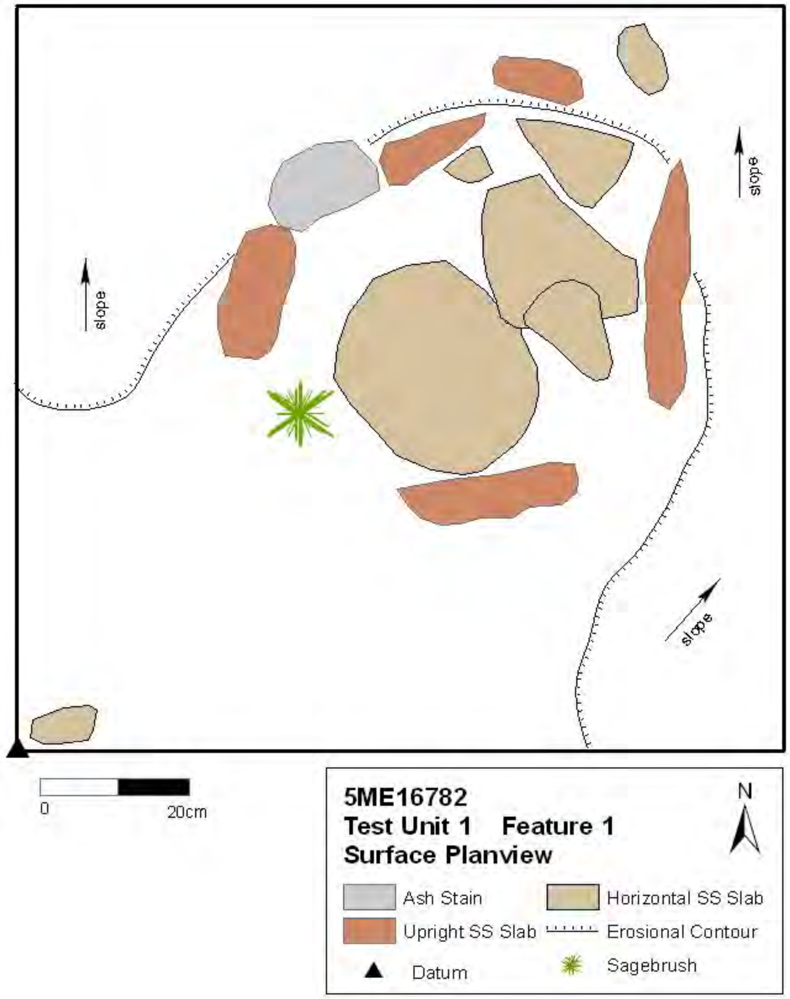



**Figure 5.8-2.**
Feature 1, plan view

The lower fill of the feature was composed of a dark charcoal stained/flecked deposit which ranged between four to six centimeters in depth. Below this were 11 angular pieces of fire-cracked sandstone, all of which were charcoal stained and thermally oxidized. They tended to cluster near the center of the feature. Though the individual cobbles are variable in size, they average about 7 x 5 x 4cm. The size and frequency of the charcoal fragments increased dramatically between the fire-cracked-rock, but the highest density occurred along the base of the slabs which form the south perimeter of the feature, followed by smaller concentrations along the west and east perimeters. A radiocarbon sample was collected from the charcoal concentrations among the fire-cracked-rock as well as from around the outer perimeter, especially along the southern basal wall of the feature. Below the fire-cracked-rock layer was a dense lens of charcoal/ash about five to ten millimeters thick which rested atop a large sandstone slab in the bottom of the feature (Figures 5.8-3, Plate 5.8-3 and 5.8.4).

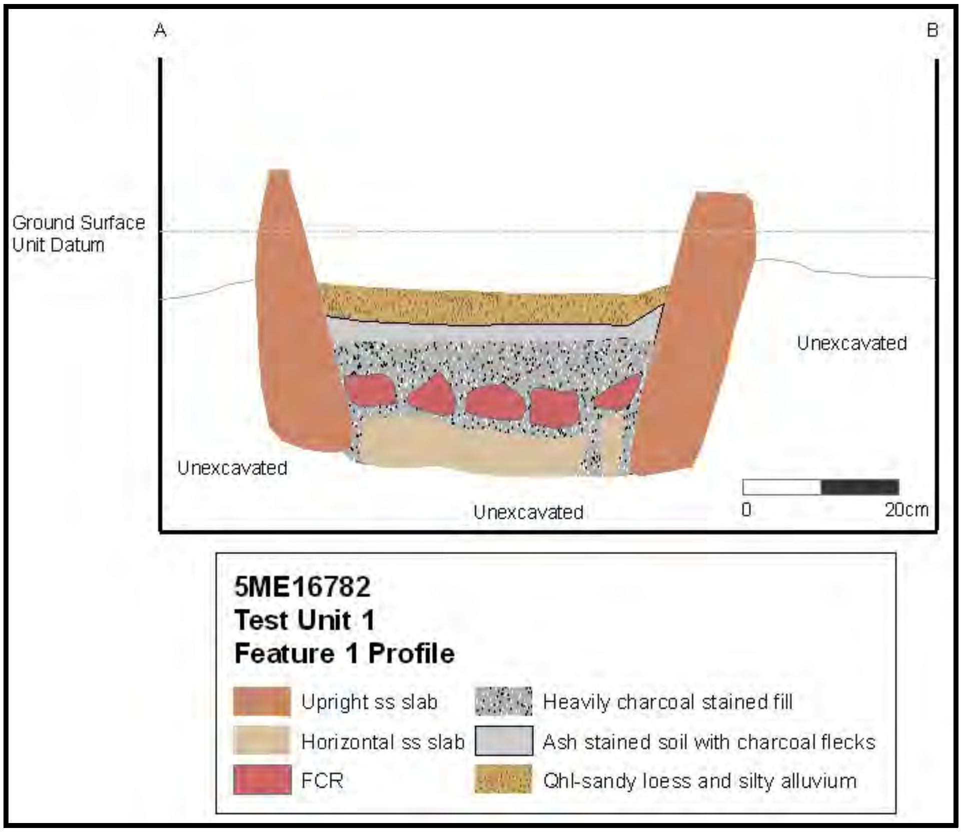



**Figure 5.8-3.** Feature 1, profile illustration.

**Plate 5.8-3.** Feature 1, fill removed.

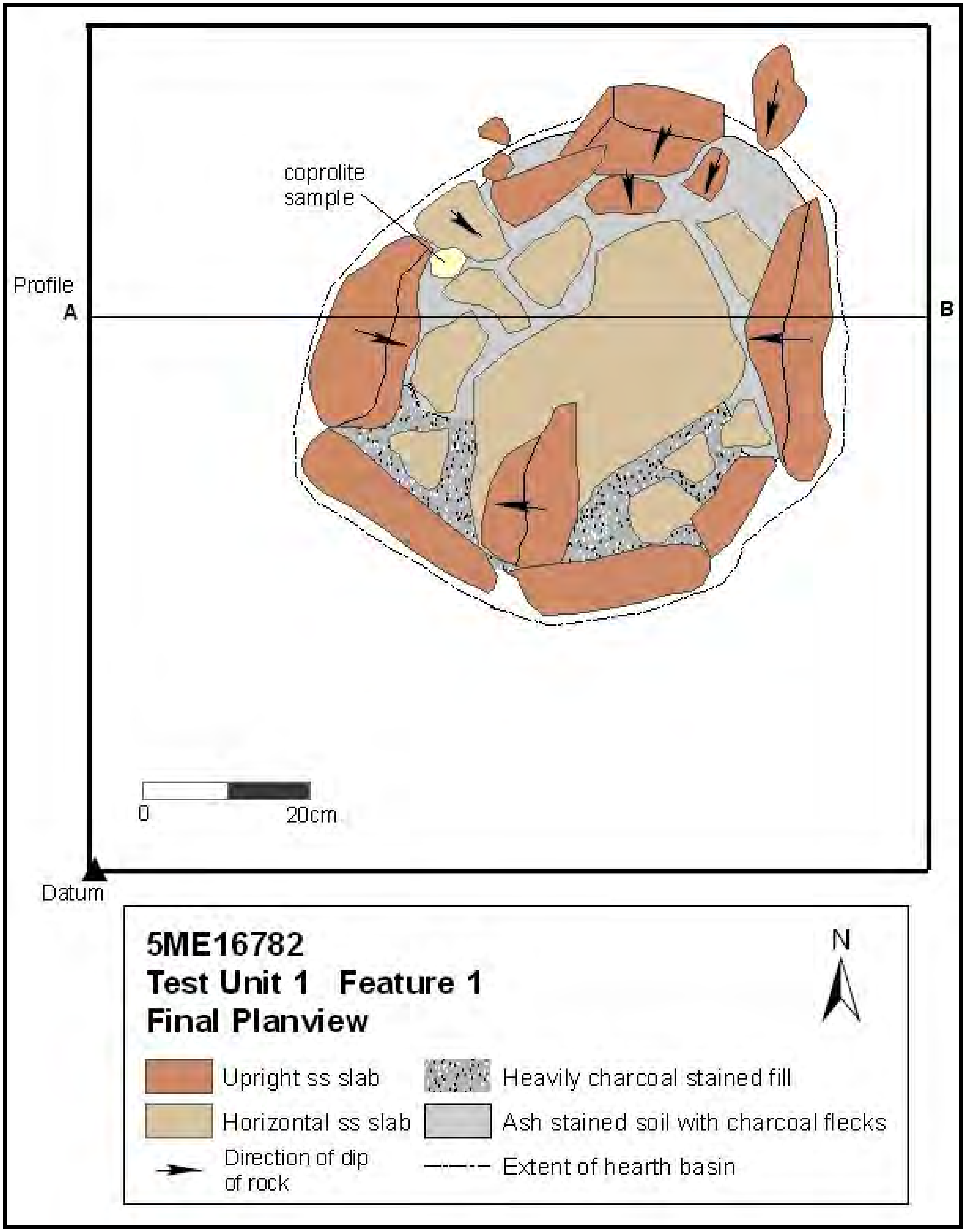



**Figure 5.8-4.** View of Feature 1, final plan view.

5.8.3.2 Feature Structural Aspects

Between 25 - 30% of the structural integrity of Feature 1 has been partially impacted by erosion, primarily on the north and northeast areas of the perimeter. The south 70% is structurally intact. Consequently, the basin outline is circular to oval in shape and roughly oriented along a northeast - southwest axis that is 70cm long, with a cross axis of 58cm.

The perimeter of the southern 70% of the basin is lined with five upright slabs (Figure 5.8-4). These slabs range in size from 30 - 38cm high, 15 - 34cm wide, and 5 - 11cm thick. All are unmodified. The tallest slabs occur on the east and west sides of the basin, and are diametrically opposed. The disturbed north and northeast portion of the slab lining appears to be a composite wall lining consisting of six smaller slabs. The largest of these smaller slabs is still in a partially upright position, with pairs of the smaller slabs of the composite wall lining occurring on either side. The largest slab is 23cm high, 14cm wide, and 5cm thick. The four smaller slabs range in size from 9-16cm long, 8-12cm wide, and 4-5cm thick. None of these four smaller slabs could be fitted together and therefore do not represent broken pieces of larger slabs.

The bottom of the feature is also slab lined and consists of a large unmodified primary slab placed near the center of the basin and oriented along a northeast-southwest axis. It is approximately 45cm long, 22cm wide, and 7cm thick. It is surrounded by eight smaller secondary slabs placed around it to fill in the gaps between the central slab and the interior walls of the slab lined basin. The sizes and shapes of these eight smaller slabs are highly variable, and range from 6-11cm long, 5-8cm wide, and 5-7cm thick.

At the south end of the basal slab, a single vertical slab was placed atop the floor slab, perpendicular to south wall, near the center. This roughly triangular shaped vertical slab is 25cm high, 20cm wide, and has a basal thickness of 10cm, with a top thickness of 6cm. The placement of this vertical slab against the curvilinear south wall of the feature effectively creates two small, roughly triangular (isosceles) shaped bays, one to the east and one to the west. The eastern bay has sides measuring 15cm and 20cm, with a hypotenuse of 30cm. The western bay has sides measuring 12cm and 20cm, with a hypotenuse of 20cm. Approximately 70% of the charcoal recovered from the feature came from these two bays. The aforementioned capstone rested atop this upright slab.

The depth of the feature is problematic due to the varying height of the intact upright slabs, the undulating surface of the basal slab, and any distinct evidence of an occupation surface around the outside of the feature. However, using a combination of measurements on the height of the three lowest intact slabs, coupled with the lichen growth lines present on the three highest slabs, indicates that a functional average depth of the feature was probably about 25cm.

5.8.3.3 Radiocarbon Dating

A standard radiocarbon analysis was performed by Beta Analytic Inc. (Beta-303003) and returned a conventional radiocarbon age of 2980 ±50 BP, with a 2 sigma calibrated result (95% probability) of Cal BC 1380 - 1040 (Cal BP 3330 to 2990). Three intercepts of the radiocarbon age with the calibration curve resulted in dates of Cal BC 1250 (Cal BP 3200) and Cal BC 1240 (Cal BP 3190) and Cal BC 1220 (Cal BP 3170).

The 340 year span of the 2 sigma calibrated result (Cal BC 1380 - 1040), coupled with the three intercepts of the radiocarbon age with the calibration curve, tends to indicate a problem with the cross section effect. Therefore, for the purposes of this report, the Cal BC 1240 (Cal BP 3190) will be used as the operative target date, and acceptable event horizon date.

5.8.3.4 Coprolites

Six measurable fragments of oblong, cylindrical, baked clay cast molds were recovered at the base of one of the upright slabs on the northwestern perimeter of Feature 1 (Figure 5.8-4). The interior dimensions of the mold casts range in size from 9 to 15mm long, and 7 to 9mm in diameter. The thickness of the mold casts is also variable, from 1mm at the equator of the mold casts to 1.5 mm at the cupule shaped ends. Based upon the number of paired end cupules, a minimum number of four individual (MNI) animals is represented by the casts. The partial remains of the interior content of one of the casts was recovered and available for examination. Utilization of a binocular microscope, under 15X and 30X magnification, revealed carbonized vegetable fibers, seed fragments, a pine needle fragment, and insect casings, plus hydrophyte mineral fragments and a fragment of an Ostracoda carapace from the ingestion of river water. The overall dimensions and identifiable contents indicate that these are probably deer dung coprolites (James C. Miller, personal communication 2011). Whether these coprolites represent a post occupation intrusion into the feature, or were placed there deliberately is unknown. However, why each of the individual coprolites would be encased in a thin coating of mud and placed within the perimeter of the slab lined hearth where they could be baked seems incongruous with an accidental post occupation intrusion into the feature.

5.8.3.5 Projectile Point

A single diagnostic projectile point was collected from the site during survey in 2009 (Plate 5.8-4; Appendix C). Specimen 5ME16782.s1 is made from a light brown/tan flake of porcellanite. It has a triangular blade with collateral flaking, an expanding stem, and a convex base. The tip of the blade exhibits a hinged snap fracture, and it is estimated that approximately 35% of the blade is missing. The left shoulder is slightly down swept coming to

a sharp point, while the right shoulder is straight and nearly perpendicular to the long axis, with
a slightly rounded point. Both notches lack evidence of grinding. Shoulder width is 5.4mm on the right shoulder, and 6.0mm on the left shoulder. Maximum length is 32.6mm, maximum width at the shoulders is 22.8mm, and maximum thickness at the notch apex is 4.1mm. Stem length is 10.2mm. Stem width at the notch apex is 10.9mm. There is a snap fracture present on the left side of the basal convexity. Consequently, the current maximum basal width is 15mm, though symmetry analysis of measurements taken from the longitudinal axis of the specimen indicate it may have originally been 17mm. Basal thickness is 2.4mm, and the base is thinned, but lacks evidence of grinding. Both the transverse and longitudinal cross sections are plano convex. The point compares well with points from the Ironstone Phase of the Uncompahgre Complex (Buckles 1971:1220), but also to those recovered from 5ME635 (Alexander and Martin 1980). While Buckles assigns a date of ca. AD 1-700, excavations at 5ME635 pushed that back to ca. 1480-800 BC.

**Plate 5.8-4.** Collected artifact.

**5.8.4 Evaluation of Research**

The slab-lined thermal feature designated as Feature 1 was constructed according to a formal design and thoughtful execution, as evidenced by the intact southern 70% of the feature. Considerable effort was made to find, collect, and transport the sandstone slabs to the location of the feature. The most likely source for the slabs is among the sandstone outcrops that are located in the intermittent drainage about 30m to the east of the site.

5.8.4.1 Site Function and Technology

Based upon the available data, the feature was constructed by first excavating a circular to oval shaped basin approximately 70cm long, 58cm wide, and 30cm deep, and roughly oriented along a northeast - southwest axis. Next, the perimeter of the southern 70% of the basin was lined with five unmodified upright slabs, with the tallest of the slabs being placed on the east and west sides of the basin in diametrically opposed positions. Then the bottom of the feature was lined with a large unmodified primary slab placed near the center of the basin and also oriented along the northeast-southwest axis. It was then surrounded by eight smaller secondary slabs placed around it to fill in the gaps between the central slab and the interior walls of the slab lined basin. The disturbed northern and northeastern portion of the slab lining appears to be a composite wall consisting of six smaller slabs. The largest of these smaller slabs is still in a partially upright position, with pairs of the smaller slabs of the composite wall lining occurring on either side. None of the four smaller slabs could be fitted together and do not represent broken pieces of larger slabs.

Once the lining of the walls and floor was completed, a single 25cm high vertical slab was placed atop the floor slab at its south end and perpendicular to south wall, near the center. The placement of this vertical slab against the curvilinear south wall of the feature effectively created two small, roughly triangular shaped bays, one to the east and one to the west.

A fire was then started in the feature which resulted in a dense lense of charcoal/ash about 0.5 - 1.0cm thick atop the large sandstone slab in the bottom of the feature. A layer of angular pieces of sandstone was then added, clustered near the center of the feature. Additional fuel was then added. This resulted in a deposit of 11 angular pieces of fire-cracked sandstone, all of which were charcoal stained and thermally oxidized. The size and frequency of the charcoal fragments increased dramatically between the fire-cracked-rock, but the highest density occurred along the base of the slabs which formed the south, west, and east perimeters of the feature. Approximately 70% of the charcoal recovered from the feature came from the two bays formed by the upright slab placed against the curvilinear south wall.

It is assumed that whatever was to be roasted or baked was then either placed directly atop the deposit of 11 angular pieces of fire-cracked sandstone clustered near the center of the feature, or within the four to six centimeters of heavily charcoal stained/flecked soil deposit which over laid the fire-cracked sandstone. In either case, the removal of the cooked food stuff(s) did not alter the clearly stratified deposits in the very bottom of the hearth. This is further supported by the two centimeter thick deposit of ash stained and charcoal flecked soil which sealed the lower deposits of the feature (Figure 5.8-3). The fire appears to have been allowed to burn out on its own.

Finally, an enigmatic large sandstone slab capstone was present on the surface near the southwest edge of the feature. It was aligned along a north-northwest to south-southeast axis, with a downward tilt to the north. The south end rested atop the upright slab which formed the divide between the two charcoal filled bays along the southern wall. The capstone was unshaped, and no carbon blackening or thermal oxidation was present on the underside of the capstone. It is possible that the capstone may have been involved during the cooking process, serving as a crude lid much like a modern Dutch oven. Otherwise, there seems little reason to place the 25cm high upright slab against the southern wall which supported the southern end of the capstone. However, the absence of any thermal alterations on the capstone would seem to preclude this. Furthermore, the presence of a wedge shaped deposit of light reddish tan loess with silty alluviums and patchy ash staining beneath the capstone, along with four smaller horizontal sandstone slabs on the surface to the northeast, tends to suggest that the capstone was added later, perhaps as part of a formalized closing of the hearth, or as an effort to protect it for future re-use. The upper fill composed of loess and silty alluvium deposits beneath the capstone occurred after the use of the hearth, and subsequently filled in the remainder of the entire slab lined basin, allowing for its intact preservation.

Though this specific type of thermal feature definitely indicates a greater processing of resources within the subsistence base, its association with a specific floral or faunal resource has not yet been clearly delineated. More research needs to be performed in this area.

5.8.4.2 Cultural Affiliation

Radiocarbon date ranges on slab-lined hearths within the large regional context of the Northern Colorado River Basin exhibit a broad temporal range extending from the early Archaic Era through the Formative Era (ca.7500 - 500 BP). Reed and Metcalf (1999:82, 84) illustrate bimodal peak occurrences at ca. 6500 - 7000 BP and 1000 - 1500 BP, with many of the earliest dates appearing in the Gunnison Basin (Stiger 2001). On a smaller, sub-regional scale involving sites in Garfield, Mesa, Montrose, and San Miguel Counties (Conner et al. 2011), an examination of the radiocarbon dates associated with slab-lined hearths reveals a somewhat narrower range between ca. 6000 - 1000 BP, with the highest frequency of occurrence at ca. 2000 - 2500 BP. The conventional radiocarbon date of 2980±50 BP (2 sigma Cal. BP 3330 to 2990) from Feature 1 at 5ME16782 helps to fill the gap in the overall range of this hearth type, thus reinforcing the long term use of this specific thermal feature. With three intercepts on the calibration curve occurring at Cal BC 1220, 1240, and 1250, Cal BC 1240 (Cal BP 3190) should be used as an acceptable event horizon date.

**5.8.5 Evaluation and Management Recommendation**

Excavation of intact thermal features has exhausted the site's potential to yield any additional information important to the prehistory of the region and is therefore field evaluated as not eligible for listing on the NRHP. Accordingly, no further work is recommended.

## 5.9 Site 5ME16784

### 5.9.1 Introduction

Site 5ME16784 was initially observed during 2009 monitoring operations on the Collbran Pipeline. At that time, the location of two apparent features was noted, a charcoal sample was collected and the site was photographed (Plate 5.9-1). Also, a stratigraphic sequence was developed based on the road cut and trench (Figure 5.9-1). The characteristics of the site suggested that it might be a pithouse floor with *in situ* features. Salvage excavations were conducted between May 20 through June 24, 2010, under the supervision of Brian O'Neil, MA. The crew consisted of Lucas Piontkowski, Anastasia Castleberry, Courtney Groff, Stanley Klassert, and Carl McIntyre of Grand River Institute.

Topographically, the buried site is located on the eastern side of a small basin formed by the head waters of Smith Gulch and Horsethief Creek at an elevation of approximately 5675 feet. It is situated on the west side of a small interfluvial ridge between these two drainage heads, near the toe of an alluvial fan formed by a small ephemeral drainage which flows off the side of the ridge just 30m to the east of the site. The location is in an area identified as winter concentration range for mule deer and elk (O'Neil 1993:143,144). Pinyon-juniper trees with sagebrush and native grasses are the predominant vegetation community, though extensive patches of sego lily (Calochortus nuttallii) were observed flowering in the sage/grass community throughout the eastern half of the headwater basin. Bedrock is mudstone and sandstone from the Wasatch Formation. Soils are predominately fine, sandy loam derived from mixed eolian deposits with increasing amounts of clay as the depth of the soils increases.

**Plate 5.9-1.** View of pipeline trench, 2009. Flags indicate Feature 1 location.

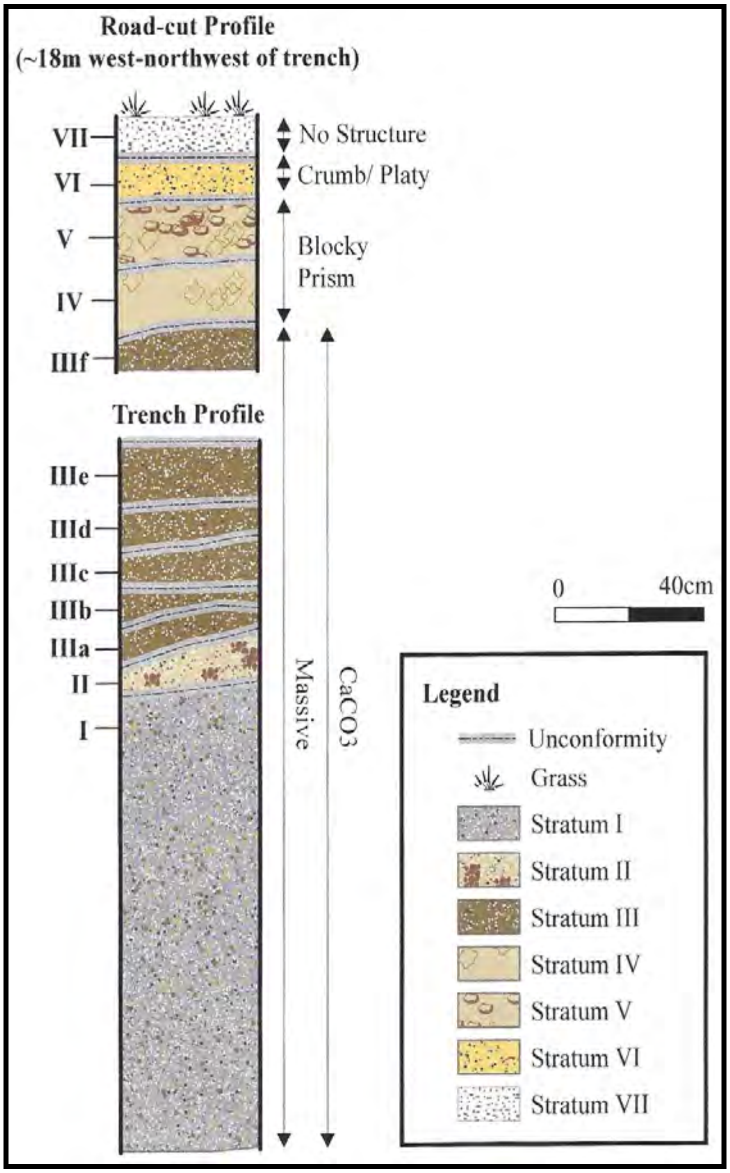



**Figure 5.9-1.** Stratigraphic profile of road cut and trench.

### 5.9.2 Field and Analytic Methodology

An east-west base line was established on the surface, above the UTM coordinates taken on the hearth feature during the monitor, and an exploratory 1.5 x 3.0m trench was laid out perpendicular to the gas pipeline trench. Excavation of the exploratory trench revealed that during the intervening months between the construction of the initial gas pipeline and the salvage excavations, another trench for a water pipeline had been excavated approximately 2.4m to the east of the gas pipeline, causing further damage to the site (Figure 5.9-2). Consequently, the intact area of the site available for data recovery was now limited to a 2.3m wide strip between the two north-south trending pipeline trenches.

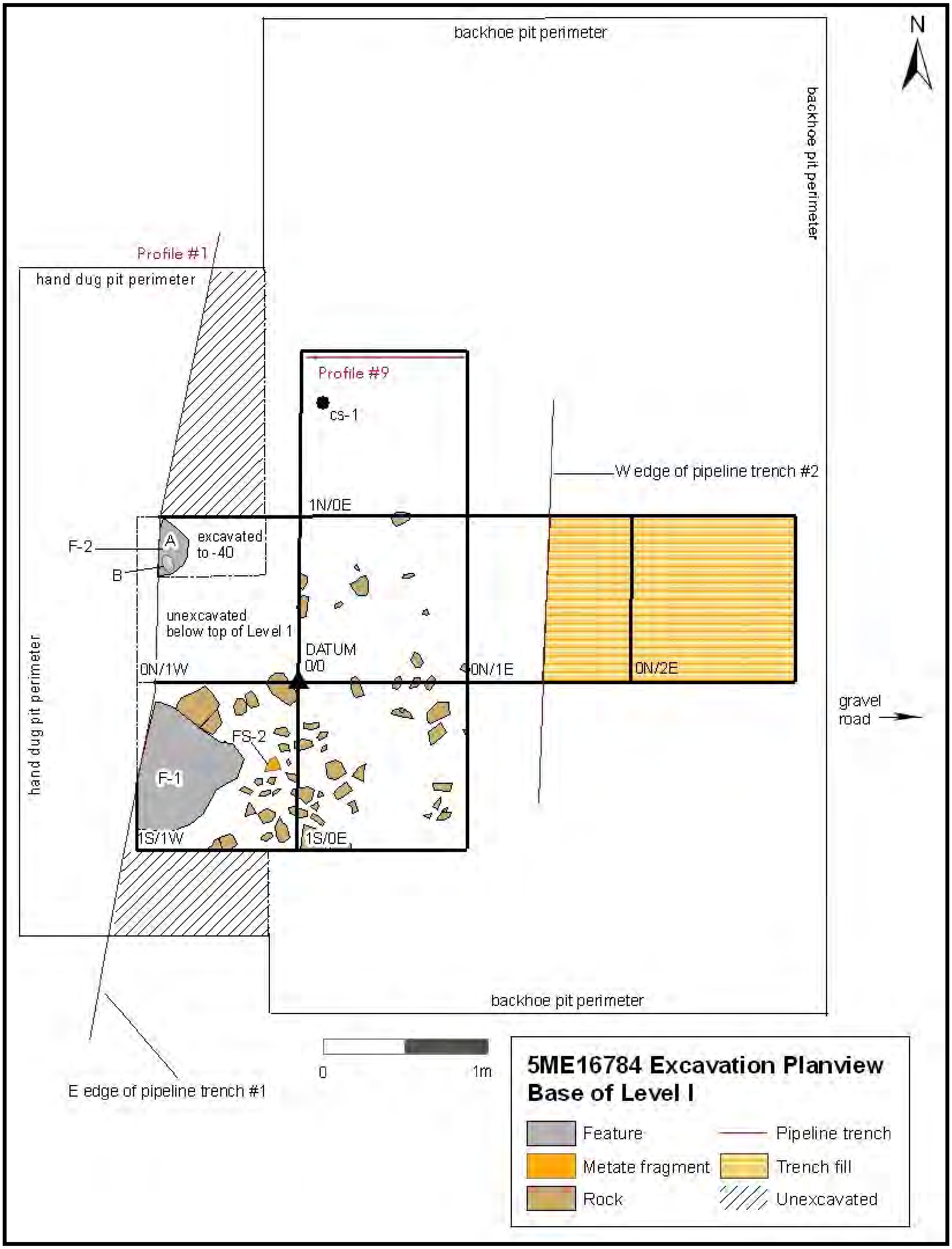



**Figure 5.9-2.** Excavation plan view with profile locations.

Excavation of the trench also confirmed the presence of culturally sterile soil above the targeted occupation horizon, to a depth of 1.2m below the present ground surface (bpgs). Further testing in a 1 x 1m unit at the west end of the trench confirmed the presence of the charcoal flecked horizon at a depth of 1.3m bpgs. Subsequently, a small backhoe was used to remove the overburden to a depth 1.2m bpgs over a 21 square meter area approximately 6m north-south by 3.5m east-west. A site datum was established inside the backhoe excavated block area; near the location of the hearth feature. A true north oriented 1 x 1m grid system was established at the 1.2m bpgs level, and the datum was designated 0N/0E. The unit datums for each of the 1 x 1m excavation units were arbitrarily designated as the southwest corner. A total of seven excavation units were originally laid out and include: 0N/0E; 0N/1E; 0N/2E; 1S/0E; 1N/0E; 1S/1W; and 0N/1W (Figure 5.9-2). The east half of unit 0N/1E and all of unit 0N/2E consisted of disturbed fill from the water pipeline trench. Consequently, unit 0N/2E was abandoned and only the west half of unit 0N/1E was excavated.

Excavation was by hand in arbitrary 10cm levels, unless natural levels could be identified. Vertical control was by line level based on the primary datum at 0N/0E set at 1.2m bpgs. Overall, individual excavation units varied in depth between 10 to 40cm below the datum plane established at 0N/0E, with excavation Level 1 between 1.2m and 1.3m bpgs and excavation Level 2 between 1.3m and 1.4m bpgs, and so on. All dirt was screened through ⅛-inch wire mesh. Radiocarbon samples were collected from Feature 1, as well as from the contact zone between excavation Levels 1 and 2.

Excavation Level 1 generally corresponds with geomorphological unit III-C, and excavation Level 2 generally corresponds with geomorphological unit III-B. Geomorphological unit III-B is non-contiguous across the excavation area (Figure 5.9-3).

### 5.9.3 Results of Fieldwork

The Feature 1 hearth basin and the Feature 2 U-shaped basin in the original pipeline trench wall were both relocated and excavated (Figure 5.9-3). Both features were incomplete, having been bisected by the pipeline trench. A total of 5.5m² were excavated between the two pipeline trenches in an attempt to find the hypothesized house basin identified during the pipeline monitor. However, no identifiable outline or prepared living surface of the hypothesized house basin could be discerned through distinct changes in soil color, composition, or compaction. Though a very diffuse charcoal flecking was present in excavation Level 1, it was primarily confined to a sheet flow of sub-angular coarse to medium grained sand mixed with silt, small spalls, pebbles, and rounded to sub-rounded sandstone talus fragments. Soil character and content were highly variable within each unit and across the five excavation units on the site, with multiple dips, strikes, and elevations present among the larger talus fragments, mixed with pebbles, coarse sands, and fine silts. This poorly sorted material is indicative of a series of sheet flows and braided rills with cut and fill cycles created by highly variable flow volumes typical of a position at the base of the toe slope of a small alluvial fan. This was particularly evident at the north edge of the excavation in the profile of the north wall of unit 1N/0E (Figure 5.9-4).

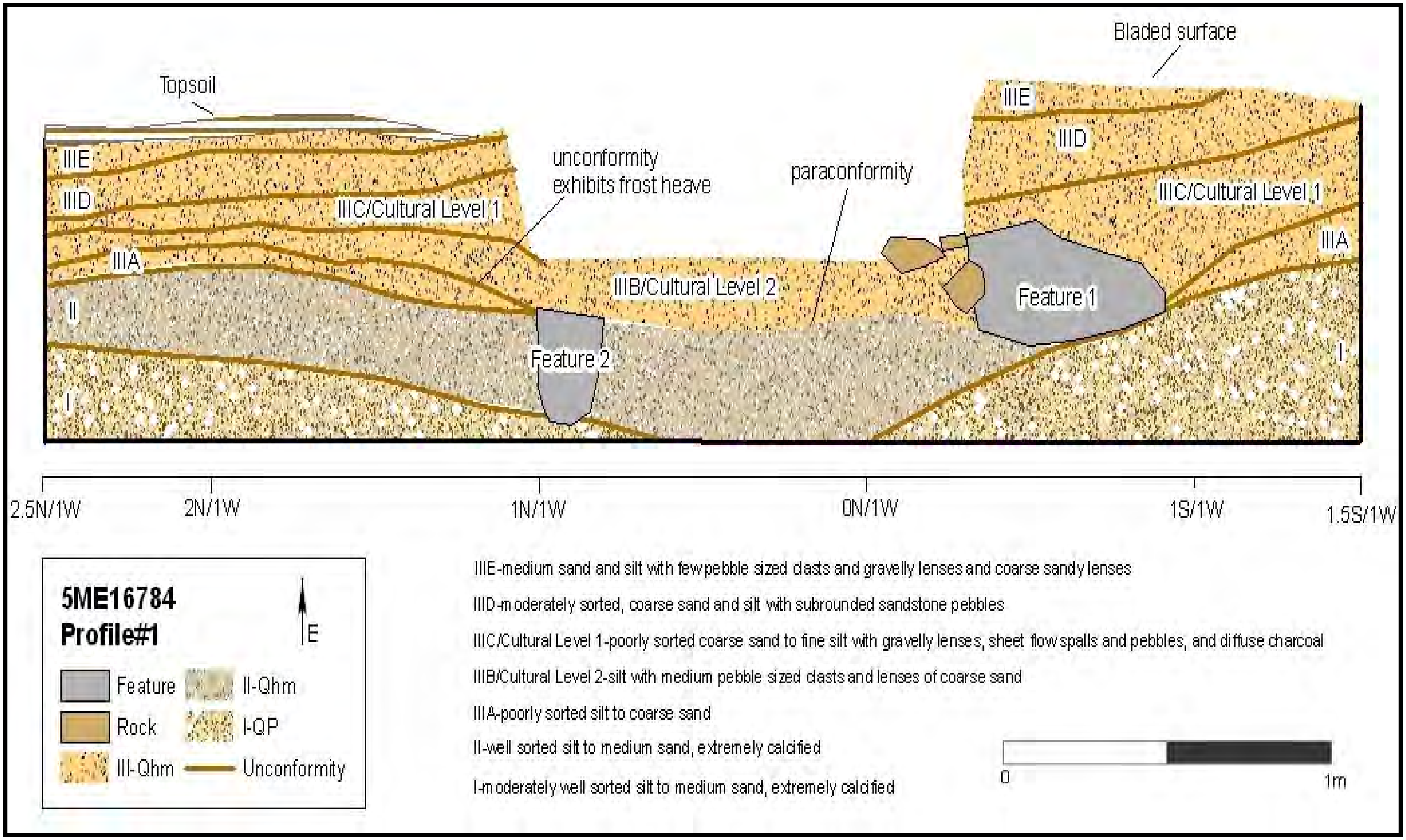



**Figure 5.9-3.** Profile view of trench showing Features 1 and 2.

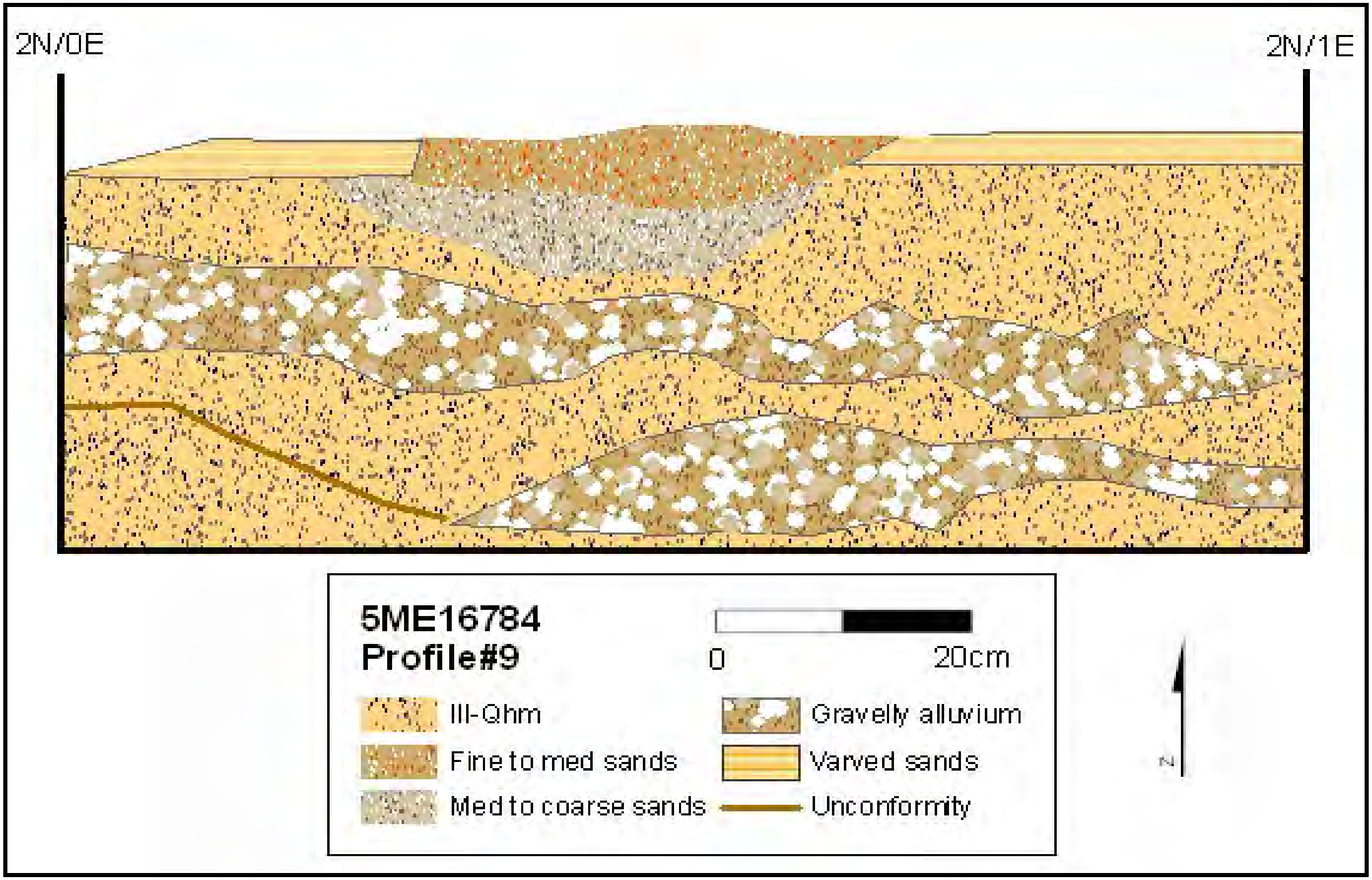



**Figure 5.9-4.** Profile #9 showing mixed soils from sheet flows.

5.9.3.1 Feature 1

Feature 1 is primarily located in the western half of unit 1S/1W. In plan view, Feature 1 appears to have been an irregularly shaped, circular to oval excavated basin (Figure 5.9-5). It is estimated that between 50 to 60% of the feature had been destroyed during excavation of the pipeline trench. However, the eastern half of the feature remained fairly intact, with the outline remnants measuring 75cm north-south by 50cm east-west, with a basin depth of 18cm. At a depth of 10 to 11cm in excavation Level 2 (10-20cm), a distinct ash stain was present at the surface of the feature and extended from the northern rim around the eastern edge to the southeastern rim. Two large sandstone slabs remained *in situ* on the northern edge of the feature, along with five smaller sandstone slabs scattered along the northeastern to southeastern rim. Immediately to the east of the feature, in Level 1 (0-10cm), was a jumbled concentration of smaller sandstone slabs with differential dips, strikes, and elevations, which extended into the adjacent excavation unit 1S/0E (Plate 5.9-2). In profile, the basin of Feature 1 contained a large, generally triangular shaped sandstone rock approximately 18x17x10cm located near the bottom of the basin, set just off center to the north. This cobble was photo documented during the original pipeline monitor and profile. Unfortunately, the large rock shifted out of place prior to making the final drawings. However, charcoal staining was present on the calcium

**Plate 5.9-2.** View of sandstone slab concentration.

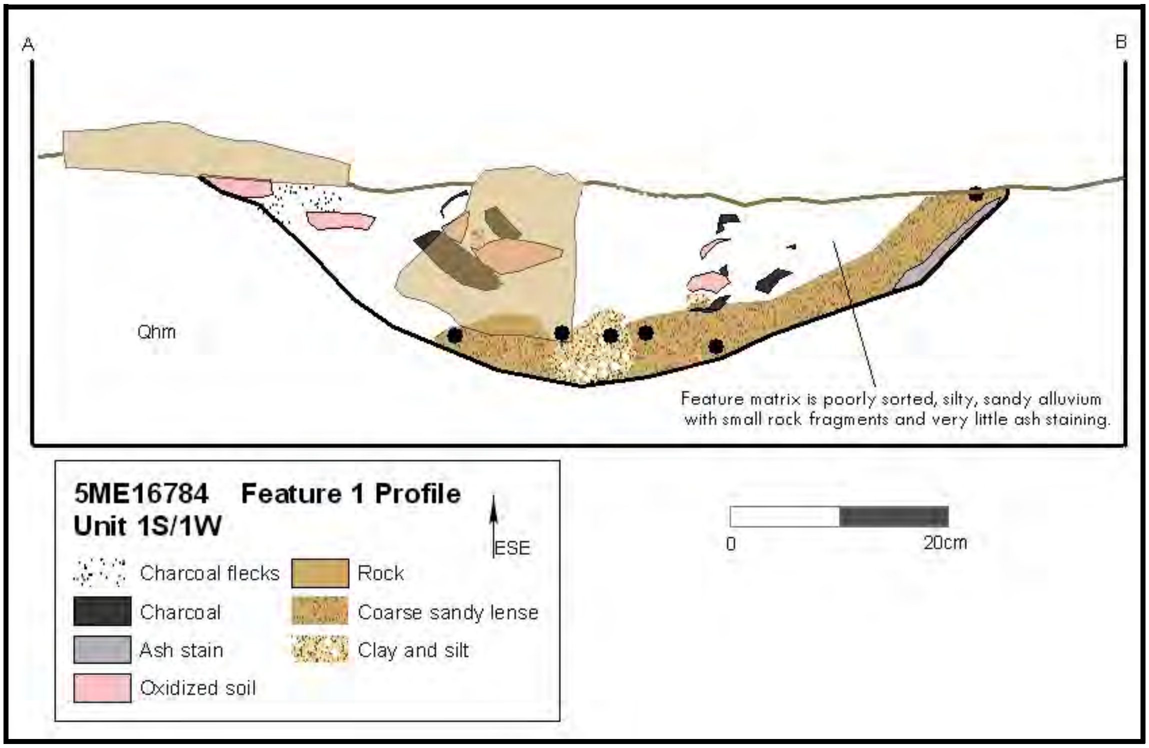



**Figure 5.9-5.** Feature 1 profile view.

carbonate rind at the back of the rock, derived from contact with two large charcoal chunks which were adjacent to it within the fill matrix. No thermal oxidation rind was evident on the rim, walls, or bottom of the basin, though a thin ash stain was present near the rim on the southern edge of the basin.

The upper and central fill of Feature 1 was 95% poorly sorted, silty, sandy clay alluvium with small talus fragments. The color was a light reddish brown (2.5YR 5/4). Very little charcoal or ash staining was present, but a few small charcoal flecks (1mm) were observed. Most of the charcoal appeared as isolated chunks ranging from 5-10mm in size and suspended within the feature fill. A few large pieces of charcoal ranging from 5-10cm in size were randomly scattered within the fill, and were often associated with thermally oxidized soil either laterally adjacent or above the charcoal, rather than below, which may indicate that the oxidation occurred upon burial of the hot coals. In addition, there are small pockets of thermally oxidized soil floating within the matrix with no associated charcoal (Plate 5.9-3).

The lower basal and central fill of Feature 1 exhibits a coarse sand lense which extends downward from the southern rim of the basin into the center. A few small charcoal flecks (1mm) were widely scattered within the coarse sand lens. A 7.5cm diameter tan silty clay deposit is present at the bottom center of the basin and bisects the coarse sand lens. Three smaller 2-5cm diameter tan silty clay deposits are also present within the feature fill and all four may represent post burial intrusive rodent activity.

5.9.3.2 Feature 2

This feature, also located in excavation Level 2, is poorly defined. Identified by discontinuities in the trench wall soil profile it was originally hypothesized as a possible storage feature. The feature's remnant dimensions are approximately 20cm north-south by 16cm east-west, but it may have been as large as 30cm in diameter and 25cm deep. The feature fill differentiates between the east and west halves of the feature. The east half is composed of fine grained silt and very fine grained sand with a moderate charcoal stain mixed with some 8mm sized charcoal flecks. The west half is poorly sorted, ranging from silt sized particles to 1.0cm very coarse sub-angular sand to fine pebbles. The bottom three to five centimeters of the fill in Feature 2 is composed of small, pebble sized gravels.

Based upon the inadequacy of the current data set, Feature 2 appears to be a either a very severely disturbed cultural feature or a natural feature such as an animal burrow/den.

**Plate 5.9-3.** Thermally oxidized soil and charcoal within Feature 1 matrix.

5.9.3.3 Radiocarbon Dating

In 2009, a charcoal sample was taken from the bottom of Feature 1 (at contact between stratigraphic Levels I and II). It produced a calibrated radiocarbon date of 2340±60 BP with calibrated intercepts at 720-700 BC, 540-360 BC, and 290-240 BC (Beta-263483). Two other charcoal samples were collected from Test Unit 1N/OE. Charcoal was sitting in coarse sandy soils (Level III D) that were mostly disturbed with visible track marks from pipeline equipment. The samples came from two small separate concentrations in the fill near the contact zone of excavation Level 1 (0-10cm) and Level 2 (10-20cm), located approximately 2.5m north-northeast of Feature 1, and 1.25m northeast of Feature 2. The first sample (Beta-303004) was collected from Level I at a depth between 8-10cm below datum in Test Unit 1N/OE, and returned an AMS conventional radiocarbon age of 3070±30 BP, with two sigma calibrated results of Cal 1410-1270 BC. There were three intercepts with the calibration curve at 1380 BC, 1330 BC, and 1330 BC. The second sample (Beta-303005) was collected from Level II at a depth between 10-12cm below datum in Test Unit 1N/OE, and returned an AMS conventional radiocarbon age of 3130±30 BP, with two sigma calibrated results of Cal 1450-1380 BC and 1330 BC. The latter two dates are from the upper fill of the site and represent redeposition of charcoal – probably the result of a wildfire event that occurred in the higher elevations about 3100 years ago, and a subsequent sheet flood episode that redeposited the charcoal. Interestingly, a mudflow event was recorded at Battlement Mesa Community sometime between 2900 and 3100 years ago (Chapter 2, Figure 2.1, p. 2-14).

5.9.3.4 Artifacts

Only two artifacts (.fs2 and .fs3) were found during the entire excavation (Appendix C). Specimen 5ME16784.fs2 is a 17x10x4cm piece of shaped sandstone slab that may have been a metate fragment. It was found in the rock pile associated with Feature 1. The proximal face is flat to very slightly concave (1mm). However, the proximal surface is heavily weathered and no smoothed surface, polish, or striations could be identified under 10X magnification. An irregular shaped 5x4cm patch of calcium carbonate stain is present near the center of the specimen. The proximal edge has been bifacially rounded, shaped by battering in association with negative flake spalls. The dorsal surface is highly irregular and weathered, with approximately 50% of the surface covered by a calcium carbonate rind. A small area of charcoal staining is present near the center, and it appears that the slab fragment was used as part of the covering over the top of Feature 1. The second specimen is a mudstone cobble core.

### 5.9.4 Evaluation of Research

Based upon the available data, Feature 1 is interpreted as a baking or roasting pit, and is estimated to have been 75-80cm in diameter and 18-20cm deep. A very distinct ash stain marked the approximate surface manifestation of Feature 1 between 10 to 11cm in the top of excavation Level 2 (10-20cm) and extended from the northern rim around the eastern edge to the southeastern rim. The pit appears to have been covered by an indeterminate number of sandstone slabs, though six sandstone slabs were found *in situ* around the eastern edge of the hearth. When the baking pit was opened, the slab cover was, at least partially, raked away from west to east, and at least 47 broken slab fragments were deposited within the charcoal peppered excavation Level I to the east of the hearth, in a scatter with multiple dips, strikes, and basal elevations. The large triangular sandstone cobble near the center of the feature may have served as a passive/radiative heat source, though no thermal oxidation was readily apparent to indicate that it was heated in a fire.

Once the contents of Feature 1 were removed, the hearth basin was apparently left open. This was indicated by the fact that the fill of the hearth was heavily disturbed, with no indications of use/event stratification. Very little charcoal or ash-staining was present, and a three to five centimeter thick coarse sand lens was present in the bottom of the hearth basin, indicating that a small, low volume, alluvial event flowed into the bottom of the open basin. This was overlain by a fill that is a poorly sorted, light reddish-brown, silty, sandy, clay alluvium with small talus fragments. Charcoal fragments ranging in size from 1mm to 8cm in length are randomly distributed within this matrix along with irregular and dispersed patches of thermally oxidized soil. Additionally, there are several 2-7.5cm oval to circular, tan, silty clay deposits present within the feature fill, which represent subsequent in-filling of post burial intrusive rodent activity.

Consequently, based upon the composition of the alluvial deposits within the hearth basin, Feature 1 probably represents a later intrusion through an earlier depositional event. The absence of any artifacts within the 5.5m² excavation area, with the exception of the possible metate fragment found among broken sandstone slabs in Level 1, suggests that the charcoal flecked deposits in excavation Level 1 are likely naturally occurring, as Level 1 was primarily confined to a sheet flow of subangular, coarse-to-medium grained sand mixed with silt, small spalls, pebbles, and rounded to sub-rounded sandstone talus fragments.

Furthermore, soil character and content was highly variable within each excavation unit and across all five of the excavation units on the site, with multiple dips, strikes, and elevations present among the larger talus fragments, mixed with pebbles, coarse sands, and fine silts. This poorly sorted material is indicative of a series of sheet flows and small braided rills with cut and fill cycles created by highly variable flow volumes typical of a position at the base of the toe slope of a small alluvial fan. This was particularly evident at the north edge of the excavation in the profile of the north wall of unit 1N/0E (Profile #9, Figure 5.9-4). Consequently, if an ephemeral architectural feature, or an earlier occupation, was originally present on the site, the archaeological evidence has been severely compromised by over two millennia of subsequent alluvial impacts and recent pipeline construction activities.

### 5.9.5 Evaluation and Management Recommendation

Excavation has exhausted the scientific potential of the site. Furthermore, variable soil characteristics and the alluvial nature of the deposits in the vicinity have greatly impacted the integrity of the cultural components. The site is field evaluated as not eligible for listing on the NRHP. Accordingly, no further work is recommended.

## 5.10 Site 5ME16786

### 5.10.1 Introduction

Site **5ME16786**, a multi-component prehistoric architectural site, lies at an elevation of 5680 feet on an undulating plain near the base of Battlement Mesa. The Grand Mesa lies to the south and the Colorado River to the west. Across the river valley, and to the north and west, is the Roan Plateau. The vegetation consists predominantly of sagebrush, rabbitbrush, biscuitroot, and native grass. The surrounding slopes are covered with pinyon and juniper. Soils are a tan loess of fine to coarse sand and silt (Plate 5.10-1).


**Plate 5.10-1.** Overview of site area, view southwest. Arrow points to excavation block in the pipeline corridor. Dry wash (photo left) was likely the water source for the site. [Google earth capture: 2013 map.]

The site, initially observed during monitoring operations, was identified by the bisection of a pit-structure, a possible hearth, and two prominent charcoal lenses (Figures 5.10-1 through 5.10-3). These were exposed at different depths in the trench walls. The features were described as follows:

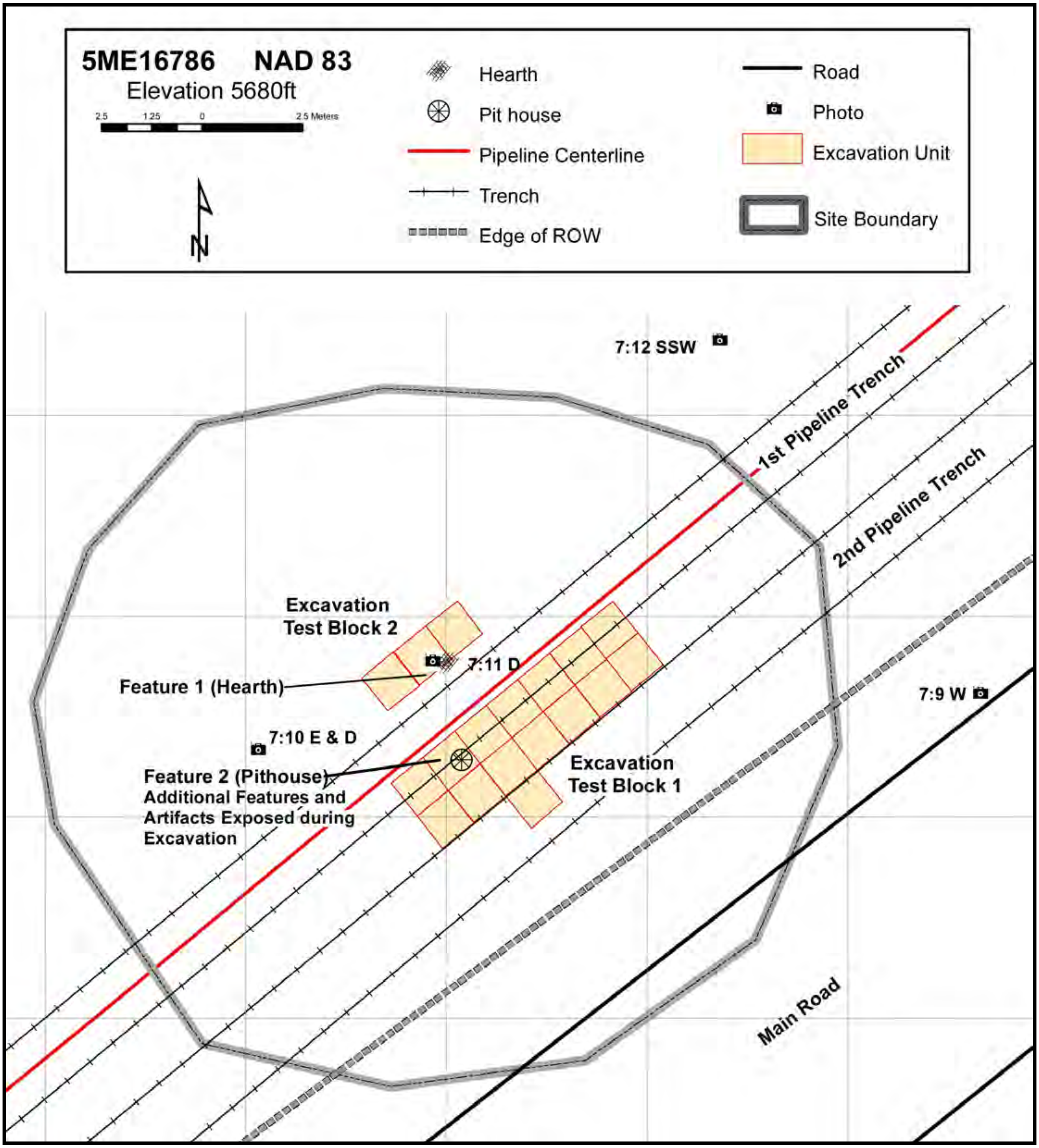



**Figure 5.10-1.** Site map showing area of discovery of the pithouse along the 1st pipeline trench, the impact area of the 2nd pipeline trench, and the excavation blocks to recover data from the remaining pithouse deposits.

The pit-structure was identified approximately 100 to 110cm below the bladed surface in the northwest and southeast walls of the trench. It consisted of a faint, lenticular ash stain that measured roughly 3.8m in diameter and 20 to 40cm in depth. The possibility of interior features was evinced by a faint, basin-shaped anomaly along the floor of the structure. This anomaly was speculated to be the central hearth, and a charcoal sample was collected and sent to Beta Analytic in Miami Florida for processing. The sample yielded a conventional radiocarbon date of 2760±70 BP (Beta No. 263484). This date concurs with the speculated antiquity of the pit-structure which was obtained through relative dating techniques (i.e., stratigraphy). Final observations at the site include an area of oxidized sediment below the floor, on the up-slope plain of the pit-structure. This circumscribed area of oxidized sediment was interpreted to be indicative of either a winter or spring occupation.

The possible hearth was identified in the northwest wall of the trench at a depth of 84cm below the bladed surface. It measured approximately 1m in diameter and 5 to 10cm in depth. Ash deposits, fire-cracked rock, and chunks of charcoal were observed. A charcoal sample was collected but proved to be insufficient for dating.

The two prominent charcoal lenses were exposed in the southeast wall of the trench. The lenses were observed to be within 20cm of the pit-structure.

Following preliminary documentation, the Collbran pipeline was installed and buried. Unfortunately, a delay in getting the consultations accomplished resulted in the installation of an additional pipeline adjacent and parallel to the Collbran pipeline, that directly affected the pithouse.

### 5.10.3 Field and Analytic Methodology

Data recovery, conducted over a period of several days beginning in late May of 2010 and terminating in late July of 2010, focused on the excavation of the features previously identified in the trench walls. These features were relocated using a Trimble Geo XT GPS unit. Upon relocation of the features, overburden was mechanically stripped. Mechanical stripping ceased with the identification of the extant undisturbed horizon (i.e., bladed surface) detected at an approximate depth of 40cm below present ground surface. Shovels were used to remove the remaining overburden.

Two non-contiguous test blocks, comprised of multiple 1m² units, were employed in the excavation of the features (Figure 5.10-1). These test blocks were established in relation to the site datum and oriented appropriately along the pipeline trench walls. The 1m² units were referenced by the coordinates (arbitrarily chosen) of their west-corner stake. Vertical control for the excavation of the units was maintained and referenced according to a permanent "Vertical Datum". This datum, the west corner-stake of unit 99X102Y, was established at present ground surface; thus, depth of overburden (approximately 40cm) was subtracted from the measurements.

Hand tools (i.e., trowels, hoes, picks, shovels, etc.) were used to excavate the 1m² units. Excavation proceeded in arbitrary 10cm levels. Contact with sterile deposits dictated the final depth of excavation. Sterile sediment, that without cultural manifestations, was established by the excavation of an additional 10cm to 50cm of soil below the deepest indication of cultural remains.

Excavated deposits, except for those identified as trench backfill or overburden, were screened through 1/4-inch hardware cloth. Deposits excavated from water screen columns were processed through a 1/16-inch mesh window screen. Water screen samples were processed concurrent with excavation in order to aid in the identification of cultural levels.

Artifacts found *in situ* were documented on plan and/or profile maps, recorded by depth below present ground surface, and bagged as individual field specimens. Artifacts and ancillary specimens recovered from screened sediment were bagged in aggregate and labeled by unit and level. Features or potential features were also mapped as well as cross-sectioned, profiled, and described. Feature fill removed during cross-section was bagged in aluminum foil and placed in a plastic bag for reinforcement. If charcoal was present, it was bagged separately. Special precaution was taken to prevent contamination of collected charcoal; charcoal was handled with tweezers and trowels.

Depth and location of cultural rock such as FCR was documented in plan view and used to attempt to discern cultural levels and relationships to features. Strike and dip of the base of each *in situ* rock encountered was recorded to determine the manner in which they were placed in the stratum (ie: natural or cultural influences).

Stratigraphic profiles were drawn to document relationships between the natural and cultural deposits at the site. Sediment grain-size, sorting, edaphic factors (soil structure and caliche), and the geochemical character of the deposits were crucial to discerning these relationships.

Following excavation, all recovered cultural material was transported back to Grand River Institute for processing and analysis. All documents are on file with the BLM, and collected artifacts will be curated at the Museum of Western Colorado in Grand Junction.

### 5.10.4 Stratigraphy

Three strata were identified at the site and were labeled Stratum I through III. For the most part, the deposits consist of laminar bedded, very poorly sorted fine or very fine sand interpreted as loess that drape over the landscape, dipping to the southwest and thinning to the southeast. The individual strata are separated by unconformities identified by thin horizons of coarser particles caused by deflation. The unconformities are lacunas and represent missing stints of time.

Stratum I, the middle Holocene loess (6500 to 4500 years ago), is the lowest in the stratigraphic sequence. It was encountered at an approximate depth of 1m below the bladed surface. In the northwest trench wall, the deposit measures roughly 80cm in thickness. In the southeast wall, it thins to a minimum thickness of about 60cm.

The deposit is pale brown in color and it is composed primarily of fine sand; however, some medium-sized granules are also present. Soil structure is massive to prism due to the greatest degree of weathering and accumulation of secondary minerals such as smectite (a clay mineral), calcite, sulfides, and iron oxy-hydroxides which are also responsible its resistant and violently calcareous nature. Due to the high percentage of smectite clay, the deposit forms dessication cracks. These cracks swell closed when wet; shrink-swell can alter the position of artifacts.

Stratum II, the first late Holocene loess (2800 to 1000 years ago), overlies the middle Holocene loess. This deposit was encountered at approximate depths of 10 to 40cm below the bladed surface. Its thickness is variable; it averages between 70 and 80cm across the site.

The above stratum, Stratum II, consists primarily of brown to dark brown, fine and very fine sand; however, a lens of unconsolidated sheet flow alluvium is present in the northwest wall of the trench. Soil structure varies from strong-blocky to blocky. The deposit is also very calcareous; it too contains a significant amount of secondary minerals which accumulated through the process of illuviation, forming a B soil horizon in the uppermost portion of the stratum. While the B horizon has rendered it most impervious to deflation, the lower portion of the deposit (prior to the formation of the B horizon) appears rather poorly preserved. At least two minor periods of deflation are present.

As illustrated in Figures 5.10-2 and 5.10-3, Stratum II contains the three cultural levels – designated from youngest to oldest as Cultural Levels I through III– previously identified in 2009. All three cultural levels are closely spaced– they are situated anywhere from 5 to 20cm apart in vertical provenance.

Conventional radiocarbon ages were obtained for Cultural Levels II and III. Cultural Level II yielded two dates: 3020±30BP (Beta No. 303008) and 2440 ±30BP (Beta No. 303006). Three dates were obtained for Cultural Level III: 2790 ± 50BP (Beta No. 303007), 2760 ±70BP (Beta No. 263484), and 2620 ±40BP (Beta No. 282180).

Stratum III, the second late Holocene loess (1000 to 1800 years ago), is the next deposit in the exposed stratigraphic sequence. The maximum depth of the stratum is unknown, considering that a portion of the deposit was removed during pipeline construction. The exposed section measures anywhere from 15 to 40cm in thickness.

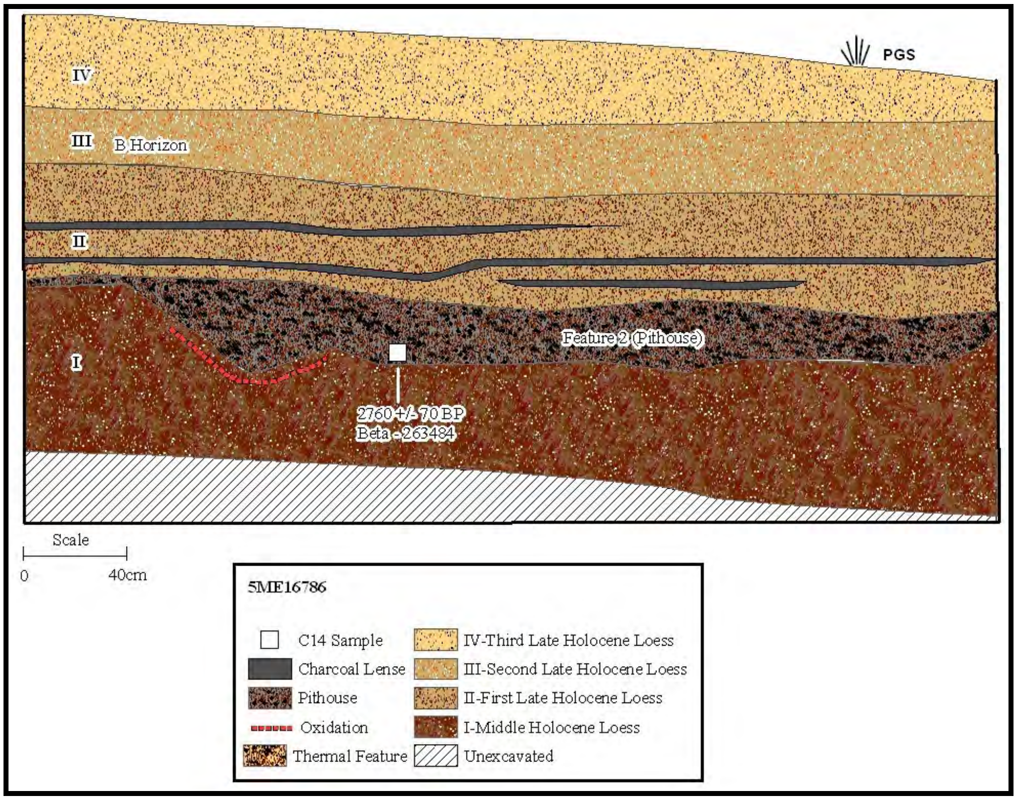



**Figure 5.10-2.** Southeast trench wall stratigraphic profile.

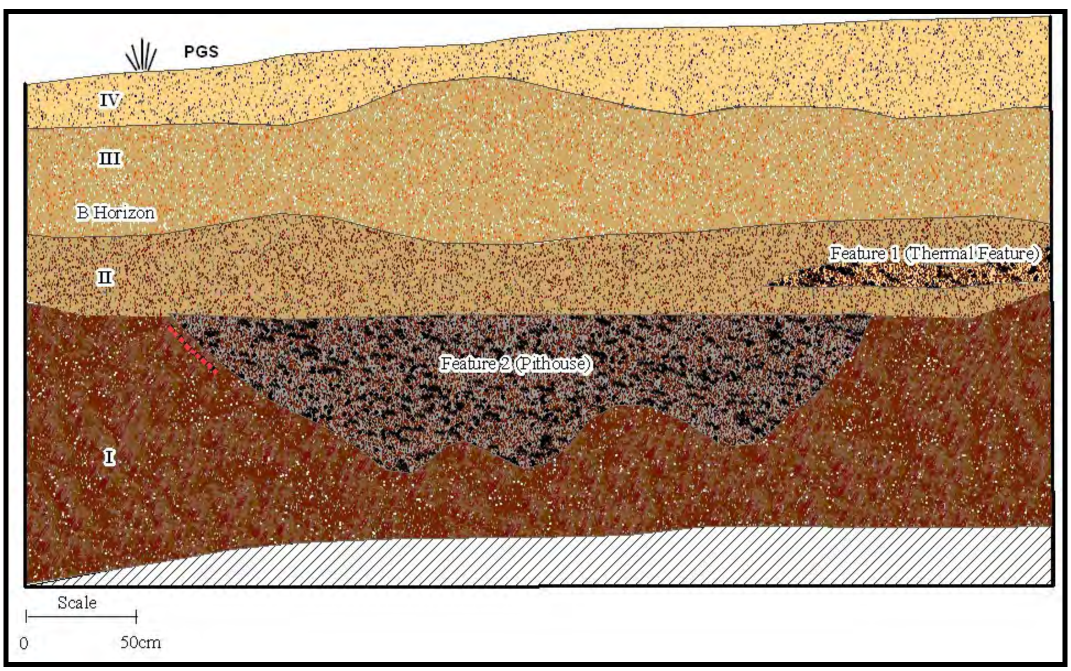



**Figure 5.10-3.** Northwest trench wall stratigraphic profile.

Stratum IV represents the third late Holocene loess and consists of brown to dark brown sand and silt. Granule size varies, but medium-sized particles are the most common. Lesser degrees of weathering have resulted in a weak-blocky soil structure.

### 5.10.5 Results Of Excavation

Two non-contiguous test blocks, oriented perpendicular to the pipeline trench walls, were excavated. Deposits were extracted in 10cm increments from a total of 16 $1m^2$ units. Excavation terminated at an average depth of 1.4m and a maximum depth of 2m below present ground surface.

The three stratified Late Archaic cultural levels (designated herein from oldest to youngest as Cultural Levels I through III) were relocated. The upper component was poorly defined, but the latter two were fairly well represented by *in situ* material.

Importantly, differentiating between the upper two cultural levels was somewhat challenging due to a continuous scatter of artifacts (e.g., a plethora of cultural rock) and mottled ash in the substrate. Identification was further impeded by the scarcity of *in situ* features and artifacts. The latter was largely affected by the compact, blocky nature of the soil which precluded methods of excavation conducive to *in situ* discovery. Picks were used intermittently to break apart the caliche-like deposits which resulted in large clumps of sediment for screening. Finally, there were no distinct natural stratigraphic layers to guide excavation– all three components were contained in the first Late Holocene sheet deposit.

#### 5.10.5.1 Cultural Level I

Cultural Level I was previously discovered in 2009 during the cultural resource monitor that was conducted for the Collbran pipeline. It was identified in the southeast wall of the pipeline trench at an approximate depth of 80cm below the bladed surface. The manifestation was described as consisting of a discontinuous charcoal lens and a possible thermal feature.

Cultural Level I– an open-air, mottled ash living surface– was poorly defined. It was diffidently relocated at depths of 70 to 80cm below present ground surface. Its relocation was based on vertical provenance data collected for cultural and non-cultural rock, chipped and ground stone artifacts, and subtle manifestations of ash and disseminated charcoal (Figure 5.10-4).

*Features*

The living surface, unadorned with *in situ* features, was characterized by a fairly even blanket of subtle, mottled ash deposits and disseminated charcoal. In units 101X102Y and 101X103Y, charcoal and ash predominated. In the latter unit, two thermally altered rocks were observed.

*Artifacts*

Cultural Level I yielded an extremely small artifact assemblage. Five artifacts– three secondary flakes, one of which was broken into two pieces, and two tertiary flakes, another one of which was broken into two pieces– were recovered from five units: 100X104Y, 101X98Y, 101X99Y, 101X102Y and 101X103Y.

*Stratigraphic Age Correlation*

No radiocarbon age determinations were obtained for Cultural Level I, largely due to the lack of *in situ* thermal features. Relative dating techniques were used to determine the general antiquity of the occupation. Based on its stratigraphic association with the first late Holocene sheet deposit, it was assigned a date of 2800 to 2000 BP.

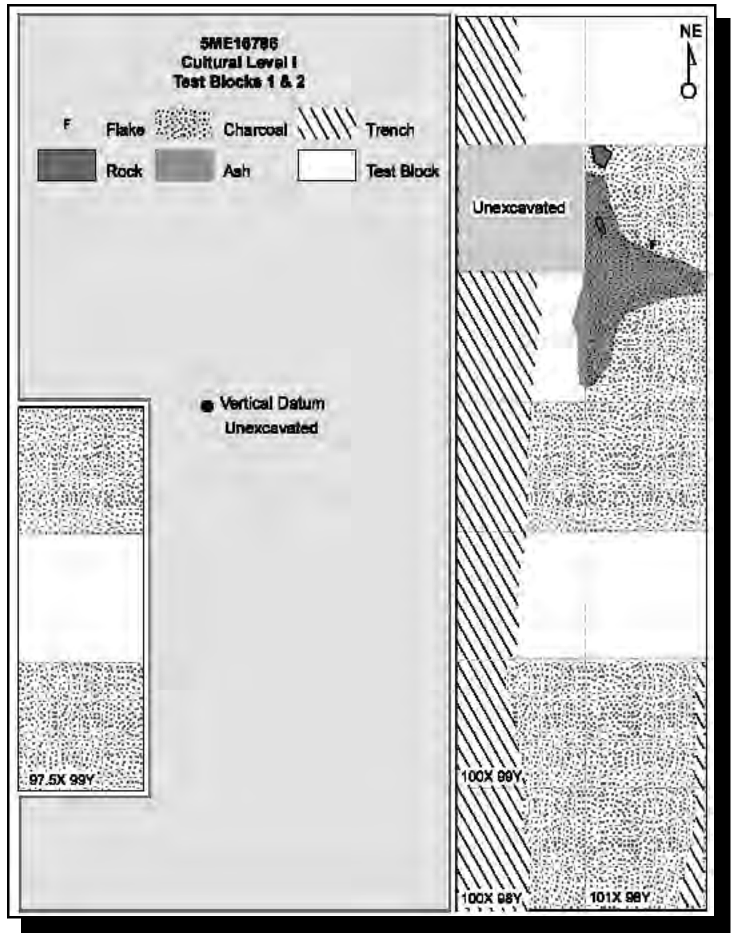



**Figure 5.10-4.** Plan view of Cultural Level I (70 to 80cm BPGS) at site 5ME16786.

<u>5.10.5.2 Cultural Level II</u>

Cultural Level II was previously identified in 2009 during the cultural resource monitor for the Collbran pipeline. It was discovered in the northwest and southeast trench walls at an approximate depth of 95cm below present ground surface. In cross-section, it consisted of a continuous, prominent charcoal lens. The occupation was identified resting on an unconformity– a thin horizon of coarser particles caused by deflation.

The cultural level– an open-air, mottled ash living surface– was relocated at approximate depths of 80 to 100cm below the extant undisturbed horizon based on vertical provenance data collected for a plethora of cultural and non-cultural rock, chipped and ground stone artifacts, and manifestations of ash and disseminated charcoal (Figure 5.10-5).

*Features*

The living surface, a deflated horizon, was mottled with ash and disseminated charcoal. A preponderance of thermally altered rock adorned the occupational floor and suggested the possibility of two deflated thermal features (Features 1 and 2). A third thermal feature was found *in situ* (Feature 3). The features are described as follows:

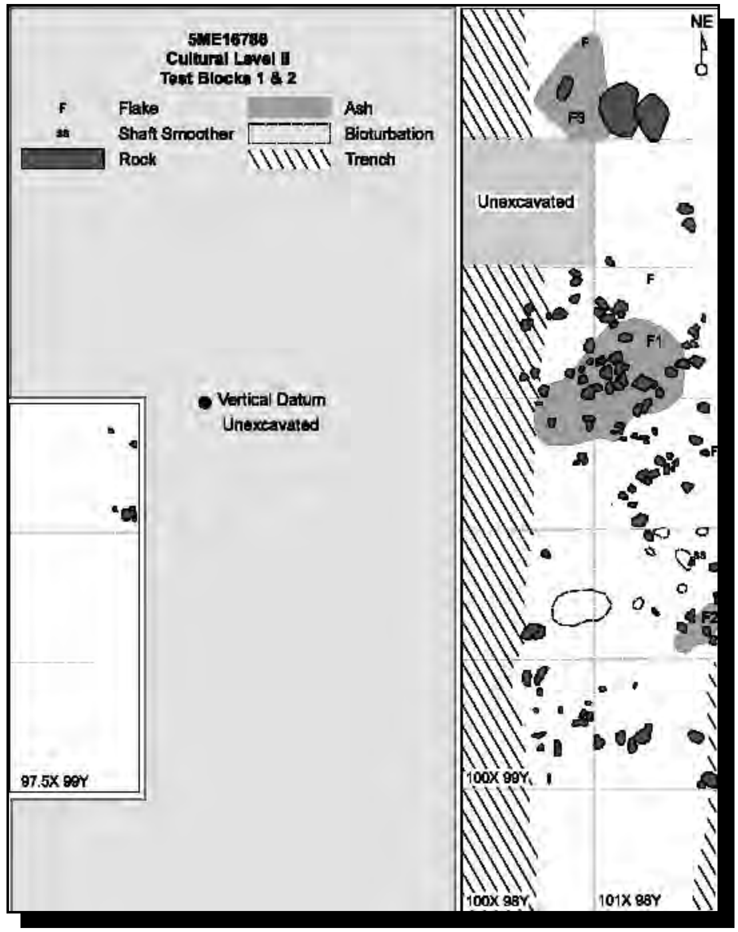



**Figure 5.10-5.** Plan view of Cultural Level II (80 to 100cm BPGS) at site 5ME16786.

Feature 1 was exposed in four units: 100X101Y, 100X102Y, 101X101Y and 101X102Y. It consisted of a 1.5m by 0.75m concentration of ash, disseminated charcoal and at least 70 pieces of thermally altered rock which, due to deflation, were scattered within an area measuring roughly 2m by 1.5m. Most of the rock was angular to sub-angular, flat and between 4 and 10cm in diameter.

Feature 2 was exposed in unit 101X100Y. It consisted of a 35cm by 15cm concentration of ash, disseminated charcoal and a few pieces of thermally altered rock. Several areas of loose, unconsolidated soil were observed adjacent to the feature and were interpreted as areas of bioturbation. A charcoal sample was obtained from the remnants of the feature and yielded a conventional $^{14}C$ date of 2440±30BP (Beta No. 303006). Additional remnants of the feature were most likely destroyed during the installation of a second pipeline immediately southwest.

Feature 3, an *in situ* roasting pit, was exposed in units 100X104Y and 101X104Y. It consisted of a basin-shaped concentration of faint and mottled ash, disseminated charcoal and a few pieces of thermally altered rock. The feature measured roughly 1.6m in diameter and 20 to 30cm in depth. Two large rocks were exposed adjacent to the feature, but were also found lower in the stratigraphic sequence. Closer examination of the stratigraphy indicated that the rocks rested on the edge of a drainage, and evidence of thermal alteration suggested use as capstones. A carbon sample obtained from the unit wall in which the feature was exposed in, yielded a conventional $^{14}C$ radiocarbon date of 3020±30BP (Beta No. 303008).

No other features were encountered; however, more thermally altered rock was observed in the southeast-half of Test Block 1. The rock may be associated with Feature 2 or it may imply the presence of additional thermal features.

*Artifacts*

Cultural Level II yielded a very low density of artifacts: eight flakes, one projectile pont fragment (5ME16786.fs15), an abrader (5ME16786.fs5), and a gastropod specimen of *Succinea*, were recovered. All flakes are tertiary and small to medium in size. One medium-chert flake exhibits signs of utilization, and one exhibits signs of heat treatment in the form of crazing. These artifacts were collected from five units: 101X98Y, 101X100Y, 101X101Y, 101X102Y, and 100X99Y. Unit 101X102Y contained the most artifacts– four specimens were recovered. The remaining units contained one to two specimens.

*Radiocarbon*

Two conventional $^{14}$C radiocarbon dates were obtained for Cultural Level II. A carbon sample from the remnants of Feature 2 yielded date of 2440±30BP (Beta No. 303006). Feature 3, as exposed in the wall of unit 100X104Y, yielded a conventional $^{14}$C age of 3020±30BP (Beta No. 303008).

5.10.5.3 Cultural Level III

Cultural Level III, a pit-structure, was discovered in 2009 at depths of 100 or 110cm below the bladed surface in the northwest and southeast pipeline trench walls. The feature was described as consisting of a faint, lenticular ash stain that measured roughly 3.8m in diameter and 20 to 40cm in depth (Figure 5.10-6).

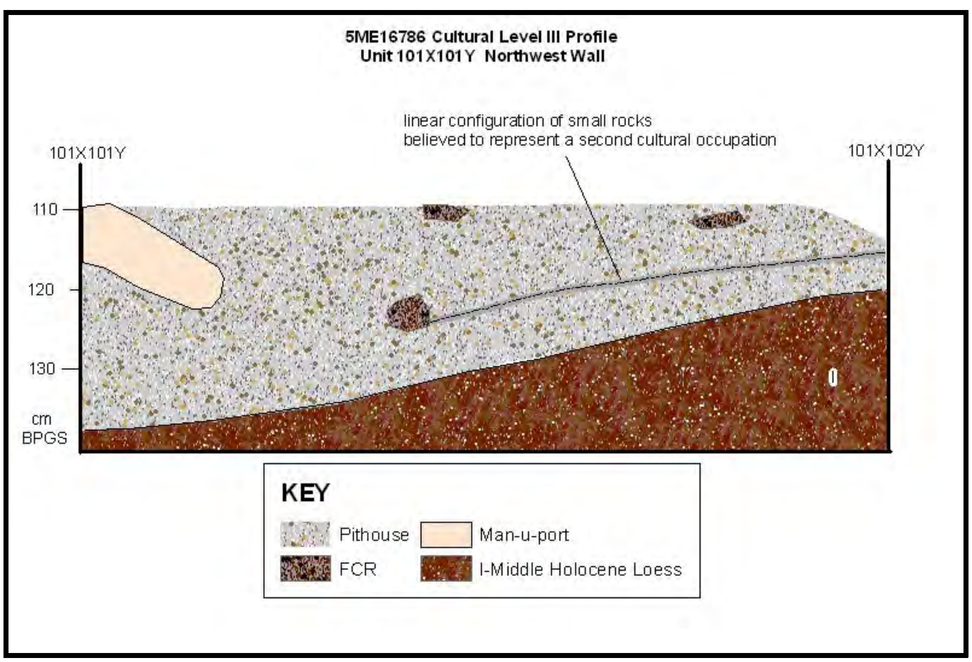



**Figure 5.10-6.** Pithouse profile exhibiting evidence of suspected second cultural occupation of Cultural Level III.

The pit-structure was relocated at depths of 100 to 145cm below present ground surface. Once exposed, the surface manifestation consisted of a large, oblong ash stain measuring 3.5m by 1.5m. Excavation revealed a basin of 20 to 40cm in depth. A second occupation of the structure was evidenced by a linear configuration of small rocks compacted into the ashy cultural fill between 120 and 130cm below present ground surface. The structure contained an arrangement of interior features such as fire hearths, storage cysts, and postholes. Chipped and ground stone artifacts were recovered from the interior.

*Features*

Interior features excavated include two fire hearths (Feature A & B), one storage cyst (Feature C), and two postholes (Feature D & E). The presence of additional features was implied by an abundance of fire-cracked rock. The features are described below:

Feature A was excavated near the southeast perimeter of the structure at (Plate 5.10-2). The feature measured approximately 50cm in diameter and 10cm in depth. Feature fill contained approximately thirty pieces of fire-cracked rock as well as charcoal and organic matter. Oxidized sediment was observed along the southeast perimeter of the feature. A carbon sample obtained from the feature during excavation yielded a conventional $^{14}C$ radiocarbon date of 2620±40BP (Beta No. 282180). The feature is believed to be associated with the second occupation of the cultural level.

**Plate 5.10-2.** Feature A, an *in situ* thermal feature.

Feature B, excavated near the center of the structure in association with the first occupation, measured roughly 40cm in diameter and 10cm in depth. Feature fill consisted of large and small pieces of charcoal as well as dense ash. An abundance of organic matter and a single fire-cracked rock were observed in the fill. Also, the northeast perimeter of the feature contained traces of oxidation. A carbon sample was obtained from this feature in 2009 and yielded a conventional radiocarbon age of 2760±70BP (Beta No. 263484). During excavation of the site, a second carbon sample was obtained from the feature for comparison of the 2009 date. The second sample yielded a conventional $^{14}C$ date of 2790±50BP (Beta No. 303007). These two dates represent a pooled average of 2780±40BP.

Feature C, a storage cist, was discovered near the southwest perimeter of the structure (Plate 5.10-3). The feature measured approximately 30cm in diameter and 15cm in depth. Feature fill consisted of loose and somewhat coarse, unconsolidated sediment that contained slight traces of ash and charcoal. The fill was easily distinguished from the substrate which consisted of a very fine sand. Three complete manos were retrieved from the base of the feature. The top of the feature was not well defined during excavation, and is therefore it is undetermined which occupation the feature is associated with.

**Plate 5.10-3.** Feature C, a storage cyst containing two distinct manos.

Features D and E were the only postholes excavated. Feature D was excavated near the center of the structure and consisted of a semi-circular charcoal stain distinguished by a vibrant perimeter of oxidized sediment (Plate 5.10-4). Excavation revealed a constriction of the diameter from 16cm to 14cm, and an angling of the trunk back towards the wall of the pipeline trench. The bottom of the feature was reached at a depth of 66cm below the floor. Fill in the upper part of the feature consisted of unconsolidated ashy sediment containing an abundance of charcoal and three angular rocks. Above the rocks, an area of localized bioturbation was evinced by the mixing of oxidized sediment with feature fill. Below the rocks, fill consisted of a very fine grey ash that lacked an abundance of charcoal. Several large, fire-cracked rocks (up to 10cm in length) and a large stone surrounded the feature. These rocks may have served as additional support for the post. Feature E manifested as a circular charcoal stain near the east-northeast perimeter of the structure. The feature measured approximately 16cm in diameter and 22cm in depth. Fill contained a small lens of ashy sediment and charcoal overlying very fine sand. Both postholes were located within the second occupation of the cultural level.

**Plate 5.10-4.** Feature D profile, a central posthole.

Evidence of additional interior and/or exterior features was most likely destroyed during the construction of the pipeline. In addition, weathering and aeolian deposition may have also precluded preservation.

*Artifacts*

A total of 28 artifacts were recovered from the interior of the structure. Chipped stone constituted the largest percentage; 64 percent of the artifacts were determined to be products of lithic reduction, 32 percent were categorized as ground stone and the remaining 4 percent is accounted for in the form of faunal material. These artifacts were recovered from a total of nine units: 97.5X101Y, 99X102Y, 100X99Y, 100X100Y, 100X101Y, 101X98Y, 101X100Y, 101X101Y, 101X102Y. Units 100X99Y, 100X101Y and 101X100Y contained the highest concentrations (6 to 7 specimens). The remaining units contained less than 5 specimens.

The chipped stone assemblage includes six tertiary flakes (one with evidence of utilization), seven secondary flakes, two secondary blade flakes exhibiting evidence of utilization, one primary flake, one spokeshave (5ME16786.fs30), and one projectile point (5ME16786.fs33) (Plate 5.10-5).

The ground stone assemblage includes nine fragmentary and complete artifacts: four manos, three metates, one comal, and one polished cobble. Most of the ground stone was recovered from units 100X99Y and 101X100Y.

*Faunal Remains*

One fragment of bone from a small to medium mammal long bone– possibly Lagomorpha– was recovered from fill excavated from the central posthole. Species identification was precluded by the absence of the proximal and distal articular surfaces.

*Radiocarbon*

Three radiocarbon age determinations were obtained for Cultural Level III: 2790 ±50BP (Beta No. 303007), 2760 ±70BP (Beta No. 263484), and 2620 ±40BP (Beta No. 282180). The first two dates were obtained from the central hearth feature while the latter date was obtained from a second hearth feature located near the perimeter of the structure. The dates from the central hearth feature (Feature B) yield a pooled average of 2780±40BP.

5.10.5.4 Disturbed Provenance

Two artifacts were collected from trench backfill and could not be associated with a cultural level. The artifacts include one secondary blade flake(5ME16786.fs1) and one unifacially ground sandstone fragment (5ME16786.fs2).

### 5.10.6 Summary of Analyses

The following section briefly describes the results of the different analyses conducted for site 5ME16786. The methods used in several of the analyses were dictated by the data set as well as the questions being asked. Research domains that were to be addressed include cultural affiliation and age, site function, seasonality, subsistence, social organization, technology, extra-regional relationships, site formation and transformation, and paleoenvironment.

5.10.6.1 Artifact Analysis

Cultural Levels I through III yielded a cumulative total of 44 field specimens. The specimens were subsumed into eleven different functional categories: lithic debitage, utilized flakes, projectile points, manos, metates, comals, unidentified ground stone, polished cobbles, abraders, spokeshaves, and faunal specimens. Table 5.10-1 summarizes these findings. A complete list of the collected artifacts is provided in Appendix C.

**Table 5.10-1.** Summary of the functional artifact classes for Cultural Levels I-III at 5ME16786.

| | Site Zone / Attribute | Cultural Level I | Cultural Level II | Cultural Level III | TOTALS |
|---|---|---|---|---|---|
| Functional Class | Lithic Debitage | 4 | 7 | 13 | **24 (55%)** |
| | Utilized Flakes | 1 | 1 | 3 | **9 (11%)** |
| | Projectile Points | 0 | 1 | 1 | **2 (5%)** |
| | Manos | 0 | 0 | 4 | **4 (9%)** |
| | Metates | 0 | 0 | 3 | **3 (7%)** |
| | Comals | 0 | 0 | 1 | **1 (2%)** |
| | Polished Cobbles | 0 | 0 | 1 | **1 (2%)** |
| | Abraders | 0 | 1 | 0 | **1 (2%)** |
| | Spokeshaves | 0 | 0 | 1 | **1 (2%)** |
| | Faunal Specimens | 0 | 1 | 1 | **2 (5%)** |
| | **TOTALS** | **5 (12%)** | **11 (25%)** | **28 (63%)** | **44** |

*Lithic Debitage*

Twenty-nine pieces of lithic debitage (including utilized flakes) were recovered from the three cultural levels. Due to the size of the sample, the specimens were subjected to a very basic analysis. The analysis involved sorting the specimens via cultural level and recording the following variables: flake morphology, size, use-wear, retouch, oxidation, pot-lidding, patination and lithic material (Table 5.10-2). For simplicity of component designation, microflakes and other debitage collected from water screened soil samples were not included in this analysis.

With regard to flake characteristics, the most noticeable aspects are: 1) the majority of the flakes are completely without cortical coverage (i.e., tertiary) and are medium in size, 2) small flakes are generally lacking, and 3) there is only a single primary flake. In addition, very few of the specimens were purposefully heat-treated or utilized as expedient tools– tools exhibiting unsystematic and random reduction techniques (i.e., unstandardized or expedient core reduction).

Lithic materials consist of chert, porcellanite, basalt, quartzite, mudstone and jasper. Chert is the most prevalent, constituting 46 percent of the lithologically distinctive materials. Basalt is the next most abundant (31 percent) and jasper is the least abundant (3 percent). All of lithic material is of local origin, supplied predominantly by the Madison, Green River, Wasatch, Burro Canyon, and Troublesome Formations.

*Tools and Utilized Flakes*

One spokeshave (5ME16786.fs30) of black chert was recovered from the pithouse in unit 97.5X101Y. The artifact has a retouched lunate notch and a very small burin-like barb on its dorsal surface. The material is believed to be of the local Wasatch Formation. Cumulatively, five utilized flakes were recovered during excavation: one from Cultural Level I, one from Cultural Level II and three from Cultural Level III. The utilized flake found in relation to Cultural Level II was fashioned from a medium sized flake of Madison Formation chert and one from Cultural Level III was a very large flake of Green River Formation chert. The remaining three were fashioned from very large blade flakes. Interestingly, two of the blade flakes are of the same porcellanite material, but found in relation to two different occupations– Cultural Levels I and III.

*Projectile Points*

An incomplete projectile point (5ME16786.fs15) of Madison Formation chert was collected in association with Cultural Level II from unit 101X98Y. The fragment consists of a complete, expanding stemmed base with one apparent corner-notched barb. A complete projectile point of Troublesome Formation chert (5ME16786.fs33) was recovered from the pithouse in unit 101X101Y. The point is corner-notched and exhibits a mildly expanding base with slightly convex basal and blade edges (Plate 5.10-5). Morphologically, it compares well

**Table 5.10-2.** Summary of the debitage analysis for site 5ME16786.

| | Site Zone / Attribute | Cultural Level I | Cultural Level II | Cultural Level III | TOTALS |
|---|---|---|---|---|---|
| **Flake Material** | Chert | 1 | 6 | 6 | **13 (46%)** |
| | Quartzite | 0 | 0 | 1 | **1 (3%)** |
| | Porcellanite (Siltstone) | 2 | 0 | 1 | **3 (10%)** |
| | Basalt | 1 | 1 | 7 | **9 (31%)** |
| | Mudstone | 1 | 1 | 0 | **2 (7%)** |
| | Jasper | 0 | 0 | 1 | **1 (3%)** |
| | **TOTALS** | **5 (17%)** | **8 (28%)** | **16 (55%)** | **29** |
| **Flake Characteristics** | Size | V Large 1<br>Large 3<br>Medium 1<br>Small 0 | Large 0<br>Medium 5<br>Small 3 | V Large 6<br>Large 4<br>Medium 5<br>Small 1 | **V Large 7 (24%)<br>Large 7 (24%)<br>Medium 11 (38%)<br>Small 4 (14%)** |
| | Cortex | Primary 0<br>Secondary 3<br>Tertiary 2 | Primary 0<br>Secondary 0<br>Tertiary 8 | Primary 1<br>Secondary 9<br>Tertiary 6 | **Primary 1 (3%)<br>Secondary 12 (42%)<br>Tertiary 16 (55%)** |
| | Angular Shatter | 1 | 3 | 1 | **5** |
| | Use-wear | 1 | 1 | 3 | **5** |
| | Retouch | 0 | 1 | 0 | **1** |
| | Oxidized | 0 | 0 | 0 | **0** |
| | Pot-lidded/Crazing | 0 | 1 | 2 | **3** |
| | Patina | 0 | 1 | 4 | **5** |
| | **TOTALS** | **5 (17%)** | **8 (28%)** | **16 (55%)** | **29** |

with the Uncompahgre Complex Horse Fly Phase Type 26 points which date 500 BC to AD 0 (Buckles 1971:1220). The plausibility of a much older date is suggested by three associated radiocarbon ages secured from the pithouse: 2790 ±50BP (Beta No. 303007), 2760 ±70BP (Beta No. 263484), and 2620±40BP (Beta No. 282180). In addition, similar points have been recovered from the Koch site (5ME635) located along the southeastern edge of Kimbell Mesa in Mesa County, Colorado. The Koch site yielded five points from the surface that were similarly associated with a conventional radiocarbon age of 2717±82 BP (Alexander and Martin 1980:39).

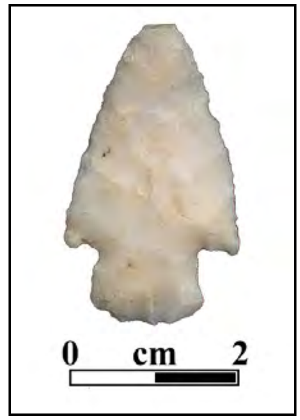



Plate 5.10-5. Corner-notched projectile point (.fs33).

*Manos*

Four manos were recovered. All of these were extracted from the interior of the pithouse. The manos were sorted into two different types: Mano Type I and Mano Type II.

Mano Type I includes one specimen (5ME16786.fs32)– a lightly ground, mano end fragment that was recovered from above the pithouse floor of the second occupation in unit 101X102Y. The fragment exhibits a nearly circular cross-section. A small wear facet is visible on what would have been the longest axis of the artifact.

Mano Type II includes three distinctive sub-rectangular specimens recovered from Feature C of the pithouse in unit 100X 99Y (Plate 5.10-6). These manos are composed of Burro Canyon orthoquartzite and are ground on all surfaces so that the three axes (length, width and depth) are of different lengths, but are all perpendicular to each other. The two smallest manos (5ME16786.fs51, 5ME16786.fs52) are reminiscent of a biscuit. These are nearly identical in size (9.57 to 9.82cm in length; 8.04 to 8.17cm in width; 5.65 to 5.67cm in thickness and weights of 753 to 766g). The third mano (5ME16786.fs50) is larger and exhibits highly parallel surfaces with a length of 11.34cm, width of 8.27cm, a thickness of 8.42cm, and a weight of 1512g. Wear patterns on all three manos are either perpendicular to the long axis or in a circular pattern or a combination of both. Although an occupation designation of the third cultural level was unable to be obtained for the feature the manos were located in association with, the abundance of ground stone associated with the second occupation leads to the speculation that these manos are likely associated with the second occupation as well.

*Polished Cobbles*

One polished cobble of basalt (5ME16786.fs37), found near the second occupation of the pithouse floor in unit 101X101Y, was collected. The specimen retains only a small portion of its polished surface which is characterized by a thin veneer of sheen, fine surface texture, and minute striations. Sharp, jagged fractures and a circumscribed area of oxidation indicate exposure to heat.

**Plate 5.10-6.** Three specimens of Mano Type II. Artifacts (from left to right) 5ME16786.fs51, 52 and 50.

*Abraders*

One grooved abrader (5ME16786.fs5) was recovered from unit 101X100Y in association with Cultural Level II. The artifact is a small sandstone fragment with a ground, lunate groove measuring 34mm in length and 7.25mm in width. Minute linear striations are visible within the groove.

*Metates*

Two metate fragments (5ME16786.fs11, 5ME16786.fs26), found above the pithouse floor in unit 101X100Y, were collected. Both specimens are composed of sandstone, have flat or non-concave ground and pecked surfaces, and are thermally altered. The smaller fragment (.fs11) exhibits signs of pecking and slight evidence of burning while the larger fragment (.fs26), exhibits signs of burning and oxidation. Pecking may also be present on the latter fragment; however, due to the deteriorated nature of the material, it is only hard to tell for sure. Both exhibit fractures along the natural bedding planes of the material as well as fractures perpendicular to those bedding planes. Both artifacts are believed to be associated with the second occupation of the pithouse.

An extremely well-made, ovoid metate (5ME16786.fs35) was recovered from the second occupation of the pithouse floor in unit 101X101Y (Plate 5.10-7). The artifact measures 50cm in length, 40cm in width and 2cm in thickness. The edges of the artifact are shaped, and the ground surface is pecked and slightly concave. Notches on either edge of the long axis of the artifact could be used to wrap cordage, making the metate portable. A fracture stemming from one notch, separating the artifact into two pieces, may have occurred during transport, at which time the metate was likely utilized as a comal. Oxidation is not profoundly evident, but a dark, sooty rind is present on the dorsal surface.

**Plate 5.10-7.** Shaped metate with notches on either side of the artifact.

*Comal*

A comal is evinced by the presence of two fragmentary ground stone remains (5ME16786.fs27). The fragments are small and highly deteriorated due to extreme heat exposure and oxidation– although a ground surface is still visible on one surface. Classification as a comal is due to the thickness of the artifact–13mm or less–as well as the evidence of burning. The material is the same sandstone of the metate fragments.

*Unidentified Ground Stone*

One ground stone artifact (5ME16786.fs2), located within disturbed provenance, was too fragmented to be accurately identified. The artifact has one ground surface and is made of the same sandstone material as the metate and metate fragments found in relation to the pithouse, although the ground surface is much more defined on this artifact.

*Faunal Remains*

A single bone specimen was recovered from the central posthole (Feature D) of the pithouse. It appears to be the fragmentary remains of a mammal long bone, although the lack of proximal or distal articular surfaces precludes species determination. The fragment is too large to be assigned to a small rodent, and may likely be that of *Lagomorpha*; it is presumed to be associated with the krotovenia disturbance noted during excavation of the posthole.

*Water Screen Results*

Water screen samples were collected in 10cm increments from depths of 40 to 130cm below present ground surface in the north corner of unit 97.5X100Y. The samples were processed through a 1/16-inch mesh window screen and the matrix was examined under a variable power binocular microscope for cultural remains and remains retaining climatic and environmental implications.

Charcoal, microflakes, bone, anthracite, and invertebrate shells were retrieved for documentation. Charcoal was observed in all levels, but was not collected. One piece of bone and a chert microflake were recovered in stratigraphic association with Cultural Level II at depths of 90 to 100cm below present ground surface. Three bone fragments, one chert microflake, and several small pieces of FCR were observed in stratigraphic association with Cultural Level III. In addition, *Oreohelix* and/or *Succinea* gastropod remains were recovered from all 10cm levels.

5.10.6.2 Radiocarbon Analysis

Charcoal samples were sent to Beta Analytic in Miami Florida for AMS radiocarbon dating. Results from the analysis were compared to the archaeologist's and geologist's knowledge of cultural trends and depositional processes at the site to reveal more exact temporal information. Furthermore, pragmatic statistical methods such as averaging was conducted to address questions regarding coevalness, and/or to better understand a series of dates obtained from the same stratigraphic unit or feature.

Five radiocarbon age determinations were returned by Beta Analytic in Miami, Florida. Two of the dates were obtained in relation to Cultural Level II: 2440±30BP (Beta No. 303006) and 3020±30BP (Beta No. 303008). The three remaining dates were obtained in relation to Cultural Level III: 2790 ±50BP (Beta No. 303007), 2760 ±70BP (Beta No. 263484), and 2620 ±40BP (Beta No. 282180).

The discrepancy between the two dates related to the second cultural level is believed to be attributed to the manner in which the carbon from the oldest date (3020± 30BP) was obtained from Feature 3. Due to the nature of the compact, blocky substrate in which Feature 3 was located, the feature was not easily excavated in plan view; therefore, charcoal was obtained from the unit wall from which the feature was excavated. Upon further examination of the stratigraphy, it appears that the charcoal sample may be from the an unidentified older component– located outside the pithouse– that was superimposed by the younger feature.

The three dates for Cultural Level III support the hypothesis of two separate occupations of the pithouse. The oldest dates of 2790±50BP and 2760±70BP yield a pooled average of 2780±40BP. These dates were obtained from a hearth feature (Feature B) located lower in stratigraphic profile than the other features found in relation to the pithouse. The remaining date of 2620±40BP was obtained from a second hearth feature (Feature A) located higher in stratigraphic profile and in relation to Features D, E and likely C.

5.10.6.3 Pollen Analysis

Nineteen pollen samples were procured from Cultural Level III. At Grand River Institute, pollen and phytoliths were isolated from those samples using a conservative extraction technique described by Gosling (2013). The samples were then submitted to the RED Lab at the University of Utah in Salt Lake City for processing (Appendix B).

All samples analyzed yielded pollen, although seven samples did not reach 300 pollen grains before 300 *Lycopodium* tracers were counted. Nonetheless, five of those seven samples reached at least 200 pollen grains. All samples except for one (.ps15, sediment under 5ME16786.fs51) maintained an acceptable unknown, obscure or deteriorated percentage of below 20 percent of total grains counted.

Fourteen pollen taxa were identified. Dominant taxa identified for all samples includes Amaranthaceae and Cupressaceae. All samples also contained *Artemisia*, Asteraceae, and *Pinus* pollen and most samples contained *Ambrosia*, *Ephedra*, and Poaceae pollen. *Typha/Sparganium*, *Alnus*, Betulaceae, *Picea*, and *Ulmus* were also identified.

Five ethnobotanically significant taxa were identified and were most likely used as food sources. These taxa include Amaranthaceae, Asteraceae, including grains of *Ambrosia* and *Cirsium*, and Rosaceae. The high percentage of Amaranthaceae likely reflects human disturbance of the site or cultivation. In addition, a number of Asteraceae taxa are known to have been used prehistorically by humans, including sunflower (*Helianthus sp.*), yarrow (*Achillea sp.*), dandelion (*Taraxacum* type), and thistle (*Cirsium sp.*) (Fowler 1986). Rosaceae is another known native food source and pot herb (Harrington 1967).

## 5.10.7 Evaluation of Research

Features uncovered during construction activities in 2009 yielded evidence of at least three cultural occupations of site 5ME16786. The presence of at least eleven cultural features and associated occupations was confirmed by archaeological excavation of the site in 2010. Radiocarbon analysis confirmed suspected cultural occupational dates of 2000 to 2800BP, based on their association with the first late Holocene loess (Miller 2010).

The youngest cultural occupation– Cultural Level I– was observed at an approximate depth of 80cm below present ground surface in 2009, and later excavated near that same depth in 2010. The level manifested as a faint ashy lens and two pieces of FCR, representative of an open-air living surface. The artifactual assemblage consisted of five flakes: two of Burro Canyon Formation porcellanite, one of Troublesome Formation chert, one of a basalt cobble and one of limestone. Due to the lack of associated thermal features, a radiocarbon date was not obtained for the component; however, a relative date of 2800 to 2000BP is assigned due to relation to the first late Holocene loess.

Cultural Level II was observed during 2009 trenching activities and relocated during excavation in 2010. The level manifested as an ashy, open-air living surface and a plethora of FCR, believed to represent the deflated remains of at least two thermal features. One of these features yielded a conventional $^{14}C$ date of 2440±30BP (Beta No. 303006). An *in situ* roasting pit manifested with two probable cap stones discovered adjacent to it, near the edge of a small, nonextant drainage. A carbon sample believed to be related to this feature yielded a conventional $^{14}C$ date of 3020±30BP (Beta No. 303008). Further inspection of the stratigraphic profile from which the sample was obtained, concluded that this date is likely representative of an older, unidentified component or cultural level.

The third cultural level (Cultural Level III) confirmed the suspected presence of a pit-structure observed in 2009, unfortunately, much of the structure was destroyed by trenching activities during the 2009 monitor, as well as by a subsequent pipeline installation adjacent, and parallel to the first pipeline. The level manifested as a basin shaped depression with a depth of 20-40cm and at least five associated features. A subsequent occupation of the structure is believed to be represented by a surface of small rocks– a second living surface– located within the basin. A hearth feature (Feature B) manifested in relation to the first occupation of the structure. Two radiocarbon dates from this feature yield a pooled average date of 2780±40BP.

A hearth feature and two postholes (Features A, D and E) were discovered in relation to the second occupation of the pit-structure. The hearth feature yielded a conventional $^{14}C$ age of 2620±40BP. Feature D was centrally located within the structure and was surrounded by an array of fire-cracked rock, and a large (40x30x6cm) stone. Exact use of the stone is unknown, and it did not exhibit any definite signs of cultural modification. It may have been used to support the central post, or it may have simply served as site furniture. A metate, mano fragment, and two metate fragments were among the ground stone assemblage associated with this second occupation. Three complete manos located within a storage cyst (Feature C), are believed to be associated with the second occupation as well. Definitive evidence of the association of this feature was lacking due to the compact nature of the substrate in which the feature was located. Postulation of this association is due to the denser ground stone assemblage associated with the second occupation. Regardless, these distinctive manos can be assigned a cultural date between 2780±40BP and 2620±40BP.

The relatively high density of ground stone material, and low density of lithic and faunal material associated with the second occupation of the pithouse evidences a higher dependency upon floral processing. The presence of snail remains favors the likelihood of ample vegetation for sustenance.

The first occupation of the pithouse seems to be poorly represented in terms of features as well as artifact assemblage; however, inference of an earlier occupation is supported by an older pooled date of 2780±40BP from feature B. This feature was also located lower in stratigraphic profile as compared to the other features within the structure.

Miller's (2010) climatic model for the past 2800 years before present is represented by cool, wet conditions and resulting stabilized vegetation conducive to loess deposition, separated by short stints of warm and dry episodes.  In contrast, Chen and Associates' (Conner and Langdon 1987) climatic model for the Battlement Mesa area describes a dry period from approximately 1900 to 2800BP.  Moist conditions and ample vegetative duff, at least locally, are suggested by the presence of two species of terrestrial gastropods– *Succinea* and a tiny *Oreohelix*-like specimens– observed throughout the excavated stratigraphic profile.

### 5.10.8 Evaluation and Management Recommendation

Site 5ME16786 has proven beneficial in yielding important information significant to the prehistory of the area.  However, excavation has exhausted the scientific potential of the site and it is therefore evaluated as not eligible for listing on the NRHP.  Accordingly, no further work is recommended.

## 5.11 Site 5ME16789

### 5.11.1 Introduction

Site **5ME16789** is a multi-component site evincing prehistoric Early and Middle Archaic architecture and an historic rock feature. It is located at an elevation of 6000 ft near the head of a dry wash that drains about two miles west into Sand Wash, which in turn flows north-northwest about five miles into the Colorado River. The site is situated just above a pour-off in the small drainage, wherein water could have been captured or at least gathered during runoffs. Vegetation is typical of this benchland and includes Upper Sonoran zone pinyon-juniper trees scattered in a sagebrush community (Plate 5.11-1). As with other sites located at this elevation around the base of Battlement Mesa, vegetation communities within a 10 km radius include the Riparian, Transitional, and Montane Zones.

**Plate 5.11-1.** Overview of southeast portion of site showing vegetation mix.

This site was originally recorded during the 2009 monitoring project. One surface cultural component was mapped and two projectile point fragments were collected (5ME16789.s1 and s.2, Plate 5.11-2). Other surface artifacts included one mano, a utilized core, one piece of burnt bone, and over thirty flakes. In addition, one suspected hearth feature was identified as were four historic rock features (three large rock piles and one cairn). These items were situated on the southwest side of the county road – opposite the locations of the pithouses that were exposed by the pipeline trenching (Figure 5.11-1).

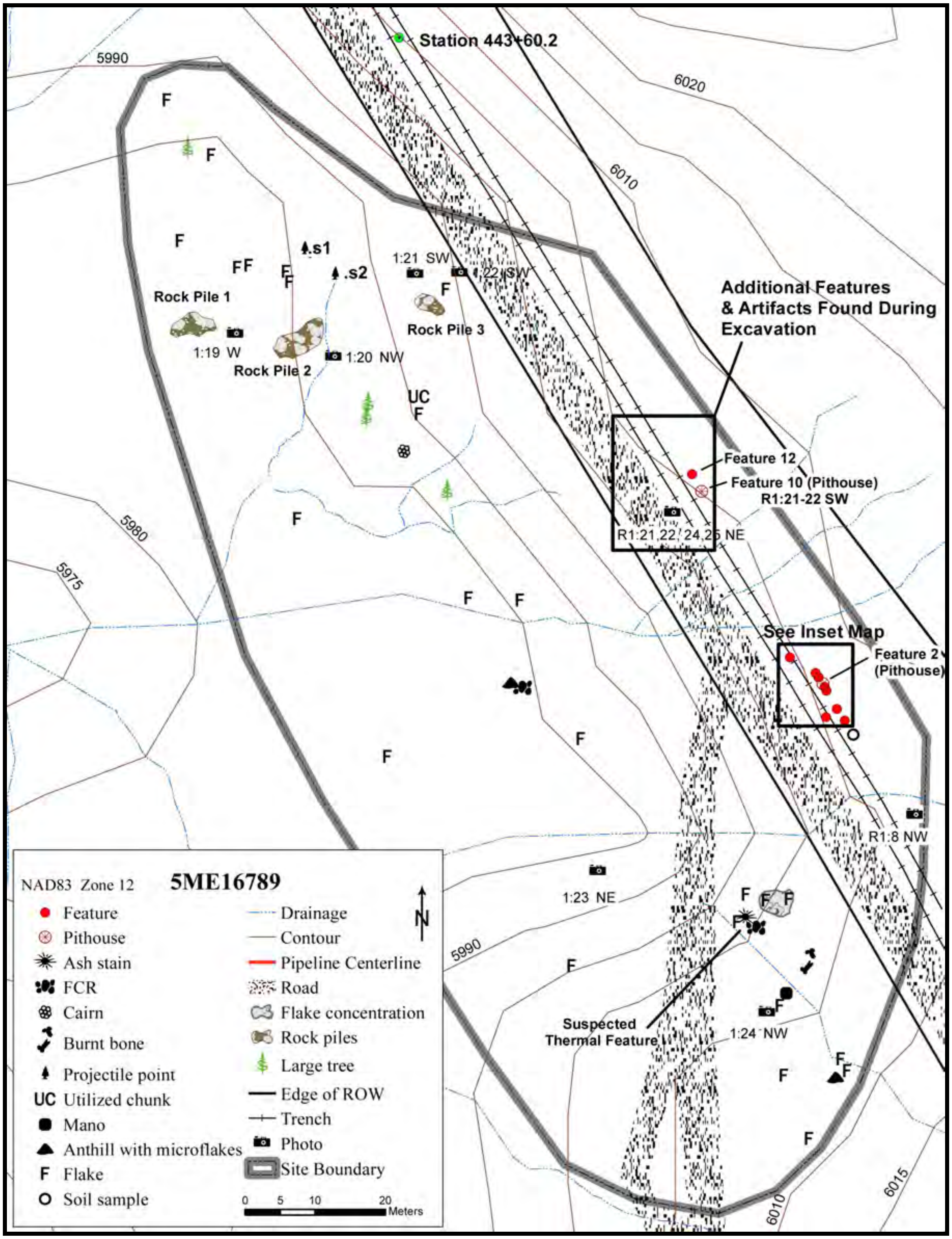



Figure 5.11-1. Site map for 5ME16789 showing locations of artifacts and features on the southwest side of the county road opposite of the pithouse locations revealed during trenching on the northeast side of the road.

The .s1 projectile point is a medium-sized, low corner-notched (nearly stemmed) type that compares well with Uncompahgre Complex Horse Fly Phase Type 26 points that roughly date ca. 500-1 BC, roughly 2500-2000 BP (Buckles 1971:1220). A similar point was found on the surface of 5ME635 and designated as Type II within that site's classificatory system. Dates for features excavated at that site averaged ca. 2700 BP and ranged between 1480-800 BC (Alexander and Martin 1980:1,23,26).


**Plate 5.11-2.** Surface collected projectile point fragments from 5ME16789: .s1, left, and .s2, right.

The 5ME16789.s2 point fragment is deeply corner-notched and compares well with the Pelican Lake type. This is a Late Plains Archaic variety that replaced McKean Complex points by ca. 3100 BP (Frison 1991:101). The date range for this point terminates about 2700 BP, and they have been identified in sites in the Rocky Mountains and western Great Plains region from as far north as south-central Saskatchewan Canada through Wyoming and into northern Colorado. Grand River Institute reports documenting these points during inventories on the Uncompahgre Plateau (Conner and Davenport 2002a; and, Conner and Davenport 2002b). At site 48CA1391 on the Belle Fourche River in Wyoming, the faunal assemblage associated with these points indicated Pronghorn hunting was dominant as part of a hunting-gathering orientation for this cultural group (Frison 1991:105). Notably, a Pelican Lake cremation burial was excavated in the Wind River Canyon of the Bighorn Basin in Wyoming (ibid.:103). Accordingly, based on the associated dates from the two surface collected points, one of the cultural horizons at the site was considered likely to date ca. 2700 BP or 850 BC.

**Plate 5.11-3.** Photograph of trenching operations through site 5ME16789. Arrows indicate locations of the pit structures found along the trench walls.

During the trench excavation, which was located on the northeast side of the county road, at least eight subsurface cultural components were exposed. The trenching exposed pit structures in two areas located approximately 30m apart (Plate 5.11-3). The north-most of the structures was exposed in both walls of the trench at a depth of 1m below the bladed right - of-way (ROW) surface. In cross-section, it appeared as a large, lenticular charcoal stain containing interior features. An additional seven charcoal lenses were identified at variable depths (0 to 1.5m below the bladed surface). Accordingly, at least eight subsurface cultural components were suggested by the presence of features and associated artifacts. A list of collected artifacts is detailed in Appendix C.

### 5.11.2 Excavation Methods

In 2010, the data recovery phase was initiated after the pipeline was placed in the trench and covered. The pit-structures were relocated using a BLM certified Trimble Geo XT; after which, the overburden was mechanically stripped. Removal of the overburden ceased once the extant undisturbed horizon (i.e., original pipeline bladed, ROW surface) was identified; shovels removed the remaining overburden. Two non-contiguous test blocks, composed of multiple $1m^2$ units, were employed based on the site datum and oriented appropriately along the pipeline trench walls (Figure 5.11-2). Each unit was referenced by its west-corner stake coordinates; vertical measurements were taken from the present ground surface thus, the depth of overburden was included in these measurements to correlate with the present ground surface.

### 5.11.3 Stratigraphy

On-site stratigraphy consists of loess and alluvial deposits, some of which have been affected by various environmental factors. The oldest deposit noted at Test Block 1 is a clay rich, Pleistocene loess (Qp/Level I) characterized by a massive structure, presence of secondary mica minerals in equal abundance with small sulfide minerals, and high amounts of calcium carbonate evinced by extreme hydrochloric acid effervescence. The Pleistocene loess is overlain by an early Holocene alluvium (Qhe/Level II) characterized by several pebble unconformities, massive structure, and a reddish-gray C-Horizon relic within small rill deposits. A pebble unconformity separates the early Holocene from three overlying middle Holocene loess deposits (Qhm/Level IV). Soil structure varies upward in profile from prism to blocky/prism to weak blocky. Calcium carbonate content is extremely high within all three deposits. The lower two middle Holocene deposits are separated by a pebble unconformity, while the upper two are separated by a flat cobble unconformity. These three deposits have been locally affected by a seep spring which has caused a slight “slumping” effect of the sediment and may have expedited the deposition of calcite in the area. The seep has apparently affected the $^{14}C$ sample collected from a cultural deposit in Level III by leaching carbon from a cultural deposit in Level IV. The Qhm loess overlain on the flat cobble unconformity defined the bladed surface of the pipeline right-of-way in 2009 and the beginning of the undisturbed deposits during 2010 excavation.

At the northwest excavation block (Test Block 2), proximity of bedrock to the surface has affected sediment deposition, and surface elevation is slightly lower than at Test Block 1. Here, the loess deposited during the middle Holocene directly overlays another flat cobble unconformity atop a regolith of decomposing mudstones of the Debeque (ie.Wasatch)

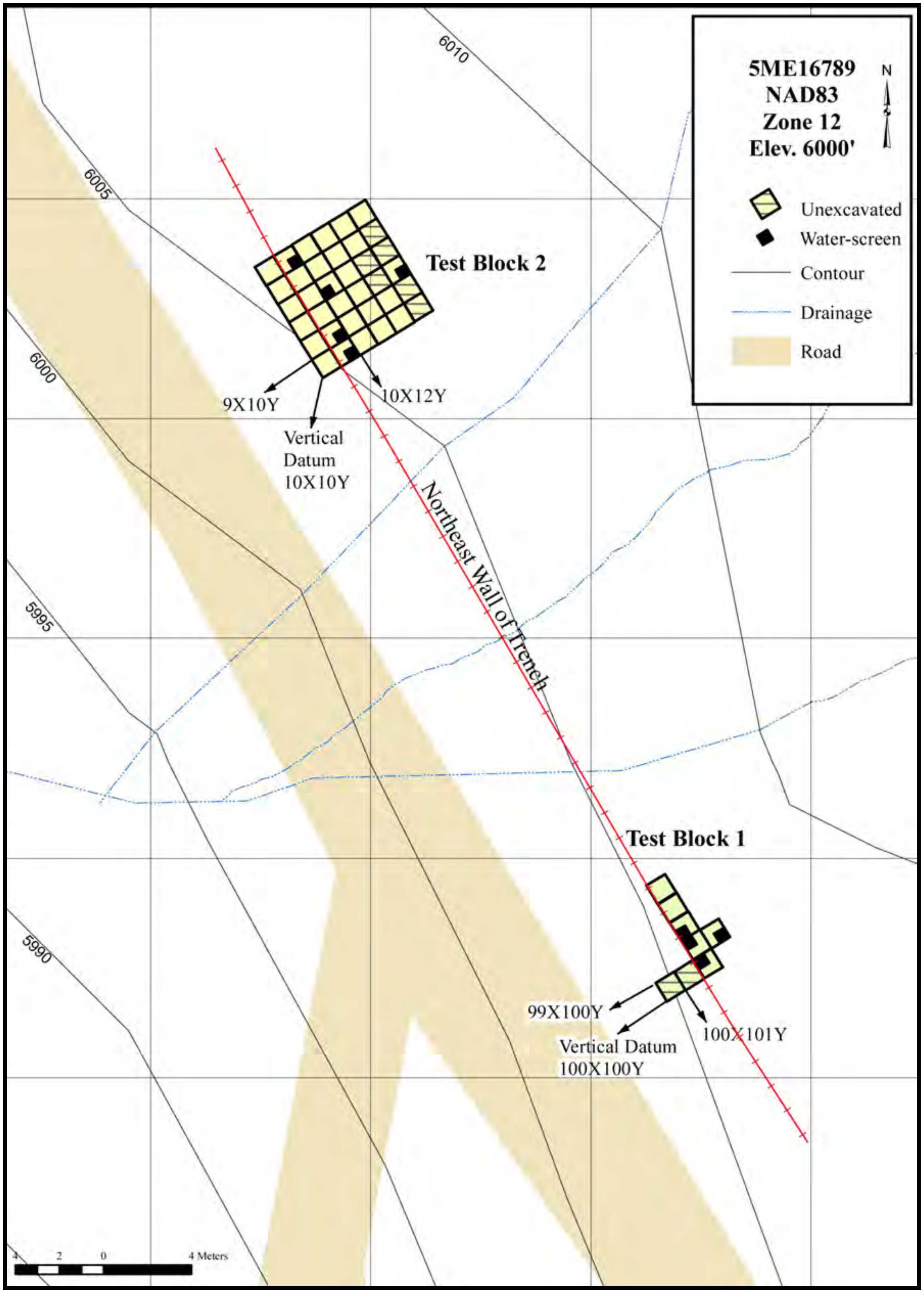



**Figure 5.11-2.** Map showing locations of excavation blocks related features exposed by pipeline trenching operations.

Formation (Eocene). This middle Holocene loess (Qhm/Level IV) is stratigraphically younger than the three noted at Test Block 1 as indicated by radiocarbon dates from cultural components at both of the blocks, and is characterized by a strong blocky structure and extreme calcification. The pithouse feature within this test block, which dated 4600±40 BP, was excavated into the bedrock's decomposing mudstone. A very coarse, poorly sorted middle Holocene age loess mixed with sheet flow alluvium, (Qhm/Level V) exhibits a strong blocky to columnar structure and extreme calcification, overlies the loess and is separated by another pebble unconformity. Three more alluvial deposits (Qhm/Level VI) overly Level V. The alluvium is characterized by a blocky structure, extreme calcification, and poorly sorted rills of silt to pebble/cobbles that becomes progressively courser nearer the surface. Two pebble unconformities separate units VIA, VIB and VIC.

A pebble unconformity caps the alluvium and defines the contact with two late Holocene loess deposits. The first loess has a platy structure and is comprised of moderately sorted silt and coarse sand. Calcium carbonate content is moderate. The second, and youngest loess sits atop a pebble unconformity and only differs from the first loess with a lower calcium carbonate content. This loess was discontinuously present at Test Block 2, as it was stripped by construction of the pipeline right-of-way in many places.

### 5.11.4 Cultural Components

Subsurface cultural components were assigned sequential numbers from suspected age of youngest to oldest based on artifact and feature depth below vertical datum (present ground surface), stratigraphic position, and, when possible, radiocarbon dates. As a result, at least nine subsurface cultural components were identified with the present project at site 5ME16789. A complete radiocarbon analysis is presented in Appendix A.

#### 5.11.4.1 First Component

A possible subsurface cultural component was suspected at an average depth of 30cm below vertical datum and consisted of seventeen pieces of disbursed FCR resembling an inverted or deflated hearth and a very sparse scatter of charcoal flecks (Feature 14). Artifacts present included, an obsidian microflake, six chert flakes, and a fragment of a small corner-notched point (Appendix C). The projectile point has patina, and is made of Madison Formation chert. It closely resembles a corner-notched point found in the pithouse at 5GF126-I and as a surface find at 5GF133, Locus 14; it was designated BMC type VIII in the Battlement Mesa Community Cultural Resources Study (Conner and Langdon 1987:7-7). The one found in the pithouse was associated with a date of 2770± 60 BP. The temporally diagnostic potential of the projectile point may assign a relative date to this assemblage; however, due to the alluvial nature of the deposits in which the cultural material was found, it is believed that the integrity of the component has been greatly compromised.


**Plate 5.11-4.** 5ME16789-2 (.fs5).

### 5.11.4.2 Second Component

The second most recent subsurface component was observed during the 2009 trenching operation and exposed in stratigraphic association with Middle Holocene sheet-wash alluvium at an average depth of 55cm below vertical datum (Test Block 2). It was identified as disbursed FCR found to be concentrated in unit 4X15Y at approximately 60cm below vertical datum. A radiocarbon sample from charcoal associated with the FCR yielded a conventional age of 3750±30 BP (Beta No. 303011). A rock-lined fire hearth (Feature 13) manifested below this FCR scatter at a depth of approximately 60cm below vertical datum. The feature measured approximately 40cm in diameter and 20cm in depth. Eleven oxidized rocks lined the steep-sloping sides as well as the bottom of the basin and one large, oxidized rock was found approximately 10cm south. Charcoal from the feature yielded a conventional radiocarbon date of 3690±30 BP (Beta No. 303012).


**Plate 5.11-5**. 5ME16789.fs23 San Rafael Stemmed

Within the same level, but in unit 9X11Y, a medium-sized, stemmed projectile point of Green River Formation chert (.fs23) was collected. It compares well with San Rafael Stemmed variations (O'Neil 1993) and resembles Buckles' Shavano Phase, Type 31, which he assigns a date of 3500-1000 BC, roughly 5500-3000 BP (Buckles 1971:1220). The only other associated artifacts were two chert flakes (one Madison Fm and one dark fossiliferous chert) and two fragments of burnt bone-likely small or medium mammal. It is important to note that erosional processes such as deflation and sheet-wash alluvium have somewhat affected the integrity of the component.

### 5.11.4.3 Third Component

The third component was discovered at an approximate depth of 85cm below vertical datum at Test Block 2. Mechanical stripping exposed cultural material in unit 6X13Y in which a feature – reminiscent of a roasting pit – was exposed (Feature 15). The feature measured approximately 45cm in diameter and 40cm in depth. Feature fill consisted of light gray ash and a few pieces of FCR. The rest of the component is defined by charcoal, FCR and ash sparsely scattered throughout the level in association with Middle Holocene sheet-wash alluvium. One small chert flake was found in relation to the component.

### 5.11.4.4 Fourth Component

The fourth component was found at an approximate depth of 100cm below vertical datum at Test Block 2. An unlined fire hearth (Feature 16) was exposed in unit 8X13Y. The feature measured approximately 40cm in diameter and 10cm in depth. Feature fill consisted of dark gray ash and small traces of charcoal. A radiocarbon sample was obtained from the feature and yielded a conventional age of 4320±30BP (Beta No. 303013). Two, large, ash-stained rocks were recorded near the feature as well. It is plausible that these rocks were intentionally placed above the feature to trap heat or to create a cooking surface. A large rock

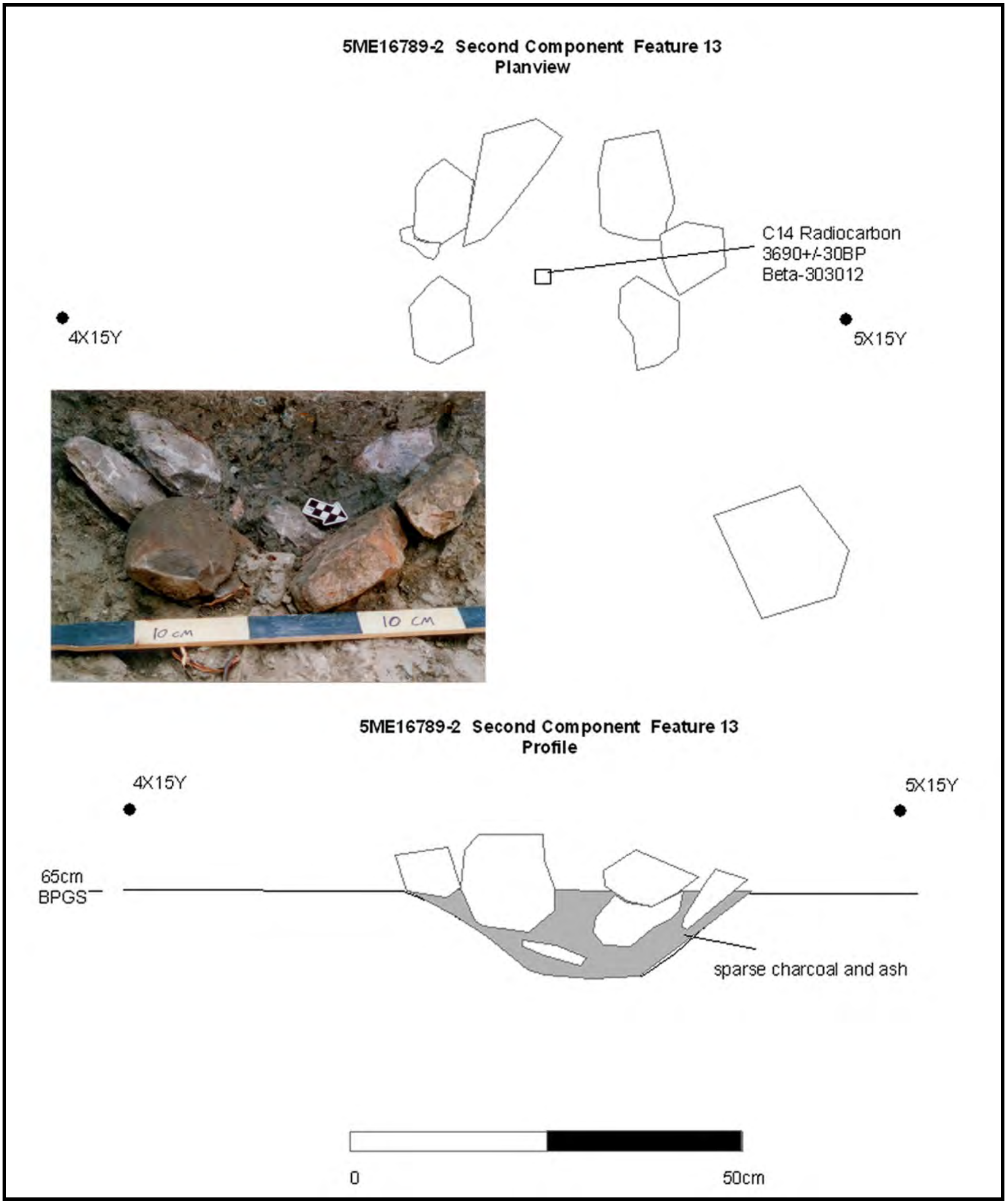



**Figure 5.11-3.** Plan and profile views of Feature 13 (Second Component), $^{14}C$ dated conventional age of 3690±30 BP.

(50x40x20cm) designated Feature 11 manifested in unit 5X12Y. The lack of additional debris or rock in the vicinity suggested it was placed by a human agent. No ash or charcoal was observed in its vicinity.

### 5.11.4.5 Fifth Component

The fifth component, previously identified in 2009 as a semi-subterranean domicile or pithouse (Feature10), was exposed at an approximate depth of 120cm below vertical datum in Test Block 2 (Figure 5.11-4). A charcoal sample was obtained in 2009 when the structure was exposed in the trench wall and yielded a conventional radiocarbon date of 4600±40BP (Beta No. 263487). A second radiocarbon date was obtained in 2010 from the floor of the pithouse (Feature 17) and yielded a conventional date of 4610±40BP (Beta No. 303014). During excavation, the initial contact with this Middle Archaic feature revealed a large, prominent charcoal stain. Further excavation uncovered a roughly circular (approximately 5m diameter), basin-shaped depression (0-15cm) containing a highly patterned arrangement of six floor features (Figure 5.11-5). Chipped stone, ground stone and bone were recovered from the structure.

Evidence suggested that the basin was excavated into the slope on the southeast and northeast perimeter to an approximate depth of 15cm. In the southeast wall of unit 9X12Y, backfill from the original construction of the structure was observed, which consisted of an amalgamation of poorly sorted, older and younger sediment. The pithouse wall depth diminished to the north where the excavated edge was no longer visible. To the northwest, the edge of the floor basin was defined by scattered large rocks that may once have formed part of the northwest wall of the structure.

It was previously believed that the entrance or opening to the domicile was located on the northeast edge of the structure. However, due to the alluvial nature of the hill slope in which the floor was excavated, it seems much more plausible that the opening would have been placed on the southwestern edge. This can only be speculated since this edge of the structure was destroyed during trenching activity.

#### *Features*

Interior features consisted of one fire hearth (Feature A), five postholes (Features B through E and H), and one peculiar feature (Feature F). Remnants of what is believed to be an activity area separator wall were also identified (Feature G). Features, artifacts and FCR identified within 130-150cm below vertical datum were identified as components of the pithouse structure. Any artifacts noted less than 10cm above the 130cm below vertical datum level, were considered to be related to the structure and may have been displaced via frost heave or other environmental processes.

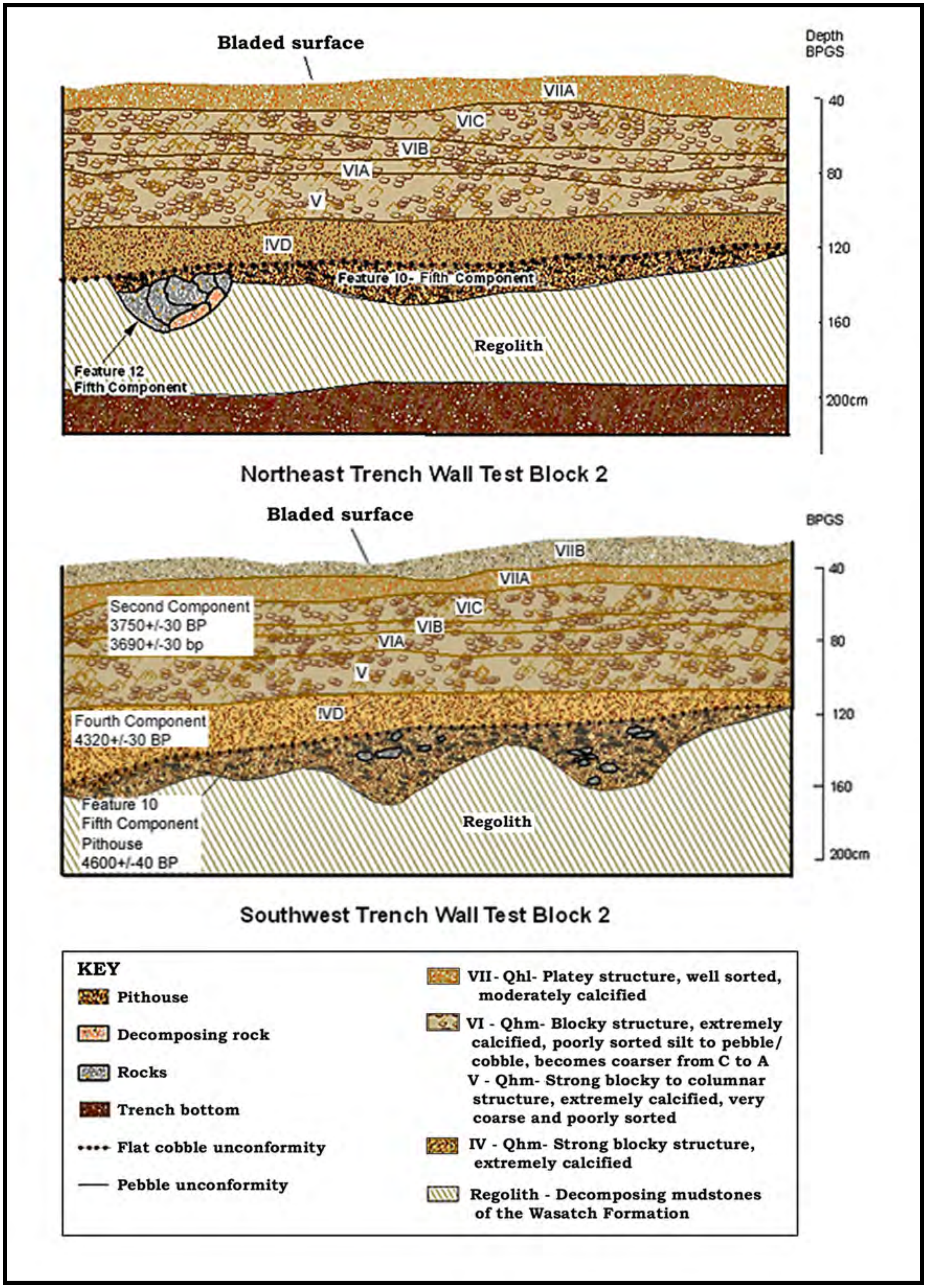



**Figure 5.11-4.** Profiles of the trench walls in 5ME16789-2, Test Block 2 showing the pithouse in the lower levels of both sides.

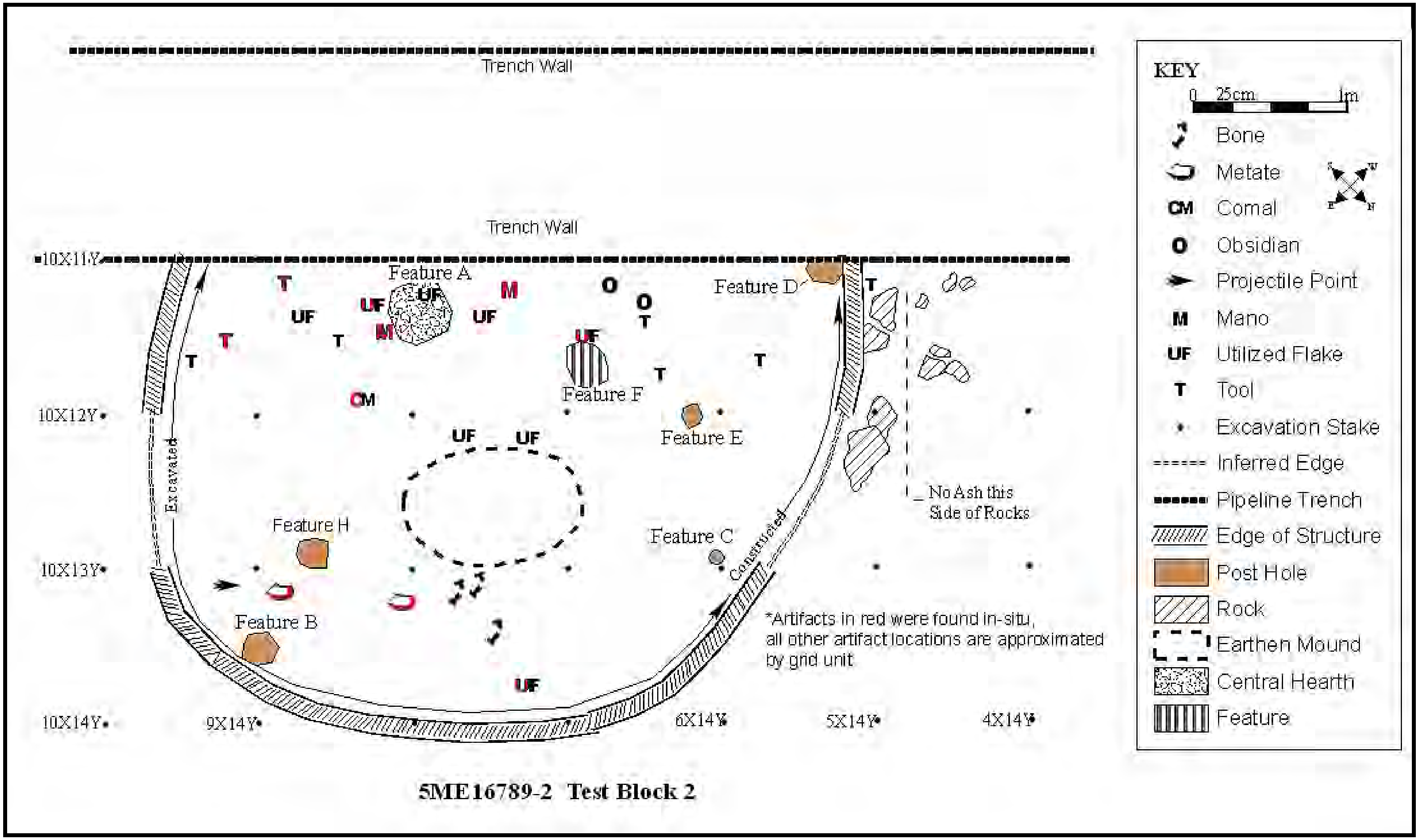



**Figure 5.11-5.** Plan view of the pithouse of Component 5 showing interior feature and floor artifacts.

## Feature A, Hearth Feature

Feature A was excavated near the center of the structure along the northeast wall of the pipeline trench. Approximately half of the feature was destroyed in 2009 during pipeline construction, therefore, the exact dimensions of the feature could not be determined, but it may have measured roughly 50cm in diameter and 14cm in depth. Fill consisted of a very sooty ash and charcoal. Few pieces of FCR were observed within the feature. Three pieces of ground stone were located near the hearth feature and include a mano, mano fragment and comal fragment. Oxidation is evident on both the mano and mano fragment, although to a much higher degree on the fragment. The complete mano also exhibits slight end wear indicating additional use as a hammerstone. A pollen sample of the mano was obtained (5ME16789.ps1).

## Feature B, Posthole

Features B through D manifested at somewhat regular intervals along the perimeter of the structure and are interpreted as possible post holes. Feature B was excavated near the east-northeast perimeter. Ovoid (18x16cm) in shape and 8cm deep, this feature contained oxidized fragments of sandstone and may have been supported by additional sandstone clasts surrounding the surface of the feature.

## Feature C, Posthole

Feature C was affected by weathering prior to sedimentation, and only slight traces of its existence were found along the north-northwest perimeter. The remnant manifestation measured roughly 8cm in diameter and 4cm in depth. Several flakes and a core were located near the feature.

## Feature D, Posthole

Feature D was excavated near the west-southwest perimeter and was initially described as a hearth (Feature 12) within the pithouse during the monitoring phase. However, during data recovery this feature was reclassified as a possible post-hole. It measured roughly 37x25cm and less than 10cm in depth.

## Feature E, Posthole

Feature E was perhaps the most well-preserved posthole identified. It manifested as a distinct charcoal stain measuring approximately 14cm in diameter and 7cm in depth. Oxidized chunks of wood were collected from within the feature and may possibly be useful in identifying species used in the construction of the superstructure.

### Feature F, Roasting or Storage Pit?

Feature F manifested approximately 1m north of the central hearth in unit 6X11Y. It measured 39x42cm and 8cm in depth. The feature was distinguished by a peculiar configuration of three rocks. One rock (6x2x5cm) was found at a 90° angle – upright within the feature – between two flat-lying rocks (6x6x2cm). The upright rock and the eastern flat-lying rock were completely oxidized while the western flat-lying rock exhibited no oxidation. Also, several pebble sized pieces of FCR were excavated from the feature fill although no charcoal was present. The southwest corner of the feature was affected by rodent disturbance.

### Feature G, Scatter of Sandstone Clasts

What has been interpreted as the collapsed remains of an activity area separator wall manifested in the units adjacent to the central hearth feature (Feature A). This scatter of sandstone clasts did not exhibit signs of oxidation-with the exception of a very small number of the clasts-and therefore it is not believed that this was the remnants of a thermal feature clean out pile. An earthen mound measuring 15cm in height manifested northeast of Feature A in unit 7X12Y. The floor around the mound as well as the hearth was depressed. It is still in speculation as to what the purpose of this mound was. Perhaps it was a sitting area for lithic tool manufacture and floral and faunal processing, or-if the entrance was located on the northeastern perimeter-it may have served as a reflector wall associated with the scatter of sandstone clasts between the door and central hearth. It may have deflected the wind from the doorway from directly affecting the fire.

### Feature H, Posthole

A fifth posthole manifested in unit 8X12Y as a concentration of eight rocks around compact, ashy soil. It is located less than 50cm southwest of Feature B and approximately 1m in from the northwest wall of the house pit. Interior diameter of the feature measured 16cm and it was only a few centimeters deep. Only two of the rocks exhibited signs of oxidation.

***Chipped Stone***

The chipped stone assemblage consisted predominately of flake tools and debitage indicative of the later stages of tool manufacture. Other chipped stone artifacts recovered from the interior of the structure include one temporally diagnostic projectile point (5ME16789-2.fs36), one obsidian projectile point midsection (5ME16789-2.fs68), one core fragment (5ME16789-2.fs113), eight utilized flakes and eight tools of varying types. One tool was likely located on the exterior of the structure. Several of the tools are believed to have served primarily as woodworking tools. Lithic debris was observed throughout the structure, however seemed to be most heavily concentrated along Feature A and closest to the southeastern perimeter.

### Projectile Point

An incomplete projectile point (5ME16789-2.fs36, Plate 5.11-6, left) consisting of one half of the blade and serrated edge, shoulder and corner notched barb, was recovered from the eastern edge of the structure. The point compares well with Elko Corner-notched and Eared types that Holmer indicates occur in the Middle-Late Archaic groups, dating ca. 3000-1000BC or 5000-3000BP, that were occupying the eastern Great Basin and western Colorado Plateau (Holmer 1986:102, Figure 12). The point is also similar to Buckles' Uncompahgre Complex Roubideau Phase Type 24, or 25, which date ca. 3000-500BC or 5000-2500BP (Buckles 1971:1220). An extrapolated composite was made to provide a better idea of the appearance of the point (Plate 5.11-6, right).

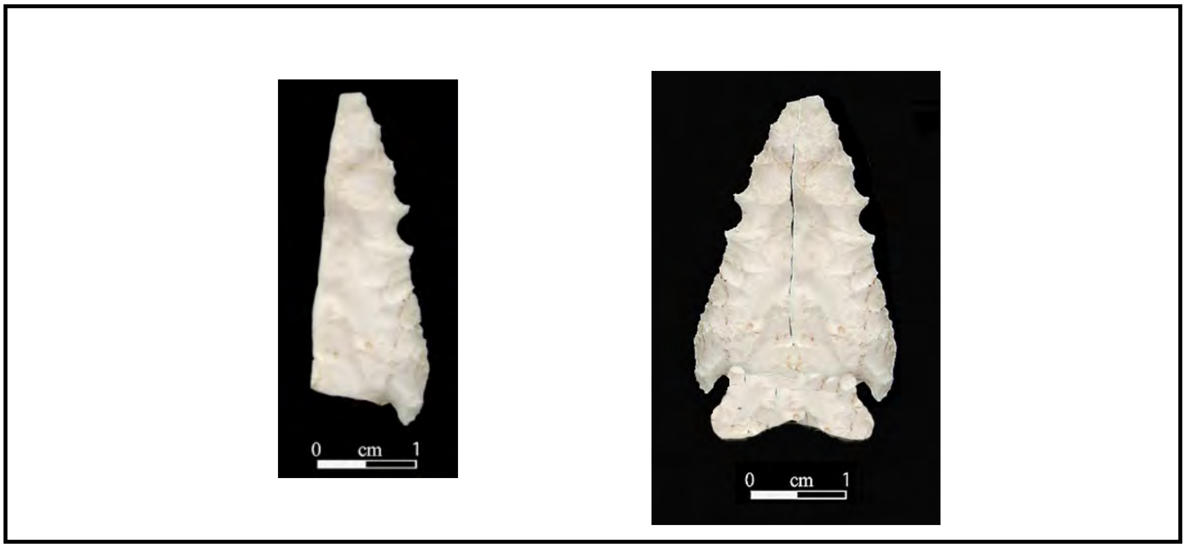



**Plate 5.11-6**. Projectile point fragment (5ME16789-2.fs36) recovered from pithouse floor (left), and possible form as original (right, extrapolated composite).

### Obsidian Tools

Two obsidian artifacts – a projectile point midsection (.fs68) and a wood- and/or bone-working tool (.fs96) found on the pithouse floor – were sent to Northwest Research Obsidian Studies Laboratory for sourcing. A separate New Mexico source was determined for each artifact, although the sources are within approximately 25 kilometers. Cerro Del Medio was designated the source for the .fs68; and Polvadera Peak was identified as the source for .fs96. The former is located in the Valle Caldera and the latter is located in the Jemez Mountains. It is important to note that the correct term for "Polvadera Peak obsidian" is "El Rechuelos obsidian," as Polvadera Peak did not produce obsidian of artifact quality (Shackley 2013). El Rechuelos obsidian is derived from several small domes located around Polvadera Peak.

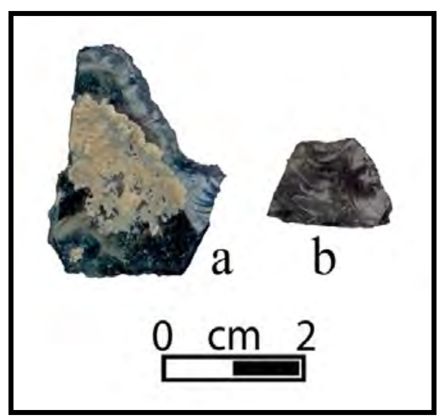



**Plate 5.11-7.** Obsidian tools from pithouse floor 5ME16789: .fs96 (a) and .fs68 (b).

## Other Lithic Tools

The lithic tool assemblage from the pithouse consisted of two biface fragments, four unifaces, two gravers, eight utilized flakes, one core fragment, and one general tool with a graver and shaping edges. If fact, several of the small lithic tools appeared to have been used for either bone or wood modification. They often exhibit graver tips and planing edges for shaping including chisels and smoothers. Plate 5.11-8 shows examples of four of these.

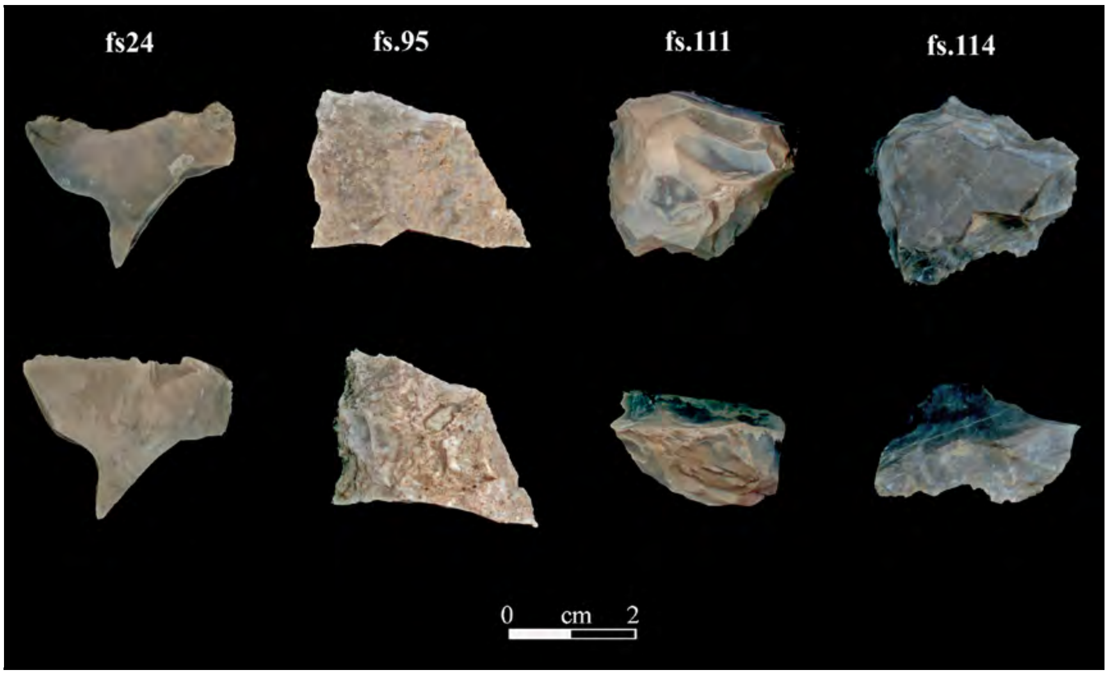



**Plate 5.11-8.** Small wood and/or bone working tools that exhibit graver tips and planing edges for shaping that were found on the pithouse floor.

## Lithic Debitage

Debitage analysis involved assigning flakes to a reduction stage sequence (early, middle, and late) based on the amount of dorsal cortex. In this study, complete dorsal cortical coverage was considered indicative of early stage manufacture, whereas some cortical coverage was considered indicative of middle stage manufacture. Late stage manufacture was evinced by the absence of dorsal cortex. Primary (complete cortex), secondary (some cortex), and tertiary (no cortex) were utilized herein to describe cortical coverage. Results of the analysis are summarized in Table 5.11-1. For simplicity of component designation, microflakes and other debitage collected from water screened soil samples were not included in this analysis.

**Table 5.11-1**. Results of debitage analysis recovered from the Fifth Component: Materials.

| Material | Quantity | Percentage |
|---|---:|---:|
| Chert | 179 | 70 |
| Chalcedony | 0 | 0 |
| Quartzite | 27 | 11 |
| Porcellanite (siltstone) | 5 | 2 |
| Basalt | 40 | 16 |
| Jasper | 2 | 1 |
| Obsidian | 0 | 0 |
| **Total** | **253** | **100** |

**Table 5.11-2**. Results of debitage analysis recovered from the Fifth Component: Characteristics.

| Characteristics | | Quantity | Percentage |
|---|---|---:|---:|
| Size | Micro | 18 | 7 |
| | Small | 163 | 64 |
| | Medium | 35 | 14 |
| | Large | 27 | 11 |
| | Very large | 10 | 4 |
| Cortex | Primary | 1 | 1 |
| | Secondary | 17 | 6 |
| | Interior | 235 | 93 |
| Other | Angular shatter | 2 | |
| | Biface tinning flakes | 21 | |

Lithic materials observed within the component include chert, quartzite, basalt, porcellanite, obsidian, siltstone and jasper. Of the total lithic flake assemblage (n=253), materials consist chiefly of a translucent Madison Formation chert (n=73) which often contains gray and orange color variations and occasional black dendritic inclusions, and Green River Formation ostracodal chert (n=78). Patination occurred on most of the lithics of these provenances and varied from slightly to heavily patinated. Heavily patinated chert specimens can be hard to distinguish material, but are assumed to be of one of these two formations due to the high occurrence of their patina.

The third most prominent flake material (n=40) was basalt, which is locally available. Several of the basalt artifacts were secondary in nature and appeared to be derived from a river cobble. A dark gray-to-black, fossiliferous chert of moderate quality and unknown provenance was found in relatively high numbers (n=25). It is similar to, but darker in color than, a local material from the Debeque (Wasatch) Formation coined "Debeque fossiliferous chert." One flake from this component is of Debeque Formation chert, and it may be that the darker chert is the heated product of the known local chert. This speculation is due to the fact that many flakes of the unknown chert exhibit heat treatment in the form of potlids. Chert from the Morrison (n=1) Formations are of note, although low in number. One flake resembling a unique chert of the Golden Valley Formation was recovered as well as a single flake of the Morrison Formation. Two flakes are of jasper.

Local quartzite materials are known from the Green River and Dakota Formations; however, only two specimens of Green River quartzite were recovered, and the remaining 23 quartzites are of unknown provenance. A dark gray quartzite material was most prevalent (n=14), which was possibly derived from the Green River Formation, however comparative specimens that resemble this material are not available. The second unknown material is a black and white quartzite (n=11). Colorado River gravels are the most likely source for these lithic materials.

Porcellanites are commonly formed near coal seams as heated mudstone fuses to form a uniform material suitable as a toolstone. Of the total porcellanites found (n=5), three are of the Burro Canyon Formation, three resemble that of the Fort Union Formation, and one is a dark gray porcellanite of unknown provenace.

### *Ground stone and Pollen*

The ground stone assemblage consisted of two manos, four metate fragments, one comal fragment, and one polishing stone. Both the mano (.fs75) and mano fragment (.fs102) exhibit signs of burning, although to a much higher degree on the fragment. The complete mano (.fs75) is an egg-shaped cobble that has a unifacial, convex grinding surface that exhibits incised striations perpendicular to the long axis on the dorsal (use) face. Pecking may be present on the ventral face but, due to calcite accumulation, is hard to distinguish for sure.

Damage to one end of the mano may be indicative of additional use as a hammerstone. The mano fragment (.fs102 is a disc-shaped mano that is bifacially ground with fairly flat use surfaces in profile. The use wear on the manos suggest they were used on different metate types – a basin-shaped metate for the egg-shaped one and a slab metate for the disc-shaped mano. The recovered metate fragments are likely parts of a single specimen made of sandstone. They are unifacial with a flat use surface and edges appear to be shaped. A single comal fragment exhibiting signs of oxidation was uncovered near Feature A. One side of the fragment was ground and the outer edges were shaped.

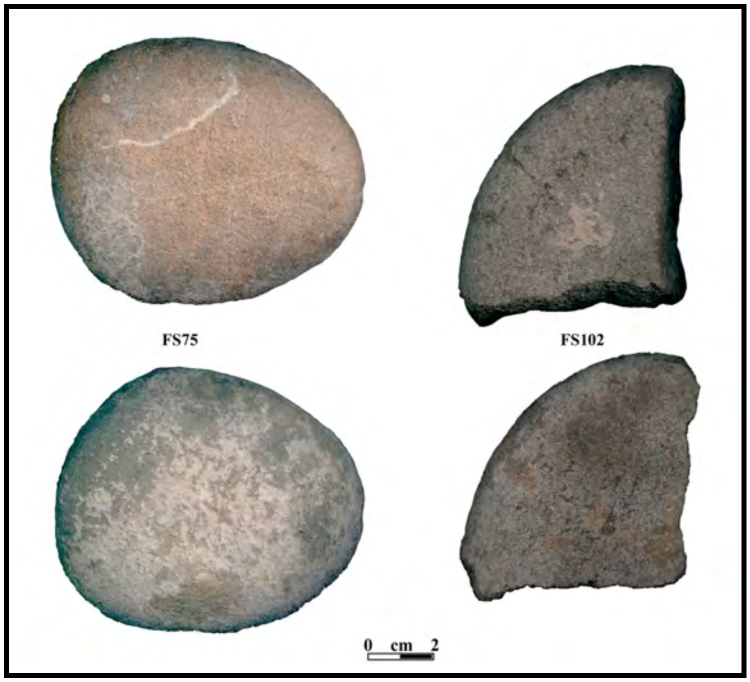



**Plate 5.11-9.** Manos recovered from the pithouse floor.

While the majority of the pollen data was derived from samples taken from the ground stone artifacts "it still reflects a stable ecosystem/climate dominated by Cupressaceae, with Amaranthaceae, *Artemisia*, Asteraceae, Poaceae, and *Pinus* fairly common on the landscape" (Blissett and Petersen 2012). The presence of Amaranthaceae in all of the samples likely reflects human disturbance of the site or concentration of these plants as a food or other resource. Some plants in the Amaranthaceae Family thrive in disturbed soils, and many produce small seeds that have been documented as being exploited by Native Americans (Harrington 1967).

*Pinus* pollen in the site is important environmentally and culturally. Based on studies of plant macrofossils by Betancourt et al. (1991) and Rhode and Madsen (1998), Rhode et al. (2010:11) have summarized the Holocene expansion north of pinyon pines from their southern Pleistocene refugia (both *Pinus monophylla* in the Great Basin and *P. edulis* in the Colorado Plateau and Colorado Rockies). They noted that pinyon pine values only began to increase after ca. Cal 4900 BP (4300 $^{14}$C BP) and reached their maximum at ca. Cal 3700 BP (3400 $^{14}$C BP). Rhode et al. (ibid.) also cite Petersen (1981) for his study of pollen in the La Plata Mountains of southwestern Colorado, which indicated *P. edulis* was present in sparse numbers there by ca. Cal 6600 BP (5800 $^{14}$C BP). Rounding out their citations is the record by Markgraf and Scott (1981:233) of pinyon pine pollen in samples recovered near Crested Butte dating just before ca. Cal 4500 BP (4000 $^{14}$C BP). Additional pollen analysis is presented in Appendix B.

***Faunal Remains***

Faunal remains were limited to small fragments with little diagnostic potential for species determination, however a general size classification was applicable. Many of the fragments are likely of a medium mammal longbone, and an unfused distal epiphysis is indicative of a fetal or adolescent specimen. A fetal specimen of a medium sized mammal such as a mule deer suggests a winter occupation of the site (Greubel 2009). The fragmentary nature of the bone may be indicative of processing for marrow or bone grease during winter months (Vehik 1977) when food is scarce, or it may simply be the result of trampling on the floor of the pithouse. Several burnt or calcined bone fragments were likely of a small mammal, possibly Lagomorpha, and are further indication of processing. All of the bone specimens were located near the northeast perimeter of the structure in unit 7X13Y. In addition to burned bone, a small fragment of a bivalve shell was recovered from unit 5X11Y.

### 5.11.4.6 Sixth Component

The sixth component, an Early Archaic occupation, was previously identified in 2009 and was exposed 40cm below vertical datum at Test Block 1 (Figure 5.11-6). Cultural material was concentrated in three units (99X102Y, 98X102Y and 97X102Y) in association with a middle Holocene loess. In unit 98X102Y, a slab-lined hearth (Feature 1) manifested below a scatter of FCR which extended into units 97X102Y and 99X102Y (Figure 5.11-7). The feature measured roughly 50cm in diameter and 30cm in depth. A total of four sandstone slabs were documented along the steep sloping sides of the basin, and five additional small to medium-sized rocks were documented near the bottom. Feature fill consisted of coarse, poorly sorted alluvium. A carbon sample was obtained from the center of the feature and yielded a conventional date of 5860±40BP (Beta No. 303009). A pollen sample obtained from the fill indicated that juniper pollen is the most prevalent, followed by sage and amaranth. The presence of amaranth possibly indicates processing of the plant, however, these plants thrive in disturbed soils and could just as easily have fallen into the hearth, as no burnt plant remains were recovered. One small Madison Formation chert flake, a Green River Formation quartzite microflake, and two pieces of porcellanite shatter were discovered in relation to the component.

### 5.11.4.7 Seventh Component

The seventh component is also an Early Archaic occupation (Figure 5.11-6). It was previously identified in 2009 as the remnants of a semi-subterranean domicile or pithouse (Feature 2). It was exposed 50cm below vertical datum at Test Block 1, in association with middle Holocene loess. The top of the feature was defined by a flat cobble unconformity mapped in stratigraphic profile in 2009. Remnants of the pit-structure were circumscribed to two units (98X102Y and 99X102Y). A conventional radiocarbon age of 5810±40BP (Beta No. 263485) has been attributed to the component due to carbon collected during 2009 trench construction.

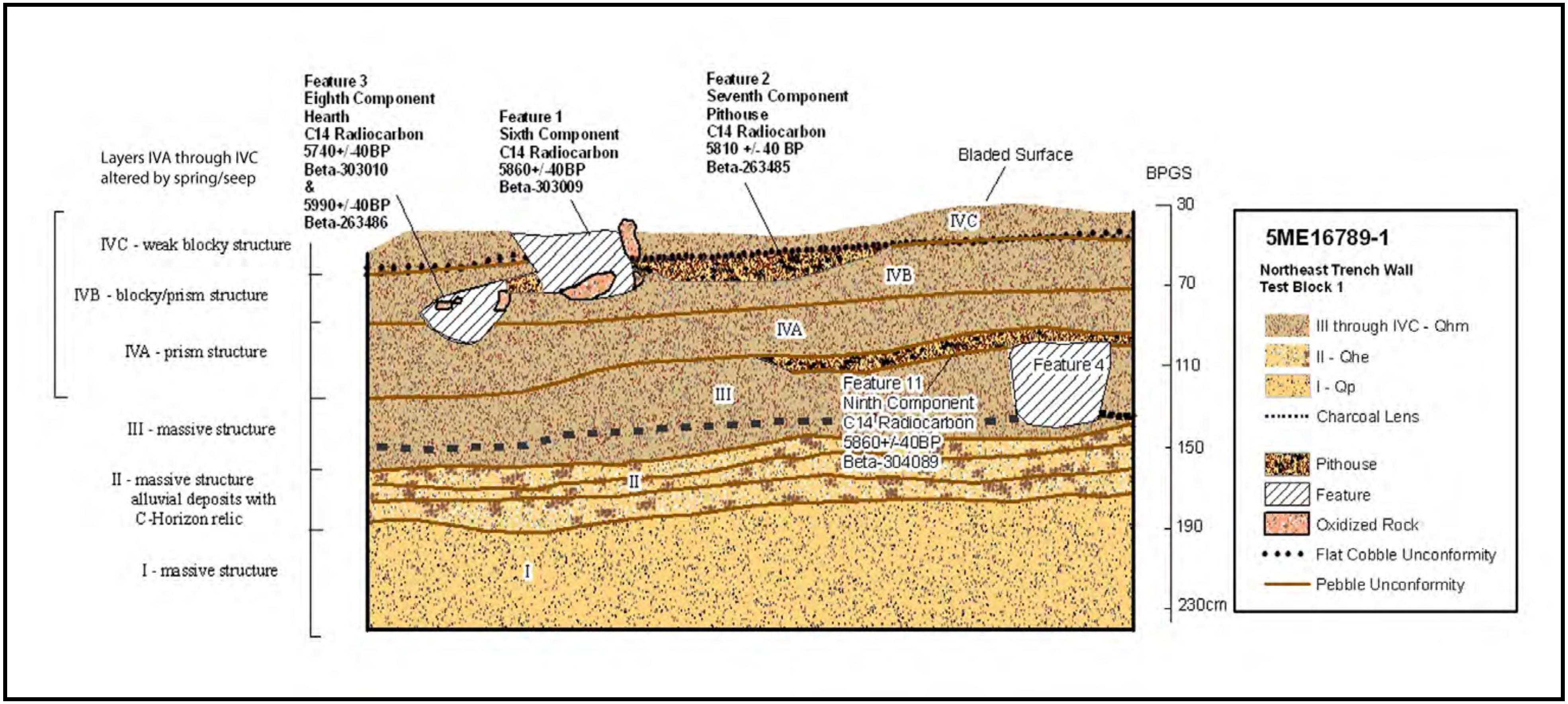



**Figure 5.11-6.** Profile of NE wall of Test Block 1 showing distribution of features and related $^{14}$C dates. Feature 11 is apparently affected by a seep causing leaching of carbon from upper levels.

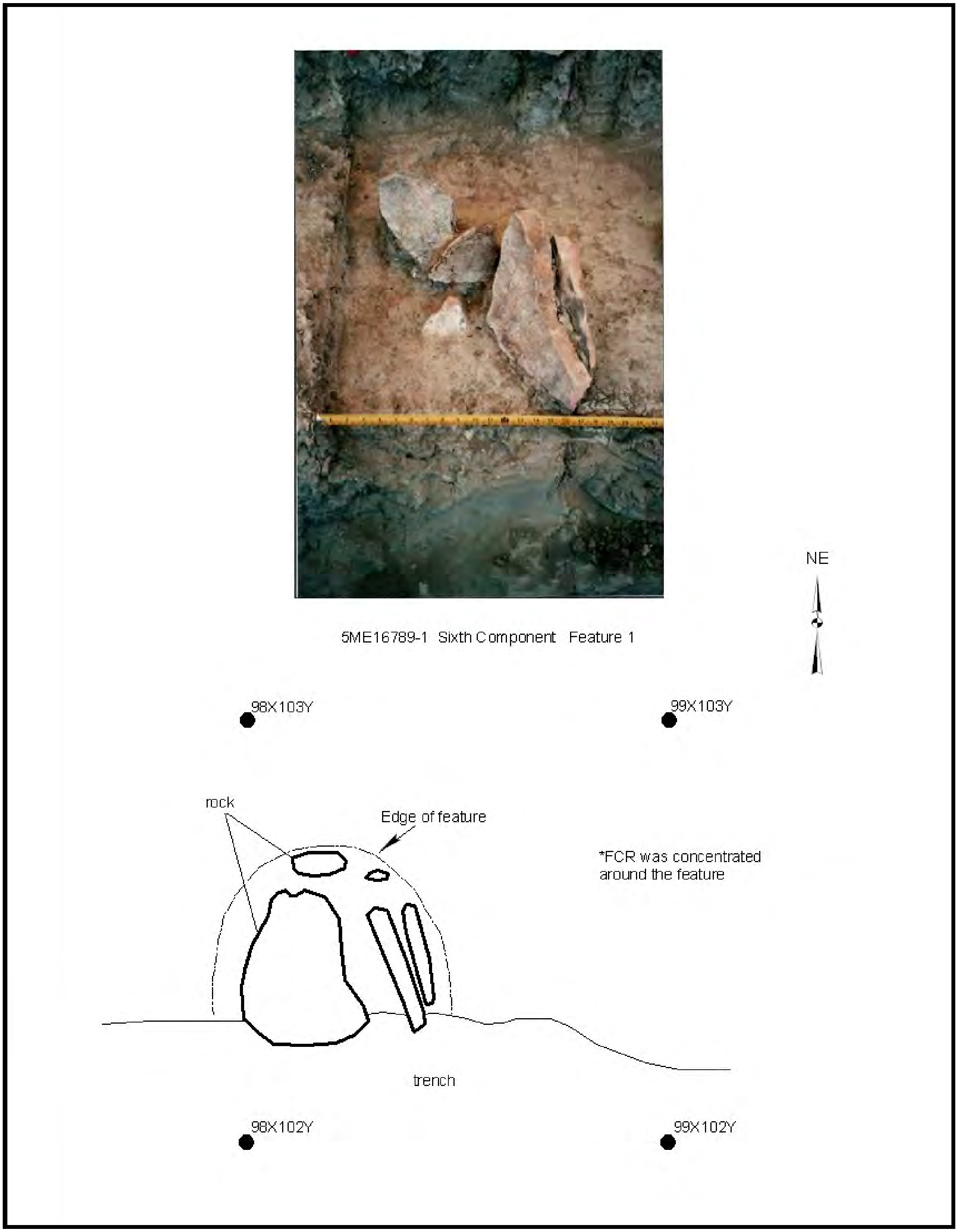



**Figure 5.11-7.** Photograph and plan view of Sixth Component Feature 1, conventional date of 5860±40BP.

Pipeline construction as well as deflation caused considerable disturbance to the structure, leaving only a small area (1.5x0.4m) of ash *in situ* along the east-northeast perimeter in units 98X102Y and 99X102Y. The thickness of the ash measured roughly 10cm. Unfortunately, many of the characteristics of the structure were inconclusive due to compromised integrity. Formal preparation of the floor could not be discerned from the intact section. Evidence of interior or exterior features were not encountered. One small, patinated chert flake of the Green River Formation was recovered from this component.

**<u>5.11.4.8 Eighth Component</u>**

A possible fire hearth (Feature 3) believed to be associated with Feature 2, was identified in cross-section in 2009 (Figure 5.11-6). The feature was harvested at that time and yielded a conventional radiocarbon date of 5990±40BP (Beta No. 263486). A charcoal sample obtained from the remains of the feature in 2010 when located in planview, yielded a conventional date of 5740±40BP (Beta No. 303010). The discrepancy between the two dates is believed to be attributed to a spring or seep that has caused a "slumping" of the middle Holocene deposits in this area. During excavation, evidence suggested that this feature was located outside the pit structure (Seventh Component) and was likely representative of an earlier occupation referred to as the eighth component in relation to the excavation. It is possible that the small, patinated chert flake believed to be related to the seventh component, is related to this fire hearth instead.

**<u>5.11.4.9 Ninth Component</u>**

The ninth component was exposed at a depth of 95cm below vertical datum at Test Block 1 in association with the middle Holocene loess (Figure 5.11-6). Again, this component was previously identified in 2009. As discovered in the trench profile, the component appeared to be the remnants of a third pit structure (Feature 11) with an associated hearth feature (Feature 4). During the 2010 excavation, cultural material was found in two units (99X102Y and 98X102Y).

In unit 99X102Y, a small area of ash was exposed in the south corner. The ash extended southeast into un-excavated deposits. Minute charcoal flecks were disseminated throughout the unit. A radiocarbon sample obtained from here yielded a conventional age of 5860±40BP (Beta No. 304089). Chipped stone or ground stone were not recovered. A large stone was found in association with the ash in unit 98X102Y. The lack of additional debris or rock in the vicinity suggested it was placed by a human agent; however, the purpose of the rock was somewhat unclear. It may

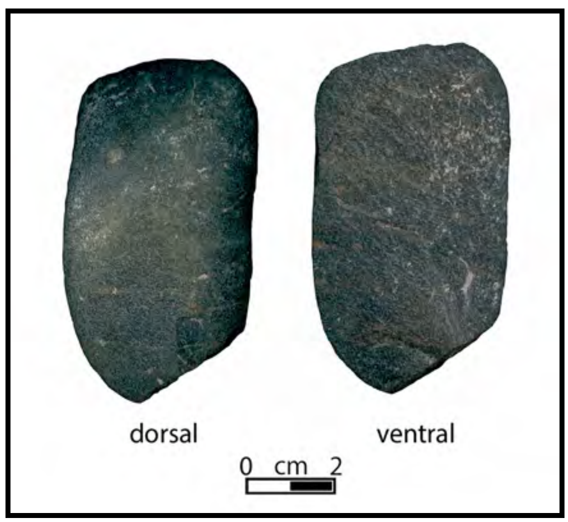



**Plate 5.11-10.** End scraper, 5ME16789. fs18.

have functioned as furniture or it could have been used as an anvil stone. The hearth feature noted in 2009 was not relocated during the 2010 excavation. An end scraper fashioned from a large, primary flake removed from a basalt cobble was recovered from this component when it was exposed in the trench wall during the 2009 monitor (5ME16789.fs18, Plate 5.11-10).

### 5.11.5 Other Features

Features 5 through 9 were ash stains observed in the trench wall at Test Block 1 during the 2009 monitor, however no definitive reference to them during 2010 excavation was able to be made. Feature 5 was an ash stain measuring 110cm in length and less than 40cm in depth with no associated FCR. The feature was located approximately 115cm below vertical datum in association with Middle Holocene loess. Feature 6 and 7 were small ash stains noted approximately 70 and 120cm below vertical datum in association with Middle Holocene loess. Feature 8 was hypothesized to be the remains of a living surface and appeared as a lenticular lense of ash, with charcoal concentrated along the bottom of the feature. It was located approximately 100cm below vertical datum in association with the Middle Holocene loess. Feature 9 was a small lenticular ash lense located 60cm below vertical datum in association with the Middle Holocene loess.

### 5.11.6 Summary of Water Screens

At Test Block 1, water screen samples were collected from units 97X102Y, 98X102Y, 99X102Y, and 98X103Y. Samples were collected in 10cm increments until suspected levels of cultural significance were reached. Samples were then collected in 5cm increments until a culturally sterile depth. Traces of charcoal were noted throughout most of the stratigraphic column with the exception of depths of 60 to 80cm below vertical datum (PGS). Charcoal was not collected from water screen samples. A single microflake of Green River formation chert was collected, likely in relation to the sixth component. Four microflakes of Green River formation chert and quartzite were collected below 88cm PGS, and are likely related to the ninth component. Specimens observed (but not collected) that originate from the local Wasatch formation include fossilized ostracods, insect burrow casts and a tiny fossilized reptile tooth.

Water screen samples were collected in arbitrary 5cm increments from units 4X11Y, 6X12Y, 7X12Y, 7X15Y, 8X11Y, 8X12Y, and in 10cm increments in unit 9X11Y. Results of the analysis are summarized in Appendix C. Charcoal traces were observed (not collected) throughout almost every 5cm increment in the entire stratigraphic column at Test Block 2, and flakes (mostly micro in size) were fairly common as well. Small samples of FCR were observed at depths of 65 to 100cm PGS, and small burnt bone specimens were found between 26 and 45cm, and 70 and 100cm PGS. Organic debris (juniper needles, juniper berry seed hulls, etc.) was common throughout water screen intervals, although such did not appear to be represented from within the middle Holocene loess at Test Block 2. Interestingly, no debris was observed from samples taken in Test Block 1.

A specimen (awn) of *Erodium cicutarium* (5ME16789-2.fs126) was collected in relation to the fourth component. The common stork's-bill, as the plant is commonly known, is an annual forb or herb that is believed to have been introduced to North America in California by Spanish explorers in the early 1700's (Howard 1992), therefore it seems likely that this specimen was introduced into the water screen sample via more recent sediments or possibly from bioturbation.

### 5.11.7 Environmental Implications of the Presence of Snails

*Oreohelix* and *Succinea* gastropod remains are commonly found among excavated sites in the area and may be useful climatic and environmental indicators for archaeological and geological stratigraphy. *Oreohelix* is a genus of terrestrial, air-breathing gastropod that is noted to be found along limestone outcrops and limestone rich, sandy soils, and in sparsely vegetated stands of juniper and/or sagebrush with ample debris or duff cover (Henderson 1912). Some species are known to occupy moister environments along streams and seeps (Hendricks 2012). *Succinea* is another genus of terrestrial, air-breathing gastropod that prefers damp environments such as marshes, seeps and streams, and occasionally, drier habitats with sparse vegetation but continually damp ground (ibid:65). While no specimens of either gastropod were found during excavation, remains were commonly located within water screened soil samples. *Succinea* was the most common of the complete specimens while many of the remains were too fragmentary in nature to assign a specific classification. *Oreohelix*-like specimens were limited to tiny examples (approximately 2mm diameter) that may or may not be assigned to the genus *Oreohelix*. One specimen of a tiny terrestrial snail was collected that resembles the genus *Vertigo*, which is known to prefer wooded habitats, under rocks and duff, and sometimes near streams (ibid:103).

In Test Block 2, *Succinea* snail specimens were located throughout the entire stratigraphic column with the exception of the young, Qhl deposits. Also, a single specimen of a tiny terrestrial snail resembling the genus *Vertigo*, was found in relation to middle Holocene alluvium. Snails were also noted from within most of the stratigraphic column in Test Block 1; however, it is important to note that water screen samples were only collected from depths of 70cm or less in unit 98X/103Y. The paucity of snail remains from shallower depths may be the lack of samples taken from those depths. Several *Succinea* specimens and the only identifiable specimens of the tiny *Oreohelix*-like gastropods were found in relation to Test Block 1. The latter is indicative of the presence of the seep as long as 5000 years ago near Test Block 1, which provided an ideal micro-environment for these tiny *Oreohelix*-like gastropods. In general, the continuous presence of terrestrial gastropods within the site is indicative of a moist local micro-environment, and the presence of substantial decaying ground cover.

### 5.11.8 Evaluation of Research

At least three of the features observed during 2009 trenching appeared to be semi-subterranean domiciles or pit-structures, however only one (Feature 10, Fifth Component) yielded definitive evidence of a structure during excavation in 2010. Evidence suggested it was partially dug into a slight slope by approximately 15cm, a depth that diminishes downslope until the excavated edge is no longer visible. Several house pits recorded by Metcalf and Reed ed. (2011:77) in Moffat and Rio Blanco counties, Colorado and Sweetwater County, Wyoming were described as being partially built into slopes with flat floors that result in the lack of a definable wall on the downhill side of the structure. Metcalf references Shields's (1998) observation of this characteristic as well. Entrances are commonly presumed to be located on the downhill side of house pits constructed in this way as is suggested by some structures identified by Metcalf. Of the many house pits excavated during Metcalf's project, only a select few (n=4) were measured or estimated to be five meters in diameter or more. In contrast with the fifth component pithouse at 5ME16789, the domiciles with diameters of at least 5m excavated by Metcalf et al. vary in depth from 40 to 115cm (ibid:78-79).

Evidence of a superstructure is based on the presence of at least five post supports along the northeast and northwest interior of the feature. Postholes were not noted near the southeastern edge of the structure. Due to the high amount of rock excavated from the interior of the structure, it may be that the subtle nature of the postholes was overlooked in some places. Three of the supports are located around the periphery of the structure, while two were located approximately 1m in from the external walls. Additional posts inside the superstructure may have been necessary to support a large domicile of such dimensions. The supports exhibited varying degrees of intactness and therefore a definitive statement cannot be made, but posts appeared to be dug into the ground at a fairly straight (90°) angle. Similar observations of pithouses with straight posthole supports were made at site 5GF126 (Conner and Langdon 1987). An oxidized wood specimen (5ME16789-2.fs78) from Feature E was collected and may serve to identify superstructure material. Shields (1998) proposes that shallow basin houses may have superstructures similar to a domed free-standing wickiup with post supports along the interior of the structure.

Pollen analysis suggests that at the time of occupation, climatic conditions and flora at the site were stable, and similar to that of present day as evident from the continual presence of Amaranthaceae and Asteraceae. Ethnobotanically, significant taxa pollen aggregates and pollen from additional plant taxa known to be used by native peoples for food or other resources include: Ambrosia, Artemisia, Cactaceae, Nyctaginaceae, Poaceae, and Rosaceae. Pollen from Salix, a wind pollinated taxon, may have come from willows located nearby (Appendix B).

Due to the proximity of the site to the higher elevations of Grand and Battlement Mesas, several intermittent drainages and their confluences exist near the site and were evident in the stratigraphy during excavation. These drainages may have provided an ample water source during wetter months and supported native vegetation useful as food and fuel sources. The discovery of terrestrial gastropods, Salix pollen, and accumulations of organic debris from water-screened soil samples reiterates the likelihood that the environment (at least locally) was fairly moist for at least parts of the year. Although processing of faunal material was not extensively evidenced within any of the cultural components, it may be safe to assume that the area supported a variety of wildlife.

#### 5.11.8.1 Stratigraphy and Climate Correlation

The stratigraphic profile at site 5ME16789 is fairly complete (Figure 5.11-8). The Pleistocene loess described by Miller (2011) in previous sections of this report is nearly 1m thick at Test Block 1; however, total thickness is not known and bedrock was not observed. Nearby drainages were likely incising during this period due to higher amounts of surface water runoff from the higher elevations. The alluvial deposits that overly the Pleistocene loess are representative of the early Holocene, during which time Miller (2011) describes simultaneous deposition of large scale dunes and aeolian deposits during the first major drought of the Holocene epoch. A C-Horizon relic indicates proximity of the area to bedrock and little to no soil development within this stratigraphic unit. The middle Holocene is first represented as a thick, extremely calcified loess with at least four erosional, or non-depositional unconformities. Cultural features located within this stratigraphic unit at Test Block 1 yielded five $^{14}C$ dates between the ages of 5990±40BP (Beta No. 263486) and 5740±40BP (Beta No. 303010). The stratigraphy has been affected by a spring seep in the immediate area and is believed to have caused a mixing of carbon within the cultural levels. The accumulation of the loess deposits signifies moist climates and stabilized vegetation (Miller 2011). Michael L. McFaul records a weakly moist, stable period in Northwestern Colorado and South-central Wyoming ca. 5800-6000BP (Metcalf and Reed 2011:8).

Bedrock was notably closer to the present ground surface approximately 30m northwest, in Test Block 2. A regolith of decomposing mudstone of the Wasatch Formation is generally located at a depth of 140cm below ground surface. The middle Holocene loess is present in this area; however, the deposits are younger in age than the youngest represented at Test Block 1. A $^{14}C$ date of 4320±30BP (Beta No. 303013) obtained from the fourth cultural component located in relation to the loess in this area, justifies this conclusion. The elevation difference due to bedrock topography likely created a low-lying area near Test Block 1, in which the Pleistocene loess, and Holocene loess and alluvium could deposit. Meanwhile, exposed bedrock near Test Block 2 would have undergone *in situ* weathering processes, and contributed to the material accumulated in the low-lying areas.

The pithouse (Feature 10) excavated into the regolith yielded a $^{14}C$ date of 4600±40BP (Beta No. 263487). A flat cobble unconformity overlying the feature indicates a flash flood, episode occurred after 4600BP and prior to the next occupation at 4320BP. Notably, Chen and Associates indicate an accumulation of windblown silts within a dry period ca. 4450BP in the Battlement Mesa area (Conner and Langdon 1987). (Flash flooding often occurs when precipitation falls rapidly on either saturated soil or very dry soil that has poor absorption ability.) The deposition of the middle Holocene loess resumes after the erosional episode until sometime post 4320BP. Miller (2011) records the end of the middle Holocene loess deposition at 4000BP; similarly, Chen and Associates, refer to a stable, yet dry, period after 4300BP that ends ca. 3900BP (Conner and Langdon 1987).

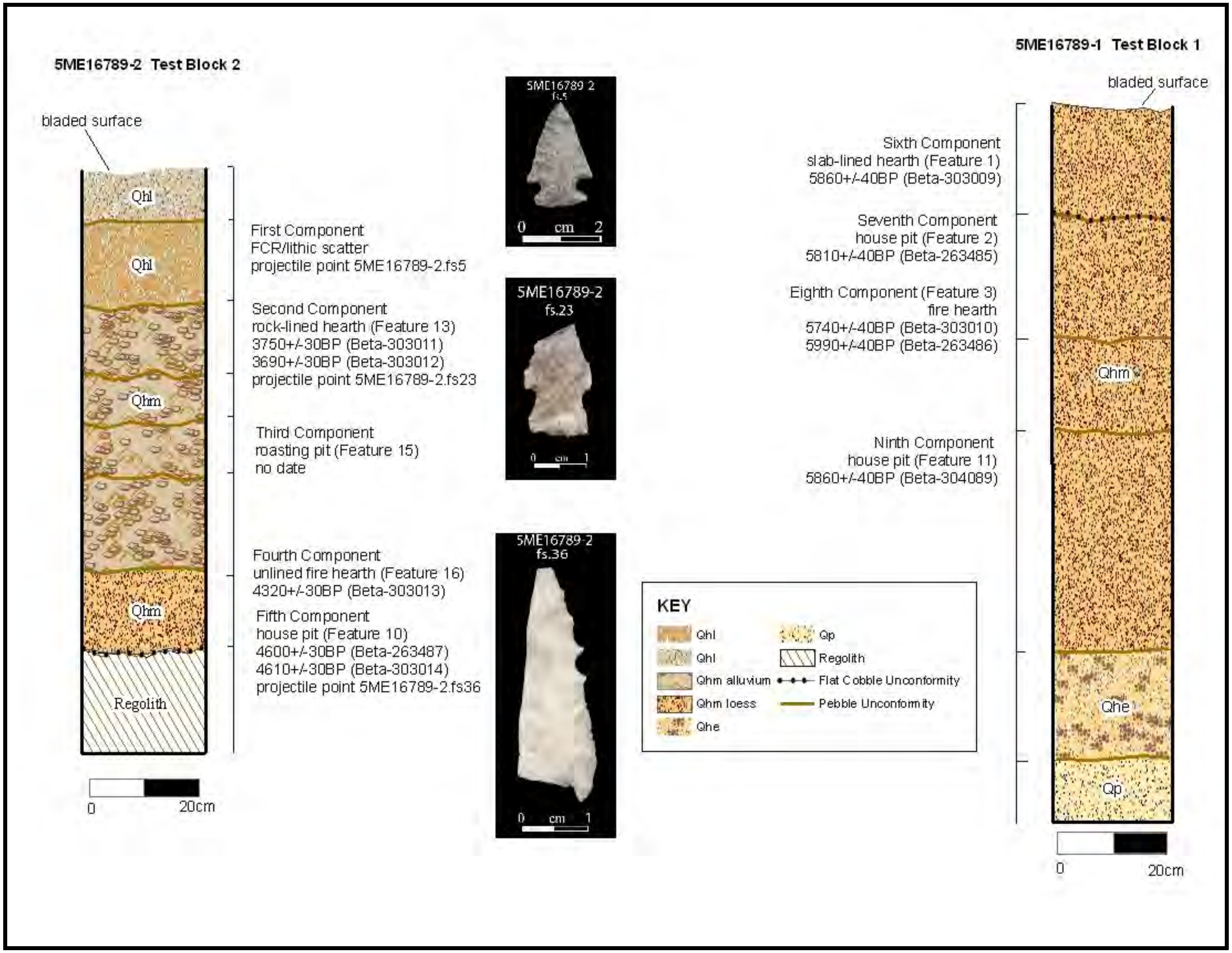



**Figure 5.11-8.** Idealized stratigraphic column showing loess and alluvial deposits in relation to dated cultural contexts.

Miller (2011) attributes alluvial deposition in the middle Holocene to a warm and dry episode, but McFaul (Metcalf and Reed 2011:8) records a moist interval ca. 4700BP to ca. 3500BP. During the latter part of that time, a cultural component was identified that yielded two $^{14}C$ Radiocarbon dates of 3750±30BP (Beta No. 303011) and 3690±30BP (Beta No. 303012) from the upper strata of the middle Holocene alluvium. Accordingly, as exhibited in the stratum of 5ME16789, loess deposition begins again only sometime post-3690BP in at least two distinct intervals of the late Holocene. These intervals are separated by an unconformity and difference in soil structure. The deposition of these loess deposits is in coincidence with wet periods separated by deflation surfaces during periodic episodes of drought, as indicated by Miller (2011).

### 5.11.9 Conclusion

Data recovery confirmed the presence of five previously identified cultural components. In addition, four new cultural components were identified. Absolute dating techniques (i.e., radiocarbon analysis) and diagnostic artifacts indicate that the cultural components extend from Early Archaic period into the Formative period (5300BC to AD1300). Radiocarbon dates correlate with stratigraphic position of the components at Test Block 2; however, at Test Block 1, the component dates appear to be mixed relative to stratigraphic position. This may be attributed to the “slumping” character of the middle Holocene soils due to a seep in this area. Additionally, it is possible that leeching has caused a mixing of carbon between the Early Archaic components.

### 5.11.10 Evaluation and Management Recommendation

The site has proven beneficial to yield information important to the prehistory of the area; however, the archaeological potential has been exhausted as a result of excavation. Therefore the site is evaluated as not eligible for listing on the NRHP. Accordingly, no further work is recommended.

## 5.12 Site 5ME16791

### 5.12.1 Introduction

Site 5ME16791 was discovered by mechanical stripping that exposed the remnants of two thermal features (Features 1 and 2) and four flakes. During grading of the pipeline right-of-way, the features were exposed on the east side of the pipeline and west of the roadway. The significance of the exposed resources and their provenience within an area of direct impact necessitated immediate mitigation through the recovery of data (Figures 5.12-1 and 5.12-2). Efforts were made to establish the vertical and horizontal extent of cultural deposits. This testing was conducted between the 16th and 21st of July 2009 by Curtis Martin, Lucas Piontkowski, Travis Archuleta, and Michael Brown.

The cultural deposits are situated on a bench northwest of a low prominence at the southwest corner of Lugans Basin near the head of Jerry Gulch (Plate 5.12-1). The elevation is 5980 feet. Soils consist of a fine to coarse gravelly loam derived from Wasatch Formation colluvium of Wasatch Formation residuum. The vegetation consists of a sparse scattering of juniper trees intermixed with sagebrush, rabbitbrush, snakeweed and native grass.

**Plate 5.12-1**. Overview of site area. Crew working at features exposed by ROW clearing.

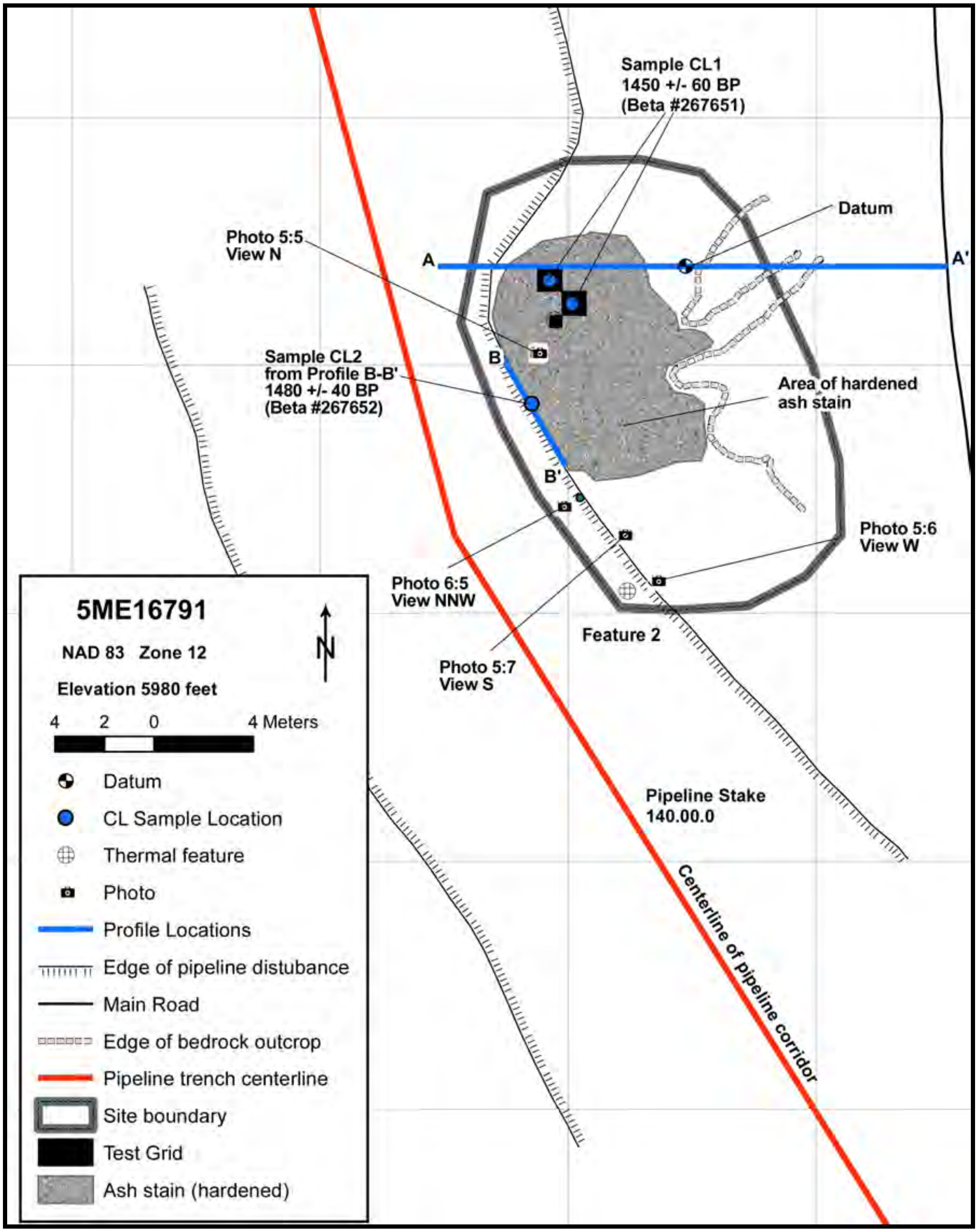



**Figure 5.12-1.** Site map for 5ME16791 with features discovered during monitoring and evaluative test pits excavated in 2009.

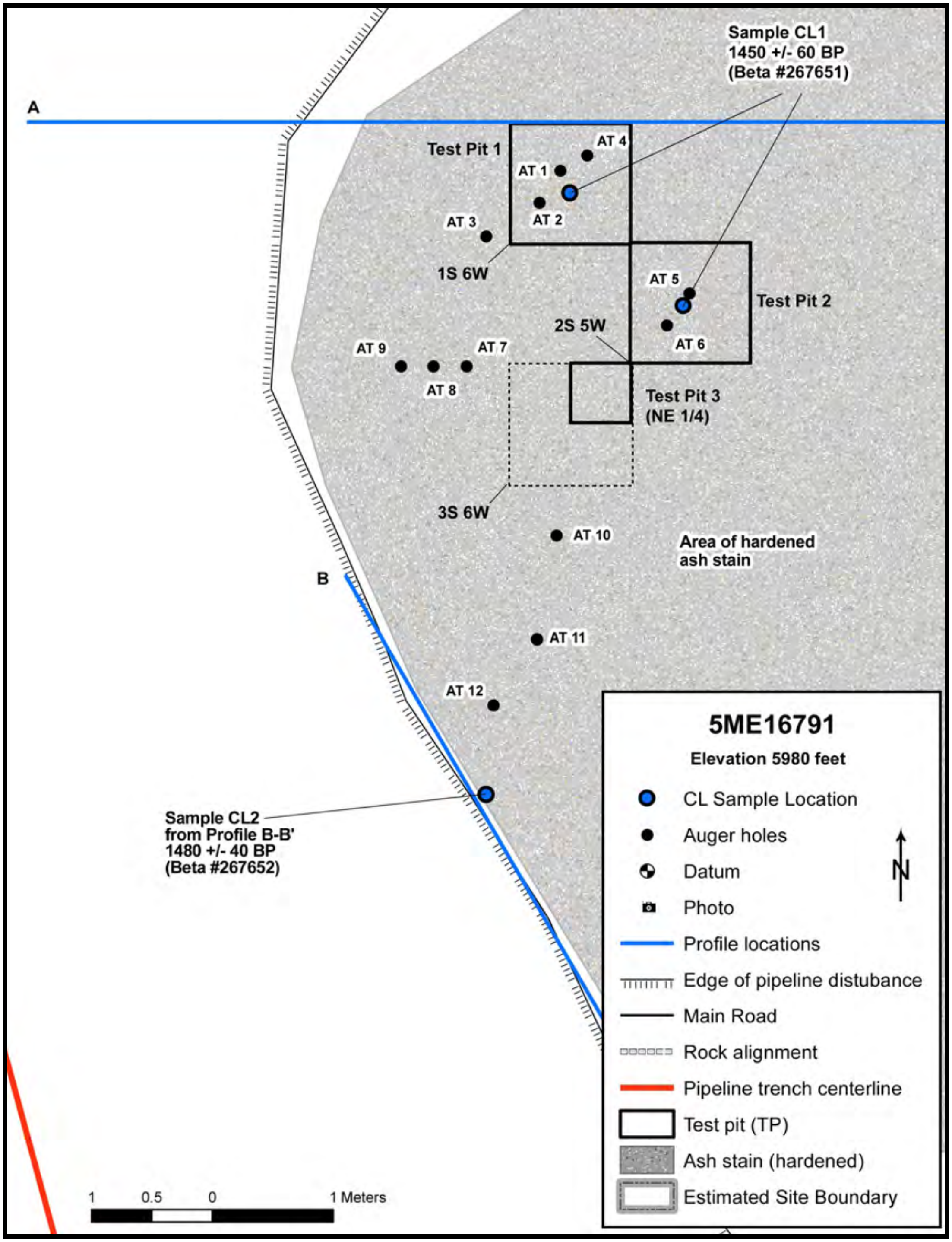



**Figure 5.12-2.** Inset map showing test pits and auger holes.

### 5.12.2 Field Methods

Three 1x1m test pits were established on the site. Test Pits 1 and 2 were fully excavated and the NE1/4 of Test Pit 3 was excavated for a total of 2.25 square meters which is within FLPMA permit guidelines. All three test units were located within Feature 1. They were laid out on a true north-south axis and the southwest corner of each unit was designated as the unit datum. The test units were on east to west sloping ground which dropped an average of 14° over 20m. The southwest corner datum nails were left in place for future reference after the excavation units were backfilled. Twelve auger tests were hand dug across the site to establish the vertical extent of the site and determine whether *in situ* stratigraphic cultural deposits still remained.

Excavation of the test units was by hand. Arbitrary levels at 10cm increments were excavated unless or until natural soil levels could be identified. All dirt was screened through a 1/8 inch wire mesh screen. Charcoal samples were taken from what appeared to be two separate cultural levels within Feature 1. The first sample (CL1) came from within Test Pits 1 and 2. The second sample (CL2) came from the ash lens exposed in the bulldozer cutbank. These samples were sent to Beta Analytic, Inc. for analysis. Plan and profile maps along with photographs were taken of the excavations. Artifacts will be returned to the landowner.

### 5.12.3 Results

Mechanical stripping exposed the remnants of two thermal features (Features 1 and 2) and four flakes within an area measuring approximately 19m north-south by 12m east-west. Feature 1 was exposed at the base of a bedrock outcrop. It consisted of a large (10m x 12m) compact ash stain. It was also exposed in the dozer cutbank, and was initially thought to be a separate cultural component. Feature 2 consisted of a smaller, more defined ash stain that measured approximately 50cm in diameter. Closer examination of Feature 2, which included removing the loose fill produced during grading and stripping, showed that it was a deflated ash stain with no potential for producing a radiocarbon date. No further investigation was conducted at Feature 2.

#### 5.12.3.1 Test Pit 1

Test Pit 1 (Figure 5.12-3) revealed the remnants of a large, diffuse, ash stain. The north edge of the test unit consisted of bulldozer balk, which was removed as a unit down to the main bulldozed level. The ash stained soil is exposed at 20cm below the original ground surface; however, the precise elevation is unknown due to the disturbance caused by bulldozing. Thirteen flakes were located on the surface and in the ashy fill. An *in situ* flake was recovered from 9.5cm below the bulldozed surface and a basal-notched projectile point was recovered from screened materials taken from the west half of the southeast quarter of the grid, 12-16cm below the bulldozed surface. Rodent disturbance is present at the southwest corner of the grid.

Auger Tests (AT) 1, 2 and 4 were placed within the test pit. Auger Test 3 was located just outside the southwest corner. Auger Test 1 presented ashy soil from the bulldozed surface down to 7cm where contact was made with a tree root. Auger Test 2 showed the densest ash between 5 and 15cm below the bulldozed surface, with the charcoal flecks as deep as 0.98m, 1.45m and 1.5-1.72m below the bulldozed surface. The southeast corner revealed several pieces of crushed sandstone that had not been heat altered. Auger Test 3, placed directly outside the southwest corner of the unit, shows sterile light brown fill to a depth of 18cm.

Charcoal fragments (originally designated Cultural Level [CL] 1) were collected throughout the excavation unit and sent for dating which produced a conventional radiocarbon date of 1450 ± 60 BP, with a calibrated intercept of AD 450 to AD 670 (Beta-267651) .

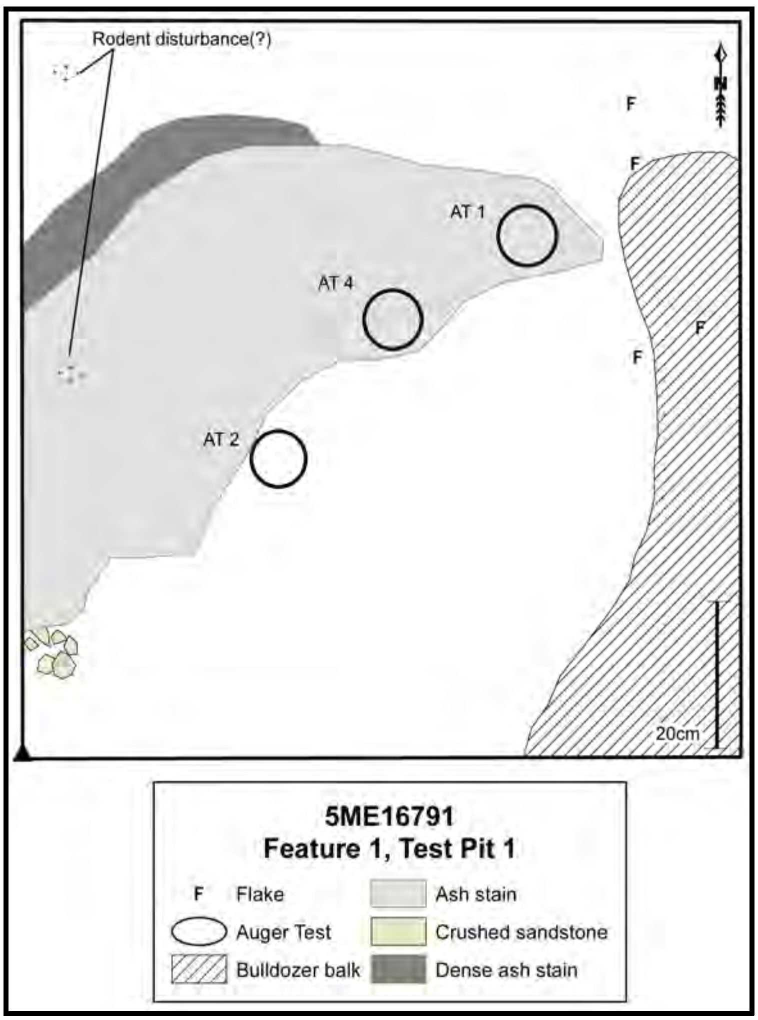



**Figure 5.12-3.** Plan view of Feature 1, Test Pit #1 located within 20cm of the bulldozed surface. Charcoal from this level was dated Cal AD 450 to AD 670. A projectile point (FS-4) was recovered from the screen.

5.12.3.2 Test Pit 2 and 3

Test Pit 2 (Figure 5.12-4) consisted of a hard packed ashy gray surface exposed at the present bulldozer level. Beneath that, 4-8cm below, was an undulating surface of ashy gray soil that covered the west half of the unit. A large rodent hole (krotovina) was present in the NW and SW quarters. Eight flakes, one of which was utilized, were recovered from the surface and the ashy fill. The northwest and southwest quarters of the unit were excavated individually as Level 1B. A flake was located in the NW 1/4, 1-15cm below the bulldozed surface.

Auger Tests (AT) 5 and 6 were placed within the test pit. Auger Test 5 was excavated to a total depth of 31cm below the bulldozed surface with no notable ash or charcoal present. Auger Test 6 revealed ashy soil and charcoal flecks 2-15cm below the bulldozed surface.

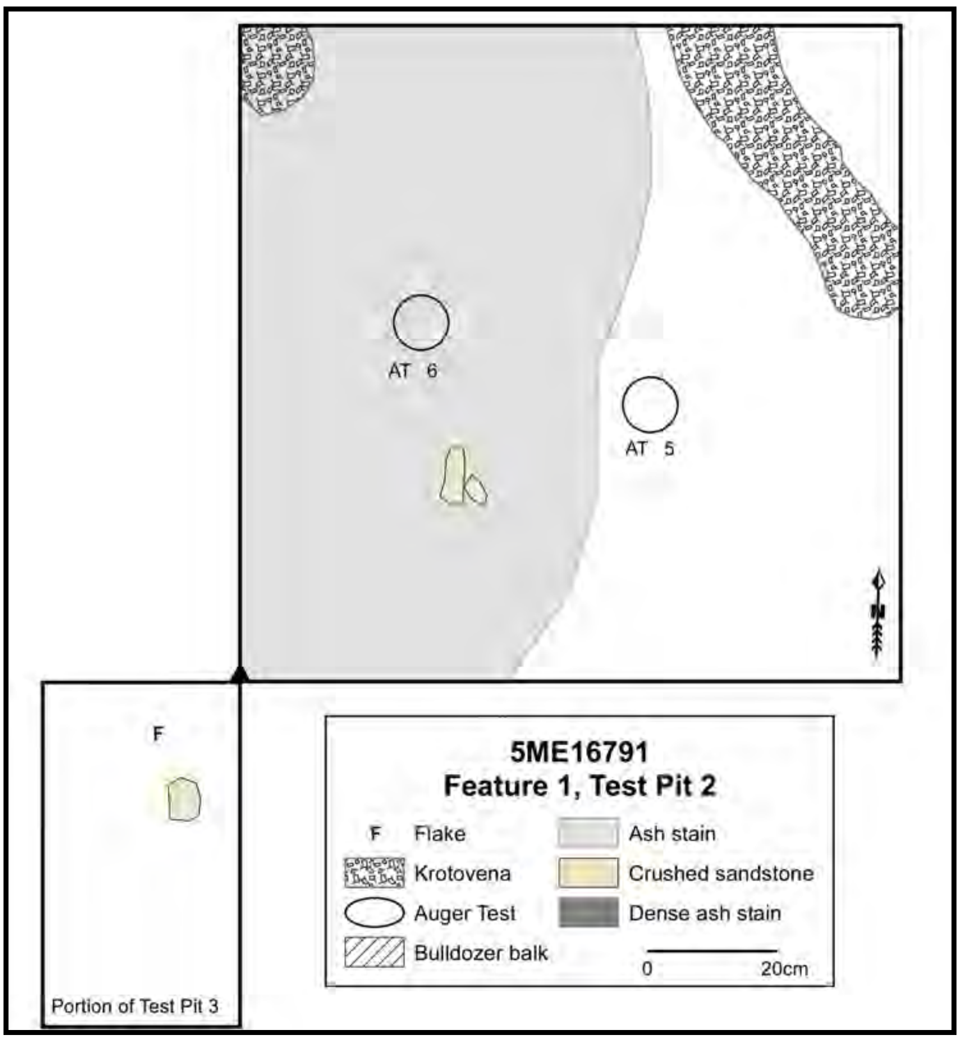



**Figure 5.12-4.** Plan view of Feature 1 Test Pit 2 and the NE 1/4 of Test Pit 3. A utilized blade flake was recovered from Test Pit 3.

A few pieces of sandstone rock were located in the SW 1/4. Test Pit 3 was located at the SW corner of Test Pit 2 (Figure 5.12-4). Only the NE 1/4 of Test Pit 3 was excavated. A utilized blade flake with edge attrition was located *in situ* 13cm below the present bulldozed surface.

5.12.3.3 Auger Tests

Auger Tests 7-12 were excavated outside of the test units (Figure 5.12-2). Results for all the auger tests are presented in Table 5.12-1. In most cases, cultural material (ash stained soil and flecks of charcoal) was contained within the top 30cm of deposition. Auger Test 9 revealed deposits at 60cm; however they were deemed non-cultural.

**Table 5.12-1.** List of results of auger test holes from site 5ME16791.

| Auger No. | Description |
|---|---|
| 1 | Ashy soil; Contact tree root at 7cm (Maximum depth). |
| 2 | Densest ash between 5-15cm (Level 1). Charcoal from 3 lower levels: .98m, 1.45m, and 1.5-1.72m.<br>Maximum depth 1.88m below “present dozer level.” |
| 3 | "Sterile" light brown fill.<br>Maximum depth 18cm below “present dozer level.” |
| 4 | Ashy soil. |
| 5 | No notable ash or charcoal present.<br>Maximum depth 31cm below “present dozer level.” |
| 6 | Ash and charcoal present 2-15cm below “present dozer level.”<br>No notable ash or charcoal below 15cm.<br>Maximum depth 55cm below “present dozer level.” |
| 7 | Ash and charcoal 2-15cm below the recently graded ground surface.<br>Maximum depth 25cm; rock with no ashy fill. |
| 8 | Maximum depth 15cm; encountered rock with no ashy fill. |
| 9 | 60cm deep charcoal flecks and slight darkening of soil.<br>Charcoal collected. |
| 10 | Ashy fill at 10-20cm. Dark fill at 30cm.<br>Charcoal flecks at 35cm. At 38cm soil is lacking ash. |
| 11 | Ashy fill and a charcoal fleck at 12-15cm.<br>Rock at 23cm, ash still present. |
| 12 | Ash level at 12cm, then rock. |

5.12.3.4 Profile A-A' and B-B'

Two profile illustrations were completed for Feature 1. Profile A-A' (Figure 5.12-5) was completed to show the present ground surface's proximity to the roadway and pipeline right-of-way. Profile B-B' (Figure 5.12-6) illustrates the location of the ash lens, located within the bulldozer cutbank. A second radiocarbon sample was taken from this location. Originally thought to be a second cultural layer, the radiocarbon date (Cal. AD 450 to 670) is coeval with the first and refutes the idea of two cultural levels within the exposed portion of Feature 1.

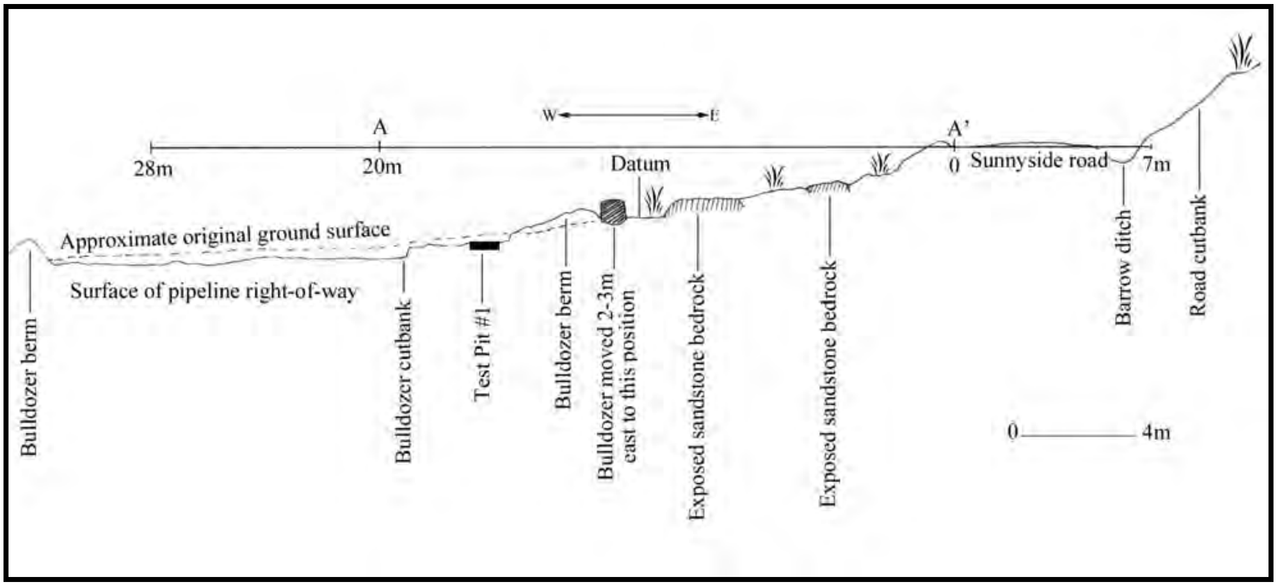



**Figure 5.12-5.** View of site 5ME16791, Profile A-A' showing the relationship of the land surface to the bulldozer activity.

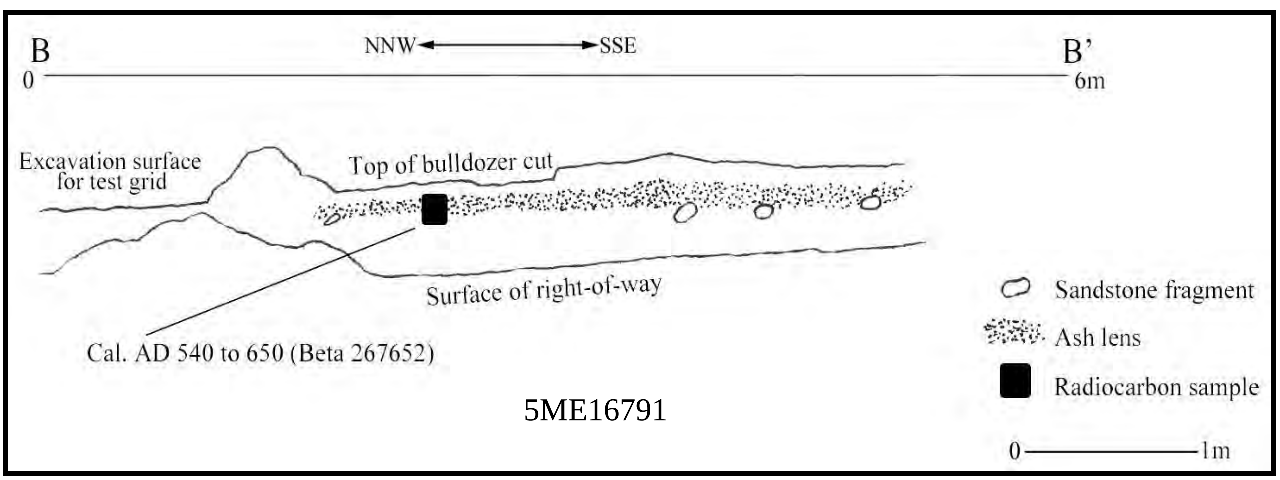



**Figure 5.12-6.** View of Profile B-B' illustrating the ash lens located in the bulldozer cutbank.

5.12.3.5 Stratigraphic Summary

In depth stratigraphic sequencing was not completed because the excavation was focused on salvaging data from the disturbed features. Initially, it was postulated that multiple cultural levels were present based on the large ash stain of Feature 1 and the ash lens present in the bulldozer cut bank. Radiocarbon dating has shown the feature manifestations to be coeval; part of the same cultural level. Auger testing results indicate that the densest cultural materials are within 30cm of the bulldozed surface; however, charcoal flecks and ashy soil were discovered at lower levels. The lower deposits were located within alluvial deposits and were determined to be non-cultural.

## 5.12.4 Artifacts

5.12.4.1 Diagnostics and Patterned Tools

A chert projectile point and a utilized porcellanite blade (Plate 5.12-2) were recovered during the project. The projectile point was located in screened materials from the southeast quarter of Test Pit 1, 12-16cm below the bulldozed surface. identified as an,) was recovered. The point (Plate 5.12-2, FS4) is similar to Anasazi style (Subtype C-13) projectile points dating ca. AD 600-1250 (Phagan 1988:125, 161). The associated date for this point of Cal AD 450 to 670 is derived from Feature 1.

The basally notched, triangular, specimen has a maximum length of 17.5mm, a maximum width of 15.3mm, and a maximum thickness of 2.1mm. It exhibits a random flaking pattern. The edge angle averages 28°. It is made from a flake blank of mottled gray and white algaltic chert, possibly from the Green River Formation.

Two utilized flakes were located, a blade flake and a flake fragment with several snap fractures. The utilized blade (Plate 5.12-3, FS19) with edge attrition was collected *in situ* 13cm


**Plate 5.12-2.** Recovered tool and diagnostic from test unit. FS #4, Anasazi projectile point Sub Type C-13 and FS #19, utilized blade.

below the bulldozed surface of Test Pit 3 (NE1/4). The specimen has a maximum length of 43.6mm, a maximum width of 22.2mm, and a maximum thickness of 8.3mm. The material is a very fine-grained dark brown mudstone (porcellanite) of unknown provenance. The edges are roughly parallel and several flakes have been randomly removed from the dorsal side. Edge attrition is visible along the parallel edges. A utilized flake fragment was also located in the ashy fill of Test Pit 2. It has a maximum length of 21.4mm, a maximum width of 9.9mm, and a maximum width of 2.8mm. This sort of edge wear/retouch is commonly associated with skinning and disarticulation activities (Braun et al 2007). A table detailing the remaining collected artifacts is presented below (Table 5.12-2).

**Table 5.12-2.** List of collected artifacts from excavated contexts at 5ME16791

| Artifact Number (5ME16791.s) | Description | Location |
|---|---|---|
| 1 | Four flakes from surface | 1S 6W |
| 2 | One flake | 1S 6W; 9.5cm below recently graded ground level |
| 3 | Nine flakes | 1S 6W; Cultural Level |
| 4 | Projectile point | 1S 6W; 12-16cm below recently graded ground surface. |
| 8 | One flake from upper fill | 2S 5W |
| 11 | Two micro flakes | 2S 5W |
| 14 | One utilized flake; 4 flakes (debitage) | 2S 5W |
| 15 | One flake | 3S 6W, E ½; Upper fill |
| 16 | Biface thinning flake | 2S 5W, NW¼; Cultural Level |
| 19 | Utilized blade | 3S 6W; E ½ 13cm below recently graded ground surface. |

5.12.4.2 Debitage

A total of 23 pieces of debitage were recovered from the excavation units. Table 5.12-3 summarizes the debitage characteristics. With the exception of one primary and one secondary flake, the rest are from the last stage of the lithic reduction process. There is one primary flake (4%), one secondary flake (4%), and 21 tertiary flakes (92%). One of the tertiary flakes was a bifacial thinning flake. A utilized blade flake and utilized flake fragment with edge attrition/retouch was collected as well. The material types are variable with 16 chert (70%), one quartzite (4%), three porcellanite (13%), and three basalt (13%). The projectile point was composed of chert as well.

**Table 5.12-3**. Debitage summary

| | Attribute \ Site | 5ME16791 | TOTALS |
|---|---|---|---|
| Flake Material | Chert | 16 | 16 (70%) |
| | Chalcedony | 0 | 0 |
| | Quartzite | 1 | 1 (4%) |
| | Porcellanite (Siltstone) | 3 | 3 (13%) |
| | Basalt | 3 | 3 (13%) |
| | Jasper | 0 | 0 |
| | Obsidian | 0 | 0 |
| | TOTALS | 23 | 23 |
| Flake Characteristics | Size | 9 micro<br>5 small<br>5 medium<br>2 large<br>2 very large | 9 micro (40%)<br>5 small (21%)<br>5 medium (21%)<br>2 large (9%)<br>2 very large (9%) |
| | Cortex | 1 primary<br>1 secondary<br>21 interior | 1 primary (4%)<br>1 secondary (4%)<br>21 interior (92%) |
| | Angular Shatter | 0 | 0 |
| | Retouched Edges | 2 | 2 |
| | Biface Thinning Flakes | 1 | 1 |
| | TOTALS | 23 | 23 |

### 5.12.5 Summary and Conclusions

Test excavations at 5ME16791 encompassed a total excavation area of 2.25 square meters. The test units were on east to west sloping ground which dropped an average of about 14° over 20 meters. Feature 1 was a large compact ash stain measuring 10m x 12m exposed at the base and southwest of a bedrock outcrop. Three 1x1m units were laid out at the northern end of the stain (Figure 5.12-1, 2). A radiocarbon sample was taken which produced an age of 1450 ± 60 BP (conventional), Cal AD 450 to 670 (Beta #267651) placing the occupation within the Formative era. Feature 2 consisted of a smaller, more defined ash stain approximately 50cm in diameter within the road cut (Figure 5.12-1). Further investigation indicated that the feature was deflated and no further information could be obtained.

Profile, A-A' (Figure 5.12-5) was 20m long and ran east to west along the northern end of the site. This profile illustrates the site in relationship to the natural topography from the county road to the pipeline right of way. Test Pit 1 is situated adjacent to the profile.

Profile, B-B' (Figure 5.12-6) was 5m long and ran north-northwest to south-southeast along the east wall of the graded pipeline right of way. A 10cm deep layer of dark ash and charcoal was observed from 13-23cm below the recently graded ground surface. Initially, it was believed that this was a second cultural level from Feature 1. A radiocarbon sample was taken which produced an age of 1480 ± 40 BP (conventional), Cal AD 540 to 650 (Beta #267652) placing the occupation within the Formative era and showing that it is contemporaneous with Feature 1.

In addition, twelve auger tests (Figure 5.12-1) were also excavated across the site. They revealed that cultural deposits appear to be the presence of a single cultural level concentrated at a depth from 0 to 30cm below the graded surface across the site; as do the profiles and $C^{14}$ dates. Evidence of charcoal at a depth of 60cm from Auger Test 12 and charcoal from depths of .98m, 1.45m and 1.5-1.72m from Auger Test 2 were located from alluvial deposits and were determined to be non-cultural.

Test Pit 1 (Figure 5.12-3) revealed the remnants of a large, diffuse, ash stain. An area of dense ash stained soil appears to be within 20cm of the original ground surface. Thirteen flakes were located on the surface and in the ashy fill. An *in situ* flake was recovered from 9.5cm below the bulldozed surface and a basal-notched projectile point was recovered from the screened materials taken from the west half of the southeast quarter of the grid, 12-16cm below the bulldozed surface. The point (Plate 5.12-2, FS4) is similar to Anasazi style (Subtype C-13) projectile points dating ca. AD 600-1250 (Phagan 1988:125, 161). The associated date for this point of Cal AD 450 to 670 is derived from Feature 1.

Test Pit 2 (Figure 5.12-4) consisted of a hard packed ashy gray surface exposed at the present bulldozer level. Beneath that, 4-8cm below, was an undulating surface of ashy gray soil that covered the west half of the unit. Eight flakes, one of which was utilized, were recovered from the surface and ashy fill. The northwest and southwest quarters of the unit were excavated individually as Level 1B. A flake was located in the NW 1/4, 1-15cm below the bulldozed surface. Only the NE 1/4 of Test Pit 3 was excavated. A utilized blade flake with edge attrition along the parallel edges was located *in situ* 13cm below the present bulldozed surface. This sort of edge wear is commonly associated with skinning and disarticulation activities (Braun et al 2007).

### 5.12.6 Evaluation and Management Recommendation

Excavation of ash stain features has exhausted the site's potential to yield any additional information important to the prehistory of the region and is therefore field evaluated as not eligible for listing on the NRHP. Accordingly, no further work is recommended.