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by

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Camino Real Fuels, L.L.C.–Dos Republicas Coal Partnership
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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

ABSTRACT

From April to June 2014, personnel from Prewitt and Associates, Inc., conducted an archeological and historical resources survey for Camino Real Fuels, L.L.C., of the North American Coal Corporation and the Dos Republicas Coal Partnership (DRCP) within 1,460 acres of land at the Eagle Pass Mine in Maverick County, Texas. The archeological survey resulted in the discovery and documentation of 16 previously unrecorded sites. Of the 16 sites, 15 are prehistoric Native American sites, and 1 is an artifact scatter associated with a complex of ruinous buildings. Three of the Native American sites are within floodplain settings and contain subsurface deposits, while all other recorded sites are confined to the surface. The 3 floodplain sites, 41MV394–41MV396, are of unknown eligibility for listing in the National Register of Historic Places under Criterion D and would need additional investigation for complete assessments. The other 13 sites are ineligible for National Register listing. The historical resources survey identified six resources: three buildings and a structure associated with the 1912–1944 Rohleder Brothers ranch; a mid-twentieth-century private irrigation system; and a ca. 1960 lake. These historical resources are recommended as ineligible for listing in the National Register.

ACKNOWLEDGMENTS

We wish to acknowledge Leland Starks and Rey Muñoz of North American Coal Corporation–Camino Real Fuels, L.L.C., for coordinating the fieldwork efforts and providing information on the survey areas during the project. Triple J–SA Construction, Inc., under the supervision of Johnny Castro, provided backhoe services during the trenching portion of fieldwork. Steven Castro served as backhoe operator. Landowner Hollis Kincaid is acknowledged for providing historical information regarding his family's property, the Kincaid Ranch.

Ross C. Fields was the principal investigator; Dr. Charles Frederick was the project geomorphologist; Aaron Norment served as project archeologist; and Amy E. Dase was the project historian. Dr. Virginia Hatfield, Jennifer Anderson, and Emory Worrell made up the archeological field crew. Karen Gardner provided bookkeeping and office logistical support. Rob Thrift processed and organized materials in the laboratory, as well as photographs and paperwork for curation. Report figures, graphics, and photographs were prepared by Sandy Hannum and Brian Wootan. Ms. Hannum was also responsible for all GIS applications related to the project.

CHAPTER 1: INTRODUCTION AND BACKGROUND INFORMATION

This report details the results of archeological investigations conducted for the Camino Real Fuels, L.L.C. (North American Coal Corporation)–Dos Republicas Coal Partnership (DRCP) in Maverick County, Texas. These investigations were performed by Prewitt and Associates, Inc., during April–June 2014 and consisted of archeological and historical resources surveys on 1,460 acres in the southeast part of the 6,346-acre Eagle Pass Mine, just northeast of Eagle Pass, Texas. The work was done to assist Camino Real Fuels, L.L.C.–DRCP in complying with the requirements of Section 106 of the National Historic Preservation Act of 1966 (as amended) and the Railroad Commission of Texas. The archeological survey resulted in the discovery of 16 previously unrecorded sites, 15 of which are prehistoric Native American sites and 1 of which is a historic site. Of the Native American sites, 9 are campsites, 2 are lithic procurement sites, and 4 are a combination of campsites and lithic procurement areas. The historic site is a complex with three buildings, a structure, and an associated artifact scatter; only the artifact scatter is within the project area. Thirteen sites are recommended as being ineligible for listing in the National Register of Historic Places, and 3 sites (41MV394, 41MV395, and 41MV396) require test excavations for full National Register assessments. The historical resources survey identified six resources—three buildings and a structure associated with the 1912–1944 Rohleder Brothers ranch; a mid-twentieth-century private irrigation system; and a ca. 1960 lake.

PROJECT AREA LOCATION

The project area lies just north of Eagle Pass in Maverick County, Texas, within and adjacent to the Elm Creek valley, which is part of the Rio Grande drainage basin. It consists of 1,460 acres between U.S. Highway 57 to the southeast and the Southern Pacific Railroad line to the northwest. The north limit of the project area is defined by previously surveyed sections of the mine, and the southern, eastern, and western edges are along the mine's permit boundary on the Kincaid Ranch (Figure 1).

GEOLOGY AND SOILS

The project area is mostly rolling upland terrain dissected by headward-eroding streams that drain into Elm Creek, which flows southward through the western part of the survey area. Some of the tributaries exhibit incised channels with small floodplains, with Elm Creek having the most extensive floodplain. The

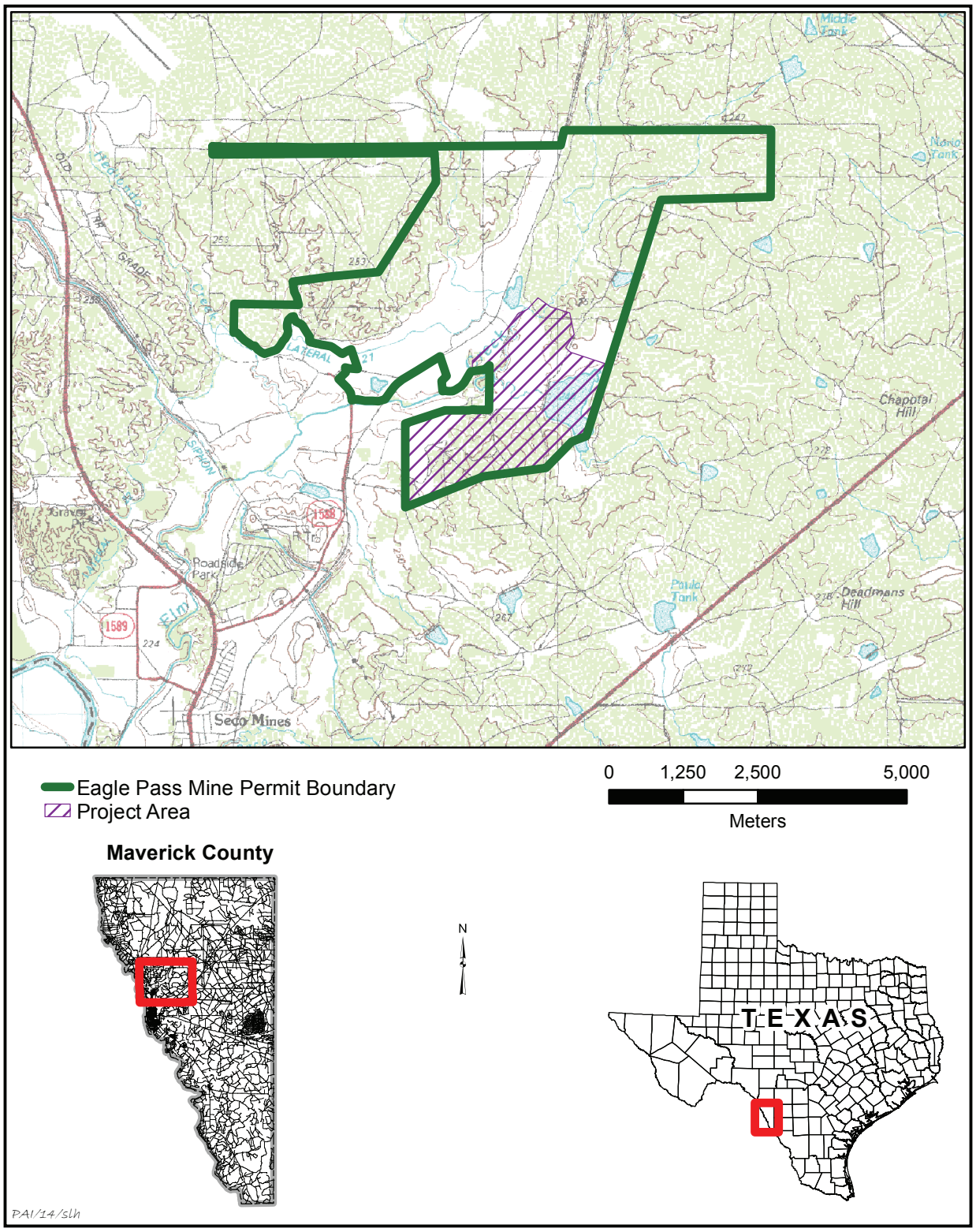

Figure 1. Map showing the location of the project area.

Elm Creek floodplain contains the main channel of the creek as well as a network of other channels that carry water during high rainfall events. Elevations range from 750 ft above mean sea level along Elm Creek and the surrounding floodplain to 860 ft along the upland ridge tops.

The entire project area is underlain by the Upper Cretaceous Olmos Formation, consisting of clay, sandstone, and coal, with dispersed pockets of Tertiary and Quaternary gravels distributed across upland ridge tops. Mapped Holocene alluvium is restricted to the Elm Creek channel and surrounding floodplain, as well as confluences with major tributaries (Bureau of Economic Geology 1976). Predominant mapped soils are Pryor association and Copita association, which are clayey and loamy residual soils weathered from shale and sandstone in uplands. The main mapped alluvial soils are Elindo silty clay loam and Montell clay (Web Soil Survey 2014).

FLORA AND FAUNA

Maverick County is in the South Texas Plains ecoregion of Texas and the Tamaulipan biotic province (Blair 1950). Upland vegetation consists of mesquite, prickly pear, tasajillo, cenizo, huisache, and a variety of grasses (Blair 1950:103). Vegetation along streams is similar to that of the uplands but with the addition of deciduous trees such as elm and hackberry.

The Tamaulipan province supports a very diverse array of wildlife, including fauna that were exploited by prehistoric Native Americans such as white-tailed deer, jackrabbits, cottontail rabbits, squirrels, raccoons, land tortoise, quail, turkey, and a variety of other birds and waterfowl.

CLIMATE

Maverick County has a semiarid climate, often receiving little precipitation. Winters are mild, with low humidity most of the year (Stevens and Arriaga 1977:59). The average winter maximum temperature is 64°F. Summers are very hot, with 115°F being the highest temperature on record. Precipitation averages just over 21 inches annually but can be very low during droughts. Prevailing winds blow out of the southeast for much of the year (Stevens and Arriaga 1977:59).

CULTURAL BACKGROUND

Archeology

The Native American cultural sequence in the Maverick County region of south Texas is divided into three periods: Paleoindian, Archaic, and Late Prehistoric. The Archaic period is further subdivided into Early, Middle, and Late Archaic. Classifications are based largely on transformations in projectile point styles and other technological changes, supplemented with data from neighboring regions. While only a basic synopsis is provided here, Hester (2004) provides a detailed discussion of the lithic technology and cultural history of this region of Texas, with

studies done by Johnson and Goode (1994) and Collins (1995) for central Texas adding chronological refinement to Hester's reconstruction.

Marked by the recovery of fluted points such as Clovis and Folsom, the Paleoindian period (pre-10,000–6,500 B.C.) represents the earliest occupations. Little is known about Paleoindian people other than they were hunters and gatherers living in small bands that were often on the move. It has long been presumed that early Paleoindians were big game hunters, but no mammoth kill or butchering sites have been recorded in south Texas (Hester 2004:133). Common points from later Paleoindian contexts in this region include Plainview and Golondrina, followed even later by the extremely common Angostura.

New projectile point styles emerged early in the Holocene epoch, and these styles serve as the basis for defining the Archaic period and its Early, Middle, and Late subperiods. Beginning some 8,500 years ago, the Early Archaic (6,500–3,500 B.C.), as described by Hester (2004:136), consists of two distinct lithic horizons represented by early corner-notched and early basal-notched projectile points, as well as the occurrence of several specialized tools. Projectile points associated with this period found on the survey reported here include Andice, Baker-Uvalde, and Merrell. The Middle Archaic (3,500–2,000 B.C.) is marked by the increased use of formal earth ovens, hearths, and burned rock middens, suggesting increased exploitation of plant food resources (Hall et al. 1986). Projectile point types found on the current survey that date to this period are Bulverde, Kinney, Pandale, and Travis. Use of earth ovens and associated burned rock accumulations continued well into the Late Archaic period (2,000 B.C.–A.D. 600/700). Ensor, Frio, Lange, Marcos, and Shumla projectile points are common Late Archaic styles seen in this region of Texas, and examples of each were recovered during the survey. Artifact evidence strongly suggests regional trade with other portions of Texas during this period (Hester 2004:143).

The advent of the bow and arrow around A.D. 800 marks the beginning of the Late Prehistoric period. Dart point styles like Ensor apparently continued to be used, suggesting persistence or recycling of some tool forms (Hester 2004:143). Arrow point styles include Scallorn, Edwards, and Perdiz. Ceramics were used for the first time during the Late Prehistoric period, perhaps suggesting more sedentary lifestyles at certain times and places. The best-documented Late Prehistoric sites are those of the Toyah horizon, which was widespread across south Texas during this time. Material culture often associated with Toyah sites includes Perdiz arrow points, small end scrapers, flake knives, flake drills, beveled knives, bone-tempered pottery, and perhaps pipes, beads, and other ornaments (Hester 2004:146).

The protohistoric period refers to the time of initial European contact, before native economies and lifeways were altered severely. It begins with the shipwreck of Cabeza de Vaca and the arrival of Spaniards in the 1600s. These early incursions by the Spanish had no lasting effects on the culture of native groups in this region. The period ends in the eighteenth century, when the Spanish established missions and presidios and set a foothold in Texas. This marks the beginning of the historic

period, and with that came a cessation of native ways of life, as well as deadly epidemics that wiped out the native populations in much of Texas.

History

Eagle Pass, as the closest city to the project area, is the seat of government and commerce in Maverick County.[1] Defining the United States border with Mexico, the Rio Grande divides the two countries, with the city of Piedras Negras, Coahuila, across the river. Several Spanish expeditions traveled in the vicinity beginning in the mid-seventeenth century and often traversed the area in the early eighteenth century. Native American groups remained present, but the Lipan Apache had displaced all others by the late eighteenth century. The first Anglo Americans arrived in 1834. At the onset of the 1846–1848 Mexican–American War, a group of mounted volunteers under the command of Captain John A. Veatch established a temporary federal military post, Camp Eagle Pass, along the banks of the Rio Grande at its confluence with the Rio Escondido, a point known as El Paso del Aguila, or the Pass of Eagles, with roads connected to Forts Inge and McIntosh. In the immediate aftermath of the Mexican–American War, the army renamed the camp Fort Duncan, and by March 1849, three companies of the First Infantry were housed there. Troops guarded the international border along the river and attempted to fend off attack from Native Americans. Merchants used the military road between San Antonio and the fort to facilitate trade with Mexico. Civilians—many traveling westward to stake their claim in gold deposits—camped on the fort's north side for protection. In 1851, a stage line between Eagle Pass and San Antonio was established for increased commerce and traffic. Federal troops returned to Fort Duncan in 1868. In 1870, the post was home to 213 enlisted men, most of whom were black Seminole Indian scouts. The scouts were critical to controlling Native American depredations in the area, with the last raid occurring in 1877.

Transportation, mining, and agriculture have been key to the county's economy. The Eagle Pass-to-Uvalde Road and a stage route traversed the project area by 1878 (Anonymous 1878). The Galveston, Harrisburg, and San Antonio Railroad, eventually part of the Southern Pacific Railroad conglomerate, reached Eagle Pass in November 1882, extending southwest to northeast just north of the project area. An understudied yet monumental aspect of transportation improvements were the thousands of land scrip certificates issued to various railroad companies in the nineteenth century and the resultant surveyed and patented acreage—valued at millions of dollars—that went directly to these monopolistic private businesses. For example, the 640-acre International and Great Northern Railroad Company Survey No. 166 was originally surveyed in 1875, and again in 1886, when the State of Texas patented this land, along with a few hundred others in Maverick County alone, to the company (Texas General Land Office 1886). Similarly, two adjacent 640-acre surveys, Nos. 5 and 198, were patented to the railroad in 1888 and 1877 (Texas General Land Office 1877, 1888). In 1905, the land was valued at $1.50 per acre (Maverick County, Ad Valorem Tax Record 1905). The railroad company retained much of their local holdings until the early twentieth century, and conveyed several surveys, including these two, to the partnership of Phelps and Cox by 1910, when

[1] The following paragraphs are adapted from Dase and Griffith (2012:15–17).

the value had increased to $4 per acre (Maverick County, Ad Valorem Tax Records 1910). Various incarnations of this partnership retained the property until about 1936 (Maverick County, Ad Valorem Tax Records 1935–1937). The sale of this land, and its many other land holdings across the state, benefited the railroad handsomely. A much recognized and desirable economic consequence of railroad improvements was related commercial development in towns with depots, such as Eagle Pass. The Rohleder family, for example, established the Windsor Hotel across the street from the passenger and freight depots and the Wells Fargo exchange office in 1892 (*Bastrop Advertiser* 1896:4; Sanborn Fire Insurance Map 1894:2). Two generations of hoteliers operated their inn until at least 1930 (U.S. Department of Commerce, Bureau of the Census 1920, 1930; U.S. Department of Commerce and Labor, Bureau of the Census 1910; U.S. Department of the Interior, Census Office 1900). With the hotel steps away from travelers, the hotel was successful for many years, and the family profited enough to own a small nearby ranch where they enjoyed hunting, recreation, and entertaining from 1912 until 1944 (see Site History for 41MV389).

Mineral extraction, particularly lignite coal, had enormous, if shortlived, success in the first part of the twentieth century. Mines at Dolchburg, named for investor Louis F. Dolch Jr., and Olmos were briefly the largest producers in Texas. Later in the century, crude oil and natural gas extraction had a more enduring effect on the local economy.

However, agriculture dominated the local economy and, with some exceptions like the Ruffin Survey, most of the county's land was reserved in a few very large farms and ranches. Maverick County invigorated its agricultural economy in the early decades of the twentieth century with irrigation canals that provided farmers with access to water. As was true for the entirety of the Winter Garden District on the South Texas Plains, irrigation allowed farmers to raise row crops instead of relying exclusively on livestock raising. Year-round production of vegetables—onions, spinach, beets, and strawberries especially—proved a boon. North of the project area, a series of masonry and concrete dams and livestock tanks along Elm Creek had been constructed by 1922 (U.S. Army Corps of Engineers 1922). By 1932, Maverick County had the most extensive gravity-fed irrigation system in the state. Some agriculturists developed private systems that took advantage of this infrastructure. Edgar B. Kincaid, who owned land in the project area by the mid-1940s, had access to both Elm Creek to the west and one of the county's main canals, built by 1936, to the south (McKericher 1936). The northwest quadrant of his International and Great Northern Railroad Company Survey No. 5 was irrigated by 1957 (U.S. Army Map Service 1957). In the aftermath of the catastrophic drought of the 1950s, Kincaid had a dam built that turned the southeast quadrant of his International and Great Northern Railroad Company Survey No. 166 and the northeast quadrant of his International and Great Northern Railroad Company Survey No. 198 into what became known as Kincaid or King Lake.

PREVIOUS INVESTIGATIONS

The Eagle Pass Mine has been the scene of a series of archeological investigations starting in 1981. The first project was conducted by Espey, Huston

and Associates, Inc., for the Dahlstrom Corporation and was an archeological survey of 3,044 acres that recorded 42 sites (Espey, Huston and Associates, Inc. 1981). The survey covered almost all of the western part of the 6,346-acre mine area (i.e., west of the Southern Pacific Railroad tracks), extending beyond the current mine boundaries in some areas. Forty-one of the sites contained only Native American remains, and 1 had both Native American and historic components. Twenty-nine sites were in lowland settings along alluvial terraces of Elm Creek and its tributaries, and the remaining 13 were in upland settings. Thirteen sites were recommended as having the potential to contain important information and thus be eligible for listing in the National Register of Historic Places; the other 29 were considered ineligible.

In 1992, the Center for Archaeological Research (CAR) of the University of Texas at San Antonio conducted an intensive survey under a contract with Marston and Marston, Inc., of 971 acres in the eastern part of the mine (i.e., east of the Southern Pacific Railroad tracks), encompassing a long segment of Elm Creek (Uecker 1994). The survey recorded 27 new archeological sites (26 Native American and 1 historic). In addition, 6 sites recorded during the 1981 survey in the western part of the mine were revisited and reassessed. Of the 33 sites examined, 20 were considered ineligible for National Register listing, and 13 were judged to need further work for complete assessments. One significant contribution of this project was inclusion of geomorphological investigations, which made an initial attempt at understanding the depositional and erosional history of the Elm Creek valley (Shanabrook 1994).

In 1993, Archaeology Consultants, Inc., surveyed ca. 100 acres within CAR's 1992 project area that had not been covered previously and recorded 2 sites; 37 other sites were reexamined. Of the 39 sites assessed, 21 were recommended for further work to determine their eligibility for National Register listing (Uecker and Warren 1995).

There was a 12-year hiatus in archeological work before GTI Environmental, Inc., conducted two testing projects for North American Coal Corporation at Native American sites in the western part of the mine in 2005. One project consisted of excavations at 41MV135, 41MV136, 41MV137, 41MV138, 41MV144, 41MV145, and 41MV160 (Iruegas, Galindo, and Iruegas 2009), and the other focused on testing at 41MV164 (Iruegas, Iruegas, and Galindo 2009). Table 1 summarizes these sites. GTI recommended that six of the eight sites (all but 41MV144 and 41MV145) contain important information and are eligible for National Register listing.

In 2007, PBS&J (now Atkins North America, Inc.) conducted data recovery investigations at 41MV135, 41MV136, 41MV137, 41MV138, 41MV160, and 41MV164 for Dos Republicas Coal Partnership/North American Coal Corporation (Stahman et al. 2011). All six are prehistoric campsites located along an unnamed tributary of Elm Creek; they are summarized in Table 1. The work consisted of extensive remote sensing of each site with limited success, excavation of 291 mechanical trenches, and documentation of 102 cultural features, of which 56 were manually excavated. The excavation strategy was based on finding features, documenting their morphology, and collecting feature fill for further analysis. The vast majority

of investigated features were burned rock cooking facilities, with a few occupation surfaces and middens sampled as well. Much of the data gathered reinforced previous interpretations that the Native American who occupied the area prehistorically were mobile hunter-gatherers who relied on local plants and animals for subsistence and used local raw materials to produce stone tools.

The following year, PBS&J conducted an intensive archeological survey of 625 acres for Dos Republicas Coal Partnership/North American Coal Corporation in several areas along the western and northern edges of the mine, all west of the Southern Pacific Railroad tracks. That survey recorded 8 new archeological sites and reevaluated 9 previously recorded sites, all of which have only Native American components (Watkins and Nash 2009). Sixteen sites were judged ineligible for National Register listing, and 1 site was recommended for further work for complete assessment.

Also in 2008, PBS&J conducted National Register of Historic Places eligibility testing at three archeological sites in the western part of the mine: 41MV141 had both Native American and historic components, and 41MV157 and 41MV161 had solely Native American materials (Watkins and Nash 2010). These sites are summarized in Table 1. All three sites were considered ineligible for National Register listing due to the high level of disturbance.

In 2009, Turpin and Sons (TAS), Inc., conducted a survey of ca. 1,625 acres in the northeast part of the mine for the Dos Republicas Coal Partnership (Turpin et al. 2010). This survey included some lands along Elm Creek and a large tributary, as well as uplands east of the Elm Creek valley. It recorded 26 new Native American sites, 24 of which were judged ineligible for National Register listing. Two sites near Elm Creek, 41MV318 and 41MV319, were found to have deeply buried deposits with the potential for important information and were recommended for further work for complete assessments. TAS, Inc., tested these two sites the following year. Table 1 summarizes the work done and the results. Turpin et al. (2011) concluded that parts of both sites have buried components with sufficient integrity to yield important information and thus that both are eligible for the National Register.

The last archeological work to take place on the mine prior to the survey reported here was conducted by TAS, Inc., in 2012 for the Dos Republicas Coal Partnership (Turner et al. 2013a, 2013b). It involved limited excavations at 10 Native American sites: 41MV139, 41MV149, 41MV184, 41MV185, 41MV186, 41MV189, 41MV190, 41MV199, 41MV201, and 41MV202. The work at 41MV139, in the western potion of the mine, was detailed in a separate report because of mine permitting considerations (Turner et al. 2013a); it was assessed as ineligible for National Register listing because its Late Archaic and Late Prehistoric components were mixed and not stratigraphically separable (Turner et al. 2013a:ii). Site 41MV149, also in the western part of the mine, also was assessed as ineligible (Turner et al. 2013b:ii), but the report documenting the details of the work there is not posted in the Texas Historical Commission's Archeological Sites Atlas and has not yet been found in the files at the mine. The other eight sites are within the Elm Creek valley in the eastern part of the mine. Table 1 summaries the work done at them. Turner

Table 1. Summary of tested and excavated sites at the Eagle Pass Mine

Site	Location	Setting	Level of Work	Excavations	Depth of Deposits (cm)	Features	Diagnostics	Dates	Time Period of Occupation	Investigator and Date
41MV135	unnamed tributary of Elm Creek; northwest portion of mine	first two constructional alluvial surfaces; late Pleistocene to late Holocene alluvium	testing; data recovery	6 BHT and 6 TU in testing; 42 BHT and 2.1 m^3 in data recovery	44	4 ovens; 3 hearths	Scallorn	A.D. 980–1650	Late Archaic to Early Historic	GTI 2005; PBS&J 2007
41MV136	unnamed tributary of Elm Creek; northwest portion of mine	first alluvial terrace	testing; data recovery	6 BHT and 6 TU in testing; 53 BHT and 6.3 m^3 in data recovery	90	9 ovens; 20 hearths; 4 burned rock clusters; 3 living surfaces	none	4710 B.C.–A.D. 1400	Early Archaic to Late Prehsitoric	GTI 2005; PBS&J 2007
41MV137	unnamed tributary of Elm Creek; northwest portion of mine	first three constructional alluvial surfaces: late Pleistocene to late Holocene alluvium	testing; data recovery	4 BHT and 5 TU in testing; 41 BHT and 2.4 m^3 in data recovery	46	2 ovens; 3 hearths; 1 burned rock scatter; 1 midden	none	2280 B.C.–A.D. 1340	Late Archaic to Early Historic	GTI 2005; PBS&J 2007
41MV138	unnamed tributary of Elm Creek; northwest portion of mine	first two constructional alluvial surfaces: late Pleistocene to late Holocene alluvium	testing; data recovery	4 BHT and 5 TU in testing; 53 BHT and 3.9 m^3 in data recovery	65	8 ovens; 17 hearths; 2 burned rock scatters; 2 living surfaces	Shumla-like	A.D. 420–1460	Late Archaic to Early Historic	GTI 2005; PBS&J 2007
41MV139	upland terrace adjacent to unnamed tributary of Elm Creek; northwest portion of mine	late Pleistocene to late Holocene alluvium	testing	4 BHT and 6 TU in testing	50	1 hearth, 4 burned rock clusters	none	920 B.C.–A.D. 1270	Late Archaic to Late Prehistoric	TAS 2012; TAS 2013
41MV141	unnamed tributary of Elm Creek; northwest portion of mine	upland stream terrace; ancient alluvium	testing	6 BHT 2 TU	56	2 burned rock features	none	N/A	unknown Prehistoric and Historic	PBS&J 2008

Table 1, continued

Site	Location	Setting	Level of Work	Excavations	Depth of Deposits (cm)	Features	Diagnostics	Dates	Time Period of Occupation	Investigator and Date
41MV144	alluvial terrace overlooking Elm Creek valley; north-central portion of mine	alluvial terrace mantled by very thin veneer of Pleistocene-age alluvium; subsoils formed in bedrock	testing	3 BHT, 5 TU	40	none	none	N/A	unknown Prehistoric	GTI 2005
41MV145	unnamed tributary of Elm Creek; north-central portion of mine	first two construction alluvial surfaces	testing	6 BHT 5 TU	140	none	none	N/A	N/A	GTI 2005
41MV149	unnamed tributary of Hediondo Creek; western edge of mine	paleosurface of thin gravelly alluvium	testing	1 BHT	60	2 hearths	none	N/A	N/A	PBS&J 2009; TAS 2012
41MV157	unnamed tributary of Elm Creek; northwest portion of mine	alluvial terrace giving way to uplands	testing	5 BHT 2 TU	10	5 burned rock clusters; 2 hearths	Abosolo, Bulverde, Frio, Langrty, Refugio	modern	Early to Late Archaic	PBS&J 2008
41MV160	unnamed tributary of Elm Creek; northwest portion of mine	floodplain: late Pleistocene to late Holocene alluvium	testing; data recovery	6 BHT and 4 TU in testing; 58 BHT and 5.9 m^3 in data recovery	77	7 burned rock clusters, 7 hearths/ovens, 2 possible hearths	none	A.D. 420–1010	Late Archaic to Late Prehistoric	GTI 2005; PBS&J 2007
41MV161	confluence of unnamed tributaries of Elm Creek; northwest portion of mine	moderately sloping uplands on ancient alluvium	testing	6 BHT 3 TU	10	3 hearths (remnant); 9 burned rock clusters	Ensor, Matamoros, Refugio, Tortugas	modern	Middle Archaic to Late Prehistoric	PBS&J 2008

Table 1, continued

Site	Location	Setting	Level of Work	Excavations	Depth of Deposits (cm)	Features	Diagnostics	Dates	Time Period of Occupation	Investigator and Date
41MV164	unnamed tributary of Elm Creek	floodplain to first alluvial terrace	testing; data recovery	6 BHT and 5(?) TU in testing; 44 BHT and 2.7 m^3 in data recovery	50	4 pit/soil stains; 2 ovens; 2 hearths; 3 burned rock clusters	Catan, 2 Darl, Desmuke, Ellis, 2 Langtry, 2 Matamoros, Shumla	A.D. 1280–1960	Early Archaic to Historic	GTI 2005; PBS&J 2007
41MV184	unnamed tributary of Elm Creek; north-central portion of mine	floodplain; recent Holocene alluvium	testing	2 BHT	30	none	none	N/A	N/A	TAS 2012
41MV185	toeslope at the confluence of a small tributary and the main channel of Elm Creek; north-central portion of mine	floodplain and first terrace; very late Holocene alluvium in floodplain with recent sheetwash covering terrace	testing	2 BHT	50	none	dart points and arrow points	N/A	Early to Middle Archaic; Late Prehistoric	TAS 2012
41MV186	unnamed tributary of Elm Creek floodplain margin; north-central portion of mine	western margin of valley where upland meets Holocene alluvial valley; palimpsest	testing	3 BHT	20	hearths	2 Angostura, Edwards, Ellis, Ensor	N/A	Late Paleoindian to Late Prehsitoric	TAS 2012
41MV189	unnamed tributary of Elm Creek; north-central portion of mine	floodplain and first terrace; active sheet wash mantle; partial palimpsest	testing	3 BHT	40	possible human burial	various Archaic dart points	N/A	Early Archaic to Late Prehistoric	TAS 2012

Table 1, continued

Site	Location	Setting	Level of Work	Excavations	Depth of Deposits (cm)	Features	Diagnostics	Dates	Time Period of Occupation	Investigator and Date
41MV190	between unnamed tributary of Elm Creek and Elm Creek channel; north-central portion of mine	floodplain and first terrace between Elm Creek and unnamed tributary; late Holocene alluvium in floodplain with active sheet wash mantle on first terrace	testing	3 BHT	20	none	middle to late Archaic dart points	N/A	Middle to Late Archaic	TAS 2012
41MV199	confluence of unnamed tributary of Elm Creek and relict channel of Elm Creek; north-central portion of mine	terrace above unnamed tributary	testing	None	0	none	bottle glass, whiteware, transferware, bolts	N/A	Historic	TAS 2012
41MV201	confluence of Elm Creek, an unnamed tributary, and a paleochannel of Elm Creek; north-central portion of mine	floodplain of Elm Creek, first and second terrace; late Pleistocene to late Holocene alluvium	testing	7 BHT	0	none	none	N/A	N/A	TAS 2012
41MV202	between relict channel of Elm Creek and unnamed tributary; north-central portion of site	floodplain and first terrace; early-middle to late Holocene alluvium	testing	7 BHT	60	>4 hearths; middens	Ensor, Kinney, Shumla	N/A	Middle to Late Archaic	TAS 2012

Table 1, continued

Site	Location	Setting	Level of Work	Excavations	Depth of Deposits (cm)	Features	Diagnostics	Dates	Time Period of Occupation	Investigator and Date
41MV318	between unnamed tributary of Elm Creek and Elm Creek channel; north-central edge of mine	floodplain and first terrace; likely late Holocene alluvium within floodplains and late Pleistocene/ early Holocene alluvium on first terrace	testing	5 BHT 3 TU	130	5 hearths/ middens/ burned rock clusters	Abosolo, Bulverde, Edgewood, Fairland, Frio, Kinney, Montell, Pandora, Shumla, Travis, Zorra	3800–220 B.C.	Early Archaic to Late Archaic	TAS 2010
41MV319	between unnamed tributary of Elm Creek and Elm Creek channel; northcentral edge of mine	floodplain and first terrace; likely late Holocene alluvium within floodplain and late Pleistocene/ early Holocene alluvium on first terrace	testing	6 BHT 2 TU	120	19 hearths; 8 middens; 2 shell middens	Abosolo, Baker/ Uvalde, Bulverde, Caracara, Catan, Desmuke, Early Triangular, Ensor 2 Frio, Marcos, Refugio	1380–170 B.C.	Late Paleoindian to Late Prehsitoric	TAS 2010

et al. (2013b) concluded that five of the sites do not contain "substantial intact cultural deposits" and thus are not eligible for National Register listing, while parts of three sites (41MV185, 41MV189, and 41MV202) contain intact buried deposits with a better potential for important information. A subsequent review of this report by Prewitt and Associates, Inc., preparatory to submittal of the draft report to the Texas Historical Commission concluded that four of the sites (41MV185, 41MV189, 41MV190, and 41MV202) need additional work for full National Register assessments.

METHODS

A crew of four archeologists surveyed the 1,460-acre area from April 28 to May 15, 2014, expending 57 person-days of effort. The crew walked transects spaced at 30-m intervals, covering about 120 m with each pass. Depending on the starting location, transects were walked in either north-south or east-west lines. In areas where vegetation was dense, transects were walked in a meandering pattern around vegetation. When artifacts were observed on the surface, crew members began closer inspection of their immediate locations. A location was determined to be an archeological site when concentrations of artifacts were observed. A temporary site boundary was created based on the size of the artifact concentration and often was extended with each passing transect. The distribution of lithic raw material is ubiquitous across much of the landscape, particularly in the uplands, and sites in these settings typically covered large areas. Site boundaries were set using a combination of the observed extent of the artifact scatter and landform extent. Ridge tops and creek/tributary channels often served as natural site boundaries. Sites were recorded by taking a waypoint with a handheld Garmin eTrex GPS unit and identified with a temporary site number.

About 81 percent of the survey area (1,185 acres) is eroded uplands east of the Elm Creek floodplain where ground surface visibility was 50–100 percent (Figure 2). Because of the visibility and the lack of sediment deposition, shovel testing was unnecessary here. Thirteen of the 16 newly recorded sites are within the uplands, and each of these was evident on the surface. The excellent surface visibility is a result of erosion aggravated over the years by livestock grazing and other landscape modifications. With very little to no topsoil in place, plants have a hard time growing. Also in the uplands is Kincaid or King Lake, a 142-acre impoundment. Several other much smaller livestock tanks are also dispersed across the uplands, accounting for less than 5 acres total. All of these tanks held water at the time of the survey and were not surveyed, except for their shorelines.

Floodplains account for 275 acres (19 percent) of the project area, primarily along Elm Creek but also along an upland tributary (see Figure 2). The survey crew walked over all of this acreage, but 62 acres (plus 18 adjoining upland acres) are in areas where the Elm Creek Protection Plan creates a buffer where excavation of any sort (i.e., shovel tests or trenches) is prohibited. This buffer zone extends 200 ft, and more in a few areas where the channel meanders, outward from the center of the main Elm Creek channel (see Figure 2).

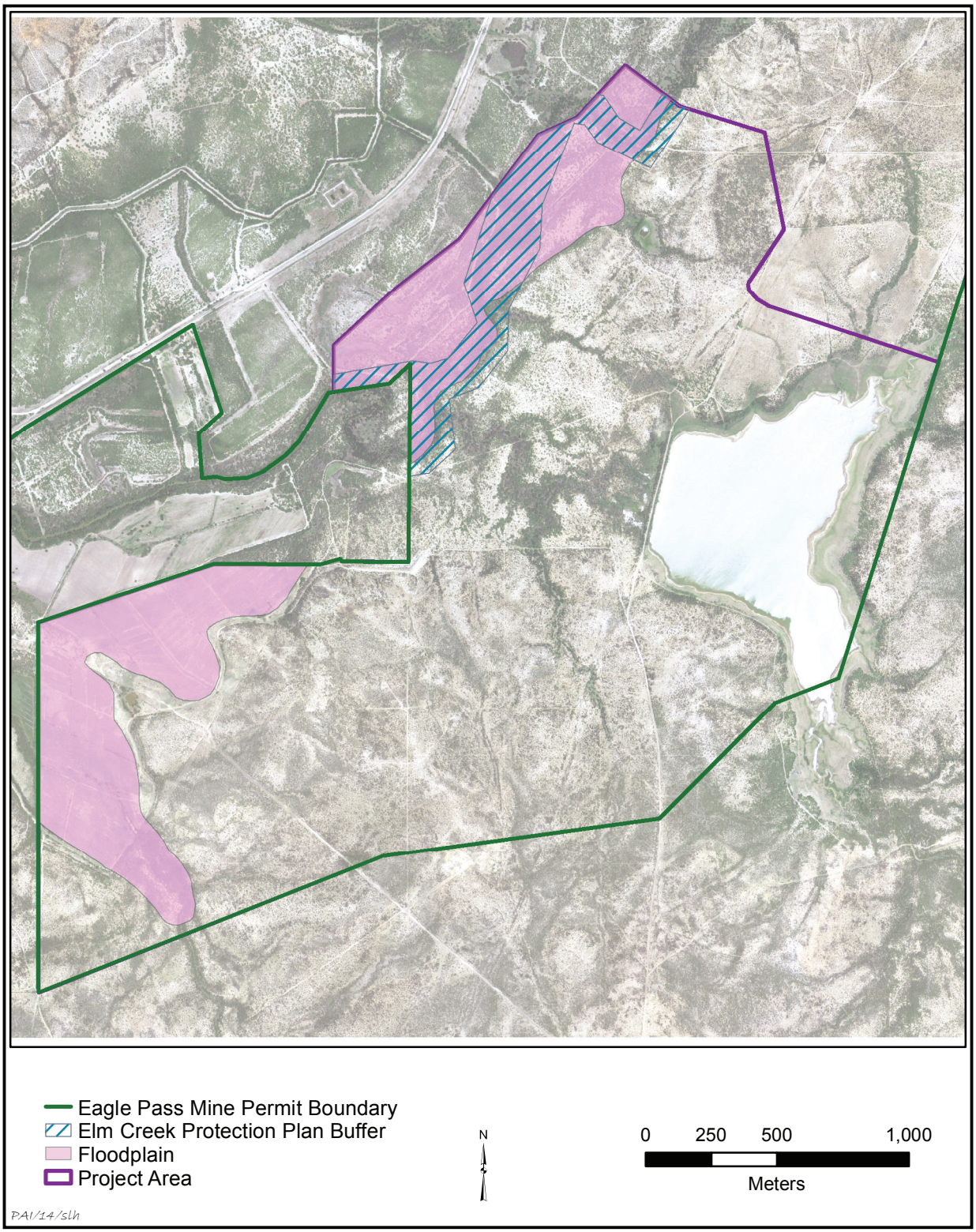

Figure 2. Aerial photograph of the project area.

Of the remaining 213 acres of floodplain, 123 acres in the southern portion have been heavily modified by leveling and construction of agricultural terraces and an associated irrigation system. Seven backhoe trenches and two shovel tests in this area showed that disturbance is extensive with bedrock close to the surface in most places; hence, intact archeological deposits are very unlikely in this setting. The only little-modified floodplain areas (outside the no-disturbance buffer zone) are 74 acres along Elm Creek on the northwest edge of the survey area and 16 acres along an upland tributary near the southwest corner, south of the terraced area. A network of meandering paleochannels dissects the surveyable floodplain of Elm Creek, further reducing the amount of acreage that could harbor archeological sites. Ground surface visibility in these two areas was good to excellent, varying from 50 to 100 percent, and archeological remains were found on the surface in both, indicating that deep burial of archeological sites by alluvial or colluvial processes is not a widespread phenomenon. Further, previous archeological work in this setting has shown that the higher terraces occupying much of the Elm Creek floodplain are cored by bedrock or Pleistocene alluvial deposits with only a thin veneer of Holocene alluvium. Given these characteristics, intensive shovel testing was considered unwarranted. Nonetheless, 11 shovel tests and 6 backhoe trenches were excavated in the 74-acre Elm Creek segment, and 3 trenches were excavated in the 16-acre upland tributary segment. Since trenches provide much greater subsurface exposure than shovel tests, the 11 tests and 9 trenches in these 90 acres are considered comparable to the shovel testing intensity specified for areas of this size in the Texas Historical Commission's Archeological Survey Standards for Texas.

The shovel tests were excavated in arbitrary 20-cm levels and measured ca. 30 cm in diameter, with all sediments excavated screened through 1/4-inch-mesh hardware cloth. Any artifacts recovered from shovel testing were collected. Each shovel test was assigned a unique identification based on the excavator's name and recorded with a handheld Garmin eTrex GPS unit. Shovel test depth, a brief soil description, and any artifacts were then recorded on a shovel test form.

Following completion of the pedestrian survey, backhoe trenching to investigate the potential for buried archeological remains in floodplain settings was conducted under the supervision of Dr. Charles Frederick on June 2–6, 2014. Sixteen trenches were placed in the three settings noted above: 6 trenches in the relatively unmodified Elm Creek floodplain, mostly on and near newly recorded sites 41MV395 and 41MV396; 7 trenches on the terraced floodplain; and 3 trenches on the upland tributary floodplain on and near newly recorded site 41MV394 (see Chapter 3 for a more detailed discussion of the methods of this portion of the fieldwork).

SURVEY AREA DESCRIPTION

The survey area consists of three basic settings: erosional uplands, extensively modified floodplain, and relatively little-modified floodplain. The uplands are a large expanse of rocky rolling land supporting low desert scrub brush, broken by King Lake (Figure 3). Like the rest of the survey area, the uplands are used mostly for grazing cattle today, with hunting being a secondary land use. According to the landowner (Hollis Kincaid, personal communication 2014), the land was cleared by

chaining after his father purchased it in the 1940s; this undoubtedly was associated with substantial surface disturbance. Erosion is another obvious disturbance factor, including gullying along parts of the several miles of two-track roads that meander throughout the area and the construction of King Lake, which has numerous piles of sandstone bedrock on its banks and a 0.5-km-long dam standing ca. 9 m high.

Figure 3. Photograph of a typical upland setting in the project area showing gravel outcrops and excellent ground surface visibility.

Much of the western edge of the survey area consists of the floodplains of Elm Creek and the lower reach of a north-flowing tributary that were modified for use as agricultural fields in the mid-twentieth century (Hollis Kincaid, personal communication 2014). They appear as a series of flat but gently sloping terraces surrounded by berms, bordered by an earthen and concrete-lined irrigation system that is ruinous (Figures 4 and 5). Used only for grazing today, this area supports moderate grass growth with sparse shrub cover. As noted above and discussed later in this report, these terraces were created by moving substantial volumes of earth through land leveling and filling.

The northwestern edge of the survey area consists of a relatively little modified segment of the Elm Creek floodplain, although it probably is more altered than is apparent (Figure 6). Lands just to the west toward the Southern Pacific railroad tracks clearly have been modified to serve as agricultural fields and are

Figure 4. Photograph of flat agricultural terraces separated by earthen berms on the heavily modified floodplain of Elm Creek.

Figure 5. Photograph of dilapidated concrete-lined irrigation ditch on the heavily modified floodplain of Elm Creek.

bordered by irrigation ditches. The area contains numerous paleochannels of Elm Creek as well as the main channel, and the presence of a large manmade levee attests to past earthmoving efforts to control runoff and stream flow here. As elsewhere, cattle grazing is the predominant land use today, with the floodplain supporting more grasses than the uplands as well as stands of deciduous trees. Despite the increased vegetation, erosion has taken a toll on parts of this area.

Figure 6. Photograph of relatively little modified Elm Creek floodplain showing typical dense vegetation.

CHAPTER 2: RESULTS OF THE ARCHEOLOGICAL SURVEY

Of the 16 sites recorded during the survey, 15 are Native American and 1 is a historic site. The Native American sites are of three types: campsites, lithic procurement areas, and combination campsites and lithic procurement areas. Campsites have evidence that a relatively broad range of activities were performed there, in the form of lithic artifacts from all stages of reduction, often several bifaces, occasional projectile points, and concentrations of burned rocks or hearths. In contrast, lithic procurement areas are sites where naturally occurring lithic materials were exploited for the manufacture of stone tools and where evidence of more general activities is lacking. In this environment, source outcrops are lag gravel deposits situated on eroding upland slopes and ridge tops. Artifacts on these sites typically include early-stage debitage, crude bifaces, tested cobbles, cores, and hammerstones. Projectile points and other formal stone tools are almost always absent. Figure 7 depicts an example of a typical procurement site. As the name indicates, combination sites have remains indicating both generalized campsite-related activities and lithic procurement.

Figure 7. Photograph of upland lithic procurement site 41MV382 showing the dense gravels exploited by prehistoric Native Americans as a source of lithic material.

Eighty percent of the Native American sites, regardless of type, are in upland settings (Figure 8). Because they are very similar in terms of most characteristics, they are described together below. The three Native American sites in lowland floodplain settings and the sole historic site are discussed individually. Maps for all sites are in Appendix A.

UPLAND NATIVE AMERICAN SITES

The 12 upland sites consist of 6 campsites, 2 lithic procurement areas, and 4 combination campsites/lithic procurement areas (Table 2). Given their setting, they lack buried cultural deposits, and the observed archeological remains surely are palimpsests. Erosion has removed any original sediment, and minimal grass cover affords excellent ground surface visibility. These sites are on ridge tops, often containing deposits of lag gravels, or they are on slopes between small erosional cuts extending down from ridge tops.

These sites vary considerably in terms of size from 4 acres (41MV393) to 73 acres (41MV382), averaging 33 acres. This is not meaningful culturally, however, since artifacts are nearly ubiquitous across the landscape and site boundaries were drawn based on both landform extent and dwindling artifact numbers. Further, 41MV381, 41MV388, 41MV392, and 41MV393 abut the edge of the survey area (i.e., the mine's permit boundary) and likely extend beyond it. They also vary considerably in terms of elevation from 760–770 ft at 41MV386, the west edge of which is on the valley wall overlooking Elm Creek, to 850–860 ft at 41MV388 on the highest point in the project area.

Only three upland sites contain potential cultural features. Site 41MV383 is one of the larger sites recorded, consisting of numerous fragments of scattered burned rocks and lithic debitage, but one concentration of debitage stood out among the rest. A cluster of several dozen debitage fragments from the same parent material was observed on the surface at the base of a small bush. This could represent a knapping station where someone sat down to manufacture a stone tool. Sites 41MV385 and 41MV392 also have numerous fragments of burned rocks and lithic debitage, but several concentrations of burned rocks (one at 41MV385 and two at 41MV392) were observed, suggesting the locations of hearths that have been disturbed by sheetwash erosion and cattle trampling. Burned rocks observed at other sites were much more scattered than in these three instances.

Forty diagnostic artifacts were recovered from 8 of the 12 upland sites. The only upland sites where projectile points were not recovered are the 2 lithic procurement areas and 2 of the smaller campsites. Sites 41MV382, 41MV383, and 41MV387 yielded the highest numbers of diagnostic artifacts. Dart point types represented are Abasolo, Andice, Baker/Uvalde, Bulverde, Early Triangular, Ellis/Marcos, Ensor, Frio, Kinney, Lange, Langtry, Marcos, Merrell, Palmillas, Pandale, Pandora, Plainview, Shumla, Tortugas, and Travis, while the only arrow point type is Scallorn (Figures 9–11). The points indicate occupations from the Paleoindian period through the Late Prehistoric period, with the earliest one being a Plainview (Figure 11f) from 41MV387 (Collins 1995; Johnson and Goode 1994; Turner et al.

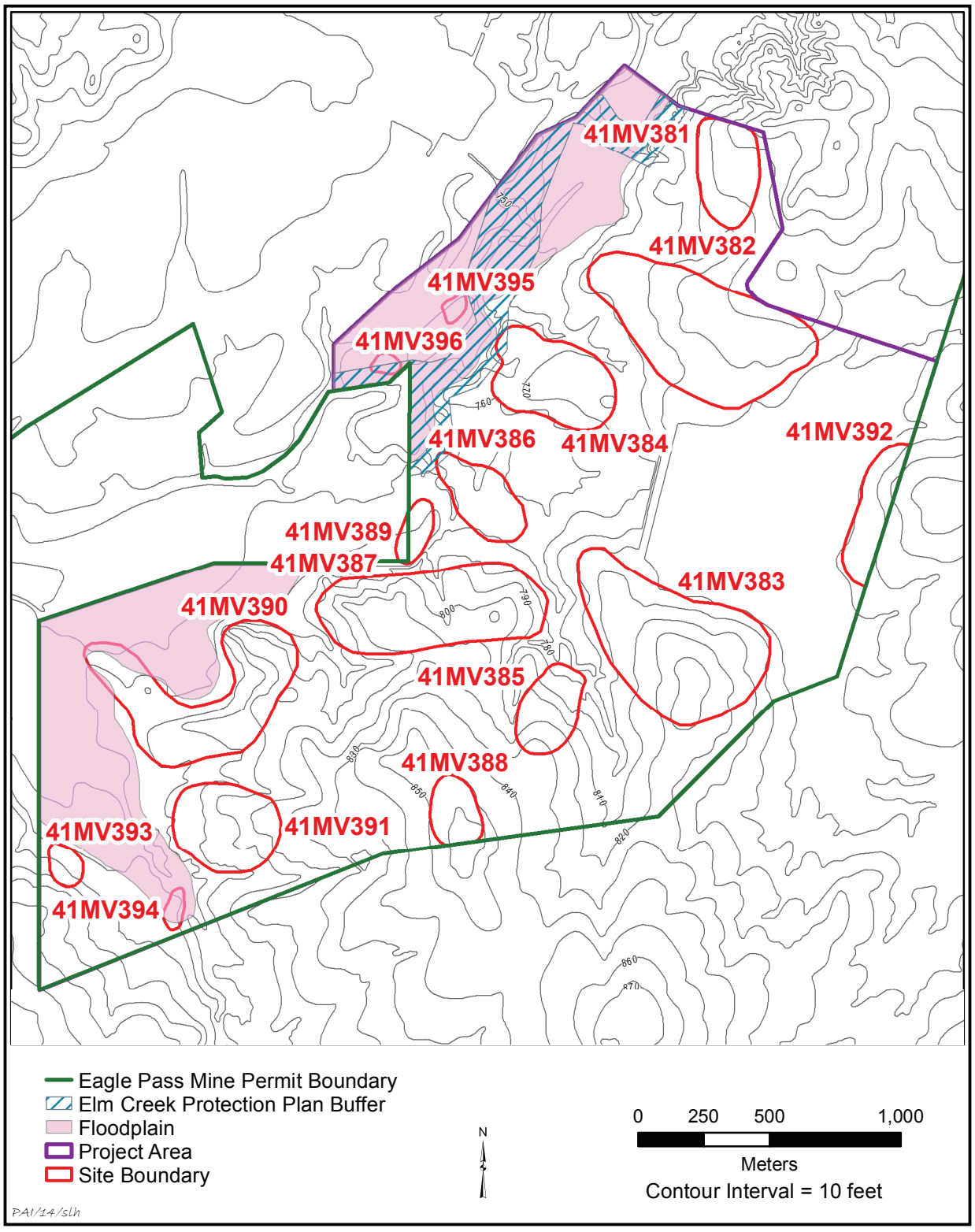

Figure 8. Topographic map showing locations of archeological sites within the project area.

Table 2. Summary of upland Native American sites

Site	Type	Size (m)	Size (acres)	Elevation (ft amsl)	Cultural Features	Diagnostic Artifacts	Other Artifacts
41MV381	lithic procurement area	400x200	20.2	803			early-stage debitage, cores, tested cobbles, hammerstones
41MV382	campsite and lithic procurement area	500x700	73.0	797		Abasolo, Andice, Baker/Uvalde, Ensor, Frio, Kinney, Langtry, Merrell, Palmillas, Pandale, Tortugas, Clear Fork tool	debitage, bifaces, burned rocks, early stage lithic debitage, cores
41MV383	campsite	550x700	70.9	810	possible flintknapping station	Ensor, Merrell, Pandora, Pipe Creek biface (similar to tool depicted in Turner et al. 2011:242)	debitage, bifaces, burned rocks
41MV384	campsite and lithic procurement area	275x500	31.8	770		Bulverde, 2 Ensor, Scallorn	early-stage debitage, other debitage, burned rocks, cores
41MV385	campsite	150x150	16.0	793	possible hearth		debitage, burned rocks
41MV386	campsite	400x400	16.7	760-770			debitage, burned rocks
41MV387	campsite	275x750	57.4	770-800		Early Triangular, Kinney (hafted biface tool), Langtry preform, Palmillas, Pandora, Pandora preform, Plainview, Shumla	debitage, bifaces, burned rocks
41MV388	campsite and lithic procurement area	450x450	10.3	850-860		Ellis/Marcos	early-stage debitage, other debitage, burned rocks, cores
41MV390	campsite and lithic procurement area	700x700	54.1	790		Marcos, Palmillas, Shumla, Travis	early-stage debitage, other debitage, bifaces, burned rocks, cores
41MV391	lithic procurement area	200x200	27.7	798			early-stage debitage, cores, tested cobbles, hammerstones
41MV392	campsite	500x125	16.0	800	two possible hearths	Ensor, Lange, 2 Marcos	debitage, burned rocks
41MV393	campsite	175x175	4.1	790		Scallorn	debitage, burned rocks

2011). A fluted biface fragment resembling a Clovis-like point (Figure 9f) was also recovered, but it is too fragmentary to be definitively labeled Clovis. The overwhelming majority of points date to the Archaic. Four points typed as Andice, Baker/Uvalde, Early Triangular, and Merrell suggest use during the Early Archaic period, and five others typed as Bulverde, Kinney, Pandale, and Travis relate to occupations during the Middle Archaic period. Goode (2002) mentions that Kinney bifaces were often used as hafted knives, not just dart points. Most points (n = 13) belong to the Late Archaic types Ellis/Marcos, Frio, Lange, Marcos, Shumla, and especially Ensor, though, suggesting relatively intensive use and occupation of the region during that interval. Nine dart points are not very informative about chronology because the types they represent (Abasolo, Langtry, Palmillas, Pandora, and Tortugas) are not well understood; they probably relate to use during the Archaic period, but it is hard to be more specific than that. Evidence of Late Prehistoric occupations consists of just 2 Scallorn arrow points (Figures 11g, h) from 41MV384 and 41MV393. Only two potentially diagnostic nonprojectile point stone tools were recovered. One is a fragment of a Clear Fork tool (Figure 9e) from 41MV382, and the other is a possible point fragment resembling a Pipe Creek biface (Figure 11e) from 41MV383. The former may be late Paleoindian to Middle Archaic in age, and the latter is possibly Late Prehistoric.

In addition to the many diagnostic stone tools, each of the sites contains numerous fragments of lithic debitage from the manufacture of stone tools. Burned rocks are also very common, with 10 sites having some. The only sites not having burned rocks are the lithic procurement sites, 41MV381 and 41MV391. Present at half the sites are cores or tested cobbles, while hammerstones were noted less commonly. Nondiagnostic bifaces in varying stages of reduction, from crude to finely worked projectile point preforms, were observed at 4 sites. Specific counts of the various nondiagnostic artifact categories were not made because of the large number of items scattered among natural gravel outcrops.

FLOODPLAIN NATIVE AMERICAN SITES

Site 41MV394

Site 41MV394 is a prehistoric campsite near the southwest corner of the project area within a slight bend of an unnamed, north-flowing tributary of Elm Creek, ca. 740 m south of where the tributary floodplain joins the Elm Creek floodplain. At first glance, it appeared to be essentially an upland setting despite its proximity to the stream. Trenching revealed that it actually is within a blanket of alluvium deposited by the tributary, however. Vegetation is typical for the area, with mesquites and prickly pears dominating and impenetrable wild persimmon trees blanketing the channel edge and hackberry trees along the stream just to the north. Ground surface visibility varied from 40 to 100 percent, with portions along the stream channel being most covered by vegetation. The site sits at 780–785 ft above sea level and covers an area measuring ca. 100 m north-south by 50 m east-west.

The site surface is littered with hundreds of fragments of chipped stone artifacts and burned rocks, with one large concentration possibly indicating the

Figure 9. Diagnostic artifacts collected. (a) Abasolo dart point (41MV382); (b) Andice dart point barb (41MV382); (c) Baker/Uvalde dart point (41MV382); (d) Bulverde dart point (41MV384); (e) Clear Fork tool (41MV382); (f) Clovis-like dart point (41MV394); (g) Early Triangular dart point (41MV387); (h) Ellis/Marcos dart point (41MV388); (i–n) Ensor dart points (41MV382, 41MV383, 41MV384, 41MV384, 41MV392, and 41MV396); (o) Frio dart point (41MV382).

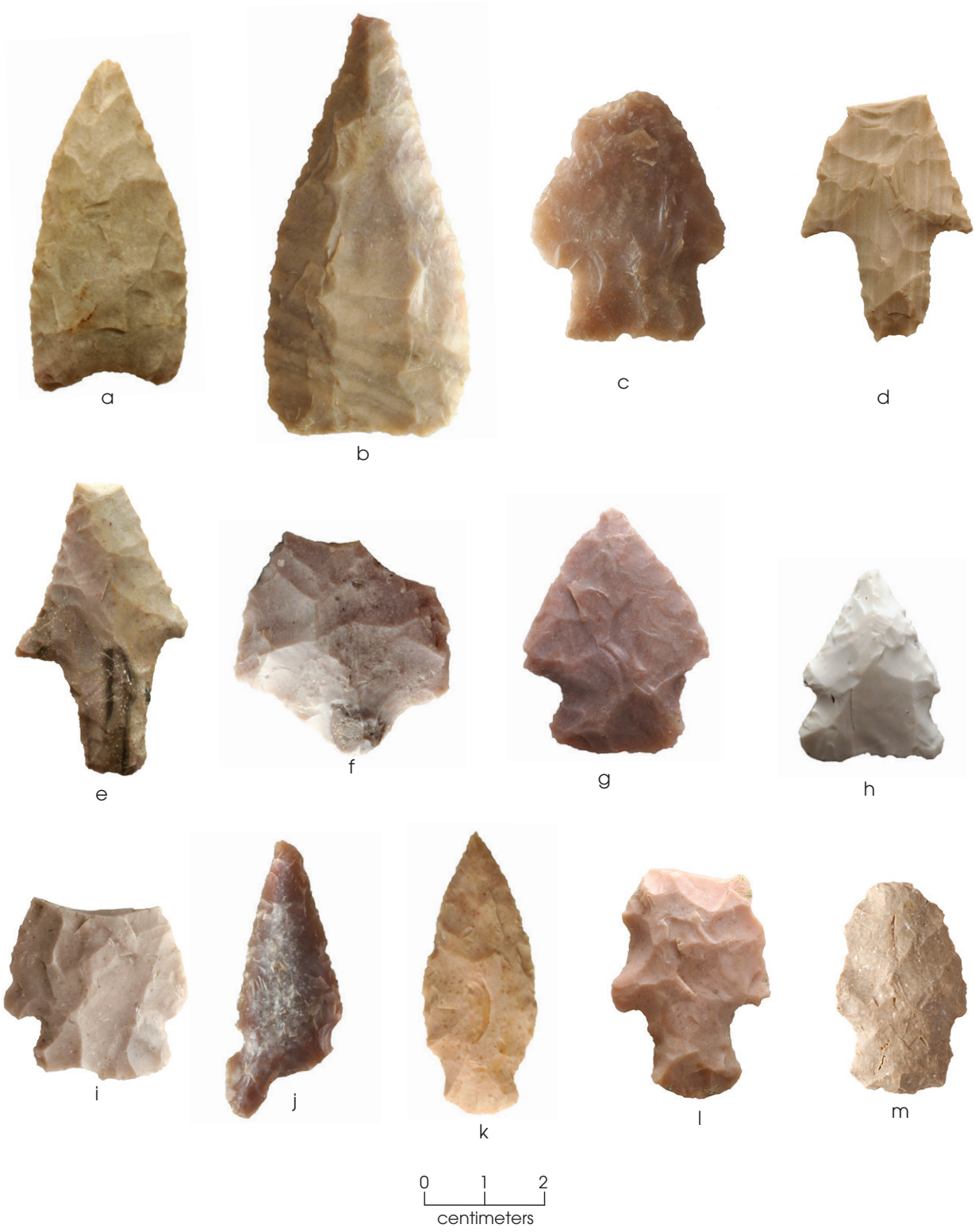

Figure 10. Diagnostic artifacts collected. (a, b) Kinney dart points (41MV382 and 41MV387); (c) Lange dart point (41MV392); (d, e) Langtry dart points (41MV382, 41MV394); (f) Langtry preform (41MV387); (g–i) Marcos dart points (41MV390, 41MV392, and 41MV392); (j) Merrell dart point (41MV383); (k–m) Palmillas dart points (41MV382, 41MV387, and 41MV390).

Figure 11. Diagnostic artifacts collected. (a) Pandale dart point (41MV382); (b, c) Pandora dart points (41MV383 and 41MV387); (d) Pandora preform (41MV387); (e) Pipe Creek biface (41MV383); (f) Plainview dart point (41MV387); (g, h) Scallorn arrow points (41MV384 and 41MV393); (i, j) Shumla dart points (41MV387 and 41MV390); (k) Tortugas dart point (41MV382); (l) Travis dart point (41MV390).

location of a hearth feature measuring ca. 2 m in diameter (Figure 12). Overland water flow has created several prominent gravel bars on the surface, indicating the amount of slopewash that the site sees during heavy rainfall events. Many artifacts, including several bifaces, flake tools, debitage, and burned rocks, were observed in these gravel bars. Two diagnostic artifacts were recovered from the surface: a Langtry dart point possibly dating to the Middle or Late Archaic period (see Figure 10e), and a Clovis-like point fragment possibly dating to the Paleoindian period (see Figure 9f). The Clovis-like specimen appears to be fluted on both sides and shows parallel pressure flaking; however, much of the base is missing.

Figure 12. Photograph of concentration of burned rocks indicating a likely hearth on the surface of 41MV394.

No shovel tests were excavated here because the topographic setting and abundant surface artifacts suggested that this site has little or no potential for buried archeological remains. Three backhoe trenches excavated after the pedestrian survey revealed otherwise, however. Trench 14, excavated perpendicular to the stream at the southeast edge of the site, measured 8.5 m long and reached a depth of 1.4 m. Several fragments of burned rock, one fragment of debitage, and scattered charcoal were recorded in the north wall of the western part of the trench within Zone 4 at depths of ca. 15–30 cm, indicating that 41MV394 does contain buried deposits. No diagnostics or features were observed within the profile, and it was difficult to

determine if the subsurface deposits were intact. Trenches 15 and 16 (9 and 3 m long and 1.5 and 2.0 m deep) were just beyond the north edge of the site, on and just upslope from a small segment of floodplain; no cultural materials were observed. These trenches are discussed in more detail in Chapter 3.

Site 41MV395

Site 41MV395 is a prehistoric campsite along the northwest side of Elm Creek, within the creek's floodplain, in the northwest part of the project area. The site is situated on high ground between the main creek channel to the east and an overflow channel or paleochannel immediately to the west. This overflow channel departs from the main channel about 60 m northeast of the site. A two-track ranch road and fence line run along the southeastern edge of the site. Mesquite trees, prickly pears, and tasajillos are the dominant vegetation, with various grasses growing close to the tree bases. Ground surface visibility was fair to excellent, ranging from 30 to 100 percent. The site covers an area ca. 100 m in diameter and is at an elevation of 762–764 ft above sea level. It lies immediately west of the Elm Creek Protection Plan buffer zone.

A moderate-density scatter of lithic artifacts consisting of dozens of pieces of debitage and burned rocks was observed across the surface here. They did not occur in any obvious concentrations suggesting features. No diagnostic artifacts were noted. Four shovel tests and three trenches were dug on and around the site. Shovel Test JA/VH4 in the central part of the site yielded three flakes and burned rock fragments near the surface; the other tests lacked artifacts. Additional shovel tests were not excavated because the extent of the site could be determined based on surface evidence and its depth could be ascertained better through trenching.

Trenches 1 and 2 were within the site, and Trench 3 was northwest of it on the other side of the overflow channel. No cultural materials were observed in Trench 3, confirming the surface and shovel test evidence that the site does not extend west of the channel. Trench 1 on the crest of the landform was 6.9 m long and 1.4 m deep; sparse burned rocks were observed in its walls within the Ap horizon in upper 20 cm and within the A horizon at a depth of 65 cm. Trench 2 was west of Trench 1 on a slightly lower part of the landform toward the overflow channel; it was 10 m long and 1.5 m deep and contained a small scatter of burned rocks within the AC horizon at a depth of 40 cm. These trenches are described in more detail in Chapter 3.

Site 41MV396

Site 41MV396 is a prehistoric campsite lying ca. 60 m north of a meander of Elm Creek on an elevated floodplain segment bounded by overflow channels/paleochannels to the north and west in the northwest part of the project area. Elevation is around 755 ft above sea level. The east end of the channel to the north has been deeply excavated to construct a large levee with a two-track road on top of it, which runs immediately east and south of the site. There is no indication that the recorded portion of the site was disturbed by this construction, but it is possible

that the site originally extended into areas now covered by the levee. Vegetation is typical, with numerous mesquite trees, prickly pears, and tasajillos dominating and a variety of scattered grasses. Ground surface visibility was very good across most of the site, ranging from 40 to 100 percent. The Elm Creek Protection Plan buffer boundary passes through the site, eliminating the south part of it from subsurface investigations.

Dozens of pieces of lithic debitage and burned rock were noted on the surface over an area measuring about 100 m in diameter. They did not occur in any obvious concentrations suggesting features. A single Late Archaic Ensor point (see Figure 9n) is the only diagnostic artifact noted. One shovel test and two trenches were dug on the site, and three other negative shovel tests were placed on nearby landforms. The onsite test, in the west-central part, produced six flakes and a few fragments of burned rock, all within the upper 20 cm. Additional shovel tests were not excavated because the extent of the site could be determined based on surface evidence and its depth could be ascertained better through trenching. Trench 4 was on the crest of the landform, and Trench 5 was downslope to the north toward the overflow channel. Trench 4 was 7.4 m long and 1.4 m deep. Burned rock scatters were observed in its walls at depths of 0–10, 20–30, and 40 cm. Trench 5 was 7.7 m long and 1.4 m deep; occasional burned rocks were noted in its walls at 20–30 cm. These trenches are described in more detail in Chapter 3.

HISTORIC SITE 41MV389

Description

Site 41MV389 is along the west-central edge of the project area, on the margin of the Elm Creek floodplain. It was first observed as an artifact scatter at the base of the slope just inside the project boundary. Upon exploration, it was determined that most of the site is outside the project area to the west. Remnants of a hunting lodge (Figure 13), two outbuildings (Figure 14), and a brick platform (Figure 15) probably for a cistern and windmill pad make up the complex; none of these are inside the project area, though. The complex and trash scatter downslope together cover an area ca. 200 m north-south by 150 m east-west.

These former buildings and structures are ruinous. A corner of two walls and part of the concrete foundation are all that remains standing of the hunting lodge. Heaps of fallen bricks are piled across the foundation. Vestiges of the two wood-frame outbuildings, one probably a covered livestock pen and the other a bird coop, have almost completely collapsed. Each had a roof of tile shingles and sheet metal. Wire net fencing surrounds the pen. The brick cistern/windmill platform measures ca. 6x10 ft. Mesquite trees and prickly pear cacti have engulfed much of these features. Numerous brick-lined flowerbeds that once decorated the area are overgrown with small bunch grasses. The complex sits atop a ridge in the bend of a large, deep manmade channel that connects to an irrigation system used to water floodplain fields to the west (see Chapter 4).

Artifacts in the trash scatter include a variety of glass fragments, glass bottles, numerous fragments of rusted metal likely representing cans, some wire,

Figure 13. Remnant walls of the ruinous hunting lodge at 41MV389 indicate early-twentieth-century construction with their handmade bricks and soft mortar joints.

and nails (Figure 16). The most common artifact is broken glass of several different colors, including "7-Up ®" green, blue, milk, and clear. A few fragments of solarized container glass were found, possibly indicating occupation in the late nineteenth or early twentieth century. Manganese was used primarily from about 1890 to 1920 to render glass clear (Society for Historical Archeology 2014). When exposed to ultraviolet light, this turns a purple or amethyst color, sometimes referred to as solarized. At least two externally threaded screw-top bottles with mold seams up the neck to the screw top were observed; these indicate twentieth-century occupation, since the automatic bottle-making machine was patented in 1903 and Owens bottles were widely distributed only after 1905 (Lockhart et al. 2010). The lids remain intact on both a clear glass bottle-top fragment and a brown Anacin bottle. The Anacin bottle, with markings from the Owens-Illinois Glass Company, was manufactured after the 1929 merger of the Owens Bottle Company and the Illinois Glass Company (Lockhart 2004).

Figure 14. Photograph of one of the two ruinous wood-frame outbuildings at 41MV389.

Figure 15. Photograph of the brick platform that probably served as the base for a windmill and cistern at 41MV389.

Figure 16. Photograph of the trash scatter within the lower portion of 41MV389.

Site History

The tract containing 41MV389, which is a small property surrounded by much larger blocks of land, initially belonged to William R. Ruffin (1842–after 1887). A native Virginian, this mulatto man lived in Belton by 1870, where he worked as a barber. He had moved to Eagle Pass by 1880, where he had a barbershop on Main Street. Ruffin may have been attracted to the town because of the larger-than-typical African American population that stemmed from Fort Duncan's Seminole scouts. Besides barbering, Ruffin had agricultural interests, and he owned 250 goats in 1881 (Maverick County, Ad Valorem Tax Record 1881). By 1882, he owned a town lot valued at $165. In 1883 and 1884, his improvements on the lot were assessed at $975, and his miscellaneous property, probably his shop equipment, was valued at $700 (Maverick County, Ad Valorem Tax Records 1882, 1883). Ruffin's shop included a wash stand, table, and closet, along with two spittoons, two stands, two bathtubs, two hat racks, two oil paintings, three looking glasses, three barber chairs with foot rests, and six chairs (Maverick County, Miscellaneous Record U1:287; U.S. Department of the Interior, Census Office 1870, 1880).

In 1885, Ruffin had the 60.8-acre parcel of land in the project area surveyed for his homestead (Figure 17). He paid $60.80 for the land plus a $5 charge for the patent fee. That March, his affiants, James Carroll and Henry Edwards, were chain carriers for Olinthus H. Hector, a civil engineer and the Maverick County surveyor. Carroll and Edwards confirmed Ruffin had been living in a house since January 6 of that year and that he had made other improvements on the land. Carroll, a 21-year-old native of New York, resided in Eagle Pass by 1880 and was a gambler

by trade. Edwards is not apparent in archival records. The survey underwent a minor correction in August, and the State of Texas patented the land to Ruffin on September 3, 1885 (Texas General Land Office 1885; U.S. Department of the Interior, Census Office 1880, 1900). Ruffin probably occupied the land for less than a year, since he sold it only a few weeks later after he received the title.

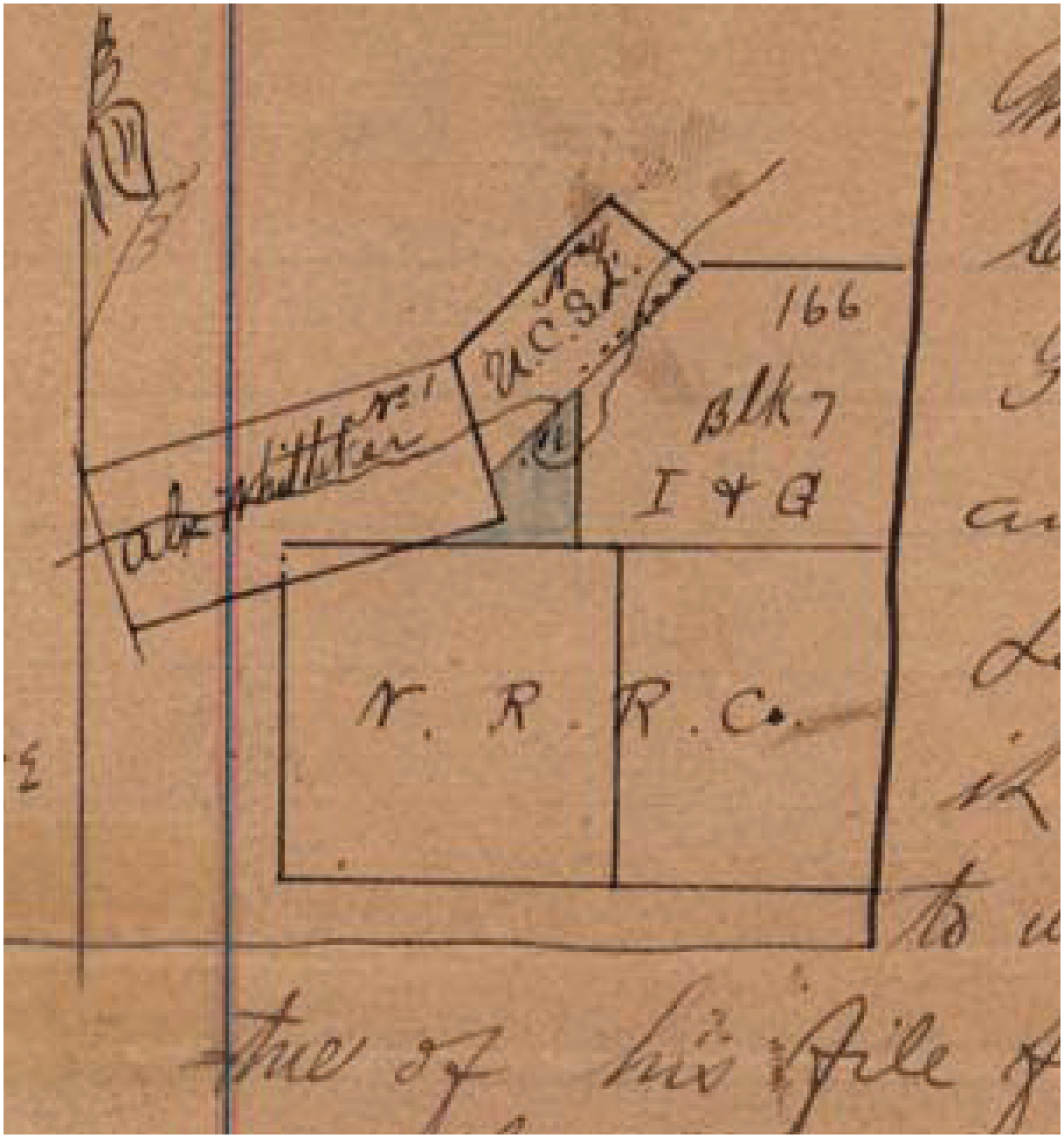

Figure 17. Section of the Texas General Land Office 1885 field notes highlighting the Ruffin Survey and indicating the location of Elm Creek, as well as the adjacent International and Great Northern Railroad Company Survey (Texas General Land Office 1885).

On September 19, 1885, Ruffin conveyed the survey to Irene F. Smith and Grace Smith for $300 (Maverick County, Deed Record X:6). The previous April, Irene F. Smith made an agreement with T. B. Biles that may have involved use of the land. For three years, Biles was to manage her branded flock of 782 grown ewes, 205 mutton, and 600 spring lambs. Biles would prudently grow the herd and be responsible for the expenses of shearing, dipping, and lambing. During the term, they would split the proceeds of shearing. At the end of the term, they would each own half the herd (Maverick County, Miscellaneous Record U1:228). The relationship between Ruffin and the Smith women is unclear, but each chose him as power of attorney representative—Irene F. Smith, living in Eagle Pass, in 1886, and Grace Smith, living in New York City, in 1887 (Maverick County, Miscellaneous Record U1:421, 423). Ruffin was assessed $100 in taxes on the survey, although he no longer held title to the land and lived in Wharton County, where he owned a lot valued at $300 (Wharton County, Ad Valorem Tax Record 1887). It is unlikely that either of the women occupied the survey between 1885 and 1888. Biles may have used the land to manage some of the sheep; however, it was not enough property to accommodate a herd this large and growing.

In February 1888, Irene F. Smith and Grace Smith conveyed the survey to Hallie Wynn Damon for $200 (Maverick County, Deed Record X1:524). The Damons did not live in Maverick County, and they were not assessed for taxes on the property (Maverick County, Ad Valorem Tax Record 1888; U.S. Department of the Interior, Census Office 1880, 1900). It is unlikely the Damons were associated with 41MV389, and they did not own the land long enough to have retained tenants.

Just a few weeks later, in April 1888, Damon and her husband conveyed the property to Louis F. Dolch Sr. (1832–1888) and Robert E. Moffitt for $250 (Mackey-Byrum 2010a; Maverick County, Deed Record X:567). Dolch and his wife, Rosina Schier Dolch (1840–1883), immigrated from Germany and were living in Castroville by 1860 with their one-year-old Texas-born daughter. There, Dolch was a beer retailer and held $1,000 in real estate and $200 in personal property (Mackey-Byrum 2010b; U.S. Department of the Interior, Census Office 1860). By 1870, the couple and their three children were living in Eagle Pass, where he was a hotel keeper. A teenage girl and four other adults—a carpenter, a tailor, and two customs inspectors—boarded with the Dolches (U.S. Department of the Interior, Census Office 1870). Ten years later, the family had grown to include six children, and Dolch was still running a hotel. The family had two male servants (U.S. Department of the Interior, Census Office 1880). After Dolch Sr.'s 1888 death, son Louis F. Dolch Jr. took over his father's estate, which included a significant amount of land in the county, including some held in partnership with either his son or Moffitt, plus 30-some equine and 500 cattle. It is unlikely the Dolch family or their tenants were associated with 41MV389.

In March 1889, Louis F. Dolch Jr. conveyed the eastern 45 acres out of the Ruffin Survey, on which 41MV389 is situated, to Moffitt for $250; he conveyed the western 15 acres to William Negley (Maverick County, Deed Record 15:91). In 1888, Moffitt and Dolch were jointly assessed $150 for the survey (Maverick County, Ad Valorem Tax Record 1888). From 1890 to 1894, Moffitt and Negley were jointly assessed $300 for the Ruffin Survey. In 1890, but not subsequently, they were also

jointly assessed $200 for four wagons and $175 for equine (Maverick County, Ad Valorem Tax Records 1890–1894). Moffitt, a native of Alabama, was a deputy collector and inspector for the customs service in 1888 and 1889. In January 1888, he assisted in the donation of a live 10-year-old jaguar, "a magnificent specimen of great size and beauty," from J. W. Riddle of Eagle Pass to the Smithsonian Institution (Rhees 1901:1243; U.S. Department of the Interior 1889:220). It is possible that Moffitt occupied the Ruffin Survey between 1888 until about 1895, when he continued to own the land, but ceased to render taxes (Maverick County, Ad Valorem Tax Records 1895–1910). In arrears, the property was forfeited to the county for nonpayment of taxes by 1912. The ruinous brick building could date to his ownership and possible occupation.

On September 11, 1912, the county sold the 45-acre parcel to George W. Rohleder and Siegfried Rohleder for $50 with a sheriff's deed (Mackey-Byrum 2010c, 2010d; Maverick County, Sheriff's Deed Records 14:24, 21:592). The family had moved to Eagle Pass in 1892, where German-born Oswald and Adeline managed the Windsor Hotel, at 309 (later 766) Quarry Street across from the railroad depot, with three of their five Indiana-born adult children: George Washington (1864–1943), Siegfried (1866–1948), and Annie (1876–1939). The two-and-a-half-story hotel included a rear semidetached kitchen and two outbuildings in 1894. George Rohleder traveled to the country a few times a week to collect bullfrogs from numerous ponds and livestock tanks, thus supplying hotel guests "with a delicious dish of frogs' legs—sufficiently palatable to please the most fickle Parisian's appetite" (*Bastrop Advertiser* 1896:4; *San Antonio Express* 1943:5; Sanborn Fire Insurance Map 1894:2; U.S. Department of the Interior, Census Office 1900). The three Rohleder siblings were innkeepers at the Windsor Hotel on Quarry Street from at least 1910 through at least 1930. The unmarried sister died in 1939, and the brothers remained bachelors in 1940, but the hotel was no longer extant (*San Antonio Express* 1939:14; U.S. Department of Commerce, Bureau of the Census 1920, 1930, 1940; U.S. Department of Commerce and Labor, Bureau of the Census 1910). During the Rohleders' ownership, the 45 acres was generally valued at $140 or $150 (Maverick County, Ad Valorem Tax Records 1914, 1920, 1922, 1925, 1930, 1935, 1940).

The Rohleder ranch included a building at the southeast corner of the survey by 1922 with a two-track road extending to the southeast (Figure 18 and see Figure 13) (U.S. Army Corps of Engineers 1922). Two outbuildings were likely present by this time as well (see Figure 14). George Rohleder was a devoted hunter and especially enjoyed the ranch, its lodge known as "The Shack," and feeding his quail (Mosebach 1932:12). A newspaper report of social activities in 1927 noted that a San Antonio family visited with the Rohleders in Eagle Pass, "spending a few days at the 'shack' on the ranch" (*San Antonio Express* 1927:14B). By 1936, the road also extended northwesterly and then turned to the west toward the small mining community of Olmos and headquarters of the Thomson family ranch (McKericher 1936).[2] Family members used the property, which also had a windmill, for hunting, recreation, and

[2] The current owner mentioned that this land may have been affiliated with the Thomson family ranch, which included several thousand acres, some of which were near the Ruffin Survey; however, the archival record does not link ownership with the Thomsons.

entertaining until 1944 (Figure 19 and see Figure 15) (U.S. Army Corps of Engineers 1941; U.S. Army Map Service 1943).

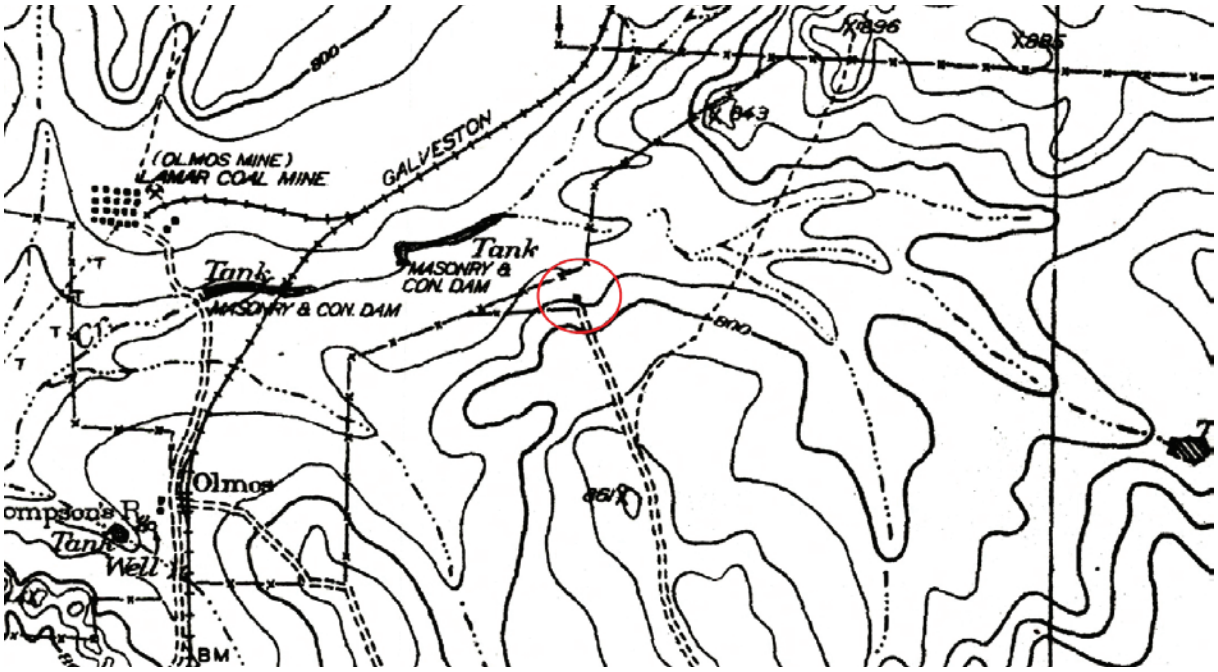

Figure 18. 1922 map showing a two-track road extending northwesterly to the building at the southeast corner of the Ruffin Survey (U.S. Army Corps of Engineers 1922).

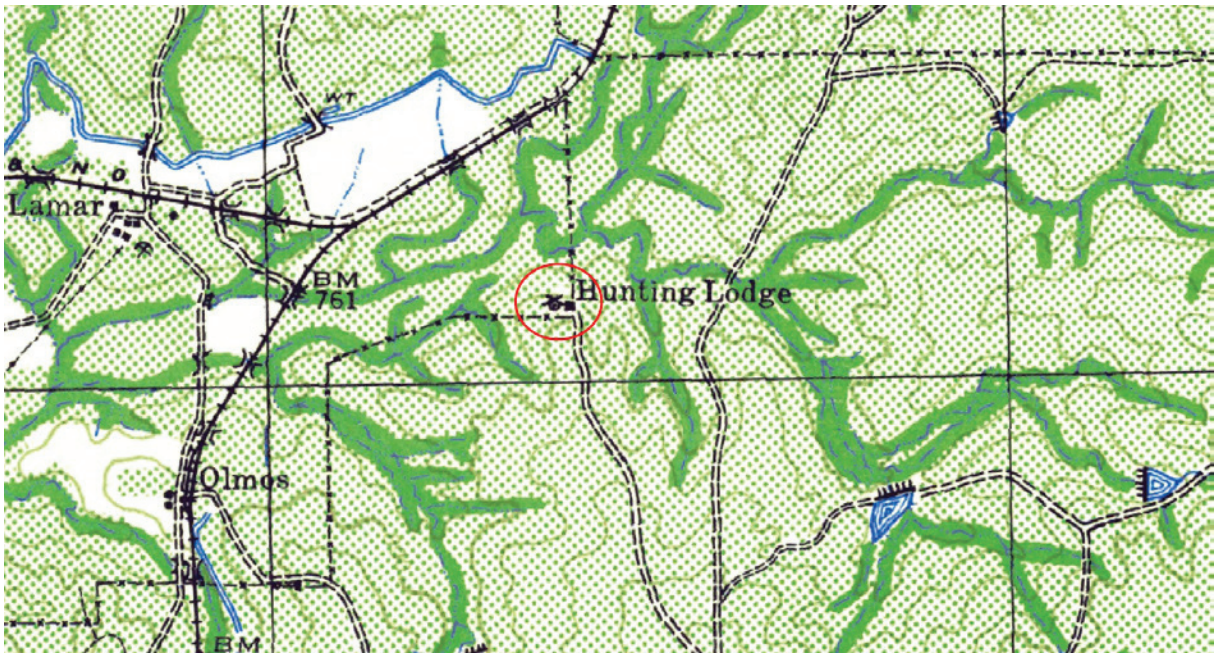

Figure 19. 1941 map showing the location of "The Shack," a hunting lodge with a windmill that the Rohleder brothers used for hunting and entertaining (excerpted from U.S. Army Corps of Engineers 1941).

In March 1944, the surviving brother, Siegfried Rohleder, conveyed the 45-acre parcel to Ambrose Bernard Boubel Sr. (1899–1962) (Maverick County, Deed Record 35:521; Schnuriger 2012). In 1940, Boubel lived with his wife and their four children in a house they owned on Comal Street in Eagle Pass. He was the county and district court clerk for Maverick County (U.S. Department of Commerce, Bureau of the Census 1940). From 1944 to 1947, the property was valued at $150, and the family homestead was in Eagle Pass (Maverick County, Ad Valorem Tax Records 1944–1947). The Boubel family may have used the property between 1944 and 1962. A 1957 aerial photograph shows the footprint of the building (Figure 20) (U.S. Army Map Service 1957).

Figure 20. 1957 aerial photograph showing the location of "The Shack" on the Rohleder brothers ranch, owned at that time by the Boubel family (U.S. Army Map Service 1957).

An older sister, Irene R. Boubel Essing, acquired the property after her brother's 1962 death. When she acquired the adjacent 15-acre parcel from the Negley family in 1965, the Ruffin Survey was again intact (Maverick County, Deed Record 69:285). Essing may have used the property between 1962 and 1967.

In December 1967, Essing conveyed the Ruffin Survey to Frances Jean Pollay Downing (Maverick County, Deed Record 83:195). Downing had grown up in Eagle Pass, where her family lived on Quarry Street (U.S. Department of Commerce, Bureau of the Census 1930, 1940). She retained the property for 22 years. A 1972 aerial photograph shows the footprint of the building (Figure 21) (U.S. Geological Survey 1972).

The property changed hands several times between 1989 and 2010. In 1989, Downing conveyed the Ruffin Survey to their son and daughter-in-law Charles G. Jr. and Barbara B. Downing (Maverick County, Deed Record 279:169). The following year, the Downings conveyed the Ruffin Survey to Jose Telles Sr. (Maverick County,

Figure 21. 1972 aerial photograph showing the continued presence of "The Shack" during ownership by Jean P. Downing (U.S. Geological Survey 1972).

Deed Record 281:219). In 1992, Jose Sr. and Bertha Telles conveyed the Ruffin Survey to James Kincaid and Hodge E. Lord (Maverick County, Deed Record 303:517). In 2010, Kincaid and Lord conveyed the Ruffin Survey to James Kincaid and Daniel F. Kincaid (Maverick County, Deed Record 1241:397). These families may have used the property, but neglect during the past 25 years left the buildings and structure derelict.

NATIONAL REGISTER ASSESSMENTS

Table 3 lists National Register of Historic Places eligibility assessments for the 16 archeological sites recorded. The 12 Native American sites situated in upland settings lack the capacity to yield important information regarding prehistory and thus are considered ineligible for listing in the National Register. The variety of temporally diagnostic artifacts found on them indicates repeated use over thousands of years, and given their setting and the absence of subsurface deposits, there is no chance of isolating the cultural materials into components that could be interpreted usefully.

In contrast, the thee Native American sites that are in alluvial settings (41MV394–41MV396) all contain buried cultural deposits in addition to surface artifact scatters. Although the limited trenching during this survey found mostly shallowly buried remains (15–30 cm at 41MV394; 0–20, 40, and 65 cm at 41MV395; and 0–10, 20–30, and 40 cm at 41MV396), some of these appeared to be intact lenses of materials that may have escaped disturbance from plowing. Further, it is possible that more deeply buried remains could be present in areas not trenched during this project. If these buried deposits retain integrity and if they contain sufficient quantities of cultural materials (e.g., features, botanical remains, faunal remains,

and artifacts) to allow components to be isolated and interpreted, then they could yield information important for understanding Native American use of the area and hence be eligible for National Register listing. They are considered to be of unknown National Register eligibility pending testing to assess them more fully. Such testing should consist of additional backhoe trenching accompanied by manually dug test pits where buried cultural deposits are present.

The sole historic archeological site (41MV389) is primarily outside the project area. Only part of the artifact scatter associated with the complex is within the permit boundary. The artifact scatter does not have the capacity to yield significant information and thus is considered ineligible for National Register listing.

Table 3. Summary of National Register of Historic Places eligibility assessments of archeological sites

Site Number	Site Type	National Register Assessment
41MV381	lithic procurement area	ineligible
41MV382	campsite and lithic procurement area	ineligible
41MV383	campsite	ineligible
41MV384	campsite and lithic procurement area	ineligible
41MV385	campsite	ineligible
41MV386	campsite	ineligible
41MV387	campsite	ineligible
41MV388	campsite and lithic procurement area	ineligible
41MV389	historic house site and trash scatter	ineligible
41MV390	campsite and lithic procurement area	ineligible
41MV391	lithic procurement area	ineligible
41MV392	campsite	ineligible
41MV393	campsite	ineligible
41MV394	campsite	unknown
41MV395	campsite	unknown
41MV396	campsite	unknown

CHAPTER 3: RESULTS OF GEOARCHEOLOGICAL INVESTIGATIONS

INTRODUCTION

This chapter summarizes the results of geoarcheological field investigations performed in June 2014. The project area straddles the southern side of the valley of Elm Creek, about 8 km north of its confluence with the Rio Grande. At this point, the valley ranges from 0.5 km to about 1 km wide and is bordered by low, relatively flat topped hills that to the north rise about 15 m above the valley floor. The southern valley margin is considerably higher and more dissected than the north side, gradually rising to a series of flat hill summits that lie about 34 m above the Elm Creek valley floor.

The Bureau of Economic Geology (1976) has mapped the geology of this region and delineated the deposits within the Elm Creek valley as Fluviatile Terrace Deposits (map Unit Qt) and Alluvium (map unit Qal). The Fluviatile Terrace Deposits are inferred by the Bureau of Economic Geology to be of Pleistocene age and are mapped across the entire Elm Creek valley from the northwest corner of the project area to the confluence of Elm Creek and the Rio Grande. Holocene-age Alluvium (Qal) is mapped starting along the northwest side of the project area and extending upstream. The absence of Holocene-age sediments in the valley as indicated by the Bureau of Economic Geology maps from the northwest side of the present project area to the Rio Grande confluence is clearly incorrect, though.

The deposits capping the flat hills north and west of Elm Creek are mapped as upper Tertiary, lower Quaternary-age Uvalde Gravel, but the cosmopolitan lithology of the gravels contained in this petrocalcic horizon (which includes abundant volcanic rock fragments) clearly indicates that these deposits are an ancient Rio Grande terrace rather than outwash of limestone debris derived from erosion of the Edwards Plateau to the north. The valley slopes east of Elm Creek are mapped by the Bureau of Economic Geology as the Cretaceous Olmos Formation (map unit Kol).

The Elm Creek valley floor in this area is relatively flat, and the course of Elm Creek is a meandering one. But close inspection of the valley floor topography reveals numerous abandoned channels, many of which become active during periods of overbank flooding, and as a result the habit of Elm Creek in the past has been referred to as anastamosed (cf. Shanabrook 1994:92), although the low-flow channel course is clearly a meandering stream.

Frederick (2010) described the geomorphology of the Elm Creek valley floor in some detail. At a large scale, the valley floor exhibits a corrugated appearance, with

slightly sinuous linear depressions (the modern and former channels) alternating with raised interchannel ridges. Frederick (2010:20–27) noted that three forms of channels are present in the Elm Creek valley immediately north and west of this project area, and these were named primary, secondary, and tertiary. The active channel of Elm Creek is a primary channel, and this course is generally relatively narrow (around 3 m wide, at low-water conditions) and deeply incised (ca. 4 m) beneath a flanking or local floodplain. Secondary channels tend to be wider (10–15 m) and shallower (their floors lie <2–3 m below the floodplain) than the primary channel, and are most likely former primary channels partially filled in by sedimentation following abandonment. Tertiary channels, unlike the primary and secondary channels, appear to be erosional flood chutes that are formed and activated during periods of overbank flooding; these features tend to be more linear and often exhibit a steeper gradient than primary and secondary channels. All three channel forms support local ponds following rainfall and flood events and could have served as loci for past human activity in the valley.

As noted, the primary and secondary channels are generally flanked by local floodplain surfaces that lie inset beneath higher interfluvial ridges, often referred to in the literature as a first or second terrace. Previous work in this area has shown that these ridges are cored by bedrock or older alluvial deposits (of Pleistocene age) and draped with a thin (<1 m) veneer of Holocene alluvium. Archeological visibility is excellent on the crests of these interfluvial ridges and almost nonexistent on the flanking floodplains.

Stevens and Arriaga (1977) mapped the soils of the Elm Creek valley floor on the northern side of the project area as the Elindo series, and two phases were recognized: 0–1 percent slopes (EdA) and 1–3 percent slopes (EdB). The Elindo series is classified as a fine-silty, mixed, active, hyperthermic, Aridic Calciustolls that exhibits an A-Bw-Bk1-Bk2 soil profile. These soils are described as having formed in ancient limey alluvium (NCSS 2014a).

Tributaries of Elm Creek in this area are often mapped as Pryor and Montell series soils. Pryor soils are defined as fine, smectitic, hyperthermic, ustertic Haplargids, exhibiting an A-Bt-Btk1-Btk2-Cd soil profile. These soils are described as having formed in calcareous clays and clay loams over soft shale in upland environments (NCSS 2014b). Montell series soils are described by NCSS (2014c) as having been formed in alluvium. These soils are classified as fine, smectitic, hyperthermic, Sodic Haplusterts and typically exhibit A-Bnss-Bnssz1-Bnssz2-Byz profiles.

METHODS

Trench excavations were directed toward landforms where burial of prehistoric cultural materials was considered possible, and three distinct settings were examined: (1) little-modified Elm Creek floodplain in the northwest part of the project area (on and near 41MV395 and 41MV396 and north of those sites); (2) heavily modified Elm Creek and lower tributary floodplains in the southwest part of the project area; and (3) little-modified tributary floodplain near the southwest

corner of the project area (on and near 41MV394). Sixteen trenches were excavated and subsequently cleaned with a knife and trowel, photographed, and described, the latter in general accordance with the methods described in Schoeneberger et al. (2012). The locations and dimensions of the trench excavations are listed in Table 4, and trench descriptions and UTM coordinates are provided in Appendix B.

Table 4. Locations and dimensions of backhoe trench excavations

Trench	Location	Length (m)	Width (m)	Depth (m)	Orientation (degrees)
1	41MV395	6.9	0.7	1.4	352
2	41MV395	10.0	1.3	1.5	350
3	41MV395	8.5	1.3	1.4	300
4	41MV396	7.4	1.4	1.4	30
5	41MV396	7.7	1.5	1.4	9
6	near Shovel Test EW002/EW003	7.3	1.5	1.6	321
7	near 41MV390	7.2	1.4	1.5	37
8	near 41MV390	6.3	1.4	1.3	321
9	near 41MV390	7.0	1.4	1.4	46
10	near 41MV390	8.0	1.4	2.0	43
11	north of 41MV393	7.3	1.4	1.3	11
12	north of 41MV393	7.4	1.4	1.3	13
13	north of 41MV393	7.8	1.4	1.4	17
14	41MV394	8.5	1.4	1.4	100
15	41MV394	9.0	1.4	1.5	100
16	41MV394	3.0	1.4	2.0	–

FIELD OBSERVATIONS

Little-Modified Elm Creek Floodplain

Trenching was done at three locations on the relatively little-modified Elm Creek floodplain in the northwest part of the project area. Two were on and adjacent to archeological sites found during the pedestrian survey (41MV395 and 41MV396), and the third was in an area north of there where no sites were found.

Site 41MV395

Site 41MV395 is on a low interfluvial ridge that is situated between the active (primary) channel of Elm Creek and tertiary channel that is northwest of the modern channel (Figure 22). A dirt road borders the site on the northeast and southeast sides, and the tertiary channel forms the northwestern site boundary. Trenches 1 and 2 were placed within the site boundary, with Trench 1 on the interfluvial ridge

and Trench 2 on a slightly lower surface that borders the tertiary channel. Trench 3 was northwest of the site, across the tertiary channel. The soils in the vicinity of Trenches 1 and 2 are mapped by Stevens and Arriaga (1977) as Elindo silty clay loam, 1–3 percent slopes, whereas the area around Trench 3 is mapped as Elindo silty clay loam, 0–1 percent slopes.

Trench 1 was excavated to a depth of 1.4 m and exposed a generally dark grayish brown deposit interpreted as late Holocene alluvium. The top 86 cm consisted of a roughly fining-upward deposit within which an Ap-A-AC soil had formed. Cultural material was observed within the Ap horizon (Zone 1) at around 15 cm, and then again in the A horizon between 60 and 70 cm within Zone 2. A buried soil was noted between 96 and 126 cm, but no cultural material was observed within this deposit.

Trench 2 was northwest of Trench 1, at the rear of the floodplain associated with the tertiary channel of Elm Creek. The trench was placed between the small tertiary channel and the slope rising to the crest of the interfluvial ridge upon which Trench 1 was placed. Although the stratigraphy of this trench is superficially similar to that of Trench 1, given that these deposits are inset below the interfluvial ridge, it is likely that these sediments are younger than or overlap with the age of the upper meter of the deposits exposed by Trench 1. The east wall of Trench 2 was drawn to show the relationships between the deposits and the cultural materials exposed by this trench (Figure 23). Like Trench 1, Trench 2 exposed two cycles of floodplain sedimentation, the top of each cycle having been altered by pedogenesis to form an A horizon. The older of these two depositional cycles occurred between approximately 74 and >130 cm, with this deposit pinching out upslope to the southeast, against the flanks of the interfluvial ridge. The younger depositional cycle occupies the upper 75 cm of the profile and presumably also pinches out against the flanks of the interfluvial ridge, but the thickness of this deposit did not notably diminish within Trench 2. A buried occupation surface comprising a scatter of burned rocks was present at the base of the A horizon (Zone 1)/top of the AC horizon (Zone 2) around a depth of 30–40 cm. It is likely that this occupation also is represented in Trench 1; it is unclear which of the two cultural zones there correlates with the occupation surface in Trench 2, but it is most likely the upper one.

Trench 3 was northwest of Trench 2 on a low interfluvial ridge between the tertiary and the secondary channels. Although the stratigraphy here was expected to be similar to Trench 2, this was not the case. Trench 3 exposed a 42-cm-thick veneer of late Holocene alluvium (similar in age and appearance to the deposits in Trench 2) that rested upon a truncated fragment of an older alluvial deposit within which a Stage II (or nodular) calcic B horizon had formed. This older deposit, which comprised more than a meter of sediment, is most likely of early to middle Holocene age. No cultural material was observed within this trench.

In summary, trenching at 41MV395 revealed cultural material buried within late Holocene alluvium of Elm Creek beneath two different geomorphic surfaces. Two occupation zones were observed in Trench 1 (ca. 15 and 65 cm), whereas a single occupation was observed within Trench 2 in a late Holocene alluvial deposit

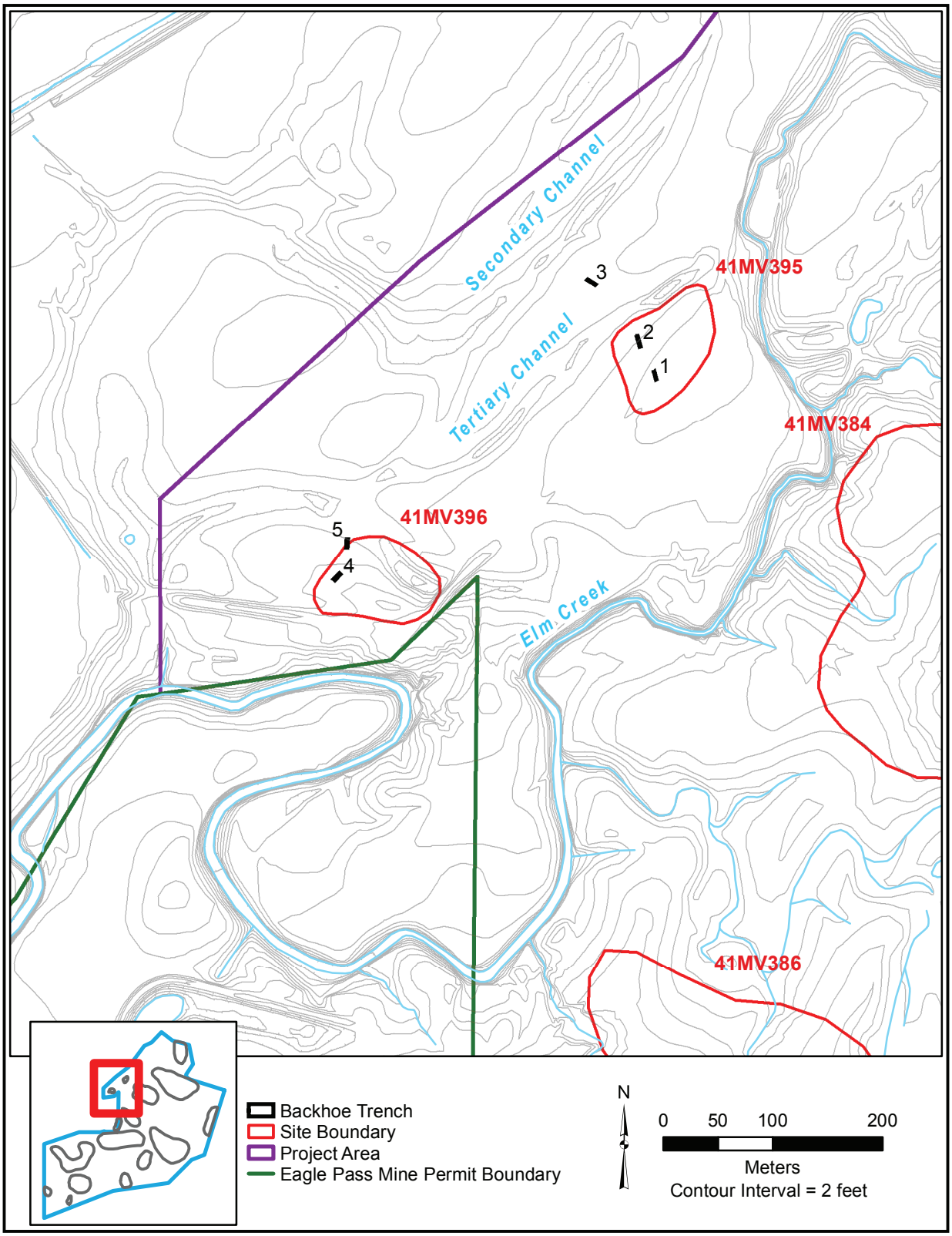

Figure 22. Map showing the locations of Trenches 1–5 on and near 41MV395 and 41MV396 and relevant landscape features.

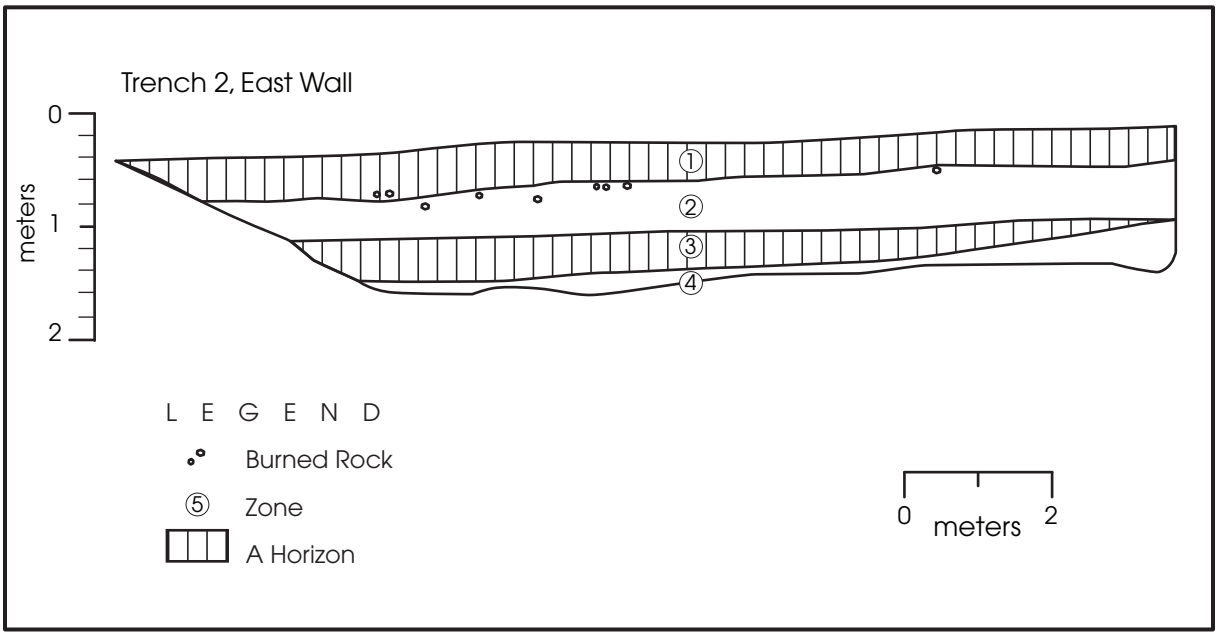

Figure 23. Drawing of the stratigraphic relationships exposed on the east wall of Trench 2 at 41MV395.

on the floodplain of an abandoned channel of Elm Creek immediately adjacent to a tertiary channel. The probable age of these occupations based upon the alluvial deposits within which they rest is most likely Late Archaic to Late Prehistoric. Figure 24 presents a stratigraphic model of the site derived from the stratigraphic relationships observed within the trench excavations and shows the most likely relationships between the buried occupations observed in the field.

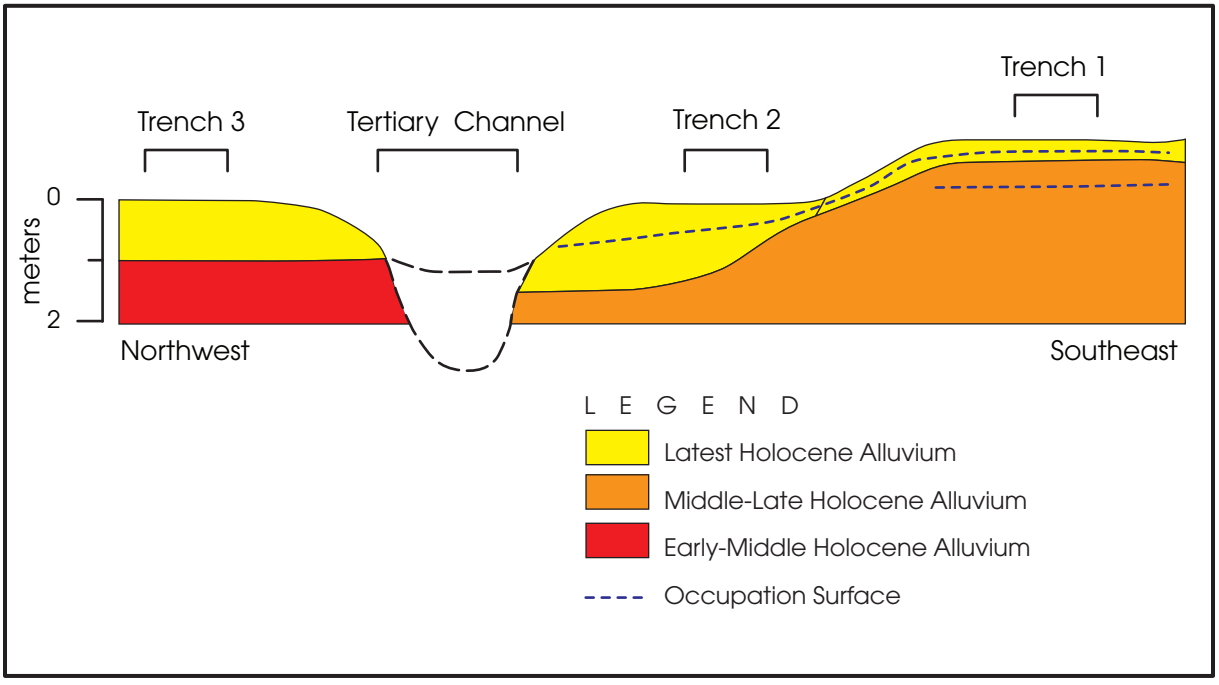

Figure 24. Sketch illustrating the relative stratigraphic positions of the prehistoric occupation zones observed within the trenches at 41MV395.

Site 41MV396

Two trenches were excavated within 41MV396, which is situated adjacent to a secondary channel of Elm Creek (see Figure 22). This channel exhibits a meandering form and is clearly an abandoned course of Elm Creek. Trench 4 was at a slightly higher elevation than Trench 5, but both trenches exposed the same deposit, a near-channel overbank facies (most likely a point bar) of late Holocene alluvium. The area of both trenches is mapped as Elindo silty clay loam, 0–1 percent slopes, by Stevens and Arriaga (1977). The two trenches exhibited subtle differences in texture and color associated with their relative position with respect to the channel, and these are highlighted below.

In general, the upper 60 cm of these deposits consists of a massive mud deposited in a floodplain setting that lacked any clear evidence of sedimentary structures and that has been altered by pedogenesis to form an A horizon between 0 and 40 cm and an AC horizon between 40 and 60 cm. Both trenches exhibited buried but isolated cultural materials in the A horizon, with Trench 4 appearing to have at least three levels of scattered burned rocks, one near the surface (0–10 cm), a second between 20 and 30 cm, and a third near the base of the A horizon around 40 cm. It was not clear if this deposit had been plowed in the past, but the lower two occupations appeared to be relatively discrete and intact. Trench 5 also exhibited a scatter of burned rocks within the A horizon at depths between 20 and 30 cm. The A horizon in Trench 5 was slightly coarser and thinner than that in Trench 4, most likely due to the differences in elevation between these two excavations.

Below 60 cm, the deposits consisted of alternating thin to medium beds of coarse and fine alluvium. In Trench 4, these beds alternate between very dark gray (10YR 3/1) silt loam to loam and brown (10YR 5/3) sandy loam to loam, and the darker-colored beds often contained abundant disseminated small fragments of charcoal and/or coal. The interfaces between the coarse and fine beds were once sharp but have been significantly blurred by the passage of small fauna. In Trench 5, the coarse-textured beds were coarser than in Trench 4 and often preserved subtle hints of bedding in the form of light and dark laminations that were pale brown (10YR 6/3) and dark gray (10YR 4/1) sandy loam, respectively. The dark-colored fine-grained beds were generally black (10YR 2/1, m) to very dark grayish brown (10YR 3/2, m) silt loam, and like those in Trench 4, they often contained significant amounts of disseminated small fragments of what appeared to be charcoal. Small (1–2 mm) fragments of reddened earth were also noted in these deposits.

In summary, scattered prehistoric cultural material was most ubiquitous in Trench 4, which was at a slightly greater distance from the channel and slightly higher above it as well. The site is adjacent to the late Holocene channel of Elm Creek, and the deposits appear to be relatively recent; these occupations likely are of Late Prehistoric age, although it is possible they could be of Late Archaic age as well. The stratigraphic separation of components in Trench 4 suggests that these occupations should have relatively good integrity, although it was difficult to assess the uppermost occupation, which may have been adversely affected by cultivation.

North Corner of the Project Area

A single trench was excavated on the Elm Creek valley floor near the northernmost corner of the project area. It was on a low interfluvial ridge (the first terrace) that lies between the active channel of Elm Creek to the east and a secondary channel that flows south-southwest along the northwest side of the ridge (Figure 25). In the area where the trench was placed, the ridge is about 100 m wide and stands about 1–2 m above the floodplain of the modern creek. Immediately to the east of this low ridge, the modern channel of Elm Creek flows at the foot of the upland and then turns abruptly northwest away from the upland for about 300 m before once again turning to the southwest, parallel to the upland margin. As a result, this small interfluvial ridge is surrounded on three sides by floodplains (modern and abandoned) of Elm Creek.

Trench 6 exposed 1.4 m of alluvium in an area mapped by Stevens and Arriaga (1977) as Elindo association soils, nearly level. The trench revealed an A-AC-C soil profile formed in near-channel overbank facies alluvium. The A and AC horizons comprise the top 40 cm of the profile, and beneath this the deposits are pedogenically unaltered and range from brown (10YR 5/3) sandy loam and loam, to very dark gray-dark gray (10YR 3.5/1) silt loam. The incipient nature of the soil formed in these deposits implies a late Holocene age. No cultural material was observed.

Heavily Modified Elm Creek and Lower Tributary Floodplain

Trenching was done at two locations on the Elm Creek and lower tributary floodplain in the southwest part of the project area, where the landscape has been heavily modified to create flat agricultural terraces separated by earthen berms. Archeological remains were not found in either area during pedestrian survey, but sites were found on the adjoining uplands (4MV390 and 41MV393), and the trenching was intended to determine if those sites extend onto the floodplain as well as to examine the effects of the terracing.

Near 41MV390

Site 41MV390 was delineated on the upland immediately abutting the south side of the Elm Creek valley (Figure 26). The northern boundary of the site wraps around a terraced agricultural field that occupies the catchment of a low-order stream. The shape and gradient of the terraced field suggest that it may be on an alluvial fan formed at the margin of the Elm Creek valley, so a suite of four trenches were excavated in this area to investigate the possibility of buried archeological sites. Trenches 7 and 8 are in an area mapped by Stevens and Arriaga (1977) as the Pryor association, undulating, whereas Trenches 9 and 10 are in an area mapped as Montell clay, 0–1 percent slopes.

The terracing of this field appears to have been done mechanically and involved the introduction of significant amounts of fill containing ferruginous concretions that are not necessarily local to this immediate area. The terraces are

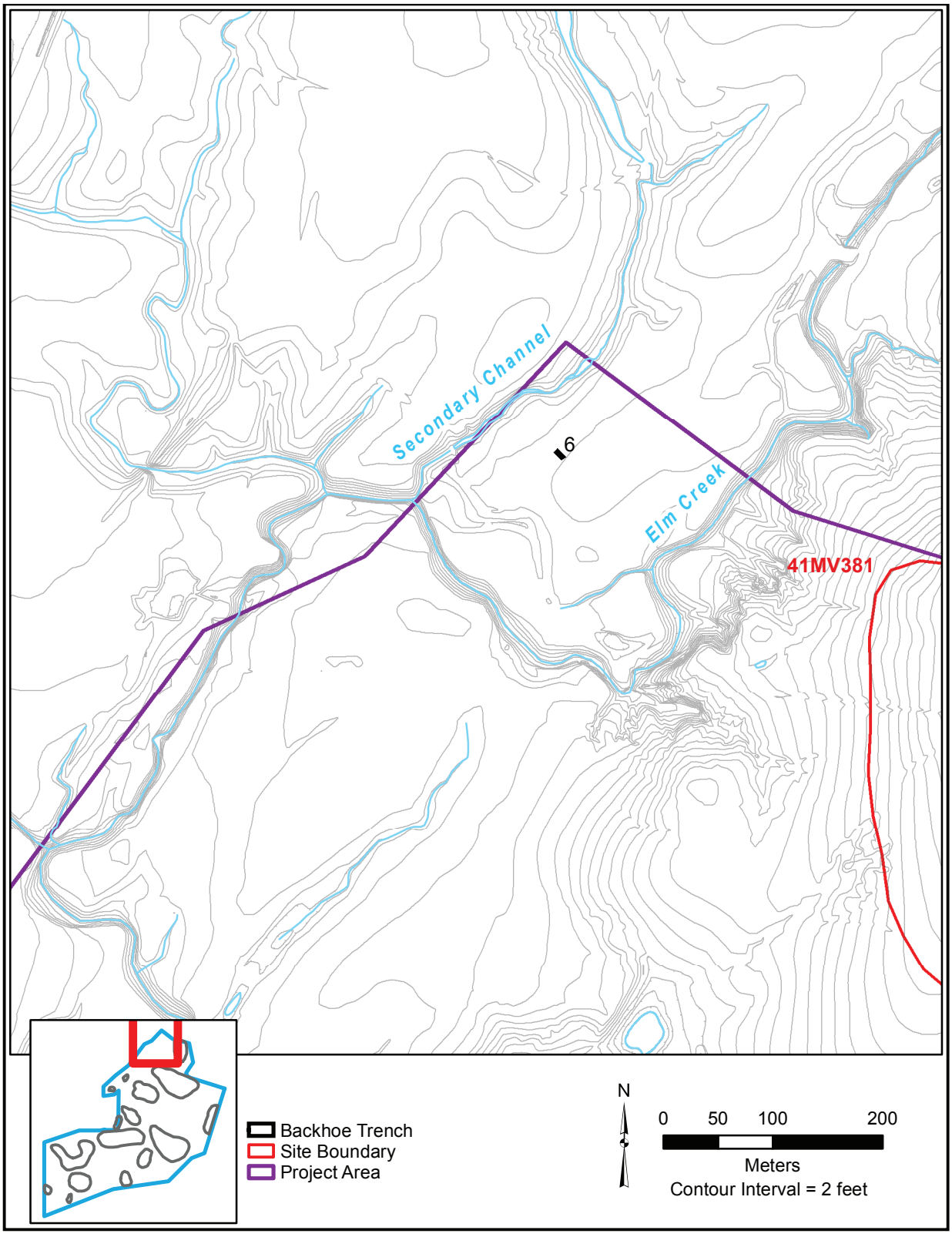

Figure 25. Map showing the location of Trench 6 with respect to Elm Creek and other local landscape features.

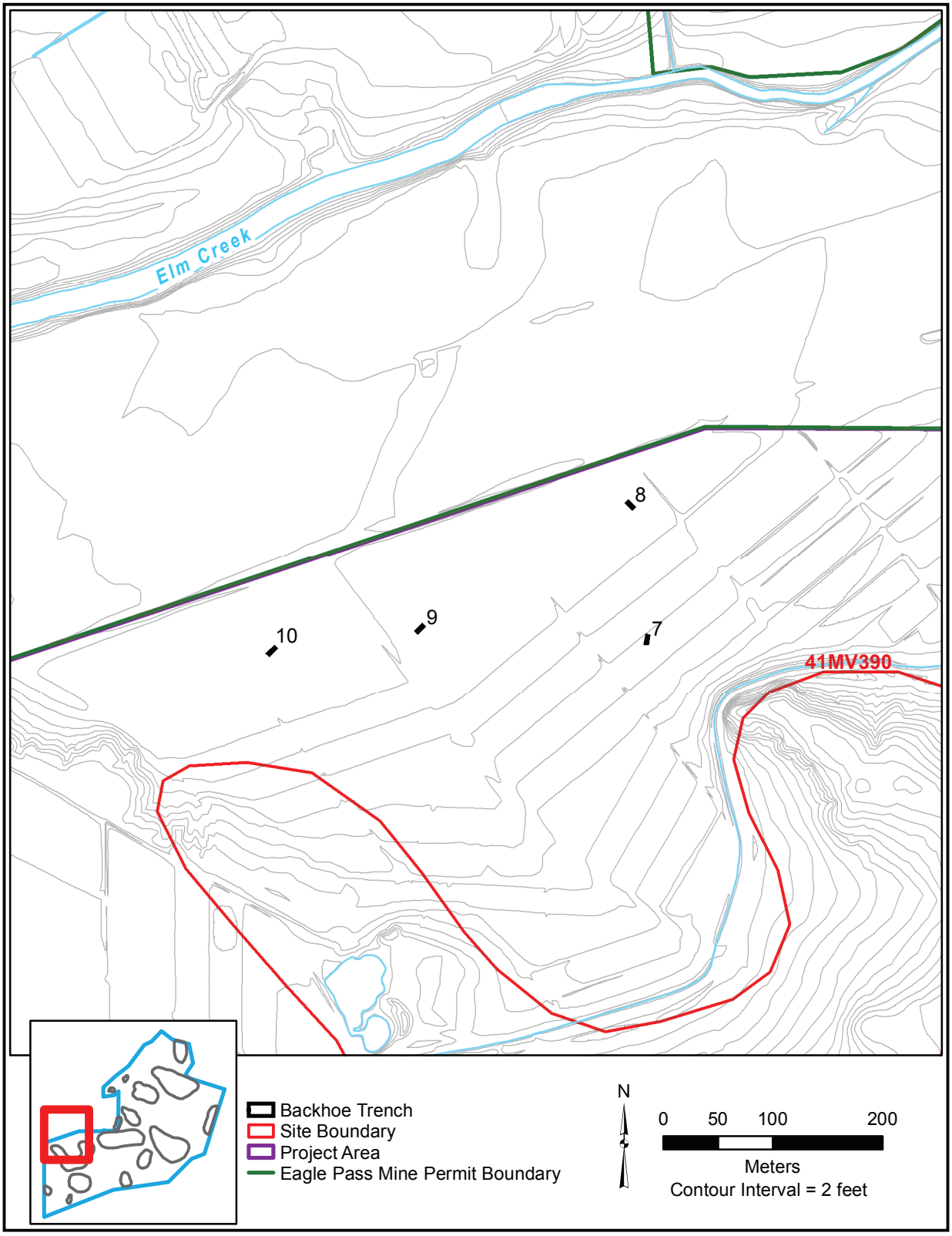

Figure 26. Map showing the locations of Trenches 7–10 relative to 41MV390 and relevant landscape features.

mostly straight line segments with earthen risers less than a meter tall; these fields were clearly graded to permit canal irrigation.

The first trench excavated in this area, Trench 7, was placed across and immediately behind one of the terrace risers to assess what the original deposits buried by terrace construction looked like and to examine the nature of the introduced fill used to construct the terrace. Previous investigations of agricultural terraces (e.g., Frederick and Krahtopoulou 2000; Krahtopoulou and Frederick 2008; Smith et al. 2013) have shown that, in traditionally terraced lands, the best preservation of the pre-terrace landscape is immediately beneath the riser where the introduction of fill earth buried the original ground surface. The least well-preserved areas lie at the rear of the treads immediately below the next higher riser, which is where sediment is commonly excavated to create the terrace tread.

The north wall of Trench 7 was drawn to illustrate the relationships between the various deposits exposed (Figure 27). The original ground surface (Zone 6), which was beneath 40–105 cm of introduced fill (Zones 1–5), consisted of dark grayish brown clay that appeared to be formed in bedrock, which was more clearly expressed in the underlying calcic B (or Bk) horizon (Zone 7), which was a light greenish gray clay with strongly developed prismatic structure and many large calcium carbonate nodules. The A horizon (Zone 6) beneath the berm appeared to have been cut to at least half its original thickness prior to deposition of fill to make the berm, which was probably done during filling of the terrace immediately downslope. Although much of the cloddy fill used to construct the terrace appears to have been derived from local topsoils, there were many ferruginous gravel-sized clasts that appear to be derived from the bedrock in this fill.

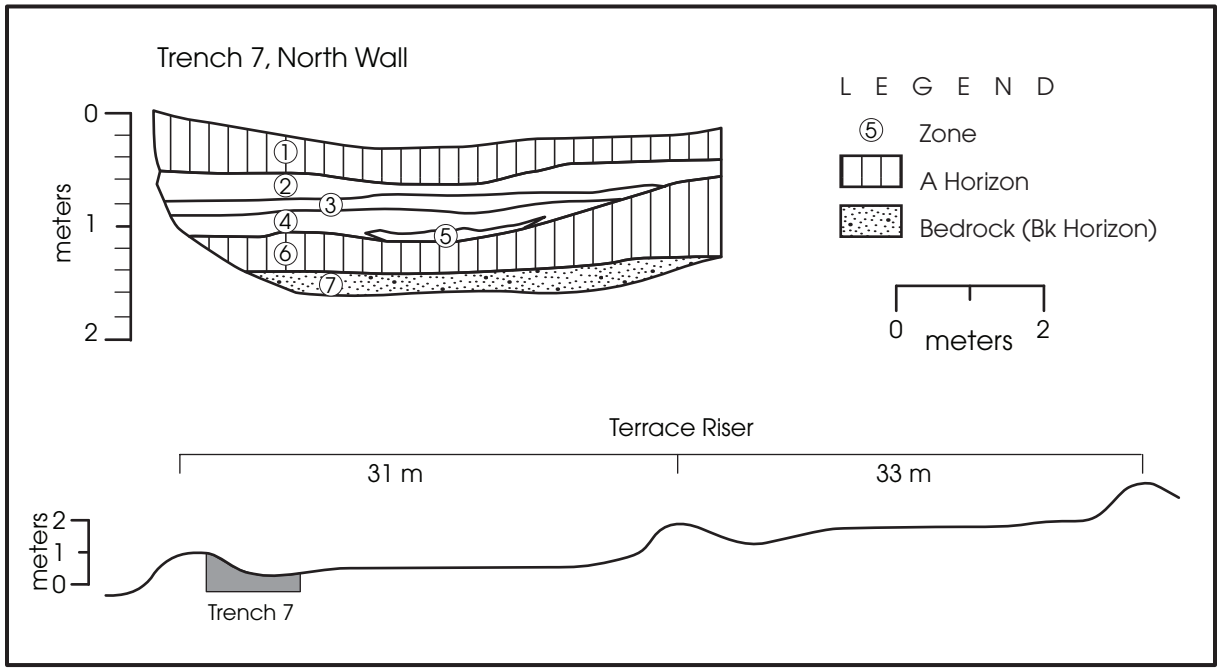

Figure 27. Drawing of the north wall of Trench 7, which was placed across the riser of an agricultural terrace (top); simplified line drawing illustrating the location of Trench 7 with respect to the terraces in this field (bottom).

Trenches 8, 9, and 10 all were in a similar slope position, at the end of the presumed alluvial fan where it abuts the floodplain of Elm Creek. Trench 8 was on the lowest terrace within this field, and the ground surface in this location was almost a meter lower than the next field immediately to the north, which is clearly part of the Elm Creek floodplain. This difference in elevation raises two possibilities: (1) that a significant amount of soil has been removed from this field, most likely to level it for irrigation, or (2) the field to the north has had a significant amount of fill added to it. The first scenario is considered most likely, in part because the land surface at Trench 9 immediately to the west is at the same elevation as the field to the north.

Trench 8 exhibited a thin (almost 20 cm) drape of recent sediment (a byproduct of irrigation or alluvial fan sediment) that rested unconformably upon a well-developed soil formed in what is most likely bedrock. The A horizon was nearly 80 cm thick and subdivided into two parts, and in general it consisted of very dark gray to black clay with upwards of 5 percent widely dispersed gravels that were largely ferruginous concretion fragments. With increasing depth, this deposit coarsened into a sandy clay and then a loam, with the coarse fragments becoming more common. The deposit at depth also exhibited evidence of gleying in the form of redox depletions, manganese concretions, and mottles. No cultural material was observed in this trench.

Trench 9 was near the center axis of the presumed alluvial fan, and like Trench 8, this exposure exhibited a thin drape (50 cm) of recent alluvium resting unconformably upon a buried soil. The buried soil bore some resemblance to the buried soil in Trench 8 but was different in some respects. It is possible that this is a cumulic soil at the edge of the Elm Creek floodplain. No cultural material was observed within this trench.

Trench 10 was west of Trench 9 and exposed a completely different alluvial deposit. This 2-m-deep excavation revealed a late Holocene alluvial deposit that comprised a massive floodplain facies in the upper 85 cm and a channel deposit below that. The size of the channel could not be determined from the trench, but this feature appeared to be flowing west-northwest and is most likely the tributary stream rather than Elm Creek. The channel sediments comprised alternating pale brown (10YR 6/3) to grayish brown (10YR 5/2) sand and dark grayish brown (10YR 4/2) gravelly sandy loam, and both of these deposits contained abundant fragments of lignite. In many ways, these deposits resembled the near-channel facies deposits exposed by Trenches 4 and 5 at 41MV396. No cultural material was observed within this trench.

Near 41MV393

Three trenches were excavated just north of 41MV393, which occupies the upland margin above a small unnamed tributary of Elm Creek that drains the landscape along the south side of the Elm Creek valley at the west edge of the project area (Figure 28). This tributary has its headwaters about 5.3 km southeast of its confluence with Elm Creek. As it approaches the Elm Creek valley, this small

stream opens out and is flanked by broad low-gradient surfaces that look like they could be ancient alluvial terraces. Three trenches were excavated from near the stream channel upslope onto a series of agricultural terraces to assess the potential for buried cultural material. All three of these excavations are in an area mapped as Pryor clay loam, 1–3 percent slopes.

The most likely trench to yield buried cultural material was Trench 11, as it was located in the lowest topographic position closest to the tributary channel. The trench exposed 70 cm of recent (latest Holocene) alluvium resting unconformably upon a cumulic buried soil, which in turn rested upon what was interpreted as weathered bedrock below 115 cm. The recent alluvium ranged from very dark gray (10YR 3/1) clay/sandy clay, to brown (10YR 5/3) sandy loam, to dark gray (10YR 4/1) clay. The cumulic soil (or 2Akb horizon) was located between 70 and 115 cm below the surface and was a black (N 2/) clay that contained a few medium calcium carbonate nodules and filaments. The presence of the nodules suggests this deposit may be older than it first appears, but it was most likely deposited in the latter half of the Holocene. The bedrock exposed at the base of this trench consisted of a light olive brown (2.5Y 5/3) and dark gray (2.5Y 4/1) clay to sandy clay with distinct reticulate iron depletions lining the peds. No cultural material was observed in this trench.

Trench 12 was placed in the middle of the agricultural terrace immediately upslope from Trench 11 and exposed about half a meter of introduced fill associated with terracing, which rested upon a truncated calcic and gypsic B horizon formed in unconsolidated bedrock. The latter consisted of brown (10YR 4/3) and gray (10YR 5/1) sandy clay to loam that contained numerous calcium carbonate nodules, gypsum threads, and clusters of gypsum crystals. Trench 13 was in the middle of the next terrace upslope from Trench 12 and exposed a soil formed in unconsolidated bedrock that exhibited an Ap-Bk1-Bk2-Bk3 soil profile. The Ap horizon was a dark grayish brown (2.5Y4/2) clay to silty clay, and the underlying calcic horizon was a light olive brown (2.5Y 5/3) clay to loam. No cultural material was observed in this trench.

In summary, the broad low-gradient slopes that have been converted to terraced agricultural land here are apparently strath terrace surfaces cut into soft bedrock by lateral scour by this small tributary stream. The alluvium present near the modern channel appears to be thin and of quite limited extent.

Little-Modified Tributary Floodplain, 41MV394

Trenching was done at a single location on the relatively undisturbed part of the floodplain of the north-flowing Elm Creek tributary in the southwest corner of the project area, upstream (south) from the area modified by agricultural terracing. The area trenched is on and adjacent to 41MV394 found during pedestrian survey (see Figure 28).

The soils mapped in this location are Pryor association, undulating. The site occupies a high spot adjacent to the channel and is flanked on the east and north by the floodplain, which in some places (like the east side) is separated from the knoll by a very subtle break in slope. The north side of the knoll where the cultural material is most ubiquitous is also bordered by the floodplain, but there

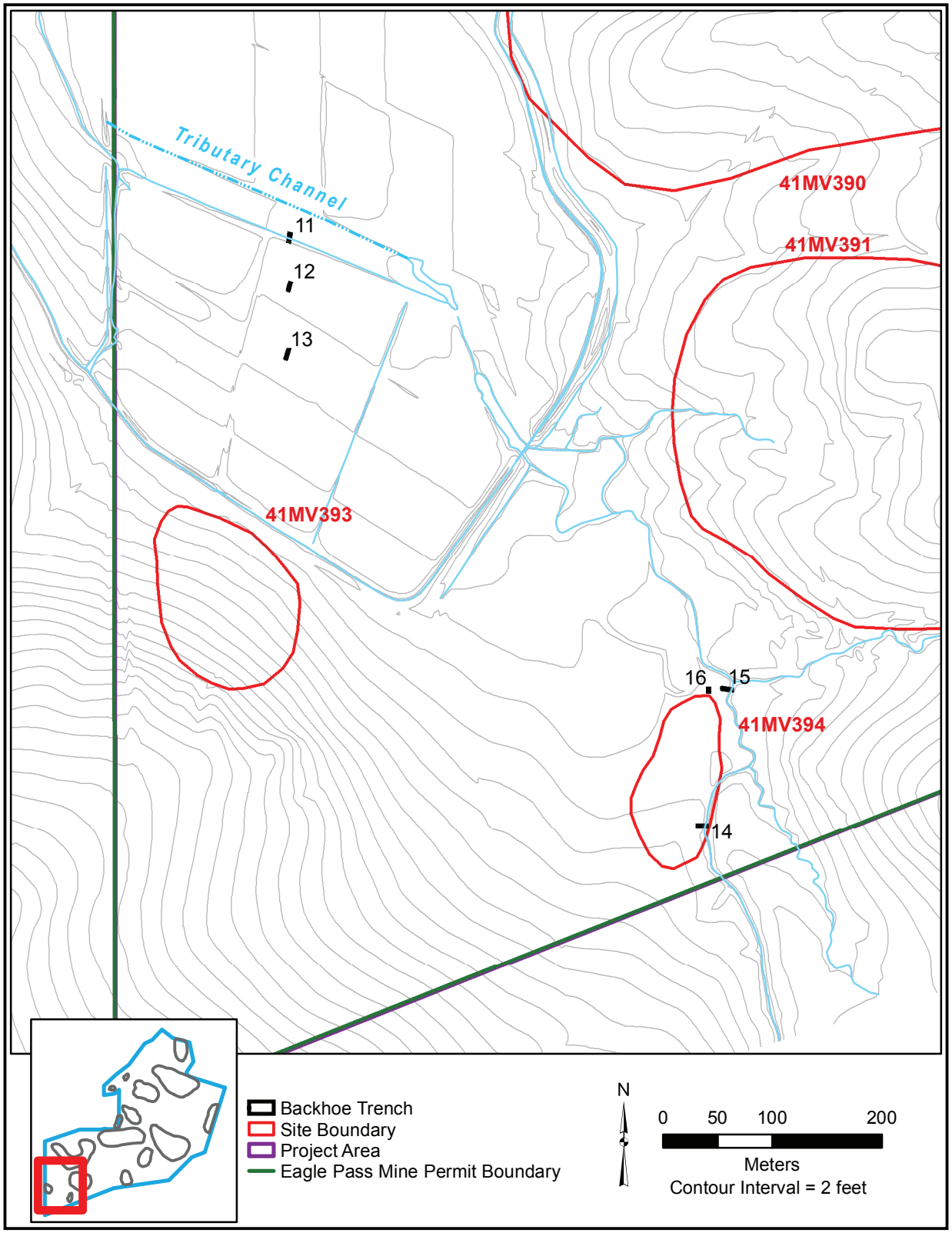

Figure 28. Map showing the locations of Trenches 11–16 relative to 41MV393 and 41MV394 and relevant landscape features.

are no obvious geomorphic clues to this other than an arcuate depression that is clearly a scour created by overbank flow. A series of three trenches were excavated at this site: Trench 14 was adjacent to the stream channel east of the knoll, whereas Trenches 15 and 16 were on the stream floodplain north of the knoll.

Trench 14 was started about a meter west of the stream channel and extended west up onto the margins of the knoll. It revealed that the knoll is cored by bedrock (Zone 6), which in the trench appeared as a light olive brown (2.5Y 5/3) loam to sandy clay with many calcium carbonate nodules (Figure 29). A late Holocene alluvial deposit (Zone 5, dark grayish brown [10YR 4/2] loam) is inset into and truncates the bedrock near the stream channel and grades upwards into a buried soil (Zone 4, very dark gray [10YR 3/1] silt loam). Zone 4 drapes over the top of the bedrock and presumably pinches and thins outside the trench to the west but did not do so within the trench. Zone 4 contained numerous pieces of scattered burned rocks, at least one piece of debitage, and quite a few fragments of scattered charcoal. Zones 4 and 5 most likely correlate with Unit E of Frederick and Stahman (2009), which was deposited in the last millennium. Overlying this paleosol was upwards of a meter of sandy to loamy alluvium that pinched and thinned to the west, toward the knoll. Zones 1 and 3 were brown (10YR 5/3 to 4/3) loam to sandy loam that appeared unaltered by pedogenesis, but Zone 2 appeared to be a very weakly developed A horizon, which pinches out within the trench. The absence of significant soil development implies a modern to latest Holocene age for these sediments, and these most likely are Unit F of Frederick and Stahman (2009).

Trench 15 was on a relatively broad and flat floodplain surface immediately adjacent to the stream channel north of the knoll and exposed about 1.4 m of sediment that most likely correlates with Zones 1–3 in Trench 14 (presumably of modern/historic age). The stratigraphic relationships revealed by Trenches 14 and 15 suggested that the same deposits observed in Trench 14 should be present here, so Trench 16 was placed between Trench 15 and the knoll; although no formal log was made of this trench, it appeared to expose a paleosol similar to Zone 4 in Trench 14 buried by recent sediments. The top of this soil was about 1 m below the surface.

The observations made from the trenching suggest that this site was defined based on an artifact scatter that rests on bedrock where it is visible on the ground surface, and that the visibility of the site (and its actual size) may be somewhat obscured by alluvial sedimentation by the immediately adjacent stream. The buried soil observed in Trench 14 clearly exposed a stratigraphically isolated occupation surface which is most likely of late Holocene age (presumably representing occupation during the Late Prehistoric or Late Archaic period). This buried occupation zone probably lies immediately north of the very low-relief knoll and could be extensive in this portion of the site (Figure 30).

DISCUSSION AND CONCLUSIONS

Trench excavations in and around archeological sites discovered during this survey revealed that three of these sites (41MV394, 41MV395, and 41MV396) have shallowly buried occupation surfaces that could retain archeological integrity.

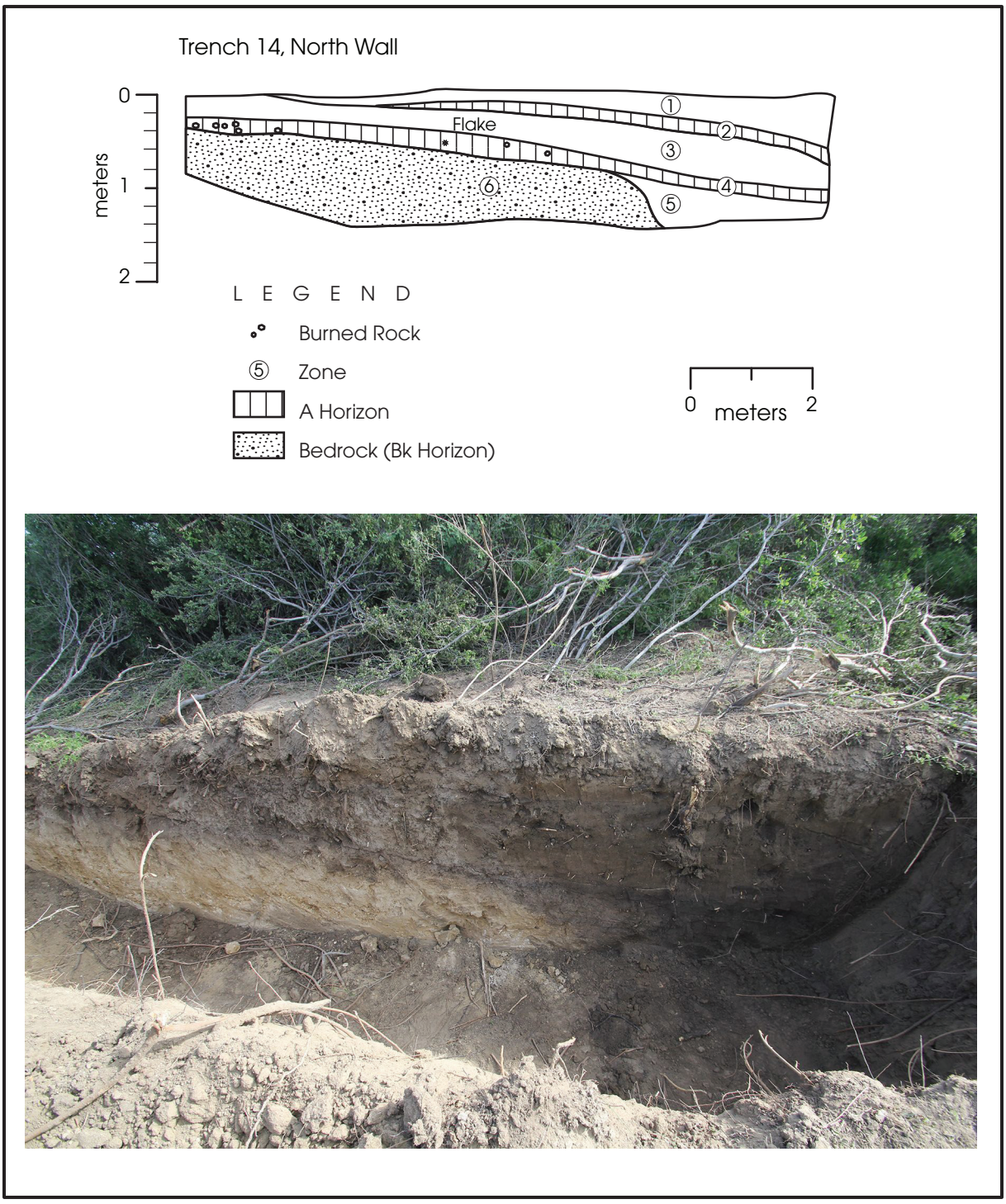

Figure 29. Drawing of the stratigraphy exposed on the north wall of Trench 14 at 41MV394 (upper) and photograph of the same wall (lower).

All of these sites appear, on the basis of the surrounding sediment, to be of late Holocene age, and thus they probably represent Late Prehistoric or Late Archaic Native American occupations. As with many sites in this area, buried cultural

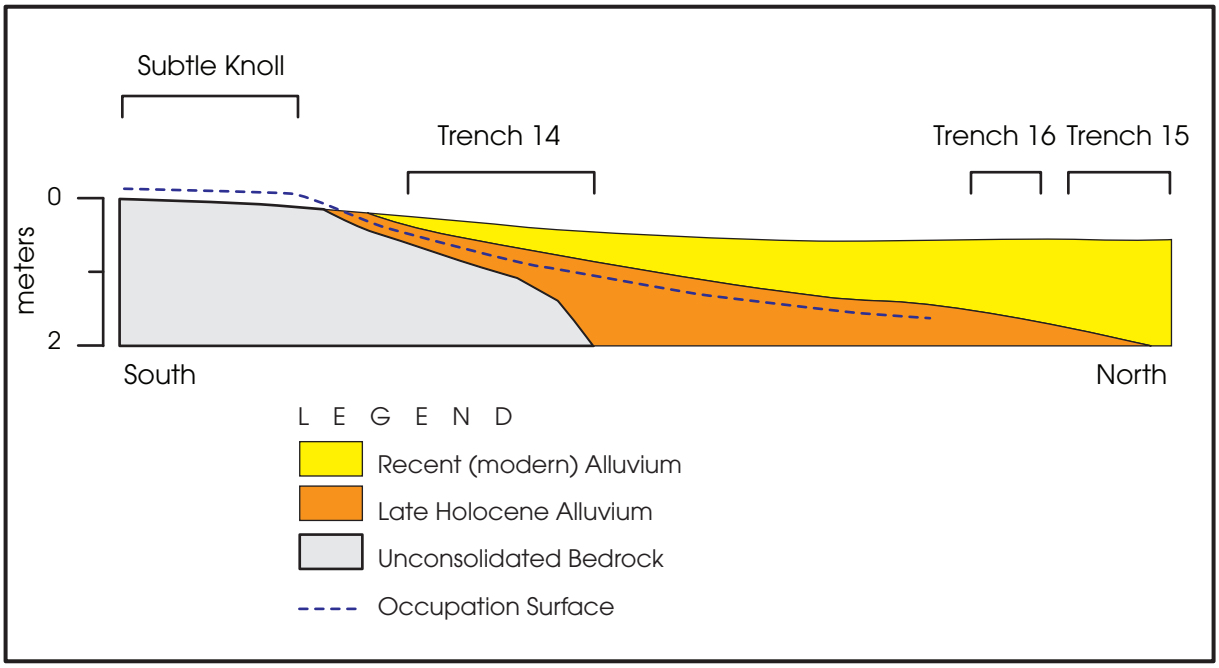

Figure 30. Sketch illustrating the inferred relative relationships between the deposits observed in the trenches at 41MV394 and the stratigraphic distribution of the observed cultural material.

materials were discovered beyond where artifacts are visible on the ground surface, owing to shallow burial by overbank flooding. On Elm Creek where the geomorphic relationships are fairly clear, this was easy to detect, but in the unnamed tributary valley where 41MV394 is situated, the distinction between the upland and the Holocene floodplain was difficult to discern.

Trenching done in the vicinity of 41MV390 and 41MV393 mostly exposed soils developed in soft bedrock that had been subsequently altered to form agricultural terraces. Although upwards of a meter of fill was introduced to form these terraces, no buried prehistoric cultural material was encountered.

CHAPTER 4: RESULTS OF THE HISTORICAL RESOURCES SURVEY

METHODS

Historical resources studies included a file search, literature review, and photographic documentation of historic-age resources. The file search guided identification of potential historic properties. Information was gathered from the Texas Historical Commission's Texas Historic Sites Atlas concerning National Historic Landmarks; National Register of Historic Places properties; Official Texas Historical Markers (Recorded Texas Historic Landmarks and subject, grave, and Texas Centennial markers); State Archeological Landmarks; and cemetery, neighborhood, military, and museum surveys. The file search revealed no designated historic properties in the project area.

The literature review guided identification of potential locations of previously undocumented historic-age resources in the study area. Topographic, soil, and highway maps along with aerial photographs that include the study area were consulted. Primary and secondary sources highlighted historical influences in the study area within which to evaluate historic-age resources. These included previously prepared cultural resources studies reports; newspaper articles; cemetery records; county deed, miscellaneous, and ad valorem tax records; state land records; and federal registers and federal decennial manuscript population schedules. The literature review indicated that historic contexts appropriate to the area of potential effects include agriculture and recreation.

The field investigations consisted of photographing resources in the project area and conducting research on those resources. The six historic-age resources constructed by 1966 were digitally photographed. Archival research was conducted at the Maverick County Clerk's office in Eagle Pass. The local irrigation district was contacted in an effort to acquire any historic maps that may be available, but telephone calls were not returned. Longtime property owner Hollis Kincaid shared his knowledge of the resources under study.

After synthesizing research from the file search and literature review with photographs from the field investigations, the identified historic-age resources were assessed for National Register eligibility. Eligible historic properties are buildings, structures, objects, sites, or districts that meet the National Register criteria for evaluation at the national, state, or local level of significance. The criteria call for eligible properties to be significant for historical associations with events or broad patterns in history (Criterion A), persons (Criterion B), architecture (Criterion C),

or prehistoric or historic archeology (Criterion D). In general, properties that are eligible should be 50 years of age or older. For resources to be considered eligible, they should retain historical and architectural authenticity, best articulated by the seven aspects of integrity: location, setting, design, materials, workmanship, feeling, and association.

DESCRIPTIONS AND NATIONAL REGISTER ASSESMENTS OF HISTORICAL RESOURCES

The historical resources survey identified six resources: three buildings and a structure associated with the 1912–1944 Rohleder ranch; a mid-twentieth-century private irrigation system; and a ca. 1960 lake (Figure 31). The ranch and irrigation system are ruinous, and the lake is not exemplary. These historical resources are each recommended as not eligible for the National Register. As a result, the proposed project will have no effect on significant historical resources. No further work is recommended for historical resources.

Rohleder Ranch

Extant historic-age resources associated with the Rohleder ranch include a hunting lodge, two outbuildings, and a brick platform for a windmill and cistern, all just outside the project area (see Historic Site 41MV389 in Chapter 2 for a description and site history). These resources are all ruinous. The lodge retains only two partial brick walls surrounded by rubble, the outbuildings have crumpled and are missing much of their original fabric, and only the platform remains where the windmill and cistern once stood. Although the property and the Rohleder brothers—the principal individuals associated with the property—are historically interesting, damage to its physical integrity has irreversibly impaired these resources. The lodge, outbuildings, and windmill and cistern may have been functional as late as 1972, but the complex appears to have been abandoned subsequently. These resources retain their original locations and associative qualities, but their integrity of setting, design, materials, workmanship, and feeling have been inalterably compromised. Their ruinous condition subjugates their associative qualities with important historical trends, events, and people, and they are recommended not eligible for the National Register under Criteria A and B. Since they are not exemplary or representative of a style, type, period, or method of construction, these resources are also recommended as not eligible under Criterion C.

Kincaid Irrigation System

The land on which the Kincaid irrigation system and lake is situated—three 640-acre surveys patented to the International and Great Northern Railroad Company in the late-nineteenth century—was held by either the railroad company or a partnership for decades. W. T. and Lucie Johnson, of Bexar County, acquired the land in about 1936 (Maverick County, Ad Valorem Tax Records 1935–1937). Taxes on the land were unrendered during the early years of their ownership (Maverick County, Ad Valorem Tax Records 1937–1943). In 1941, the Johnsons conveyed 17,729.1 acres, including the 640-acre survey to C. P. Burton, of Dallas County, for

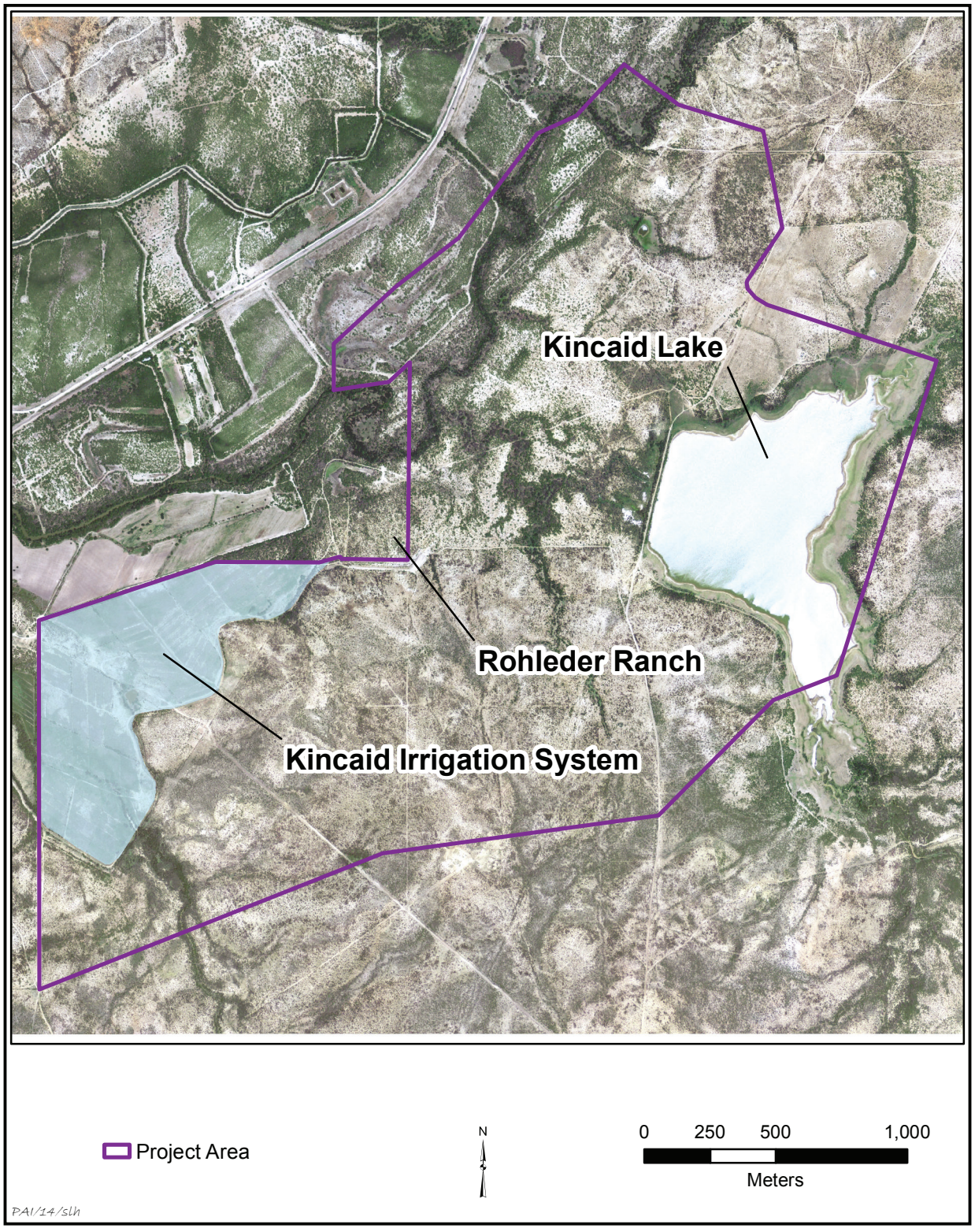

Figure 31. Modern aerial photograph showing locations of historical resources within the project area.

$81,729 (Maverick County, Deed Record 32:538). Taxes on the land were unrendered during Burton's ownership (Maverick County, Ad Valorem Tax Records 1941–1945). During these 60-some years, the property was never occupied but may have been leased for livestock ranching.

In 1946, C. P. and Mary Irene Burton conveyed the land to Edgar B. Kincaid, of Sabinal, for $208,240.80 (Maverick County, Deed Record 38:636). Kincaid owned other land in Maverick County as early as 1945. In 1947, his combined holdings there were assessed at $45,000 (Maverick County, Ad Valorem Tax Records 1945, 1947).[3] The property still was not occupied, but Kincaid made improvements to take advantage of the county irrigation system, irrigating the northwest quadrant of one survey he held by 1957. He also had a dam built that turned the southeast quadrant of one survey and the northeast quadrant of another into Kincaid or King Lake.

The extant irrigation system consists of a series of concrete-lined channels that delivered water to flat but gently sloping manmade terraces surrounded by earthen berms. Row crops were grown on the terraces. The main ditch, which originated at the Maverick County Irrigation Canal immediately east of the Southern Pacific Railroad tracks 1.7 km to the southwest, entered the west-central edge of the project area and from there proceeded generally northeasterly, following the base of the Elm Creek valley wall (Figure 32). Lateral ditches ran mostly northwesterly from the main ditch to the terraces on the floodplain. The system is no longer functional and has been abandoned. The channels and ditches are ruinous, overgrown vegetation incapacitates them, and headgates are in disrepair (Figures 33–35). Although the system retains its original location and associative qualities, the integrity of setting, design, materials, workmanship, and feeling have been inalterably compromised. Its ruinous condition subjugates associative qualities with important historical trends, events, and people, and the system is recommended not eligible for the National Register under Criteria A and B. Since it is not exemplary or representative of a style, type, period, or method of construction, the system is also recommended as not eligible for the National Register under Criterion C.

Kincaid Lake

Kincaid Lake is a large (ca. 142 acres) manmade feature, built in about 1960. The lake is associated with agricultural recovery and revival efforts in the aftermath of the 1950s drought; however, its associative qualities are not strong enough to make it eligible for the National Register under Criterion A or B. Although the dam and lake retain their physical integrity, they are without distinction and possess no special design attributes. Since they are not exemplary or representative of a style, type, period, or method of construction, they also are recommended as not eligible for the National Register under Criterion C.

[3] As was the case with the Ruffin Survey, the current owner mentioned that this land may have been affiliated with the Thomson family ranch, which included several thousand acres, some of which were near the International and Great Northern Railroad Survey Nos. 5 and 166; however, the archival record does not link ownership with the Thomsons.

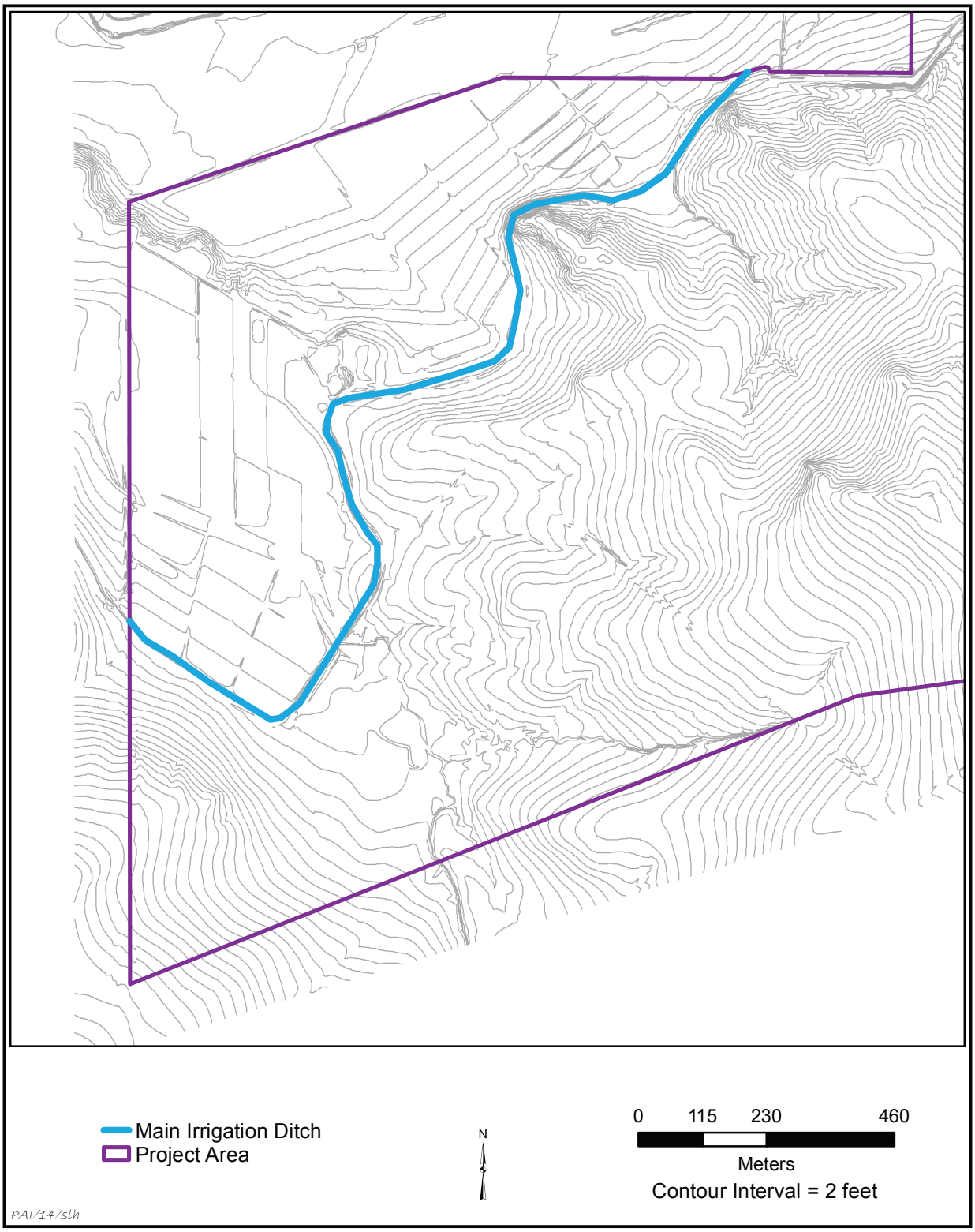

Figure 32. Topographic map showing the layout of the Kincaid irrigation system. The main ditch followed the base of the valley wall and fed water to agricultural fields on the floodplain via lateral ditches.

Figure 33. Photograph of ditch along the Kincaid irrigation system overgrown with foliage. This lateral ditch delivered water to manmade terraces on the Elm Creek floodplain.

Figure 34. Photograph of lateral ditch in the Kincaid irrigation system incapacitated by broken concrete.

Figure 35. Photograph of headgate that allowed water to enter lateral ditches from the main channel in the Kincaid irrigation system.

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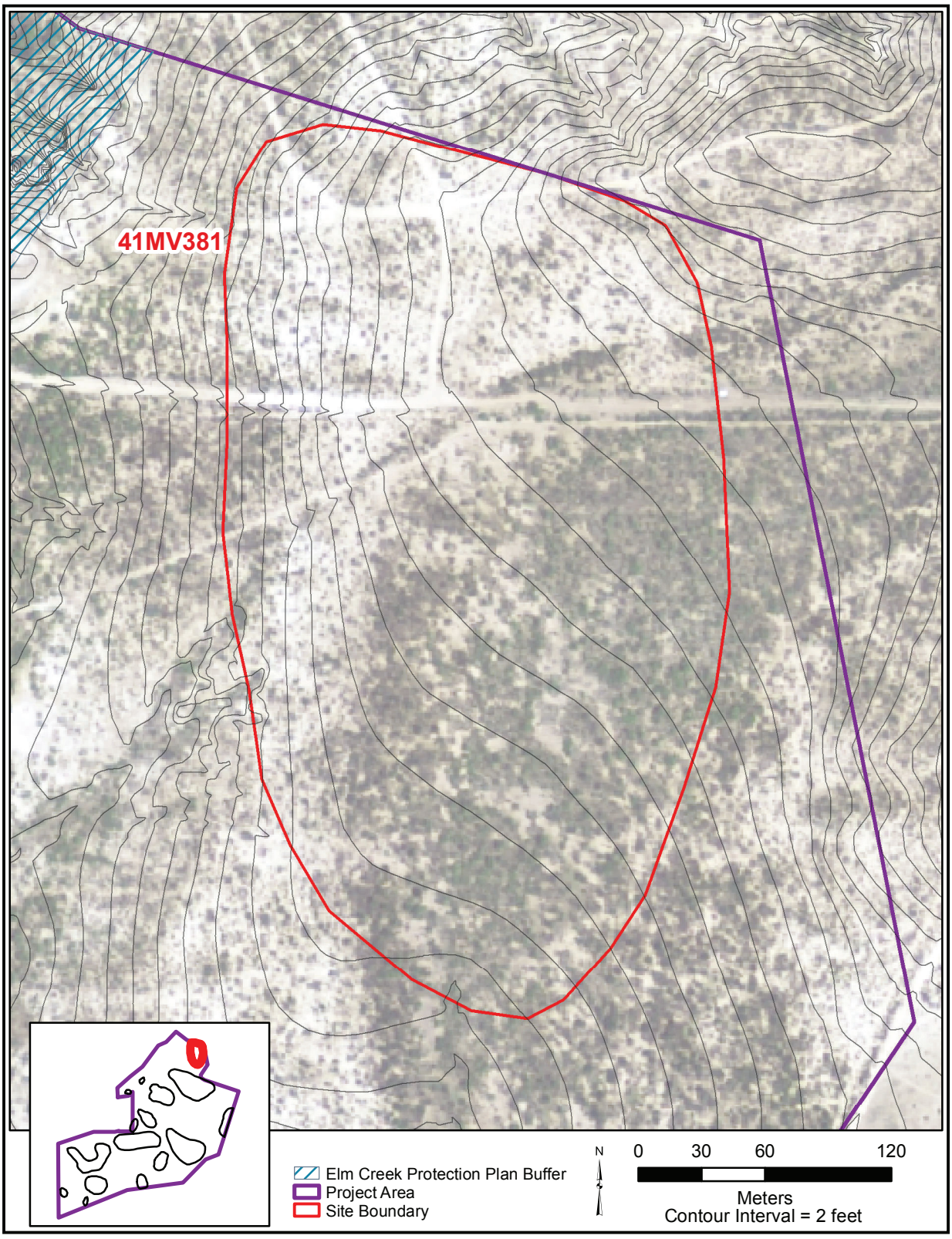
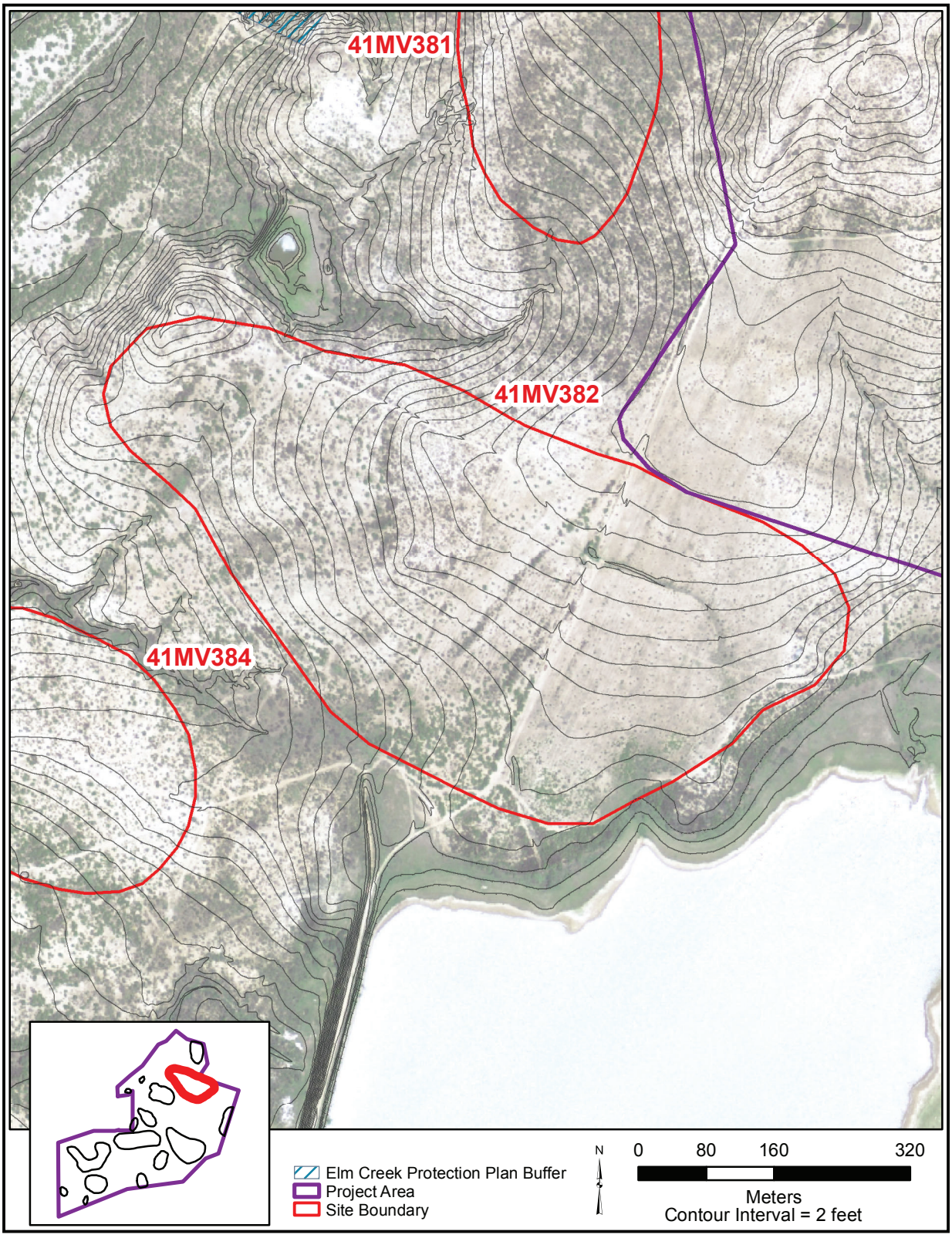
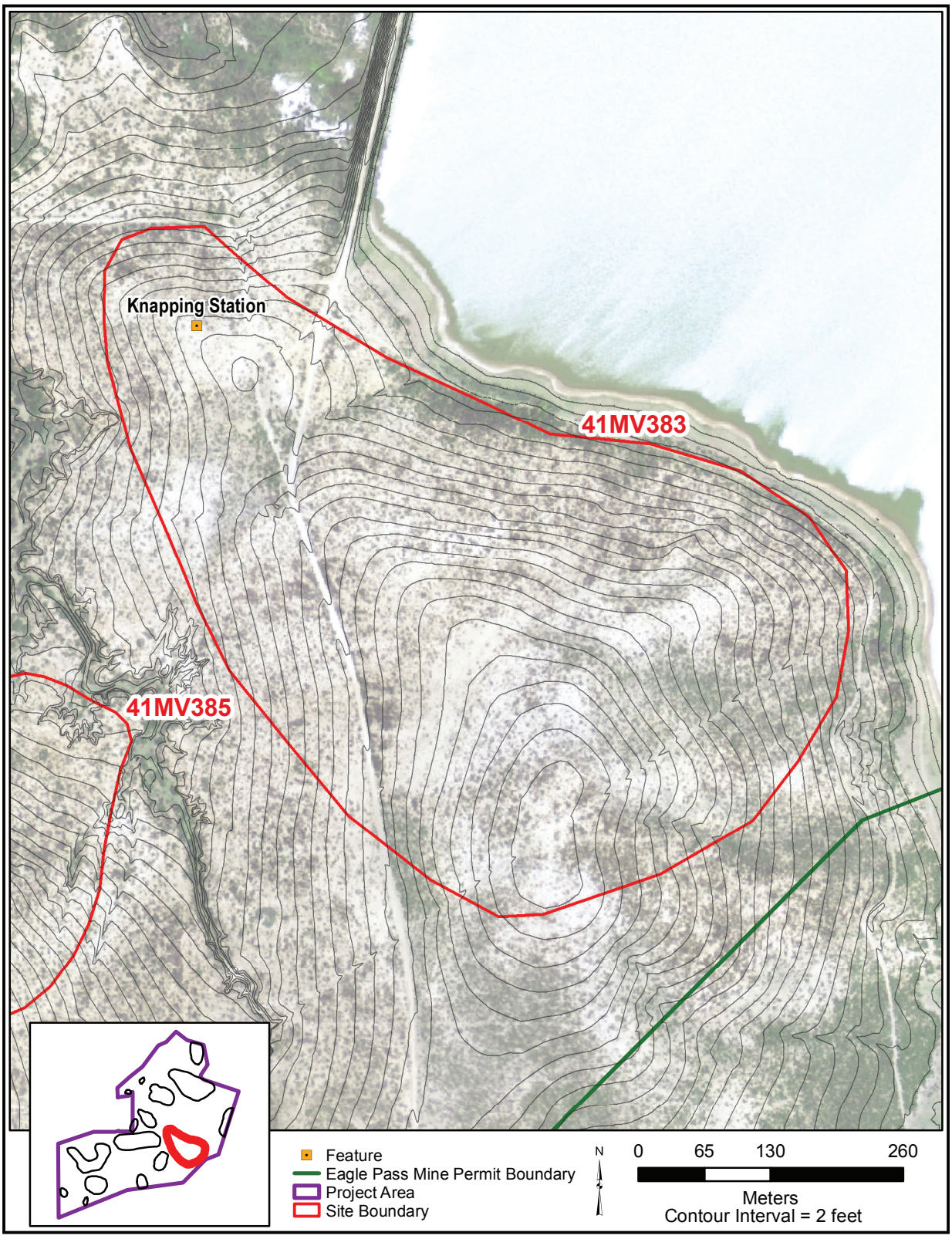
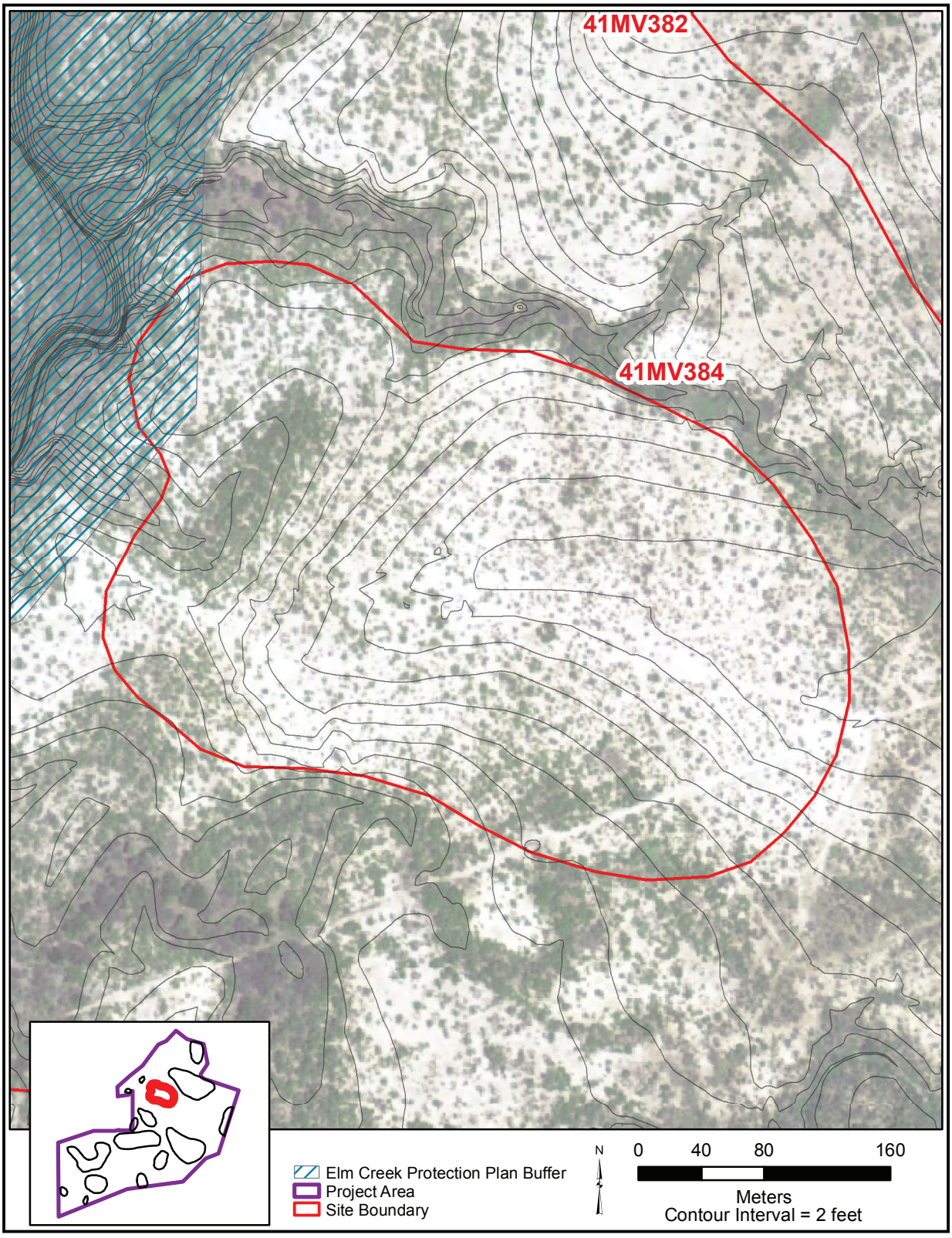
APPENDIX A: Site Maps


41MV381
Elm Creek Protection Plan Buffer
Project Area
Site Boundary
N
0
30
60
120
Meters
Contour Interval = 2 feet


41MV381
41MV382
41MV384
Elm Creek Protection Plan Buffer
Project Area
Site Boundary
N
0
80
160
320
Meters
Contour Interval = 2 feet


Knapping Station
41MV383
41MV385
Feature
Eagle Pass Mine Permit Boundary
Project Area
Site Boundary
N
0
65
130
260
Meters
Contour Interval = 2 feet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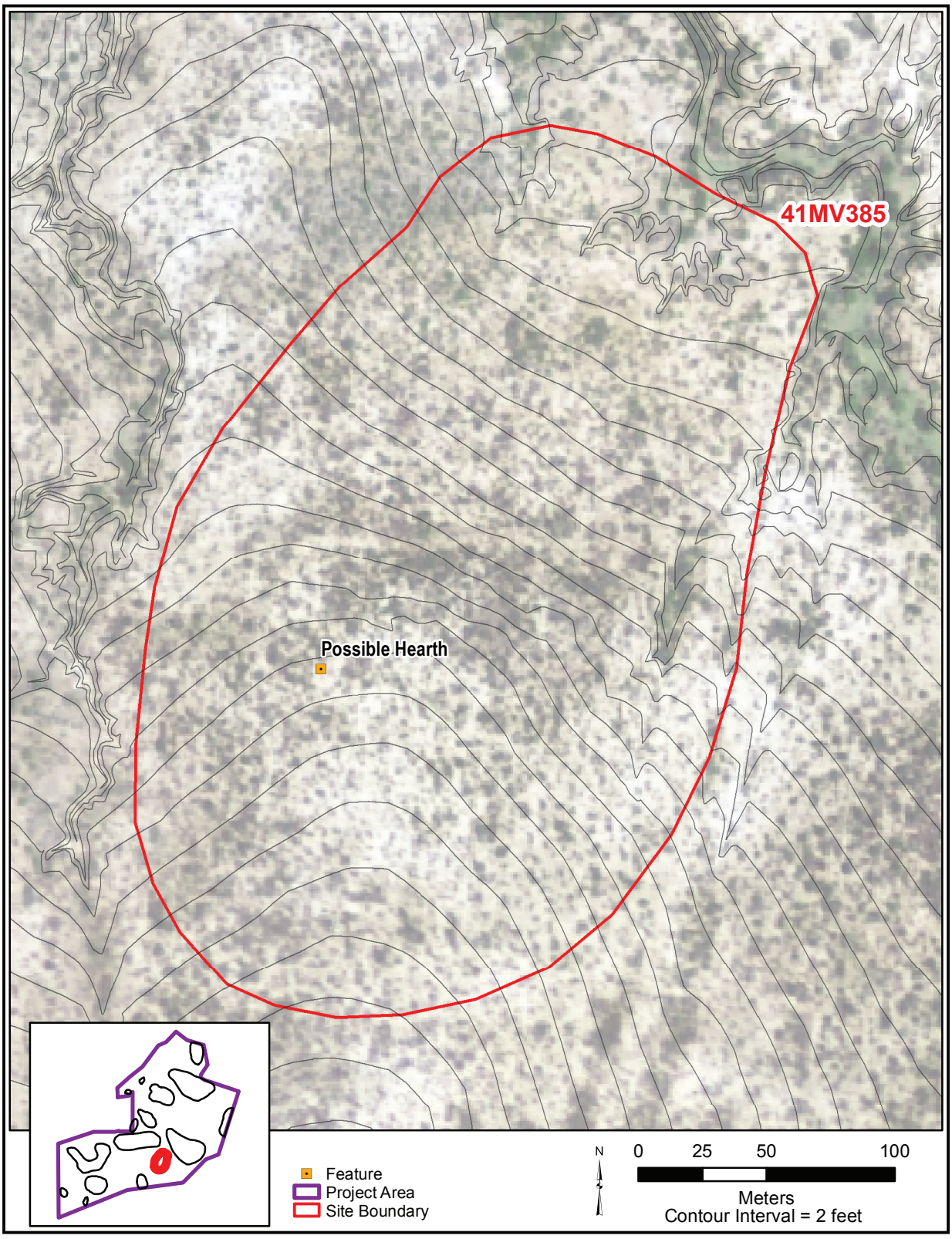
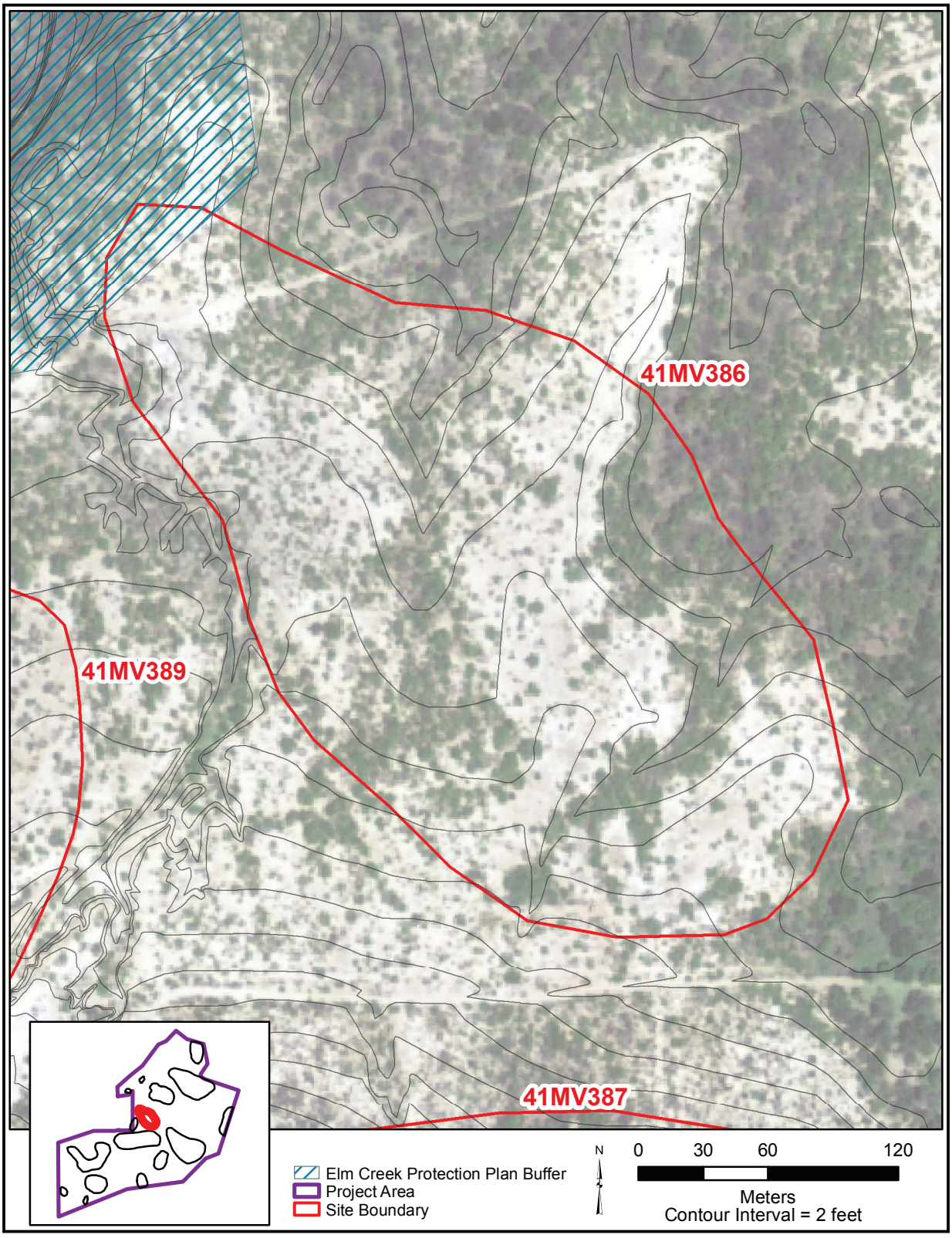
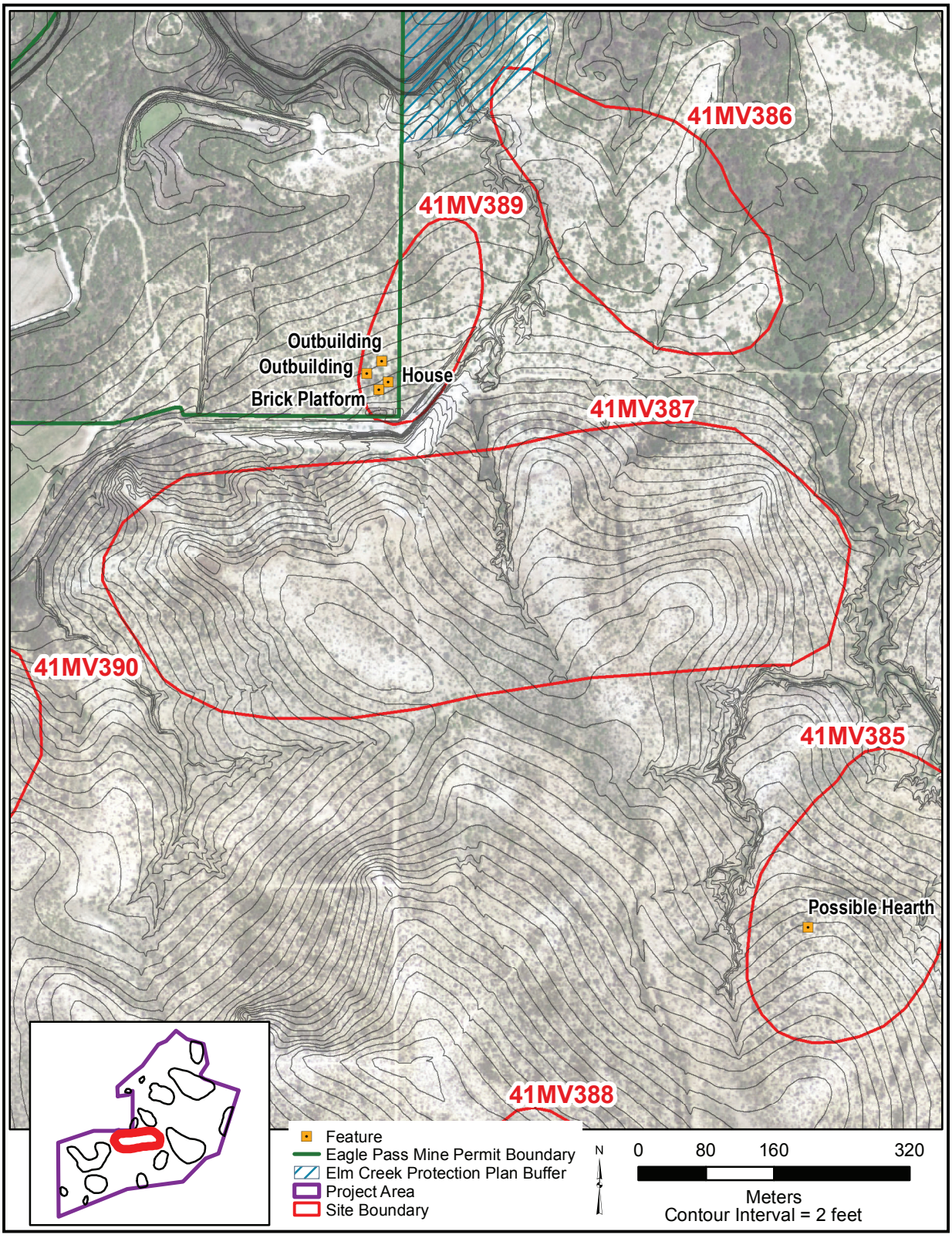
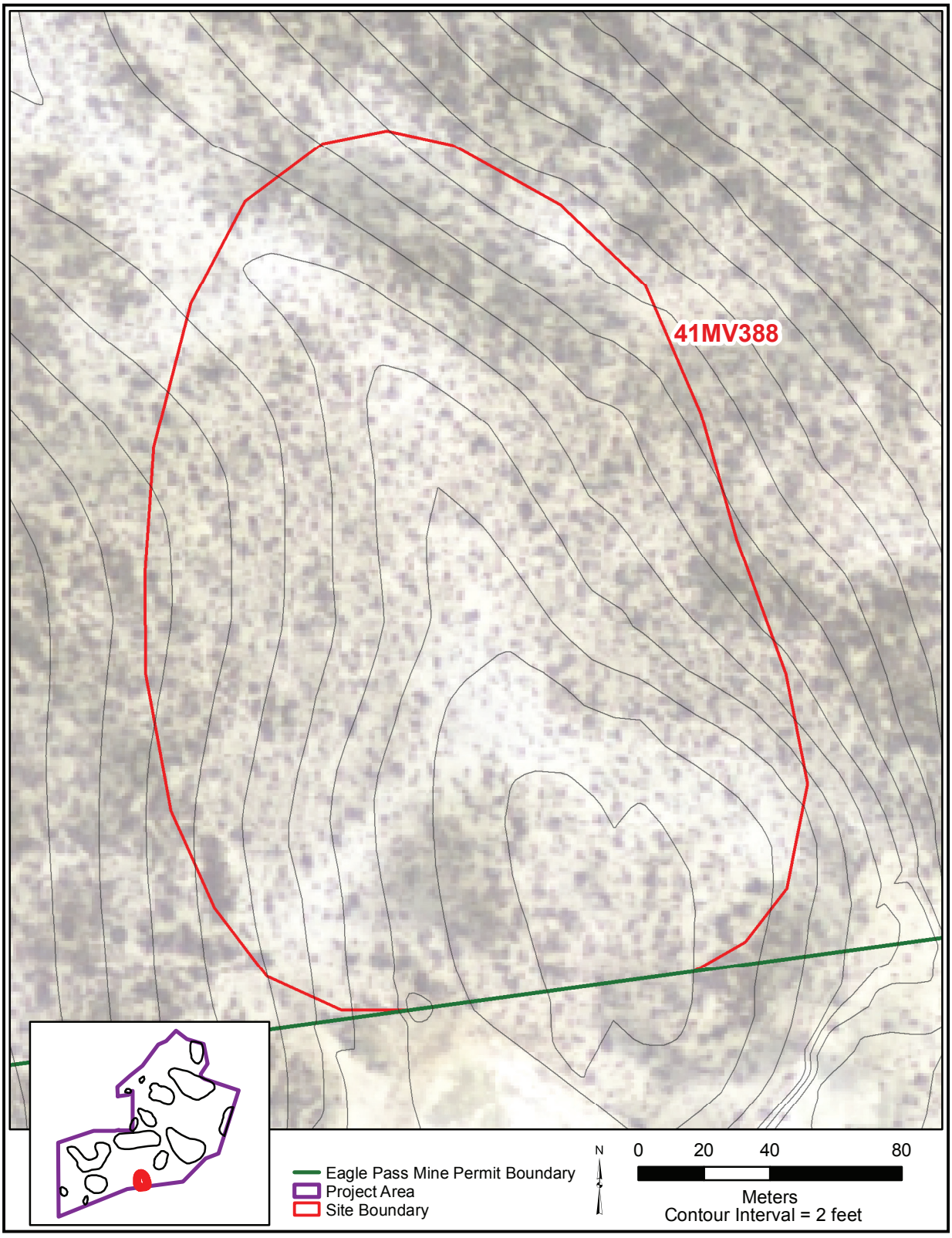
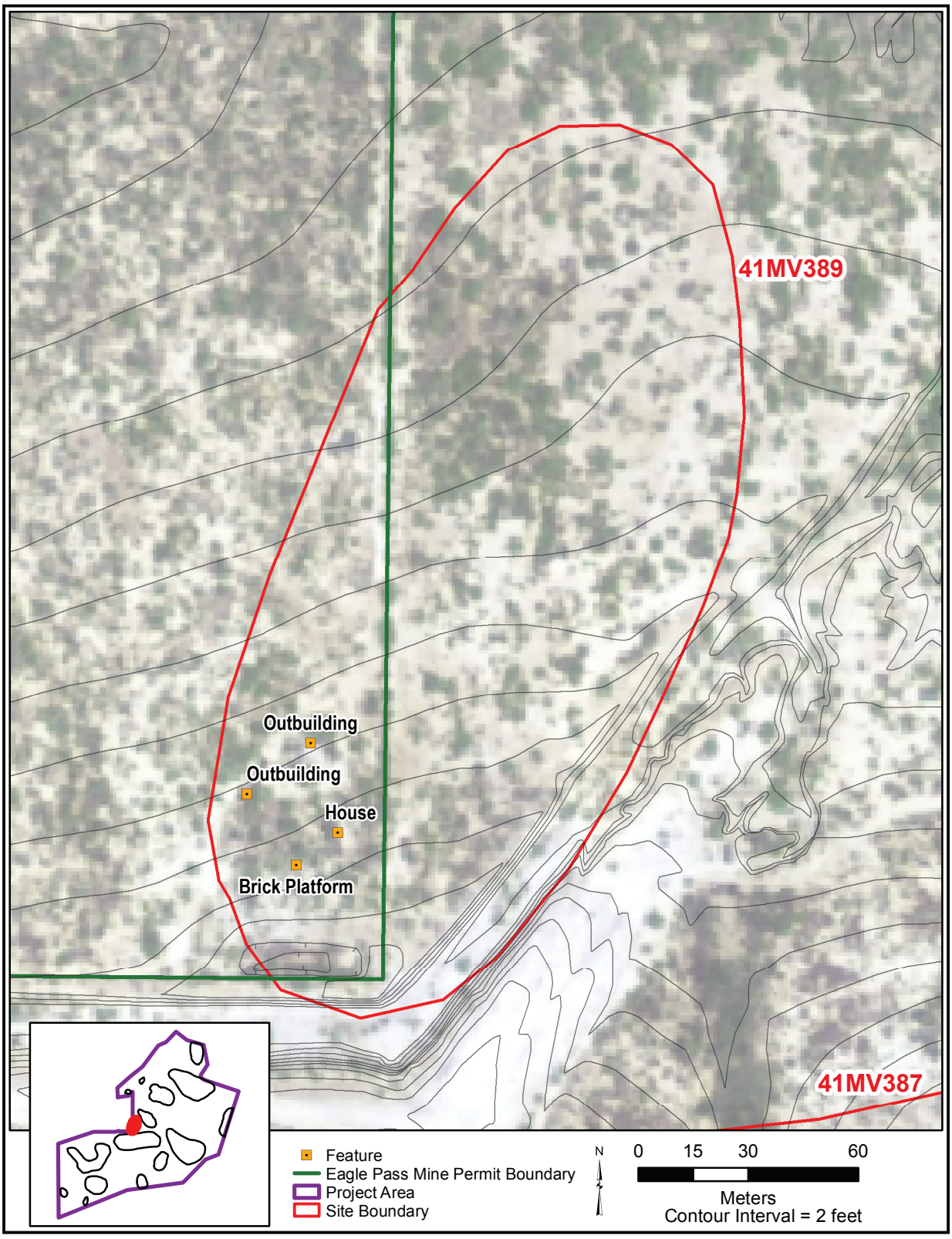
41MV384
Elm Creek Protection Plan Buffer
Project Area
Site Boundary
N
0
40
80
160
Meters
Contour Interval = 2 feet

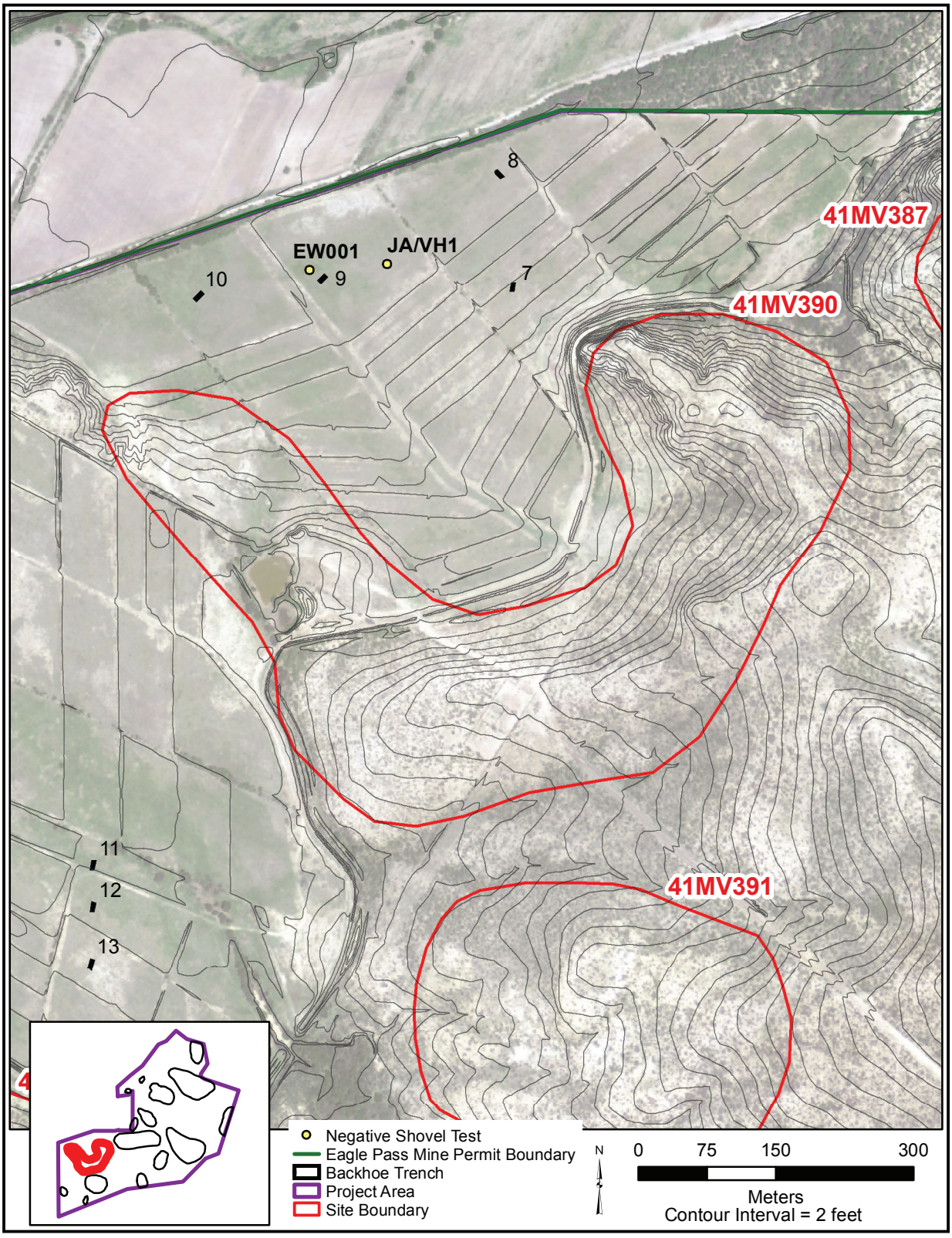

41MV385
Possible Hearth
Feature
Project Area
Site Boundary
N
0
25
50
100
Meters
Contour Interval = 2 feet

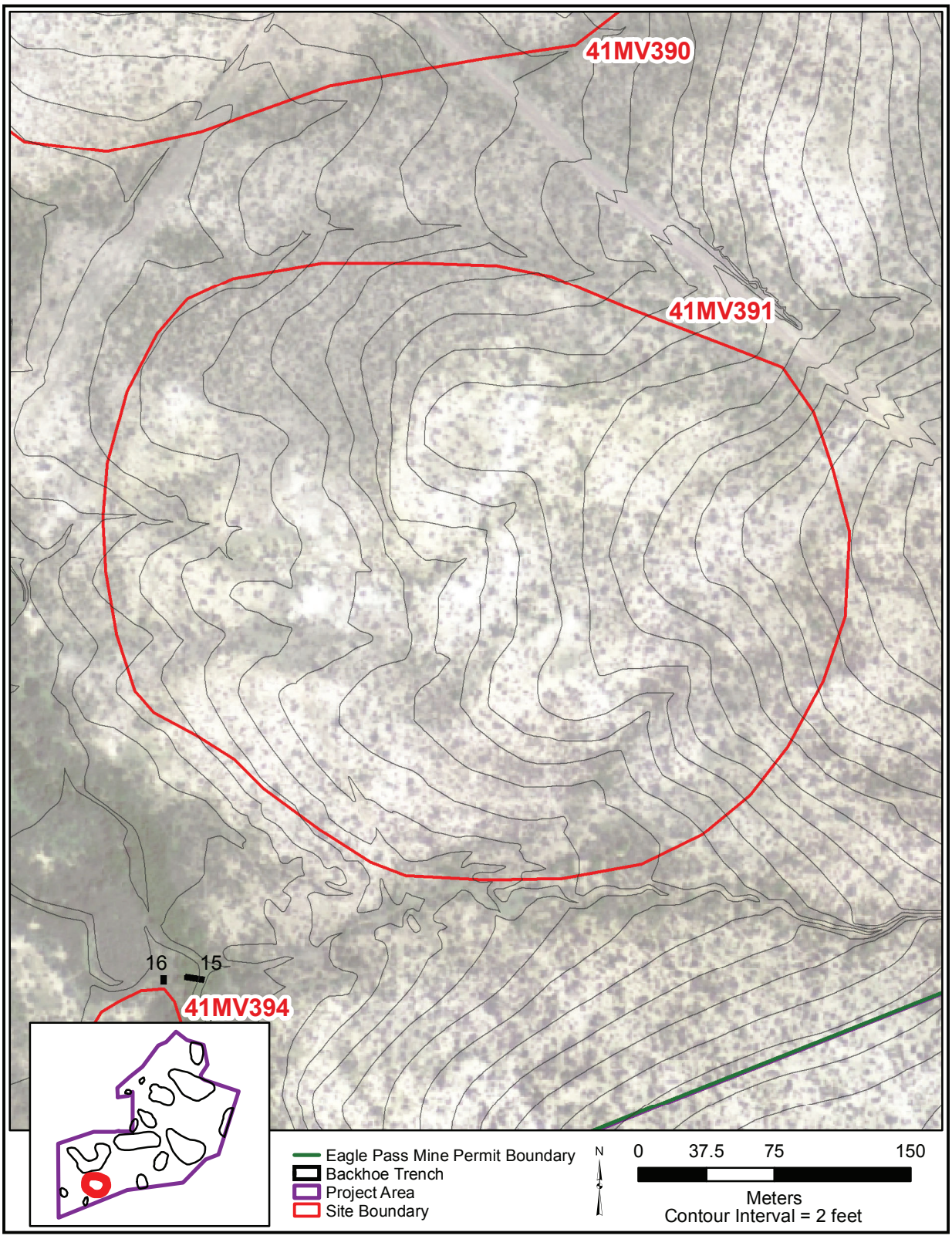

41MV386
41MV389
41MV387
Elm Creek Protection Plan Buffer
Project Area
Site Boundary
N
0
30
60
120
Meters
Contour Interval = 2 feet

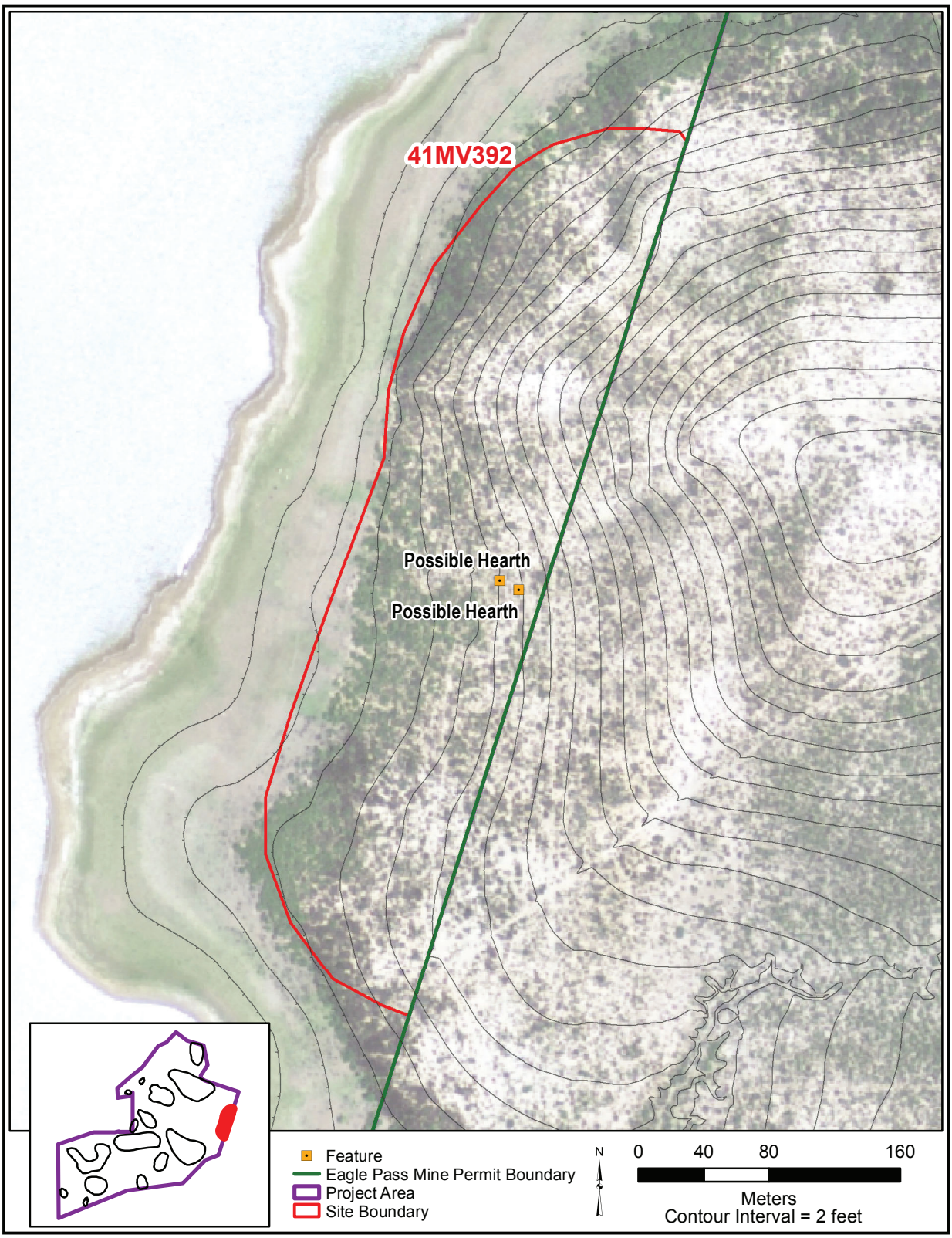

41MV386
41MV389
Outbuilding
Outbuilding
House
Brick Platform
41MV387
41MV390
41MV385
Possible Hearth
41MV388
Feature
Eagle Pass Mine Permit Boundary
Elm Creek Protection Plan Buffer
Project Area
Site Boundary
N
0
80
160
320
Meters
Contour Interval = 2 feet

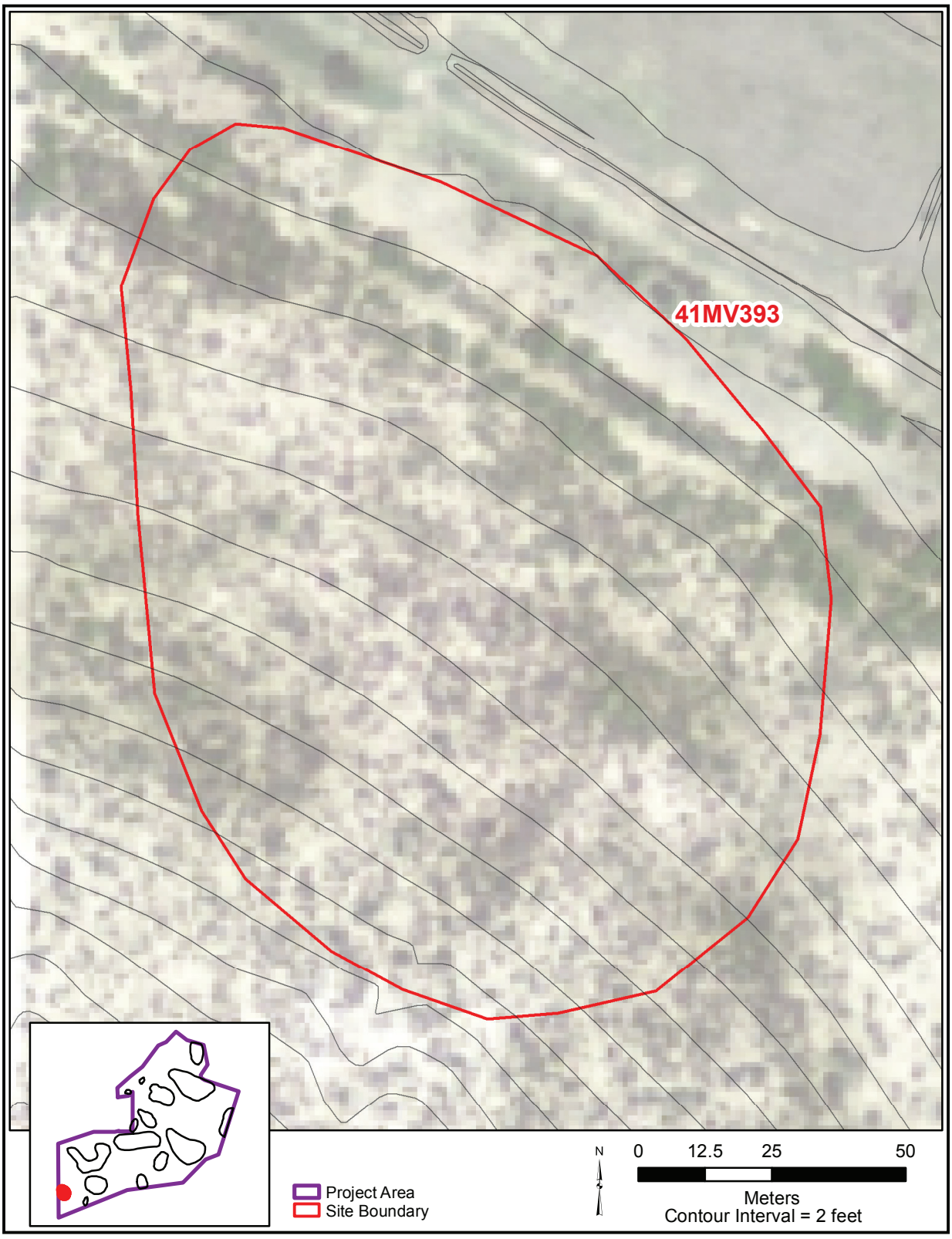

41MV388
Eagle Pass Mine Permit Boundary
Project Area
Site Boundary
N
0
20
40
80
Meters
Contour Interval = 2 feet


41MV389
Outbuilding
Outbuilding
House
Brick Platform
41MV387
Feature
Eagle Pass Mine Permit Boundary
Project Area
Site Boundary
N
0 15 30 60
Meters
Contour Interval = 2 feet


8
41MV387
EW001
JA/VH1
10
9
7
41MV390
11
12
13
41MV391
Negative Shovel Test
Eagle Pass Mine Permit Boundary
Backhoe Trench
Project Area
Site Boundary
N
0
75
150
300
Meters
Contour Interval = 2 feet


41MV390
41MV391
16
15
41MV394
Eagle Pass Mine Permit Boundary
Backhoe Trench
Project Area
Site Boundary
N
0
37.5
75
150
Meters
Contour Interval = 2 feet


41MV392
Possible Hearth
Possible Hearth
Feature
Eagle Pass Mine Permit Boundary
Project Area
Site Boundary
N
0
40
80
160
Meters
Contour Interval = 2 feet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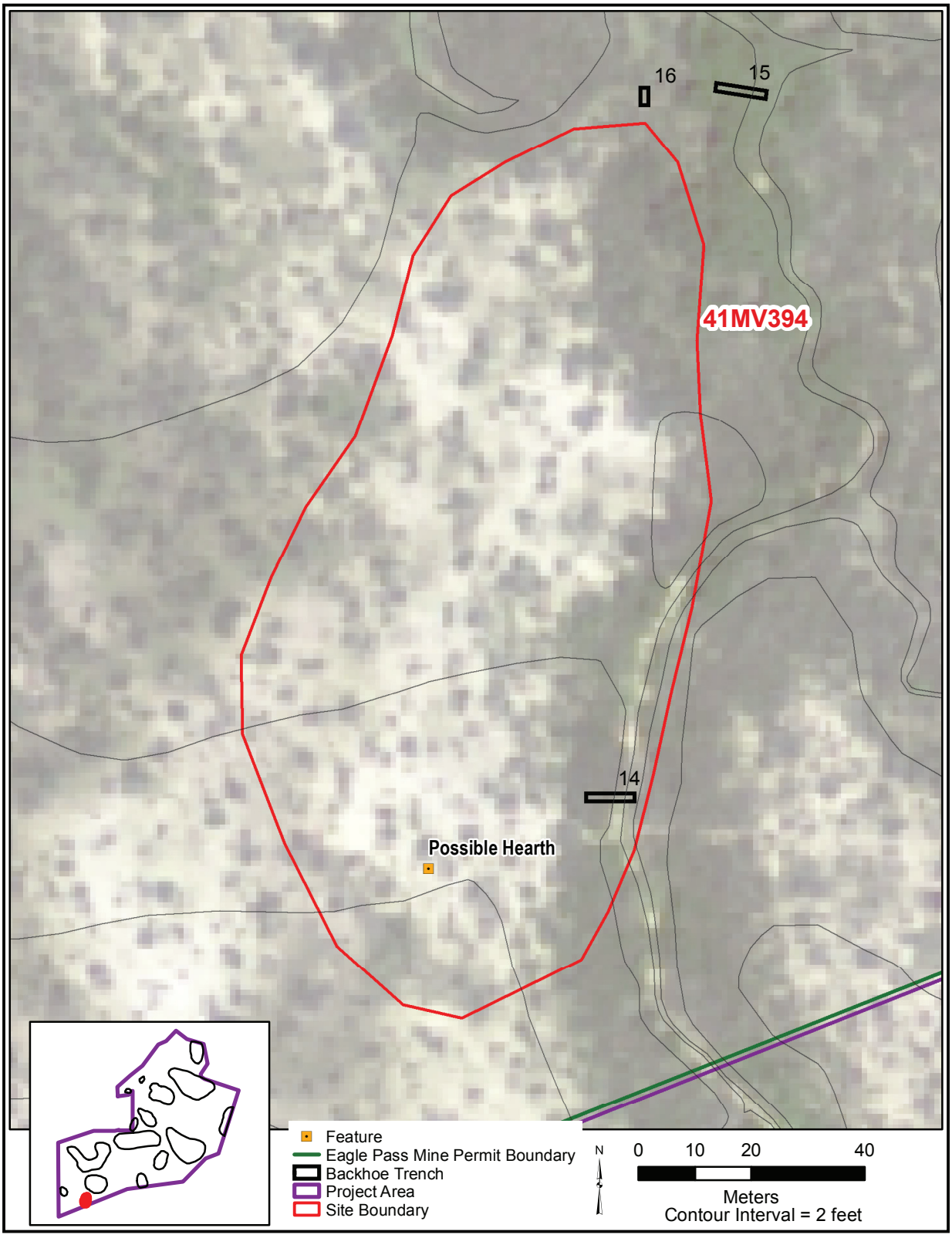
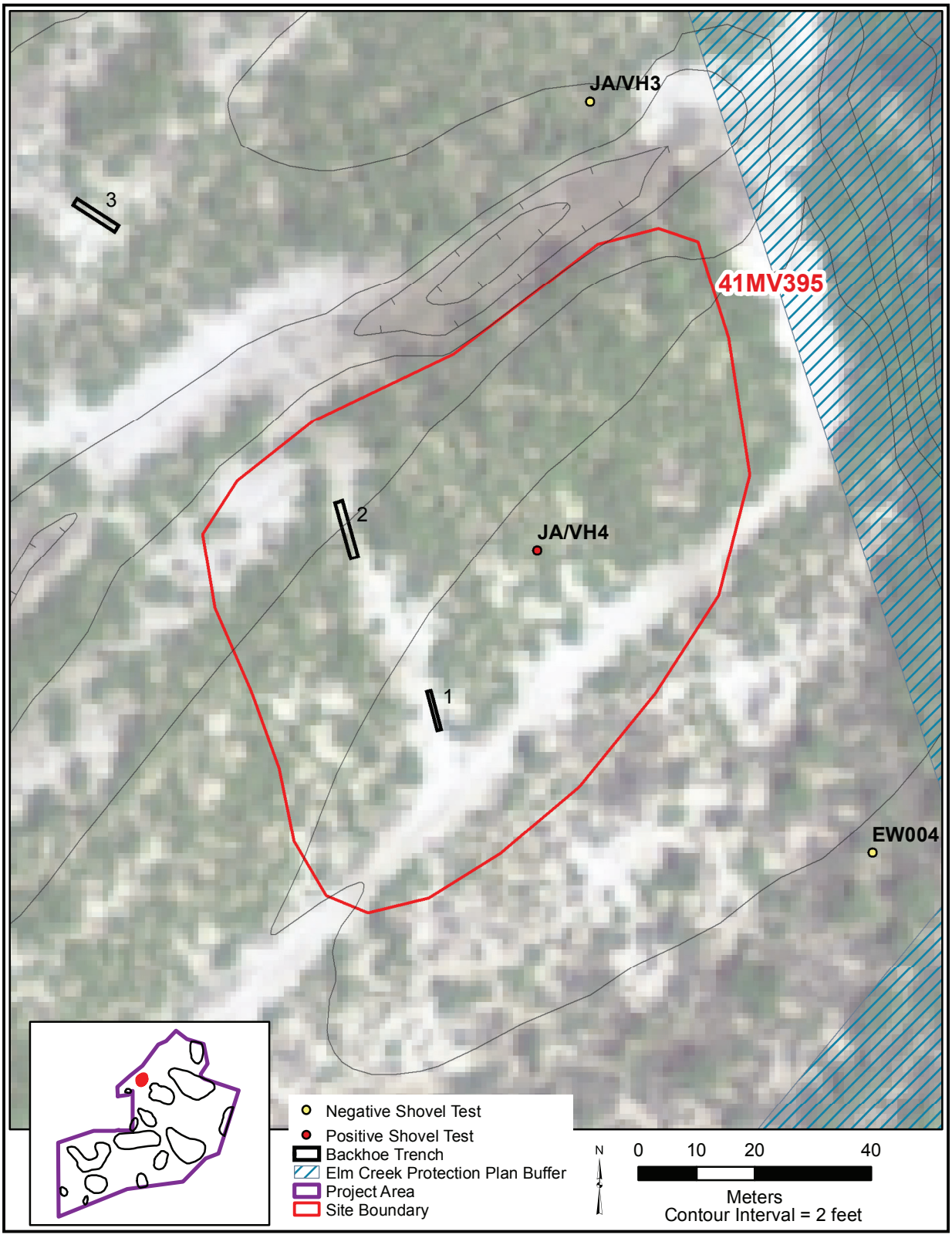
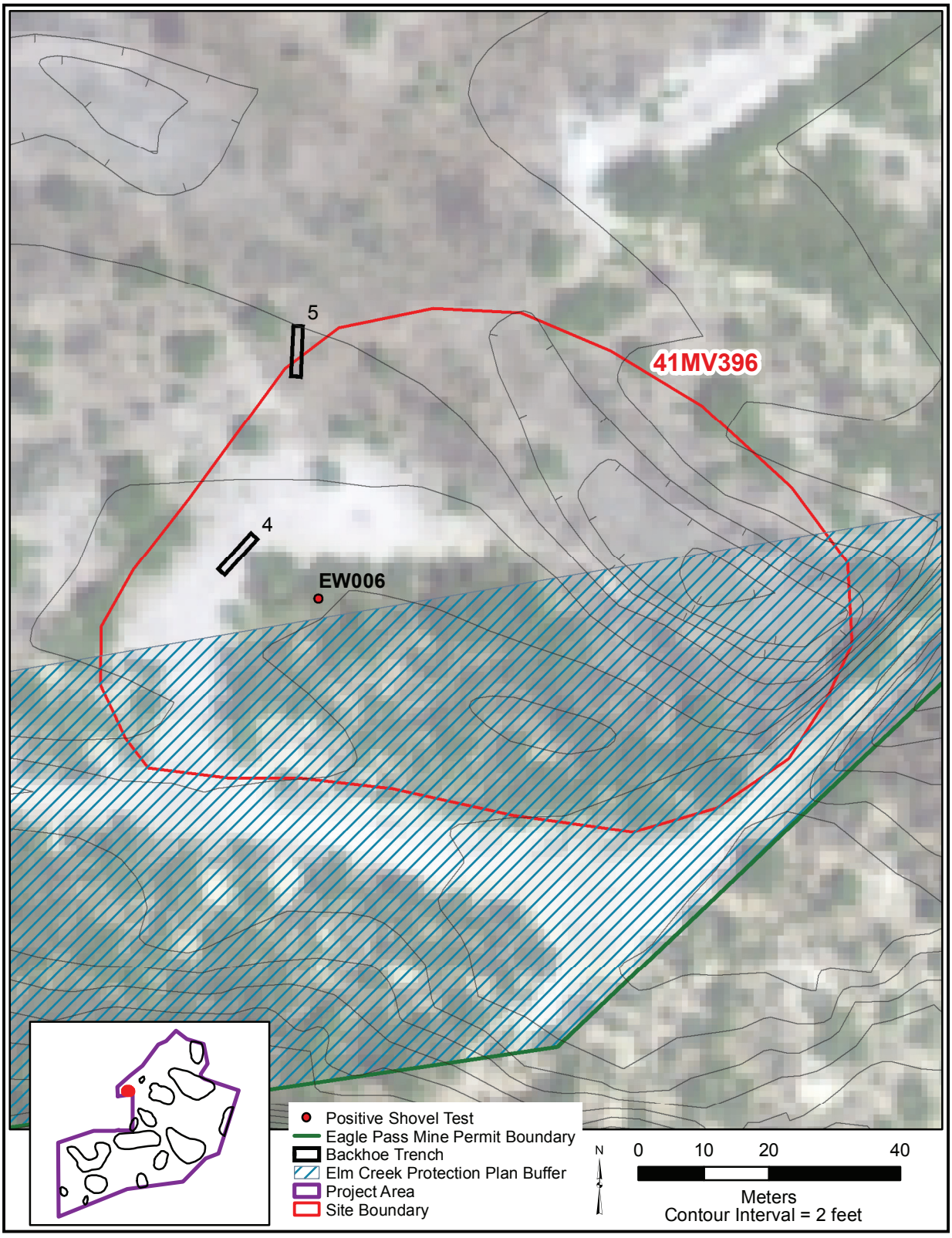
Project Area
Site Boundary
N
0
12.5
25
50
Meters
Contour Interval = 2 feet


16
15
41MV394
14
Possible Hearth
Feature
Eagle Pass Mine Permit Boundary
Backhoe Trench
Project Area
Site Boundary
N
0
10
20
40
Meters
Contour Interval = 2 feet


JA/VH3
3
41MV395
2
JA/VH4
1
EW004
Negative Shovel Test
Positive Shovel Test
Backhoe Trench
Elm Creek Protection Plan Buffer
Project Area
Site Boundary
N
0
10
20
40
Meters
Contour Interval = 2 feet


5
41MV396
4
EW006
Positive Shovel Test
Eagle Pass Mine Permit Boundary
Backhoe Trench
Elm Creek Protection Plan Buffer
Project Area
Site Boundary
N
0
10
20
40
Meters
Contour Interval = 2 feet

APPENDIX B: Soil Stratigraphy Descriptions

Trench 1
Location: Zone 14, 358979E, 3187209N, NAD83
Comments: Site 41MV395. Most likely late Holocene alluvium.

Zone	Depth	Horizon	Description
1	0–34	Ap	Dark grayish brown (10YR 4/2, m) loam, friable, moderate to strong medium to fine subangular blocky structure, clear smooth boundary, strongly effervescent, many termite galleries, few pieces of burned rock in top 20 cm.
2	34–82	A	Dark grayish brown (10YR 4/2, m) loam, very friable, weak to moderate medium subangular blocky structure, clear smooth boundary, strongly effervescent, few (1%) calcium carbonate filaments, one piece of burned rock was noted at 65 cm, hints of bedding but no clearly visible sedimentary structures.
3	82–96	AC	Grayish brown-brown (10YR 5/2.5, m) sandy clay loam, very friable, massive, abrupt smooth boundary, violently effervescent.
4	96–126	2Ab	Very dark grayish brown-dark grayish brown (10YR 3.5/2, m) loam to sandy clay loam, very friable, weak medium subangular blocky structure, clear smooth boundary, violently effervescent, a trace (<1%) white gypsum threads.
5	126–140	2Acyb	Dark grayish brown-brown (10YR 4/2.5, m) loam, very friable, massive, violently effervescent, few (1–2%) white gypsum threads.

Trench 2
Location: Zone 14, 358964E, 3187240N, NAD83
Comments: Site 41MV395. Trench was on the floodplain of an abandoned channel of Elm Creek and exposed a thin veneer of latest Holocene alluvium resting on slightly older, yet still Late Holocene, alluvium. Many scattered burned rocks were buried at the interface of Zones 1 and 2.

Zone	Depth	Horizon	Description
1	0–32	A	Very dark grayish brown (10YR 3/2, m) loam, friable, weak to moderate coarse prismatic structure parting to moderate medium to coarse subangular blocky structure, gradual smooth boundary, strongly effervescent, many (10–15%) open termite galleries.
2	32–74	AC	Dark grayish brown (10YR 4/2, m) loam to silt loam, very friable, weak to moderate very coarse prismatic structure parting to weak coarse subangular blocky structure, abrupt smooth boundary, violently effervescent, many (15–20%) open termite galleries, a few pieces of burned rock were noted around 40 cm below the surface; this deposit may have a colluvial component, but geometry in long trench looks alluvial, suggesting this is an in situ occupation.
3	74–114	2Akssb	Very dark grayish brown (10YR 3/2, m) clay, firm, strong medium prismatic structure parting to strong medium to fine angular blocky structure, abrupt smooth boundary, violently effervescent, many (7–10%) calcium carbonate filaments, common pressure faces, few slickensides, possibly a trace of gypsum threads but most white filaments dissolve in dilute hydrochloric acid.
4	114–130	2Ckb	Light yellowish brown (10YR 6/4, m) loam to silt loam, friable, violently effervescent, massive, common (3–5%) calcium carbonate filaments, common dark gray (10YR 4/1) clay coats on ped faces.

Trench 3
Location: Zone 14, 358921E, 3187294N, NAD83
Comments: Site 41MV395. This appears to be an older alluvial deposit (early Holocene) draped with a thin veneer of younger (middle-late Holocene?) mud, the base of which is most likely around 45 cm below the surface.

Zone	Depth	Horizon	Description
1	0–26	A	Dark gray (10YR 4/1, m) loam, very hard, weak to moderate coarse platy structure, abrupt smooth boundary, strongly effervescent, few (1–3%) very fine faint brown (7.5YR 4/4) thread-like mottles.
2	26–44	AC	Dark grayish brown (10YR 4/2, m) loam to sandy clay loam, friable, strong medium angular blocky structure, clear smooth boundary, violently effervescent, common very fine faint brown (7.5YR 4/4) thread-like mottles, very few <1 mm patches of black manganese coats on ped faces.
3	44–70	2Bw	Grayish brown-brown (10YR 5/2.5, m) sandy clay loam, friable, moderate to strong medium to coarse subangular blocky structure, clear smooth boundary, few (1–2%) very fine faint brown (7.5YR 4/4) thread-like mottles.
4	70–140	2Bk	Light yellowish brown (10YR 6/4, m) loam to sandy loam, very friable, massive to weak coarse subangular blocky structure, violently effervescent, common (5%) fine to medium (3–5 mm) white irregular calcium carbonate nodules.

Trench 4
Location: Zone 14, 358689E, 3187025N, NAD83
Comments: Site 41MV396. Deposits appear to be late Holocene alluvium, which below 60 cm appears to represent a near-channel overbank depositional environment with floodplain above that depth. Cultural material was observed throughout Zone 1 (top 42 cm), and at least one and possibly more components appear to be somewhat discrete and intact. The lowest component (ca. 40–42 cm) is clearly intact, and one around 25 cm also appears to retain some integrity. Above 25 cm, the material appears to be more scattered and possibly disturbed by plowing.

Zone	Depth	Horizon	Description
1	0–42	A	Very dark brown (10YR 2/2, m) loam to silty clay loam, friable, strong very coarse angular blocky structure parting to strong medium to coarse platy structure, clear smooth boundary, strongly effervescent, few (1–2%) calcium carbonate filaments on ped faces, many (10–20%) open termite galleries; zone appears to contain at least one and possibly more discrete prehistoric occupations, and burned rocks and debitage were noted throughout.
2	42–63	AC	Very dark grayish brown (10YR 3/2, m) loam, friable, weak to moderate very coarse subangular blocky structure, abrupt smooth boundary, strongly effervescent.
3	63–70	C	Brown (10YR 4/3, m) loam, very friable, weak coarse subangular blocky structure, clear smooth boundary, strongly effervescent, ~45% passage features (0.5–1 cm diameter) mostly by insects; this was a discrete sand bed when originally deposited, but the boundaries and texture have been altered by extensive faunaturbation by what appears to have been insects.
4	70–86	C	Brown (10YR 4/3, m) to dark grayish brown (10YR 4/2, m) loam, very friable, weak medium subangular blocky structure, clear smooth boundary, strongly effervescent, few (1%) calcium carbonate filaments, few (1–2%) fine (1–3 mm) charcoal fragments, widely dispersed; like Zone 3, this was probably a discrete sand bed when originally deposited but has since been blurred by faunaturbation.
5	86–95	C	Very dark gray (10YR 3/1, m) silt loam, very friable, weak medium subangular blocky structure, abrupt smooth boundary, strongly effervescent, contains thin zones of charcoal (many [25%] fine to medium [1–5 mm] fragments) and a few (<1%) small (<1 mm) fragments of reddened burned earth; although dark in color, appears to be fine-grained floodplain mud rather than a buried soil.

Trench 4, continued

Zone	Depth	Horizon	Description
6	95–105	C	Brown (10YR 5/3, m) sandy loam, very friable, weak coarse subangular blocky structure, abrupt smooth boundary, strongly effervescent, many (20–30%) passage features (0.5–1 cm diameter), few (1–2%) fine charcoal fragments; overall, the zone appears very bioturbated by insects/worms.
7	105–114	C	Very dark gray (10YR 3/1, m) loam, very friable, weak to moderate fine to medium subangular blocky structure, abrupt smooth boundary, strongly effervescent, few (1%) calcium carbonate filaments, common (>5%) fine disseminated charcoal fragments.
8	114–138	C	Brown (10YR 4/3, m) loam to sandy loam, friable, weak very coarse subangular blocky structure, strongly effervescent, few (1–3%) calcium carbonate filaments, <1% charcoal fragments.

Trench 5

Location: Zone 14, 358698E, 3187056N, NAD83

Comments: Site 41MV396. This trench was closer to the channel than Trench 4 and exposed a deposit with more sand at depth.

Zone	Depth	Horizon	Description
1	0–8	C	Very dark gray (10YR 3/1, m) loam, very friable, weak fine to medium subangular blocky structure, abrupt smooth boundary, slightly effervescent, sheetwash debris, laminated.
2	8–37	A	Very dark gray (10YR 3/1, m) silt loam, friable, moderate to strong medium subangular blocky structure, gradual smooth boundary, strongly effervescent, common fine faint brown (7.5YR 4/4) mottles (thread-like and on ped faces), few very widely dispersed burned rocks.
3	37–60	AC	Dark gray (10YR 4/1, m) silty clay loam, friable, moderate medium to coarse prismatic structure parting to strong medium subangular blocky structure, clear smooth boundary, strongly effervescent, common fine faint brown (7.5YR 4/4) mottles (thread-like and on ped faces).
4	60–65	C	Very dark grayish brown (10YR 3/2, m) silt loam, very friable, massive, clear smooth boundary, strongly effervescent, common to many (5–20%) very fine (1–3 mm) charcoal fragments.
5	65–81	C	Brown (10YR 4/3, m, 40%) and dark gray (10YR 4/1, m, 60%) sandy loam, friable, weak to moderate fine to medium subangular blocky structure, clear to abrupt smooth boundary, strongly effervescent, traces of bedding are visible, but most has been destroyed by postdepositional bioturbation, primarily by small soil fauna, few to common (1–7%) very fine (1–3 mm) charcoal fragments.
6	81–84	C	Black (10YR 2/1, m) silt loam, very friable, weak medium subangular blocky structure, clear to abrupt smooth boundary, slightly effervescent, many (50–80%) very fine (1–3 mm) charcoal fragments, few (1–3%) fine (1–2 mm) fragments of reddened earth.
7	84–105	C	Brown (10YR 5/3, m, 60%) and dark gray (10YR 4/1, m, 40%) sandy loam, very friable, massive, clear smooth boundary, strongly effervescent, many passage features but subtle traces of horizontal bedding remain despite extensive bioturbation.
8	105–105	C	Dark grayish brown (10YR 4/2, m) loam to sandy loam, very friable, weak fine subangular blocky structure, clear smooth boundary, slightly effervescent, few (1%) calcium carbonate filaments, many (15–20%) fine (1–4 mm) charcoal fragments.
9	108–130	C	Pale brown (10YR 6/3, m, 60%) and dark gray (10YR 4/1, m, 40%) sandy loam, very friable, massive to weak fine subangular blocky structure, slightly effervescent, few (2–3%) fine (1–2 mm) charcoal fragments.

Trench 6
Location: Zone 14, 359628E, 3188057N, NAD83
Comments: No cultural material was observed. Late Holocene alluvium, near-channel facies.

Zone	Depth	Horizon	Description
1	0–20	A	Very dark gray (10YR 3/1, m) silt loam, very friable, strong fine to medium subangular blocky structure, clear smooth boundary, violently effervescent, few (1%) calcium carbonate filaments.
2	20–45	AC	Very dark grayish brown (10YR 3/2, m) silt loam, very friable, moderate to strong fine subangular blocky structure, clear smooth boundary, violently effervescent.
3	45–60	A	Brown (10YR 5/3, m) loam, very friable, weak coarse subangular blocky structure, clear smooth boundary, violently effervescent.
4	60–75	C	Dark grayish brown (10YR 4/2, m) loam to sandy loam, very friable, weak medium subangular blocky structure, clear smooth boundary, violently effervescent.
5	75–92	C	Gray (10YR 5/1, m) loam to sandy loam, very friable, weak coarse subangular blocky structure, abrupt smooth boundary, violently effervescent.
6	92–104	C	Dark grayish brown (10YR 4/2, m) loam to silt loam, very friable, weak fine subangular blocky structure, abrupt smooth boundary, violently effervescent.
7	104–114	C	Light olive brown (2.5Y 5/3, m) loam, very friable, weak to moderate fine to medium subangular blocky structure, abrupt smooth boundary, violently effervescent.
8	114–123	C	Very dark gray–dark gray (10YR 3.5/1, m) silt loam, friable, moderate medium subangular blocky structure, abrupt smooth boundary, few (1–2%) calcium carbonate filaments, violently effervescent.
9	123–140	C	Brown (10YR 5/3, m) sandy loam to loam, very friable, weak very coarse subangular blocky structure, violently effervescent, common (3–5%) calcium carbonate filaments.

Trench 7
Location: Zone 14, 358023E, 3186074N, NAD83
Comments: Trench excavated across a terrace to examine the intact soil preserved beneath the terrace riser. The profile was only cursorily described.

Zone	Depth	Horizon	Description
1	–	Ap	Dark grayish brown cloddy introduced fill.
2	–	C	Yellowish brown sandy introduced fill.
3	–	C	Very dark grayish brown clayey introduced fill.
4	–	C	Brown sandy introduced fill.
5	–	C	Muddy gravel, 70–80% ferruginous concretion fragments up to 4 cm in diameter, primarily in a small depression immediately behind berm; introduced fill.
6	–	2Ab	Dark grayish brown clay, very hard, strong coarse prismatic structure, gradual smooth boundary, buried former ground surface, soil formed in bedrock.
7	–	2Bk	Light greenish gray clay, very hard, strong medium prismatic structure, many (7–10%) coarse (up to 1.5 cm) calcium carbonate nodules, soil formed in bedrock.

Trench 8
Location: Zone 14, 358007E, 3186196N, NAD83
Comments: Trench was placed at the east/distal end of an alluvial fan on what appears to be the floodplain of Elm Creek, but the floodplain surface across a ditch from this field stands about 1 m higher, which is either due to 1 m of soil having been removed from this field in the course of terracing or the addition of 1 m to that field. Given that the other field looks relatively unaltered, the soil was probably removed from this field in the process of terracing the surface. This is most likely a soil formed in clayey bedrock.

Zone	Depth	Horizon	Description
1	0–19	C	Dark grayish brown (10YR 4/2, m) clay, hard/very firm, strong medium to fine angular blocky structure, abrupt wavy boundary, strongly effervescent, 1–3% coarse fragments; introduced fill.
2	19–65	2Akyssb	Black (10YR 2/1, m) to very dark gray (10YR 3/1, m) clay, very firm, strong very coarse prismatic structure parting to strong medium to coarse angular blocky structure with a tendency towards wedge structure, gradual wavy boundary, strongly effervescent, 3–5% coarse fragments, many distinct slickensides on ped faces, common to many (3–7%) medium distinct calcium carbonate nodules, few (3%) white gypsum threads.
3	65–100	2Ayssb	Very dark gray (10YR 3/1, m, 60–80%) and dark grayish brown (2.5Y 4/2, m, 20–40%) clay, very firm, strong, medium to fine wedge structure, gradual smooth boundary, strongly effervescent, 3–5% coarse fragments, common to many (3–5%) white gypsum threads on ped faces, many distinct slickensides on ped faces, common pressure faces.
4	100–120	2Bgb	Olive brown (2.5Y 4/3, m, 50%) and dark gray (2.5Y 4/1, m, 50%) sandy clay, firm, moderate coarse subangular blocky structure, clear smooth boundary, violently effervescent, 1–3% coarse fragments, common fine distinct dark reddish brown (5YR 3/4) mottles on ped faces, gray areas may be redox depletions (iron) along channels and passages, few (1%) gypsum threads.
5	120–130	2Bkgb	Light yellowish brown (10YR 6/4, m, 60%) and dark gray (10YR 4/1, m, 40%) loam, very friable, weak coarse subangular blocky structure, slightly effervescent, 7–10% coarse fragments, gravels have partial to complete calcium carbonate coats, few fine faint black spherical manganese concretions.

Trench 9
Location: Zone 14, 357815E, 3186083N, NAD83
Comments: Trench also placed in an area where distal tributary alluvial fan deposits were expected, and the height of the surface is about the same as the floodplain to the west. No cultural material was observed. The top 50 cm is most a likely late Holocene tributary alluvial fan deposit, whereas the underlying soil is most likely formed in clayey bedrock.

Zone	Depth	Horizon	Description
1	0–14	Ap	Very dark gray (10YR 3/1, m) silty clay to clay, firm, strong medium to fine subangular blocky structure, clear smooth boundary, slightly effervescent, <1% white gypsum threads; late Holocene tributary fan alluvium.
2	14–51	C	Dark gray–dark grayish brown (10YR 4/1.5, m) clay to silty clay, firm, moderate coarse prismatic structure parting to moderate to strong medium to fine subangular blocky structure, abrupt wavy boundary, strongly effervescent; late Holocene tributary fan alluvium.
3	51–105	2Aykssb	Black (10YR 2/1, m) to very dark gray (10YR 3/1, m) clay, firm, strong medium to fine wedge structure, diffuse wavy boundary, slightly effervescent, few calcium carbonate filaments, few to common (1–3%) medium faint gray (10YR 6/1) irregular calcium carbonate nodules, common (5–15%) white gypsum threads; soil formed in clayey bedrock (?).
4	105–140	2Ayb	Black (10YR 2/1, m) to very dark gray (10YR 3/1, m) clay, very friable, weak coarse subangular blocky structure (but moist soil does not show true structural development), slightly effervescent, <1% gypsum threads.

Trench 10
Location: Zone 14, 357680E, 3186063N, NAD83
Comments: Trench was in the middle of the tributary alluvial fan near where it should have flowed onto the Elm Creek floodplain, and it exposed 2 m of what appears to be late Holocene tributary alluvium with abundant redeposited lignite. The top 85 cm are a floodplain facies, and below 85 cm the deposits are associated with a tributary channel that was oriented roughly west-southwest, more or less parallel with Elm Creek in this reach of the valley. The trench exposed the south side of the channel deposit. No cultural material was observed.

Zone	Depth	Horizon	Description
1	0–25	Ap	Very dark gray (10YR 3/1, m) clay, firm, moderate medium subangular blocky structure, clear smooth boundary, slightly effervescent, 1–5% coarse fragments, few clods of other sediment (10YR 5/3 clay), <1% gypsum threads.
2	25–45	A	Black (10YR 2/1, m) to very dark gray (10YR 3/1, m) clay, firm, strong medium angular blocky structure, clear smooth boundary, noneffervescent to slightly effervescent.
3	45–85	AC	Dark gray–dark grayish brown (10YR 4/1.5, m) silty clay, friable, moderate medium to fine subangular blocky structure, clear smooth boundary, strongly effervescent, common to many (3–10%) gypsum threads.
4	85–90	C	Dark gray (10YR 4/1, m) clay loam, firm, weak to moderate medium to coarse subangular blocky structure, abrupt smooth boundary, strongly effervescent, 5–7% coarse fragments which include fine siliceous gravel, caliche, and coal.
5a	90–110, 120–135, 155–160, 164–174, 182–200	C	Pale brown (10YR 6/3, m) to grayish brown (10YR 5/2, m) sand, loose, single grain, abrupt smooth boundary, slightly effervescent, 0–15% coarse fragments, the majority of which are coal.
5b	110–120, 135–155, 160–164, 164–174, 174–182,	C	Dark grayish brown (10YR 4/2, m) gravelly sandy loam, loose to very friable, single grain, abrupt smooth to wavy boundary, slightly effervescent, 30–80% coarse fragments, the majority of which are coal fragments, few freshwater mussel shells.

Trench 11
Location: Zone 14, 357565E, 3185443N, NAD83
Comments: Trench was placed adjacent to a tributary stream channel in a landscape where most of the lower slopes have been terraced. The upper 70 cm appears to be modern/recent alluvium that rests on a cumulic late Holocene paleosol, which in turn rests on bedrock (below 115 cm).

Zone	Depth	Horizon	Description
1	0–20	AC	Dark gray (10YR 4/1, m) clay, friable, moderate medium subangular blocky structure, clear wavy boundary, violently effervescent.
2	20–42	C	Brown (10YR 5/3, m) sandy loam, loose, single grain, abrupt smooth boundary, violently effervescent, 5–7% coarse fragments.
3	42–70	CA	Very dark gray (10YR 3/1, m) clay to sandy clay, very friable, weak to moderate fine to medium subangular blocky structure, clear wavy boundary, violently effervescent.
4	70–115	2Akb	Black (N 2/, m) clay, friable, weak coarse to medium subangular blocky structure, gradual smooth boundary, few (1%) calcium carbonate filaments, few medium (2–5 mm) faint gray (10YR 6/1) irregular shaped calcium carbonate nodules.
5	115–125	3Cg	Light olive brown (2.5Y 5/3, m, 60%) and dark gray (2.5Y 4/1, m, 40%) clay to sandy clay, firm, weak coarse subangular blocky structure, violently effervescent, common medium distinct dark gray (2.5YR 4/1) reticulate iron depletions lining peds.

Trench 12
Location: Zone 14, 357565E, 3185398N, NAD83
Comments: Trench was upslope of Trench 11, on the next terrace tread, and exposed a soil, the top 50 cm of which appears to be introduced fill associated with terracing, which rests on a calcic and gypsic B horizon formed in unconsolidated bedrock.

0	Depth	Horizon	Description
1	0–18	Ap	Dark grayish brown (10YR 4/2, m) silty clay, friable, moderate medium subangular blocky structure, clear smooth boundary, violently effervescent, 1–3% coarse fragments; most likely introduced fill.
2	18–47	C/Bw	Brown (10YR 5/3, m) clay, firm, weak very coarse subangular blocky structure, gradual smooth boundary, violently effervescent.
3	47–97	2Bky1	Brown (10YR 4/3, m) and gray (10YR 5/1, m) sandy clay, very friable, moderate coarse subangular blocky structure, diffuse smooth boundary, strongly effervescent, many (7–15%) medium to coarse distinct to prominent very pale brown (10YR 8/3) irregular calcium carbonate nodules, lower half of the zone has few (1–3%) 1-cm-diameter clusters of gypsum crystals which are upwards of 5 cm long each.
4	97–125	2Bky2	Brown (10YR 4/3, m) sandy clay to loam, very friable, massive, slightly effervescent, few (1–3%) calcium carbonate filaments, common (5–7%) white gypsum threads, common 1 cm diameter clusters of gypsum crystals that are ca. 5 cm long each.

Trench 13
Location: Zone 14, 357563E, 3185336N, NAD83
Comments: Trench was placed upslope of Trench 12 and appears to be a soil formed in bedrock.

Zone	Depth	Horizon	Description
1	0–21	Ap	Dark grayish brown (2.5Y 4/2, m) clay to silty clay, friable, moderate fine to medium subangular blocky structure, clear smooth boundary, violently effervescent.
2	21–67	Bk1	Light olive brown (2.5Y 5/3, m) clay, firm, strong medium angular blocky structure, clear smooth boundary, violently effervescent, few to common (2–3%) medium distinct white irregular calcium carbonate nodules.
3	67–94	Bk2	Light olive brown (2.5Y 5/3, m) clay, firm, weak to moderate very coarse subangular blocky structure, clear smooth boundary, violently effervescent, few (3%) calcium carbonate filaments; a single *Rabdotus* snail was observed at a depth of 94 cm.
4	94–140	Bk3	Light olive brown (2.5Y 5/3, m) loam, very friable, weak coarse subangular blocky structure, violently effervescent, few (1–3%) calcium carbonate filaments, few (<1%) medium faint white irregular calcium carbonate nodules.

Trench 14
Location: Zone 14, 357942E, 3184905N, NAD83
Comments: Site 41MV394. Trench was placed on the first terrace.

Zone	Depth	Horizon	Description
1	0–30	C	Brown (10YR 5/3, m) loam to sandy loam, very friable, weak to moderate medium subangular blocky structure to massive, abrupt smooth boundary, violently effervescent, partial preservation of subhorizontal bedding planes in the east end of the trench.
2	30–40	2Ab	Dark grayish brown (10YR 4/2, m) silt loam, very friable, weak coarse subangular blocky structure, clear smooth boundary, violently effervescent, few termite galleries.
3	40–90	2C	Brown (10YR 4/3, m) loam to sandy loam, very friable, massive, abrupt smooth boundary, violently effervescent, traces of subhorizontal bedding are visible at the east end of the trench.

Trench 14, continued

Zone	Depth	Horizon	Description
4	90–103	3Ab	Very dark gray (10YR 3/1, m) silt loam, very friable, weak to moderate medium subangular blocky structure, abrupt smooth boundary, violently effervescent, few (1–3%) fine (1–2 mm) scattered charcoal fragments appear to be associated with occupation that is primarily manifest upslope and toward the west end of the trench; a few burned rocks were noted in this zone in the western half of the trench.
5	103–140	3C	Dark grayish brown (10YR 4/2, m) loam, very friable, weak coarse subangular blocky structure to massive, abrupt smooth to wavy boundary, violently effervescent, boundary with bedrock is blurred by faunaturbation.
6	>140	4Bk	Light olive brown (2.5Y 5/3, m) loam to sandy clay, firm, weak to moderate coarse subangular blocky structure, violently effervescent, many (7–10%) calcium carbonate filaments, common to many (7–20%) medium to coarse (3–20 mm) white calcium carbonate nodules and masses.

Trench 15
Location: Zone 14, 3587965E, 3185030 N, NAD83
Comments: Site 41MV394. Trench was on a flat constructional floodplain surface adjacent to the channel of a small unnamed tributary. The deposits exposed here above 60 cm all appear to be of recent (modern) age, but Zone 3 may be of late Holocene age.

Zone	Depth	Horizon	Description
1	0–15	A	Very dark gray (10YR 3/1, m) silt loam, very friable, weak medium subangular blocky structure, clear smooth boundary, violently effervescent.
2a	15–60	C	Brown (10YR 5/3, m) to pale brown (10YR 6/3, m) sand to loamy sand, very friable, massive, abrupt smooth boundary, violently effervescent; zone is comprised of many thin alternating fine and coarse beds and laminae, with Zone 2a representing the coarse material and Zone 2b the fine; overall, Zone 2 is dominated by sandy sediment (Zone 2a).
2b	15–60	C	Dark grayish brown (10YR 4/2, m) silt loam, very friable, massive, abrupt smooth boundary, violently effervescent.
3a	60–140	C	Dark grayish brown (10YR 4/2, m) to very dark grayish brown (10YR 3/2, m) silt loam to loam, very friable, massive, abrupt smooth boundary, violently effervescent; Zone 3 consists of numerous thin beds and laminae of alternating color/texture, with Zone 3a representing the fine-textured material and Zone 3b the coarser sediments; overall, Zone 3 is dominated by finer-textured darker-colored sediment (Zone 3a).
3b	60–140	C	Brown (10YR 5/3, m) sand, very friable, massive, abrupt smooth boundary, violently effervescent.

Trench 16
Location: Zone 14, 357948E, 3185029N, NAD83
Comments: Site 41MV394. Not described in detail.