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Cultural Resources Survey for the El Paso Natural Gas Company Vail Compressor Station Modifications, Pima County, Arizona

JUNE 2020

PREPARED FOR

El Paso Natural Gas Company, L.L.C.

PREPARED BY

SWCA Environmental Consultants

**CULTURAL RESOURCES SURVEY FOR THE
EL PASO NATURAL GAS COMPANY VAIL COMPRESSOR
STATION MODIFICATIONS, PIMA COUNTY, ARIZONA**

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SWCA Project No. 61813

SWCA Cultural Resources Report No. 20-391

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ABSTRACT

Report Title: Cultural Resources Survey for the El Paso Natural Gas Company Vail Compressor Station Modifications, Pima County, Arizona

Project Name: Vail Compressor Station

Project Location: 10200 South Rita Road, Tucson, Arizona 85747

Project Locator Universal Transverse Mercator Coordinates: 517935 mE, 3547815 mN, North American Datum 83, Zone 12

Project Sponsor: El Paso Natural Gas Company, L.L.C. (EPNG)

Sponsor/Agency Project Number: Not applicable (N/A)

Federal Agency: Federal Energy Regulatory Commission (FERC)

Other Agencies: Pima County Department of Environmental Quality (PDEQ)

Applicable Regulations: Section 106 of the National Historic Preservation Act (NHPA) (36 Code of Federal Regulations 800)

Funding Source: Private

Description of the Project/Undertaking: EPNG proposes modifications to the existing piping at the Vail Compressor Station. Specifically, the modifications consist of adding gas cooling facilities (e.g., piping, valves, fans) and gas recycling to allow for operational flexibility. Cooling is required to preserve the pipe's anti-corrosion coating. The proposed modifications meet the conditions for construction and operation under EPNG's FERC blanket certificate, provided they meet the environmental conditions of the certificate. The proposed modifications also require review and approval by PDEQ, as they constitute a significant permit revision to EPNG's Title V Air Quality permit. EPNG retained SWCA Environmental Consultants (SWCA) to conduct a cultural resources survey in support of the NHPA Section 106 review that is required as a condition for use of the FERC blanket certificate program and to support PDEQ's cultural resources review responsibilities.

Project Area/Area of Potential Effects (APE): The Vail Compressor Station is a 4.3-acre fenced facility within a larger 40-acre parcel of land that is owned by EPNG and used primarily for equipment storage. All project installations will take place within the 4.3-acre fenced station yard. For the purposes of the cultural resources survey, the 40-acre parcel of land is considered the APE, as portions of it may be used for staging and storage during project construction. Herein, the *project area* and the *APE* are one and the same.

Legal Description: The project area is in Section 4, Township 16 South, Range 15 East, as depicted on the U.S. Geological Survey Tucson SE, Arizona, 7.5-minute quadrangle.

Land Jurisdiction: Private

Total Acres of the Project Area: 40 acres

Total Acres Surveyed: 40 acres

Acres Not Surveyed: 0 acres

Consultant Firm/Organization: SWCA

Project Number: 61813 (SWCA)

Permit Number: N/A

Arizona State Museum Accession Number: N/A

Dates of Fieldwork: June 10, 2020

Number of Properties Recorded: Two

Eligible Properties: None

Ineligible Properties: One – Vail Compressor Station archaeological site

Unevaluated Properties: None

Exempt Properties: Two – Vail Compressor Station and EPNG California lines (in-use historic-era structures)

Sites/Properties Not Relocated: None

Comments: The cultural resources survey in support of the proposed modifications at the Vail Compressor Station covered the entire 40-acre EPNG-owned parcel, within which is a fenced 4.3-acre area containing the compressor station and associated facilities. The survey resulted in the identification of three historic-era properties, all of which are associated with the historic-era activities of EPNG and its employees. The properties include the in-use California lines (Line Nos. 1100 and 1103, discussed together), the in-use Vail Compressor Station, and the Vail Compressor Station archaeological site, the latter of which includes the remnants of the residential camp and various ruined or disused features associated with the operation of the compressor station or activities of EPNG employees and their families.

The California lines (Line Nos. 1100 and 1103) and the Vail Compressor Station are facilities that are part of the historically significant in-use EPNG system. As in-use natural gas pipeline facilities on non-tribal lands, these properties are exempt from Section 106 review until at which time they are abandoned via a filing with FERC under Natural Gas Act Section 7b (*Federal Register* 67[66]:16364–16365).

The Vail Compressor Station archaeological site contains the remains of the seven-house residential camp and various features associated with the operation of the Vail Compressor Station. All that remains of the camp today are street remnants, curbing, several light poles, dead or dying landscaping trees, a few concrete pads, and sparse artifacts. The buildings have been removed. The archaeological features related to the Vail Compressor Station are associated with the historic EPNG pipeline system, particularly the California lines, which marked EPNG's post-World War II expansion of service to California. The archaeological remains of the residential camp and other features associated with the operation of the compressor station do not retain the necessary integrity to convey the historic significance of the station and therefore should be considered non-contributing (i.e., ineligible) components of the historically significant in-use EPNG system. Further study of the archaeological features would not reveal information important to our understanding of EPNG's historic pipeline system. The Vail Compressor Station archaeological site is ineligible for the National Register of Historic Places.

A Section 106 finding of no historic properties affected is warranted for this undertaking.

If previously unidentified cultural resources are discovered during future project-related activities, work should stop at that location and reasonable steps should be taken to secure the preservation of the discovery and evaluate its historical significance. If the discovery includes human remains or funerary objects, the Arizona State Museum repatriation coordinator should also be contacted per Arizona Revised Statutes 41-865.

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PROJECT DESCRIPTION

El Paso Natural Gas Company, L.L.C. (EPNG) proposes modifications to the existing piping at the Vail Compressor Station southeast of Tucson in Pima County, Arizona (Figure 1). Specifically, the modifications consist of adding gas cooling facilities (e.g., piping, valves, fans) and gas recycling to allow for operational flexibility. Cooling is required to preserve the pipe's anti-corrosion coating. The proposed modifications meet the conditions for construction and operation under EPNG's Federal Energy Regulatory Commission (FERC) blanket certificate, provided they meet the environmental conditions of the certificate. The proposed modifications also require review and approval by Pima County Department of Environmental Quality (PDEQ), as they constitute a significant permit revision to EPNG's Title V Air Quality permit. EPNG retained SWCA Environmental Consultants (SWCA) to conduct a cultural resources survey in support of the National Historic Preservation Act Section 106 review that is required as a condition for use of the FERC blanket certificate program and to support PDEQ's cultural resources review responsibilities.

PROJECT LOCATION, AREA OF POTENTIAL EFFECTS

The Vail Compressor Station is a 4.3-acre fenced facility within a larger 40-acre parcel of land that is owned by EPNG and used primarily for equipment storage. All project installations will take place within the 4.3-acre fenced station yard. For the purposes of the cultural resources survey, the 40-acre parcel of land is considered the area of potential effects (APE), as portions of it may be used for equipment staging and storage during project construction. Herein, the *project area* and the *APE* are one and the same.

The project area is the entirety of tax parcel 305-01-001A. It is in Section 4, Township 16 South, Range 15 East, depicted on the U.S. Geological Survey Tucson SE, Arizona, 7.5-minute quadrangle (Figure 2). The street address is 10200 South Rita Road, Tucson, Arizona 85747.

ENVIRONMENTAL SETTING

The project area is located on a relict alluvial fan emanating from the Santa Rita and Empire Mountains to the southeast. The Arizona Geological Survey has mapped the surficial geology of the project area as Quaternary to late Tertiary period alluvium (Shipman 2004). On this surface, archaeological deposits are expected to be at or near the modern ground surface.

The project area slopes gently downward to the west-northwest with elevations ranging from 2,955 feet (901 meters [m]) above mean sea level (amsl) to 2,940 feet (896 m) amsl. Several small unnamed drainages flow east to west across the project area. The nearest named drainage is South Fork of Airport Wash, located about 215 m south of the project area. South Fork of Airport Wash is a tributary of Airport Wash, itself a tributary of the Santa Cruz River. Airport Wash flows into the Santa Cruz River approximately 13 miles (20.9 kilometers) northwest of the project area.

The study area is located within the Arizona Upland subdivision of the Sonoran Desertscrub biotic community (Brown 1994). Most of the undisturbed area is lightly vegetated range land, dominated by scrubby mesquite and burroweed. A custom soil report generated using the Web Soil Survey (Natural Resources Conservation Service 2020) shows one soil map unit in the project area—Stagecoach–Sahuarita Association, 1 to 8 percent slopes. These soils are very gravelly sandy to fine-sandy loams that form on fan terraces and are classified as not prime farmland.



Figure 1. Project location.

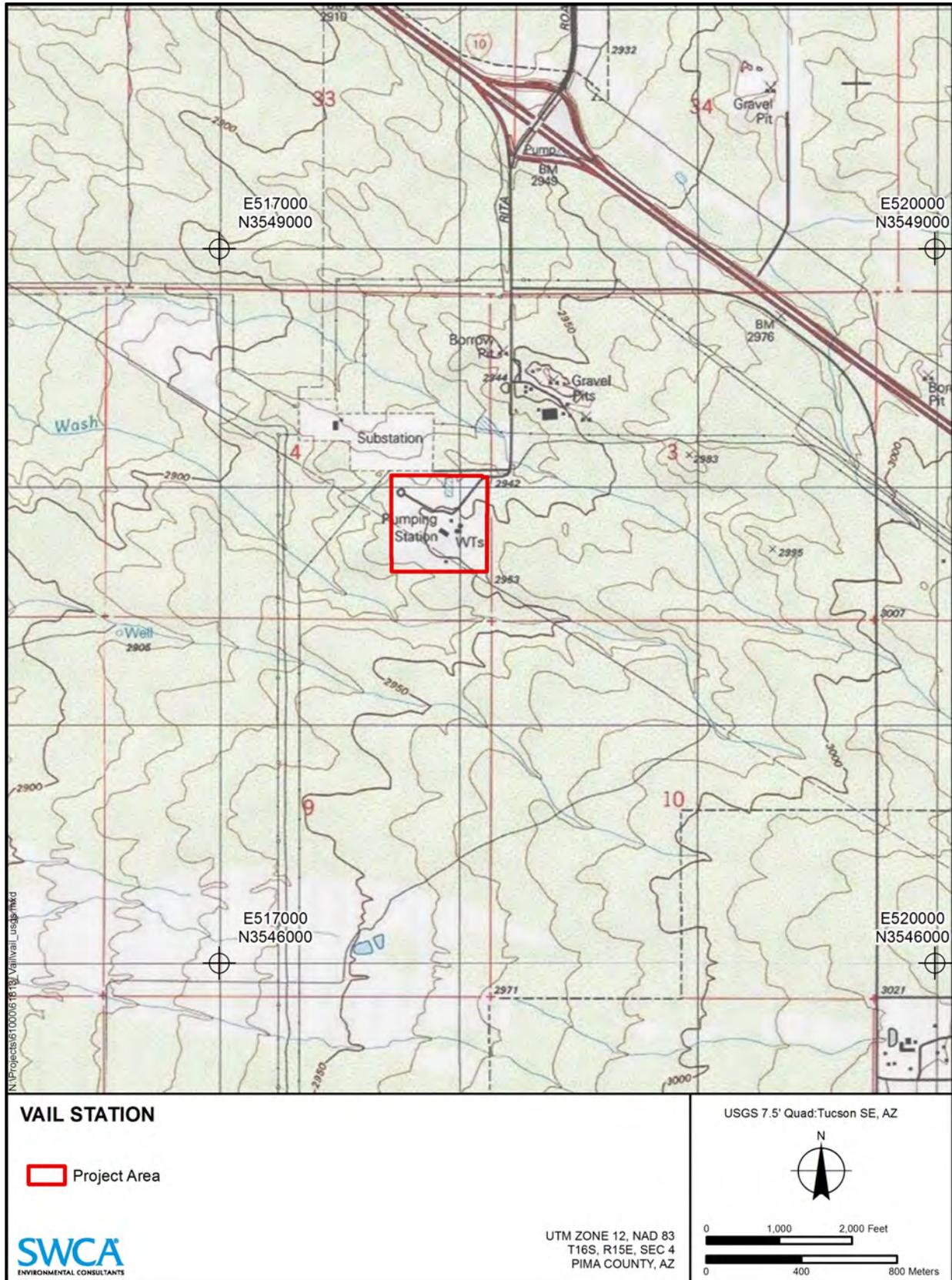


Figure 2. Project area.

CULTURE HISTORY

Paleoindian Period (9500–8000 B.C.)

The earliest known human occupation of southeastern Arizona is associated with the Paleoindian period (9500–8000 B.C.). Archaeological remains that characterize the period reflect the activities of small hunting and gathering groups that hunted large-game animals. Many excavated Paleoindian sites give evidence for the killing and butchering of now-extinct large mammals. Artifact assemblages include distinctive fluted projectile points, which were hafted to handheld spears, and other tools used for skinning animals and cutting meat and bone.

Early and Middle Archaic Periods (8000–2000 B.C.)

The extinction of large Pleistocene mammals during Paleoindian times was at least one cause of a shift from a largely hunting-based economy to an economy based on a broad spectrum of wild plant and animal foods. Dates for the beginning of the Early Archaic period are not well established, but the available evidence suggests that it began around 8000 B.C. The Early Archaic period is poorly documented in southern Arizona and is virtually unknown in the Tucson Basin (Huckell 1984:137). Tapering stemmed points, such as the Lake Mohave, Jay, and Silver Lake types, characterize assemblages from this period, as do plant-processing tools such as grinding stones.

In southern Arizona, the Middle Archaic period is better represented than the Early Archaic period. Excavations at Los Pozos, AZ AA:12:91(ASM), along the Santa Cruz River in the Tucson Basin, identified deeply buried evidence of episodic occupations during the late Middle Archaic (Gregory 1999). Finds included hearths, oxidized surfaces, multiple Cortaro points, and only minimal amounts of ground stone artifacts. Small charred seeds and mesquite beans reflected on-site processing of wild floral resources. Large- and small-mammal remains represented important resources for food, tools, and probably pelts (Gregory 1999:85–86). Early evidence of maize (*Zea mays*) was also found in non-feature contexts from the Middle Archaic deposit (Gregory 1999:118). Early maize remains have also been identified in deeply buried features with Cortaro style projectile points at Las Capas, AZ AA:12:111(ASM) (Whittlesey et al. 2007). The association of cultigens, specifically maize, with Middle Archaic projectile points was also documented at the Clearwater site, AZ BB:13:6(ASM), in downtown Tucson (Thiel and Mabry 2006).

Late Archaic–Early Agricultural Period (2000 B.C.–A.D. 200)

As more research is undertaken in southeastern Arizona, the beginning of the Late Archaic–Early Agricultural period, herein referred to as the Early Agricultural period, is being pushed back in time. The earliest phase of the period, dating from about 2000 to 1200 B.C., is currently unnamed but has been identified as being present at several sites.

In the Tucson Basin, the San Pedro phase of the Early Agricultural period (1200–800 B.C.) witnessed several changes in artifact assemblages, cultural features, and archaeobotanical remains, signifying changes in settlement and subsistence patterns. Results from earlier excavations at the Milagro site, AZ BB:10:46(ASM), located on a terrace north of Tanque Verde Creek in the eastern Tucson Basin, indicated that the San Pedro phase of the Early Agricultural period was characterized by relatively small domestic structures with small interior, bell-shaped storage pits, abundant flaked stone artifacts (including San Pedro style projectile points), simple shell jewelry, clay objects, utilitarian seed milling equipment, and maize cultivation—suggesting some level of sedentism (Huckell and Huckell 1984).

Excavations at Las Capas in 1998 and 1999 by SWCA (Whittlesey et al. 2007) and Desert Archaeology, Inc. (Mabry 2008) provided a wealth of new information about the San Pedro phase. Evidence was found that the site's occupants, as early as 1300 B.C., were cultivating maize, building irrigation ditches, constructing pit structures, and using large bell-shaped storage pits in both extramural and intramural contexts. An incipient ceramic technology was identified that included fired clay figurines, beads, pipes, small, nonutilitarian vessels, and a few sherds that may have been part of larger vessels. In addition, the excavations yielded large shallow pit structures, large extramural, bell-shaped storage pits that were comparable in size to the later Cienega phase pits, and numerous stemmed projectile points that appear to date to the early part of the San Pedro phase.

The succeeding early and late Cienega phases (800 B.C.–A.D. 200) witnessed an increase in complexity of site structure at habitation sites. House shapes and functions became more diverse, and large bell-shaped storage pits became more common, some of which were located within pit structures (Gregory 2001; Huckell 1990, 1995; Mabry 1998). Corner-notched Cienega points replaced the earlier San Pedro points and ground stone and shell inventories became more elaborate. Settlements appeared to have been used for much of the year, perhaps reflecting an increased reliance on agricultural production. Characteristics of the architecture, artifact assemblage, and archaeobotanical remains, combined with evidence for the planned organization of space, suggest that the Cienega phase settlements of Santa Cruz Bend, AZ AA:12:746(ASM), and Los Pozos, AZ AA:12:91(ASM), were occupied for most of the year at least, possibly on a year-round basis (Gregory 2001; Mabry 1998).

Early Ceramic Period (A.D. 200–650)

The Early Ceramic period marks the transition between the Early Agricultural period and the subsequent Hohokam Pioneer period. It is divided in two phases: the Agua Caliente and the Tortolita phases. Plain brown ware ceramics and vessel shapes that include primarily seed jars and occasional outcurved-rim bowls characterize the Agua Caliente phase. The earliest identified utilitarian ceramic vessels date from A.D. 200–400 (Deaver and Ciolek-Torrello 1995). These sand-tempered ceramics represent initial attempts at ceramic vessel technology and are found over broad areas of the Southwest. These vessels are associated with the Peñasco phase of the San Simon Mogollon in southeastern Arizona, the Agua Caliente phase in the Tucson Basin, and the Red Mountain phase in the Gila-Salt Basin. Because they co-occur in many areas and are technologically similar, these plain ware vessels suggest that cultural differentiation, characteristic of later periods, had yet to occur.

Architecture at Early Ceramic period sites shows a formalization of previous building techniques. Many of the pit structures were square to rectangular, with formal, plastered hearths centered on the entryway. Several documented structures have entryways flanked by adobe pillars that supported entry posts. This formalization in architecture suggests greater residential stability. True pit houses characterize the Agua Caliente phase. During the following Tortolita phase, houses in pits make their appearance, and they eventually replace the former style of architecture (Wallace and Lindeman 2003:Table 4.1). The non-random organization of space within the community, which began as early as the Early Agricultural period, continued, with discrete courtyard groups, large open areas (plazas), and large communal houses. Several patterns from the Early Ceramic period continued into the Hohokam sequence, whereas others persisted in the Mogollon cultural tradition of southeastern Arizona (Ciolek-Torrello 1995). After about A.D. 650, sufficient cultural differentiation was present to warrant treating the material culture of groups that inhabited southern Arizona as separate cultural entities.

The Hohokam (A.D. 650–1450)

The Hohokam archaeological culture of the Tucson and Gila-Salt Basins developed out of the Early Ceramic period. The Hohokam sequence is composed of four periods: Pioneer (A.D. 650–750), Colonial (A.D. 750–950), Sedentary (A.D. 950–1150), and Classic (A.D. 1150–1450). In the Tucson Basin, the Pioneer period is subdivided into the Estrella-Sweetwater and Snaketown phases; the Colonial period includes the Cañada del Oro and Rillito phases; the Sedentary period is composed of the Early, Middle, and Late Rincon phases; and the Classic period comprises the Tanque Verde and Tucson phases.

The Pioneer period is marked by the beginning of pottery with simple geometric designs, known as Estrella and Sweetwater Red-on-gray. Red-on-buff pottery with more complex designs appears in the Snaketown phase. The discovery of one Pioneer period canal at the Dairy Site (Deaver 1996) gives evidence of canal irrigation.

Population rapidly increased during the Colonial period. By A.D. 800, the start of the Rillito phase, a number of settlements had become established along the Santa Cruz River. Doelle and Wallace (1991) suggest a fourfold increase in the number of sites, compared with the Cañada del Oro phase. Ball court villages dating to the Colonial period are known in the western Tucson Basin along the Santa Cruz River as well as at the base of the Tortolita and Santa Catalina Mountains and in Avra Valley (Czaplicki and Ravesloot 1989; Doelle and Wallace 1991; Downum 1993). These ball court villages were composed of larger communities that included farmsteads and field houses as well as loci for wild plant procurement. The Tucson Basin population began manufacturing their characteristic red-on-brown pottery, which differed from, but paralleled, Gila-Salt Basin red-on-buff pottery in terms of design and, to some extent, vessel shape.

The Sedentary period witnessed a substantial growth in the size of existing villages and an increase in the number of ball court villages in both the Tucson and Gila-Salt Basins. Irrigation systems were expanded, and settlements extended away from riverine environments to secondary drainages and bajadas. The growing populations also fostered the expansion of trade networks, and by the middle of the Sedentary period, the Hohokam regional system reached its maximum extent (Crown and Judge 1991; Wilcox 1991).

In the Tucson Basin, beginning with the Late Rincon phase, widespread abandonment of the existing courtyard groups occurred, and a large number of other changes appeared. New architectural types, new modes of interment, and changes in subsistence and economic pursuits were introduced, following changes in settlement structure. Changes in architecture included the addition of various types of adobe wall constructions and inhumations were added to the mortuary complex. Changes in subsistence pursuits included the significant increase in use of wild species, specifically agave. The development of alternative farming methods in the early Sedentary period and the expansion in the Late Sedentary and Classic periods suggests that other options were needed to mitigate the unpredictable availability of water for irrigation (Crown 1984; Fish et al. 1984:69). Comparable data were obtained from a series of Late Rincon to Tanque Verde phase transition sites from the Marana area (Miksicek 1987).

The Classic period was a time of major change. In the Tucson Basin, styles of red-on-brown ceramics (specifically Tanque Verde Red-on-brown) became simpler and more rectilinear. Tanque Verde Red-on-brown pottery expanded beyond the Tucson Basin, appearing in low frequencies in the Gila Basin and the western Papaguería. A study of the production and distribution of Classic period Tanque Verde Red-on-brown vessels from sites in the Marana and Robles communities of the northern Tucson Basin failed to identify production centers (Harry 1997). This differs significantly from the pre-Classic periods, during which actual centers of production existed.

During the Classic period, inhumation became the dominant mode of burial. Additional architectural forms appeared, including adobe-walled pit houses and, later, aboveground structures of adobe and stone masonry. These structures were often incorporated in compounds that were surrounded, entirely or in part, by adobe and stone walls. Ball court construction ceased, and earthen platform mounds, indicators of larger community organization, became the focal point of communal activities. At the end of the Classic period, residential units, possibly elite residences, were built on some of the mounds. The Hohokam aggregated into larger primary villages located along major drainages, possibly as a result of an increase in warfare (or threat thereof) (Doelle and Wallace 1991). Maize, beans, squash, and cotton continued to dominate agricultural production, but a wider variety of cultivars and wild plant resources were exploited.

The Classic period was a time of population migration, most likely prompted by increased environmental fluctuation, especially drought. Evidence of population relocation from northern and central Arizona has been documented in southeastern Arizona in the San Pedro River valley and possibly the eastern Tucson Basin (Clark 2001; Di Peso 1958; Slaughter and Roberts 1996; Woodson 1999). The changes in Classic period material culture, site structure, and settlement patterns may result from sociopolitical and economic reorganization prompted by the influx of new people to the region.

By the Late Classic period (Tucson phase), there is an indication of increased social differentiation and aggregation of populations into fewer and larger villages, where elites resided. During the Tucson phase, population aggregation is apparent in the southern Tucson Basin (at the Zanardelli site on the Santa Cruz River floodplain and near Martinez Hill), the northern Altar Valley (around the Coyote Mountains), and at University Indian Ruin at the confluence of the Pantano and Tanque Verde washes (Doelle and Wallace 1991:Figure 7.26).

Protohistoric Period and Historic Native American Period

The Protohistoric period, from the end of the Hohokam occupation around A.D. 1450 to Spanish contact at the end of the sixteenth century, is little understood in southern Arizona. Historical documents from the earliest Spanish contact suggest that the Sobaipuri, a Piman group, occupied the area at the end of the Protohistoric period (Doelle 1984). Archaeological evidence is sparse for the period, although Seymour (2011) argues that some Sobaipuri sites were larger and more enduring than their visibility in the archaeological record suggests. Diagnostic artifacts associated with the Sobaipuri include Whetstone Plain and Sobaipuri Plain ceramics and small triangular points with deeply notched bases and serrated edges (Masse 1981:44).

Historic Period

The Historic period in the Tucson Basin can be divided into a Spanish/Mexican period (A.D. 1699–1854) and an American period (A.D. 1854–present)—with the terms *Spanish*, *Mexican*, and *American* referring to political hegemony rather than ethnic identity (Ayres 1984). Spanish colonization of what is now known as southern Arizona began in the 1690s with the travels of the Jesuit missionary Eusebio Francisco Kino. Kino first traveled as far north as the Tucson Basin in 1692 and 1694 (Doelle 1984). The mission at San Xavier del Bac in the southern Tucson Basin was established under Kino's influence in 1700. In 1775, a presidio was established in Tucson to protect the missions at San Xavier and San Agustín from Apache attack (Harry and Ciolek-Torrello 1992). Small numbers of Spanish settlers populated the Santa Cruz Valley after the establishment of the presidio, but settlement slowed after Mexican independence and renewed Apache attacks (Clemensen 1987; Harry and Ciolek-Torrello 1992).

The American period began with the Gadsden Purchase, when southern Arizona became U.S. territory in 1854. The population expanded but remained centered on the town of Tucson until the 1870s because of

Apache raids. Arizona pioneer Bill Kirkland—credited with flying the first American flag in the Gadsden Purchase and fathering the first Anglo-American child born in Arizona (Trimble 2017)—built a ranch house around the same time he acquired the Canoa Ranch Spanish land grant. His ventures were under constant threat of attack, and he moved out of the area during the American Civil War. Settlers were more secure after the Apache truce of 1872, when an increased military presence at Fort Lowell helped control Apache raiding (Clemensen 1987; Harry 1993). Construction of the Southern Pacific Railroad from 1878 to 1880 accelerated the transformation of the regional economy by providing access to the mines, farms, and ranches of the West by the factories and markets of the East. The arrival of the railroad in Tucson in 1880 initiated the transformation of Tucson, with its population of 8,000, into a more modernized city. The following decade brought the construction of St. Mary’s Hospital, electric streetlights, a system of street naming and numbering, and a state university to Tucson. By 1950, the population of Tucson had grown to nearly 120,000.

PREVIOUS RESEARCH

Archaeological Records Search

Before fieldwork, an SWCA archaeologist consulted the AZSITE database to identify previously conducted surveys and previously recorded sites in the project area and within a 1.0-mile (1.6-kilometer) radius of the project area. The records review identified 22 previous cultural resources surveys within 1 mile of the project area that together covered an estimated 45 percent of the search radius. Most of the surveyed area is east and south of the project area, where block surveys have been conducted. Elsewhere, multiple linear surveys have been conducted along Interstate 10, Rita Road, and multiple utility corridors. None of the surveys intersect the project area.

No archaeological sites or other cultural resources have been previously recorded within the project area. Eight archaeological sites have been recorded within 1 mile of the project area. These sites consist mostly of light artifact scatters associated with small fire-cracked rock clusters, although a few of the sites are rock clusters without associated artifacts. Interstate 10 north of the project area has been recorded as the former alignment of State Route 80.

Historical Document Research

Historical maps were consulted to identify historic-era features that may be present in the search area. The General Land Office plat of Township 16 South, Range 15 East, filed in 1897, shows an unpatterned network of unnamed roads, but no other cultural features. None of the roads are depicted as passing through the project area, although one road is shown running north-south approximately 200 m to the west of the project area. The 1905 U.S. Geological Survey 30-minute map depicts the project area as being within a large area labeled as the SANTA RITA FOREST RESERVE. Multiple roads are shown on the map, including one unimproved road that appears to have passed through the northeastern part of the project area. The 1968 U.S. Geological Survey Tucson SE 15-minute quadrangle depicts the project area as a PUMPING PLANT. The two large buildings within the present-day fenced compressor station are shown, as are seven buildings forming a residential camp, a sewage lagoon, and a pipeline (EPNG Line Nos. 1100 and 1103). Very little other development is in the area.

National Register of Historic Properties Database Research

No properties listed in the NRHP are within the project area or the 1-mile search radius.

SURVEY METHODS

SWCA archaeologists Paul Rawson and Heather West conducted the survey on June 10, 2020. Based on the previous research, expectations for the discovery of archaeological findings, except those associated with the Vail Compressor Station and its former residential camp, were low.

General conditions for the survey were good. Surface visibility averaged about 80 percent. The project area, bounded by fence lines, was clearly defined. Evidence for cultural resources was sought in the form of artifacts (e.g., lithics, prehistoric or historic-era ceramics, metals, or glass) or features (concentrations of fire-affected rock, charcoal-stained soil, prehistoric- or historic-era structures, or other cultural anomalies).

The Arizona State Museum (ASM) has established standards for evaluating materials identified during archaeological surveys (ASM 1995). Briefly, properties of archaeological interest must contain the remains of past human activity that are at least 50 years old. Beyond this, two classes of findings are recognized, the site and the isolated occurrence (IO). To qualify as a site, a property must contain, within an area no more than 50 feet in diameter, 30 or more artifacts of a single type, unless all pieces originate from a single source (e.g., one broken bottle or ceramic vessel); 20 or more artifacts when multiple types are present; any number of artifacts, when a single fixed feature is present; or multiple fixed features, with or without any associated artifacts. The site can be larger than 50 feet in diameter as long as any 50-foot-diameter portion of the site meets one of these conditions. Artifact finds that do not meet these criteria but that are over 50 years old may be designated as IOs. Archaeological sites are accurately mapped and plotted using a handheld global positioning system (GPS) device, photographed, and recorded using a standard ASM form. The precise location points of the IOs are recorded using a handheld GPS unit. Standard survey methodology in Arizona is non-collection survey (i.e., artifacts are field analyzed and then returned to their original locations).

National Register of Historic Places Criteria for Evaluation

Four criteria are applied in the evaluation of cultural properties for inclusion in the NRHP (36 Code of Federal Regulations 60.4). Normally, a significant property must be at least 50 years old and meet at least one of these four criteria to be considered eligible for the NRHP. According to the NRHP criteria, the quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and

- A. that are associated with events that have made a significant contribution to the broad patterns of our history;
- B. that are associated with the lives of persons significant in our past;
- C. that embody distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguished entity whose components may lack individual distinction; or
- D. that have yielded, or may be likely to yield, information important in prehistory or history.

SURVEY RESULTS

The cultural resources survey of the project area resulted in the recording of three cultural resources—the in-use historic-era structure/facility that is the Vail Compressor Station; the in-use historic-era natural gas

pipelines Line Nos. 1100 and 1103, herein discussed together; and the archaeological remains associated with the Vail Compressor Station, including the associated, but demolished residential camp (Figure 3).

El Paso Natural Gas Company's California Lines (Line Nos. 1100 and 1103)

In 1947, EPNG constructed Line No. 1100 in response to the growing demand for natural gas in California. This was quickly followed by the construction of Line No. 1103 in 1949. These two pipelines, which run parallel to each other over most of their length between the Permian Basin of west Texas and the Colorado River at the Arizona-California border, are known colloquially as the California lines. These lines transported natural gas from processing fields in west Texas to the Southern California Gas Company pipeline system with an interconnection near Blythe, California.

Line No. 1100, a 26-inch-diameter pipeline, is also known as the Line from Eunice Plant to Colorado River (California Line). During its construction, EPNG developed new methods, including the first use of a trenching machine (Ditch Witch trenching wheel), which excavated “a ditch 3½ feet wide, 6 feet deep, two miles a day” (EPNG 1950), and smooth bending the pipe (Mangan 1977:131). The pipeline was built using four spreads of about 250 men each. Compressor stations were built first at El Paso and Tucson, and then at Guadalupe, Texas; Deming, New Mexico; and Willcox and Gila, Arizona. The El Paso and Deming compressors were built onto smaller existing compressors that had been constructed in 1931 for a pipeline to Cananea, Mexico. Prior to the completion of construction of the 738-mile-long Line No. 1100, EPNG filed with the Federal Power Commission to build an additional 423 miles of a 30-inch-diameter loop line, to be known as Line No. 1103, or Line from Keystone ML Plant to Colorado River (California 1st Loop Line). To meet market demands, EPNG's system continued to grow by leaps and bounds in the early 1950s, with the addition of thousands of miles of new pipeline and additional compression across the Southwest, making EPNG one of the world's largest natural gas transmission companies. To illustrate this point, the EPNG system had a wartime (World War II) maximum capacity to move 146 million cubic feet per day, and by 1954, the system capacity had grown to 2 billion cubic feet per day (Steely and Newsome 2008:31, 38). The California lines, particularly Line No. 1100, are historically significant for bringing natural gas from the oil fields of west Texas to southern California, playing an important role in the post-World War II economic boom of California, and initiating a period of unheralded growth and economic success for EPNG.

In 2002, the Advisory Council on Historic Preservation granted all federal agencies a Section 106 review exemption (non-tribal lands only) for undertakings affecting in-use historic-age natural gas pipelines and associated facilities, except for those undertakings that entail the abandonment of the facilities (*Federal Register* 67[66]:16364–16365). The Advisory Council on Historic Preservation prescribed a format for documenting abandoned lines that includes 1) a brief history; 2) documentation through as-built drawings, historical photographs, or photographs of significant features; 3) a map of the property; and 4) an annotated bibliography. SWCA assembled the prescribed documentation for the entire historic-age EPNG mainline system in *Machine in the Garden: El Paso Natural Gas Company's Mainline Pipelines through the Desert Southwest* (Steely and Newsome 2008), which includes the fully developed Historic Context, “Pipeline Operations of El Paso Natural Gas in New Mexico, Texas, and Arizona, 1928–1956.”

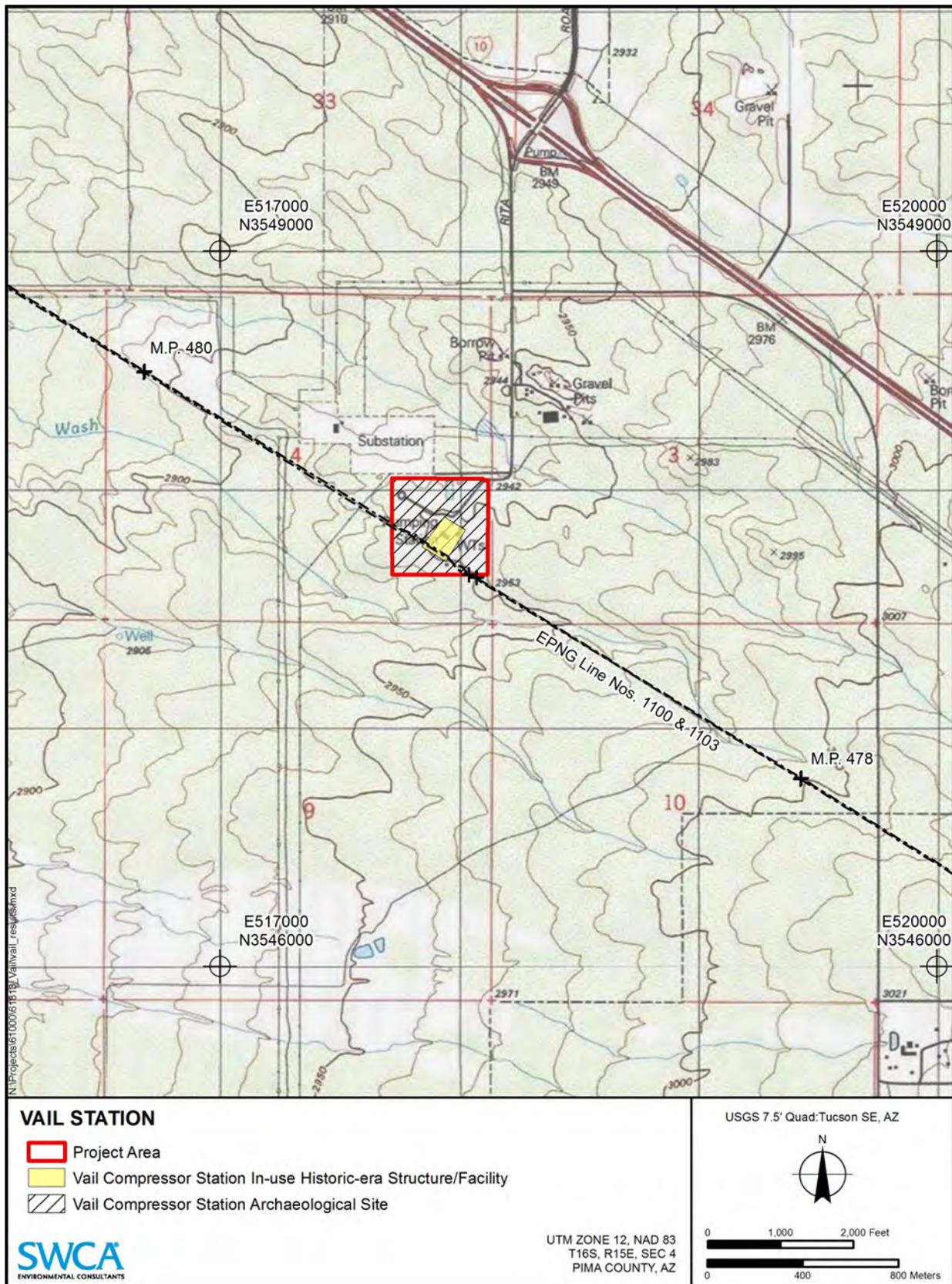


Figure 3. Survey results.

Vail Compressor Station

In 1953, EPNG filed an application with the Federal Power Commission to increase the capacity of its system by an additional 400 million cubic feet per day (Steely and Newsome:37–38), which was achieved through the construction of several new large pipelines in New Mexico and northern Arizona and the addition of 15 new compressor stations, including the Vail Compressor Station on the California lines just southeast of Tucson. Compression at the Vail station was, and still is, accomplished by three natural gas–fired General Electric turbines (Model GE M3002-RA) (Figure 4). A small residential camp of seven houses was constructed next to the facility to house employees and their families. The housing was removed, most likely during the 1960s, and today, the Vail Compressor Station is automated and, for the most part, unattended. The Vail Compressor Station retains sufficient integrity to be considered a contributing component of the historically significant EPNG system when evaluated under the historic context “Pipeline Operations of El Paso Natural Gas in New Mexico, Texas, and Arizona, 1928–1956” (Steely and Newsome 2008). Like the California lines, the Vail Compressor Station is an in-use historic-era natural gas pipeline facility that is exempt from Section 106 review until at which time it is abandoned via a filing with FERC under Natural Gas Act Section 7b (*Federal Register* 67[66]:16364–16365).



Figure 4. Vail Compressor Station; view facing south.

Vail Compressor Station Archaeological Site

In 1953, the Vail Compressor Station was constructed on the California lines to add compression to the EPNG system to allow for the westward transport of larger volumes of natural gas. As was customary at this time, the EPNG facility, built on 40 acres of land owned by EPNG, included a residential camp to house workers and their families. These camps consisted of clusters of houses of similar design; recreational facilities, such as playgrounds and meeting halls; and landscape elements such as tree-lined streets with curbing and sidewalks. Most of these camps were dismantled in the 1960s. The primary impetus for the abandonment was federal tax law changes that were enacted around 1960 that required

EPNG to account for worker housing as financial benefits to employees, and, likewise, employees were to be taxed on this newly recorded pay increase (Steely and Newsome 2008). Private automobiles, which most employees already owned, and improved public roads also played roles in facilitating living in and commuting from nearby towns.

At most compressor stations, all that remains of these housing camps are streetscape/landscape elements, such as paved streets, curbs, and dead or dying trees that historically would have been irrigated; concrete building foundations; and associated features such as light posts, sewer lines, and water wells. This is the case at the Vail Compressor Station, which we know from a circa 1960 inventory of EPNG compressor stations to have had a residential camp containing two 6-room houses, five 5-room houses, and a playground (Figure 5). The Vail Compressor Station archaeological site is the archaeological remains of the residential camp as well as other disused or ruined features and artifacts associated with the operation of the Vail Compressor Station (Figure 6).



Figure 5. Historic photograph (c. 1960) of the Vail Compressor Station and its residential camp, facing southwest.

Residential Camp

Very little remains of the residential camp at the Vail Compressor Station, as the houses and their foundations have been removed and much of the area containing them has been graded and maintained as a fenced storage yard. The single paved street with a cul de sac remains, as does curbing along the cul de sac (see Figure 6; Figure 7). Other features include the sewer line and sewage lagoon that served the community, several concrete slabs that were not house foundations, multiple light posts (Figure 8), the outdoor grill in the communal area (Figure 9), a low stone wall and fenced enclosure that may have been a community garden, the backboard of a basketball hoop, and a capped water well.

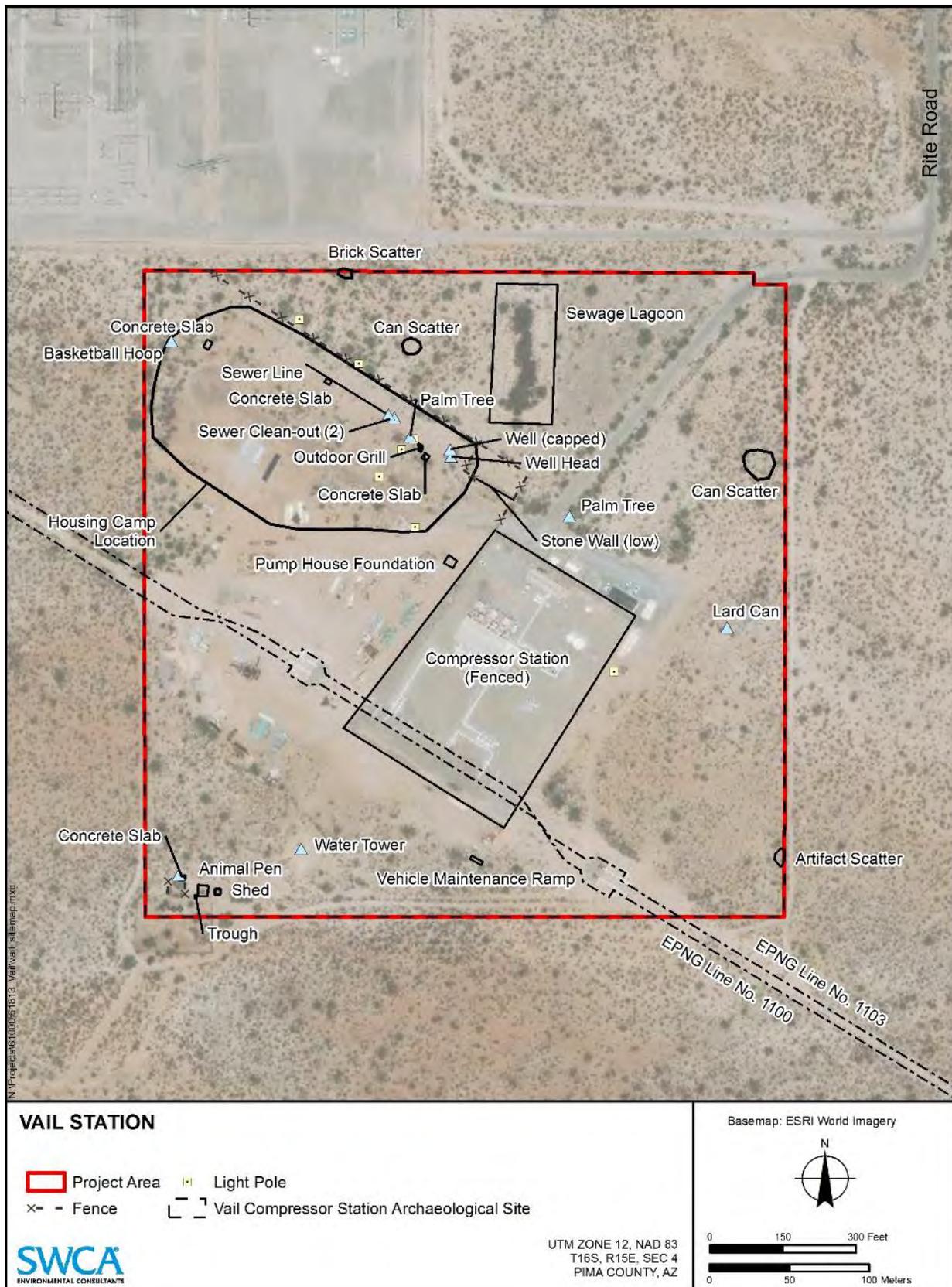


Figure 6. The Vail Compressor Station archaeological site.



Figure 7. Concrete curb along a cul de sac with a basketball hoop backboard in the rear, facing west.



Figure 8. Light post with CAUTION CHILDREN AT PLAY sign, facing west.



Figure 9. Outdoor grill with capped well in rear, facing west. This feature is visible in Figure 6.

Other Features and Artifacts

The 40-acre Vail Compressor Station parcel contains other features and artifact scatters not directly associated with the residential camp. Some of these features are associated with the operation of the compressor station, such as the water tank tower (Figure 10), a vehicle maintenance ramp (Figure 11), and the presumed pump house that would have provided water for cooling the compressor facilities (Figure 12). Other features appear to have been associated with animal husbandry (Figure 13) and refuse disposal, including an animal pen and adjacent shed, and the following small refuse piles with artifacts apparently dating from the 1953 to 1960s occupation of the residential camp:

- Northeast of the compressor station in a 10 × 10-m area—five crushed cans, including a coffee can, and an ESTAB-embossed meat can
- Southeast of the compressor station in an 11 × 7-m area—glass bottle fragments from approximately 10 colorless, brown, aqua, green, and cobalt bottles, at least one of which had an applied-color label; clay sewer pipe fragments; and approximately 10 can fragments; maker's marks indicated manufacture by Owens-Illinois (DURAGLAS) and Fairmount Glass Works; one bottle contained BARTON'S DYNASHINE shoe polish
- North of the residential camp in a 10 × 10-m area—approximately 10 sanitary cans and the internal friction lid of a HERSHEY'S cocoa canister
- North of the residential camp in a 3 × 4-m area—a brick scatter of approximately 15 bricks, including one LD&Co brick from Tucson's DeVry brickyard; one large sanitary can; and various pieces of metal

Eligibility Evaluation

The Vail Compressor Station archaeological site contains the remains of the seven-house residential camp and various features associated with the operation of the Vail Compressor Station. All that remains today of the camp are street remnants, curbing, several light poles, dead or dying landscaping trees, a few concrete pads, and sparse artifacts. The buildings have been removed. The archaeological features associated with the Vail Compressor Station are associated with the historic EPNG pipeline system, particularly the California lines, which marked EPNG's post-World War II expansion of service to California. The archaeological remains of the residential camp and other features associated with the operation of the compressor station do not retain the necessary integrity to convey the historic significance of the station and therefore should be considered non-contributing (i.e., ineligible) components of the historically significant in-use EPNG system. Further study of the archaeological features would not reveal information important to our understanding of EPNG's historic pipeline system.



Figure 10. Tower that would have supported a large water tank, facing southwest.



Figure 11. Vehicle maintenance ramp, facing east.



Figure 12. Pump house foundation and wellhead just outside of fenced compressor station, facing west. The pump house is visible in Figure 6.



Figure 13. Animal pen, concrete trough (right side of photograph), and corrugated sheet metal and wood frame shed (rear, left side of photograph) in the southeastern corner of the project area, facing southeast. These features are adjacent to, but separated by a fence from, a wooden corral, visible in this photograph, located on state trust land outside of the project area.

SUMMARY AND MANAGEMENT RECOMMENDATIONS

The cultural resources survey in support of the proposed modifications at the Vail Compressor Station covered the entire 40-acre EPNG-owned parcel, within which is a fenced 4.3-acre area containing the compressor station and associated facilities. The survey resulted in the identification of three historic-era properties, all of which are associated with the activities of EPNG and its employees. The properties include the in-use California lines (Line Nos. 1100 and 1103, discussed together), the in-use Vail Compressor Station, and the Vail Compressor Station archaeological site, the latter of which includes the remnants of the residential camp and various ruined or disused features associated with the operation of the compressor station or activities of EPNG employees and their families.

The California lines (Line Nos. 1100 and 1103) and the Vail Compressor Station are facilities that are part of the historically significant in-use EPNG system. As in-use natural gas pipeline facilities on non-tribal lands, these properties are exempt from Section 106 review until at which time they are abandoned via a filing with FERC under Natural Gas Act Section 7b (*Federal Register* 67[66]:16364–16365).

The Vail Compressor Station archaeological site contains the remains of the seven-house residential camp and various features associated with the operation of the Vail Compressor Station. All that remains today of the camp are street remnants, curbing, several light poles, dead or dying landscaping trees, a few concrete pads, and sparse artifacts. The buildings have been removed. The archaeological features associated with the Vail Compressor Station are associated with the historic EPNG pipeline system, particularly the California lines, which marked EPNG's post-World War II expansion of service to

California. The archaeological remains of the residential camp and other features associated with the operation of the compressor station do not retain the necessary integrity to convey the historic significance of the station and therefore should be considered non-contributing (i.e., ineligible) components of the historically significant in-use EPNG system. Further study of the archaeological features would not reveal information important to our understanding of EPNG's historic pipeline system. The Vail Compressor Station archaeological site is ineligible for listing in the NRHP.

A Section 106 finding of no historic properties affected is warranted for this undertaking.

If previously unidentified cultural resources are discovered during future project-related activities, work should stop at that location and reasonable steps should be taken to secure the preservation of the discovery and evaluate its historical significance. If the discovery includes human remains or funerary objects, the ASM repatriation coordinator should also be contacted per Arizona Revised Statutes 41-865.

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