Extended Phase I Geoarchaeological Report for SR-138 Northwest Corridor Improvement Project, Antelope Valley, Los Angeles County

7-LAN-138 PM 0.4/36.75, 7-LAN-5 PM 79.7/82.7, 7-LAN-14 PM 73.8/74.2
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USGS 7.5' Lebec (1991), Black Mountain (1991), La Liebre Ranch (1995), Neenach School (1995), Fairmont Butte (1995), Little Buttes (1965 photorevised 1974), and Rosamond (1973) quadrangles

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1.0 SUMMARY OF FINDINGS

The SR-138 Northwest Corridor Improvement Project is proposed by Caltrans on behalf of FHWA, in cooperation with Los Angeles County Metropolitan Transportation Authority (Metro). Caltrans and Metro propose to improve the Northwest Corridor along SR-138 in the Antelope Valley, Los Angeles County, between Interstate 5 on the west and State Route 14 on the east. The purpose of the Extended Phase I (XPI) Geoarchaeological Assessment was to define the spatial distribution of late Quaternary landforms within the study area based on existing soil and geologic data sources and to create a buried-site sensitivity model for the Project. The entire Area of Potential Effects (APE) was assessed for buried-site sensitivity. The APE is a 36.8-mile corridor that is at least 600 feet wide centered on the existing SR-138.

This report provides an overview of the sensitivity of the APE for previously unidentified and buried prehistoric and historic archaeological resources. The overview is based on a literature review and a series of maps that portray the relative sensitivity of the corridor. This geoarchaeological assessment relied primarily on existing geological literature and soils maps. A list of identified resources with subsurface deposits in the APE is provided to show the kinds of subsurface resources that could occur.

Within the Project APE, Quaternary Period (Pleistocene and Holocene alluvial fan and valley) deposits predominate. Quaternary deposits contain fluvial and alluvial material derived from surrounding slopes and major waterways. Late Pleistocene to late Holocene deposits underlie the majority of the Project APE, from Quail Lake east to SR-14. Late Pleistocene to late Holocene alluvial fans and valley deposits are considered likely settings for encountering surface and subsurface traces of early Native American habitation and activities. Three categories of buried site potential were identified: High, Moderate, and Low. Pleistocene-aged or older (between two million and 11,000 years ago, or older in age) and early Holocene (8,000 to 11,000 years ago) deposits are considered to be very low in archaeological sensitivity. Based on subsurface excavations at Fairmont Butte and other sites, the Middle Holocene (8,000 to 5,000 years ago) is considered as highly sensitive, and the later Holocene (5,000 years ago to present) is also considered have high sensitivity, depending on other factors such as known archaeological sites and major water sources. These sediments correspond to the Upper Palmdale and Post Palmdale stratigraphic units, which may have a depth as low as 17 meters below the surface, but are likely concentrated in the top 2 meters of soil. Landforms with high potential for buried archaeological material are those that were formed during the period when people could have been present in the area (during the Late Pleistocene and Holocene). Therefore, it may be more appropriate to say that these landforms have the potential to contain buried prehistoric sites while older landforms do not.

Approximately 80 to 90 percent of the Project APE overlies sediments (Qya, Qyf, Qf, Qw, Qa, Qls, and Qe) that have the potential to contain subsurface archaeological deposits in relatively shallow depths (mostly within the first 2 meters below surface, but possibly extending down to a depth of 17 meters below surface). Testing using backhoe trenching or similar method(s) could be carried out to verify the presence of subsurface archaeological deposits along the route. However, given the large percentage of the Project APE that overlaps areas considered to have the potential for containing subsurface deposits, even trenching to examine a sample of the 36-mile long APE would be a major effort. If geoarchaeological testing is conducted, a qualified geoarchaeologist should characterize the age, stratigraphic units, and thickness of sediments in the trenches.

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2.0 INTRODUCTION

A geoarchaeological study was completed for the SR-138 Northwest Corridor Improvement Project (Project) in December, 2014 and January, 2015. The Project area is located in the Antelope Valley along SR-138 between Interstate 5 (I-5) on the west and State Route 14 (SR-14) on the east in Los Angeles County, California (see Study Vicinity Map and Study Location Map in Section 9). The study area is the entire Area of Potential Effects (APE), a corridor 36.8 miles long and 4,491.5 acres in area (see APE Map in Attachment A to the HPSR).

The purpose of the geoarchaeological study was to assess the potential for buried or subsurface archaeological material to occur in the APE. This report presents the findings of a desktop geoarchaeological assessment conducted for the Project between October and January, 2015. No fieldwork was conducted as part of this assessment. This study was completed in accordance with requirements specified in Chapter 5 (Subsections 5.5.1–5.5.6) of the Caltrans Standard Environmental Reference (SER), Environmental Handbook on Cultural Resources. The SER lists several kinds of Extended Phase I studies. One of these is a geoarchaeological study designed "to search for archaeological deposits (as an extension of the survey effort) in areas of high sensitivity where such deposits may be buried, or obscured by sediment deposition, vegetation, or landscaping or other modern development." The primary objectives of this Extended Phase I study are (1) to help the Project proponent select a preferred alternative route by developing an archaeological sensitivity model for buried cultural resources; (2) conduct a limited search for buried archaeological sites in areas deemed to be of high sensitivity; and (3) evaluate the potential for buried cultural deposits in areas of high archaeological sensitivity. The development of the geoarchaeologic sensitivity model involves conducting a geologic and geomorphic desktop assessment of the APE, which entails the review of existing geologic maps, soil-survey reports, records-search results, and other relevant data sources.

The study was carried out by Mitchel Bornyasz and Wendy Blumel. Mr. Bornyasz has over 15 years professional experience in the geosciences with areas of expertise in Quaternary geology, soils stratigraphy, geomorphology and geoarchaeology. He has a B.S. in Geological Sciences from San Diego State University and is a licensed Professional Geologist (PG) in California. Ms. Blumel has an M.A. in Anthropology from Louisiana State University. She has six years of experience in southern California archaeological investigations as a field director and staff and senior archaeologist.

Native American consultation consisted of sending letters to Native American contacts provided by the NAHC, making follow-up phone calls, and holding an informational meeting for Native Americans. Native American consultation is documented in the Archaeological Survey Report (ASR) and Historic Property Survey Report (HPSR) for the Project. Because no fieldwork was done for the geoarchaeological study, there was no Native American monitoring.

3.0 CONTEXT

Environmental, prehistoric, ethnographic, and historic contexts for the Project study area are provided in Section 5 of the ASR. Additional information on physiography, climate, and hydrology is presented here.

3.1 Physiography

The Project site is located in the Mojave Desert province of Southern California. This region is a southern subsection of the Basin and Range physiographic province; both are characterized by north-south-trending mountain ranges separated by broad alluvial valleys. Predominant landforms within this province include isolated mountains and ranges, separated by basins with alluvial fans, playas, and dunes (Bornyasz 2014). The SR-138 Project APE is located in the western Antelope Valley portion of the Mojave Desert. The Antelope Valley is an approximately 4,000 square-kilometer basin formed by movement along the Garlock and San Andreas Faults (Ponti 1985). The Garlock Fault uplifted the Tehachapi Mountains to the north and the San Andreas Fault uplifted the San Gabriel Mountains to the south. These two mountain ranges form the V-shaped Antelope Valley along their eastern boundaries. The uplift of the Tehachapi and San Gabriel Mountain ranges isolated the Antelope Valley from the coast and created an interior drainage basin. The formation of this interior drainage basin is a relatively recent event, likely resulting from the uplift of the San Gabriel Mountains approximately 1 to 2 million years ago, which closed off Tertiary drainage routes from the Tehachapi Mountains to the ocean. Due to this recent uplift, the Antelope Valley is almost entirely filled with Quaternary sediments (Ponti 1985).

The Project APE in the western portion of the Antelope Valley is in the Antelope-Fremont Valleys Watershed in the east and the Santa Clara Watershed in the west (Bornyasz 2014). The Antelope-Fremont Valleys Watershed (2,160,629 acres) is predominantly within Kern and Los Angeles Counties and extends from the community of Boron west to the community of Mojave and south to the Lancaster-Palmdale area. The most hydrologically significant streams in the Antelope Valley region begin in the San Gabriel Mountains on the southern edge of the Antelope Valley Region and include, from east to west, Big Rock Creek, Little Rock Creek, Amargosa Creek, and Oak Creek from the Tehachapi Mountains. All of the drainages recorded within the Antelope-Fremont Valleys Watershed within the Project area are considered to be isolated and flow toward the three dry lakes on Edwards Air Force Base. Except during the largest rainfall events of a season, surface water flows quickly percolate into stream beds and recharge the groundwater basin. Surface water flows that reach the dry lakes are generally lost to evaporation. The Antelope-Fremont Valley Watershed extends approximately from Old Ridge Route Road on the west to the eastern end of the APE (Bornyasz 2014).

The Santa Clara Watershed (1,032,382 acres) is predominantly within Los Angeles County and includes the tributaries of the Santa Clara River. The Santa Clara Watershed is approximately 786 square miles within of Los Angeles County, approximately 243 square miles within Ventura County, and 1 square mile within Kern County (LACDPW 2014). The Santa Clara Watershed is one of the last free-flowing natural riparian systems left in California, flowing approximately 86 miles from the San Gabriel Mountains to the Pacific Ocean (LACDPW 2014). The Santa Clara Watershed drains approximately 1,600 square miles or 1.7 million acres of the San Gabriel, Castaic, Santa Susana, and Sierra Madre Mountains. Five major tributaries are present in the watershed: Piru Creek, Castaic Creek, San Francisquito Creek, Bouquet Canyon, and Mint Canyon (LACDPW 2014). In the Project area the Santa Clara Watershed extends approximately from Old Ridge Route Road west to the end of the Project boundary (Bornyasz 2014).

Previous geologic mapping of this region was conducted by Jennings et al. in 1977. This 1977 Geologic Map of California indicates the portion of the western Antelope Valley containing the Project APE is made up almost entirely of Quaternary Period alluvium and deposits (Pleistocene-Holocene Epochs, 2 million years ago to present), with the exception of the extreme western, approximately 3.34-mile, portion of the APE that was underlain by Miocene and Pliocene-age marine and nonmarine rocks (23 to 2 million years ago) (Jennings et al. 1977). In 1981, Ponti et al. compiled a more detailed geologic map of the Antelope Valley for the U.S. Geological Survey. The 1981 map shows that the western Antelope Valley is primarily composed of late Pleistocene to mid-Holocene alluvial sediments with small, sporadic, sand dune deposits located throughout the western valley and lacustrine sediments underlying its eastern end (Ponti et al. 1981). More recent maps compiled by Bedrossian et al. (2012) indicate that the majority of the western Antelope Valley consists of Late Pleistocene and Holocene alluvial valley and fan deposits, eolian sand dune deposits, and lacustrine sediments, with intermittent stands of bedrock (Tertiary, Mesozoic, and older) most prevalent near the borders of the Tehachapi and San Gabriel Mountain ranges (Bedrossian et al. 2012).

3.2 Climate and hydrology

The Project APE currently lies within an arid region with little natural perennial surface water. The average annual rainfall within the Project study area ranges from 18.8 inches in Lebec (northwest of the west end of the APE), to 7.4 inches in Lancaster (south of the east end of the APE) (TWC 2014a, 2014b). Most of the rain falls between the months of December and March (Bornyasz 2014). As a result of the low precipitation, surface hydrology is dominated by ephemeral washes, flowing only during storm events and remaining dry for most of the year. The hydrologic regime for the area follows the general Mediterranean climate, with cool, wet winters and warm, dry summers.

4.0 SCOPE OF WORK

ECORP conducted a geoarchaeological study of the entire Project APE, concentrating on what types of soils are present within the corridor and what potential there is for buried cultural resources. To this end, ECORP conducted a literature review, produced a series of maps that portray the relative sensitivity of the corridor, and compiled a technical report. The geoarchaeological assessment was a desktop effort and primarily relied on existing geological literature and soils maps.

4.1 Literature Review

A literature review was conducted of readily available documents and applicable information in an effort to identify and evaluate the various landforms and natural deposits previously documented within the study area. The data reviewed included previously recorded cultural resources reports and site records, geologic maps and reports, and geologic publications.

A cultural resources record search was performed on May 21 to 23, 2014 at the South Central Coastal Information Center (SCCIC) of the California Historic Resources Information System at California State University, Fullerton for previously recorded cultural resources within the survey area and within a 1-mile radius of the Project APE. All previously-recorded site records were reviewed for information on site location, surficial soil deposits, and site depth (if applicable).

Regional geologic maps of the area were reviewed. An early Geologic Map of California was produced by Jennings et al. in 1977 for the California Division of Mines and Geology (1:750,000 scale). Geologic information specific to the Antelope Valley was compiled by Ponti et al. (1981) and illustrated on the U.S. Geological Survey 15' quadrangle map entitled "*Map Showing Quaternary Geology of the Central Antelope Valley and Vicinity, California*". More recent geological mapping was conducted by Bedrossian et al. (2012) and illustrated on the California Geologic Survey, CGS Special Report 217, Plate 22 Lancaster Sheet, 1:100,000 scale. The majority of the findings presented here are based on the later Bedrossian et al. map. In addition to the reports of the geology for the area, publications on paleo-landforms and soil stratigraphy in the region were reviewed (Orme 2008; Ponti 1985).

4.2 Technical Report

This technical report was prepared to document the methods and findings of the geoarchaeological assessment. The findings presented herein include background information summarizing the geologic and geomorphologic conditions in the APE with regard to assessing the potential for surface and/or buried archaeological deposits. The report includes a summary of geomorphologic surface conditions associated with the various landforms present and a discussion of the potential for subsurface archaeological material.

5.0 RESULTS

5.1 Sediment Correlations and Age

There are bedrock outcrops in the westernmost portion of the Project APE, west of Quail Lake. These outcrops consist of coarse-grained Tertiary age formations (TSS), predominantly sandstone and conglomerates. East of Quail Lake, the Project APE contains Quaternary sediments dating from the middle Pleistocene to the late Holocene. Soil deposits consist primarily of alluvium from fan and valley deposits, but also include eolian dune deposits and lacustrine sediments. Details of surficial sediments in the Project APE are included in Table 1 below and their locations are shown on the CGS Geologic Units Map (Section 9).

Table 1. Quaternary Surficial Deposits within the Project APE.

Name	Type	Description	Period	Dates (years BP)
Qof	Old Alluvial Fan Deposits	Slightly to moderately consolidated and moderately dissected boulders, cobbles, gravel, sand, and silt at the lower end of a valley or canyon	Middle to Late Pleistocene	500,000 to 12,000
Qol	Old Lacustrine Playa and Estuarine (Paralic) Deposits	Slightly to moderately consolidated and moderately dissected fine-grained silt, mud and clay from lake, playa and estuarine deposition	Middle to Late Pleistocene	500,000 to 12,000
Qya	Young Alluvial Valley Deposits	Unconsolidated to slightly consolidated clay, silt, sand, and gravel located in stream valleys, alluvial flats, or rivers	Holocene	12,000 to 1,000
Qyf	Young Alluvial Fan Deposits	Unconsolidated to slightly consolidated and undissected to slightly dissected boulders, cobbles, gravel, sand, and silt at the base of a valley or canyon	Holocene	12,000 to 1,000
Qf	Alluvial Fan Deposits	Recently deposited unconsolidated boulders, cobbles, gravel, sand, and silt. Typically deposited in a fan shaped cone emanating from a stream, river, or canyon	Late Holocene	1,000 to present
Qw	Alluvial wash Deposits	Unconsolidated sand and gravel sediment that has recently been deposited in active stream and river channels	Late Holocene	1,000 to present
Qe	Aeolian Dune Deposits	Unconsolidated, well sorted wind-blown sand, can occur as dunes or sand sheets	Late Holocene	1,000 to present
Qa	Alluvial Valley Deposits	Unconsolidated gravel, sand, silt, and clay. Spread regionally on alluvial flats and large river valleys.	Late Holocene	1,000 to present
Qls	Landslide Deposits	Unconsolidated to moderately consolidated sediments from debris flows and older landslides	Late Holocene	1,000 to present

Information compiled from Bedrossian et al. 2012

Although geologic maps of the area show the locations of surficial deposits within the APE, they do not provide an indication of the potential thickness of these deposits. In 1985, Daniel J. Ponti published a study of the Quaternary stratigraphic sequence within the Antelope Valley. Ponti argues that alluvial deposition within the Antelope Valley was likely rapid and episodic, separated by periods of relative stability. He also argues that these periods of episodic alluviation correspond to climatic changes associated with transitions from glacial to interglacial periods (Ponti 1985). Ponti outlined six major alluvial units that appear throughout the Antelope Valley. These units are detailed in Table 2 below.

Table 2. Stratigraphic Sequence of the Antelope Valley

Alluvial Unit	Dates (years BP)	Period	Potential Thickness	Probable Corresponding Bedrossian et al. unit(s)
Lower Tylerhorse	>300,000	Pleistocene	0.5 to 2 meters	Qvof
Middle Tylerhorse	250,000	Pleistocene	no thicker than 1.5 meters	Qof
Upper Tylerhorse	140,000	Pleistocene	1 to 20 meters	Qof
Lower Palmdale	30,000 to 90,000	Late Pleistocene	May exceed 20 meters	Qof, Qol,
Upper Palmdale	8,000 to 14,000	Early Holocene	May exceed 12 meters	Qof, Qol, Qya, Qyf
Post Palmdale	8,000 years to present	Middle to Late Holocene	Less than 5 meters	Qya, Qyf, Qf, Qw, Qe, Qa, Qls

Tylerhorse deposits date to between 300,000 and 140,000 years BP and predate human occupation within the Antelope Valley. Tylerhorse deposits tend to be confined to areas adjacent to mountains and are not prevalent in the valley floor. Tylerhorse soils contain well developed argillic (clayey) horizons and have a subangular blocky to prismatic structure with reddish-brown hues (7.5YR to 5YR in the Munsell soil color chart) (Ponti 1985).

Palmdale deposits (upper and lower) date to the late Pleistocene and early Holocene and make up the majority of the Antelope Valley floor. Palmdale deposits have weak argillic horizons and lack the red hues of the Tylerhorse deposits. Palmdale soils have a moderately subangular structure and vary in color from pale to dark brown (10YR Munsell). Both the Lower and Upper Palmdale deposits tend to be thick, regularly exceeding a depth of 10 meters. Of these, Upper Palmdale deposits are the most commonly exposed on the valley surface. Upper Palmdale deposits overlie/inter-finger with lacustrine deposits from Pleistocene and Holocene lakes (Ponti 1985). These deposits date to the early Holocene (8,000 to 14,000 years BP) and may contain evidence of the earliest human occupation of the region.

Post Palmdale deposits date to the mid to late Holocene (8,000 years BP to Present). Post Palmdale soils are weakly developed and occur near active stream channels and depositional surfaces (Ponti 1985). Evidence of human occupation within the region is likely to only be found within the Upper Palmdale and Post Palmdale sediments and are not likely to occur in sediments greater than 17 meters deep.

5.2 Overview of Buried Sites within the Western Antelope Valley

A records search was performed for previously recorded cultural resources within a 1-mile radius of the Project APE. The records search results show that 215 cultural resources have been previously recorded within the 1-mile records search radius. These resources include both prehistoric (166 resources), multi-component (4 resources), and historic-period (45 resources) resources. Prehistoric site types consist of residential sites (mostly temporary camps), lithic scatters, sites consisting only of fire-affected rock (probably from former hearths or roasting pits), bedrock milling sites, quarries, and a cairn (see Section 4.1 of the ASR). Historic-age resources consist of refuse scatters, roads, homestead sites, aqueducts, dugout shacks, and utility lines. As a result of the records search, it appears that most known, surficial, archaeological resources are concentrated in the western quarter and the central portion of the Project study area, which includes the Project APE and the 1-mile records search radius.

In the western quarter of the Project study area, high concentrations of prehistoric surficial sites are located in the fine and course-grained Tertiary bedrock hills (Tss and Tsh) with intermittent Holocene and Pleistocene alluvial valleys (Qa and Qya) found southeast and north of the I-5/SR-138 junction; in the coarse-grained Tertiary bedrock hills (TSS) and Late to Middle Pleistocene old alluvial fan deposits (Qof) on the north side of Quail Lake; and in some of the Late Holocene alluvial deposits (Qf) directly to the east of Quail Lake. These sites tend to consist of bedrock milling sites and cobble quarries/lithic scatters. In this area people were making use of the Tertiary and Pleistocene lithic material.

The central portion of the Project study area contains the northern portions of Fairmont Butte and Antelope Buttes. Fairmont Butte is a northeast-southwest trending hill composed of coarse-grained Tertiary bedrock (Tss). Antelope Buttes, adjacent to the east side of Fairmont Butte, are composed of Mesozoic and Older Granitic and other Intrusive Rocks (gr). The entirety of Fairmont Butte contains a previously recorded prehistoric quarry and occupation site (CA-LAN-1789/H). Not surprisingly, the late to middle Pleistocene old alluvial fan deposits (Qof) and Holocene to late Pleistocene surficial deposits (Qyf) to the north of Fairmont Butte/ Antelope Buttes contain a high density of archaeological sites. These sites north of Fairmont Butte consist mainly of lithic and fire-affected rock scatters. Little Buttes, a small hill composed of Tertiary volcanic bedrock (Tv) located to the northeast of Fairmont Butte, contains a second large prehistoric quarry site (CA-LAN-76).

The concentration of prehistoric sites drops off dramatically in the eastern portion of the Project study area which contains Holocene alluvial valley deposits (Qya) and Pleistocene lacustrine (Lake Thomson) deposits (Qol), where the resources are primarily of historic and modern age.

Of the 215 sites identified during the records search, 33 have had some degree of subsurface testing and/or data recovery conducted. All of these tested sites are prehistoric or multi-component in age. Of these 33 sites, six (CA-LAN-1777, CA-LAN-1780, CA-LAN-1783, CA-LAN-1789/H, P19-003727, and CA-LAN-4384) contained intact subsurface deposits. Intact deposits are defined as subsurface materials that were not reported to be within an obvious plow zone or contain signs of other disturbances such as historic-period artifacts at the same depths as prehistoric artifacts. Details of all six sites are presented in Table 3. Four of these sites (CA-LAN-1777, CA-LAN-1780, CA-LAN-1783, and CA-LAN-4384) contained subsurface deposits with a depth of between 36 and 65 centimeters below surface (cmbs). All four sites are prehistoric artifact scatters and are located within 1.5 miles of the northern and western boundaries of Fairmont Butte, in areas with Holocene to late Pleistocene young alluvial fan deposits (Qyf). Two sites (P19-003727 and CA-LAN-1789/H[Fairmont Butte]) with subsurface components are located within Late Holocene Alluvial Valley Deposits. P19-003727 is a multi-component site located approximately 0.5-mile northeast of Fairmont Butte. This site is located within a seasonal drainage channel of younger alluvium that transects older old alluvial fan deposits from the middle and late Pleistocene. Deposits in P19-003727 have a depth of 60 cmbs.

Table 3. Sites in the Project Area Vicinity Containing Subsurface Deposits

Resource Designation	Description	Depth of deposit (cmbs)	Sediments	Reference
CA-LAN-1777 (P19-001777)	Artifact scatter of lithics, ground stone, and FAR	65	Young Alluvial Fan Deposits (Qyf)	Love, B., DPR Record (1990); URS Corp., DPR Record (2009); Trampier, J. and T. Terry, DPR Update (2014)
CA-LAN-1780 (P19-001780)	Artifact scatter containing flakes, FAR, cores, tools, and ground stone	41	Young Alluvial Fan Deposits (Qyf)	Love, B., DPR Record (1990); URS Corp., DPR Record (2009); Trampier, J. and T. Terry, DPR Update (2014)

CA-LAN-1783 (P19-001783)	Artifact scatter containing flakes, cores, FAR, and ground stone	36	Young Alluvial Fan Deposits (Qyf)	Love, B., and W. De Witt, DPR Record (1990); Larson, K., L. Schrader, and T. Stevenson, DPR Record (2010); Greenberg, M., S. Suarez, M. Richards, L. Schrader, M. Armstrong, and B. Bertram, DPR Update (2010)
CA-LAN-1789/H (P19-001789)	Fairmont Butte site containing occupation areas, lithic quarries, lithic work areas bedrock mortars, and a pictograph	200	Alluvial Valley Deposits (Qa)	Love, De Witt, and Lillard, DPR Record (1989); Whitley, D.S., DPR Update (2004); Stanton, P., DPR Update (2011)
P19-003727	Prehistoric artifact scatter with lithics, ground stone, and flaked tools and historic-period refuse	60	Alluvial Valley Deposits (Qa)	Blind, H., T. Kennedy, F.H. Arellano, J. Hamad, DPR Record (2007); Greenberg, M., S. Suarez, L. Schrader, B. Bartram, M. Richards, and M. Armstrong, DPR Update (2010)
CA-LAN-4384 (P19-004384)	FAR concentration	40-50	Young Alluvial Fan Deposits (Qyf)	Terry, T., DPR Record (2013)

References are DPR 523 records on file at the SCCIC

A portion of the Fairmont Butte site (CA-LAN-1789/H), located along the southeastern base of the butte, was excavated in the 1970s by Mark Sutton. In these excavations, Sutton found subsurface deposits in two soil horizons that continued to a depth of 2 meters. The uppermost soil horizon contained a dark midden with a dense deposit of varied late period artifacts. This upper horizon extended to a depth of 60 cmbs (Sutton 1978). From 60 to 200 cmbs, the site contained a light-colored soil with exclusively rhyolitic artifacts and no late materials. Based on earlier investigations of this site and findings at similar sites in the vicinity, Sutton proposed that these early materials may date to between 5,000 to 7,000 BP (Sutton 1978).

5.3 Buried Site Potential

The potential for buried prehistoric archaeological deposits and archaeological sensitivity within the study area was determined based on map distribution of different Tertiary Period-aged (originating between 66 and 2 million years ago) and Quaternary Period-aged (originating in the last two million years) landforms. Three categories of buried site potential were identified: High, Moderate, and Low. Pleistocene aged or older (between two million and 11,000 years ago, or older in age) and early Holocene (8,000 to 11,000 years ago) deposits are considered to be low in archaeological sensitivity. Based on subsurface excavations at Fairmont Butte and other sites, the middle Holocene (8,000 to 5,000 years ago) is considered as highly sensitive, and later Holocene (5,000 years ago to present) is also considered high sensitive, depending on other factors such as known archaeological sites and major water sources. Table 4 presents the archaeological sensitivity of soils based on their age.

Table 4. Sensitivity Potential of Different Landforms

Landform	Sensitivity Potential
Early Holocene Fans and Valley Deposits; Pre-Pleistocene through Latest Pleistocene Hillslopes, Fans and Floodplains; (8,000 to 11,000 years ago, or earlier)	Low
Middle Holocene Fans and Floodplains (8,000 to 5,000 years ago)	High
Late Holocene Fans and Floodplains (5,000 to present)	High

The overall sensitivity ranking was generated by a review of the various specific geological formations in the Project study area. Of these landforms, middle and late Holocene alluvial fans and valley deposits are present within the Project study area and are considered highly sensitive for containing undocumented prehistoric sites (Table 5). Relatively stable eolian deposits also contain landforms that are sensitive for archaeological sites and human remains. Table 5 presents the archaeological sensitivity of soils based on the Bedrossian et al. (2012) geologic map. These factors were used to provide a gross means of ranking different portions of the Project APE.

Table 5. Buried Site Potential of Different Landforms

Landform	Buried Site Potential
Older Alluvium (Qof)	Low
Older Lacustrine Deposits (Qol)	Low
Young Alluvial Deposits (Qya, Qyf)	High
Late Alluvial Deposits (Qf, Qw, Qa)	High
Late Landslide Deposits (Qls)	High
Eolian Deposits (Qe)	High

6.0 CONCLUSIONS REGARDING SENSITIVITY FOR BURIED ARCHAEOLOGICAL SITES

6.1 Prehistoric Resources

Within the Project study area, Quaternary Period (Pleistocene and Holocene) alluvial fan and valley deposits predominate. Quaternary deposits contain fluvial and alluvial material derived from surrounding slopes and major drainages. Late Pleistocene to late Holocene alluvial fans and valley deposits are considered likely settings for encountering surface and subsurface traces of early Native American habitation and activities. These sediments correspond to the Upper Palmdale and Post Palmdale stratigraphic units, which may have a depth as great as 17 meters below the surface (Ponti 1985). That said, based on previously tested cultural resources in the Project study area, subsurface prehistoric cultural material within the Project APE may be expected in the top 60 to 70 cmbs in late Pleistocene to Holocene sediments (Qya and Qyf), but may reach down to 2 meters in newer, late Holocene, alluvial sediments (Qf, Qw, Qa, Qls, and Qe). Approximately 80 to 90 percent of the Project APE overlies sediments (Qya, Qyf, Qf, Qw, Qa, Qls, and Qe) that are considered to have a high potential of containing subsurface archaeological deposits. The distribution of these sediments along the SR-138 route is shown on the Buried Sites Sensitivity Map (Section 9) and is described in the paragraphs below.

The western portion of the Project APE is dominated by Tertiary bedrock outcrops (Tss and Tsh) with intermittent Holocene fan and valley deposits (Qya and Qf) that fill in channels and drainages between the bedrock outcrops. The San Andreas Fault runs directly through this area. In the prehistoric era, this fault created natural water seeps in the current location of Quail Lake. Based on the number and density of previously recorded surficial cobble quarry and bedrock milling sites in the hills surrounding Quail Lake, it is reasonable to suppose that prehistoric peoples likely used a portion of the APE in this area for water, food processing on bedrock milling features, and lithic resource procurement. Thus, although the potential of subsurface deposits on the Tertiary bedrock hills in this area is low, the probability of there being buried deposits within the Holocene sediments (Qya and Qf) that fill in the channels between hills must be considered high.

Near the community of Neenach, the Project APE leaves the hills and flattens out. From Neenach to the community of Antelope Acres, the APE is dominated by late Pleistocene and Holocene alluvial fan deposits (Qf and Qyf) with intermittent outcrops of middle to late Pleistocene fan deposits (Qof), late Holocene alluvial valley deposits (Qa), and late Holocene eolian dune deposits (Qe). The older Pleistocene deposits (Qof) likely predate human occupation in the region and are considered to have a low potential of containing subsurface deposits. Multiple sites with subsurface deposits have been previously identified within the late Pleistocene to Holocene fan deposits (Qyf) and may date to as early as 5,000 to 7,000 years BP (Sutton 1978). Thus, the potential of finding subsurface deposits must be considered high in these sediments. Younger alluvial fan deposits (Qf) may be overlying older deposits that contain archaeological resources. Thus, these sediments should also be considered to have a high potential of containing subsurface materials. Eolian dune environments tend to have a high turnover and movement of sediments and should also be considered to have a high potential of containing buried deposits.

Near the eastern edge of the community of Antelope Acres, the sediments transition to large flat plains of late Pleistocene to Holocene young alluvial valley deposits (Qya). Few previously recorded surficial sites have been recorded on these sediments. However, these sediments lie adjacent to the western boundary of the Pleistocene Lake Thomson deposits (Qol) that overlie the very easternmost portion of the Project APE. Lake Thomson reached its zenith during the late Pleistocene and desiccated during the Holocene, retreating eastward to form Rosamond Lake, Rogers Lake, and Buckhorn Lakes outside of the Project APE to the east. The potential for finding subsurface deposits in these Lake Thomson lacustrine deposits is low. However, the Late Pleistocene and Holocene alluvium that borders these lacustrine sediments may overlie buried lake shores that were occupied during the early and mid Holocene as Lake Thomson retreated and alluvial and eolian sediments moved in. Thus, these deposits should be considered to have a high potential for buried deposits.

Landforms with high potential for buried archaeological material are those that were formed during the period when people could have been present in the area (during the Late Pleistocene and Holocene). Therefore, it may be more appropriate to say that these landforms have the potential to contain buried prehistoric sites while older landforms do not.

6.2 Historic-Age Resources

The majority of the surficial sediments within the APE predate the historic period in California (400 BP to present). Given the age and stability of the sediments within the majority of the Project APE, the likelihood of encountering subsurface historic-age deposits is very low. Surficial sites such as refuse scatters, roads, aqueducts, and utility lines are not likely to contain subsurface deposits. Subsurface artifacts and features may be encountered on sites such as house sites where features such as privy pits and cisterns were excavated into older sediments. Suspected historic-age subsurface features should be tested for archaeological deposits prior to the start of construction.

7.0 SUMMARY AND RECOMMENDATIONS

The SR-138 Northwest Corridor Improvement Project is proposed by Caltrans to improve the corridor along SR-138 in the Antelope Valley between I-5 on the west and SR-14 on the east. The purpose of this Extended Phase I Geoarchaeological Assessment was to define the spatial distribution of late Quaternary landforms within the study area based on existing soil and geologic data sources and to create a buried-site sensitivity model for the Project.

This report provides an overview of the sensitivity of the Project APE for previously unidentified and buried prehistoric and historic archaeological resources. To this end, ECORP conducted a literature review, produced a series of maps that portray the relative sensitivity of the corridor, and compiled a technical report.

Within the Project APE, Quaternary Period (Pleistocene and Holocene alluvial fan and valley) deposits predominate. Late Pleistocene to late Holocene deposits underlie the majority of the Project APE. Late Pleistocene to late Holocene alluvial fans and valley deposits are considered likely settings for encountering surface and subsurface traces of early Native American habitation and activities.

Based on geologic maps, soil stratigraphy, and known subsurface deposits, approximately 80 to 90 percent of the Project APE overlies sediments (Qya, Qyf, Qf, Qw, Qa, Qls, and Qe) that have the potential to contain subsurface archaeological deposits in relatively shallow depths (mostly within the first 2 meters below surface, but possibly extending down to a depth of 17 meters below surface).

Testing using backhoe trenching or similar method(s) could be carried out to verify the presence of subsurface archaeological deposits along the route. However, given the large percentage of the Project APE that overlaps areas considered to have the potential for containing subsurface deposits, even trenching to examine a sample of the 36-mile long APE would be a major effort. If trenching were to be undertaken, a qualified geoarchaeologist should be present to characterize the age, stratigraphic units, and thickness of sediments observed in the trenches.

It should be noted that this report does not describe the particular identified resources that could be affected by the Project. This summary instead considers the relationship of sensitive soil formations and identified sites against the Project footprint to demonstrate the overall potential of the APE to contain unidentified buried archaeological resources.

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9.0 MAPS

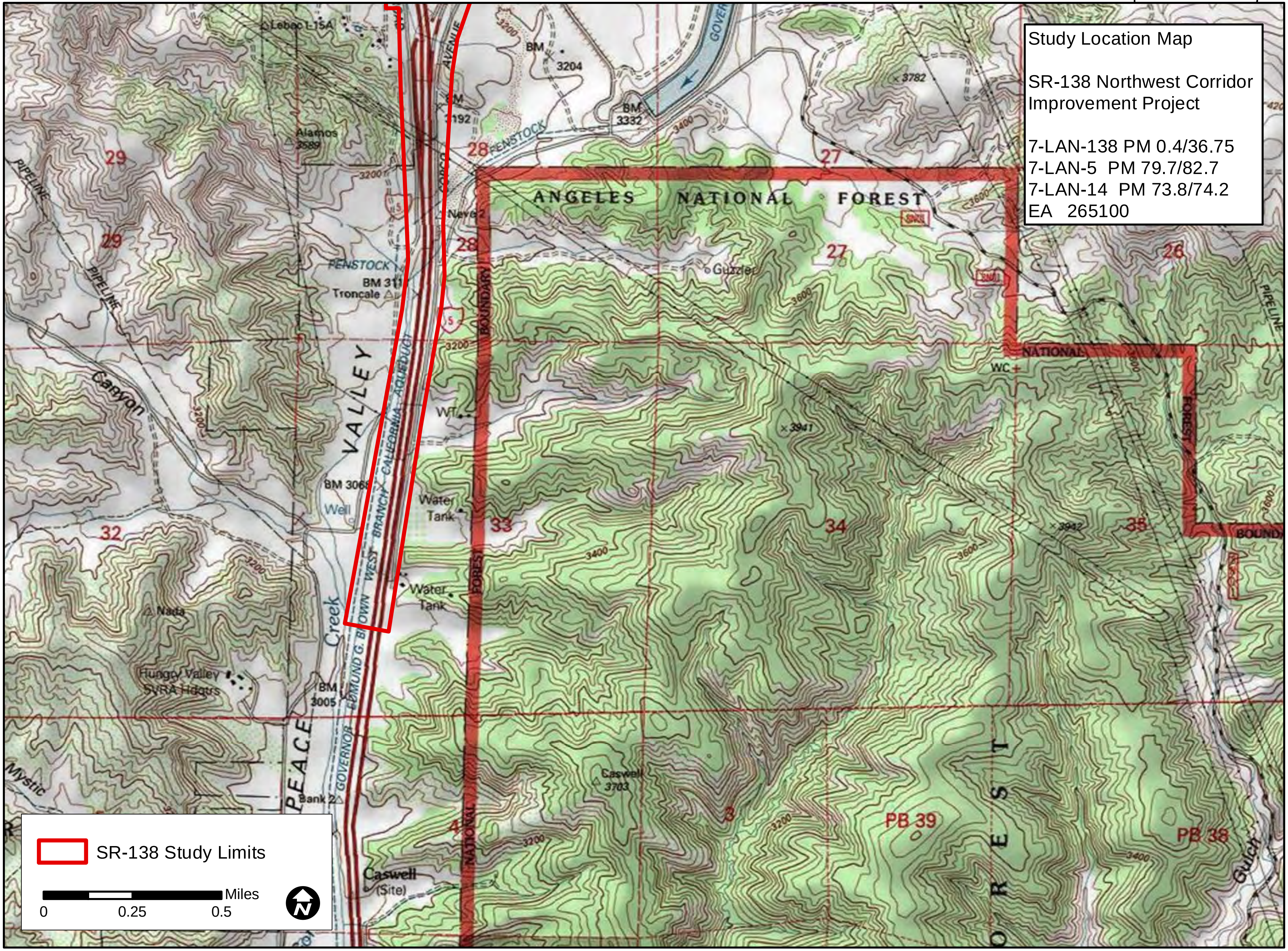
Study Vicinity Map

Study Location Map

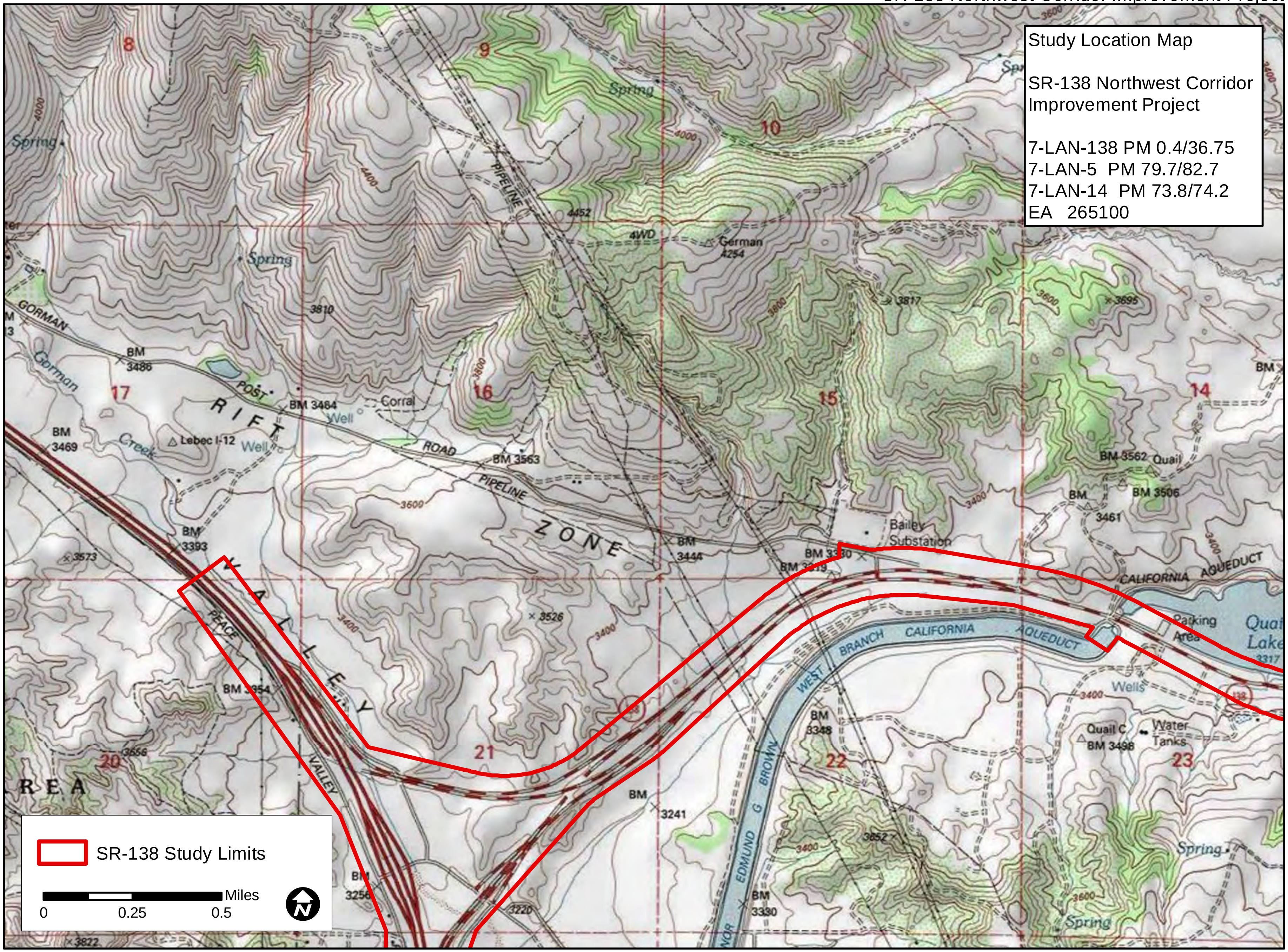
CGS Geologic Units Map

Buried Sites Sensitivity Map

Study Vicinity Map (USGS 1x2 Degree Los Angeles, California, Quadrangle)



Study Location Map (USGS 7.5 Minute Lebec, La Liebre Ranch, Neenach School, Fairmont Butte, Little Buttes, Rosamond, Black Mountain, California, Quadrangle)



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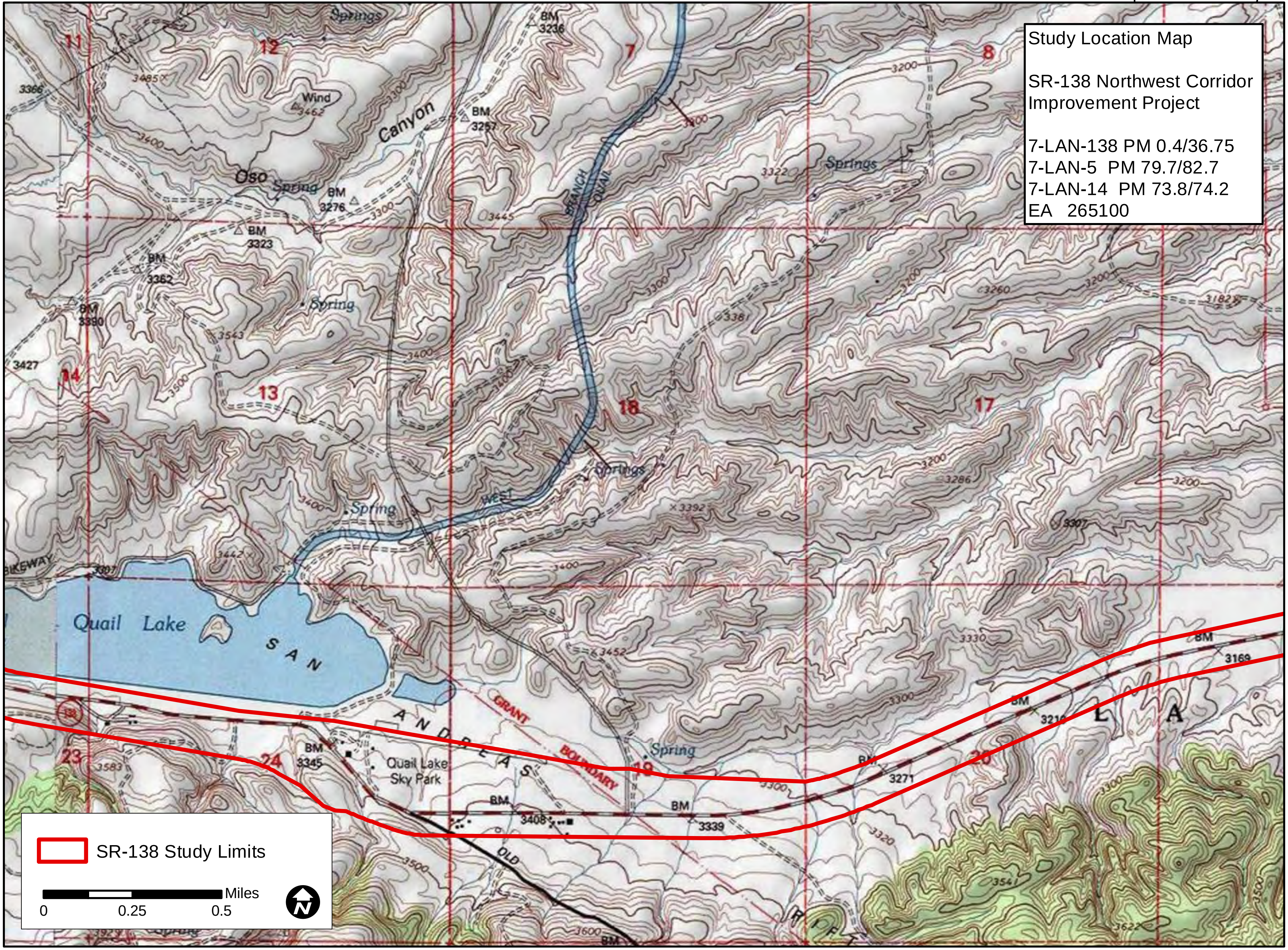
Sheet 2 of 12



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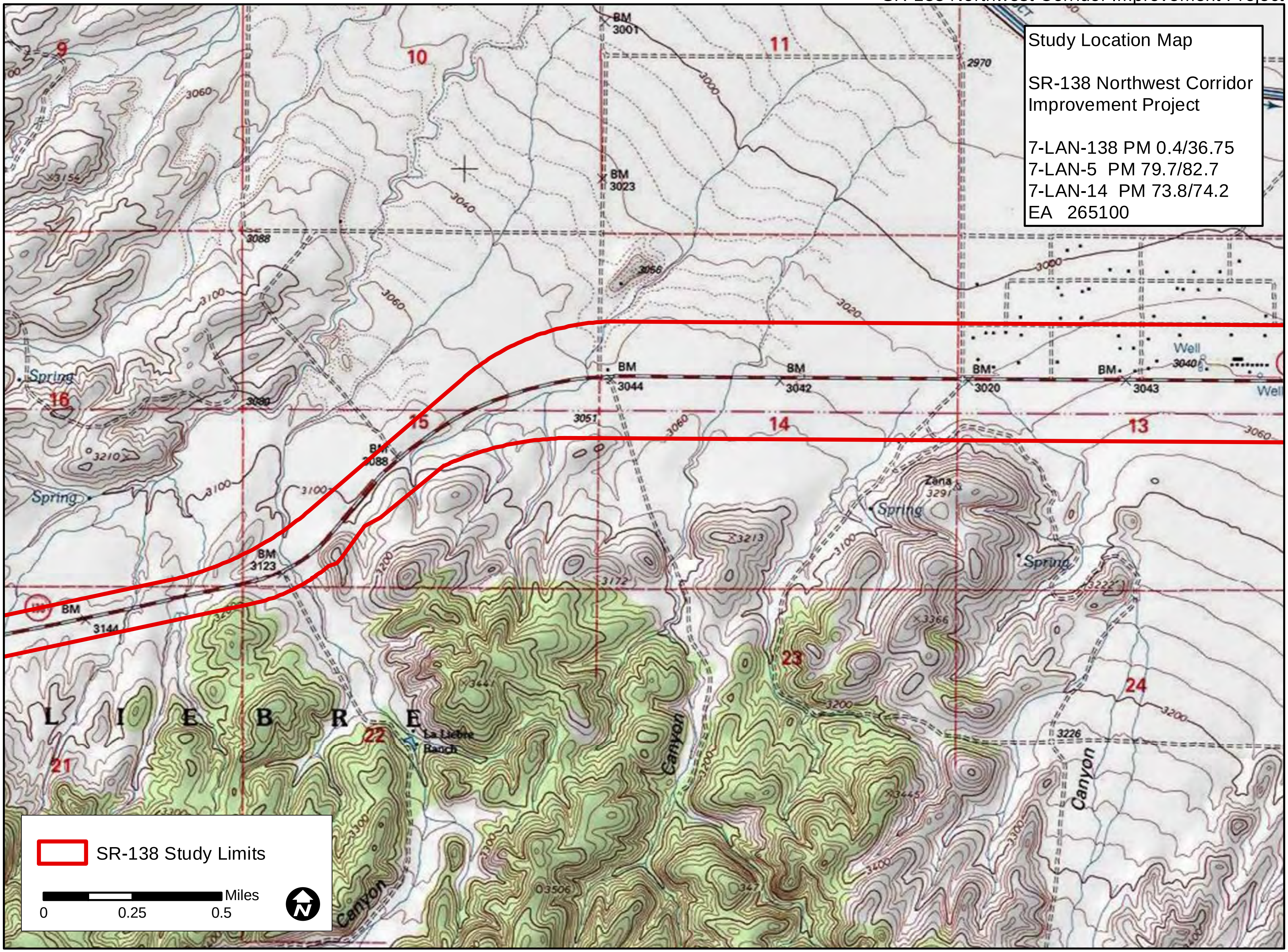
Sheet 3 of 12



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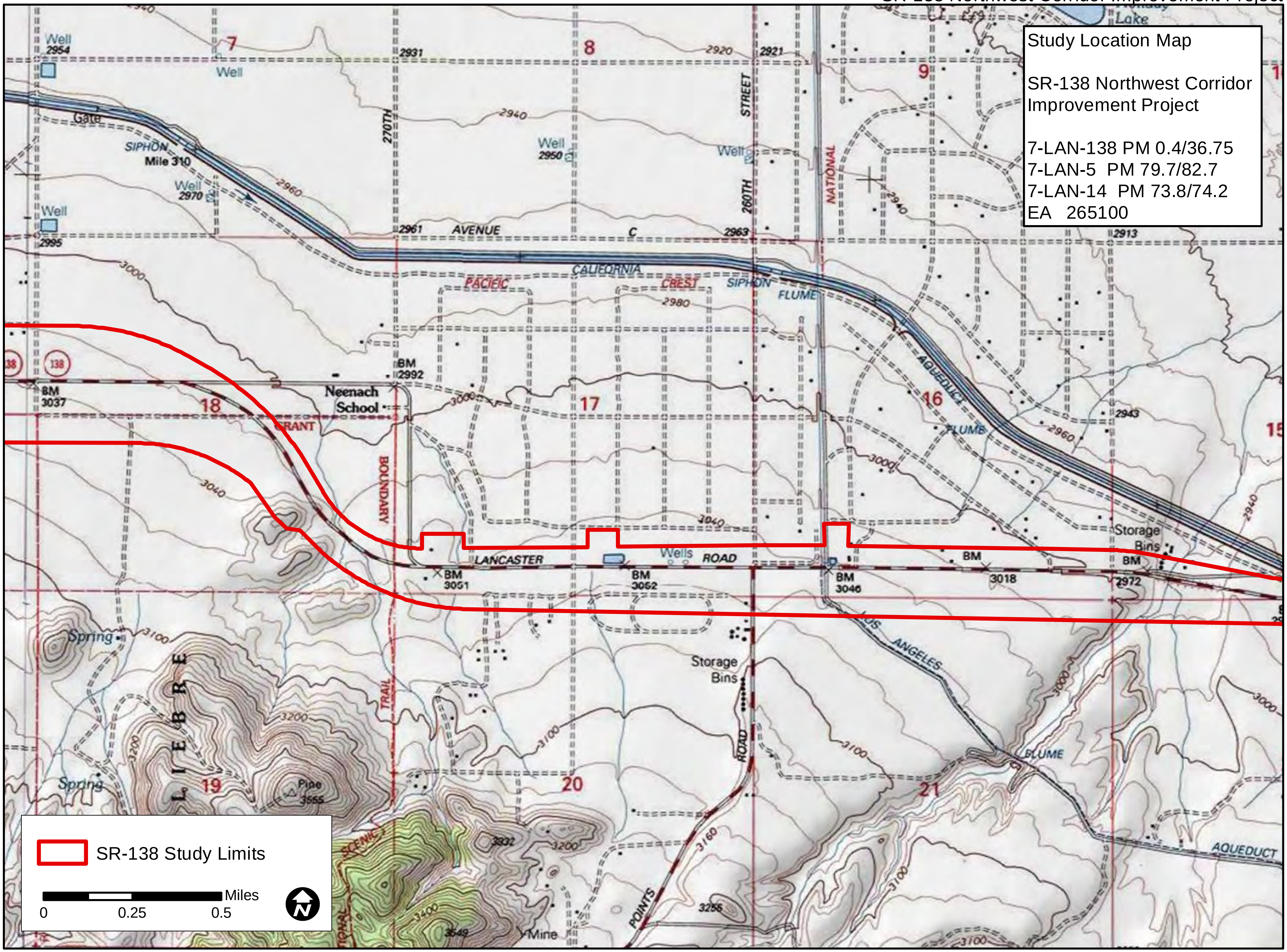

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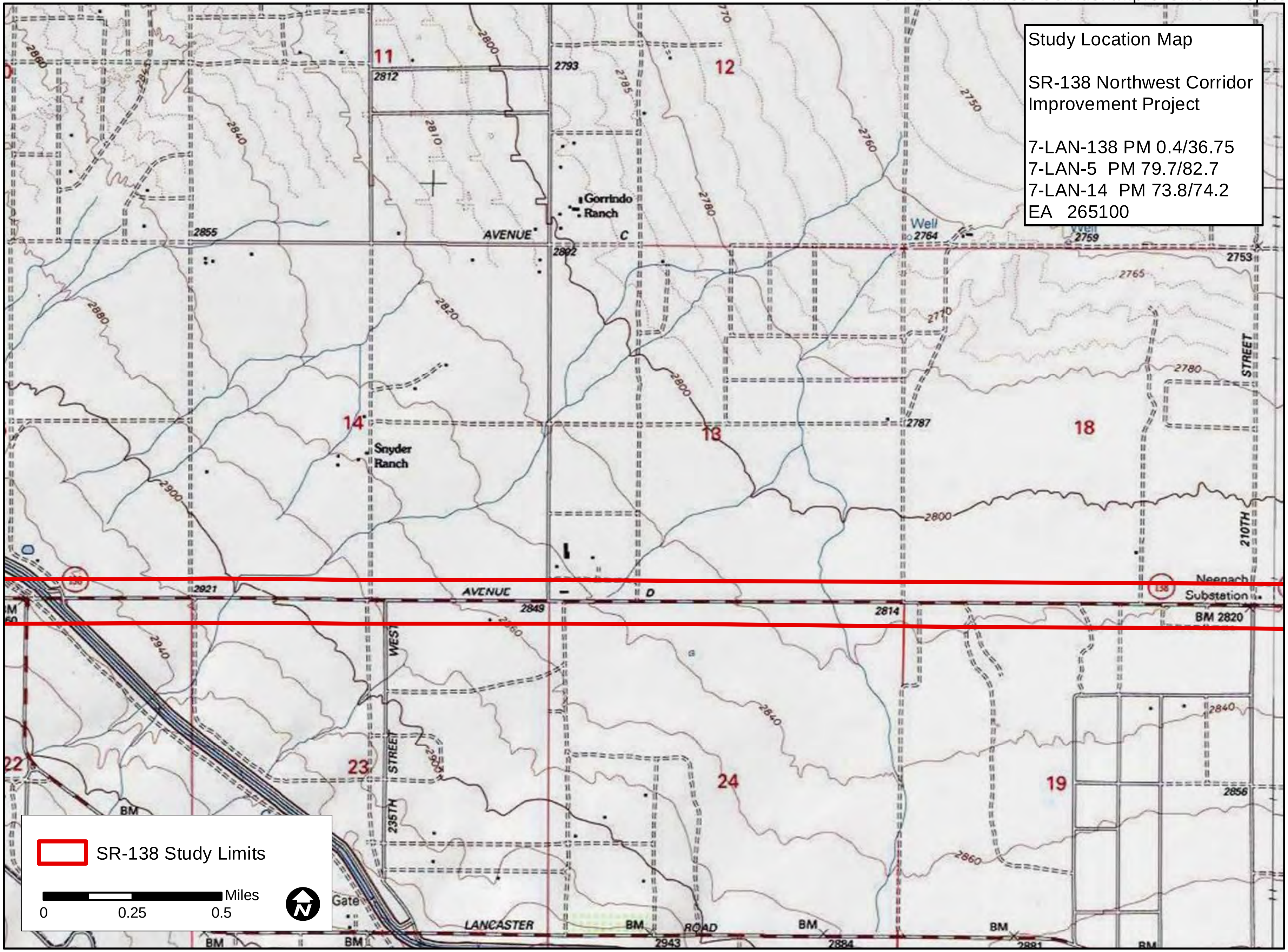

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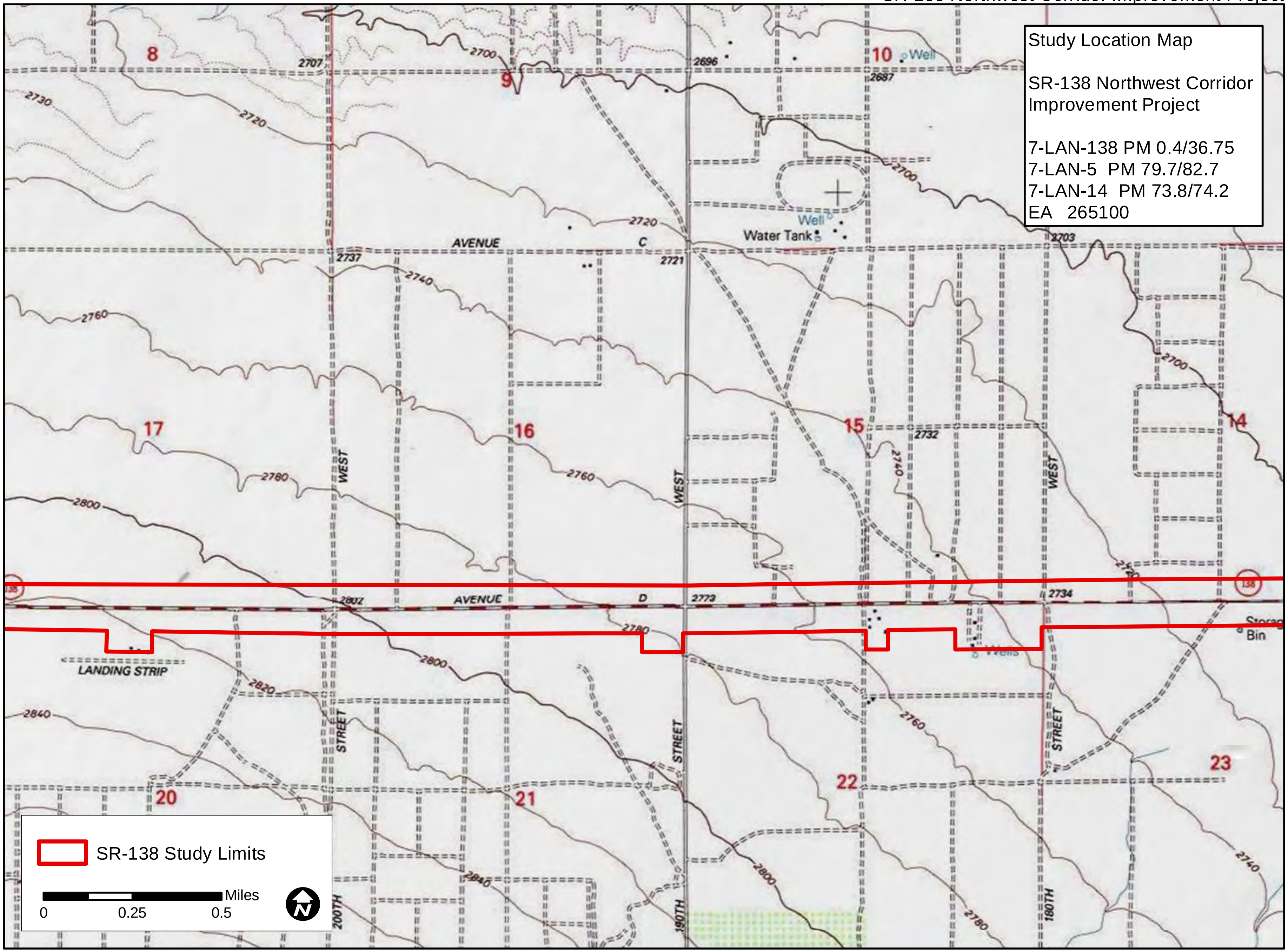
Sheet 6 of 12



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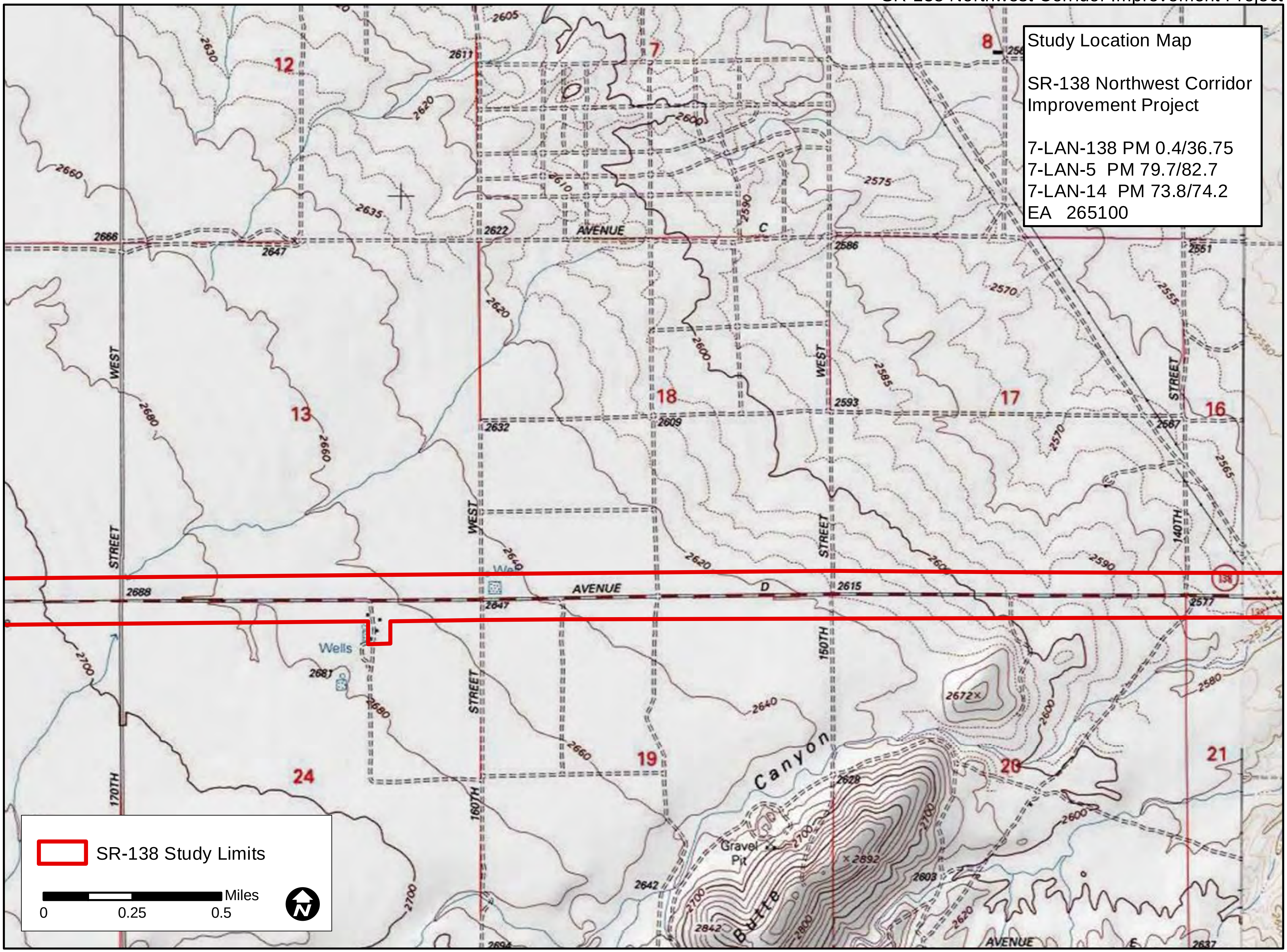
Sheet 7 of 12



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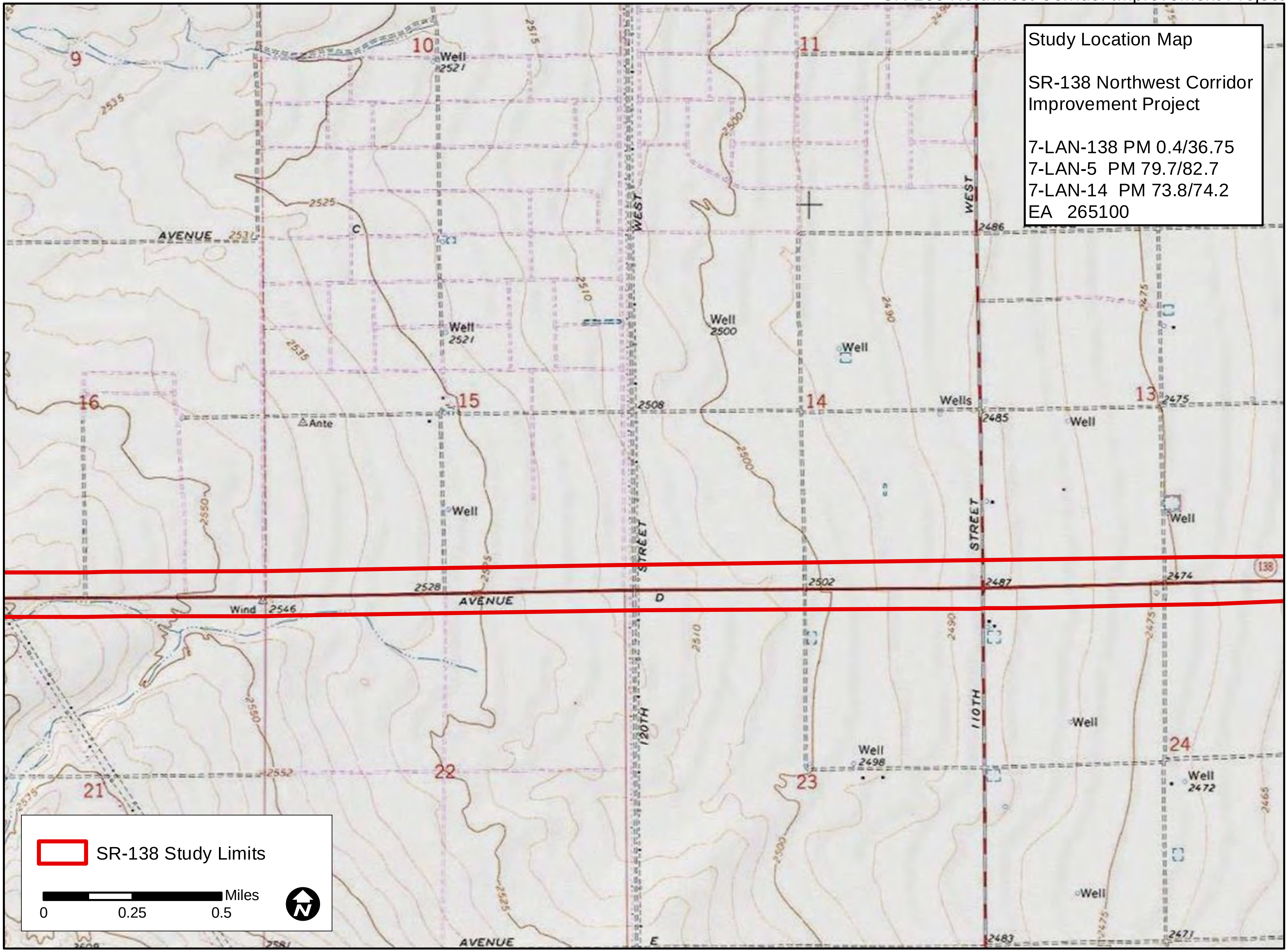
Sheet 8 of 12



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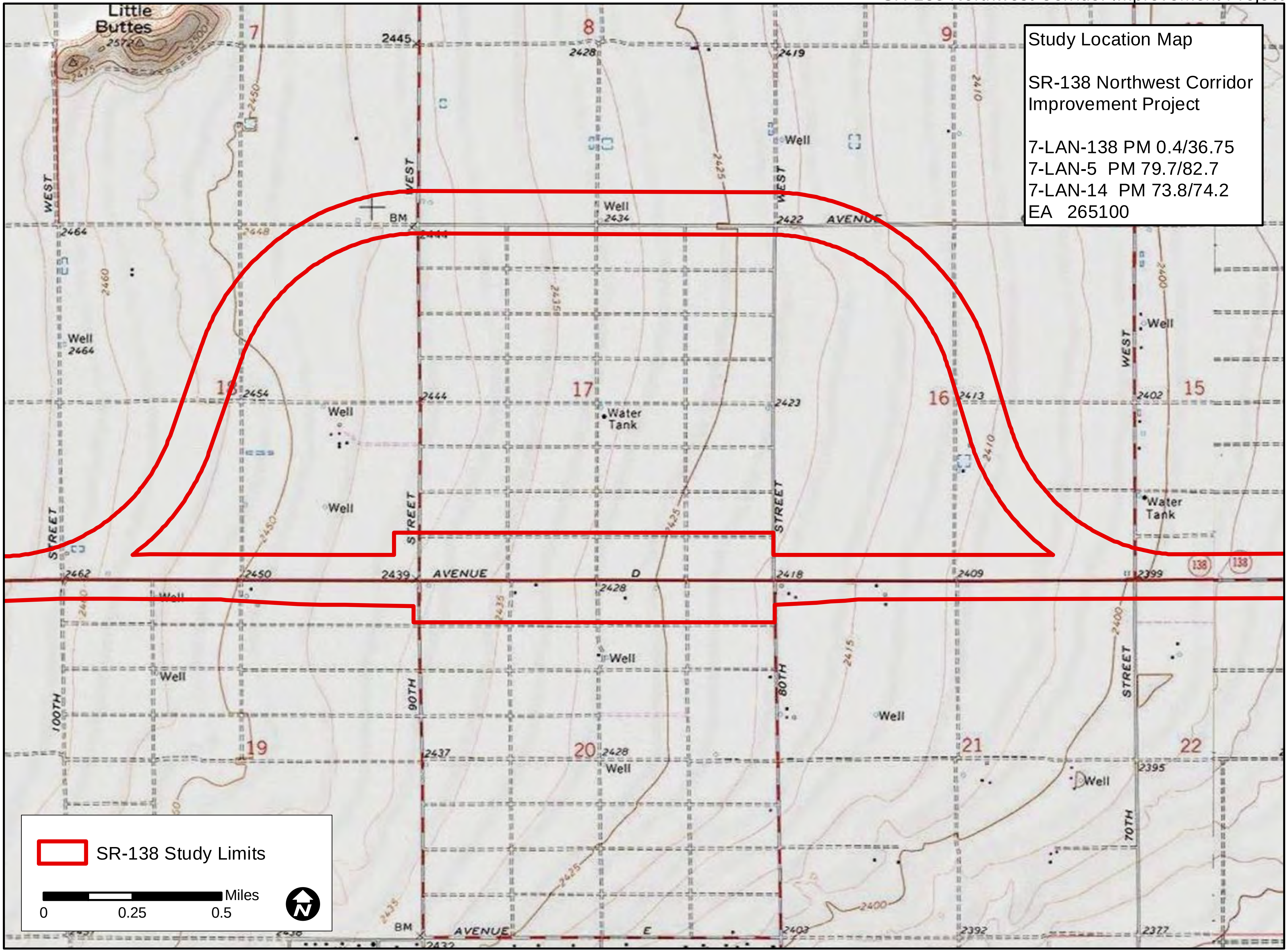

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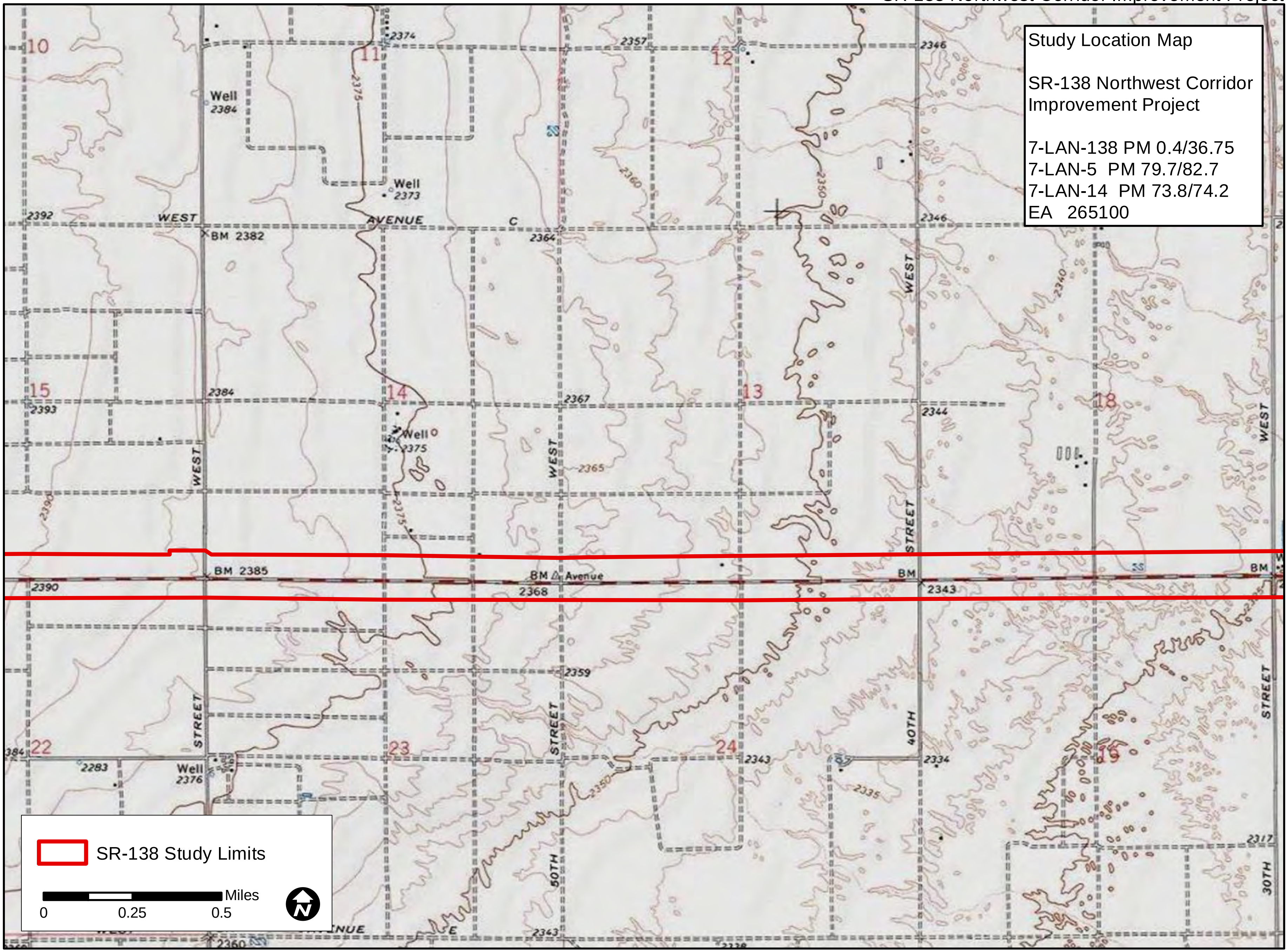
Sheet 10 of 12



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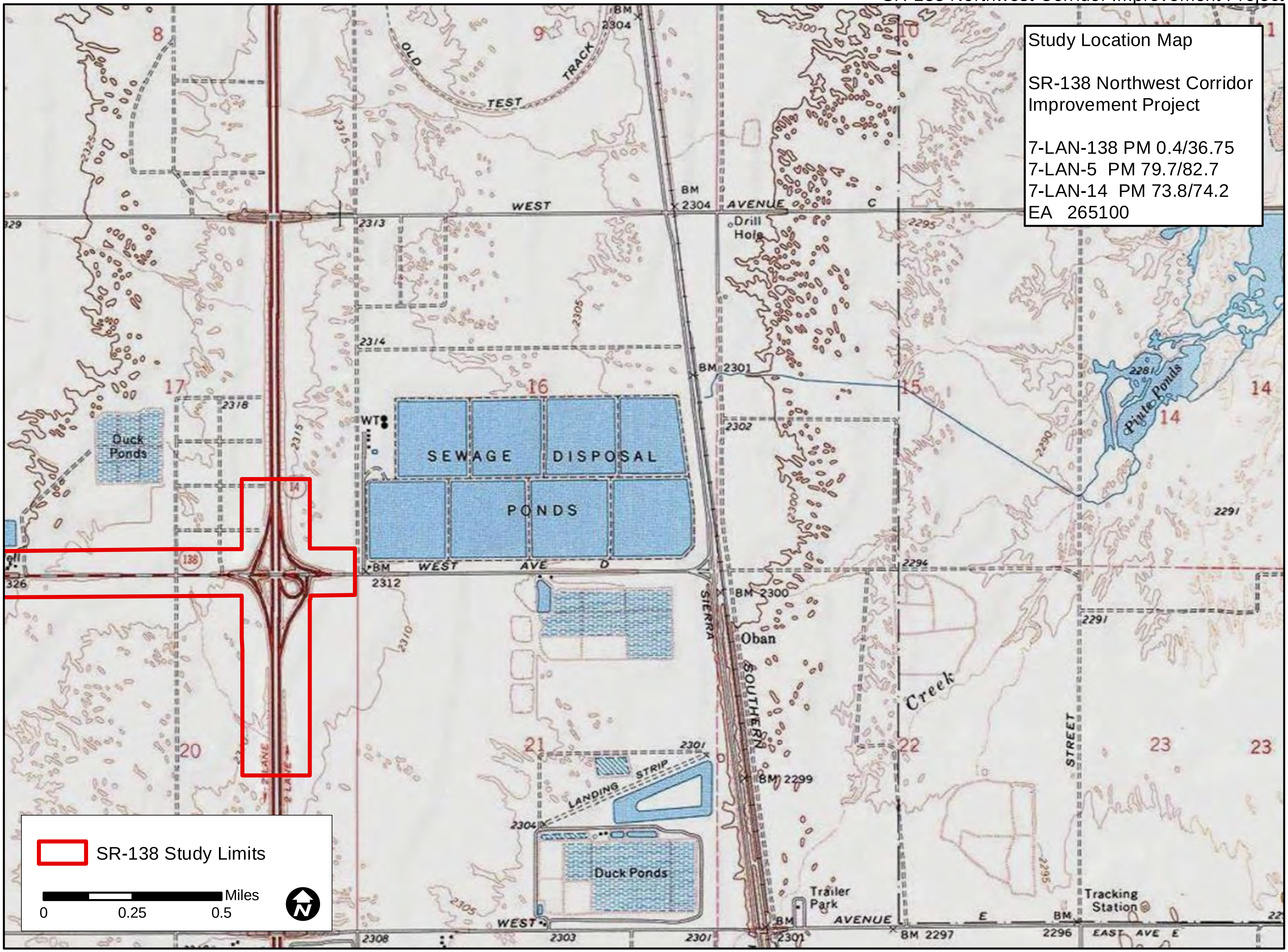
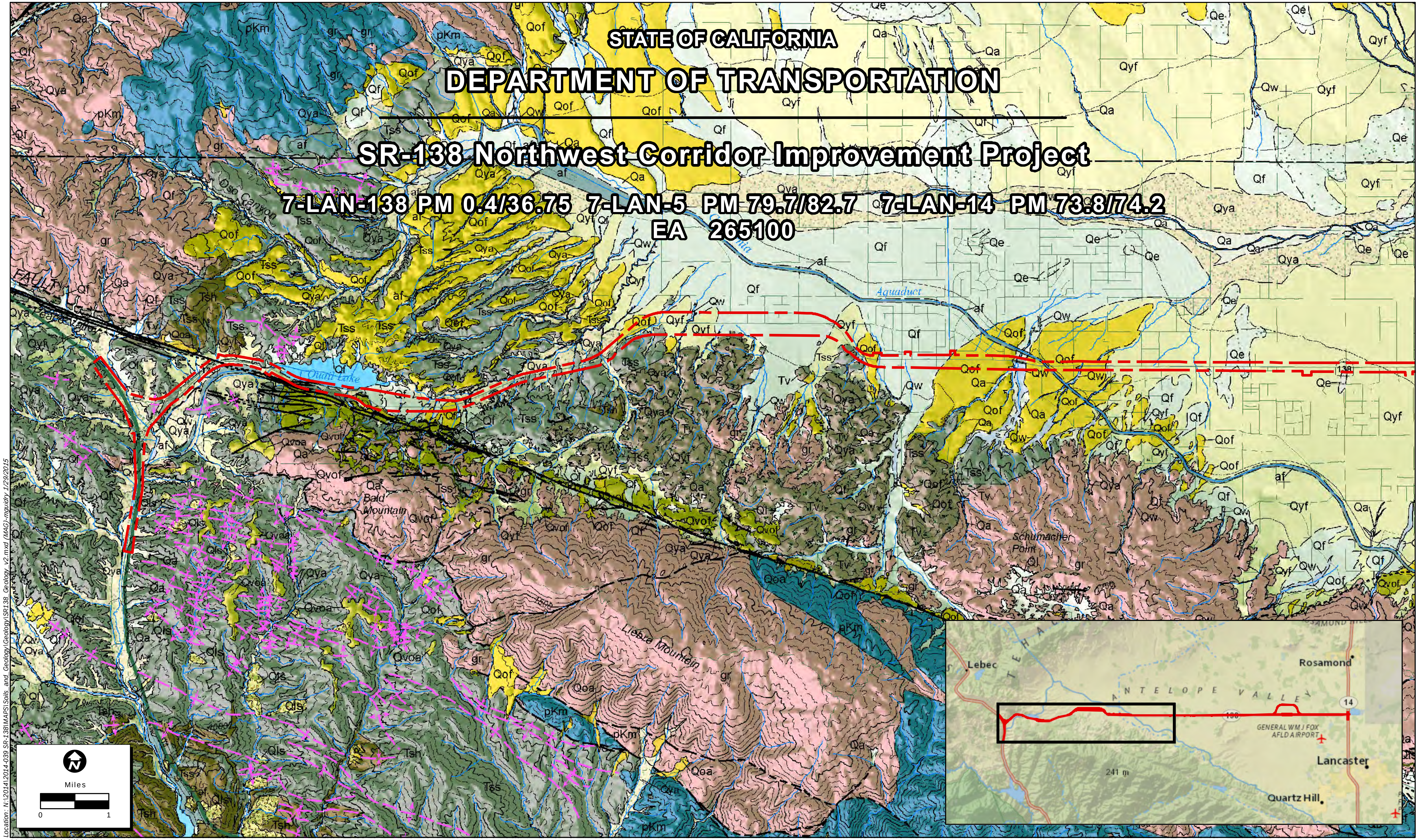


Study Location Map (USGS 7.5 Minute Lebec, La Liebre Ranch, Neenach School, Fairmont Butte, Little Buttes, Rosamond, Black Mountain, California, Quadrangle)
Sheet 12 of 12



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Source: California Department of Conservation

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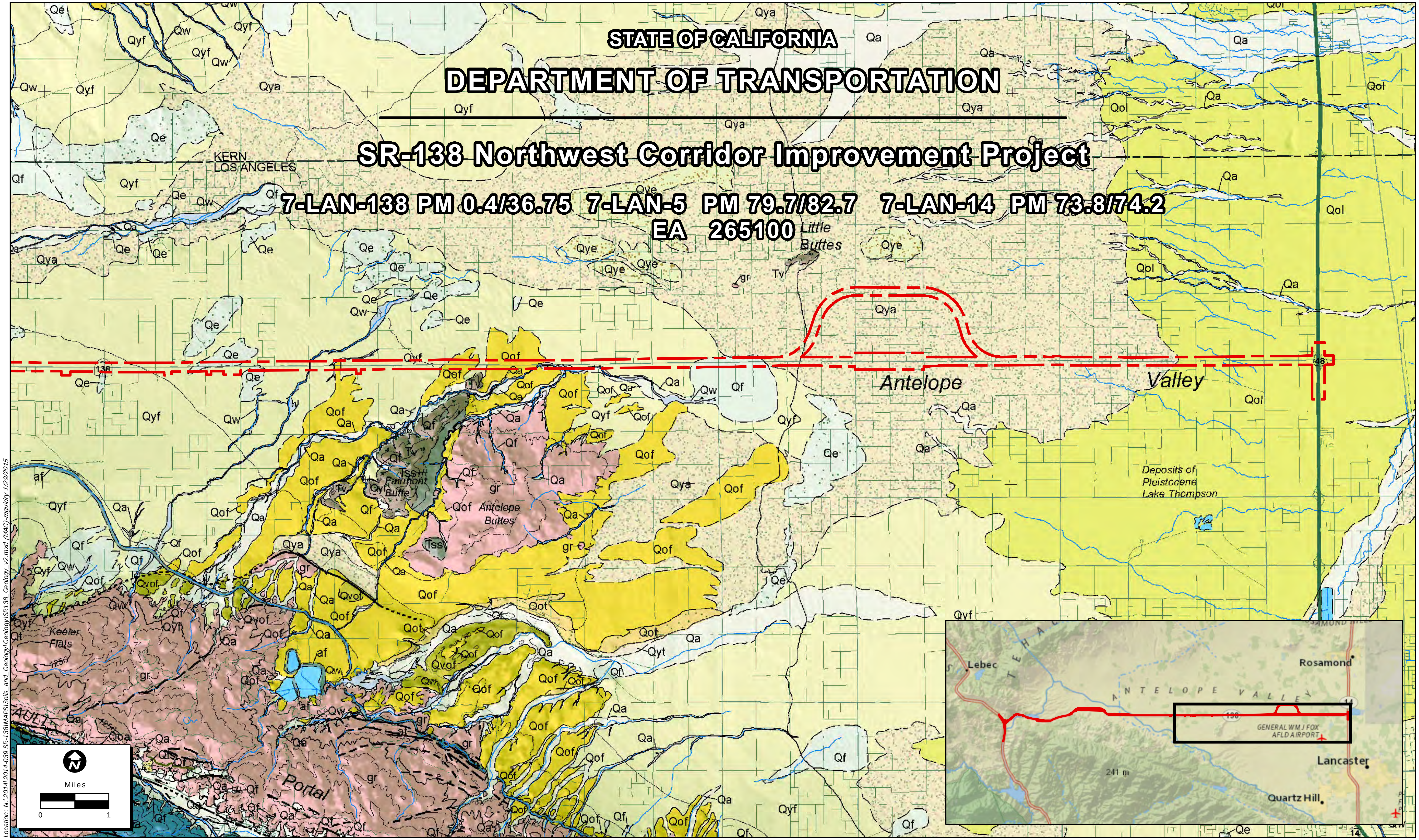
CGS Geologic Units

2014-039 SR 138



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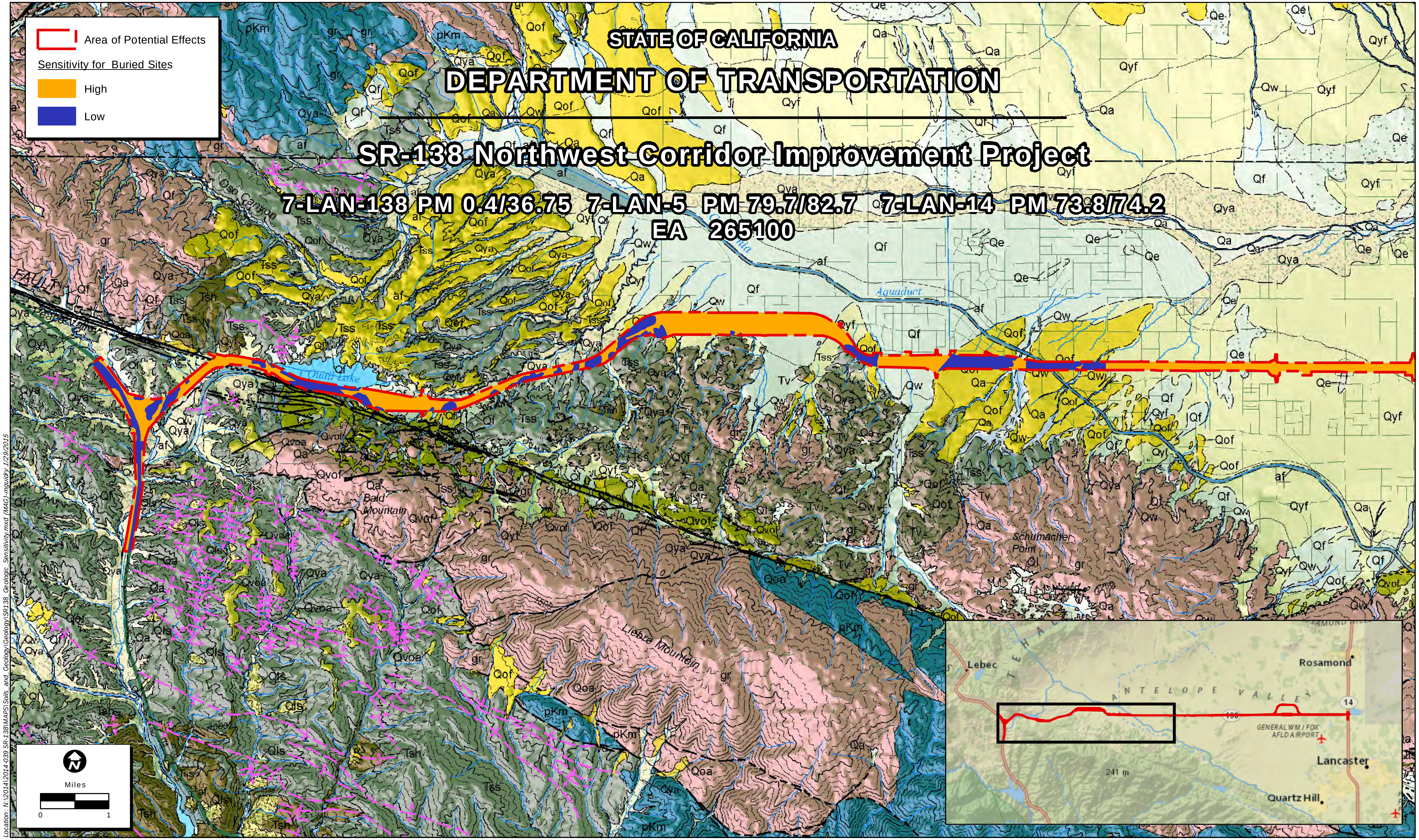

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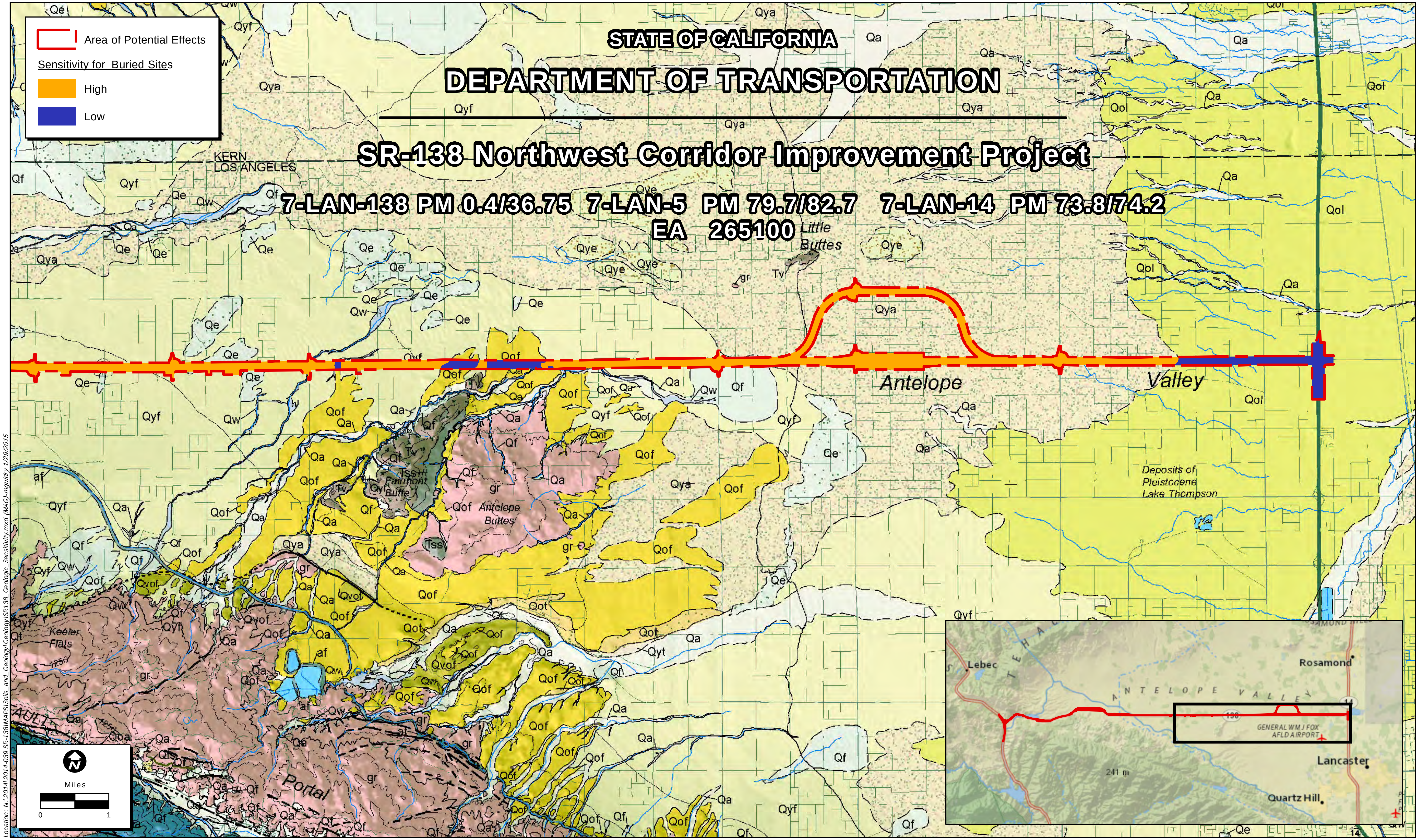
Buried Sites Sensitivity Map

2014-039 SR 138



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