Appendix F
Paleontological Resources

Appendix F-1

Segment 1 Inventory and Errata

FINAL PALEONTOLOGICAL TECHNICAL STUDY

GALE TO PISGAH SUBSTATION TELECOMMUNICATIONS LINES PROJECT

Southern California Edison Company

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1.0 EXECUTIVE SUMMARY

This report presents the results of the paleontological technical study conducted by Paleo Solutions, Inc. (Paleo Solutions) in support of the Southern California Edison Company (SCE) Gale to Pisgah Substation Telecommunications Lines Project (Project) in unincorporated San Bernardino County, California. SCE is proposing to modify or replace several telecommunication poles along the 28.7-mile long telecommunications line between the Gale and Pisgah substations, which trends parallel to Interstate 40. The telecommunication line extends from near the unincorporated Community of Daggett to Pisgah Crater in San Bernardino County. The Project area is situated on lands administered by the Bureau of Land Management (BLM) Barstow Field, encompassing approximately 5.73 miles (15.80 acres in the right-of-way) of the 28.7 total miles of the transmission line corridor; on lands administered by the United States (U.S.) Department of Defense (DOD), encompassing approximately 1.02 miles (3.08 acres); on lands administered by the State of California, encompassing approximately 0.85 miles (2.57 acres in the right-of-way); and private/undetermined property, encompassing approximately 21.06 miles (63.92 acres). All paleontological work was completed in compliance with the National Environmental Policy Act (NEPA), BLM policies and procedures, the California Environmental Quality Act (CEQA), and best practices in mitigation paleontology. All paleontological work was conducted under California BLM Paleontological Use Permit CA-16-03P (Expiration March 16, 2019) and Fieldwork Authorization FA-680-18-03 approved by the Barstow Field Office on October 31, 2017.

The paleontological potential of the Project area was evaluated based on an analysis of existing paleontological data and a Phase 1 field survey (156.86 acres at a Class III level). The three components of the analysis of existing data included a geologic map review, a literature search, and synthesis of previously conducted institutional record searches of nearby and overlapping SCE projects. The analysis of existing data was supplemented with a pedestrian field survey. Geologic mapping by Dibblee (1967, 1970, 2008a-b) and Dibblee and Bassett (1966a-b) indicates that the Project area is primarily underlain by Quaternary older (Pleistocene-age) fan deposits (Qof); younger Quaternary (Holocene-age) alluvial deposits (Qa), clay deposits (Qc), alluvial fan gravel deposits (Qf), and windblown sand (Qs); and Quaternary basalt flows of Pisgah Crater (Qb). The field survey confirmed the presence of these geologic units; however, the depth to Quaternary older (Pleistocene-age) deposits below younger Quaternary (Holocene-age) deposits (Qa, Qc, Qf, and Qs) remains unknown. Additionally, portions of the Project area have been extensively disturbed at the surface to unknown depths. Miocene to Oligocene andesite (Ta) and andesite intrusion (Tai), and Tertiary brecciated basalt (Tbb) and tuff (Tt); and Quaternary older (Pleistocene-age) alluvium (Qoa) are also mapped in the vicinity of the Project area and, while not observed during the survey, may be present subsurface.

According to the record searches, there are no previously recorded fossil localities within the Project area. However, the San Bernardino County Museum (SBCM) and the Natural History Museum of Los Angeles County (LACM) reported several vertebrate localities from Miocene to Pleistocene deposits in the Project vicinity (McLeod, 2012, 2013; Scott, 2012, 2013). Additionally, during the SCE Coolwater-Lugo transmission line survey conducted by Paleo Solutions (Paleo Solutions, 2014a-b), several nonsignificant fossil localities were observed in Pleistocene-age sediments within close proximity to the Project area for the Gale-Pisgah transmission line corridor. Although these localities were nonsignificant, they demonstrate the possibility of significant paleontological resources within the bounds of the Project area. Moreover, literature and database reviews identified numerous vertebrate, invertebrate, and plant fossils recovered from Pleistocene-age deposits elsewhere in San Bernardino County and California (Appendix D *in* Paleo Solutions, 2014c).

The Potential Fossil Yield Classification (PFYC) system was applied to the results of the analysis of existing data and field survey. Quaternary older (Pleistocene-age) fan deposits and alluvial deposits (Qof and Qoa, respectively) consist of coarse-grained sand, gravel, and cobbles at the surface; however, they also consist of fine-grained sediments at very shallow depth. Thus, Quaternary older fan and alluvial deposits have a moderate paleontological potential (PFYC 3). Younger Quaternary (Holocene-age) alluvial deposits (Qa),

clay deposits (Qc), alluvial fan gravel deposits (Qf), and windblown sand (Qs) are estimated to be less than 10,000 years old and have low paleontological potential (PFYC 2) because they are typically too young to contain *in situ* fossils. However, these younger deposits often overlie older geologic units with higher paleontological potential, which may be impacted at shallow depth. Although rare, brecciated tuffs (Tt) have the potential to contain poorly preserved paleontological resources; thus, brecciated tuff (Tt) also has a low paleontological potential (PFYC 2). Quaternary basalt flows of Pisgah Crater (Qb) and Tertiary andesite and andesite intrusions (Ta and Tai, respectively) have a very low paleontological potential (PFYC 1) because they form from the cooling of molten rock; thus, they have no potential for fossil preservation. Tertiary brecciated basalt (Tbb) also has a very low paleontological potential (PFYC 1) because brecciated basalts form during high energy volcanic eruptions not conducive for fossil preservation.

Based on the ground disturbance necessary to complete the Project, there is the potential for adverse impacts to scientifically significant paleontological resources within Quaternary older (Pleistocene-age) fan and alluvial deposits (Qof, Qoa) within the subsurface of the Project area. No fossil localities were recorded during the survey, although sediments conducive to fossilization were observed. Construction excavations that disturb Pleistocene-age sediments should be monitored by a professional paleontologist in order to reduce potential adverse impacts on scientifically important paleontological resources to a less than significant level. Prior to construction, a paleontological resource monitoring and mitigation plan (PRMMP) should be prepared. It should provide detailed recommended monitoring locations; a description of a worker training program; detailed procedures for monitoring, fossil recovery, laboratory analysis, and museum curation; and notification procedures in the event of a fossil discovery by a paleontological monitor or other project personnel. A curation agreement with the SBCM, LACM, or another accredited repository approved by the BLM Barstow Field Office must also be obtained.

Because the majority of the Project area surface is composed of younger Quaternary alluvial deposits (Qa) of varying thickness, the depth at which Quaternary older sedimentary deposits occur beneath the surface is unknown. Therefore, it is recommended that all excavations in all locations of the Project area mapped as Quaternary older fan deposits (Qof) be monitored full-time. Areas mapped as Quaternary alluvial deposits (Qa), clay deposits (Qc), alluvial fan gravel deposits (Qf), and windblown sand (Qs), and areas determined to be covered by previously disturbed sediments or artificial fill, should be spot checked during excavations that exceed depths of 5 feet to check for underlying, paleontologically sensitive Pleistocene-age deposits (e.g., Qof, Qoa). If older paleontologically sensitive deposits are observed during spot checking, full-time monitoring should be implemented in those areas. If it is determined that only previously disturbed deposits, artificial fill, and younger Quaternary deposits (Qa, Qc, Qf, Qs) are impacted, the monitoring program should be reduced or suspended. Areas mapped as Quaternary basalt flow of Pisgah Crater (Qb), Miocene to Oligocene andesite (Ta) and andesite intrusion (Tai), and Tertiary brecciated basalt (Tbb) and tuff (Tt) have a very low to low potential for paleontological resources and do not require further mitigation. Any subsurface bones or potential fossils that are unearthed during construction should be evaluated by a professional paleontologist.

2.0 INTRODUCTION

This report presents the results of the paleontological technical study conducted by Paleo Solutions in support of the SCE Gale to Pisgah Substation Telecommunications Lines Project in unincorporated San Bernardino County, California (Figure 1). All paleontological work was completed in compliance with NEPA, BLM policies and procedures, CEQA, and best practices in mitigation paleontology (Murphey et al., 2014). All paleontological work was conducted under California BLM Paleontological Use Permit CA-16-03P (Expiration March 16, 2019) and Fieldwork Authorization FA-680-18-03 approved by the Barstow Field Office on October 31, 2017.

2.1 PROJECT LOCATION

The Project area is situated along Interstate 40 and the National Trails Highway (Historic Route 66) between the unincorporated Community of Daggett and Pisgah Crater in San Bernardino County. It encompasses approximately 60 acres and is mapped on the United States Geologic Survey (USGS) Daggett, Newberry, and Cady Mountains 7.5' Topographic Quadrangles. The Project is situated along lands administered by the BLM, the DOD, the State of California, and private/undetermined ownership.

The Project area is situated on lands administered by the BLM Barstow Field Office in Sections 5, 10, and 12 of Township 8 North, Range 4 East; Sections 7, 13 through 15, and 18 of Township 8 North, Range 5 East; Sections 18 and 19 of Township 8 North, Range 6 East; Section 26 of Township 9 North, Range 1 East; and Sections 30 through 32 of Township 9 North, Range 3 East, encompassing approximately 5.73 miles (15.80 acres) of the 28.7 total miles of the transmission line corridor. The portion of the Project area administered by the DOD is located in Section 9, Township 8 North, Range 4 East, encompassing approximately 1.02 miles (3.08 acres). The Project area is also situated on lands administered by State of California in Sections 22, 23, and 26 of Township 9 North, Range 1 East; and Section 26 of Township 9 North, Range 2 East, encompassing approximately 0.85 miles (2.57 acres) of the total length of the transmission line corridor. The remainder of the line is situated along private/undetermined property, encompassing approximately 21.06 miles (63.92 acres) of the total corridor length, and is situated in Sections 1 through 3 of Township 8 North, Range 3 East; Sections 4 through 6 and Sections 10 through 12 of Township 8 North, Range 4 East; Sections 13 and 15 through 18 of Township 8 North, Range 5 East; Section 18 of Township 8 North, Range 6 East; Sections 22, 25, and 26 of Township 9 North, Range 1 East; Sections 25 through 30 of Township 9 North, Range 2 East; and Sections 30 through 34 of Township 9 North, Range 3 East.

Geologic mapping by Dibblee (1967, 1970, 2008a-b) and Dibblee and Bassett (1966a-b) indicate that the Project area is underlain by Quaternary older fan deposits (Qof), Quaternary basalt flows of Pisgah Crater (Qb), Quaternary alluvial deposits (Qa), Quaternary windblown sand deposits (Qs), Quaternary clay deposits (Qc), and Quaternary alluvial fan gravel deposits (Qf) (Appendix A).

2.2 PROJECT DESCRIPTION

SCE is proposing to modify or replace several telecommunication poles along the 28.7-mile long telecommunications line between the Gale and Pisgah substations, which trends parallel to Interstate 40.

Pursuant to federal, state, and local environmental regulations, SCE requested a paleontological inventory and assessment of the Project area to study the potential impact that ground-disturbing activities will have on significant paleontological resources. This report presents the findings and results of that investigation.

Table 1. Gale to Pisgah Substation Telecommunications Lines Project Summary

Project Name	Gale to Pisgah Substation Telecommunications Lines Project			
Project Description	Southern California Edison Company (SCE) is proposing to modify or replace several telecommunication poles along the 28.7-mile long telecommunications line between the Gale and Pisgah substations, which trends parallel to Interstate 40. Pursuant to federal, state, and local environmental regulations, SCE requested a paleontological inventory and assessment of the Project area to study the potential impact that ground-disturbing activities will have on significant paleontological resources.			
Project Area	The Project area is situated along the Interstate 40 and the National Trails Highway (Historic Route 66) between the unincorporated Community of Daggett and Pisgah Crater in San Bernardino County.			
Total Mileage	28.7 miles			
Location (PLSS)	**Quarter-Quarter**	**Section**	**Township**	**Range**
	SESE, NENE, NWNW, SWNW, NESW, NWSE, SESE, SWSE	5, 9, 10, 12	8N	4E
	SESE, SWSE, L 1, L 2, NWSW, NESE, NESW, NWSE, NWSW, SWNW, SENE, SENW, SWNE, SWNW, NENE	7, 13, 14, 15, 18	8N	5E
	NESE, SESE, SWSE, L 1, L 1, L 2, NESE, NWNE, NWNE, L 1, L 1	18, 19	8N	6E
	NENE, NWNE, NWNE	26	9N	1E
	L 2, NENE, NENW, L 131, L 138, SWNW	30, 31, 32	9N	3E
	NESE, NWSW, SESW, SWSE, SWSW, NWSW, NWNE	22, 23, 26	9N	1E
	SWSE	26	9N	2E
	NESE, NWSE, SENW, SWNE, SWNW, SENE, SWNE, L 2, L 3, L 4, L 1, L 2, L 3	1, 2, 3	8N	3E
	SWSW, SESE, SESW, SWSE, SWSW, SWSW, SWSW, L 2, NESE, NWSE, SESE, L 1, L 2, NENE, NENW, NWNE, NWNW, SENE, SENW, SWNE, SWNW, NESE, NESW, NWSE, SENW, SWNW, NESW, NWSW	4, 5, 6, 9, 10, 11, 12	8N	4E
	NESW, NWSE, NWSW, SESE, SWSE, SWNW, NENW, NWNW, SENE, SENW, SWNE, NENE, NENW, NWNE, NWNW, NENE	13, 15, 16, 17, 18	8N	5E
	L 2	18	8N	6E
	NESE, NESW, NWSE, SENW, NENE, NENW, NWNE, NWNW, NENE, NWNW, NENE	22, 25, 26	9N	1E
	SESE, SESW, SWSE, SWSW, NESW, NWSE, NWSW, SESE, SWSE, NESE, NESW, NWSE, SENW, SWNW, SENE, SENW, SWNE, SWNW, NENE, NENW, NWNE, NWNW, SENE, NENE, SWNE, L 1, L 2	25, 26, 27, 28, 29, 30	9N	2E
	L 2, L 2, NENE, NENW, NWNE, NESE, SENE, SENW, SWNE, SWNW, NESE, NESW, NWSE, NWSW, NWSW, SESW, SWSW, SESW	30, 31, 32, 33, 34	9N	3E
Land Owner	**Surface Management Agency**	**Miles**		
	Federal (BLM)	5.73		
	Federal (DOD)	1.02		
	State of California	0.85		

	Privately Owned/Undetermined		21.06	
Topographic Map(s)	USGS Daggett, Newberry, and Cady Mountains 7.5' Topographic Quadrangles			
Geologic Map(s)	Geologic Map of the Barstow & Daggett 15' Quadrangles, San Bernardino County, California, scale 1:62,500 (Dibblee, 2008a); Geologic Map of Newberry & Cady Mountain 15' Quadrangles, San Bernardino County, California, scale 1:62,500 (Dibblee, 2008b).			
Mapped Geologic Unit(s) and age(s)	**Geologic Unit**	**Map Symbol**	**Age**	**Paleontological Potential (PFYC)**
	Quaternary Alluvial Deposits	Qa	Holocene	2 (Low)
	Quaternary Clay Deposits	Qc	Holocene	2 (Low)
	Quaternary Alluvial Fan Gravel Deposits	Qf	Holocene	2 (Low)
	Quaternary Windblown Sand Deposits	Qs	Holocene	2 (Low)
	Quaternary Older Fan Deposits	Qof	Holocene to Pleistocene	3 (Moderate)
	Quaternary Older Alluvial Deposits	Qoa	Holocene to Pleistocene	3 (Moderate)
	Quaternary Basalt Flows of Pisgah Crater	Qb	Quaternary	1 (Very Low)
	Tertiary Brecciated Basalt	Tbb	Tertiary	1 (Very Low)
	Tertiary Brecciated Tuff	Tt	Tertiary	2 (Low)
	Tertiary Andesite	Ta	Miocene to Oligocene(?)	1 (Very Low)
	Tertiary Andesite Intrusion	Tai	Miocene to Oligocene(?)	1 (Very Low)
Surveyor(s)	Mathew Carson, M.S., and Joseph Raum, B.S.			
Date(s) Surveyed	November 09, 2017			
Formations Surveyed	Quaternary Alluvial Deposits (Qa), Quaternary Clay Deposits (Qc), Quaternary Alluvial Fan Gravel Deposits (Qf), Quaternary Windblown Sand Deposits (Qs), Quaternary Older Fan Deposits (Qof)			
Permits	California BLM Paleontological Use Permit CA-16-03P (Expiration March 16, 2019) and Fieldwork Authorization FA-680-18-03 (dated October 31, 2017).			
Previously Documented Fossil Localities within the Project area	Museum records searches from San Bernardino County Museum (SBCM) and the Natural History Museum of Los Angeles County (LACM) were conducted during previous Paleo Solutions investigations for SCE projects, such as the Jasper Transmission Line and the Coolwater-Lugo Transmission Line projects, which overlap the Gale-Pisgah Project area (Paleo Solutions, 2013, 2014a-c). Museum records searches do not document any fossil localities within the bounds of the Project area. Numerous fossil localities have been recovered from within the vicinity of the Project area in sediments of Miocene-, Pleistocene-, and Holocene-age, as well as in other comparable sediments from within San Bernardino County and California; however, these databases have no fossil localities within the bounds of the Project area. During surveys for the Coolwater-Lugo Transmission Line Project (Paleo Solutions, 2014a-c), Paleo Solutions field staff recorded several nonsignificant fossil occurrences, which included Miocene-aged plant impressions and fossil bone and tooth fragments, and bone fragments from Pleistocene-aged alluvial deposits in close proximity to the Gale Pisgah transmission line corridor. While these fossils were not collected, they demonstrate the			

	possibility that scientifically significant paleontological resources may be present in undisturbed sediments within the footprint of the Project area.
Paleontological Results	No paleontological resources were discovered during the survey. Therefore, no fossils were collected.
Disposition of Fossils	Not applicable; no fossils observed or collected during survey.
Recommendation(s)	Construction excavations that disturb Quaternary older (Pleistocene-age) sediments should be monitored by a professional paleontologist in order to reduce potential adverse impacts on scientifically important paleontological resources to a less than significant level. Prior to construction, a paleontological resource monitoring and mitigation plan (PRMMP) should be prepared. It should provide detailed recommended monitoring locations; a description of a worker training program; detailed procedures for monitoring, fossil recovery, laboratory analysis, and museum curation; and notification procedures in the event of a fossil discovery by a paleontological monitor or other project personnel. A curation agreement with SBCM, LACM, or another accredited repository approved by the BLM Barstow Field Office must also be obtained. The field survey confirmed the presence of very low to moderate paleontological potential for the sedimentary units within the Project area. Therefore, it is recommended that all excavations in areas mapped as Quaternary older fan deposits (Qof) (PFYC 3) be monitored full-time. Areas mapped as Quaternary alluvium, clay, alluvial fan gravel, and windblown sand (Qa, Qc, Qf, and Qs, respectively), and areas determined to be covered by previously disturbed sediments or artificial fill, should be spot checked during excavations that exceed depths of 5 feet to check for underlying, paleontologically sensitive older sedimentary deposits. If older paleontologically sensitive deposits are observed during spot checking (e.g., Quaternary older fan deposits [Qof] and Quaternary older alluvium [Qoa]), full time monitoring should be implemented in those areas. If it is determined that only previously disturbed sediments, artificial fill, or younger Quaternary deposits (Qa, Qc, Qf, and Qs) are impacted, then the monitoring program should be reduced or suspended. Igneous rocks, such as Quaternary basalt flow deposits of Pisgah Crater (Qb), Miocene- to Oligocene-age andesite (Ta) and andesite intrusion (Tai), and Tertiary brecciated basalt (Tbb) and tuff (Tt), have very low to low potential to contain scientifically significant paleontological resources; thus, no monitoring is required in these geologic units. Any subsurface bones or potential fossils that are unearthed during construction should be evaluated by a professional paleontologist

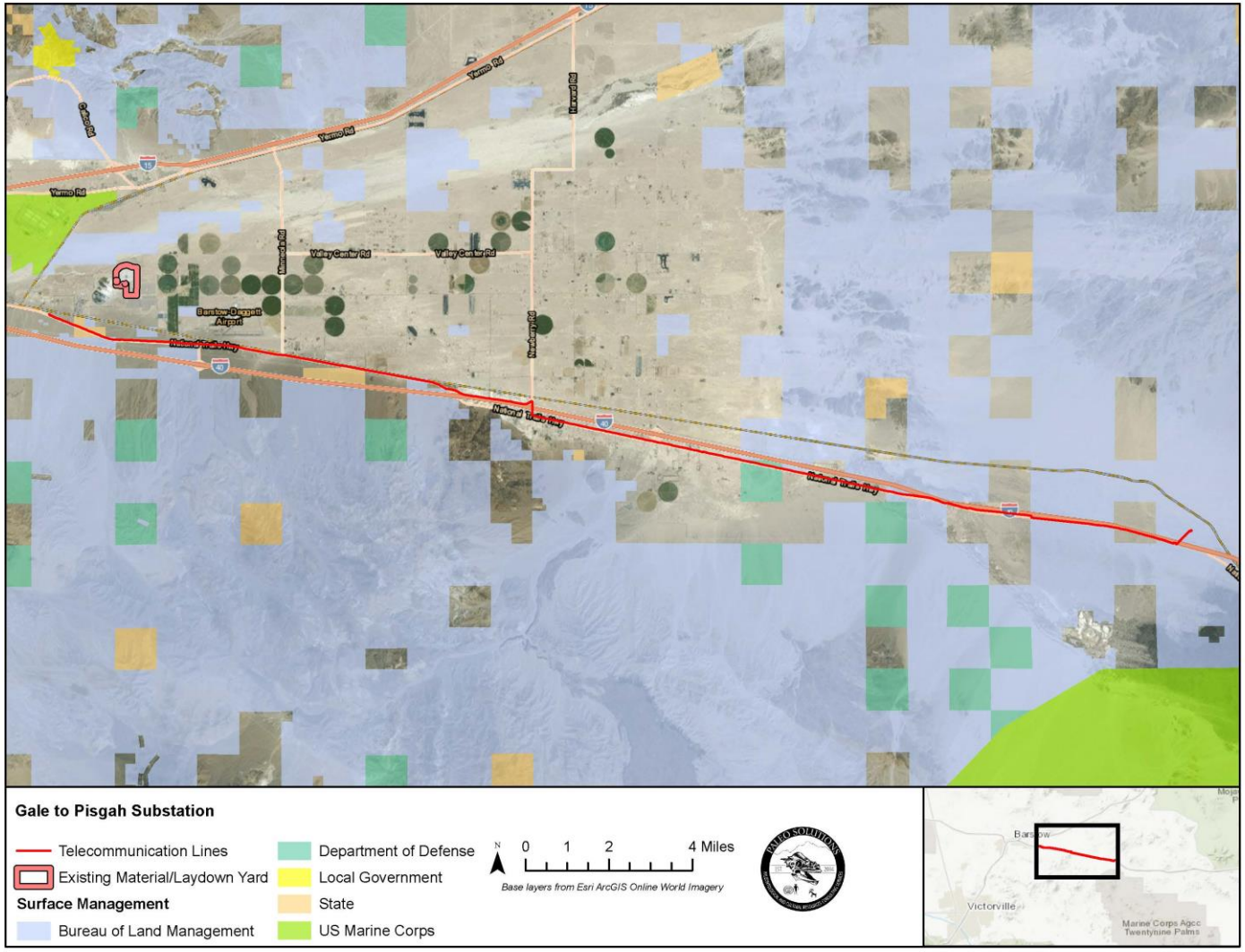

Figure 1. Project location map.

3.0 DEFINITION AND SIGNIFICANCE OF PALEONTOLOGICAL RESOURCES

As defined by Murphey and Daitch (2007): "Paleontology is a multidisciplinary science that combines elements of geology, biology, chemistry, and physics in an effort to understand the history of life on earth. Paleontological resources, or fossils, are the remains, imprints, or traces of once-living organisms preserved in rocks and sediments. These include mineralized, partially mineralized, or unmineralized bones and teeth, soft tissues, shells, wood, leaf impressions, footprints, burrows, and microscopic remains. Paleontological resources include not only fossils themselves, but also the associated rocks or organic matter and the physical characteristics of the fossils' associated sedimentary matrix.

The fossil record is the only evidence that life on earth has existed for more than 3.6 billion years. Fossils are considered non-renewable resources because the organisms they represent no longer exist. Thus, once destroyed, a fossil can never be replaced. Fossils are important scientific and educational resources because they are used to:

- Study the phylogenetic relationships amongst extinct organisms, as well as their relationships to modern groups;
- Elucidate the taphonomic, behavioral, temporal, and diagenetic pathways responsible for fossil preservation, including the biases inherent in the fossil record;
- Reconstruct ancient environments, climate change, and paleoecological relationships;
- Provide a measure of relative geologic dating that forms the basis for biochronology and biostratigraphy, and which is an independent and corroborating line of evidence for isotopic dating;
- Study the geographic distribution of organisms and tectonic movements of land masses and ocean basins through time;
- Study patterns and processes of evolution, extinction, and speciation; and
- Identify past and potential future human-caused effects to global environments and climates."

Fossil resources vary widely in their relative abundance and distribution and not all are regarded as significant. According to BLM Instructional Memorandum (IM) 2009-011, a "Significant Paleontological Resource" is defined as:

> "Any paleontological resource that is considered to be of scientific interest, including most vertebrate fossil remains and traces, and certain rare or unusual invertebrate and plant fossils. A significant paleontological resource is considered to be of scientific interest if it is a rare or previously unknown species, it is of high quality and well-preserved, it preserves a previously unknown anatomical or other characteristic, provides new information about the history of life on earth, or has an identified educational or recreational value. Paleontological resources that may be considered not to have scientific significance include those that lack provenience or context, lack physical integrity due to decay or natural erosion, or that are overly redundant or are otherwise not useful for research. Vertebrate fossil remains and traces include bone, scales, scutes, skin impressions, burrows, tracks, tail drag marks, vertebrate coprolites (feces), gastroliths (stomach stones), or other physical evidence of past vertebrate life or activities" (BLM, 2008).

Vertebrate fossils, whether preserved remains or track ways, are classified as significant by most state and federal agencies and professional groups (and are specifically protected under the California Public Resources Code). In some cases, fossils of plants or invertebrate animals are also considered significant and can provide important information about ancient local environments.

The full significance of fossil specimens or fossil assemblages cannot be accurately predicted before they are collected, and in many cases, before they are prepared in the laboratory and compared with previously collected fossils. Pre-construction assessment of significance associated with an area or formation must be made based on previous finds, characteristics of the sediments, and other methods that can be used to determine paleoenvironmental and taphonomic conditions.

4.0 LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

This section of the report presents the regulatory requirements pertaining to paleontological resources that apply to this Project.

4.1 FEDERAL REGULATORY SETTING

If any federal funding is used to wholly or partially finance a project, it is sited on federal lands, involves a federal permit, and/or includes a perceived federal impact, federal laws and standards apply, and an evaluation of potential impacts on paleontological resources may be appropriate and/or required. The management and preservation of paleontological resources on public and federal lands are prescribed under various laws, regulations, and guidelines.

4.1.1 National Environmental Policy Act (16 USC Section 431 et seq.)

The National Environmental Policy Act of 1969, [NEPA] as amended (Public Law [Pub. L.] 91-190, 42 United States Code [USC] 4321-4347, January 1, 1970, as amended by Pub. L. 94-52, July 3, 1975, Pub. L. 94-83, August 9, 1975, and Pub. L. 97-258 § 4(b), Sept. 13, 1982) recognizes the continuing responsibility of the Federal Government to "preserve important historic, cultural, and natural aspects of our national heritage . . ." (Sec. 101 [42 USC § 4321]) #382). With the passage of the Paleontological Resources Preservation Act (PRPA) (2009), paleontological resources are considered to be a significant resource and it is therefore now standard practice to include paleontological resources in NEPA studies in all instances where there is a possible impact.

4.1.2 Antiquities Act of 1906

The Antiquities Act of 1906 (16 USC 431-433) states, in part:

> That any person who shall appropriate, excavate, injure or destroy any historic or prehistoric ruin or monument, or any object of antiquity, situated on lands owned or controlled by the Government of the United States, without the permission of the Secretary of the Department of the Government having jurisdiction over the lands on which said antiquities are situated, shall upon conviction, be fined in a sum of not more than five hundred dollars or be imprisoned for a period of not more than ninety days, or shall suffer both fine and imprisonment, in the discretion of the court.

Although there is no specific mention of natural or paleontological resources in the Act itself, or in the Act's uniform rules and regulations (Title 43 Part 3, Code of Federal Regulations [43 CFR 3]), the term "objects of antiquity" has been interpreted to include fossils by the National Park Service (NPS), the BLM, the Forest Service (FS), and other federal agencies. Permits to collect fossils on lands administered

by federal agencies are authorized under this Act. However, due to the large gray areas left open to interpretation due to the imprecision of the wording, agencies are hesitant to interpret this act as governing paleontological resources.

4.1.3 Federal Land Management and Policy Act (FLMPA) (43 USC 1701)

Federal law including the Federal Land Management and Policy Act (FLMPA) of 1976 (43 USC 1701) includes objectives such as the evaluation, management, protection and location of fossils on BLM-managed lands, defines fossils, and lays out penalties for the destruction of significant fossils. Also, NEPA requires the preservation of "historic, cultural, and natural aspects of our national heritage." Most recently, the Omnibus Public Lands Act refines NEPA and FLMPA guidelines and strictures, as well as outlines minimum punishments for removal or destruction of fossils from Federal/public lands (see below).

4.1.4 Paleontological Resources Preservation Act (PRPA)

Paleontological Resources Preservation, Title VI, Subtitle D in the Omnibus Public Lands Act of 2009, Public Law 111-011 Purpose: The Secretary (Interior and Agriculture) shall manage and protect paleontological resources on Federal land using scientific principles and expertise. With the passage of the PRPA, Congress officially recognizes the importance of paleontological resources on federal lands (U.S. Department of the Interior, US Department of Agriculture) by declaring that fossils from federal lands are federal property that must be preserved and protected using scientific principles and expertise. The PRPA provides:

- Uniform definitions for "paleontological resources" and "casual collecting";
- Uniform minimum requirements for paleontological resource use permit issuance (terms, conditions, and qualifications of applicants);
- Uniform criminal and civil penalties for illegal sale and transport, and theft and vandalism of fossils from Federal lands; and
- Uniform requirements for curation of federal fossils in approved repositories.

4.2 STATE REGULATORY SETTING

4.2.1 California Environmental Quality Act (CEQA)

The procedures, types of activities, persons, and public agencies required to comply with the CEQA are defined in the Guidelines for Implementation of CEQA (State CEQA Guidelines), as amended on March 18, 2010 (Title 14, Section 15000 et seq. of the California Code of Regulations) and further amended January 4th, 2013. One of the questions listed in the CEQA Environmental Checklist is: "Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?" (State CEQA Guidelines Section 15064.5 and Appendix G, Section V, Part C).

4.2.2 State of California Public Resources Code

The State of California Public Resources Code (Chapter 1.7), Sections 5097 and 30244, includes additional state level requirements for the assessment and management of paleontological resources. These statutes require reasonable mitigation of adverse impacts to paleontological resources resulting from development on state lands, and define the excavation, destruction, or removal of paleontological "sites" or "features" from public lands without the express permission of the jurisdictional agency as a misdemeanor. As used in Section 5097, "state lands" refers to lands owned by, or under the jurisdiction of, the state or any state agency. "Public lands" is defined as lands owned by, or under the jurisdiction of, the state, or any city, county, district, authority, or public corporation, or any agency thereof.

4.3 LOCAL REGULATORY SETTING

4.3.1 San Bernardino County

The Conservation Element of the San Bernardino County General Plan (2007) contains one goal (CO 3) and one map (Paleontologic Resources Overlay Map, noted in the General Plan as "not available yet"), as well as three programs regarding paleontological resources within the County. Goal CO 3 requires that the County will preserve and promote its historic and prehistoric cultural heritage. Three programs within the General Plan delineate the required County actions regarding paleontological resources. In areas of unknown paleontological potential, field surveys prior to grading will be required to establish the need for paleontologic monitoring. Projects requiring grading plans that are located in areas of known fossil occurrences, or demonstrated in a field survey to have fossils present, will have all rough grading (cuts greater than 3 feet) monitored by trained paleontologic crews working under the direction of a qualified professional, so that fossils exposed during grading can be recovered and preserved. Fossils include large and small vertebrate fossils; the latter recovered by screen washing of bulk samples.

Finally, a report of findings with an itemized accession inventory will be prepared as evidence that monitoring has been successfully completed. A preliminary report will be submitted and approved prior to granting of building permits, and a final report will be submitted and approved prior to granting of occupancy permits. The adequacy of paleontologic reports will be determined in consultation with the Curator of Earth Science, SBCM.

4.4 PERMITS

All paleontological work was conducted under California BLM Paleontological Use Permit CA-16-03P (Expiration March 16, 2019) and Fieldwork Authorization FA-680-18-03 approved by the Barstow Field Office on October 31, 2017 (Appendix B). Geraldine Aron, M.S., Principal Investigator, oversaw all work as the permit holder and administrator.

5.0 METHODS

This paleontological analysis of existing data included a geologic map review, a literature search, and museum records search review from previously conducted paleontological inventories in the vicinity of the Project area. The analysis of existing data was supplemented with a Phase 1 pedestrian field survey, conducted by Mathew Carson, M.S. and Joseph Raum, B.S. The goal of this report is to evaluate the paleontological potential of the Project area and make recommendations for the mitigation of adverse impacts on paleontological resources that may occur as a result of the proposed Project. Mathew Carson, M.S. performed the background research and authored this report. Geraldine Aron, M.S. oversaw all aspects of the Project as the Paleontological Principal Investigator. Courtney Richards, M.S. performed the technical review of this report. GIS maps were prepared by Barbara Webster, M.S.

Paleo Solutions will retain an archival copy of all Project information including field notes, maps, and other data.

5.1 ANALYSIS OF EXISTING DATA

Paleo Solutions reviewed geologic mapping of the Project area by Dibblee and Minch (1967, 1970, 2008a-b) and Dibblee and Bassett (1966a-b). The literature reviewed included published and unpublished scientific papers. Paleontological museum records search results from the SBCM and LACM acquired during previous paleontological investigations conducted by Paleo Solutions on behalf of SCE for the Jasper Substation and the Coolwater-Lugo Transmission projects (Paleo Solutions, 2013, 2014a-c) were analyzed and incorporated

into this paleontological investigation; the Project area entirely overlaps portions of the Jasper Substation and the Coolwater-Lugo Transmission projects, and thus, museum records searches for the Project area have already been conducted.

5.2 FIELD SURVEY

The field survey was conducted by Paleo Solutions staff members Mathew Carson, M.S., and Joseph Raum, B.S., on November 09, 2017. The paleontological survey was performed in order to determine the paleontological potential of the geologic deposits underlying the Project area. The survey was conducted after a review of aerial photographs indicated the Project area included areas of undisturbed native sediment. The pedestrian survey included inspection of the Project area with the majority of focus occurring in areas with native rock and sediment exposures. Rock and sediment exposures as well as the surrounding areas were photographed and documented. Reference points were acquired using a GPS unit. Sediment and bedrock lithologies were recorded and analyzed and used to better interpret the Project's paleontological potential, and thus better understand the Project's potential impact.

5.3 CRITERIA FOR EVALUATING PALEONTOLOGICAL POTENTIAL

The PFYC system was developed by the BLM (BLM, 2016). Because of its demonstrated usefulness as a resource management tool, the PFYC has been utilized for many years for projects across the country, regardless of land ownership. It is a predictive resource management tool that classifies geologic units on their likelihood to contain paleontological resources on a scale of 1 (very low potential) to 5 (very high potential). This system is intended to aid in predicting, assessing, and mitigating paleontological resources. The PFYC ranking system is summarized in Table 2.

Table 2. Potential Fossil Yield Classification (BLM, 2016)

BLM PFYC Designation	Assignment Criteria Guidelines and Management Summary (PFYC System)
1 = Very Low Potential	Geologic units are not likely to contain recognizable paleontological resources.
	Units are igneous or metamorphic, excluding air-fall and reworked volcanic ash units.
	Units are Precambrian in age.
	Management concern is usually negligible, and impact mitigation is unnecessary except in rare or isolated circumstances.
2 = Low	Geologic units are not likely to contain paleontological resources.
	Field surveys have verified that significant paleontological resources are not present or are very rare.
	Units are generally younger than 10,000 years before present.
	Recent eolian deposits
	Sediments exhibit significant physical and chemical changes (i.e., diagenetic alteration) that make fossil preservation unlikely
	Management concern is generally low, and impact mitigation is usually unnecessary except in occasional or isolated circumstances.
3 = Moderate Potential	Sedimentary geologic units where fossil content varies in significance, abundance, and predictable occurrence.
	Marine in origin with sporadic known occurrences of paleontological resources.
	Paleontological resources may occur intermittently, but these occurrences are widely scattered
	The potential for authorized land use to impact a significant paleontological resource is known to be low-to-moderate.
	Management concerns are moderate. Management options could include record searches, pre-disturbance surveys, monitoring, mitigation, or avoidance. Opportunities may exist for hobby collecting. Surface-disturbing activities may

BLM PFYC Designation	Assignment Criteria Guidelines and Management Summary (PFYC System)
	require sufficient assessment to determine whether significant paleontological resources occur in the area of a proposed action and whether the action could affect the paleontological resources.
4 = High Potential	Geologic units that are known to contain a high occurrence of paleontological resources.
	Significant paleontological resources have been documented but may vary in occurrence and predictability.
	Surface-disturbing activities may adversely affect paleontological resources.
	Rare or uncommon fossils, including nonvertebrate (such as soft body preservation) or unusual plant fossils, may be present.
	Illegal collecting activities may impact some areas.
	Management concern is moderate to high depending on the proposed action. A field survey by a qualified paleontologist is often needed to assess local conditions. On-site monitoring or spot-checking may be necessary during land disturbing activities. Avoidance of known paleontological resources may be necessary.
5 = Very High Potential	Highly fossiliferous geologic units that consistently and predictably produce significant paleontological resources.
	Significant paleontological resources have been documented and occur consistently
	Paleontological resources are highly susceptible to adverse impacts from surface disturbing activities.
	Unit is frequently the focus of illegal collecting activities.
	Management concern is high to very high. A field survey by a qualified paleontologist is almost always needed and on-site monitoring may be necessary during land use activities. Avoidance or resource preservation through controlled access, designation of areas of avoidance, or special management designations should be considered.
U = Unknown	Geologic units that cannot receive an informed PFYC assignment
	Geological units may exhibit features or preservational conditions that suggest significant paleontological resources could be present, but little information about the actual paleontological resources of the unit or area is unknown.
	Geologic units represented on a map are based on lithologic character or basis of origin, but have not been studied in detail.
	Scientific literature does not exist or does not reveal the nature of paleontological resources.
	Reports of paleontological resources are anecdotal or have not been verified.
	Area or geologic unit is poorly or under-studied.
	BLM staff has not yet been able to assess the nature of the geologic unit.
	Until a provisional assignment is made, geologic units with unknown potential have medium to high management concerns. Field surveys are normally necessary, especially prior to authorizing a ground-disturbing activity.

6.0 ANALYSIS OF EXISTING DATA

The Mojave Desert is one of California's twelve geomorphic provinces. Located on a wedge-shaped fault block, much of the province is bound to the north by the left-lateral Garlock Fault and to the south by the right-lateral San Andreas Fault. The Mojave Desert borders the Transverse Ranges and Colorado Desert provinces, which are located to the northwest and southwest, respectively. The Sierra Nevada and the Basin and Range provinces create the northern boundary, and the Colorado River and the Nevada state line establish the eastern boundary (Norris and Webb, 1976). Within the province are north to northeast trending folds, steeply dipping faults, and several major thrust faults (Jahns, 1954).

Prior to 250 million years ago, the Mojave Desert region was a passive continental margin. When the supercontinent Pangaea began to break apart, plate convergence initiated, and the western continental margin began to override the convergent oceanic crust. As subduction progressed, magma began intruding upwards through the continental crust and gradually emplaced great granitic batholiths. These batholiths form the cores of the Sierra Nevada and many of the ranges throughout the Mojave Desert region (Hewett, 1954). In addition to plutonic episodes, the Mojave Desert region experienced volcanic activity, beginning in the Jurassic Period, when an extensive volcanic arc system developed across the region (Hewett, 1954). Both volcanism and plutonic intrusions resumed throughout the region until Late Cretaceous time (Hewett, 1954).

From late Mesozoic to middle Tertiary time, the province was subjected to widespread erosion. The absence of lower Tertiary sedimentary rocks within the Mojave block, and their presence in nearby areas to the north, south, and west, indicate that the block stood above the surrounding areas during these epochs and that sediment drainage was external (Hewett, 1954). After approximately 30 million years of tectonic serenity, the region experienced new tectonic activity as the Great Basin began to spread apart and a great rift-style fault system developed. Igneous intrusions, volcanism, and sedimentation all were initiated in response to regional extension. A thick sequence of Tertiary deposits, consisting of sandstones, shales, conglomerates, carbonates, tuffs, breccias, lava flows, and basaltic and rhyolitic plugs, unconformably overlie the basement terrain. Prior to the late Miocene, the Mojave Desert was shedding sediments to the west toward the Pacific Ocean. By the end of the middle Miocene, this east-west flow was disrupted by the formation of northwest-trending basins, and the result was the development of an internal, basinal drainage system. The Tertiary deposits record the onset of this internal drainage in the Mojave Desert region.

Although faulting, folding, and volcanism all resumed during the Quaternary Period, erosion has been the dominant landscaping force from late Tertiary to Recent time. Today, the Mojave Desert displays large expanses of low-lying alluvium, fluvial, and playa lake deposits with sporadic mountain remnants piercing through the flat alluvial blanket (Hewett, 1954). In the central Mojave Desert, the depth of alluvial deposits ranges from a few meters to possibly more than 1,000 meters (3,280 feet) in thickness.

6.1 LITERATURE SEARCH

Geologic mapping indicates that the Project is immediately underlain by Quaternary basalt flows of Pisgah Crater (Qb); Quaternary older (Holocene to Pleistocene) alluvial fan deposits (Qof); and younger Quaternary (Holocene) alluvium, clay, alluvial fan gravels, and windblown sands (Qa, Qc, Qf, and Qs) (Dibblee, 1967, 1970, 2008a-b; Dibblee and Bassett, 1966a-b). Within a half-mile buffer surrounding the Project centerline, Tertiary (possibly Miocene to Oligocene) igneous rocks (i.e., andesite and andesite intrusion; Ta and Tai, respectively), Tertiary brecciated volcanoclastic rocks (i.e., basalt breccia and tuff breccia; Tbb and Tt, respectively), and Quaternary older (Pleistocene) alluvium (Qoa) have been mapped. Although these geologic units are not present at the surface immediately within the bounds of the Project area, they may be present at shallow depth, and thus, have the potential to be impacted during ground-disturbing activities. Therefore, the geologic units mapped within a half-mile buffer of the Project centerline are also included in this analysis. The paleontological potential of each geologic unit potentially impacted by ground-disturbing activities are discussed below. The geographic distributions of the geologic units in the Project area, as mapped by Dibblee (1967, 1970, 2008a-b) and Dibblee and Bassett (1966a-b) are presented in Appendix A and Appendix C.

6.1.1 Igneous Rocks – Tertiary (Ta, Tai)

Two Tertiary igneous rock units (Ta, Tai), possibly Miocene to Oligocene in age, are located within a half-mile to the south in topographically high areas near the Project area. These geologic units have a very low potential to produce scientifically important paleontological resources (PFYC 1).

Igneous rocks are crystalline or non-crystalline rocks that form through the cooling and subsequent solidification of lava or magma. Intrusive (plutonic) igneous rocks form below the earth's surface, and extrusive (volcanic) rocks form on the earth's surface. Lava and magma are formed by the melting of pre-existing plutonic rocks in the earth's crust or mantle due to increases in temperature, changes in pressure, or changes in geochemical composition. Extreme temperatures in the environments in which intrusive igneous rocks form prevent the preservation of fossils. The formation of extrusive igneous rocks as a result of volcanic processes is associated with extremely high temperatures that also generally prevent the preservation of fossils.

The following Tertiary igneous rocks are present within a half-mile buffer of the Project area (Dibblee and Bassett, 1966a-b; Dibblee 2008a-b):

- Andesite (Ta) – Tertiary (Miocene to Oligocene[?]): Greenish-gray, brown and dark reddish-brown, massive and aphanitic to porphyritic, composed mostly of plagioclase and gradational into andesite breccias; and
- Andesite Intrusion (Tai) – Tertiary (Miocene to Oligocene[?]): Pinkish-, greenish-, to brownish-gray, massive to flow-laminated, microcrystalline, composed mostly of plagioclase.

6.1.2 Brecciated Volcanoclastic Rocks – Tertiary (Tbb, Tt)

Within a half-mile south of the Project area, Tertiary-age brecciated volcanoclastic rocks, comprised of basalt (Tbb) and tuff (Tt) are present, near areas of other mapped igneous rocks of high topographic relief (see Igneous Rocks –Tertiary above). Dibblee (2008a-b) describes the brecciated basalt as dark-gray to black, porphyritic, subvitreous, mostly massive, with coarse-grained clasts (boulders), poorly sorted, angular to subrounded in form. Based on the high heat and high-energy environment (i.e., volcanic eruption) in which these rocks formed, brecciated basalts have a very low paleontological potential (PFYC 1). On the other hand, fine-grained brecciated tuffs form under conditions that may under certain geologic conditions permit scientifically important fossils to be preserved. Dibblee (2008a-b) describes the tuff breccia as yellowish- to light-greenish-gray, crudely bedded with angular, cobble-sized andesitic clasts in a matrix of consolidated volcanic ash. Therefore, the tuff breccia has a low paleontological potential (PFYC 2).

6.1.3 Basalt Flow of Pisgah Crater - Quaternary (Qb)

The Project area is underlain by Quaternary extrusive igneous rocks of the basalt flow of Pisgah Crater (Qb) near the eastern extent of the Project area. This geologic unit has a very low potential to produce scientifically important paleontological resources (PFYC 1). See Igneous Rocks – Tertiary for a full discussion on these types of rocks. These basalt deposits consist of black, vesicular microcrystalline and porous rocks with small vugs between grains and forms at least one ropy flow on surficial deposits (Dibblee and Bassett, 1966a-b).

6.1.4 Quaternary Older Deposits – Holocene to Pleistocene (Qof, Qoa)

Several unnamed Quaternary older deposits (Holocene to middle to late Pleistocene) are exposed immediately under the Project area or nearby within its half-mile buffer. These deposits are concentrated near the eastern-extent of the Project area and consist of older fan deposits (Qof) and older alluvium (Qoa). Older fan deposits are composed of weakly consolidated, massive to poorly bedded, gray, coarse gravel derived from nearby highlands. Older alluvium is composed of cobble, gravel, and sand clasts that are poorly bedded to massive (Dibblee, 2008b; Dibblee and Bassett, 1966a-b).

Ice Age taxa have been recovered from Pleistocene-age deposits of San Bernardino County, including specimens of rodents (*Peromyscus* sp., *Dipodomys ordii*, *Neotoma* sp., *Thomomys* sp., among others), rabbits (*Lepus* sp.), horse (*Equus conversidens*), badger (*Taxidea taxus*), cats (*Smilodon* sp., *Puma concolor*), mammoth (*Mammuthus* sp.) camel (*Camelops* sp., *Hemiauchenia* sp.), sloth (*Nothrotheriops* sp., *Megalonyx* sp.), tortoise (*Opherus agassizi*) as

well as bison, antelope, and many other taxa of mammals (Jefferson, 1991; Reynolds, 1991; Brattstrom, 1961). There are numerous Pleistocene-age localities throughout San Bernardino County and the Mojave Desert, some of which are accumulations of material by woodrats for nests (woodrat middens) in caves, and many of which are deposits from along the shorelines of Pleistocene lakes (Stegner, 2015; Grayson, 2011). While the depositional environment of the cave deposits and lake deposits differs from that of the Project area, there is the potential for a similar fauna to be recovered during Project excavations.

Some Pleistocene-age alluvial deposits are composed of coarse-grained material, which is not typically conducive to the preservation of fossils. For example, coarse-grained surficial Quaternary deposits derived from the local plutonic igneous rocks have a low probability to contain fossils; however, older, finer grained alluvial sediments may contain significant paleontological resources. Therefore, Quaternary older deposits are assigned a moderate paleontological potential (PFYC 3).

6.1.5 Younger Quaternary Deposits – Holocene (Qa, Qc, Qf, Qs)

Younger Quaternary deposits typically consist of variable compositions of unconsolidated clay, silt, sand, gravel, and larger clasts. Holocene sediments within the Project area consist of alluvium (Qa), clay (Qc), alluvial fan gravels (Qf), and windblown sands (Qs) (Dibblee, 1967, 1970, 2008a-b; Dibblee and Bassett, 1966a-b). Alluvium (Qa) consists of cobble-pebble gravel and sand near hills, grading outward into finer grained material, such as fine-grained sand, silt, and clay. Clay (Qc) deposits mapped near the Project area consist of light-gray clay or dry mud, derived from alluvium upgradient. Alluvial fan gravels (Qf) consist of coarse gravel to boulders of unsorted, subrounded fragments, derived from adjacent mountains. Windblown sand deposits (Qs) consist of a thin veneer over the surface to small dunes of fine-grained sand, derived from erosion by westerly winds on alluvium, clay, and alluvial fan deposits (Dibblee, 2008a-b; Dibblee and Bassett, 1966a-b). Holocene-age (less than 11,000 years old) sediments are typically too young to contain fossilized material (Society of Vertebrate Paleontology [SVP], 2010), but they may overlie sensitive older (e.g., Pleistocene- and Pliocene-age) deposits at variable depth. Younger Quaternary deposits are assigned low paleontological potential (PFYC 2) at the surface using BLM (2016) guidelines. However, they have an unknown paleontological potential in the subsurface since there is potential for these deposits to be conformably underlain by older, paleontologically sensitive geologic units.

6.2 PALEONTOLOGICAL RECORD SEARCH RESULTS

Because the footprint of the Project area overlaps areas affected by the SCE Jasper Substation and SCE Coolwater-Lugo Transmission projects previously assessed for paleontological resources by Paleo Solutions, the results of the museum record searches presented in the paleontological assessment reports for these projects (Paleo Solutions, 2013, 2014a-c) are compiled and presented here. The purpose of the record searches was to determine whether any museum fossil localities occur within or adjacent to the Project area and ascertain the abundance and taxonomic diversity of fossils collected from the same geologic units elsewhere in San Bernardino County to assist with the determination of the paleontological potential of the Project area. The Project area traverses multiple geologic units of varying ages and paleontological sensitivities; thus, fossil specimens found within the same geologic unit or comparable unit are included below.

For the Jasper Substation and Coolwater-Lugo Transmission projects, Paleo Solutions requested museum record searches from SBCM and LACM, and also reviewed the UCMP database.

The SBCM records at least three localities within one mile of the Gale-Pisgah Project area, the closest being ¼ to ½ mile north of the eastern end of the Gale-Pisgah alignment (Paleo Solutions, 2013). No localities were recorded by SBCM within the Project boundaries. Localities SBCM 1.58.74 and 1.58.75 yielded fossil remains of large mammal and freshwater mollusks from lacustrine sediments situated approximately ¼ to ½ mile north of the eastern end of the Project area. Additionally to the north, locality SBCM 1.78.2 yielded

fossil remains of freshwater mollusks and gastropods as well as indeterminate vertebrate elements from lacustrine sediments associated with Troy Lake, roughly one mile north of the Project corridor (Scott, 2012, 2013).

Within the vicinity of the Project area, SBCM has fossil locality records from Miocene- and Pleistocene-age sediments (Scott, 2012, 2013). SBCM records for Pleistocene-age sediments from the vicinity of the Project area have yielded rodents (Rodentia), including squirrel (Sciuridae), and camels (Camelidae, *Camelops*); SBCM records for Miocene-age sediments from the vicinity of the Project area have yielded insects (Instecta), ostracodes (Ostracoda, *Heterocypris*), freshwater fish (Cyprinidae, Gila), snakes (Serpentes, Calamagras), lizards (Lacertilia), rodents (Sciuridae, *Miospermophilus*, Heteromyidae, *Cupidinimus* n., *Cupidinimus nebraskensis*, *Mojavemys* cf. *lophatus*, *Peridiomys*, *Proheteromys sulculus*, *Mookomys altifluminus*, *Perognathus furlongi*, *Perognathus minutus*), carnivorans, including an extinct "bear dog" (Amphicyonidae), dog (Canidae), and cat (Machairodontinae, Felidae), camels (small, medium, and large Camelidae), antilocaprids (*Merycodus*), artiodactyls (even-toed ungulates belonging to Artiodactyla), horse (*Archaeohippus*, *Merychippus*, *Merychippus* cf. *carrizoensis*, *Merychippus stylodontus*), and plant root casts. Although Miocene-age deposits are not mapped within the footprint of the Project area, they may be present within the bounds of the Project area at shallow depth, particularly near the Mojave River. Several miles southwest of the Project area near the City of Victorville, Pleistocene-age Quaternary older alluvial deposits, derived from the ancestral Mojave River and the Victorville fan, have also yielded a diverse and abundant fossil fauna, which include shrew, giant ground sloth, rabbit, rodent, bear, mammoth, horse, and camel. Although these locations are far from the Project area, similar deposits are mapped underlying the Project area, demonstrating the possible fossils that may be encountered in the Gale-Pisgah Project area.

Museum records search results from LACM indicate that no fossil localities exist within the bounds of the Gale-Pisgah Project area. However, according to LACM several fossil localities have been discovered from within the vicinity of the Project area within older Miocene-, Pleistocene-, and Holocene-age deposits. Miocene-age deposits of the Barstow Formation from near Daggett Ridge near the northwestern extent of the Gale-Pisgah Project area have yielded fossil specimens of tortoise (Testudinidae), carnivorans (Carnivora), horse (*Merychippus*), and camel (*Hesperocamelus*, *Oxydactylus*, and *Stenomylus*). Miocene-age deposits of the Crowder Formation from near Crowder Canyon have also produced fossil specimens of turtle (Testudinata), horse (*Merychippus tehachapiensis*, *Parapliohippus carrizoensis*), and camel (Camelidae). From Pleistocene-age Quaternary older alluvial deposits along the Mojave River west of the Gale-Pisgah Project area, an otherwise unrecorded fossil specimen of mammoth was collected in 1961. Deposits east-southeast of the Project area near the base of the Newberry Mountains produced an extensive late Pleistocene fauna including tortoises, lizards, snakes, ducks, pigeons, eagles, crows, owls, rabbits, squirrels, mice, dogs, cats, skunks, raccoons, horses, camels, pronghorn antelopes, sheep, and human. The closest vertebrate fossil locality from the LACM is located to the northeast of the Project area and produced horse (*Equus conversidens*) and camel (*Camelops*) specimens. Additionally, several fossil localities representing an extensive fossil fauna of mostly birds, including an extinct gull-like bird (*Phoenicopterus minutus*) has been recovered from Troy Lake along Manix Wash and the Mojave River. Moreover, Pleistocene- to Holocene-age Quaternary alluvial deposits within the vicinity of the Project area near Victorville have yielded fossil camel (*Camelops* sp.), and farther west near the census-designated community of Littlerock, several fossils have been recovered from older Quaternary and younger Quaternary deposits that have yielded snake (*Pituophis*, *Lampropeltis*), lizard (*Gambelia wislizenii*), rabbit (*Sylvilagus*), and rodent (*Chaetodipus*, *Dipodomys*, *Thomomys*). Finally, the record search documents note that while much of the Project area is surficially mapped as younger Quaternary deposits, older deposits may be encountered at shallow depth and have the potential to produce significant fossils (McLeod, 2012, 2013).

Additionally, a records search was compiled by Robert Reynolds (Appendix D *in* Paleo Solutions, 2014c), a professional paleontologist, independent researcher, and former curator at SBCM, which includes Miocene- to Holocene-age fossil localities. Miocene- to Pleistocene-age fossil taxa include insects, rodents,

indeterminant mammal remains, and cat and camel tracks. Pleistocene- to Holocene-age deposits also yield fish remains.

No previously recorded fossil localities have been documented within the Project area by UCMP (Paleo Solutions, 2014a-c).

Within close proximity of the Gale-Pisgah Project area, Paleo Solutions field staff discovered two nonsignificant fossil localities from Miocene-age Barstow Formation and Quaternary older alluvial deposits during a survey of an expansion of the Coolwater-Lugo Project area, which overlaps the Gale-Pisgah Project area along the northwestern terminus of the line (Paleo Solutions, 2014a-c). Plant impressions and fossil bone and tooth fragments were discovered in Barstow Formation deposits and fossil bone fragments were discovered from Quaternary older alluvial deposits. While these fossil occurrences were deemed nonsignificant and were not collected during the survey, and while the Barstow Formation is not exposed immediately within the bounds of the Gale-Pisgah Project area, they demonstrate the possibility of fossil material to be preserved within Miocene- and Pleistocene-age deposits.

7.0 FIELD SURVEY

The Project area is located between the unincorporated Community of Daggett and Pisgah Crater along Interstate 40 and the National Trails Highway (Historic Route 66); thus, its position along the highway has contributed to its low topographic relief, consisting of low rising, gently rolling hills and flat plains, with shallow drainage channels incising the landscape near perpendicular to the path of the transmission line. The Project area trends northwest-southeast across a complex of alluvial deposits, which splay out from the nearby highlands. The eastern extent of the transmission line's corridor consists of gently rolling hills and broad alluvial fans, with existing disturbances consisting of electrical towers and poles, fences, paved roads, graded gravel access roads, manmade drainage channels and culverts, a rail road trackway, and an enclosed substation along the eastern terminus of the Project (Figures 2 through 5). The central portion of the Project area is relatively flatter than the eastern portion; however, it transverses along the base of a series of small mountains and buttes comprised of igneous rocks near the unincorporated Community of Newberry Springs. Existing ground disturbances in the central portion of the Project area include electrical towers and poles, fences, paved roads, freeway overpass structures (i.e., the interchange of the National Trails Highway and Interstate 40), graded gravel access roads, private residencies, debris, and soil stockpiles from previous earthmoving activities (Figures 2 through 5). The western portion of the Project area, west of Newberry Springs, consists of flat topography, with disturbed surficial sediments. Ground disturbances in this portion of the Project area include paved roads, dirt access roads, nearby railroad track ways, dispersed private residencies, fences, and electrical poles (Figures 2 through 5). Vegetation over the entirety of the Project area varied widely, ranging from completely unvegetated to sparse desert brush and low grasses (Figure 6).

The following subsections summarize the observed geology and paleontology of the Project area during the field survey.

7.1 GEOLOGY

Dibblee (1967, 1970, 2008a-b) and Dibblee and Bassett (1966a-b) map the Project area as being underlain by Quaternary older fan deposits (Qof), Quaternary alluvial deposits (Qa), Quaternary clays (Qc), Quaternary alluvial fan gravel deposits (Qf), Quaternary windblown sand (Qs), and Quaternary extrusive igneous rocks of the basalt flow of Pisgah Crater (Qb).

During the survey, Paleo Solutions' field staff conducted a 100% pedestrian survey of the Quaternary older fan deposits (Qof), which consisted of tan to reddish brown, coarse-grained sand to fine gravel (i.e., granules to pebbles), unconsolidated, moderately sorted, rounded to angular, and composed of weathered, eroded, and

transported igneous rock clasts of basalt or tuff (Figure 7). At the surface, Quaternary older fan deposits (Qof) contained a higher concentration of cobble-sized igneous rock clasts of vesicular basalt and tuff due to deflation of fine-grained sedimentary particles (Figure 7); softer igneous rock clasts, such as tuff, also have vugs presumably derived from similar wind erosive-processes. Below the upper half inch of surficial sediments in areas mapped as Quaternary older fan deposits (Qof), sediments consist of very fine-grained sand and silt, poorly to moderately consolidated, and well sorted, with scant cobble-sized igneous rock clasts (Figure 8). Sidewalls of incision channels and road outcrops along the National Trails Highway (Historic Route 66) exposed approximately 3 to 5 feet of older fan deposits, comprised of tannish-pink, very fine-grained sand and silt, with pebble- to cobble-sized igneous rock clasts (i.e., vesicular basalt, tuff, and jasper), moderately sorted, and exhibiting planar bedding of coarse-grained materials, with more massive layers of fine-grained sediments (Figure 9). Topographically, areas mapped as Quaternary older fan deposits (Qof) contained more surface incisions and relatively more topographic relief, consisting of higher rolling hills than the surrounding flatter areas.

Quaternary alluvial deposits (Qa) consist of the largest mapped geologic unit across the Project area (Figure 10). Paleo Solutions' field staff used a combination of pedestrian and visual (i.e., drive-by) confirmation of the mapped extent of Quaternary alluvial deposits (Qa) within the bounds of the Project area. Quaternary alluvial deposits (Qa) consisted of tan, coarse-grained sand to fine gravel at the surface, with unconsolidated, well-sorted, subrounded basalt and tuff fragments (Figure 11). Much like Quaternary older fan deposits (Qof), Quaternary alluvial deposits (Qa) are deflated at the surface, with very fine-grained sand and silt, unconsolidated, well sorted, with scant cobble-sized igneous rock clasts at shallow depth (approximately 0.5 inches below the ground surface) (Figure 11). Quaternary alluvial deposits were observed in flatter portions of the Project corridor and contained relatively higher concentrations of desert grasses and vegetation compared to Quaternary older fan deposits (Qof).

Additional younger Quaternary-age deposits, such as Quaternary clays (Qc), Quaternary alluvial fan gravels (Qf), and Quaternary windblown sands (Qs), were also observed near the center portion of the Project corridor and were confirmed by both pedestrian and visual (i.e., drive by) confirmation. Quaternary clay (Qc) consisted of buff silt and clay deposits, massive to loosely bedded, with lenses of very fine-grained windblown sand and silt and scant igneous rock pebbles and small cobbles (Figure 12). At the surface, clay deposits (Qc) exhibited desiccation cracks in soft, unconsolidated deposits at the surface along shallow (approximately 0.5-feet deep, or less) channels trending parallel to the National Trails Highway (Historic Route 66) and the rail road trackway. Quaternary alluvial fan gravel deposits (Qf) were similar in lithology to Quaternary older fan deposits (Qof), consisting of tan to reddish-brown, coarse-grained sand to granules, unconsolidated, moderately sorted, rounded to angular, and composed of weathered, eroded, and transported igneous rock fragments from nearby highlands (Figure 13). Much like Quaternary older fan deposits (Qof), the younger Quaternary alluvial fan gravel deposits (Qf) are deflated at the surface, with a higher concentration of cobble-sized clasts at the surface than at shallow depth. Quaternary windblown sand deposits (Qs) consisted of tan to buff unconsolidated, well sorted, fine-grained sand, with scant igneous rock cobbles at the surface (Figure 14).

Paleo Solutions' field staff conducted a visual (i.e., drive by) confirmation of the areas mapped as Quaternary extrusive igneous rocks of the basalt flow of Pisgah Crater (Qb); however, this geologic unit was not subject to a pedestrian survey since basalt flow deposits have a very low potential for fossil preservation (PFYC 1). Basalt flow deposits consisted of black, dark brown, and dark red basalt clasts (mafic, fine-grained volcanic rock formed from cooling lava), with weathered rocks at the surface consisting of cobble- to boulder-sized clasts, containing vesicles and vugs (Figure 15). Portions of the areas mapped as basalt flow deposits (Qb) contain large volcanic rock outcrops along the National Trails Highway (Historic Route 66), with a very thin veneer of alluvium and windblown sand and silt deposited between rock outcrops (Figure 15).

Geologic units mapped within the vicinity of the Project area, but not mapped immediately within its bounds, such as Quaternary older alluvium (Qoa), Tertiary basalt and tuff breccias (Tbb and Tt), and Tertiary andesite and andesite intrusion (Ta and Tai), were not encountered during the survey. Although these deposits were not observed within the bounds of the Project area, they are within the immediate vicinity of the Project area and may be present at shallow depth beneath younger deposits.

7.2 PALEONTOLOGY

No paleontological resources were observed or collected during the survey. However, sediments conducive to fossil preservation, such as Quaternary older fan deposits (Qof), were observed along road cuts and wash channel incisions within the bounds of the Project area. The fine-grained beds within older Quaternary deposits are favorable for harboring recognizable and intact scientifically significant vertebrate fossils.

Younger Quaternary deposits, such as Quaternary alluvium, clay, alluvial fan gravel, and windblown sand (Qa, Qc, Qf, and Qs, respectively), were also observed on adjacent low-rising hills, road cuts, and wash channels within the bounds of the Project area. These deposits are typically too young to contain scientifically significant paleontological resources; however, they may be underlain by older Quaternary deposits, such as Quaternary older fan deposits (Qof) and older alluvium (Qoa), which have a higher potential for fossil preservation.

Figure 2. Current ground disturbances within the vicinity of the Project area, including an electrical substation. View north.

Figure 3. Current ground disturbances within the vicinity of the Project area, including private residencies. View south.

Figure 4. Current ground disturbances within the vicinity of the Project area, including private residencies with graded roads and debris piles. View west.

Figure 5. Current ground disturbances within the vicinity of the Project area, including a rail road trackway. View north.

Figure 6. Overview of the Project area near structure 1700577E, illustrating the low topographic relief. Foreground contains more densely vegetated Quaternary alluvial deposits in a flat plain (Qa); background contains less vegetated Quaternary older fan deposits (Qof) on a gentle incline. View west.

Figure 7. Quaternary older fan deposits (Qof), showing deflation of surface sediments from wind erosion. Surface sediments consist of coarse-grained sand to fine gravel, unconsolidated, moderately sorted, with cobbles of basalt or tuff. View west.

Figure 8. Quaternary older fan deposits (Qof) less than 1-foot below ground surface, showing very fine-grained sand and silt, poorly to moderately consolidated, and well sorted, with scant cobble-sized igneous rock clasts. View west.

Figure 9. Quaternary older fan deposits (Qof), consisting of tannish-pink, very fine-grained sand and silt, with pebble- to cobble-sized igneous rock clasts, moderately sorted, and exhibiting planar bedding of coarse-grained materials, with more massive layers of fine-grained sediments. View southwest.

Figure 10. Quaternary alluvium (Qa) and overview of the Project area from the National Trails Highway-Interstate 40 interchange. View west.

Figure 11. Quaternary alluvial deposits (Qa), consisting of tan, coarse-grained sand to fine gravel at the surface, with unconsolidated, well sorted, subrounded basalt and tuff fragments. View west.

Figure 12. Quaternary clays (Qc) exposed in a shallow channel along National Trails Highway (Historic Route 66). Clay consisted of buff silt and clay deposits, massive to loosely bedded, with lenses of very fine-grained windblown sand and silt and scant igneous rock pebbles and small cobbles. View north.

Figure 13. Quaternary alluvial fan gravel deposits (Qf), which consists of coarse-grained sand to granules, unconsolidated, moderately sorted, and composed of igneous rock fragments from nearby highlands. View southwest.

Figure 14. Quaternary windblown sand deposits (Qs), consisting of unconsolidated, well sorted, fine-grained sand, with scant igneous rock cobbles at the surface. View south.

Figure 15. Quaternary extrusive igneous rocks of the basalt flow of Pisgah Crater (Qb), consisting of black, dark brown, and dark red, vesicular, fine-grained rock, which formed from cooling lava after a volcanic eruption. Windblown sand and fine-grained alluvial deposits are discontinuously deposited at the surface. View north.

8.0 IMPACTS TO PALEONTOLOGICAL RESOURCES

Impacts on paleontological resources can generally be classified as either direct, indirect or cumulative. Direct adverse impacts on surface or subsurface paleontological resources are the result of destruction by breakage and crushing as the result of surface disturbing actions including construction excavations. In areas that contain paleontologically sensitive geologic units, ground disturbance has the potential to adversely impact surface and subsurface paleontological resources of scientific importance. Without mitigation, these fossils and the paleontological data they could provide if properly recovered and documented, could be adversely impacted (damaged or destroyed), rendering them permanently unavailable to science and society.

Indirect impacts typically include those effects which result from the continuing implementation of management decisions and resulting activities, including normal ongoing operations of facilities constructed within a given project area. They also occur as the result of the construction of new roads and trails in areas that were previously less accessible. This increases public access and therefore increases the likelihood of the loss of paleontological resources through vandalism and unlawful collecting. Human activities that increase erosion also cause indirect impacts to surface and subsurface fossils as the result of exposure, transport, weathering, and reburial.

Cumulative impacts can result from incrementally minor but collectively significant actions taking place over a period of time. The incremental loss of paleontological resources over time as a result construction-related surface disturbance or vandalism and unlawful collection would represent a significant cumulative adverse impact because it would result in the destruction of non-renewable paleontological resources and the associated irretrievable loss of scientific information.

Excavations in the Project area that impact Quaternary older fan deposits (Qof) and Quaternary older alluvium (Qoa), either at the surface or at depth beneath previously disturbed sediments, artificial fill, or younger Quaternary alluvium (Qa), clay (Qc), alluvial fan gravel (Qf), and windblown sand (Qs) may well result in an adverse direct impact on scientifically important paleontological resources. Excavations entirely within previously disturbed sediments, artificial fill, or younger Quaternary deposits are unlikely to uncover significant fossil vertebrate remains; furthermore, any recovered resources from previously disturbed sediments or artificial fill will lack stratigraphic context. However, younger deposits may shallowly overlie older *in situ* sedimentary deposits. Topographic relief is minimal throughout the survey area, and the minimal bedrock exposures provide little indication of the depth at which older more paleontologically sensitive sediments occur beneath younger surficial deposits. Therefore, grading and other earthmoving activities may potentially result in significant adverse direct impacts to paleontological resources throughout most of the Project area, with exceptions for areas underlain by Miocene to Oligocene andesite (Ta) and andesite intrusion (Tai), Tertiary brecciated basalt (Tbb) and tuff (Tt), and volcanic basalts flow deposits (Qb), which have a very low to low paleontological potential.

9.0 RECOMMENDATIONS

Construction excavations that disturb older Quaternary-age sediments should be monitored by a professional paleontologist in order to reduce potential adverse impacts to scientifically important paleontological resources to a less than significant level. Prior to construction, a paleontological resource monitoring and mitigation plan (PRMMP) should be prepared. It should provide detailed recommended monitoring locations; a description of a worker training program; detailed procedures for monitoring, fossil recovery, laboratory analysis, and museum curation; and notification

procedures in the event of a fossil discovery by a paleontological monitor or other project personnel. A curation agreement with SBCM, LACM, or another accredited repository approved by the BLM Barstow Field Office must also be obtained. The field survey confirmed the presence of geologic units of very low to moderate paleontological potential. Here, road cut outcrops and incision channels exposed Quaternary older fan deposits (Qof) (PFYC 3) beneath less than 1 foot of younger Quaternary alluvial deposits (Qa) in areas mapped as Quaternary older fan deposits (Qof). The depth to older Quaternary deposits (e.g., Qof, Qoa) where younger Quaternary deposits (Qa, Qc, Qf, and Qs) (PFYC 2) are mapped at the surface is unknown. In all other areas where paleontologically sensitive geologic units are mapped but are not exposed at the surface due to the presence of previously disturbed sediments, the depth to the paleontologically sensitive sediments is also unknown. Therefore, it is recommended that all excavations in all locations of the Project area mapped as Quaternary older fan deposits (Qof) (PFYC 3) be monitored full-time. Areas mapped as Quaternary alluvium (Qa), clay (Qc), alluvial fan gravel (Qf), and windblown sand (Qs), and areas determined to be covered by previously disturbed sediments and artificial fill, should be spot checked during excavations that exceed depths of 5 feet to check for underlying, paleontologically sensitive older sedimentary deposits. If older, paleontologically sensitive deposits are observed, full-time monitoring should be implemented in those areas. If it is determined that only disturbed sediments, artificial fill, and younger Quaternary deposits are impacted, the monitoring program should be reduced or suspended. Due to their very low to low paleontological potential, Miocene to Oligocene andesite (Ta) and andesite intrusion (Tai); Tertiary brecciated basalt and tuff (Tbb and Tt); and Quaternary volcanic basalts flow deposits (Qb) do not require monitoring. Any subsurface bones or potential fossils that are unearthed during construction should be evaluated by a professional paleontologist.

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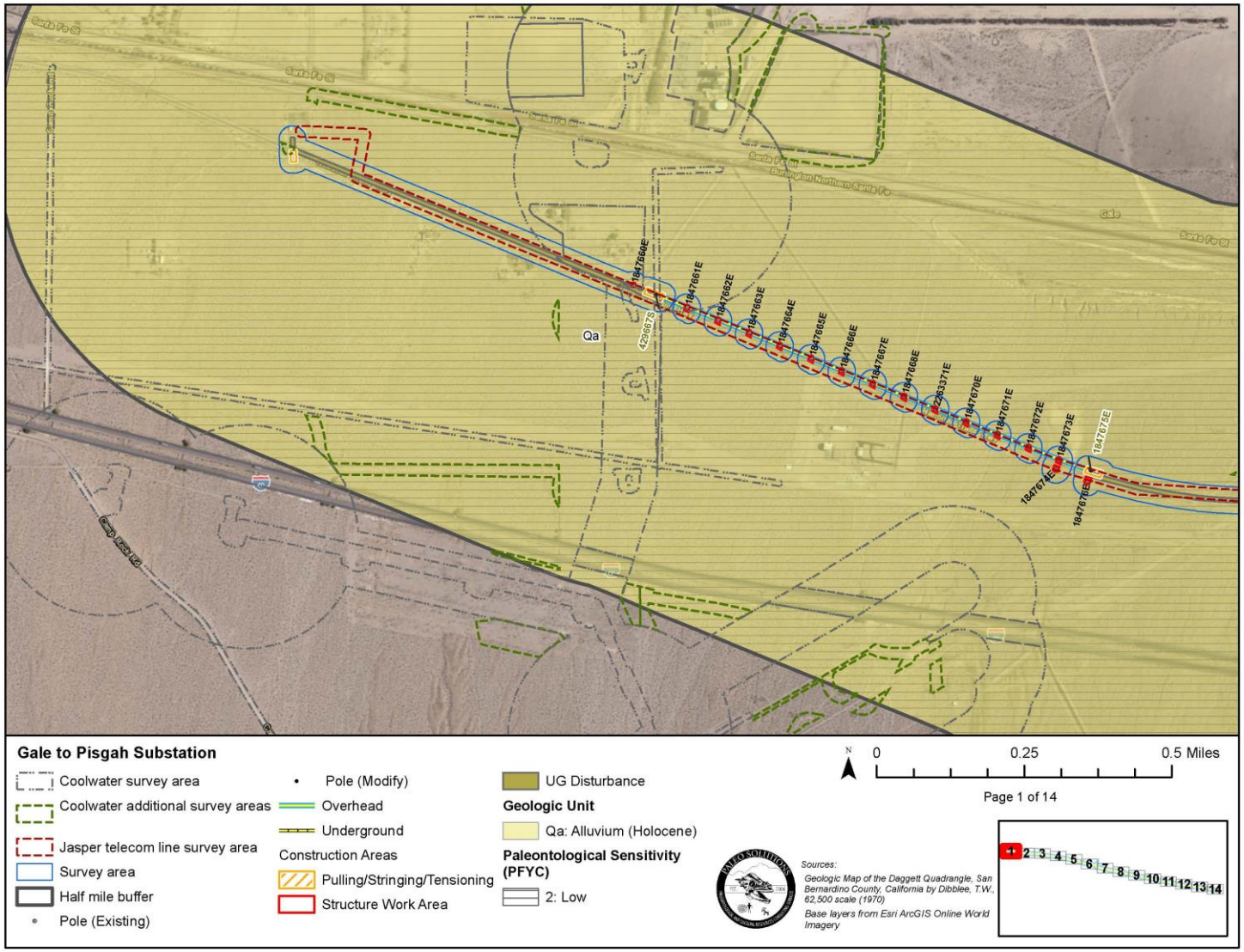
APPENDIX A. GEOLOGIC MAPS OF THE PROJECT AREA


Santa Fe St
Burlington Northern Santa Fe
Qa
Gale to Pisgah Substation
Coolwater survey area
Coolwater additional survey areas
Jasper telecom line survey area
Survey area
Half mile buffer
Pole (Existing)
Pole (Modify)
Overhead
Underground
Construction Areas
Pulling/Stringing/Tensioning
Structure Work Area
UG Disturbance
Geologic Unit
Qa: Alluvium (Holocene)
Paleontological Sensitivity (PFYC)
2: Low
N
0
0.25
0.5 Miles
Page 1 of 14
Sources:
Geologic Map of the Daggett Quadrangle, San Bernardino County, California by Dibblee, T.W., 62,500 scale (1970)
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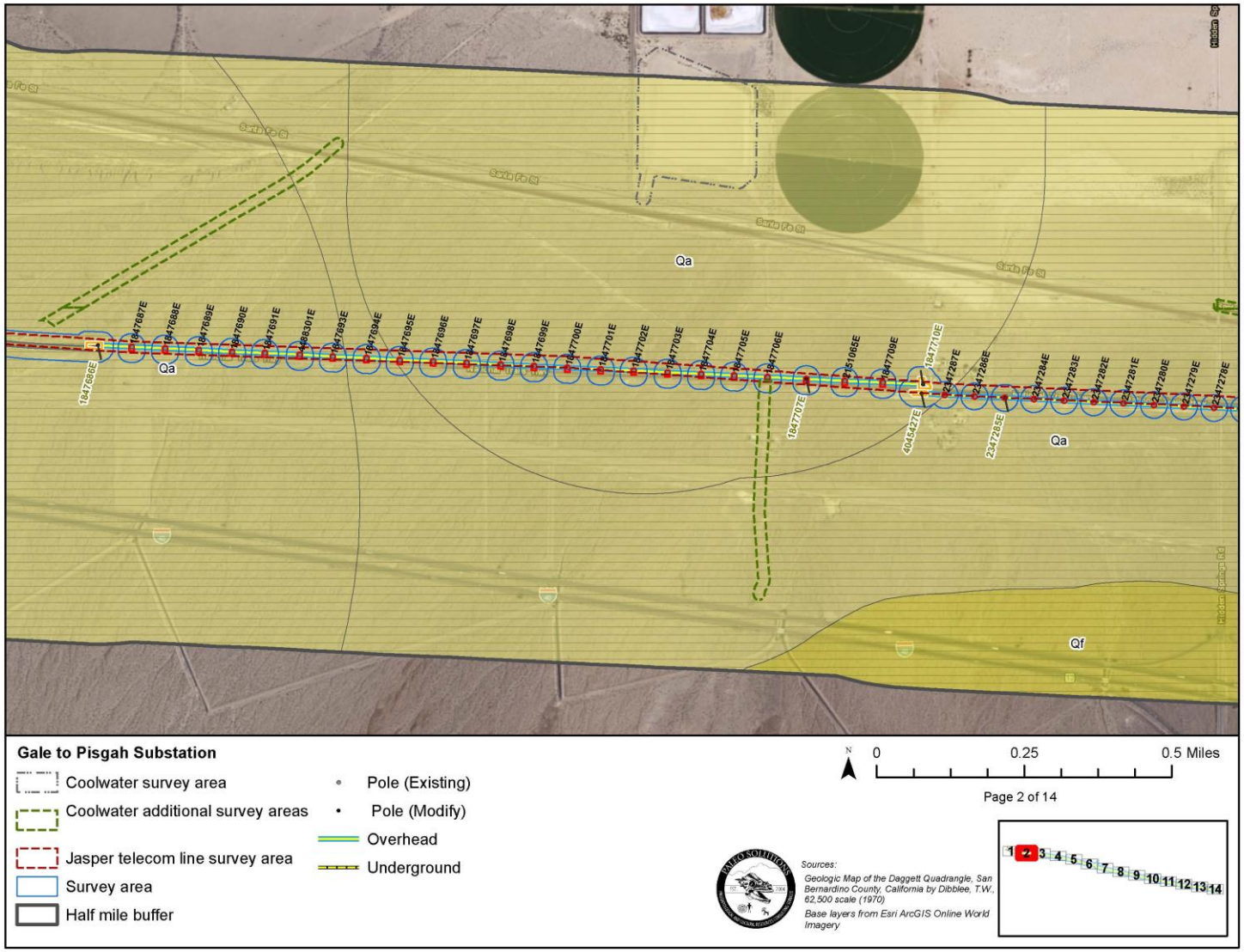
Qa
Qf
Gale to Pisgah Substation
Coolwater survey area
Coolwater additional survey areas
Jasper telecom line survey area
Survey area
Half mile buffer
Pole (Existing)
Pole (Modify)
Overhead
Underground
N
0
0.25
0.5 Miles
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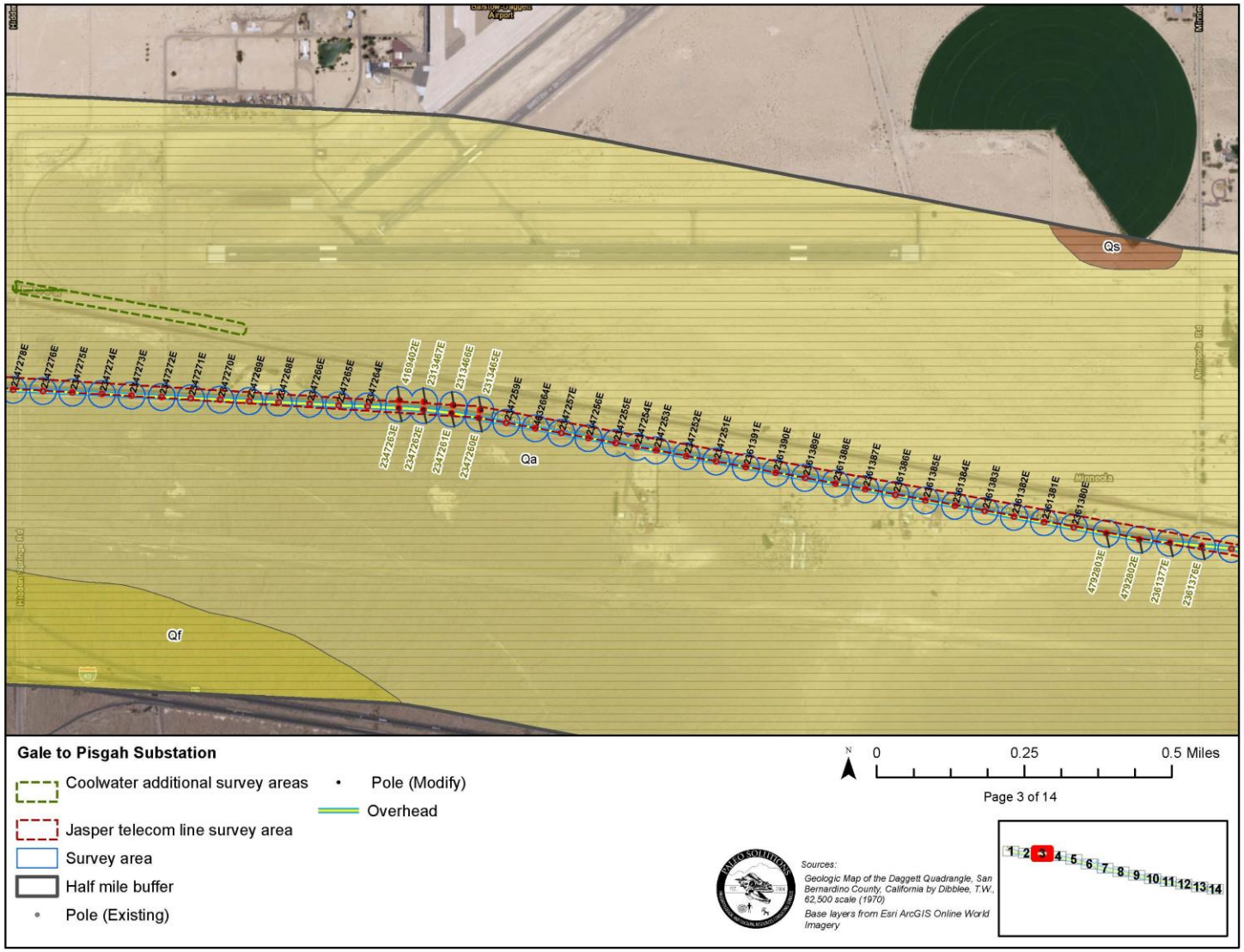
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Qa
Qf
Gale to Pisgah Substation
Coolwater additional survey areas
Jasper telecom line survey area
Survey area
Half mile buffer
Pole (Existing)
Pole (Modify)
Overhead
N
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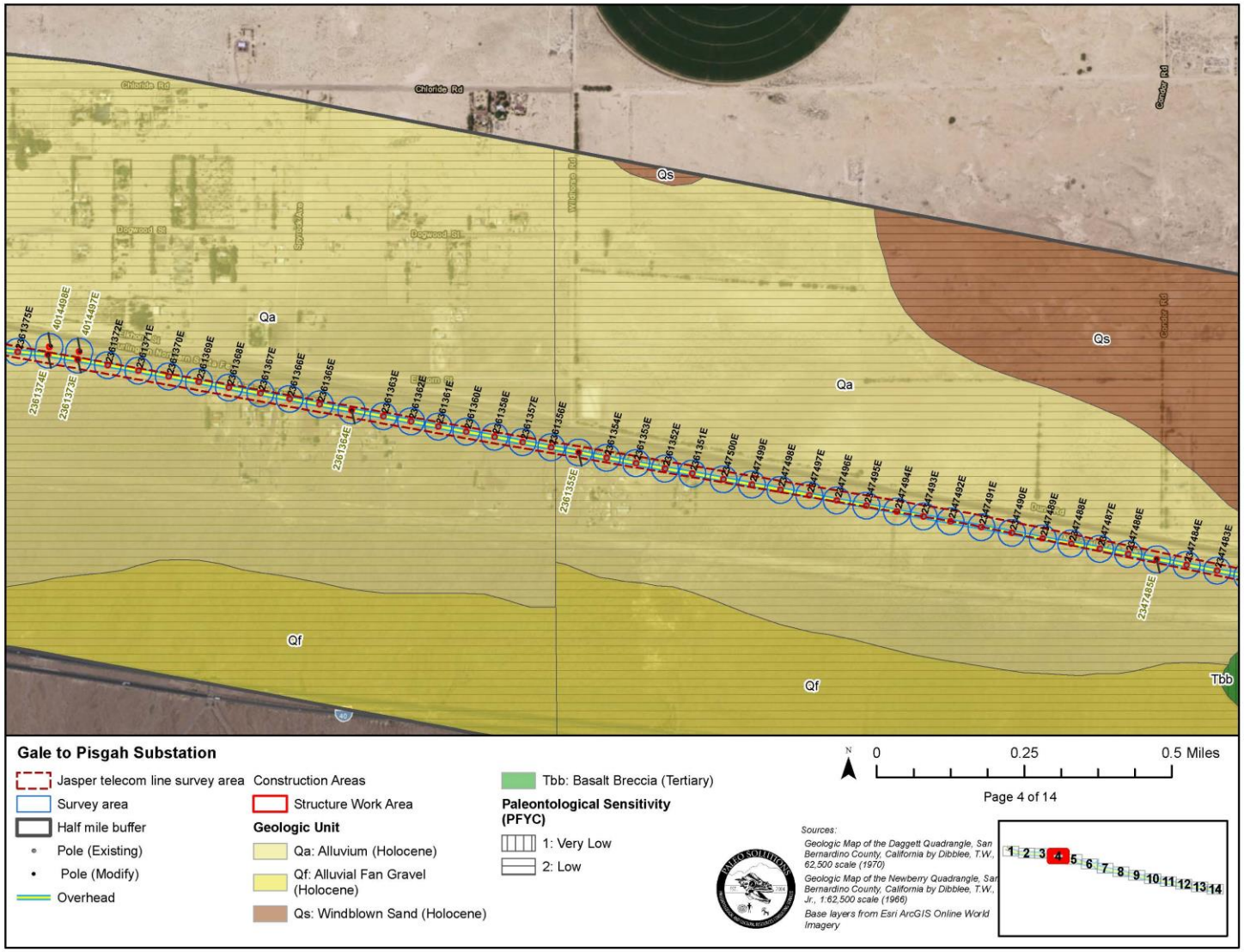
Chloride Rd
Dogwood St
Qa
Qs
Qf
Tbb
Gale to Pisgah Substation
Jasper telecom line survey area
Survey area
Half mile buffer
Pole (Existing)
Pole (Modify)
Overhead
Construction Areas
Structure Work Area
Geologic Unit
Qa: Alluvium (Holocene)
Qf: Alluvial Fan Gravel (Holocene)
Qs: Windblown Sand (Holocene)
Tbb: Basalt Breccia (Tertiary)
Paleontological Sensitivity (PFYC)
1: Very Low
2: Low
N
0
0.25
0.5 Miles
Page 4 of 14
Sources:
Geologic Map of the Daggett Quadrangle, San Bernardino County, California by Dibblee, T.W., 62,500 scale (1970)
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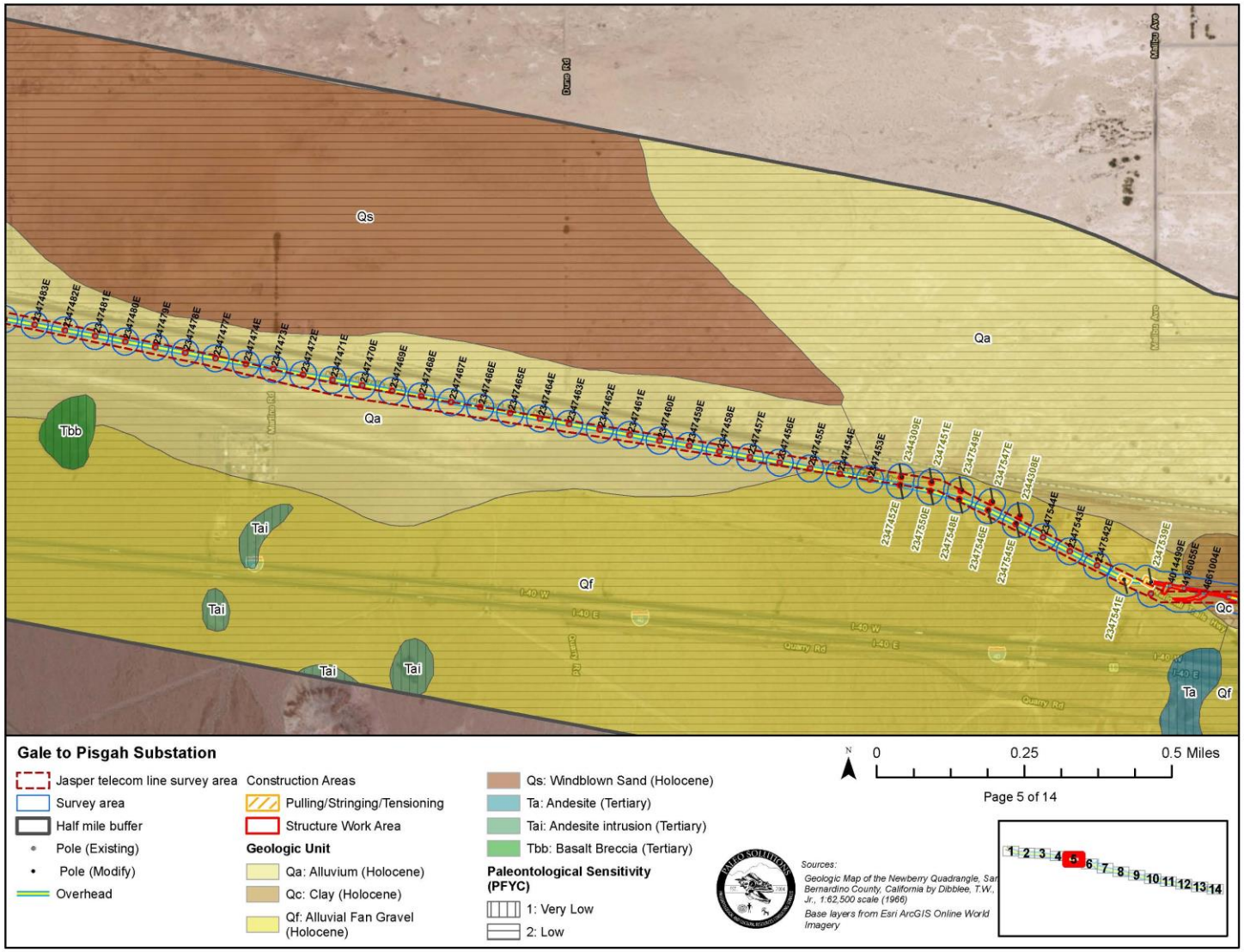
Dunn Rd
Mallow Ave
Qs
Qa
Tbb
Tai
Qf
Qc
Ta
Quarry Rd
I-40 W
I-40 E
Gale to Pisgah Substation
Jasper telecom line survey area
Survey area
Half mile buffer
Pole (Existing)
Pole (Modify)
Overhead
Construction Areas
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Structure Work Area
Geologic Unit
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Qc: Clay (Holocene)
Qf: Alluvial Fan Gravel (Holocene)
Qs: Windblown Sand (Holocene)
Ta: Andesite (Tertiary)
Tai: Andesite intrusion (Tertiary)
Tbb: Basalt Breccia (Tertiary)
Paleontological Sensitivity (PFYC)
1: Very Low
2: Low
N
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Page 5 of 14
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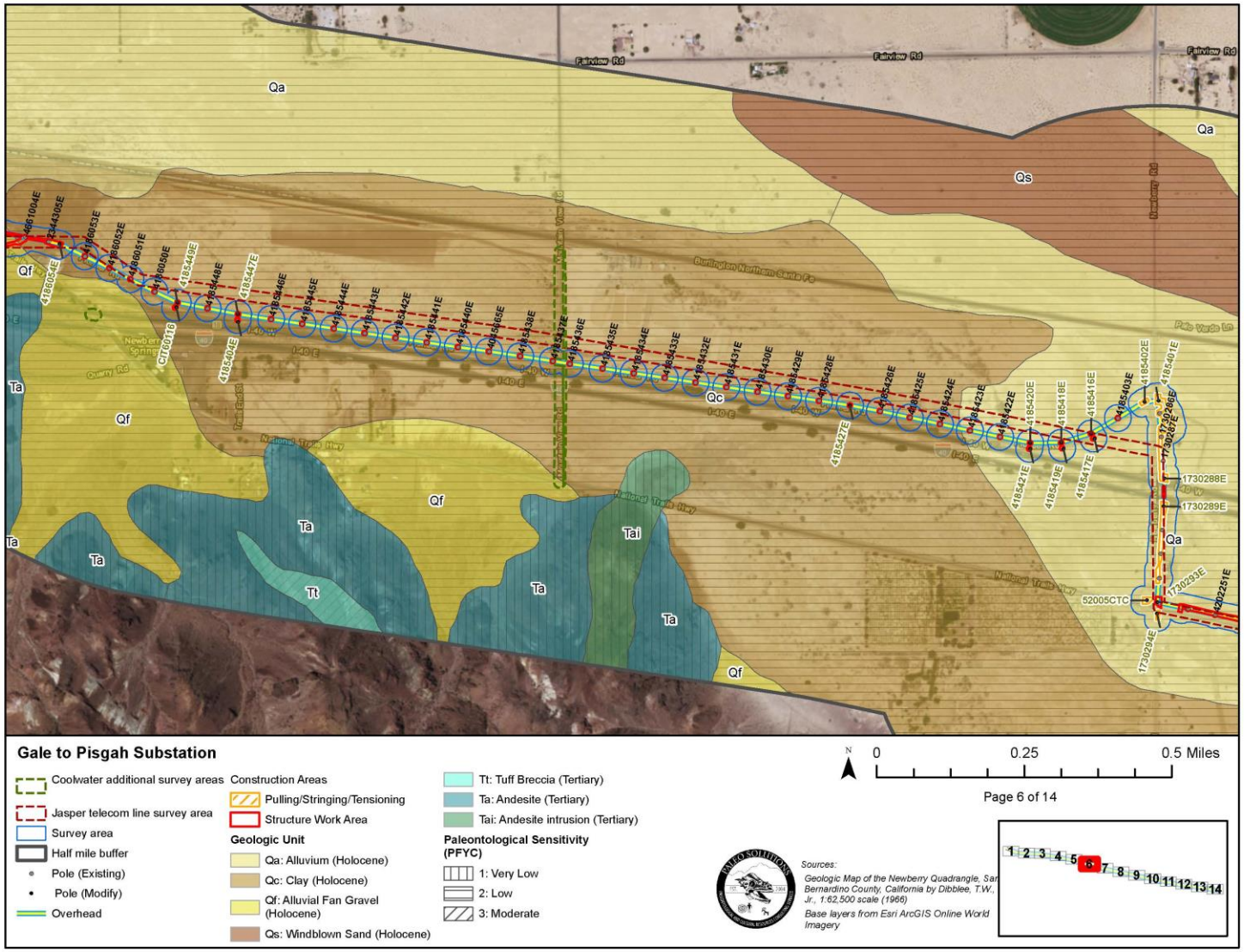
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Coolwater additional survey areas
Jasper telecom line survey area
Survey area
Half mile buffer
Pole (Existing)
Pole (Modify)
Overhead
Construction Areas
Pulling/Stringing/Tensioning
Structure Work Area
Geologic Unit
Qa: Alluvium (Holocene)
Qc: Clay (Holocene)
Qf: Alluvial Fan Gravel (Holocene)
Qs: Windblown Sand (Holocene)
Tt: Tuff Breccia (Tertiary)
Ta: Andesite (Tertiary)
Tai: Andesite intrusion (Tertiary)
Paleontological Sensitivity (PFYC)
1: Very Low
2: Low
3: Moderate
N
0
0.25
0.5 Miles
Page 6 of 14
Sources:
Geologic Map of the Newberry Quadrangle, San Bernardino County, California by Dibblee, T.W., Jr., 1:62,500 scale (1966)
Base layers from Esri ArcGIS Online World Imagery
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Burlington Northern Santa Fe
National Trails Hwy
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Qs
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Qc
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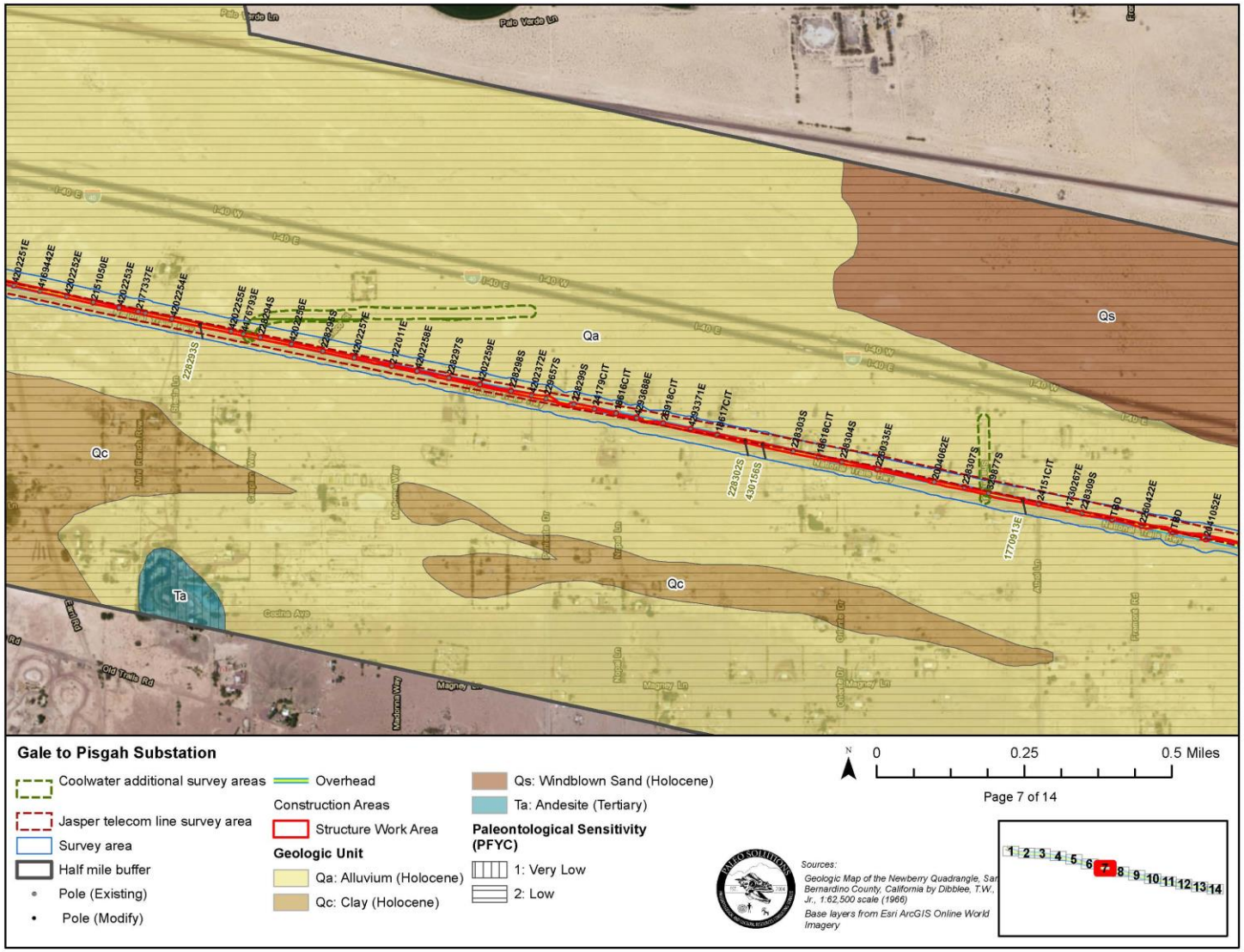
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Jasper telecom line survey area
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Pole (Modify)
Overhead
Construction Areas
Structure Work Area
Geologic Unit
Qa: Alluvium (Holocene)
Qc: Clay (Holocene)
Qs: Windblown Sand (Holocene)
Ta: Andesite (Tertiary)
Paleontological Sensitivity (PFYC)
1: Very Low
2: Low
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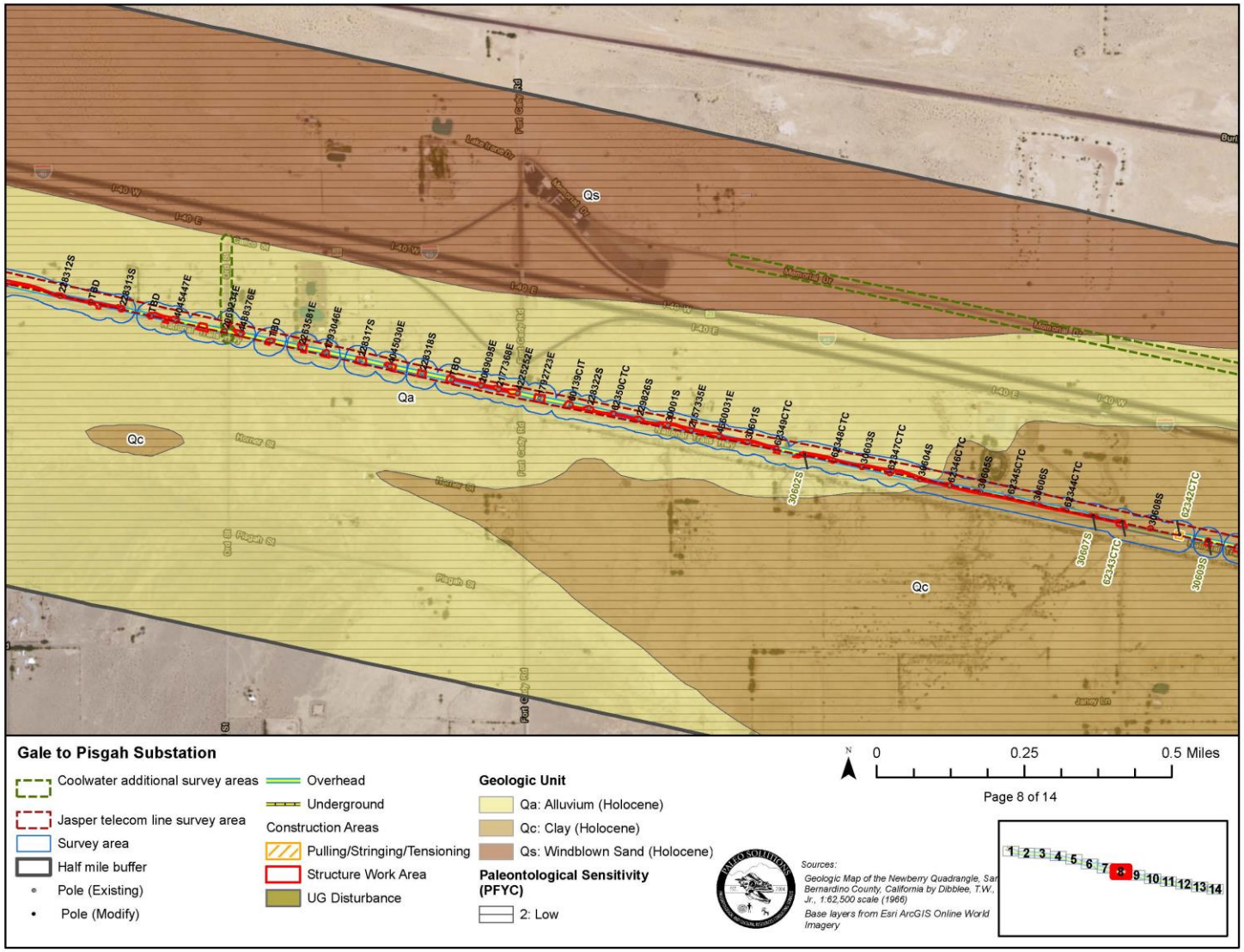
Page 7 of 14
Sources:
Geologic Map of the Newberry Quadrangle, San Bernardino County, California by Dibblee, T.W., Jr., 1:62,500 scale (1966)
Base layers from Esri ArcGIS Online World Imagery
Qa
Qc
Qs
Ta
I-40 E
I-40 W
Palo Verde Ln
Old Trails Rd
Magney Ln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Jasper telecom line survey area
Survey area
Half mile buffer
Pole (Existing)
Pole (Modify)
Overhead
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Construction Areas
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UG Disturbance
Geologic Unit
Qa: Alluvium (Holocene)
Qc: Clay (Holocene)
Qs: Windblown Sand (Holocene)
Paleontological Sensitivity (PFYC)
2: Low
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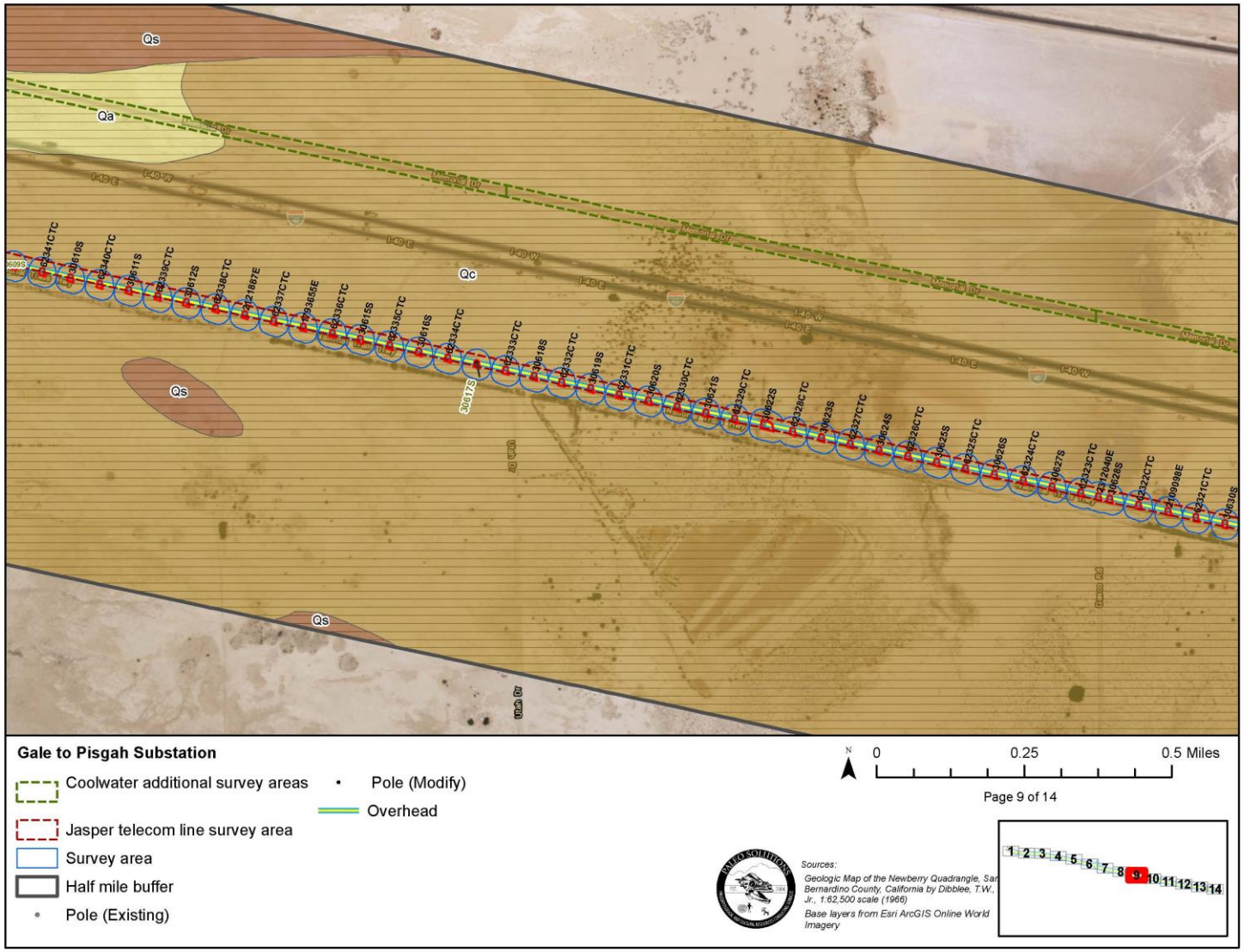
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Qa
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Gale to Pisgah Substation
Coolwater additional survey areas
Jasper telecom line survey area
Survey area
Half mile buffer
Pole (Existing)
Pole (Modify)
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Page 9 of 14
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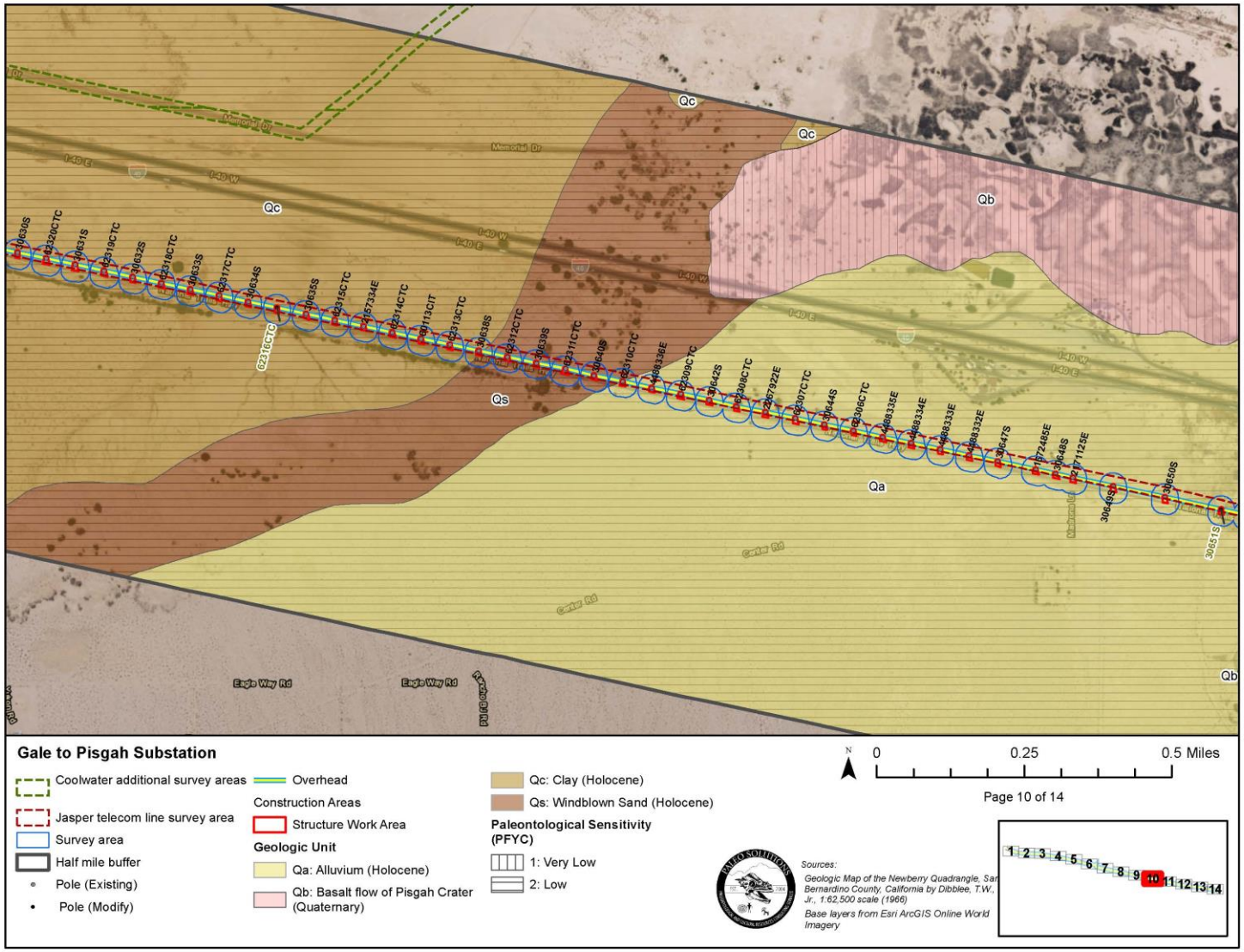
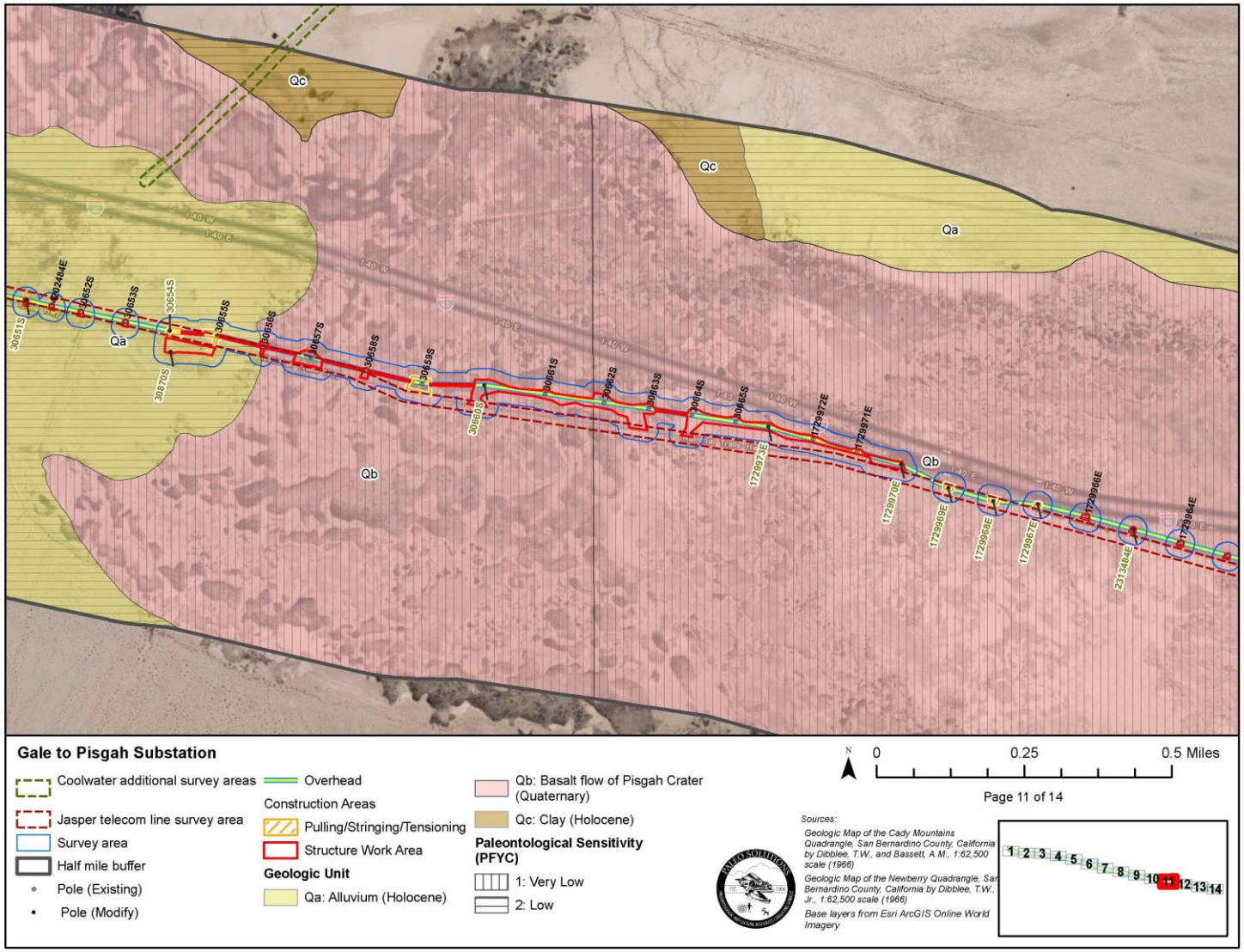
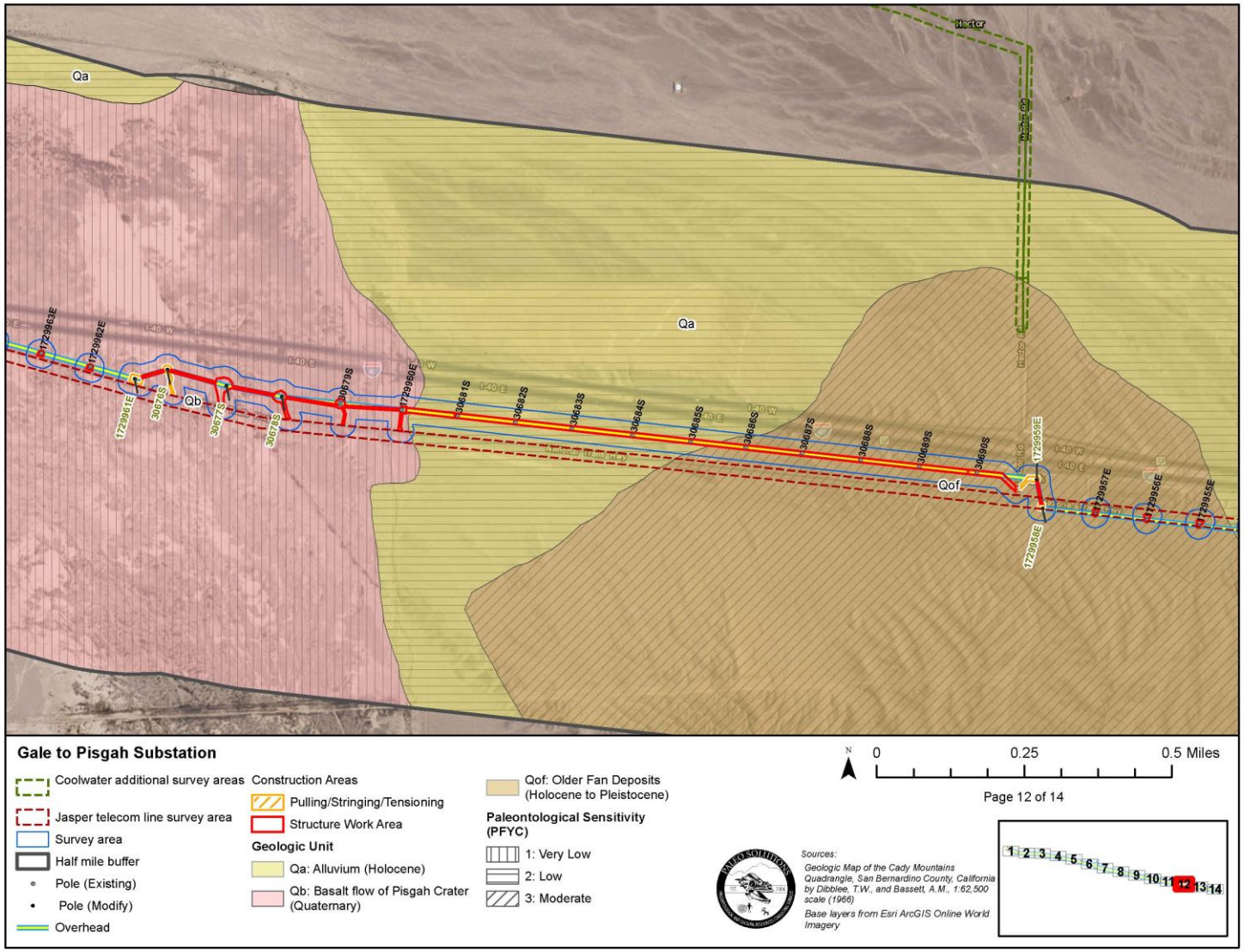
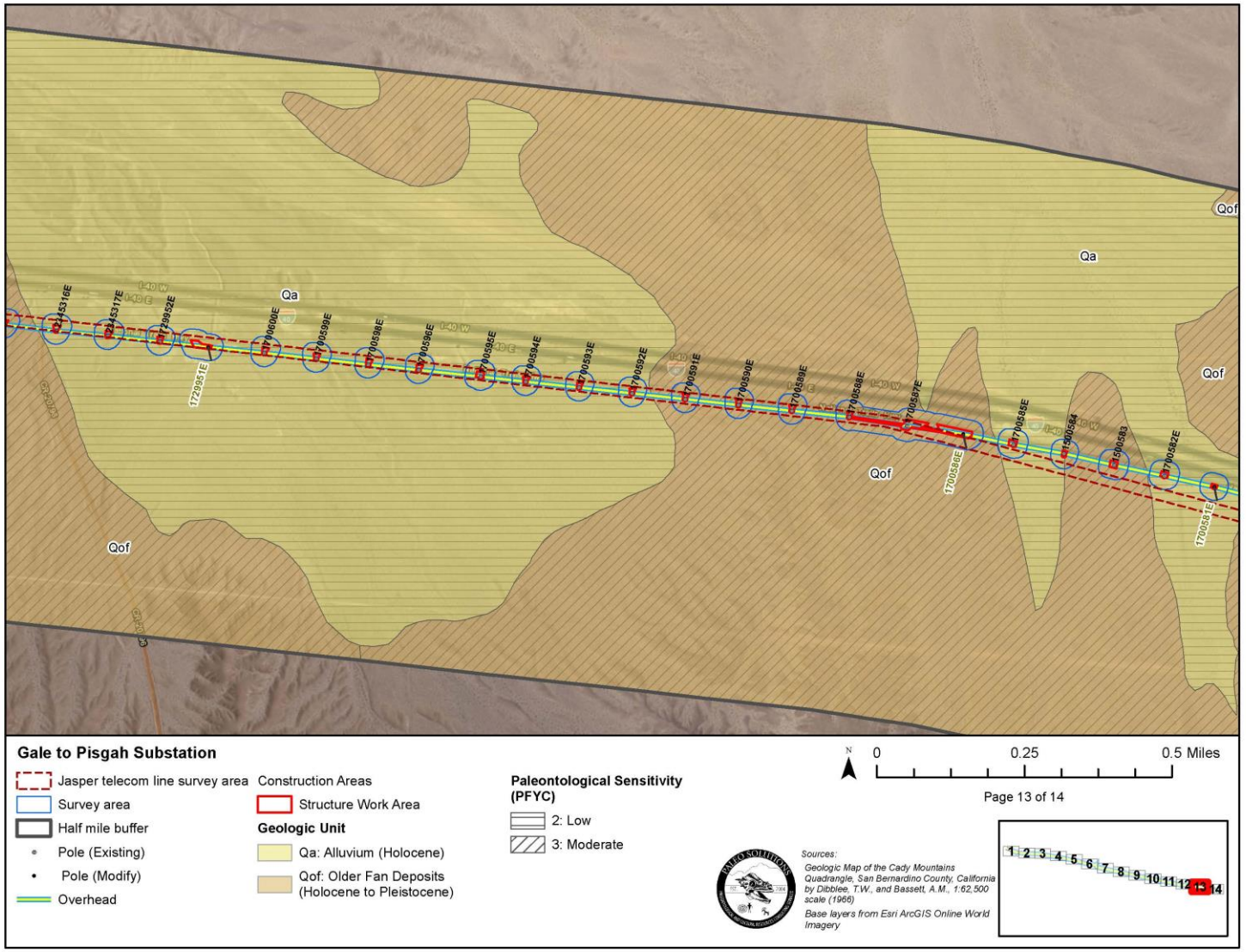
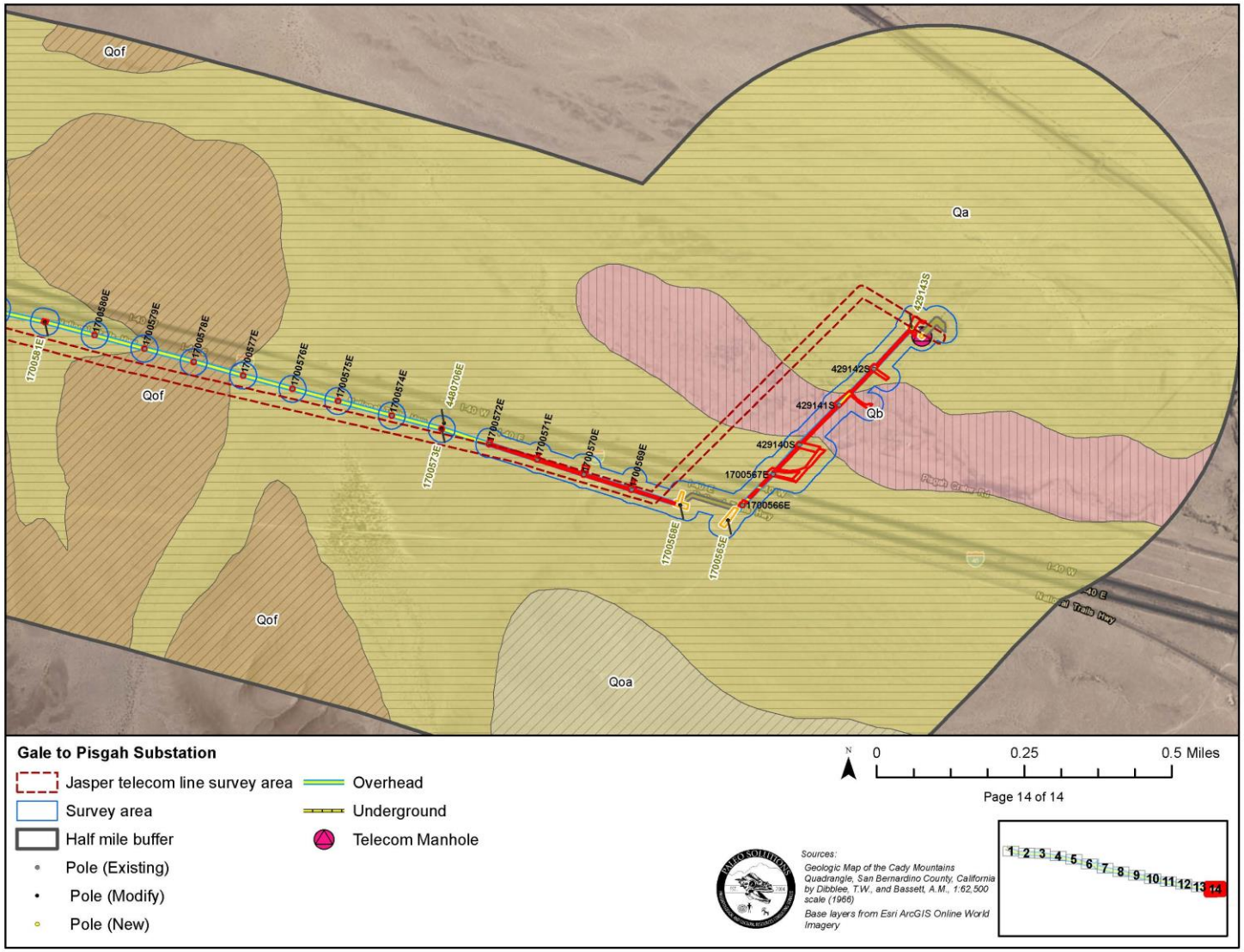
Base layers from Esri ArcGIS Online World Imagery
1 2 3 4 5 6 7 8 9 10 11 12 13 14


Gale to Pisgah Substation
Coolwater additional survey areas
Jasper telecom line survey area
Survey area
Half mile buffer
Pole (Existing)
Pole (Modify)
Overhead
Construction Areas
Structure Work Area
Geologic Unit
Qa: Alluvium (Holocene)
Qb: Basalt flow of Pisgah Crater (Quaternary)
Qc: Clay (Holocene)
Qs: Windblown Sand (Holocene)
Paleontological Sensitivity (PFYC)
1: Very Low
2: Low
N
0
0.25
0.5 Miles
Page 10 of 14
Sources:
Geologic Map of the Newberry Quadrangle, San Bernardino County, California by Dibblee, T.W., Jr., 1:62,500 scale (1966)
Base layers from Esri ArcGIS Online World Imagery
Qc
Qb
Qs
Qa
Eagle Way Rd
Memorial Dr
I-40 E
I-40 W


Qc
Qa
Qb
I-40 W
I-40 E
Gale to Pisgah Substation
Coolwater additional survey areas
Jasper telecom line survey area
Survey area
Half mile buffer
Pole (Existing)
Pole (Modify)
Overhead
Construction Areas
Pulling/Stringing/Tensioning
Structure Work Area
Geologic Unit
Qa: Alluvium (Holocene)
Qb: Basalt flow of Pisgah Crater (Quaternary)
Qc: Clay (Holocene)
Paleontological Sensitivity (PFYC)
1: Very Low
2: Low
N
0
0.25
0.5 Miles
Page 11 of 14
Sources:
Geologic Map of the Cady Mountains Quadrangle, San Bernardino County, California by Dibblee, T.W., and Bassett, A.M., 1:62,500 scale (1966)
Geologic Map of the Newberry Quadrangle, San Bernardino County, California by Dibblee, T.W., Jr., 1:62,500 scale (1966)
Base layers from Esri ArcGIS Online World Imagery


Qa
Qb
Qof
Gale to Pisgah Substation
Coolwater additional survey areas
Jasper telecom line survey area
Survey area
Half mile buffer
Pole (Existing)
Pole (Modify)
Overhead
Construction Areas
Pulling/Stringing/Tensioning
Structure Work Area
Geologic Unit
Qa: Alluvium (Holocene)
Qb: Basalt flow of Pisgah Crater (Quaternary)
Qof: Older Fan Deposits (Holocene to Pleistocene)
Paleontological Sensitivity (PFYC)
1: Very Low
2: Low
3: Moderate
N
0
0.25
0.5 Miles
Page 12 of 14
Sources:
Geologic Map of the Cady Mountains Quadrangle, San Bernardino County, California by Dibblee, T.W., and Bassett, A.M., 1:62,500 scale (1966)
Base layers from Esri ArcGIS Online World Imagery


Qa
Qof
Gale to Pisgah Substation
Jasper telecom line survey area
Survey area
Half mile buffer
Pole (Existing)
Pole (Modify)
Overhead
Construction Areas
Structure Work Area
Geologic Unit
Qa: Alluvium (Holocene)
Qof: Older Fan Deposits (Holocene to Pleistocene)
Paleontological Sensitivity (PFYC)
2: Low
3: Moderate
N
0
0.25
0.5 Miles
Page 13 of 14
Sources:
Geologic Map of the Cady Mountains Quadrangle, San Bernardino County, California by Dibblee, T.W., and Bassett, A.M., 1:62,500 scale (1966)
Base layers from Esri ArcGIS Online World Imagery


Qof
Qa
Qb
Qoa
1700581E
1700580E
1700579E
1700578E
1700577E
1700576E
1700575E
1700574E
4480706E
1700573E
1700572E
1700571E
1700570E
1700569E
1700568E
1700565E
1700566E
1700567E
429143S
429142S
429141S
429140S
Gale to Pisgah Substation
Jasper telecom line survey area
Survey area
Half mile buffer
Pole (Existing)
Pole (Modify)
Pole (New)
Overhead
Underground
Telecom Manhole
N
0
0.25
0.5 Miles
Page 14 of 14
Sources:
Geologic Map of the Cady Mountains Quadrangle, San Bernardino County, California by Dibblee, T.W., and Bassett, A.M., 1:62,500 scale (1966)
Base layers from Esri ArcGIS Online World Imagery
1 2 3 4 5 6 7 8 9 10 11 12 13 14

APPENDIX B. BLM PERMIT AND FIELDWORK AUTHORIZATION

United States Department of the Interior
BUREAU OF LAND MANAGEMENT
California State Office
2800 Cottage Way, Suite W1623
Sacramento, CA 95825
www.blm.gov/ca

March 16, 2016

In Reply Refer To:
CA930 8151(P)

Geraldine Aron
Paleo Solutions, Inc.
911 S. Primrose Ave, Unit N
Monrovia, CA 91016

Dear Ms. Aron:

The Bureau of Land Management (BLM) is pleased to issue a 3-year Scientific Paleontological Permit (*CA-16-03P*) to Paleo Solutions, Inc. for use on Public Lands managed by California BLM as specified in your permit. This permit is issued under the authority of the Federal Land Policy and Management Act (FLPMA) and the Antiquities Act of 1906. Keep a copy with you at all times in the field.

This permit authorizes the permit holder to conduct and collect paleontological resources pertaining to both scientific research and commercial projects. BLM would like to emphasize a few points. First, this permit assigns to your firm the responsibility to submit reports and other documents in a timely fashion and such submittal will be a major point of review of your firm's performance under this permit. Second, you are required to contact the appropriate Field Office to obtain a Field Use Authorization before you begin any fieldwork. Please allow the Field Office sufficient lead-time to process your application for a Field Use Authorization. The Field Office may impose additional conditions and stipulations at that time. Third, please be mindful that it is your firm's responsibility to ensure assignment of supervisory field personnel (crew chiefs) to projects that have at least four months' local experience and who otherwise meet the standards of the Bureau.

Our office is enclosing a map of California BLM Field Offices with phone numbers of cultural heritage staff and a copy of your permit with attached National special permit conditions. BLM draws your attention to these stipulations and encourages you to read and understand them. Please sign page 5, as indicated, and **return a copy of this signature page to the California BLM State Office within 30 days of your receipt of the permit**. Your permit will be valid after your signature is received.

Should you have any questions contact James Barnes at email jjbarnes@blm.gov or by phone 916-978-4676.

Sincerely,

Tom Pogacnik
Deputy State Director
Natural Resources Division

Enclosures as stated

DI Form 1991 (Rev Sept 2004)
OMB No. 1024-0037
Exp. Date (01/31/2008)

United States Department of the Interior

PERMIT FOR PALEONTOLOGICAL INVESTIGATIONS

To conduct archeological work on Department of the Interior lands and Indian lands under the authority of:

- ☐ The Archaeological Resources Protection Act of 1979 (16 U.S.C. 470aa-mm) and its regulations (43 CFR 7).
- ☒ The Antiquities Act of 1906 (P.L. 59-209; 34 Stat. 225, 16 U.S.C. 431-433) and its regulations (43 CFR 3).
- ☐ Supplemental regulations (25 CFR 262) pertaining to Indian lands.
- ☒ Bureau-specific statutory and/or regulatory authority: Federal Land Policy and Management Act of 1976 (Public Law 94-570), and Section 302 of Public Law 94-4579

Please use this number when referring to this permit
No.: CA-16-03P

1. Permit issued to Paleo Solutions, Inc.	2. Under application dated January 21, 2016
3. Address 911 S. Primrose Ave., Unit N, Monrovia, CA 91016	4. Telephone number(s) (562) 818-7713
	5. E-mail address(es) geraldine@paleosolutions.com

6. Name of Permit Administrator Geraldine Aron Telephone number(s): (562) 818-7713 Email address(es): geraldine@paleosolutions.com	7. Name of Principal Investigator(s) Geraldine Aron, Paul Murphy, Jennifer Kelly, Courtney Richards Telephone number(s): GA: (562) 818-7713, PM: (303) 514-1095, JK: (714) 206-5433, CR: (626) 716-2000 Email address(es): geraldine@paleosolutions.com, pmurphy@paleosolutions.com, jkelly@paleosolutions.com, crichards@paleosolutions.com
8. Name of Field Director(s) authorized to carry out field projects	Telephone number(s): Email address(es):
9. Activity authorized Survey and limited surface collection	
10. On lands described as follows All lands managed by the Bureau of Land Management-California	
11. During the duration of the project From March 16, 2016 To March 16, 2019	
12. Name and address of the curatorial facility in which collections, records, data, photographs, and other documents resulting from work under this permit shall be deposited for permanent preservation on behalf of the United States Government. Natural History Museum of Los Angeles County, 900 Exposition Blvd., Los Angeles, CA 90007	
13. Permittee is required to observe the listed standard permit conditions and the special permit conditions attached to this permit.	
14. Signature and title of approving official Tom Pogacnik, Deputy State Director, Natural Resources Division	15. Date 03/17/2016

15. Standard Permit Conditions

a. This permit is subject to all applicable provisions of 43 CFR Part 3, 43 CFR 7, and 25 CFR 262, and applicable departmental and bureau policies and procedures, which are made a part hereof.

b. The permittee and this permit are subject to all other Federal, State, and local laws and regulations applicable to the public lands and resources.

c. This permit shall not be exclusive in character, and shall not affect the ability of the land managing bureau to use, lease or permit the use of lands subject to this permit for any purpose.

d. This permit may not be assigned.

e. This permit may be suspended or terminated for breach of any condition or for management purposes at the discretion of the approving official, upon written notice.

f. This permit is issued for the term specified in 11 above.

g. Permits issued for a duration of more than one year must be reviewed annually by the agency official and the permittee.

h. The permittee shall obtain all other required permit(s) to conduct the specified project.

i. Archeological project design, literature review, development of the regional historic context framework, site evaluation, and recommendations for subsequent investigations must be developed with direct involvement of an archeologist who meets the Secretary of the Interior's Standards for Archeology and Historic Preservation; fieldwork must be generally overseen by an individual who meets the Secretary of the Interior's Standards for Archeology and Historic Preservation.

j. Permittee shall immediately request that the approving official (14. above) make a modification to accommodate any change in an essential condition of the permit, including individuals named and the nature, location, purpose, and time of authorized work, and shall without delay notify the approving official of any other changes affecting the permit or regarding information submitted as part of the application for the permit. Failure to do so may result in permit suspension or revocation.

k. Permittee may request permit extension, in writing, at any time prior to expiration of the term of the permit, specifying a limited, definite amount of time required to complete permitted work.

l. Any correspondence about this permit or work conducted under its authority must cite the permit number. Any publication of results of work conducted under the authority of this permit must cite the approving bureau and the permit number.

m. Permittee shall submit a copy of any published journal article and any published or unpublished report, paper, and manuscript resulting from the permitted work (apart from those required in items q. and s., below), to the approving official and the appropriate official of the approved curatorial facility (item 12 above).

n. Prior to beginning any fieldwork under the authority of this permit, the permittee, following the affected bureau's policies and procedures, shall contact the field office manager responsible for administering the lands involved to obtain further instructions.

o. Permittee may request a review, in writing to the official concerned, of any disputed decision regarding inclusion of specific terms and conditions or the modification, suspension, or revocation of this permit, setting out reasons for believing that the decision should be reconsidered.

p. Permittee shall not be released from requirements of this permit until all outstanding obligations have been satisfied, whether or not the term of the permit has expired. Permittee may be subject to civil penalties for violation of any term or condition of this permit.

Permit No.**CA-16-03P** **DI Form 1991 (Rev Sept 2004) Page 3**

15. Standard Permit Conditions (continued)

q. Permittee shall submit a preliminary report to the approving official within a timeframe established by the approving official, which shall be no later than 6 weeks after the completion of any episode of fieldwork, setting out what was done, how it was done, by whom, specifically where, and with what results, including maps, GPS data, an approved site form for each newly recorded archeological site, and the permittee's professional recommendations, as results require. If other than 6 weeks, the timeframe shall be specified in Special Permit Condition p. Depending on the scope, duration, and nature of the work, the approving official may require progress reports, during or after the fieldwork period or both, and as specified in Special Permit Condition r.

r. Permittee shall submit a clean, edited draft final report to the agency official for review to insure conformance with standards, guidelines, regulations, and all stipulations of the permit. The schedule for submitting the draft shall be determined by the agency official.

s. Permittee shall submit a final report to the approving official not later than 180 days after completion of fieldwork. Where a fieldwork episode involved only minor work and/or minor findings, a final report may be submitted in place of the preliminary report. If the size or nature of fieldwork merits, the approving official may authorize a longer timeframe for the submission of the final report as specified in Special Permit Condition q.

t. Two copies of the final report, a completed NTIS Report Documentation Page (SF-298), available at http://www.ntis.gov/pdf/rdpform.pdf, and a completed NADB-Reports Citation Form, available at http://www.cr.nps.gov/aad/tools/nadbform_update.doc, will be submitted to the office issuing the permit.

u. The permittee agrees to keep the specific location of sensitive resources confidential. Sensitive resources include threatened species, endangered species, and rare species, archeological sites, caves, fossil sites, minerals, commercially valuable resources, and sacred ceremonial sites.

v. Permittee shall deposit all artifacts, samples and collections, as applicable, and original or clear copies of all records, data, photographs, and other documents, resulting from work conducted under this permit, with the curatorial facility named in item 12, above, not later than 90 days after the date the final report is submitted to the approving official. Not later than 180 days after the final report is submitted, permittee shall provide the approving official with a catalog and evaluation of all materials deposited with the curatorial facility, including the facility's accession and/or catalog numbers.

w. Permittee shall provide the approving official with a confirmation that museum collections described in v. above were deposited with the approved curatorial facility, signed by an authorized curatorial facility official, stating the date materials were deposited, and the type, number and condition of the collected museum objects deposited at the facility.

x. Permittee shall not publish, without the approving official's prior permission, any locational or other identifying archeological site information that could compromise the Government's protection and management of archeological sites.

y. For excavations, permittee shall consult the OSHA excavation standards which are contained in 29 CFR §1926.650, §1926.651 and §1926.652. For questions regarding these standards contact the local area OSHA office, OSHA at 1-800-321-OSHA, or the OSHA website at http://www.osha.gov.

z. Special permit conditions attached to this permit are made a part hereof.

Permit No.**CA-16-03P** **DI Form 1991 (Rev Sept 2004) Page 4**

16. Special Permit Conditions

- ☒ a. Permittee shall allow the approving official and bureau field officials, or their representatives, full access to the work area specified in this permit at any time the permittee is in the field, for purposes of examining the work area and any recovered materials and related records.
- ☒ b. Permittee shall cease work upon discovering any human remains and shall immediately notify the approving official or bureau field official. Work in the vicinity of the discovery may not resume until the authorized official has given permission.
- ☒ c. Permittee shall backfill all subsurface test exposures and excavation units as soon as possible after recording the results, and shall restore them as closely as reasonable to the original contour.
- ☒ d. Permittee shall not use mechanized equipment in designated, proposed, or potential wilderness areas unless authorized by the agency official or a designee in additional specific conditions associated with this permit.
- ☒ e. Permittee shall take precautions to protect livestock, wildlife, the public, or other users of the public lands from accidental injury in any excavation unit.
- ☒ f. Permittee shall not conduct any flint knapping or lithic replication experiments at any archeological site, aboriginal quarry source, or non-site location that might be mistaken for an archeological site as a result of such experiments.
- ☒ g. Permittee shall perform the fieldwork authorized in this permit in a way that does not impede or interfere with other legitimate uses of the public lands, except when the authorized officer specifically provides otherwise.
- ☒ h. Permittee shall restrict vehicular activity to existing roads and trails unless the authorized officer provides otherwise.
- ☒ i. Permittee shall keep disturbance to the minimum area consistent with the nature and purpose of the fieldwork.
- ☒ j. Permittee shall not cut or otherwise damage living trees unless the authorized officer gives permission.
- ☒ k. Permittee shall take precautions at all times to prevent wildfire. Permittee shall be held responsible for suppression costs for any fires on public lands caused by the permittee's negligence. Permittee may not burn debris without the authorized officer's specific permission.
- ☒ l. Permittee shall conduct all operations in such a manner as to prevent or minimize scarring and erosion of the land, pollution of the water resources, and damage to the watershed.
- ☒ m. Permittee shall not disturb resource management facilities within the permit area, such as fences, reservoirs, and other improvements, without the authorized officer's approval. Where disturbance is necessary, permittee shall return the facility to its prior condition, as determined by the authorized officer.
- ☒ n. Permittee shall remove temporary stakes and/or flagging, which the permittee has installed, upon completion of fieldwork.
- ☒ o. Permittee shall clean all camp and work areas before leaving the permit area. Permittee shall take precautions to prevent littering or pollution on public lands, waterways, and adjoining properties. Refuse shall be carried out and deposited in approved disposal areas.
- ☐ p. Permittee shall submit the preliminary report within _____ days/weeks of completion of any episode of fieldwork..
- ☐ q. Permittee shall submit the final report within _____ days/weeks/months after completion of fieldwork..
- ☐ r. Permittee shall submit progress reports every _____ months over the duration of the project.
- ☒ s. California special permit conditions are attached.

Permit No.**CA-16-03P** **DI Form 1991 (Rev Sept 2004) Page 5**

Special Permit Conditions Continuation Sheet: California Conditions

- a. Work under this permit is limited to specific service approved for each permit. This may consist of non-collection survey, limited testing to determine site content and limits or extensive testing emergency excavation and/or salvage projects. Testing/ excavation projects may be conducted under the authority of this permit only upon completion of ARPA consultation with Native American Groups and written approval from the Bureau for such work. (CARIDAPs for the purpose of the identification of archaeological resources are authorized under a FLPMA/ARPA Permit).
- b. Permittees shall verbally and subsequently in writing contact the appropriate BLM Field Manager prior to the beginning of each of his field operations (with follow-up written notification) to inform the BLM of specific work to be conducted. At this time, the BLM Field Manager may impose additional stipulation as deemed necessary to provide for the protection and management of resource values in the general site or project area.
- c. All cultural artifacts and other related materials such as notes, photographs, etc., acquired under the provisions of this permit **remain the property of the United States Government and may be recalled at any time for the use of the Department of the interior or other agencies of the Federal Government.** Cultural materials collected under the provisions of this permit must be curated at a repository approved by the BLM. Curation shall be at a local qualified repository, if feasible, and an approved curation facility shall be designated prior to all field projects. An itemized list of all materials with accession numbers, curated at the repository will be submitted to the State Office and to the appropriate Field Office within 180 days of the completion of individual field projects. A copy of a receipt from the curation facility must be submitted with the list or catalogue.
- d. Permittees shall acquire a primary number from the appropriate Information Center for each cultural resource documented while undertaking work authorized by this permit.
- e. The BLM Field Manager or authorized representative may require a monthly letter progress report outlining what was accomplished. This report, if required, is due by the fifth day of the following month, unless different arrangements are approved.
- f. The individual(s) in direct charge must be academically qualified and possess adequate field experience. At least two weeks prior to initiation field work, the permittees must provide the BLM Field Manager with the vitae of individuals proposed to be in direct charge if not approved at the time of permit issuance. A list of field crew members should be submitted at the same time. Only the individual(s) listed in Item No. 8 of the permit is/are authorized to be in direct charge of field work conducted under this permit.
- g. The person(s) in direct charge of field work, shall be on site at all times when work is in progress. Failure to comply with permit stipulations will result in removal of subject's name(s) from the approved list of person-in-direct-charge.
- h. Care should be exercised to avoid directly or indirectly increasing access or potential vandalism to sensitive sites.
- i. All National Permit Stipulations are binding. The authority for issuing permits in the Bureau of Land Management rests solely with the State Director as Delegated by the Secretary of the Interior and all further delegation is prohibited by Secretarial Order. No Modification of National Permit Conditions 8 or 9 or of the California Special Permit Conditions may occur except by written decision of the State Director.
- j. The Bureau of Land Management shall be cited in any report of work done under this permit, including publications such as books, news articles and scientific publications, as well as oral reports, films, television programs, and presentations in other media.

By signing below, I, the Principal Investigator, acknowledge that I have read and understand the Permit for Archeological Investigations and agree to its terms and conditions as evidenced by my signature below and initiation of work or other activities under the authority of this permit.

Signature and title:	Date:
	03/17/2016

United States Department of the Interior
FIELDWORK REQUEST AND AUTHORIZATION
PALEONTOLOGICAL INVESTIGATIONS

DI Form 1991
(BLM Rev July 2005)

FA-680-18-03

Authorization to conduct Paleontological studies on public lands managed by the Bureau of Land Management under the authority of:
☒ The Antiquities Act of 1906 (P.L. 59-209; 34 Stat. 225, 16 U.S.C. 431-433) and its regulations (43 CFR 3).
☒ Bureau-specific statutory and/or regulatory authority: Federal Land Policy and Management Act of 1976 (Public Law 94-570), and Section 302 of Public Law 94-4579

Please use this number when referring to this permit

No.: CA-16-03P

1. Applicant (Business/Firm) and BLM State Permit Number Paleo Solutions, Inc	**2. Application date:** 10/31/2017
3. Address 911 S Primrose Ave, Unit N Monrovia, CA 91016	**4. Telephone number(s)** 562-818-7713
	5. E-mail address(es) geraldine@paleosolutions.com
6. Name of Permit Administrator Geraldine Aron **Telephone number(s):** 562-818-7713 **Email address(es):** geraldine@paleosolutions.com	**7. Name of Principal Investigator(s)** Geraldine Aron, Courtney Richards, and Paul Murphey **Telephone number(s):** 562-818-7713; 626-716-2000; 303-882-8048 **Email address(es):** geraldine@paleosolutions.com, crichards@paleosolutions.com; paul@paleosolutions.com
8. Name of Field Director(s) authorized to carry out field projects Geraldine Aron	**Telephone number(s):** 562-818-7713 **Email address(es):** geraldine@paleosolutions.com

9. Nature of paleontological fieldwork proposed:
☒ **Survey and limited surface collection.** ☐ **Excavation**
Briefly describe: A paleontology survey is being recommend for Southern California Edison SCE EA for Gale to Pisgah Substation Project: A field survey of paleontologically sensitive locations PFYC 3 above, and within the Project area will be conducted as well as verification of geologic extents of PFYC 1 and PFYC 2 units and previously recorded fossil localities. All sedimentary units with a PFYC of 3 or higher must be inspected during a pre-construction field survey and assessed to determine their actual potential for containing fossils of fossiliferous paleosols. The survey and assessment may revise the PFYC of some sedimentary units.

The field survey will be conducted by a survey crew consisting of two paleontologists. The crew will complete a 100% pedestrian linear survey of all potentially fossiliferous bedrock outcrops and exposures of surficial sediments that occur on PFYC U, 3, 4, or 5 formations and verification of PFYC Class 1 and 2 extents. Areas with very low to low sensitivity will not be intensively surveyed.

Paleo Solutions' Principal Investigator, Geraldine Aron, will oversee the paleontological field survey activities. The field survey is anticipated to take a maximum of 3 working day to complete (10 hours/day) based on the initial analysis of existing data, and the access roads mapped for the Project.

Some areas were originally surveyed during the SCE Coolwater to Lugo and Jasper Telecom Projects.

Please see the attached map.

10. Location of proposed work (attach topographic map copy with project boundaries
Please see the attached map

11. Dates of proposed work: **From:** 10/31/17 **To:** 3/1/17

12. Name and address of the curatorial facility in which collections, records, data, photographs, and other documents resulting from work under

DI Form 1991 (Rev July 2005) Page 2

this permit shall be deposited for permanent preservation on behalf of the United States Government. Natural History Museum of Los Angeles County (LACM), 900 Exposition Blvd., Los Angeles, CA 90007	
13. Permittee is required to observe the listed standard permit conditions and the special permit conditions attached to this permit.	
14. Signature and title of applicant:	**15. Date** 10/31/17
16. Signature and title of approving official: AFM	**17. Date** 10/31/17

APPENDIX C. MAPPED GEOLOGY BY CONSTRUCTION AREA

Construction Area name	Construction Area Type	Nearest Transmission Structure	Geology (Age)	Paleontological Potential (PFYC)
Wire Setup (Telecommunication)	Pull Sites	429143S	Qa: Alluvium (Holocene)	2
Wire Setup (Telecommunication)	Pull Sites	429143S	Qa: Alluvium (Holocene)	2
Telecommunication	Underground Work Area	429143S	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	429143S	Qa: Alluvium (Holocene)	2
Telecommunication	Walking	429143S	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	30628S	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	30612S	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	4488333E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2361385E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2347274E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2347454E	Qf: Alluvial Fan Gravel (Holocene)	2
Telecommunication	Pole Work Areas	TBD	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2171125E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	1729951E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2347259E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2361365E	Qa: Alluvium (Holocene)	2
Wire Setup (Telecommunication)	Pull Sites	4185402E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2361381E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	4185420E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	1847700E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	4202484E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	30607S	Indetermined	--
Telecommunication	Pole Work Areas	2347459E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	62337CTC	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	2361370E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2347260E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2347478E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	4014499E	Qf: Alluvial Fan Gravel (Holocene)	2
Telecommunication	Pole Work Areas	4186054E	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	30624S	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	1847702E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	1700567E	Qa: Alluvium (Holocene)	2
Telecommunication	Walking	1700567E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	1847673E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2347466E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2347286E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	30634S	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	2347548E	Qf: Alluvial Fan Gravel (Holocene)	2
Telecommunication	Pole Work Areas	2347261E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	62319CTC	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	2347472E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	4488332E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	62334CTC	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	1700574E	Qa: Alluvium (Holocene)	2
Telecommunication	Underground Work Area	1847675E	Qa: Alluvium (Holocene)	2
Wire Setup (Telecommunication)	Pull Sites	1847675E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	TBD	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	1847672E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	62316CTC	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	62336CTC	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	4185434E	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	1847665E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2347488E	Qa: Alluvium (Holocene)	2
Wire Setup (Telecommunication)	Pull Sites	30659S	Qb: Basalt flow of Pisgah Crater (Quaternary)	1
Telecommunication	Walking	30659S	Qb: Basalt flow of Pisgah Crater (Quaternary)	1
Telecommunication	Pole Work Areas	2361357E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	62309CTC	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2361382E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	30650S	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	4660031E	Qa: Alluvium (Holocene)	2
Wire Setup (Telecommunication)	Pull Sites	1730288E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	1730288E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2361355E	Qa: Alluvium (Holocene)	2

Construction Area name	Construction Area Type	Nearest Transmission Structure	Geology (Age)	Paleontological Potential (PFYC)
Telecommunication	Pole Work Areas	2347275E	Qa: Alluvium (Holocene)	2
Telecommunication	Underground Work Area	429667S	Qa: Alluvium (Holocene)	2
Wire Setup (Telecommunication)	Pull Sites	429667S	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	62314CTC	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	4488376E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	30678S	Qb: Basalt flow of Pisgah Crater (Quaternary)	1
Telecommunication	Pole Work Areas	30651S	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2347465E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	30617S	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	1700594E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	429141S	Indetermined	--
Telecommunication	Walking	429141S	Indetermined	--
Telecommunication	Pole Work Areas	30627S	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	30639S	Qs: Windblown Sand (Holocene)	2
Telecommunication	Pole Work Areas	2347251E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2347273E	Qa: Alluvium (Holocene)	2
Telecommunication	Walking	30689S	Indetermined	--
Telecommunication	Pole Work Areas	2361380E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	4186051E	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	1729966E	Qb: Basalt flow of Pisgah Crater (Quaternary)	1
Telecommunication	Pole Work Areas	1847663E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2361388E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	4185426E	Qc: Clay (Holocene)	2
Wire Setup (Telecommunication)	Pull Sites	4045427E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	30615S	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	2347265E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2347461E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	30633S	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	1847687E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2157334E	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	1700572E	Qa: Alluvium (Holocene)	2
Telecommunication	Walking	1700572E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2177368E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2361387E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2347266E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2347453E	Qf: Alluvial Fan Gravel (Holocene)	2
Telecommunication	Pole Work Areas	2347491E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	4045447E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2347482E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	30647S	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	62327CTC	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	4185442E	Qc: Clay (Holocene)	2
Telecommunication	Underground Work Area	1700565E	Qa: Alluvium (Holocene)	2
Wire Setup (Telecommunication)	Pull Sites	1700565E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2347477E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	1729972E	Qb: Basalt flow of Pisgah Crater (Quaternary)	1
Telecommunication	Pole Work Areas	1729964E	Qb: Basalt flow of Pisgah Crater (Quaternary)	1
Telecommunication	Pole Work Areas	1847695E	Indetermined	--
Telecommunication	Pole Work Areas	4185441E	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	1847671E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2347253E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	4488335E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	1700578E	Qof: Older Fan Deposits (Holocene to Pleistocene)	3
Telecommunication	Pole Work Areas	30658S	Qb: Basalt flow of Pisgah Crater (Quaternary)	1
Telecommunication	Walking	30658S	Qb: Basalt flow of Pisgah Crater (Quaternary)	1
Telecommunication	Walking	30658S	Qb: Basalt flow of Pisgah Crater (Quaternary)	1
Telecommunication	Pole Work Areas	2121887E	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	2347464E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2347283E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2109098E	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	2361374E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2361377E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2361362E	Qa: Alluvium (Holocene)	2

Construction Area name	Construction Area Type	Nearest Transmission Structure	Geology (Age)	Paleontological Potential (PFYC)
Telecommunication	Pole Work Areas	2312040E	Qc: Clay (Holocene)	2
Wire Setup (Telecommunication)	Pull Sites	30676S	Qb: Basalt flow of Pisgah Crater (Quaternary)	1
Telecommunication	Walking	30676S	Qb: Basalt flow of Pisgah Crater (Quaternary)	1
Telecommunication	Walking	30676S	Qb: Basalt flow of Pisgah Crater (Quaternary)	1
Telecommunication	Pole Work Areas	4185429E	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	1847661E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	62321CTC	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	1500584	Indetermined	--
Telecommunication	Pole Work Areas	4186055E	Indetermined	--
Telecommunication	Pole Work Areas	30638S	Indetermined	--
Telecommunication	Pole Work Areas	30648S	Qa: Alluvium (Holocene)	2
Telecommunication	Walking	1729960E	Qb: Basalt flow of Pisgah Crater (Quaternary)	1
Telecommunication	Walking	1729960E	Qb: Basalt flow of Pisgah Crater (Quaternary)	1
Telecommunication	Pole Work Areas	1700590E	Qof: Older Fan Deposits (Holocene to Pleistocene)	3
Telecommunication	Pole Work Areas	1500583	Qof: Older Fan Deposits (Holocene to Pleistocene)	3
Telecommunication	Pole Work Areas	62333CTC	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	2347284E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	1847703E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	429142S	Qa: Alluvium (Holocene)	2
Telecommunication	Walking	429142S	Indetermined	--
Telecommunication	Pole Work Areas	1700587E	Qof: Older Fan Deposits (Holocene to Pleistocene)	3
Telecommunication	Walking	1700587E	Qof: Older Fan Deposits (Holocene to Pleistocene)	3
Telecommunication	Pole Work Areas	2347497E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	4185430E	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	1847662E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2347458E	Qa: Alluvium (Holocene)	2
Wire Setup (Telecommunication)	Pull Sites	1730291E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2347455E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2347500E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	62338CTC	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	62312CTC	Qs: Windblown Sand (Holocene)	2
Telecommunication	Pole Work Areas	1700570E	Qa: Alluvium (Holocene)	2
Telecommunication	Walking	1700570E	Qa: Alluvium (Holocene)	2
Telecommunication	Walking	1700570E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	4185436E	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	2347481E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	1700586E	Qof: Older Fan Deposits (Holocene to Pleistocene)	3
Telecommunication	Pole Work Areas	1847699E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2347469E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2263581E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	4185427E	Qc: Clay (Holocene)	2
Wire Setup (Telecommunication)	Pull Sites	1729959E	Qof: Older Fan Deposits (Holocene to Pleistocene)	3
Telecommunication	Walking	1729959E	Qof: Older Fan Deposits (Holocene to Pleistocene)	3
Telecommunication	Pole Work Areas	62311CTC	Qs: Windblown Sand (Holocene)	2
Telecommunication	Pole Work Areas	30616S	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	2347269E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	1847660E	Qa: Alluvium (Holocene)	2
Wire Setup (Telecommunication)	Pull Sites	1847660E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	62317CTC	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	62320CTC	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	4792803E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2361371E	Qa: Alluvium (Holocene)	2
Wire Setup (Telecommunication)	Pull Sites	1847710E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2361383E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2347480E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	1847704E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	4488334E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2361366E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	30640S	Qs: Windblown Sand (Holocene)	2
Telecommunication	Pole Work Areas	1729957E	Qof: Older Fan Deposits (Holocene to Pleistocene)	3
Telecommunication	Pole Work Areas	2069234E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2069234E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2347252E	Qa: Alluvium (Holocene)	2

Construction Area name	Construction Area Type	Nearest Transmission Structure	Geology (Age)	Paleontological Potential (PFYC)
Telecommunication	Pole Work Areas	1700579E	Indetermined	--
Telecommunication	Pole Work Areas	1793655E	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	1847694E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2347278E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2347474E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	30660S	Indetermined	--
Telecommunication	Pole Work Areas	2347494E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2347270E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	1672485E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2347452E	Qf: Alluvial Fan Gravel (Holocene)	2
Telecommunication	Pole Work Areas	2347546E	Qf: Alluvial Fan Gravel (Holocene)	2
Telecommunication	Pole Work Areas	30632S	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	4045665E	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	1847705E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	1700591E	Qof: Older Fan Deposits (Holocene to Pleistocene)	3
Telecommunication	Pole Work Areas	30631S	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	2361353E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	1847667E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2347460E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2347471E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2361351E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	30652S	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	1847698E	Qa: Alluvium (Holocene)	2
Wire Setup (Telecommunication)	Pull Sites	1700568E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	62313CTC	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	2347490E	Qa: Alluvium (Holocene)	2
Wire Setup (Telecommunication)	Pull Sites	1729969E	Qb: Basalt flow of Pisgah Crater (Quaternary)	1
Telecommunication	Pole Work Areas	2347495E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	4792802E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	4488301E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2361384E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	1700577E	Qa: Alluvium (Holocene)	2
Telecommunication	Walking	30656S	Qb: Basalt flow of Pisgah Crater (Quaternary)	1
Telecommunication	Pole Work Areas	30656S	Indetermined	--
Telecommunication	Pole Work Areas	2347470E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2347483E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	1700598E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	4185444E	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	4186052E	Qc: Clay (Holocene)	2
Telecommunication	Walking	30664S	Qb: Basalt flow of Pisgah Crater (Quaternary)	1
Telecommunication	Pole Work Areas	4185440E	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	2347499E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	4185423E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	429140S	Qa: Alluvium (Holocene)	2
Telecommunication	Walking	429140S	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	30679S	Qb: Basalt flow of Pisgah Crater (Quaternary)	1
Telecommunication	Walking	30679S	Qb: Basalt flow of Pisgah Crater (Quaternary)	1
Telecommunication	Pole Work Areas	2361368E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2347457E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2347543E	Qf: Alluvial Fan Gravel (Holocene)	2
Telecommunication	Walking	30681S	Indetermined	--
Telecommunication	Pole Work Areas	2347463E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	4185424E	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	62315CTC	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	2361390E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	1847691E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	62323CTC	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	30653S	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	1847693E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	1700566E	Qa: Alluvium (Holocene)	2
Telecommunication	Walking	1700566E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2361360E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	1793046E	Qa: Alluvium (Holocene)	2

Construction Area name	Construction Area Type	Nearest Transmission Structure	Geology (Age)	Paleontological Potential (PFYC)
Telecommunication	Pole Work Areas	4185403E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	62307CTC	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	4185437E	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	2347257E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2347263E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	62318CTC	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	1729952E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2347262E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	4185443E	Qc: Clay (Holocene)	2
Wire Setup (Telecommunication)	Pull Sites	1729961E	Qb: Basalt flow of Pisgah Crater (Quaternary)	1
Telecommunication	Pole Work Areas	1700589E	Qof: Older Fan Deposits (Holocene to Pleistocene)	3
Telecommunication	Pole Work Areas	62322CTC	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	30611S	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	2347256E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2347254E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	30622S	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	2347285E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	30644S	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	4185431E	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	228317S	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	1729962E	Qb: Basalt flow of Pisgah Crater (Quaternary)	1
Telecommunication	Pole Work Areas	2313484E	Qb: Basalt flow of Pisgah Crater (Quaternary)	1
Telecommunication	Pole Work Areas	1847664E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	1847690E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2347279E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	30626S	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	2347542E	Qf: Alluvial Fan Gravel (Holocene)	2
Telecommunication	Pole Work Areas	2347268E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	62306CTC	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	1847709E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2347276E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2347487E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	1729963E	Qb: Basalt flow of Pisgah Crater (Quaternary)	1
Telecommunication	Pole Work Areas	228313S	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	4186053E	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	1847706E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	30618S	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	2347462E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	1700576E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	1700600E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	1847688E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2347468E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	1847697E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2347484E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	62340CTC	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	1847696E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	4185435E	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	4185432E	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	1700571E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2361356E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	1847701E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2361367E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2361373E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	30657S	Qb: Basalt flow of Pisgah Crater (Quaternary)	1
Telecommunication	Pole Work Areas	1700582E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	30623S	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	62330CTC	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	60113CIT	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	30621S	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	4185445E	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	1700593E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2347287E	Indetermined	--
Telecommunication	Pole Work Areas	2347493E	Qa: Alluvium (Holocene)	2

Construction Area name	Construction Area Type	Nearest Transmission Structure	Geology (Age)	Paleontological Potential (PFYC)
Telecommunication	Pole Work Areas	4045030E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	1700585E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2347255E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	4488336E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	62331CTC	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	2263371E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2347456E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2361363E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2361352E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	30609S	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	62339CTC	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	2347498E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2361386E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2347264E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	62328CTC	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	30610S	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	62335CTC	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	4661004E	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	4661004E	Indetermined	--
Telecommunication	Pole Work Areas	1730293E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	1700575E	Qa: Alluvium (Holocene)	2
Telecommunication	Walking	30655S	Qa: Alluvium (Holocene)	2
Wire Setup (Telecommunication)	Pull Sites	30655S	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2347545E	Qf: Alluvial Fan Gravel (Holocene)	2
Telecommunication	Pole Work Areas	2347496E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	4185433E	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	2361375E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	1847670E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2347492E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	62332CTC	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	4186050E	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	4632664E	Qa: Alluvium (Holocene)	2
Wire Setup (Telecommunication)	Pull Sites	1729967E	Qb: Basalt flow of Pisgah Crater (Quaternary)	1
Telecommunication	Pole Work Areas	1700588E	Qof: Older Fan Deposits (Holocene to Pleistocene)	3
Telecommunication	Walking	1700588E	Qof: Older Fan Deposits (Holocene to Pleistocene)	3
Telecommunication	Pole Work Areas	4185425E	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	30620S	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	30649S	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2347467E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2267922E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	62329CTC	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	1729955E	Qof: Older Fan Deposits (Holocene to Pleistocene)	3
Telecommunication	Pole Work Areas	62325CTC	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	2347479E	Qa: Alluvium (Holocene)	2
Telecommunication	Walking	30690S	Qof: Older Fan Deposits (Holocene to Pleistocene)	3
Telecommunication	Pole Work Areas	2347486E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	62326CTC	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	4185446E	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	1729956E	Qof: Older Fan Deposits (Holocene to Pleistocene)	3
Telecommunication	Pole Work Areas	2361391E	Qa: Alluvium (Holocene)	2
Wire Setup (Telecommunication)	Pull Sites	2347541E	Qf: Alluvial Fan Gravel (Holocene)	2
Telecommunication	Pole Work Areas	30619S	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	2361354E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2347544E	Qf: Alluvial Fan Gravel (Holocene)	2
Telecommunication	Pole Work Areas	2347282E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	1700581E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	4185448E	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	30608S	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	62308CTC	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	62310CTC	Indetermined	--
Telecommunication	Pole Work Areas	30625S	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	1700580E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	4185418E	Qa: Alluvium (Holocene)	2

Construction Area name	Construction Area Type	Nearest Transmission Structure	Geology (Age)	Paleontological Potential (PFYC)
Telecommunication	Pole Work Areas	4185449E	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	1792723E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2347281E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	1700595E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	1700599E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2347280E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2347489E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2361364E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2347550E	Qf: Alluvial Fan Gravel (Holocene)	2
Telecommunication	Pole Work Areas	30630S	Qc: Clay (Holocene)	2
Wire Setup (Telecommunication)	Pull Sites	2347539E	Qf: Alluvial Fan Gravel (Holocene)	2
Telecommunication	Pole Work Areas	2347539E	Qf: Alluvial Fan Gravel (Holocene)	2
Telecommunication	Pole Work Areas	2347271E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	62324CTC	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	2345317E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	1847668E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2151065E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	1847707E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2361361E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2361372E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2347272E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	4185438E	Qc: Clay (Holocene)	2
Wire Setup (Telecommunication)	Pull Sites	1729968E	Qb: Basalt flow of Pisgah Crater (Quaternary)	1
Telecommunication	Pole Work Areas	1700573E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2361358E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	1700596E	Qa: Alluvium (Holocene)	2
Telecommunication	Underground Work Area	62342CTC	Qc: Clay (Holocene)	2
Wire Setup (Telecommunication)	Pull Sites	62342CTC	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	2345316E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	4185422E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	1700592E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	30635S	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	1847689E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	62341CTC	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	30677S	Qb: Basalt flow of Pisgah Crater (Quaternary)	1
Telecommunication	Walking	30677S	Qb: Basalt flow of Pisgah Crater (Quaternary)	1
Telecommunication	Pole Work Areas	228318S	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	4185428E	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	2361389E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2361369E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	4185447E	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	2347485E	Qa: Alluvium (Holocene)	2
Telecommunication	Walking	30654S	Qa: Alluvium (Holocene)	2
Wire Setup (Telecommunication)	Pull Sites	30654S	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	4185416E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2361376E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2347538E	Qf: Alluvial Fan Gravel (Holocene)	2
Telecommunication	Pole Work Areas	1847666E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	30642S	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	1700569E	Qa: Alluvium (Holocene)	2
Telecommunication	Walking	1700569E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2347473E	Qa: Alluvium (Holocene)	2
Wire Setup (Telecommunication)	Pull Sites	1847686E	Qa: Alluvium (Holocene)	2
Wire Setup (Telecommunication)	Pull Sites	1729958E	Qof: Older Fan Deposits (Holocene to Pleistocene)	3
Telecommunication	Pole Work Areas	1847674E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	1847676E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	4185421E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	4185419E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	4185417E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	4014498E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	4014497E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2344309E	Qf: Alluvial Fan Gravel (Holocene)	2
Telecommunication	Pole Work Areas	2347451E	Qf: Alluvial Fan Gravel (Holocene)	2

Construction Area name	Construction Area Type	Nearest Transmission Structure	Geology (Age)	Paleontological Potential (PFYC)
Telecommunication	Pole Work Areas	2347549E	Qf: Alluvial Fan Gravel (Holocene)	2
Telecommunication	Pole Work Areas	2347547E	Qf: Alluvial Fan Gravel (Holocene)	2
Telecommunication	Pole Work Areas	2344308E	Qf: Alluvial Fan Gravel (Holocene)	2
Telecommunication	Pole Work Areas	CIT60116	Qc: Clay (Holocene)	2
Telecommunication	Pole Work Areas	4185404E	Qc: Clay (Holocene)	2
Wire Setup (Telecommunication)	Pull Sites	1730294E	Qa: Alluvium (Holocene)	2
Telecommunication	General Disturbance	30870S	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	4169402E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2313467E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2313466E	Qa: Alluvium (Holocene)	2
Telecommunication	Pole Work Areas	2313465E	Qa: Alluvium (Holocene)	2
Wire Setup (Telecommunication)	Pull Sites	52005CTC	Qa: Alluvium (Holocene)	2
Manhole	Manhole	429143S	Qa: Alluvium (Holocene)	2
I-40 Crossing #1		1730288E	Qa: Alluvium (Holocene)	2
I-40 Crossing #2		1700566E	Qa: Alluvium (Holocene)	2