SAN DIEGO GAS & ELECTRIC COMPANY
CLEVELAND NATIONAL FOREST
POWER LINE REPLACEMENT PROJECTS
PALEONTOLOGICAL MONITORING & TREATMENT PLAN

PALEOSERVICES
SAN DIEGO NATURAL HISTORY MUSEUM

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EXECUTIVE SUMMARY

This Paleontological Monitoring and Treatment Plan (PMTP) was prepared for the San Diego Gas & Electric Company's (SDG&E) Cleveland National Forest Power Line Replacement Projects (Project) located in east-central San Diego County, California. The Project is part of a coordinated fire safety and service reliability plan proposed by SDG&E, which aims to update and fire-harden its network of electric lines and facilities in certain areas of Cleveland National Forest (CNF), federal lands, and non-federal lands. The Project includes the following components:

- Replacement of approximately 2,200 existing wood poles with fire-resistant, weathered steel poles;
- undergrounding of approximately 26 miles of existing 12 kilovolt (kV) distribution lines;
- removal of approximately 30 miles of existing 12 kV and 19 miles of existing 69 kV overhead facilities; and
- closure of approximately 23 miles of access roads.

Certain project-related excavations will encounter sedimentary and metasedimentary rocks that may contain nonrenewable paleontological resources.

The PMTP provides an overview of geological rock units found within the Project area, discusses the potential of these rock units for containing paleontological resources (following the Potential Fossil Yield Classification system developed by the United States Forest Service and Bureau of Land Management), and outlines the specific Project components that may impact potentially fossil-bearing rock units. In addition, the PMTP presents a detailed monitoring plan containing specific steps to be implemented prior to the start of construction, during the ground disturbance phase of construction, and following completion of ground disturbance in the event that fossils either are, or are not, discovered and salvaged from the Project.

All potentially fossil-bearing rock units underlying the Project have been assigned a PFYC of 3B (unknown paleontological potential) and include Pliocene and Pleistocene nonmarine sedimentary rocks, and an undivided unit of Mesozoic-aged metasedimentary & metavolcanic rocks. Project components that may impact these rock units and their contained paleontological resources and that are recommended for paleontological monitoring during construction include: 1.) 69kV power line and 12kV distribution line wood-to-steel proposed pole replacement using the direct bury method (pole removal and pole replacement using the micropile method are not recommended for paleontological monitoring); and 2.) trenching for line undergrounding and installation of splice vaults. The project components, as currently proposed, that occur in areas underlain by potentially fossil-bearing rock units include 135 poles to be replaced using the direct bury method (primarily along TL682), and 1.25 miles of trenching and associated splice vault installation for undergrounding along C440. The specific number of poles and method of construction may change as final project design is completed.

Recommended paleontological monitoring and treatment guidelines are divided into three phases and include:

- **Preconstruction:** retention of Qualified Project Paleontologist; designation of professional repository to receive any salvaged fossils; attendance of Project Paleontologist at pre-construction meetings as appropriate; completion of worker environmental awareness program for all excavation personnel; development of research design.
- **During Construction:** excavation monitoring in areas of concern by a paleontological monitor; salvage of unearthed, significant fossil remains.
- **Post Construction**: fossil preparation, curation, and storage of salvaged fossils (if any); completion of final paleontological monitoring report.

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1.0. INTRODUCTION

This Paleontological Monitoring and Treatment Plan (PMTP) was prepared for the San Diego Gas & Electric Company's (SDG&E) Cleveland National Forest Power Line Replacement Projects (Project) located in east-central San Diego County, California. The PMTP is divided into a series of steps to be implemented prior to the start of construction, during the ground disturbance phase of construction, and following completion of ground disturbance in the event that fossils either are, or are not, discovered and salvaged from the Project. The PMTP will be updated throughout the course of the Project as needed based on the final engineering designs for different phases and components of the Project.

The PMTP was prepared in accordance with Applicant Proposed Mitigation Measure (APM) CUL-08 from the Project's Final Environmental Impact Report/Environmental Impact Statement's Mitigation Monitoring, Compliance, and Reporting Program (MMCRP) and the United States (U.S.) Forest Service (USFS) Record of Decision, which includes minimum requirements for development of this Plan and implementation of the procedures to be followed in the field. All steps taken in the mitigation program are in accordance with industry standards (e.g., United States Department of Agriculture, Forest Service [USFS], 1996; Bureau of Land Management [BLM], 2007; Society of Vertebrate Paleontology [SVP], 2010; Murphey et al., 2014), as well as San Diego County guidelines (Stephenson et al., 2009) and City of San Diego Guidelines (City of San Diego, 2011). This PMTP will pertain to areas of the Project where excavation activities will be conducted at locations underlain by geologic units with a Potential Fossil Yield Classification (PFYC) Class 3.

1.1 PROJECT DESCRIPTION

As part of a coordinated fire safety and service reliability plan SDG&E proposes to update and fire-harden its network of electric lines and facilities in certain areas of CNF, other federal lands, and non-federal lands, as depicted in Figure 1. The Project not only traverses USFS lands, but due to the patchwork of land ownership in the Project study area, also traverses lands managed by the BLM; tribal lands held in trust by the Bureau of Indian Affairs (BIA); Cuyamaca Rancho State Park lands managed by California State Parks (CSP); lands under the jurisdiction of the City of San Diego, and private holdings within unincorporated San Diego County.

The Project includes the following components:

- Replacement of approximately 2,200 existing wood poles with fire-resistant, weathered steel poles;
- undergrounding of approximately 26 miles of existing 12 kilovolt (kV) distribution lines;
- removal of approximately 30 miles of existing 12 kV and 19 miles of existing 69 kV overhead facilities; and
- closure of approximately 23 miles of access roads.

2.0 OBJECTIVES

The purpose of this PMTP is to provide a description of measures that will be implemented to address monitoring and treatment of paleontological resources. This PMTP provides specific information regarding pre-construction field surveys, construction personnel training, necessary permits, research design, monitoring methodology, fossil discovery and recovery protocols, fossil preparation and curation procedures, and the preparation of a final monitoring report. The management practices and activities in this Plan are intended to accomplish the following objectives:

- minimize the impact to paleontological resources due to ground disturbance during construction; and
- provide for the proper treatment of fossils, if discovered, during construction of the Project.

3.0 APPLICANT PROPOSED MITIGATION MEASURES

Applicant proposed mitigation measure, APM CUL-08 provides for the protection of paleontological resources. This mitigation measure states:

"A paleontological monitor will be present for excavation activities conducted at locations with underlying PFYC Class 3 geologic deposits where new steel poles are unable to be installed in the same location as of that of the existing wood pole. In the event that fossils are unexpectedly encountered during construction, a qualified paleontologist will have the authority to divert or temporarily halt construction activities in the area of discovery to allow the recovery of fossil remains in a timely fashion. When significant fossils are discovered, the paleontologist will recover them in accordance with professional standards. Fossil remains collected during monitoring and salvage will be cleaned, repaired, sorted, cataloged, and curated in a scientific institution with permanent paleontological collections. The paleontological monitor will follow the procedures outlined in the Paleontological Monitoring and Treatment Plan, which will be prepared and will include information regarding pre-construction field surveys, construction personnel training, necessary permits, research design, monitoring methodology, fossil discovery and recovery protocols, fossil preparation and curation procedures, and the preparation of a final monitoring report."

4.0 PALEONTOLOGICAL RESOURCES

4.1 DEFINITION OF PALEONTOLOGICAL RESOURCES

Paleontological resources (i.e., fossils) are the remains and/or traces of prehistoric plant and animal life. Although typically it is assumed that fossils must be older than ~10,000 years (i.e., the generally accepted end of the last glacial interval of the Pleistocene Epoch), organic remains of early Holocene age can also be considered to represent fossils because they are part of the

record of past life. Fossil remains such as bones, teeth, shells, leaves, and wood are found in the geologic deposits (rock formations) within which they were originally buried. For the purposes of this report, paleontological resources can be thought of as including not only the actual fossil remains but also the collecting localities and the geologic formations containing those localities.

Direct impacts to paleontological resources occur when excavation activities cut into the geologic deposits (formations) within which fossils are buried. These direct impacts are in the form of physical destruction of fossil remains. Since fossils are the remains of prehistoric animal and plant life they are considered to be nonrenewable.

4.2 REGULATORY FRAMEWORK

As discussed above, paleontological resources are scientifically and educationally significant nonrenewable resources and as such are protected under federal, state, and local laws, regulations, and ordinances. Pertinent laws, regulations, and ordinances are summarized below.

4.2.1 FEDERAL

Notable Federal legislative protection for paleontological resources includes the Antiquities Act of 1906, the National Environmental Policy Act of 1969, the Federal Land Policy Management Act of 1976, and the Paleontological Resources Preservation Act of 2009.

The American Antiquities Act of 1906 (6 U.S.C. 431-433). Establishes a penalty for disturbing or excavating any historic or prehistoric ruin or monument or object of antiquity on federal lands. The act also establishes a permit requirement for collection of antiquities on federal lands. Although not specifically addressing paleontological resources, the act is considered relevant to such resources by number of federal agencies that consider fossils to be objects of antiquity.

The National Environmental Policy Act (NEPA) of 1969, (P.L. 91-190; 42 U.S.C. 4321-4347), recognizes the continuing responsibility of the Federal Government to "preserve important historic, cultural, and natural aspects of our national heritage . . ." (Sec. 101 [42 U.S.C. § 4321]) (#382). As with the American Antiquities Act, NEPA does not specifically address paleontological resources but is interpreted by many federal agencies to be applicable to such resources. For example, the BLM and the USFS both view NEPA as one of the major laws protecting paleontological resources on public lands.

The Federal Land Policy and Management Act (FLPMA) of 1976 (P.L. 94-579; 43 U.S.C. 1701-1782) defines significant fossils as: unique, rare or particularly well-preserved; an unusual assemblage of common fossils; being of high scientific interest; or providing important new data concerning [1] evolutionary trends, [2] development of biological communities, [3] interaction between or among organisms, [4] unusual or spectacular circumstances in the history of life, [5] or anatomical structure.

The Paleontological Resources Preservation Act (PRPA) of March 2009 (P.L. 111-011) is the first statute to directly address management and protection of paleontological resources on USFS, BLM, and U.S Department of the Interior, Bureau of Reclamation (BOR) lands. This law essentially codifies collecting polices of federal land management agencies. It allows reasonable amounts of common invertebrate and plant fossils to be casually collected with negligible disturbance. In addition, it requires protection and preservation of uncommon invertebrate and plants and all vertebrate fossils, including imprints, molds, casts, etc. The PRPA further describes requirements for permitting collection on federal lands, stipulations regarding the use of paleontological resources in education, continued federal ownership of recovered

paleontological resources, and standards for acceptable repositories of collected specimens and associated data. The PRPA also provides for criminal and civil penalties for unauthorized removal of paleontological resources from federal lands.

To implement the policies of the PRPA, the Department of Agriculture adopted regulations (Title 36 C.F.R. Part 291) in April 2015 to manage, protect, and preserve paleontological resources on National Forest System lands. These regulations provide for management of paleontological resources by establishing fossil collection permitting procedures, setting curation standards, establishing civil and criminal penalties, prohibiting fossil collection for commercial purposes, and developing procedures for allowing the casual collection of some of these resources on certain lands and under specific conditions.

The Bureau of Indian Affairs provides guidance (Indian Affairs Manual Part 59, Chapter 7) regarding the protection and management of paleontological resources on tribal lands. Specific requirements are given under this policy for the excavation and removal of imbedded fossils that includes obtaining a permit from the BIA operating under the authority of the Secretary of the Interior.

4.2.2 STATE

Notable State legislative protection includes the California Environmental Quality Act and the Public Resources Code.

The California Environmental Quality Act (CEQA, Public Resources Code Section 21000 *et seq.*) protects paleontological resources on both state and private lands in California. This act requires the identification of environmental impacts of a proposed project, the determination of significance of the impacts, and the identification of alternative and/or mitigation measures to reduce adverse environmental impacts. The Guidelines for the Implementation of CEQA (Title 14, Chapter 3, California Code of Regulations: 15000 *et seq.*) outlines these necessary procedures for complying with CEQA. Paleontological resources are specifically included as a question in the CEQA Environmental Checklist (Section 15023, Appendix G): "Will the proposed project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature." Also applicable to paleontological resources is the checklist question: "Does the project have the potential to… eliminate important examples of major periods of California history or pre-history." For the proposed project, implementation of APM CUL-08 protects paleontological resources in compliance with CEQA.

Other state requirements for paleontological resource management are included in the Public Resources Code (Chapter 1.7), Section 5097.5 and 30244. These statutes prohibit the removal of any paleontological site or feature on public lands without permission of the jurisdictional agency, defines the removal of paleontological sites or features as a misdemeanor, and requires reasonable mitigation of adverse impacts to paleontological resources from developments on public (state) lands.

4.2.3 LOCAL

The County of San Diego primarily addresses management of paleontological resources through CEQA. In addition, Section 87.430 of the County's Grading Ordinance specifically establishes procedures for the mitigation of potential impacts to paleontological resources during earthwork operations. Detailed guidelines for determining significance and mitigation procedures for

paleontological resources are provided by the County's Department of Public Works (Stephenson et al., 2009).

The City of San Diego has developed specific guidelines for the implementation of CEQA regarding the management of paleontological resources within the City's boundaries (City of San Diego, 2011). Specifically, the City provides Initial Study Questions and Significance Thresholds to determine whether a proposed project will significantly impact paleontological resources. If it is determined that a project may impact paleontological resources, the City provides guidelines for the mitigation of these impacts, most commonly through implementation of a monitoring program.

4.3 RESOURCE ASSESSMENT CRITERIA: POTENTIAL FOSSIL YIELD CLASSIFICATION (PFYC)

In recognizing the fact that paleontological resources are considered to include not only actual fossil remains and traces, but also the fossil collecting localities and the geologic formations containing those fossils and localities, the Forest Service and the BLM have developed a procedure for evaluating the paleontological resource potential of individual geologic rock units. This procedure utilizes the Potential Fossil Yield Classification (PFYC) system to assign ranks to rock units based on the relative abundance of vertebrate fossils or scientifically significant invertebrate or plant fossils (USFS, 1996; BLM, 2007). Under the PFYC system, geologic formations with a higher potential are assigned a higher class number. The PFYC system, as originally defined by the Forest Service (USFS, 1996), and later refined by the BLM (2007), is outlined below.

The PFYC system is required for assessment of paleontological resources located on all federal lands (e.g., Department of Agriculture and Department of Interior managed lands), and is readily applicable to resources on state, county, tribal, and private lands. Thus, the PFYC system will be used to assess the entirety of the Project.

4.3.1 PFYC CLASS 5 – VERY HIGH

Very high potential (PFYC Class 5) is assigned to geologic formations that consistently and predictably produce vertebrate fossils or scientifically significant invertebrate or plant fossils.

4.3.2 PFYC CLASS 4 –HIGH

High potential (PFYC Class 4) is assigned to geologic formations containing a high occurrence of significant fossils. Vertebrate fossils or scientifically significant invertebrate or plant fossils are known to occur and have been documented within these deposits, but may vary in occurrence and predictability.

4.3.3 PFYC CLASS 3A –MODERATE

Moderate potential (PFYC Class 3a) is assigned to geologic formations that are known to contain vertebrate fossils or scientifically significant non-vertebrate fossils, but these occurrences are widely scattered. These formations may contain common invertebrate or plant fossils.

4.3.4 PFYC CLASS 3B –UNKNOWN

Unknown potential (PFYC Class 3b) is assigned to geologic formations that exhibit geologic features and preservational conditions that suggest significant fossils could be present, but little information about the paleontological resources of the unit or the area is known. This may indicate the unit or area is poorly studied, and field surveys may uncover significant finds. The

units in this Class may eventually be placed in another Class when sufficient survey and research is performed.

4.3.5 PFYC CLASS 2 –LOW

Low potential (PFYC Class 2) is assigned to geologic formations that are not likely to contain vertebrate fossils or scientifically significant non-vertebrate fossils.

4.3.6 PFYC CLASS 1 –VERY LOW

Very Low potential (PFYC Class 1) is assigned to geologic formations that are not likely to contain recognizable fossil remains.

4.4 SUMMARY OF PALEONTOLOGICAL RESOURCE ASSESSMENT

A paleontological resource assessment of the Project area was completed in March 2012 (PaleoServices, 2012). Since completion of this assessment, more detailed descriptions of project components (e.g., depth of trenching for undergrounding duct banks) and new information concerning paleontological resources for the Project have become available. As such, the PFYC Classifications of one geologic rock unit has been updated for this report (Table 1). This unit, as mapped by Todd (2004), is described as Jurassic–Cretaceous aged metavolcanic and metasedimentary rocks (KJvs), and was previously thought to be of a metamorphic grade too high to preserve intact fossil remains. However, more recent assessments of this rock unit suggest the degree of metamorphism is similar to that of the Julian Schist, indicating an increased potential for the preservation of fossils. Consequently, this rock unit has been reassigned a PFYC rank of Class 3b (Unknown Potential) from the former PFYC rank of Class 1 (Very Low). With this reassignment, additional portions of the Project are recommended for paleontological monitoring, and the list of poles, vaults, and areas of trenching have been updated accordingly as outlined in Table 2 and Appendix 1.

4.4.1 SUMMARY OF PROJECT GEOLOGY AND PFYC

The paleontological resource assessment determined that the project alignment, which traverses a series of mountain ranges and their western foothills, as well as intervening alluvial valleys, is primarily underlain by crystalline basement rocks, with screens of Mesozoic metamorphic rocks, and accumulations of alluvial deposits ranging in age from Pleistocene to Recent (Rogers, 1965; Todd, 2004). For simplification purposes, geologic rock units of similar age, composition, and method of formation have been grouped together in this report. For example, all intrusive (plutonic) igneous rocks (e.g., Tonalite of La Posta, Chiquito Peak Monzogranite, Cuyamaca Gabbro) have been grouped together. Table 1 summarizes these groupings, as well as a description of the group and its PFYC ranking. A geologic map of the proposed alignment, using these rock unit groups, is presented in Figure 1 and Appendix 1, and a paleontological resource potential map is presented in Figure 2.

In summary, all intrusive igneous rocks (gr) and high grade metamorphic rocks (Mg) are assigned PFYC Class 1 (very low paleontological potential), all Holocene-aged sedimentary rocks (Qc, Qya, Qls) are assigned PFYC Class 2 (low paleontological potential), and Pliocene to Pleistocene-aged sedimentary rocks (Qoa, Qco, QTf) are assigned PFYC Class 3b (unknown paleontological potential). Additionally, metamorphic rock units believed to contain screens of potentially fossil-bearing metasedimentary rocks (Mm) are assigned PFYC Class 3b (unknown paleontological potential). However, it should be emphasized that only portions of this rock unit are potentially fossil-bearing (i.e., the metasedimentary rocks and not the metavolcanic rocks).

Because precise geologic mapping of the metasedimentary portion of this rock unit has not been completed, the entire rock unit has been assigned PFYC Class 3b. As discussed below in Section 6.1, paleontological monitoring requirements for this rock unit may be augmented (e.g., reduced or eliminated in areas containing only metavolcanic rocks) as more is learned about this rock unit over the course of the monitoring and treatment program.

Table 1. Summary of geologic rock units underlying the Project. MSUP Label and MSUP Name refer to the name applied to a group of formations for this report. Original Label and Original Name refer to the name of the rock unit on published geologic mapping of Rogers (1965)‡ or Todd (2004)*.

MSUP Label	MSUP Name	PFYC	Description	Original Label	Original Name
Qc	Colluvium	2	Holocene colluvial deposits	Qc*	Colluvium
Qya	Young alluvium	2	Holocene alluvial deposits, undivided	Qu* Qal*‡ Qya*	Alluvium, undivided Recent Alluvium Young alluvium
Qls	Landslide deposits	2	Holocene landslide deposits	Qls*	Landslide deposits
Qoa	Older alluvium	3b	Pleistocene alluvial deposits, undivided	Qt*‡ Qoa* Qc‡	Nonmarine terrace deposits Older alluvium Pleistocene nonmarine sedimentary deposits
Qco	Pauba Formation	3b	Pleistocene nonmarine conglomerate	Qco‡	Pleistocene nonmarine sedimentary deposits
QTf	Fanglomerate	3b	Pliocene - Pleistocene nonmarine fanglomerate	QTf*	Fanglomerate
Mg	Mesozoic gneiss & undivided metamorphic rocks	1	High grade metamorphic rocks, undivided	Kmv* Jhc* Jsp*	Metavolcanic rocks Gneiss of Harper Creek Migmatitic schist and gneiss of Stephenson Peak
Mm	Mesozoic metasedimentary & metavolcanic rocks	3b	Metavolcanic and metasedimentary rocks, undivided. Fossils may be preserved within metasedimentary portions	KJvs* JTRm* ms‡	Metavolcanic and metasedimentary rocks Metasedimentary and metavolcanic rocks Pre-Cretaceous metasedimentary rocks
gr	undivided intrusive igneous rocks	1	undivided intrusive igneous rocks of Cretaceous age or older	Kcp* Kcm* Kc* Kjv* KJld* Kmgp* Kpv* Ka* Kgm* Klb* Klp* Kih* KJem* Jcr* bi‡ gr-t‡ gr-m‡	Chiquito Peak Monzogranite Corte Madera Monzogranite Cuyamaca Gabbro Japatul Valley Tonalite Leucocratic dikes Monzogranite of Mother Grundy Peak Monzogranite of Pine Valley Tonalite of Alpine Tonalite of Granite Mountain Tonalite of Las Bancas Tonalite of La Posta Indian Hill granodiorite Quartz Diorite of East Mesa Granodiorite of Cuyamaca Reservoir Mesozoic basement intrusive rocks tonalite (quartz diorite) and diorite Pre-Cenozoic granitic & metamorphic rocks

*unit derived from published mapping by Todd (2004), ‡unit derived from published mapping by Rogers (1965)

4.4.2 ANALYSIS OF PROJECT COMPONENTS

Only project components that will involve earthwork into previously undisturbed rock units have the potential to impact paleontological resources. Thus, those project components that will not involve earthwork (e.g., access road maintenance, single to double circuit conversion) will not impact paleontological resources, and thus will not require paleontological monitoring.

The project components that will involve earthwork activities, and thus may potentially require paleontological monitoring and treatment, are described below:

- Wood-to-Steel Pole Replacement, 69kV tie-lines (TL) and 12kV circuits (C): This project component will involve removal of wood poles with an average diameter of 20 inches, and replacement with steel poles with an average diameter of 30 inches for TL 682, 36 to 60 inches for all other tie-lines (TL 626, TL 625, TL 629, TL 6923, and TL 6931), and 14 inches for all circuits.
    - Direct Bury Method – This activity will involve drilling using augers anticipated to be between 4 to 8 feet in diameter for tie-lines, and between 2 to 4 feet in diameter for circuits. Depth below ground surface can be 15 feet or deeper depending upon the height of the pole. Such augering typically brings up fragmented pieces of bedrock that are large enough to contain any preserved paleontological resources.
        - Paleontological monitoring and treatment is recommended in areas underlain by rock units assigned a rank of PFYC Class 3b.
    - Pier Foundation Method – This activity will involve drilling using augers anticipated to be up to 8 feet in diameter. Depth below ground surface can be 20 feet or deeper depending upon the height of the pole. Such augering typically brings up fragmented pieces of bedrock that are large enough to contain any preserved paleontological resources.
        - Paleontological monitoring and treatment is recommended in areas underlain by rock units assigned a rank of PFYC Class 3b.
    - Micropile Method – This activity will involve drilling a grid pattern of small diameter (<1 foot) holes. Augers with diameters less than about 18 inches pulverize bedrock, and thus will destroy any contained paleontological resources. As a consequence, it is not possible to mitigate micropile foundation drilling for paleontological resources.
        - Paleontological monitoring and treatment is not recommended
    - Removal – This activity will not involve excavation into native rock units.
        - Paleontological monitoring and treatment is not recommended
- Undergrounding:
    - This activity will involve trenching for installation of duct banks in existing roadways. Anticipated trench dimensions are approximately 2.5 feet wide by 5 feet deep.

- Paleontological monitoring and treatment is recommended in areas underlain by rock units assigned a rank of PFYC Class 3 or greater.

- This activity will involve installation of splice vaults that are approximately 5.5 feet wide, 8 feet long, and 7 feet deep. Vaults will be located roughly every 500 to 800 feet along the trenching alignment
    - Paleontological monitoring and treatment is recommended in areas underlain by rock units assigned a rank of PFYC Class 3 or greater.

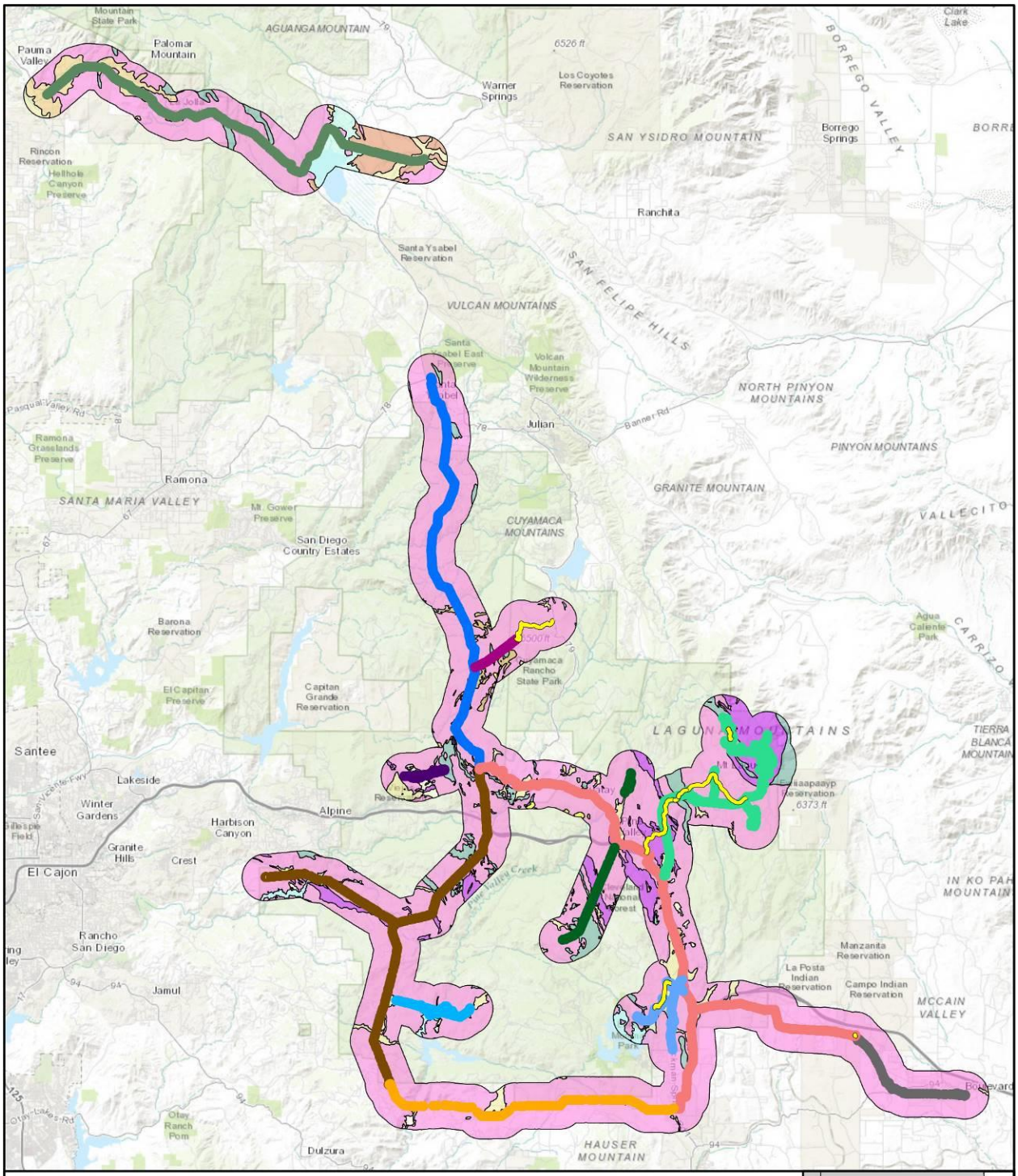
4.4.3 Project Components Recommended for Monitoring and Treatment

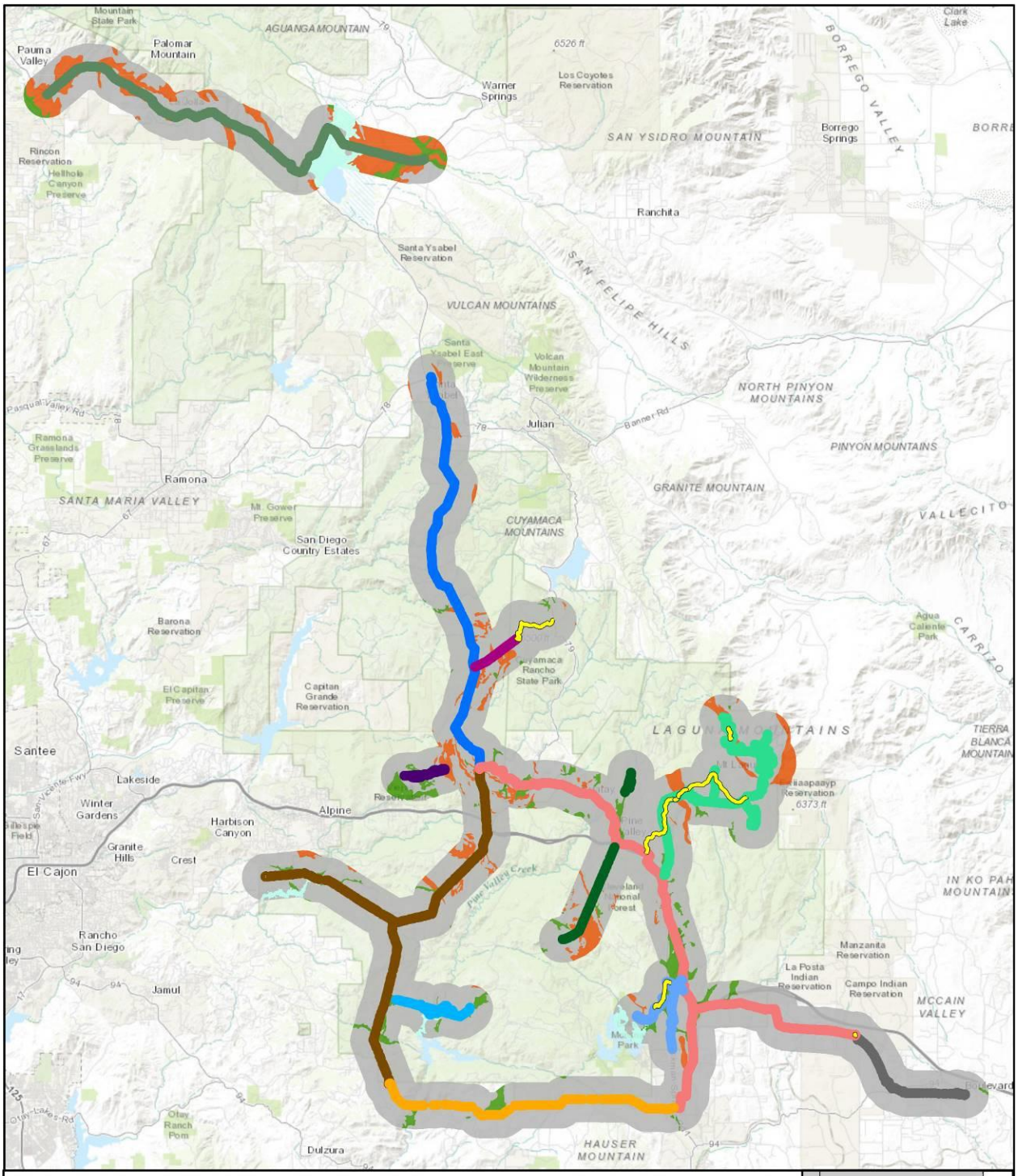
Taking into account the PFYC assignments discussed in Section 4.4.1, and the nature of ground disturbance for specific project components outlined in Section 4.4.2, a compiled list of the 135 poles recommended to be monitored for paleontological resources is provided in Table 2, and depicted in Appendix 1. The precise listing of pole locations may change as the final project design is completed and will be incorporated into revised tables at that time. In summary, only pole replacement activities using the direct bury method in areas underlain by rock units with a rank of PFYC Class 3b are recommended for paleontological monitoring. The majority of these pole locations occur along TL 682, but also include certain poles along C440, C442, C78, TL625C, TL626A, and TL629A.

Additionally, undergrounding activities associated with C440, as currently designed, will involve approximately 1.25 miles of trenching in areas underlain by potentially fossil-bearing metamorphic rocks (Mm), as depicted in Appendix 1 (Page 7, Page 8). This trenching, as well as installation of associated vaults, is recommended for paleontological monitoring.

Table 2. Summary of poles recommended for paleontological monitoring and treatment.

Line Segment	Poles Recommended for Paleontological Monitoring and Treatment	No. of Poles
C440	P-001, P-003, P-20, P-200, P-305, P-306, P40057, P40061	8
C442	P176979, P176983, P176984, P176991, P176992, P176993, P176994, P176996, P176997, P176998, P176999, P177000, P177001, P-29 (#65/#67), P-31 (#72)	15
C78	P-1, P172710, P-2, P-3, P-4, P-5, P-7, P-8, P-9	9
TL625C	Z119859, Z272935, Z272936, Z272937, Z272938, Z273028, Z273029, Z273034, Z273035	9
TL626A	P778979, Z371501, Z371502, Z371560, Z371561	5
TL629A	Z172740, Z173066, Z173067, Z273043	4
TL682	P112105, P204379, P518927, P611297, P714736, P819181, Z115188, Z115190, Z115191, Z115192, Z115712, Z115713, Z115714, Z118003, Z118006, Z118007, Z118008, Z118009, Z118010, Z118011, Z118013, Z118014, Z118021, Z118023, Z118024, Z118034, Z118035, Z118036, Z118037, Z118039, Z118040, Z118041, Z118043, Z118044, Z118046, Z118047, Z118048, Z118049, Z118050, Z118051, Z118052, Z118053, Z118055, Z118056, Z118080, Z118081, Z118082, Z118191, Z118192, Z118193, Z118194, Z118195, Z118196, Z118197, Z118198, Z118199, Z118200, Z118201, Z118202, Z118203, Z118204, Z118205, Z118206, Z118207, Z118208, Z118209, Z118210, Z118211, Z118212, Z118213, Z118214, Z118215, Z118216, Z118217, Z118218, Z118219, Z118220, Z118221, Z118222, Z118223, Z18017, Z210985, Z310148, Z310149, Z711236	85
	Total:	**135**


Geologic Map Units
Qc colluvium
Qya young alluvial deposits
Qls landslide deposits
Qoa old alluvial deposits
Qco Pauba Formation
QTf fanglomerate
Mg gneiss & undivided metamorphic rocks
Mm metasedimentary & metavolcanic rocks
gr undivided intrusive igneous rocks
Project Components
C157
C440
C442
C449
C78
C79
TL625
TL626
TL629
TL682
TL6923
TL6931
undergrounding
Sources: Geology modified from Todd 2004 and Rogers 1965; Topographic Basemap, Esri et al., 2016
San Bernardino County
Riverside County
San Diego County
Imperial County
map extent
PaleoServices
FIGURE 1
Geologic Map, Overview
Cleveland National Forest Power Line Replacement Projects
County of San Diego, California
0
10
Approximate Scale in Miles
N


Potential Fossil Yield Classification Rating
Class 1 (very low)
Class 2 (low)
Class 3b (unknown)
Project Components
C157
C440
C442
C449
C78
C79
TL625
TL626
TL629
TL682
TL6923
TL6931
undergrounding
Sources: Geology modified from Todd 2004 and Rogers 1965; Topographic Basemap, Esri et al., 2016
San Bernardino County
Riverside County
San Diego County
Imperial County
map extent
PaleoServices
FIGURE 2
Paleontological Potential Map, Overview
Cleveland National Forest Power Line Replacement Projects
County of San Diego, California
0
10
Approximate Scale in Miles
N

5.0 PLAN IMPLEMENTATION

5.1 PRECONSTRUCTION

Prior to commencement of construction activities, some or all of the following actions are recommended.

5.1.1 RETENTION OF QUALIFIED PROJECT PALEONTOLOGIST

Prior to the start of construction, a qualified Project Paleontologist (as defined below) shall be retained to implement the PMTP, including serving as supervisor to any retained qualified paleontological monitors (as defined below). The Project Paleontologist shall be in possession of all necessary agency permits.

5.1.1.1 Qualifications

The qualified Project Paleontologist must have a Master's Degree or Ph.D. in paleontology or related subject area, knowledge of the local paleontology, and professional expertise with paleontological procedures and techniques. In turn, the qualified paleontological monitor(s) will have a BA or BS in geology or paleontology and a minimum of 1 year of monitoring experience in local sedimentary rocks. Demonstrated experience may be substituted for academic training.

5.1.2 DESIGNATION OF REPOSITORY

A professional repository shall be contracted with prior to the start of construction to curate and store any fossils that may be recovered during construction. Such an institution should be a recognized paleontological specimen repository with a permanent curator, such as an AAM-accredited museum or university (e.g., San Diego Natural History Museum, Natural History Museum of Los Angeles County, or University of California Museum of Paleontology). The repository shall be capable of storing fossils in a facility with adequate security against theft, loss, damage, fire, pests, and adverse climate conditions.

5.1.3 ATTENDANCE AT PRE-CONSTRUCTION MEETING

The Project Paleontologist shall attend appropriate pre-construction meetings or daily tailboards to consult with the grading and excavation contractors concerning excavation schedules, paleontological field techniques, and safety issues.

5.1.4 WORKER ENVIRONMENTAL AWARENESS PROGRAM (WEAP)

Prior to the start of construction, the Project Paleontologist shall coordinate and help to develop the worker environmental awareness program (WEAP) section on paleontological resources to ensure that all construction personnel understand paleontological monitoring requirements, the roles and responsibilities of paleontological monitors, and the appropriate action to be taken in the event of a discovery of paleontological resources. The penalties associated with the unauthorized collection of or intentional disturbance of any paleontological resources, as well as the penalties for noncompliance with paleontological monitoring and treatment requirements shall be clearly communicated. Training shall include a definition of paleontological resources and an overview of potential paleontological resources that may be encountered during ground disturbing activities. Such information is designed to help facilitate worker recognition of paleontological resources, resource avoidance, and immediate notification to the Project

Paleontologist, or paleontological monitor. All construction personnel will be required to attend the WEAP prior to conducting work on the project.

5.1.5 RESEARCH DESIGN

There are specific research themes associated with the sedimentary rock units present within the Project area. These research themes should be considered when determining the types of data to be collected during implementation of the PMTP.

Research themes that apply to the Pliocene-Pleistocene and Pleistocene-aged sedimentary rocks found in the Project area include the following:

- Plio-Pleistocene land mammal diversity, evolution, and systematics
- Plio-Pleistocene non-marine paleoenvironments in upland valleys of eastern San Diego County
- Plio-Pleistocene paleoecologic structure of land mammal assemblages
- Plio-Pleistocene biostratigraphic age assignments of nonmarine sedimentary rocks in upland valleys of eastern San Diego County

Research themes that apply to the Mesozoic-aged metasedimentary rocks found in the Project area include the following:

- Mesozoic marine biodiversity and taxonomy
- Mesozoic marine paleoenvironments of eastern San Diego County
- Mesozoic biostratigraphic age assignments of metasedimentary rocks of eastern San Diego County

5.2 DURING CONSTRUCTION

Commencement of construction related excavation activities marks the time when potential impacts to paleontological resources could occur. To mitigate these potential impacts, some or all of the following actions are required:

5.2.1 EXCAVATION MONITORING: DUTIES AND AREAS TO BE MONITORED

A qualified paleontological monitor(s) working under the direction of the Project Paleontologist shall be present full-time during all ground disturbance activities in areas underlain by geologic rock units/formations assigned a rank of PFYC Class 3b (Figure 1, Figure 2, Appendix 1), as outlined in Section 4.4.3. The specific pole numbers for each tie-line and circuit that will need to be monitored are outlined in Table 2. The trenching and vault locations to be monitored are depicted in Appendix 1.

The SDG&E Cultural Resource Specialist and the Lead Environmental Inspector will ensure the Project Paleontologist and paleontological monitor(s) are informed about current plans and any construction or scheduling changes. The monitor(s) will coordinate with the Project Paleontologist to determine the timing for monitoring in the identified areas of concern. It will be the responsibility of the Project Paleontologist and paleontological monitor(s) to maintain communication and coordination with the construction team.

A paleontological monitor will observe and inspect any temporarily exposed outcrops (e.g., trench and auger spoils, vault walls) for paleontological remains. Ideally, inspection would

involve examination of every newly exposed surface, but operationally this is often impossible. The pace and quantity of equipment in the cut may determine how often and where paleontological monitors can inspect. When active excavations are too dangerous to enter because of a narrow cut, heavy equipment traffic, or other reason, monitoring may be conducted from an elevated vantage point.

Based on conditions in the field, paleontological monitoring may be reduced or increased at the discretion of the Project Paleontologist. For the Project, this is particularly relevant for areas underlain by geologic rock units/formations mapped as Mesozoic metasedimentary & metavolcanic rocks (Mm), as only the metasedimentary portions of this rock unit are potentially fossil-bearing. If it is determined by the Project Paleontologist that an area to be impacted by construction is underlain by the metavolcanic portion of this unit, paleontological monitoring may be reduced to spot-checking or discontinued in this area.

Paleontological monitors will work as efficiently as possible in order to minimize any delay to construction operations.

5.2.1.1 Data Recovery (stratigraphy)

Recording of stratigraphic data will be an on-going aspect of excavation monitoring to provide context for any subsequent fossil discoveries. Spoils piles and any temporary outcrops should be examined and observed geologic features recorded on project plans and field notes. The goal of this work is to delimit the nature of potentially fossiliferous sedimentary and metasedimentary rock units in the Project area, determine their areal distribution and depositional contacts, and record any evidence of structural deformation. Standard geologic and stratigraphic data collected include lithologic descriptions (color, sorting, texture, structures, and grain size), stratigraphic relationships (bedding type, thickness, and contacts), and topographic position. Measurement of stratigraphic sections will be routinely done and areas containing exposures of fossiliferous sedimentary or metasedimentary deposits will be studied in detail and fossil localities recorded on measured stratigraphic sections.

5.2.1.2 Safety Procedures

Safety of paleontological field personnel is a critical concern during the construction phase. Safety procedures to be followed by field personnel may include wearing appropriate clothing (high-visibility safety vests, hard hats, steel toed boots), carrying large handheld orange flags, securing equipment operators attention before observing spoils piles, or other temporary exposures, notifying grading personnel before beginning a salvage excavation, marking fossil discovery sites with surveyor's flagging, and using caution while driving on haul roads. Attendance of the preconstruction meeting (section 5.3) and daily or weekly tailgate meetings at the Project area are important for discussing mutual safety issues between paleontological field personnel and construction personnel.

5.2.2 PROCEDURES FOR PALEONTOLOGICAL DISCOVERIES

The goal of paleontological monitoring is to observe excavation activities, to evaluate and recover unearthed paleontological resources, and to ensure Project compliance with relevant environmental requirements. When fossils are discovered, the following procedures will be followed. Recovery methods may vary to some degree depending on the types of fossils discovered (e.g., macrofossils, microfossils, or plant fossils) and the nature of the enclosing sedimentary deposits.

5.2.2.1 Discovery process and work stoppage:

In general, when a fossil discovery occurs, the qualified paleontological monitor will immediately contact the Project Paleontologist and notify appropriate construction personnel. The monitor, under direction of the Project Paleontologist, will have the authority to divert, direct, or temporarily halt ground disturbing activities in the area of discovery to allow for preliminary evaluation of potentially significant paleontological resources and to determine if additional measures (i.e., collection and curation) are required. In certain cases (e.g., discovery of a single, isolated fossil specimen), the qualified paleontological monitor may choose to recover the fossil before contacting the Project Paleontologist to avoid unnecessary construction delays (see Section 6.2.3).

5.2.2.2 Determination of significance:

The resource significance of the discovered paleontological resources will be determined by the Project Paleontologist. For significant paleontological resources, a data recovery program will be initiated that will follow the general steps outlined below with some refinements based on the type and nature of the specific discovery.

The data recovery program will largely be driven by the research themes (see section 5.6) and will incorporate appropriate field methods for data collection to answer specific questions, as well as plans for the preparation, curation, and storage of recovered fossils, and data collection and post-collection phases of fossil recovery.

5.2.2.3 Macrofossil recovery

Many fossil specimens discovered during excavation monitoring are readily visible to the naked eye and large enough to be easily recognized and removed. Upon discovery of such macrofossils, the qualified paleontological monitor will temporarily flag the discovery site for avoidance and evaluation as described above. Actual recovery of unearthed macrofossils can involve several techniques including "pluck-and-run," hand quarrying, plaster-jacketing, and/or large-scale quarrying. The "pluck-and-run" technique typically is used for single, isolated fossil specimens and when equipment activity in the vicinity of the discovery area is heavy and immediate action is required to remove the specimen so as not to slow the progress of construction operations. "Pluck-and-run" recovery involves exploratory probing around a partially exposed fossil specimen to determine its dimensions, the application of consolidants (Acryloid, Butvar, or Vinac) to stabilize any damaged or weakened areas of the fossil, and removal of the specimen in a block of matrix. Hand quarrying typically consists of site specific "mining" of fossil-rich sedimentary rock layers without establishment of a geographic grid framework. Fragile fossils are stabilized as described above. Hand quarrying and the "pluck-and-run" techniques can typically be carried out in several minutes, to an hour, thus minimizing the duration of any work stoppage.

Particularly large and/or articulated vertebrate fossils require special handling because of their size and/or fragility and are typically recovered in a process called plaster-jacketing. The process begins by isolating a partially exposed specimen from the temporary exposure in a matrix-supported sedimentary pedestal. The pedestal is then slightly undercut at its base to form an overhanging lip and a layer of damp newsprint or tissue paper is placed on the upper surface of the block. Strips of burlap fabric are then soaked in a mixture of Plaster-of-Paris and laid across the matrix block to dry. Depending upon the volume of the block, one, two, or more layers of

plaster-soaked burlap strips are formed on the block. Especially large blocks (over two feet in length) are reinforced with wooden or metal splints. Once the plaster hardens, the supporting pedestal is undercut and the block turned over. Hand tools are then used to remove any excess matrix from the bottom of the block and a plaster and burlap cap is constructed on the inverted side using the same methods described above. When all layers of plaster are dry and hard, the completed plaster jacket is then labeled with a field number and north arrow and removed from the field. Depending on the size, complexity, and number of plaster jackets, recovery may require several hours to several days to complete. The discovery of a concentration of large vertebrate fossils (e.g., a bone bed) would require more time (e.g., several days) for recovery.

5.2.2.4 Microfossil recovery

Many significant fossils often are too small to be readily visible in the field (e.g., small mammal teeth, fish otoliths, lizard limb bones), but are nonetheless significant and worthy of attention because of their potential to provide important information concerning past biodiversity, environments, and climates. Such fossils are also useful in determining the geologic age of the enclosing strata. If sedimentary horizons are observed that either contain micro-vertebrate fossils, or appear to have high potential to contain such fossils, these horizons shall be sampled by collecting bulk quantities of sedimentary matrix. These bulk matrix samples then undergo laboratory processing in order to isolate the microfossils, as outlined in Sections 7.1.2 and 7.1.3. Specific procedures for recovery of microfossils are described below. It should be emphasized that once a bulk matrix sample has been collected and removed from the Project area, construction activities can resume.

For micro-vertebrate fossils (e.g., small mammal, bird, reptile, amphibian, or fish remains) guidelines developed by the Society of Vertebrate Paleontology (SVP, 2010) define an adequate sample as comprising "…4.0 cubic meters (6,000 lbs. or 2,500 kg) of matrix for each site, horizon or paleosol." However, the uniqueness of the micro-vertebrate fossils recovered may justify screen washing even larger amounts… as determined by the Project Paleontologist." It is understood that conditions in the field may be such that recovery of 6,000 lbs. matrix samples is not possible, and a smaller matrix sample may be warranted at the discretion of the Project Paleontologist. Ideally, micro-vertebrate fossil sites will occur within a layered sequence of strata from which several successive strata may yield individual micro-vertebrate fossil horizons. A maximum of one bulk matrix sample per fossil horizon shall be collected. This sample shall be assumed to contain a representative assemblage of fossils preserved in that fossil horizon. For each sample collected, it is recommended that a 200 lb. (90 kg) subsample be initially processed to determine the fossil productivity of the larger sample. Generally, if five or more complete mammal teeth are recovered from the subsample, the remainder of the sample should be processed. If fewer teeth are recovered, processing should cease.

There is also the possibility that sites may be discovered that preserve the fossil remains of micro-invertebrate organisms (e.g., ostracods, diatoms, micro-gastropods, and micro-bivalves). When micro-invertebrate sites are discovered they initially should be evaluated in terms of fossil preservation, specimen abundance, and taxonomic diversity to determine the level of sampling. For sites with good preservation and high abundance and diversity, an adequate sample would comprise 0.1 cubic meters (50 lbs. or 23 kg) of matrix from each fossil horizon. For micro-invertebrate sites with less than good preservation and relatively low abundance and diversity, an adequate sample would comprise 0.2 cubic meters (100 lbs. or 45 kg) of matrix from each fossil horizon. As with micro-vertebrate sites, micro-invertebrate sites ideally should occur within a

layered sequence of strata from which several successive strata may yield individual micro-invertebrate fossil horizons. A maximum of one matrix sample per fossil horizon shall be collected.

5.2.2.5 Paleobotanical fossil recovery

Paleobotanical specimens typically occur in fine-grained, laminated strata and will require special recovery techniques. When fossil plant sites are discovered, they initially should be evaluated in terms of fossil preservation, specimen abundance, and taxonomic diversity to determine the level of sampling. For sites with well-preserved and relatively complete leaves, an adequate sample would aim to recover at least 20 specimens of each recognized leaf type (species or morphotypes). Large blocks (>2 feet in diameter) of sedimentary rock typically can be hand quarried from the temporary outcrop and then split along bedding planes to reveal compressed fossil plant material (e.g., leaves, stems, and flowers). Individual slabs are then wrapped in tissue paper or newsprint to minimize destruction of the fossils during desiccation. In some cases, specimens that are delaminating or flaking may need to be coated with special consolidants (e.g., Vinac or Butvar). It should be emphasized that once an adequate sample has been collected and removed from a paleobotanical discovery site, construction activities can resume. Suggested procedures for laboratory processing of fossil plant material are described below in Section 7.1.4.

5.2.2.6 Time required for fossil recovery

As discussed elsewhere in Section 6.2, the vast majority of fossil salvages can be accomplished relatively quickly, requiring a few minutes to a few hours of focused recovery work to complete. However, recovery of large vertebrate fossils or concentrations of vertebrate fossils may require several days to weeks to complete. In many cases, fossil recovery may be expedited through the temporary use of on-site heavy equipment to remove sedimentary overburden, collect bulk matrix samples, and/or lift plaster jackets. It should also be emphasized that avoiding or minimizing construction delays can be achieved by diverting earthwork operations to other areas of the Project while fossil recovery work is under way.

5.3 POST CONSTRUCTION

In the event fossils are discovered and salvaged, the fossils will be prepared, identified, catalogued, and stored in a recognized professional repository and a Final Paleontological Monitoring report written that summarizes the results of pre-construction, during-construction, and post-construction activities (if applicable) and findings. If no fossils are salvaged over the course of monitoring, an abbreviated Final Paleontological Monitoring report shall be prepared.

5.3.1 FOSSIL PREPARATION

Fossil remains collected during the monitoring and salvage portion of the monitoring and treatment program will be cleaned, repaired, and/or screenwashed as described below. Fossil preparation shall follow the standards of the designated repository. Prior to commencement of work, an estimate of fossil preparation costs should be developed based on number and type of specimens, preparation labor rates, and preparation supply needs.

5.3.1.1 Specimen preparation

Preparation of fossil specimens will involve removal of extraneous and concealing sedimentary matrix from specimens using various mechanical methods including pneumatic air scribes,

micro-sandblasters, and simple hand tools (hammers, chisels, X-acto knives, brushes, dental picks, and pin vises). Fossil preparation will also involve consolidation of weak or porous specimens by the application of specialized media including polyvinyl acetate resins (e.g., Vinac), acrylic resins (e.g., Acryloid), or polyvinyl butyral resins (e.g., Butvar). Repair of broken/damaged specimens will require the use of various adhesives including cyanoacrylate glues (e.g., Zap) polyvinyl acetate emulsions (e.g., carpenter's glue), and polyvinyl butyral resins (e.g., Butvar).

5.3.1.2 Screenwashing

Recovery of micro-vertebrate fossils will be accomplished by screenwashing bulk samples of fossil-bearing sedimentary matrix. The process begins by breaking large blocks into 2-3 cm cubes to facilitate air-drying of the matrix. Once dry, the matrix is placed into water-filled 5 gallon plastic buckets to soak for no less than 15 minutes with stirring. The slurry is then poured onto nested 20 (0.84 mm openings) and 30 (0.59 mm) mesh stainless steel screens placed in water-filled troughs. Manual agitation of the screens forces the fine clays and silts through the mesh and concentrates the coarser sand and fossil material on the screens. The screens are then placed at a tilt facing the sun to dry. Once dry, the coarse concentrate is transferred into plastic sample bags and labeled with all pertinent site locality data.

5.3.1.3 Heavy liquid floatation

Screenwashed concentrates can be further concentrated by the use of heavy liquids (e.g., zinc bromide and/or tetrabromoethane) to concentrate particles of equal density. Generally, fossil bones and teeth sink along with heavy mineral grains (e.g., magnetite) while lighter quartz and feldspar mineral grains float. This separation process produces a very rich concentration of fossil remains, typically isolated teeth of small mammals (e.g., rodents).

5.3.1.4 Paleobotanical preparation

Preparation of plant fossils will involve first splitting slabs of mudstone/siltstone matrix along laminations to reveal individual or composite leaf impressions. Any remaining matrix still obscuring the impressions will then be removed with X-acto knives. The exposed impressions may require stabilization with specialized media (e.g., Vinac or Butvar).

5.3.2 FOSSIL CURATION

Following preparation of salvaged fossil remains the specimens will be sorted/picked, identified, and catalogued as described below. Fossil curation shall follow the standards of the designated repository. Prior to commencement of work, an estimate of fossil curation costs should be developed based on number and type of specimens, curation labor rates, and supply needs.

5.3.2.1 Sorting/picking

Fossils require sorting/picking to group together specimens of the same taxon (e.g., species and/or genus) into individual taxon lots.

5.3.2.2 Identification

Once sorted, individual taxon lots will then be identified to the lowest taxonomic level practical (e.g., family, genus, and/or species).

5.3.2.3 Cataloguing

Sorted and identified specimens are then assigned unique specimen catalogue numbers and entered into an electronic catalogue database. A specimen number may represent a single fossil specimen or a batch of specimens belonging to a single species. Catalogue numbers are written on individual specimens using India ink on a patch of white acrylic paint. Curation also involves placement of taxon lots into archival specimen trays with labels containing relevant taxonomic, geologic, and geographic information.

5.3.2.4 Locality data

Formal descriptions of fossil collection locality records, including geographic, geologic, taphonomic, and collection data, need to be compiled and stored electronically with the specimen catalogue data.

5.3.3 FOSSIL STORAGE

Prepared fossils will be professionally curated and adequately stored in the designated repository. Adequate storage shall include conservation of specimens in a stable environment away from flammable liquids, corrosive chemicals, organic materials subject to mildew, and sources of potential water damage. Typically, this is accomplished by placing curated specimens in archival quality, steel drawers and cabinets, which are housed in climate-controlled collection rooms. Specimens shall be available for study by future researchers, students, and citizen scientists, and thus shall be stored in a fashion that allows for retrieval of individual specimens and associated collection data. Specimen storage should be accompanied by supporting data (e.g., field notes, GPS data, photographs, geologic maps, stratigraphic reports), and fossil preparation data (e.g., description of preparation techniques and materials used for individual specimens).

The contracted repository may charge reasonable costs associated with curation and specimen storage. Such costs may include necessary curatorial supplies (e.g., archival specimen trays, glass vials, foam), as well as a one-time fee for initial specimen storage, which is generally calculated based on the actual or prorated purchase price of steel drawers and cabinets, and a prorated cubic foot volume charge for the collection room.

5.3.4 FINAL PALEONTOLOGICAL MONITORING REPORT

A final paleontological monitoring report will be completed that presents the results of the implementation of this PMTP. If fossils are discovered and salvaged, the report will include discussions of the methods used, stratigraphic section(s) exposed, fossils collected, and significance of the recovered fossils relative to the research themes and questions. A complete inventory of salvaged, prepared, and curated fossils will be included. If no fossils are salvaged, an abbreviated technical report that summarizes the field methods used and stratigraphy exposed should be completed. All final paleontological monitoring reports will be submitted to SDG&E for review and approval. A copy of the final reports will be provided to agency representatives upon request.

6.0 REFERENCES

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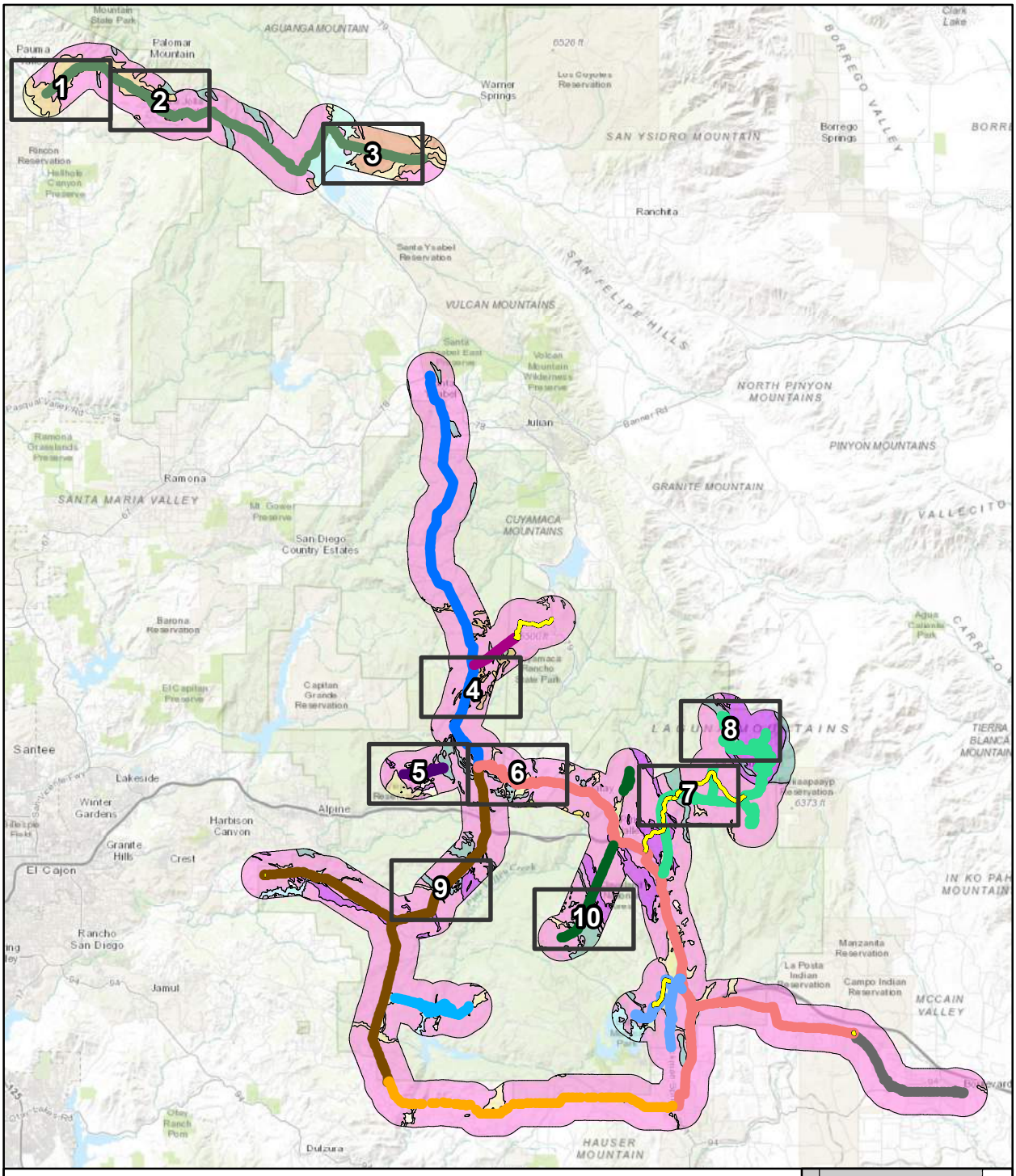
APPENDIX 1



Geologic Map Units

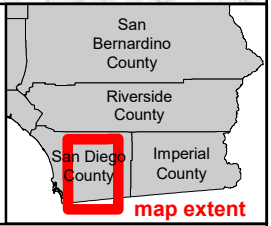
Qc	colluvium	QTf	fanglomerate
Qya	young alluvial deposits	Mg	gneiss & undivided metamorphic rocks
Qls	landslide deposits	Mm	metasedimentary & metavolcanic rocks
Qoa	old alluvial deposits	gr	undivided intrusive igneous rocks
Qco	Pauba Formation		

Project Components

C157	TL625
C440	TL626
C442	TL629
C449	TL682
C78	TL6923
C79	TL6931

undergrounding

Sources: Geology modified from Todd 2004 and Rogers 1965; Topographic Basemap, Esri et al., 2016



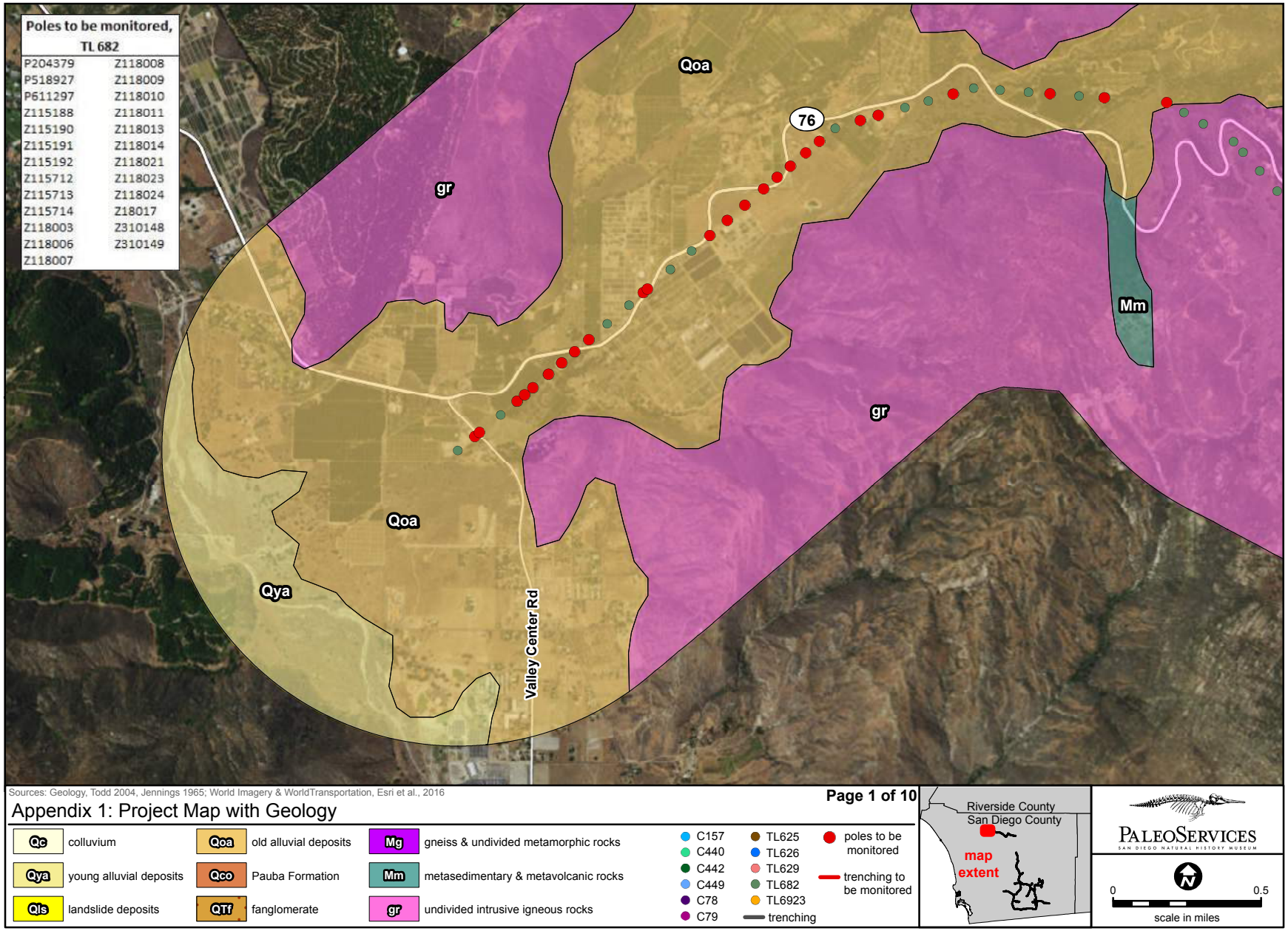
PaleoServices
San Diego Natural History Museum

Appendix **3**

Index Map
Cleveland National Forest Power Line Replacement Projects
County of San Diego, California

0 10
Approximate Scale in Miles

N


Poles to be monitored, TL 682
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Z118009
Z118010
Z118011
Z118013
Z118014
Z118021
Z118023
Z118024
Z18017
Z310148
Z310149
Qoa
gr
76
Mm
gr
Qoa
Qya
Valley Center Rd
Sources: Geology, Todd 2004, Jennings 1965; World Imagery & WorldTransportation, Esri et al., 2016
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Appendix 1: Project Map with Geology
Qc colluvium
Qya young alluvial deposits
Qls landslide deposits
Qoa old alluvial deposits
Qco Pauba Formation
QTf fanglomerate
Mg gneiss & undivided metamorphic rocks
Mm metasedimentary & metavolcanic rocks
gr undivided intrusive igneous rocks
C157
C440
C442
C449
C78
C79
TL625
TL626
TL629
TL682
TL6923
trenching
poles to be monitored
trenching to be monitored
Riverside County
San Diego County
map extent
PALEOSERVICES
SAN DIEGO NATURAL HISTORY MUSEUM
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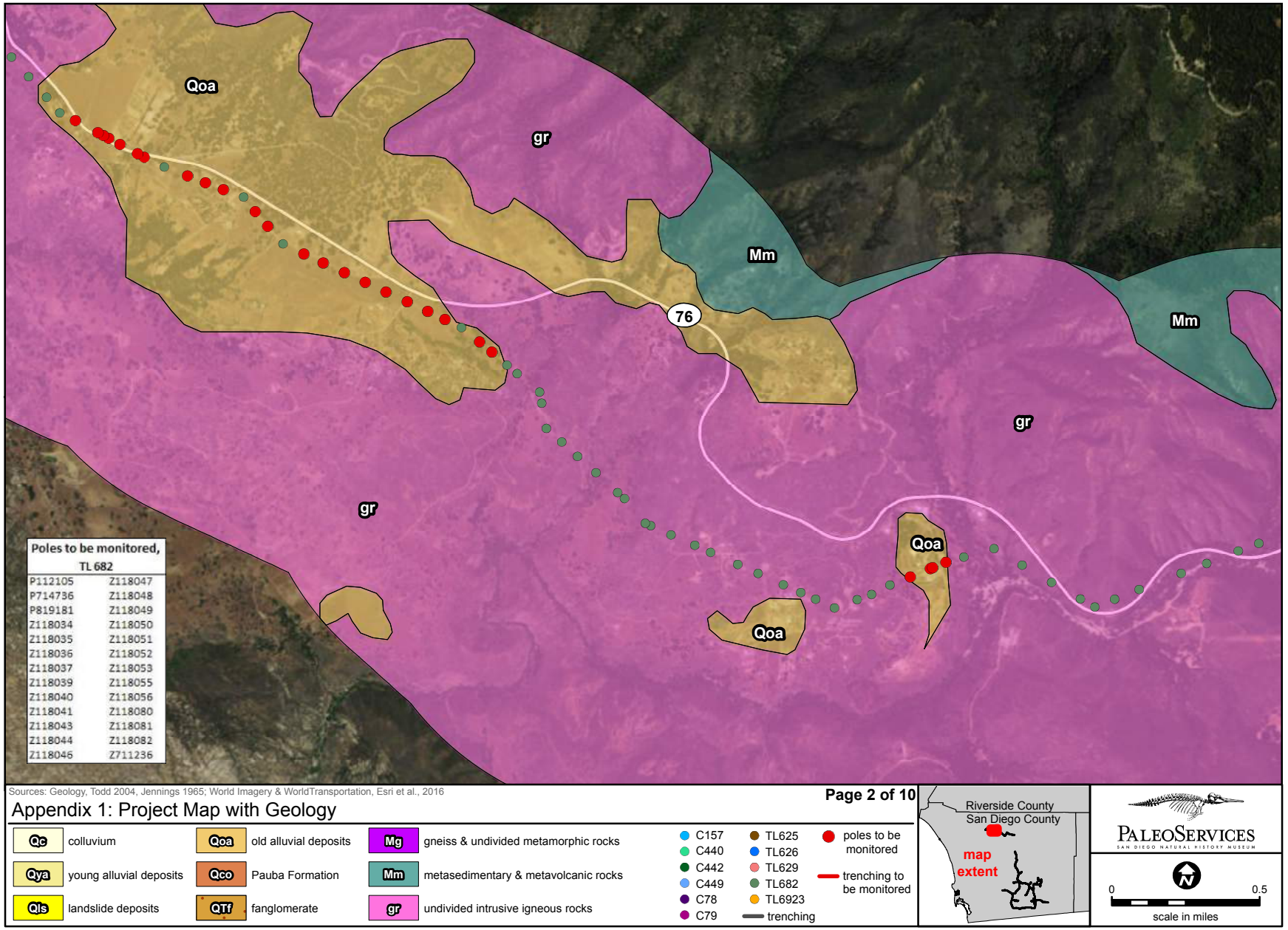
scale in miles


Qoa
gr
Mm
76
Mm
gr
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Poles to be monitored, TL 682
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Z118044 Z118082
Z118046 Z711236
Sources: Geology, Todd 2004, Jennings 1965; World Imagery & WorldTransportation, Esri et al., 2016
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Appendix 1: Project Map with Geology
Qc colluvium
Qya young alluvial deposits
Qls landslide deposits
Qoa old alluvial deposits
Qco Pauba Formation
QTf fanglomerate
Mg gneiss & undivided metamorphic rocks
Mm metasedimentary & metavolcanic rocks
gr undivided intrusive igneous rocks
C157
C440
C442
C449
C78
C79
TL625
TL626
TL629
TL682
TL6923
trenching
poles to be monitored
trenching to be monitored
Riverside County
San Diego County
map extent
PALEOSERVICES
SAN DIEGO NATURAL HISTORY MUSEUM
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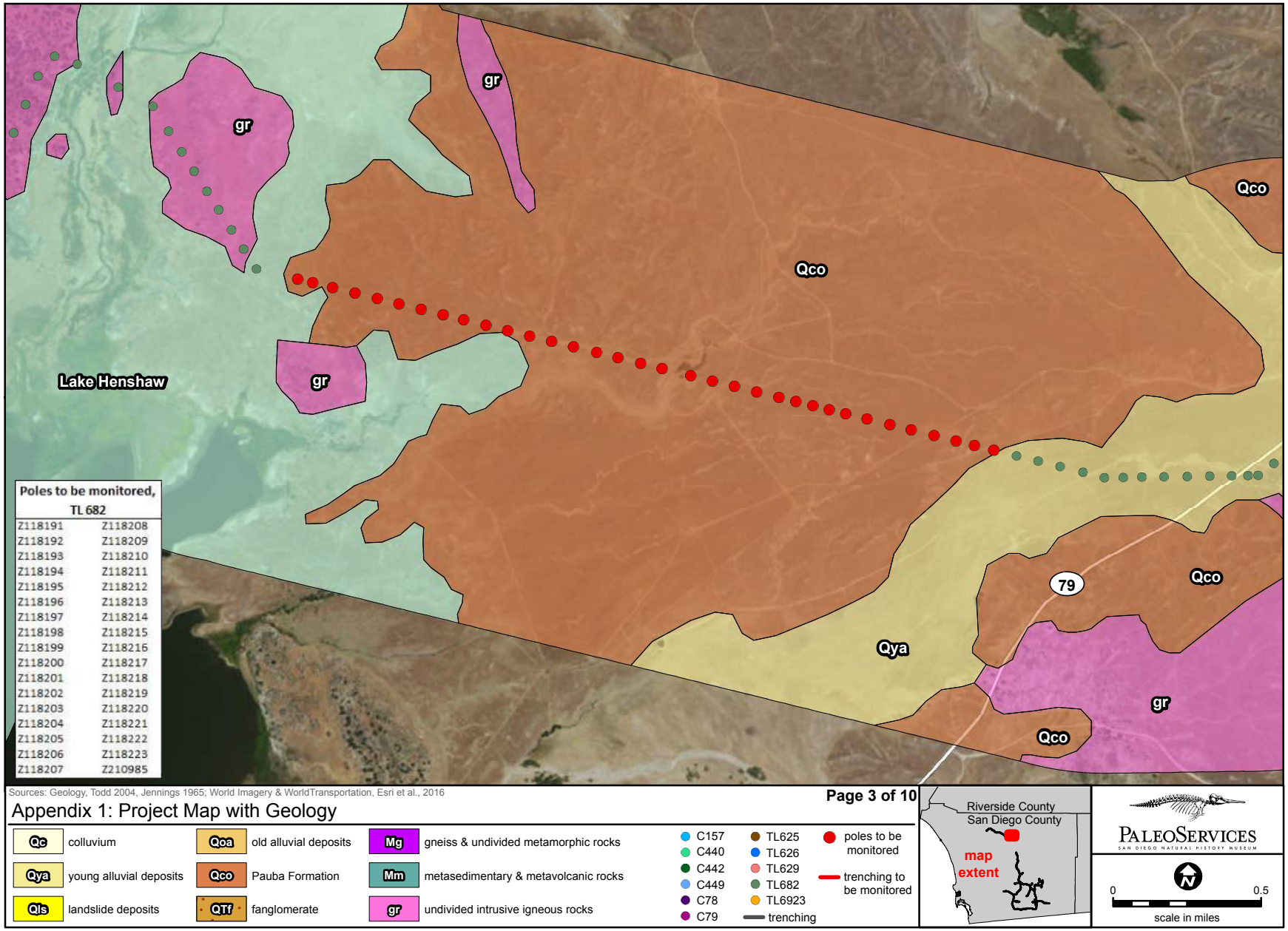
scale in miles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Qya
Lake Henshaw
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Poles to be monitored, TL 682
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Z118193 Z118210
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Z118195 Z118212
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Sources: Geology, Todd 2004, Jennings 1965; World Imagery & WorldTransportation, Esri et al., 2016
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Appendix 1: Project Map with Geology
Qc colluvium
Qya young alluvial deposits
Qls landslide deposits
Qca old alluvial deposits
Qco Pauba Formation
QTf fanglomerate
Mg gneiss & undivided metamorphic rocks
Mm metasedimentary & metavolcanic rocks
gr undivided intrusive igneous rocks
C157
C440
C442
C449
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C79
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TL626
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TL6923
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poles to be monitored
trenching to be monitored
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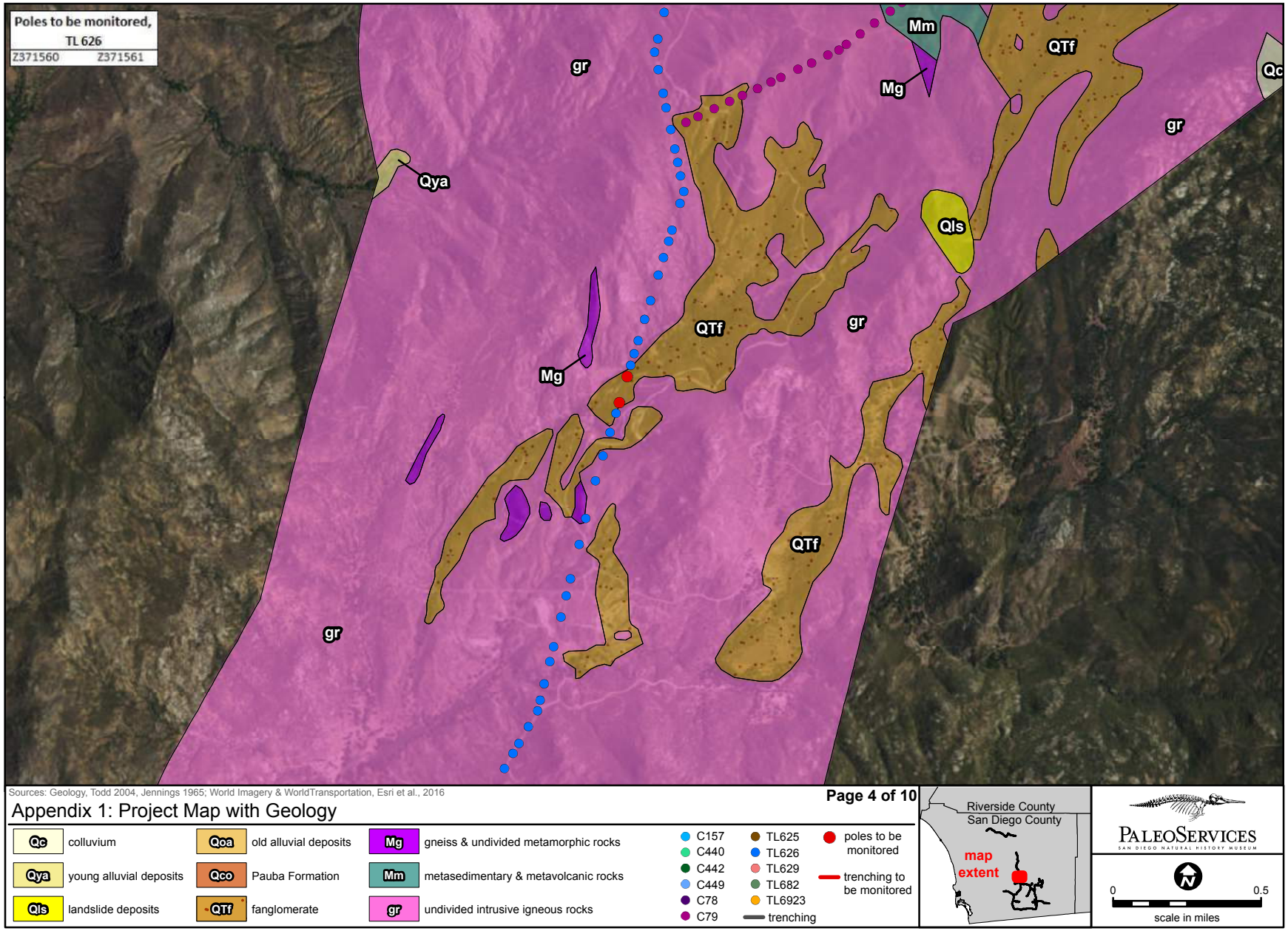
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Mg
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Qya
Qls
QTf
gr
Mg
QTf
gr
Sources: Geology, Todd 2004, Jennings 1965; World Imagery & WorldTransportation, Esri et al., 2016
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Qc colluvium
Qya young alluvial deposits
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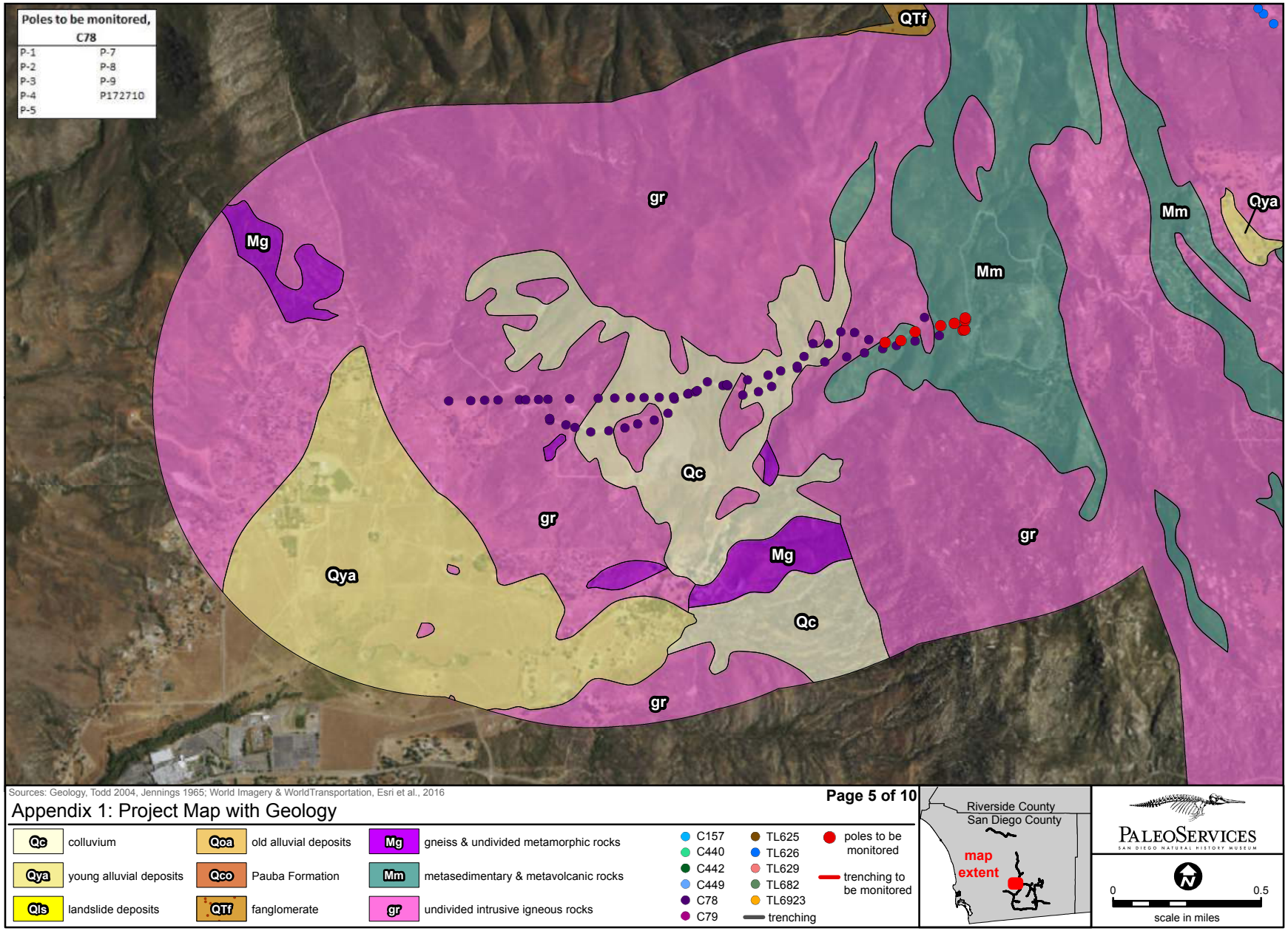
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P-2
P-3
P-4
P-5
P-7
P-8
P-9
P172710
QTf
gr
Mg
Mm
Qya
Qc
Sources: Geology, Todd 2004, Jennings 1965; World Imagery & WorldTransportation, Esri et al., 2016
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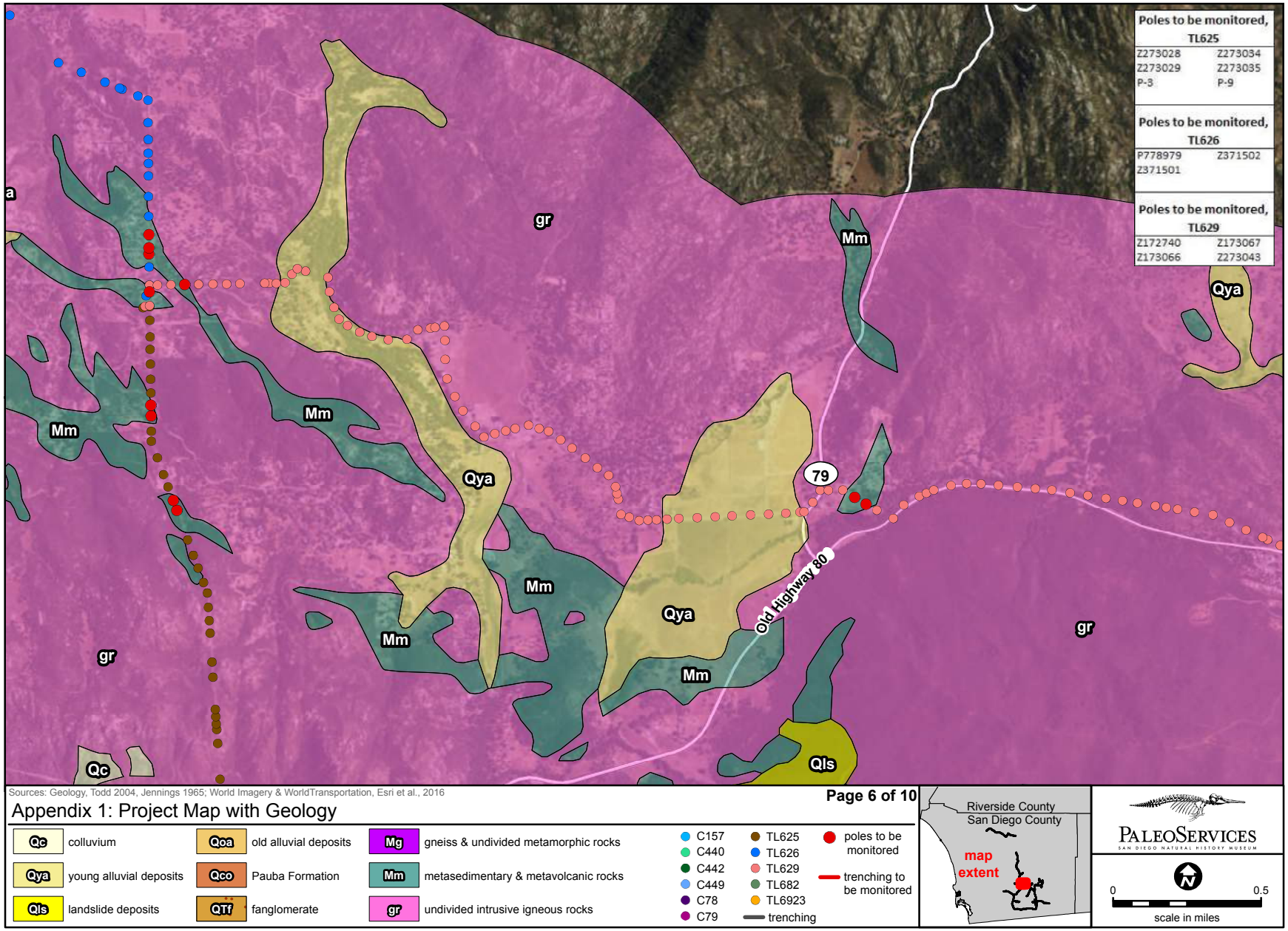
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Z273028 Z273034
Z273029 Z273035
P-3 P-9
Poles to be monitored, TL626
P778979 Z371502
Z371501
Poles to be monitored, TL629
Z172740 Z173067
Z173066 Z273043
gr
Mm
Qya
79
Old Highway 80
Qc
Qls
Sources: Geology, Todd 2004, Jennings 1965; World Imagery & WorldTransportation, Esri et al., 2016
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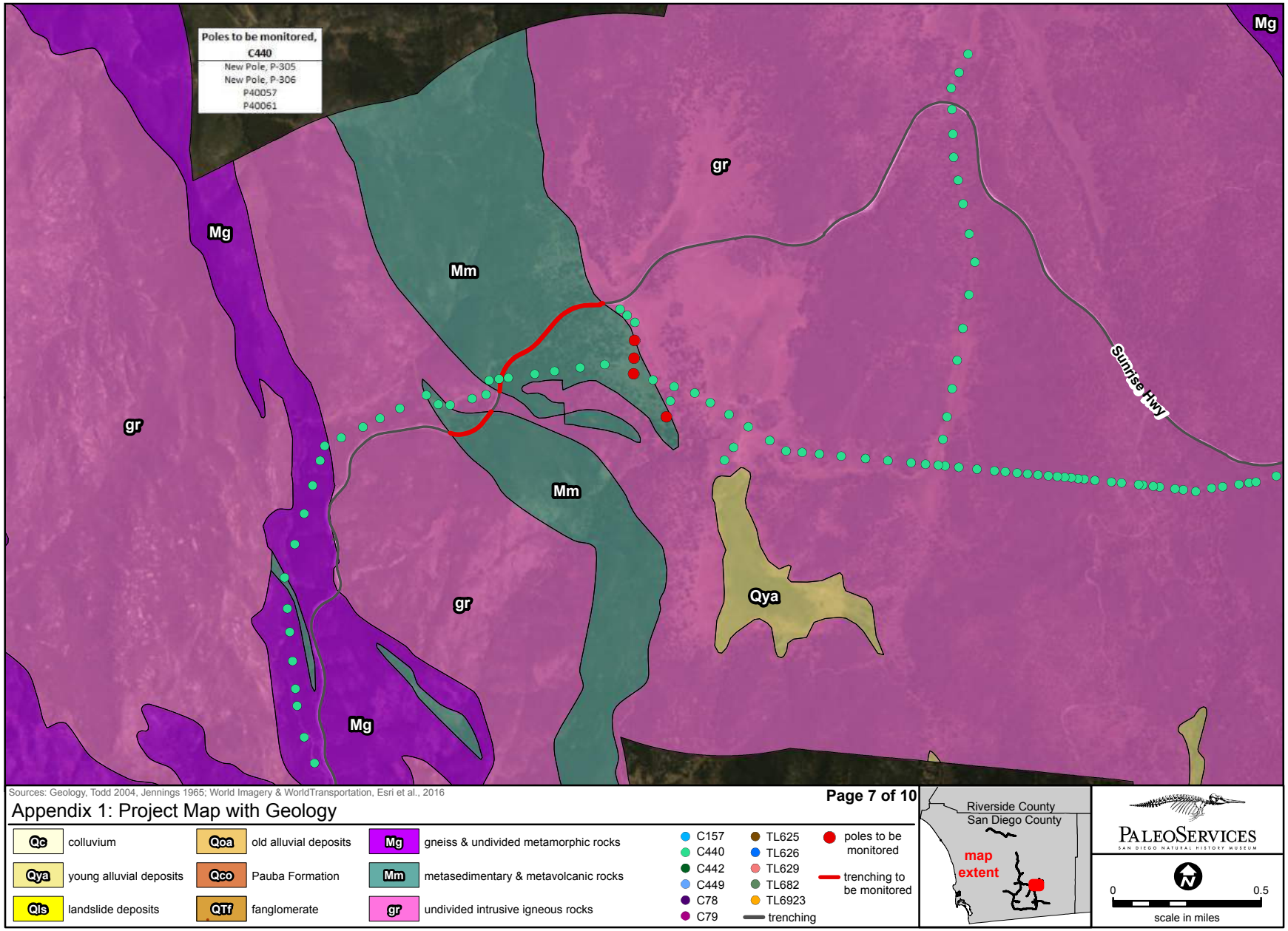
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New Pole, P-305
New Pole, P-306
P40057
P40061
Mg
gr
Mm
Sunrise Hwy
Qya
Sources: Geology, Todd 2004, Jennings 1965; World Imagery & WorldTransportation, Esri et al., 2016
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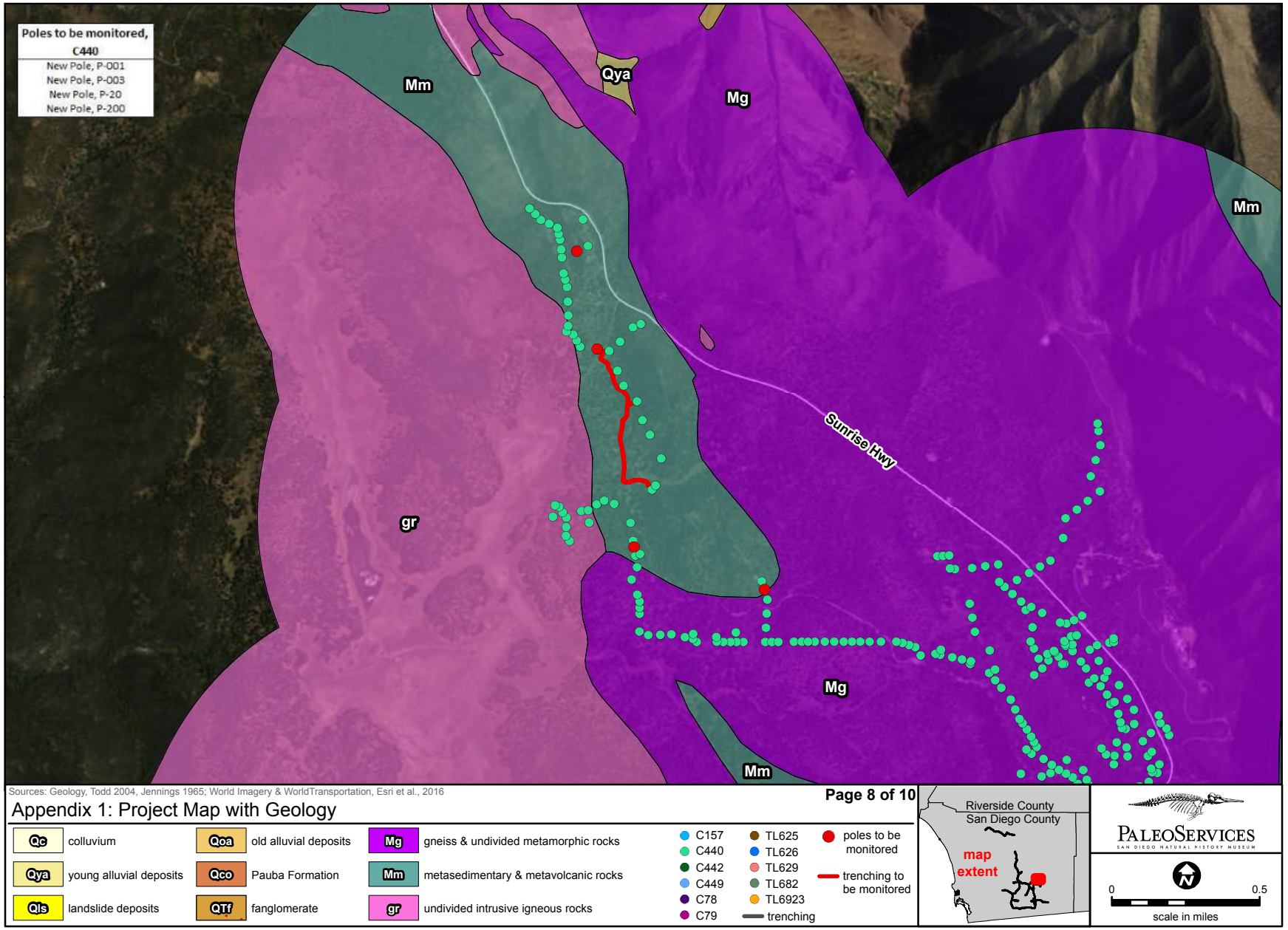
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New Pole, P-001
New Pole, P-003
New Pole, P-20
New Pole, P-200
Mm
Qya
Mg
Mm
Sunrise Hwy
gr
Mg
Mm
Sources: Geology, Todd 2004, Jennings 1965; World Imagery & WorldTransportation, Esri et al., 2016
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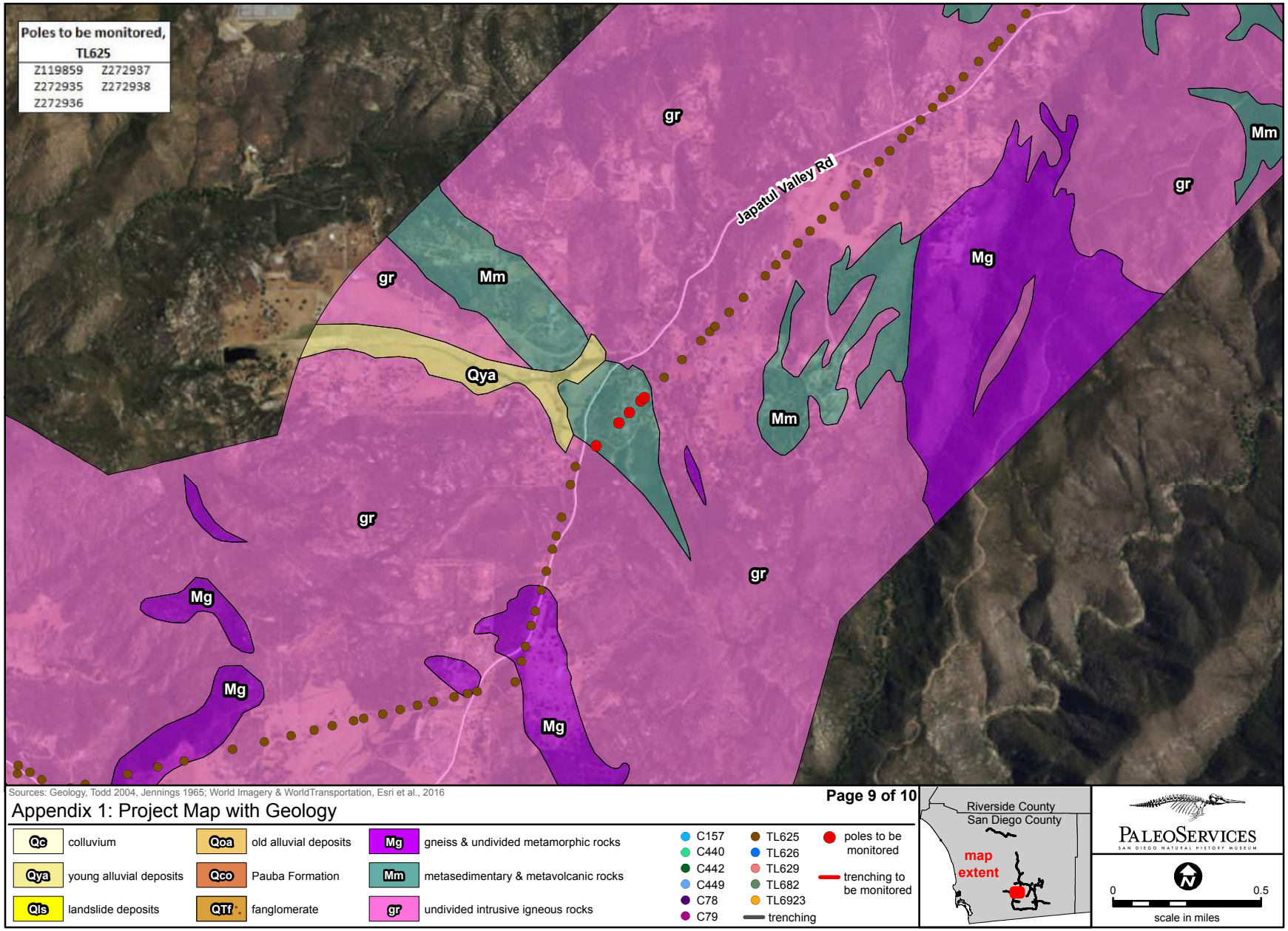
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Z272936
Japatul Valley Rd
gr
Mm
Mg
Qya
Sources: Geology, Todd 2004, Jennings 1965; World Imagery & WorldTransportation, Esri et al., 2016
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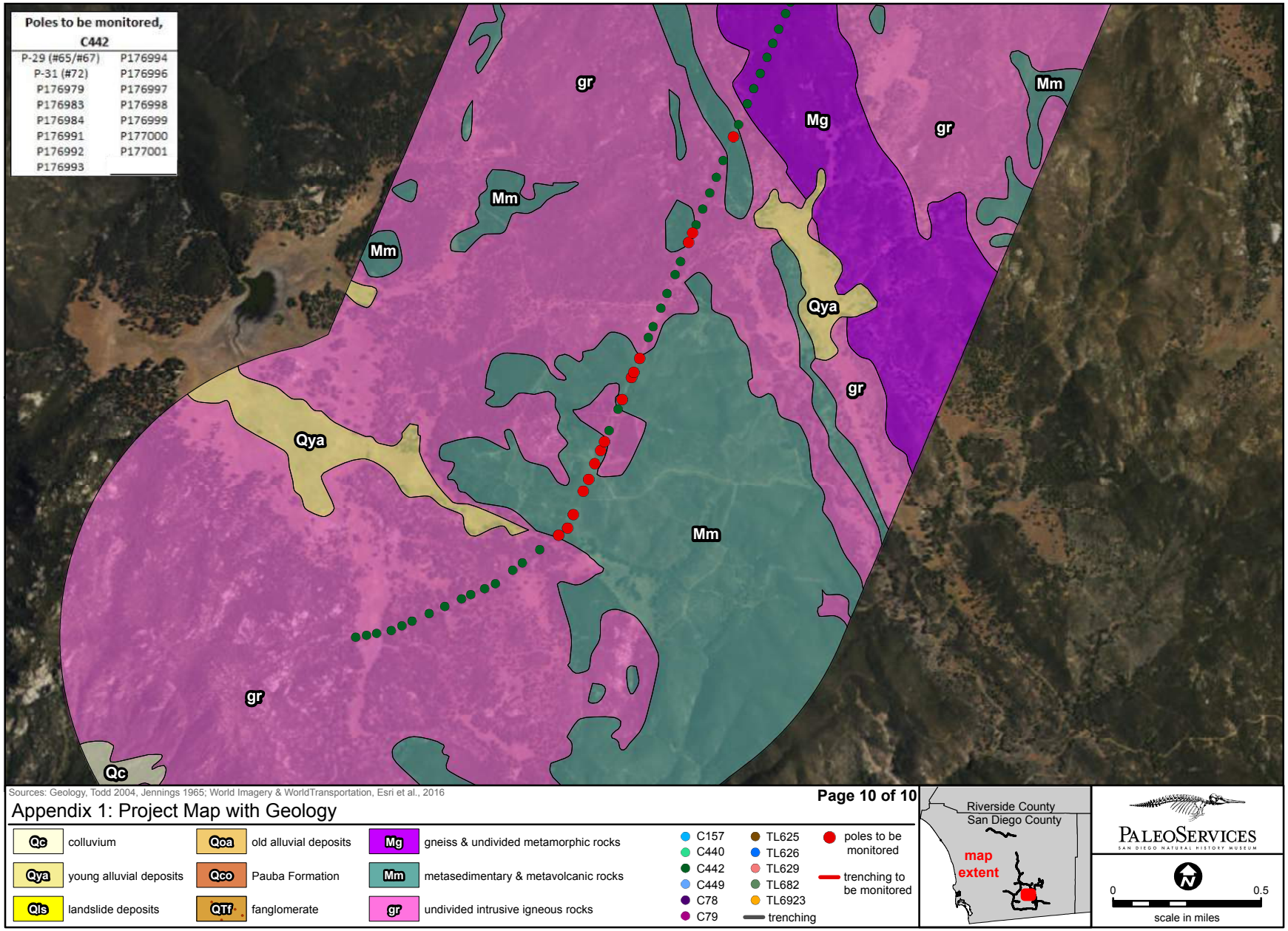
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P-31 (#72)
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P176983
P176984
P176991
P176992
P176993
P176994
P176996
P176997
P176998
P176999
P177000
P177001
gr
Mm
Mg
gr
Mm
Mm
Qya
gr
Qya
Mm
gr
Qc
Sources: Geology, Todd 2004, Jennings 1965; World Imagery & WorldTransportation, Esri et al., 2016
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