ATTACHMENT 5.7-A: PALEONTOLOGICAL RESOURCES MEMORANDUM

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T: (909) 254-4035
F: (602) 254-6280
info@chronicleheritage.com

SACRAMENTO, CALIFORNIA
2501 Capitol Avenue, Suite 200
Sacramento, California 95816

July 26, 2024

Robert Curley
Chief Technical Officer
Insignia Environmental
545 Middlefield Road, Suite 210
Menlo Park, California 94025
Transmitted via email to rcurley@insigniaenv.com

RE: Paleontological Resource Technical Memorandum for the Collinsville 500/230 kV Substation Project, Sacramento River Delta Region in Contra Costa, Solano, and Sacramento Counties, California

Dear Robert Curley,

At the request of Insignia Environmental, PaleoWest, LLC dba Chronicle Heritage (Chronicle Heritage) conducted a paleontological resource assessment for the Collinsville 500/230 kV Substation Project (Project) within the Sacramento River Delta region in Contra Costa, Solano, and Sacramento counties, California (**Error! Reference source not found.**). The goal of the assessment was to detail the results of a literature review and museum records search, summarize the paleontological sensitivity of the geologic units within and in the vicinity of the Project area, assess potential impacts from Project implementation for adverse effects to scientifically significant paleontological resources under California Environmental Quality Act (CEQA) guidelines, and provide management recommendations for avoiding or reducing adverse effects to paleontological resources from the Project development, as necessary.

This paleontological resource assessment included a fossil locality records search conducted by the Natural History Museum of Los Angeles County (NHMLAC). The records search was supplemented by a review of existing geologic maps and primary literature regarding fossiliferous geologic units within the proposed Project vicinity and region. This technical memorandum, written in accordance with the guidelines set forth by the Society of Vertebrate Paleontology (SVP) (2010), has been prepared to support environmental review under CEQA.

Project Location and Description

LS Power Grid California, LLC (LSPGC) proposed the Collinsville 500/230 kilovolt (kV) Substation Project (Project) to be in Contra Costa, Solano, and Sacramento counties, California. The Project area is in Sections 22–24 and 26–27 of Township 3 North, Range 1 East in the Antioch North, California (1979) and Honker Bay, California (1981) USGS 7.5-minute quadrangles (**Error! Reference source not found.**, Figure 3, and Figure 4). The substation will provide an additional supply from the 500 kV system into the northern Greater Bay Area that will increase reliability and advance additional renewable generation. The Project has an in-service date requirement of June 1, 2028, per the California Independent System Operator (CAISO) functional specification.

Figure 1. Project vicinity map.

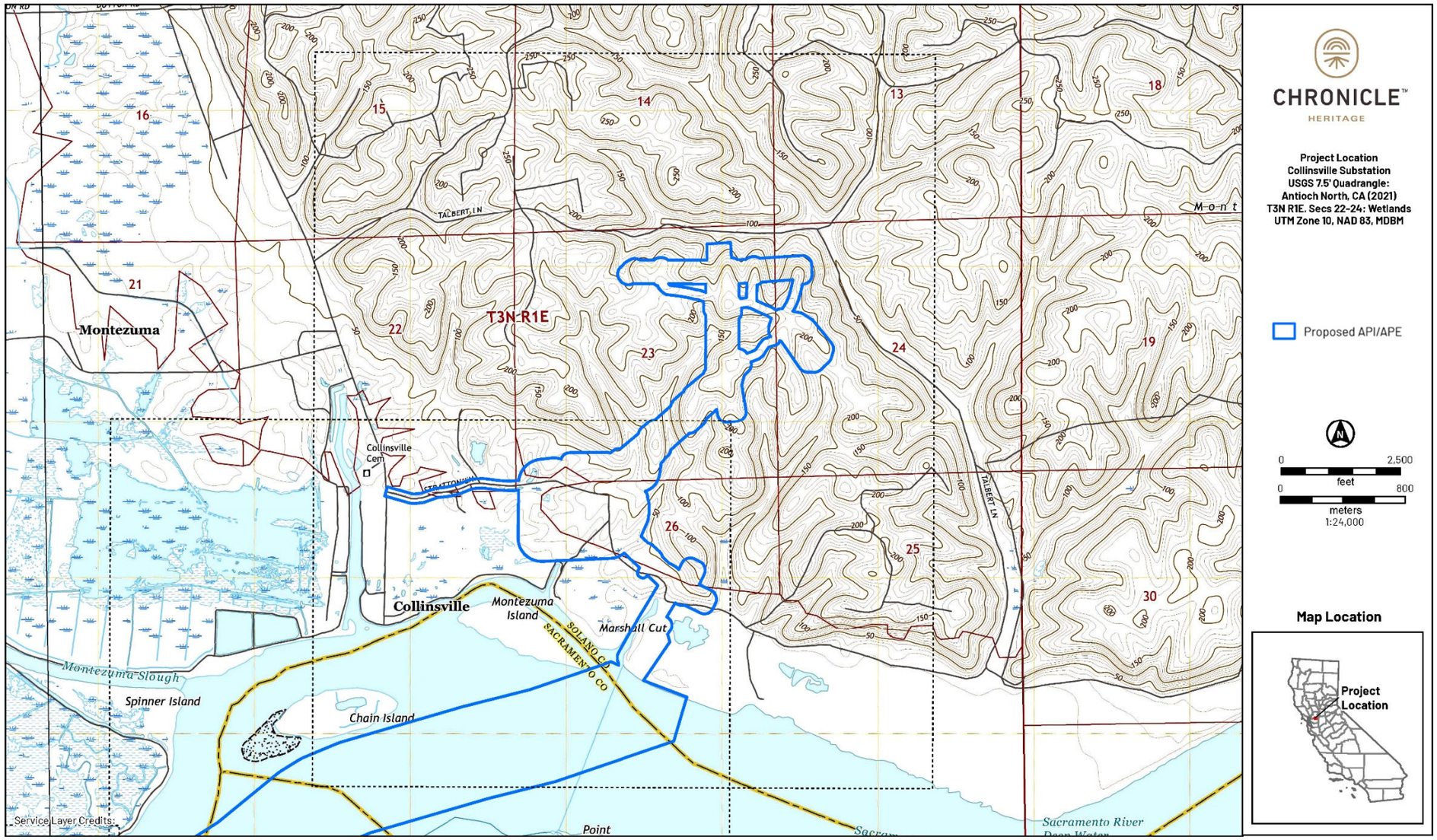


Figure 2. Project location map (1 of 3), proposed Collinsville Substation.

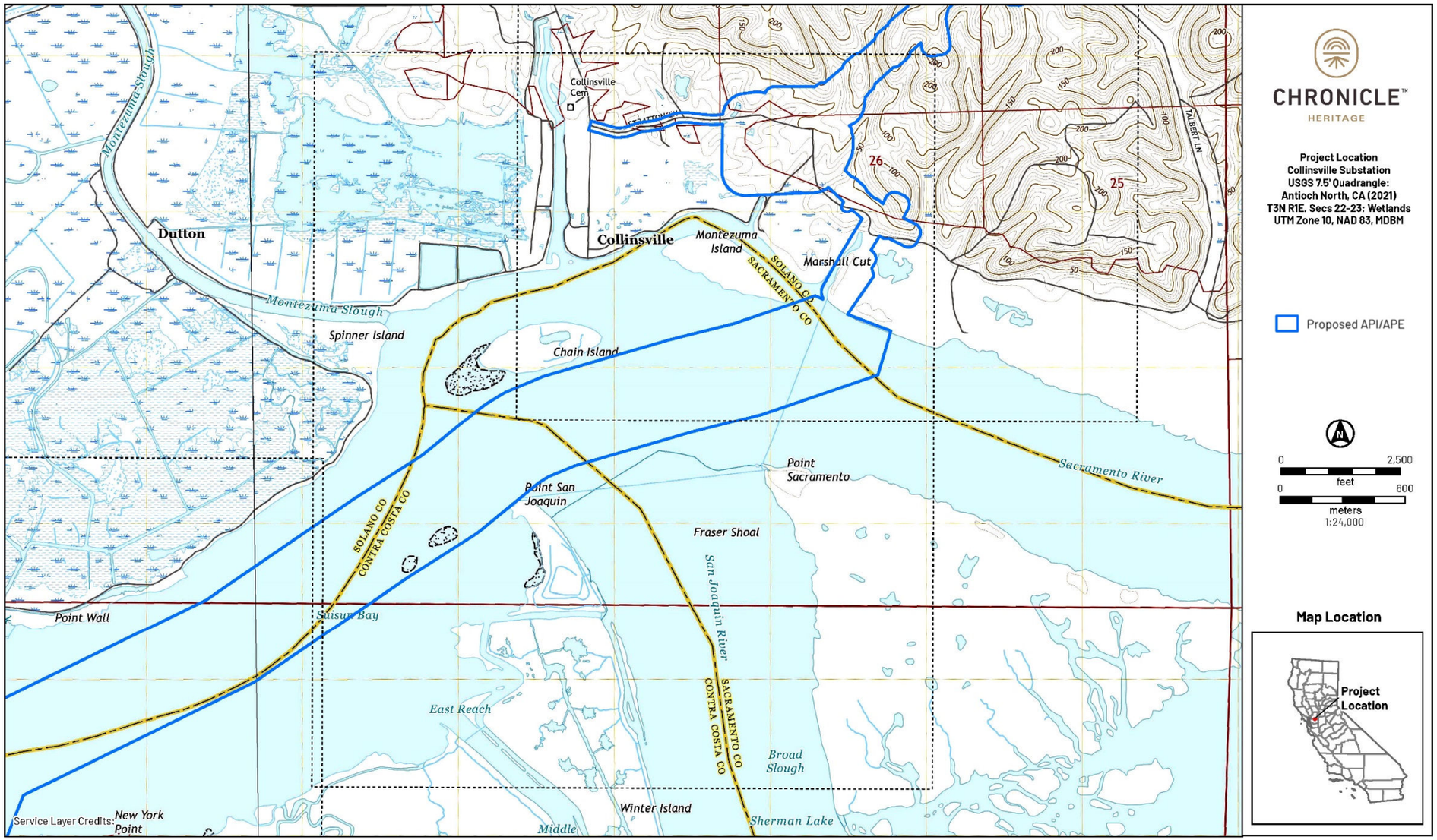


Figure 3. Project location map (2 of 3), submerged alignment.

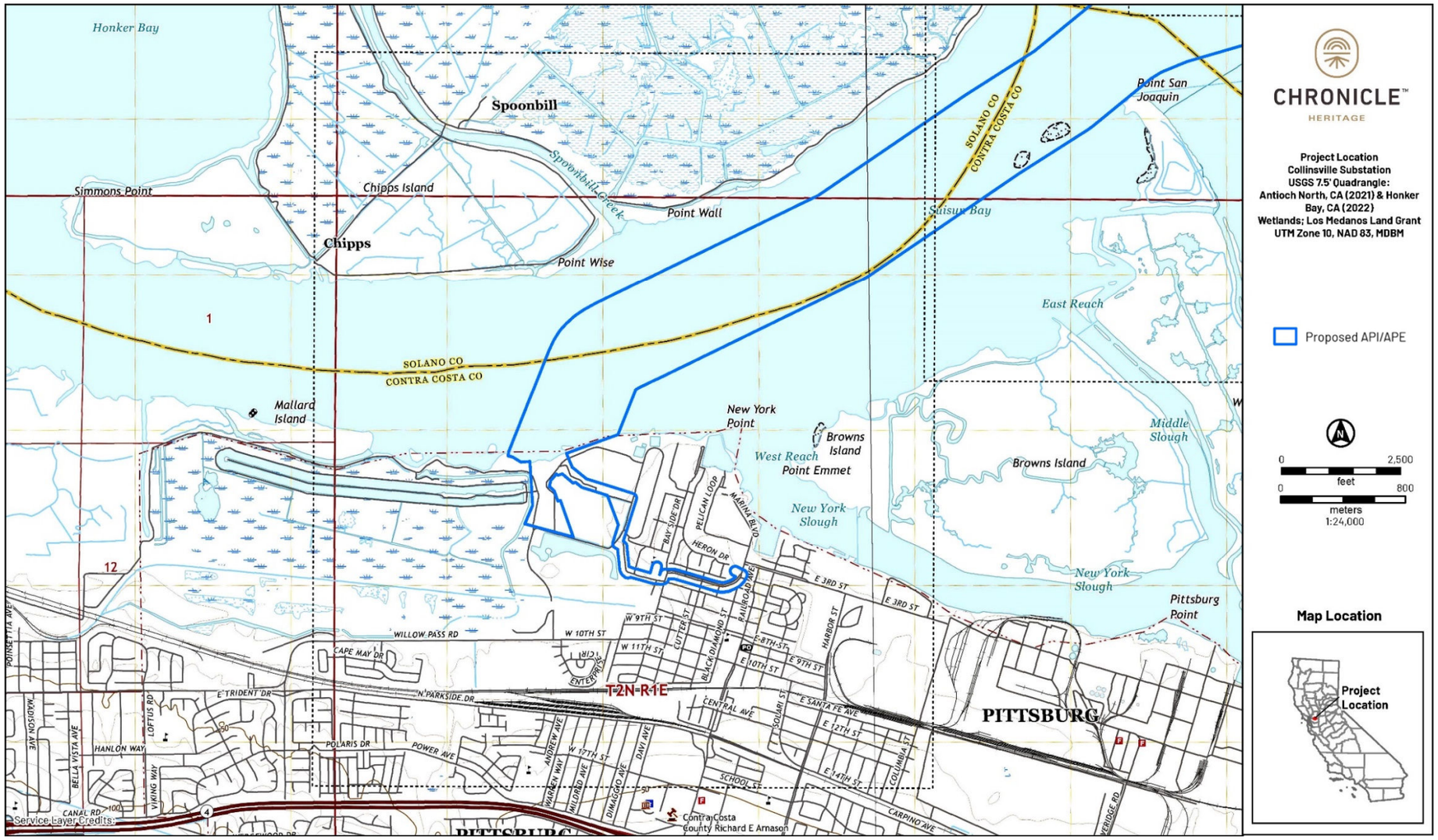


Figure 4. Project location map (3 of 3), PG&E's existing Pittsburg Substation

Note: Please see Figure 16 for the most up-to-date proposed API/APE for the proposed telecommunications line south of the Sacramento River.

Figure 5. Proposed API/APE vertical detail map (1 of 12).

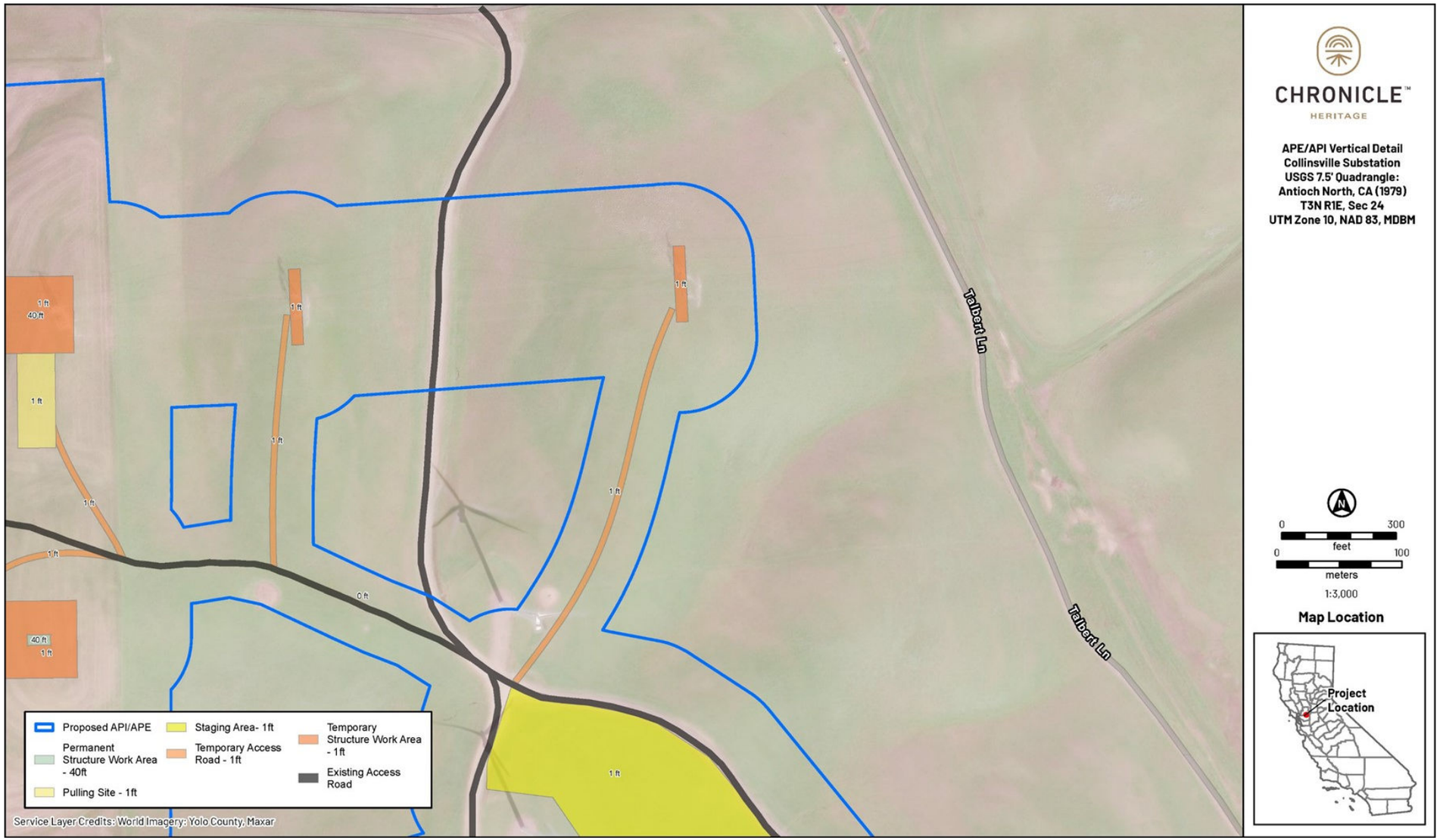


Figure 6. Proposed API/APE vertical detail map (2 of 12).

Figure 7. Proposed API/APE vertical detail map (3 of 12).

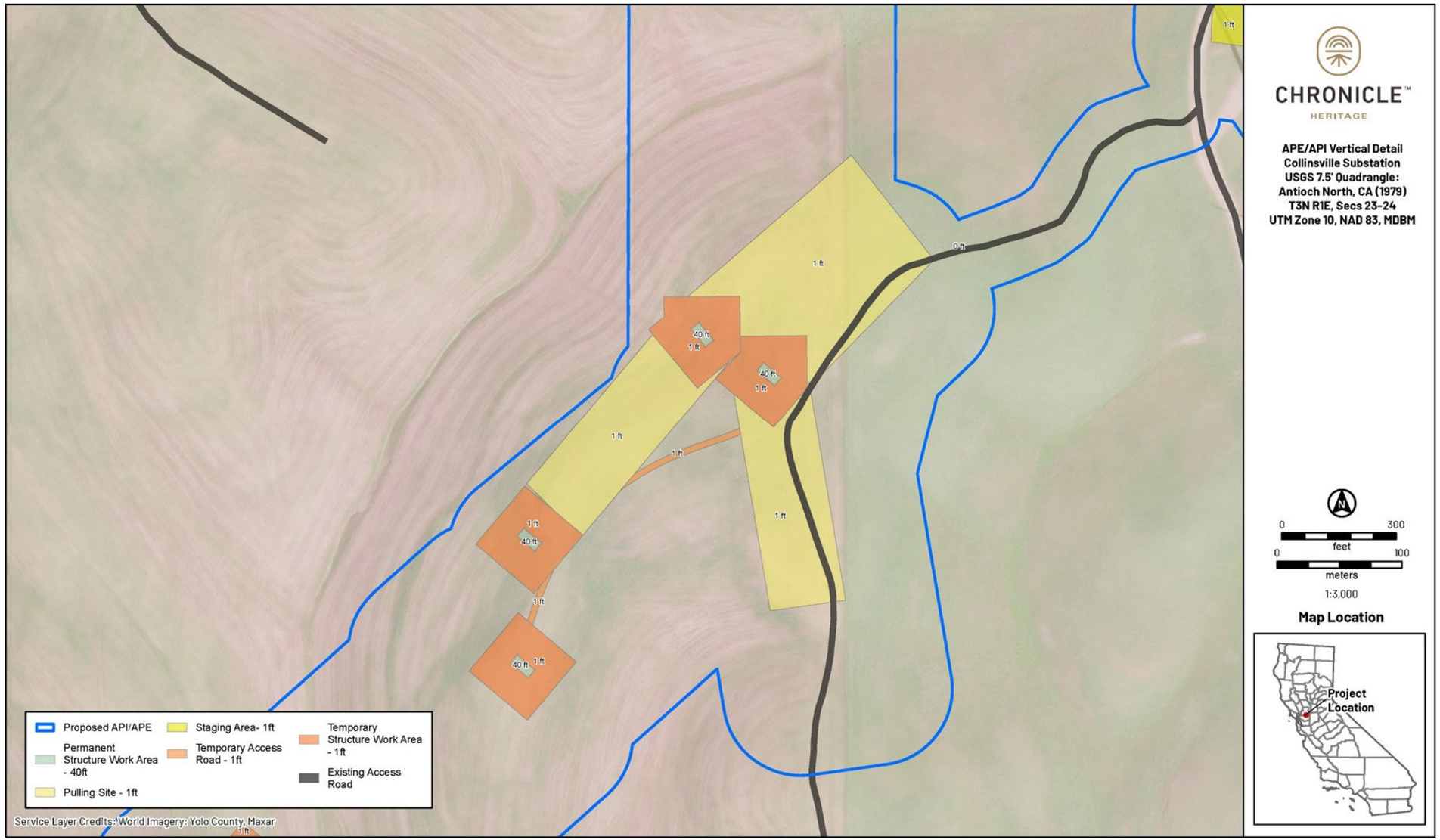


Figure 8. Proposed API/APE vertical detail map (4 of 12).

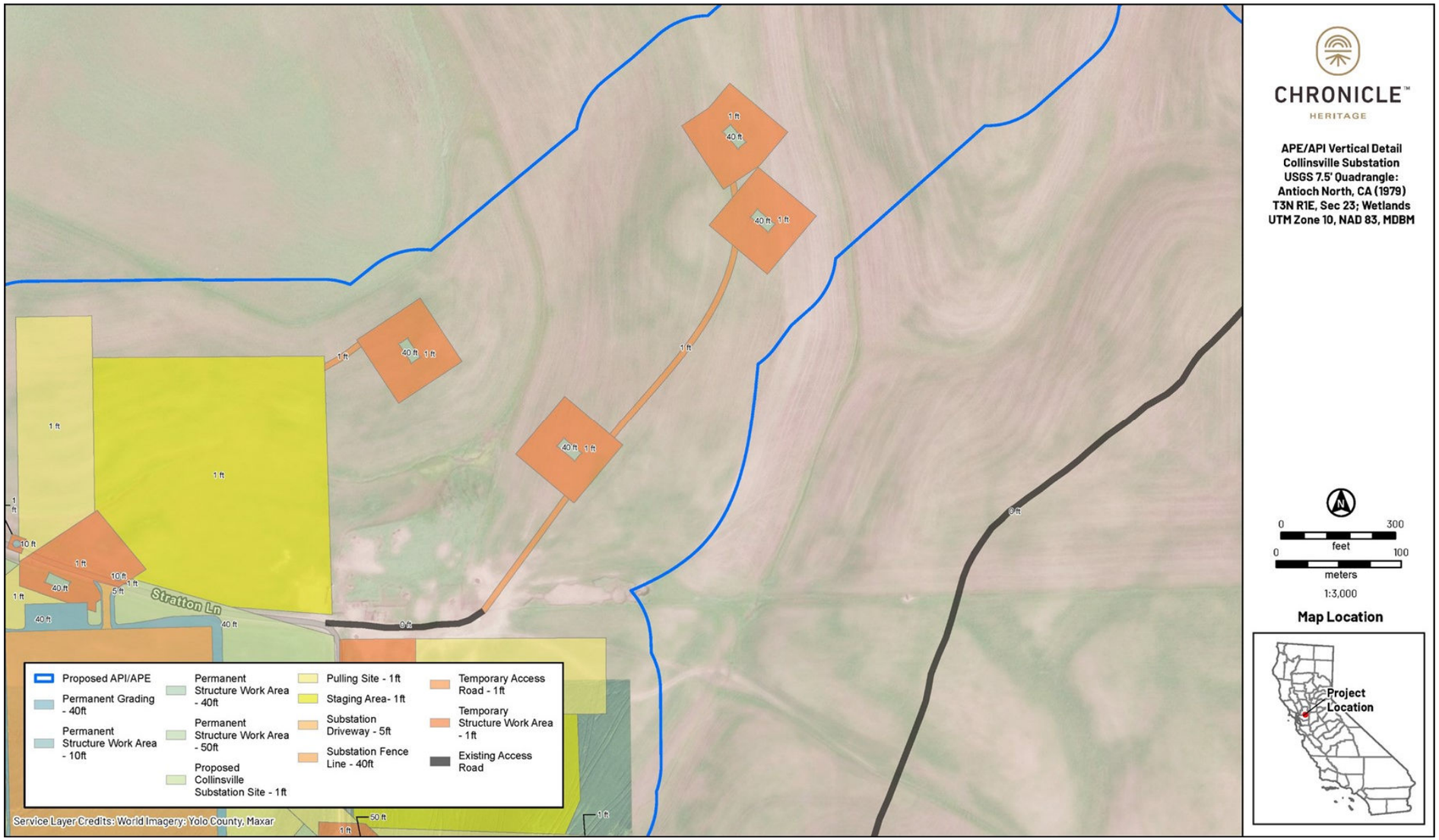


Figure 9. Proposed API/APE vertical detail map (5 of 12).

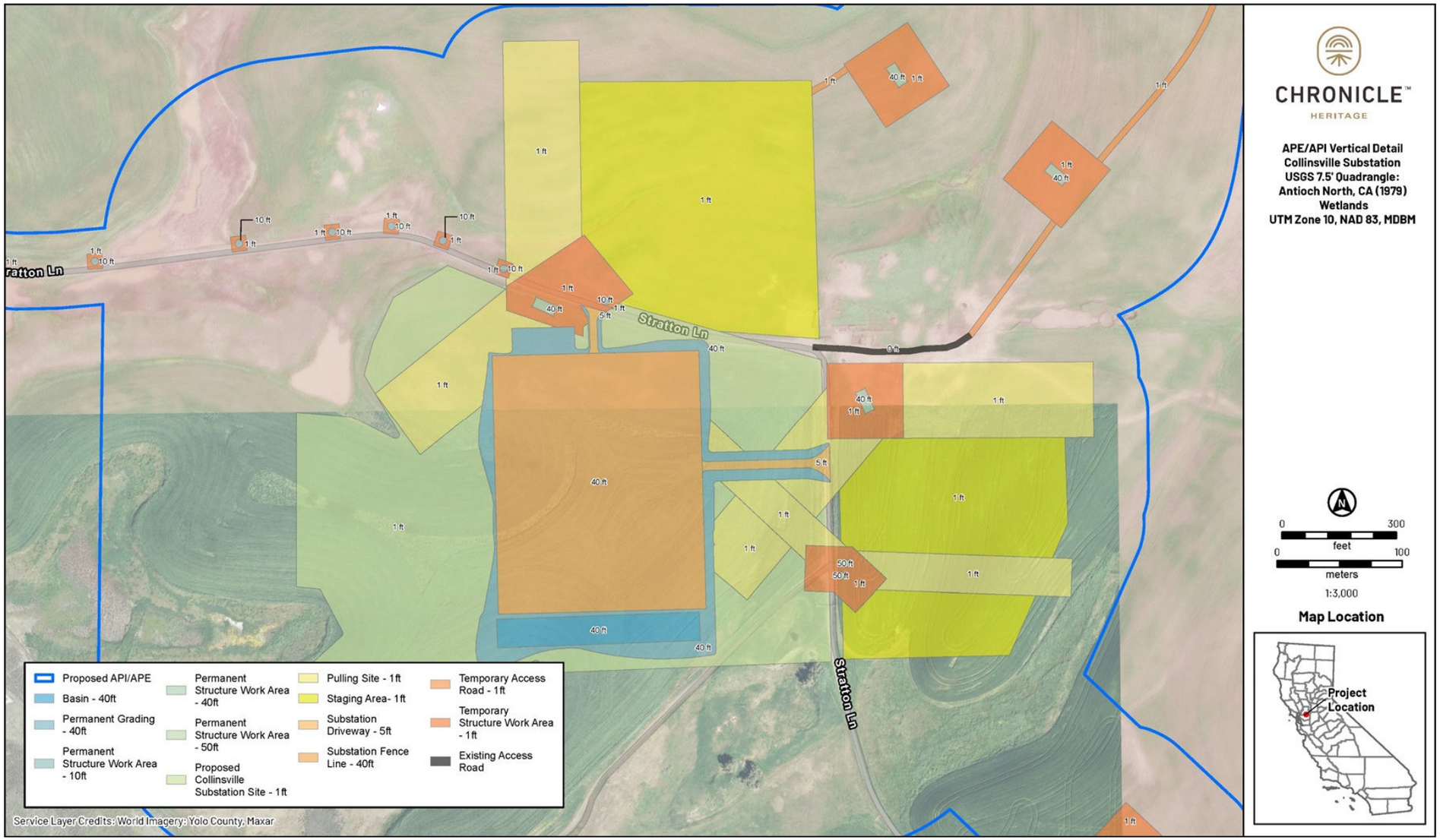


Figure 10. Proposed API/APE vertical detail map (6 of 12).

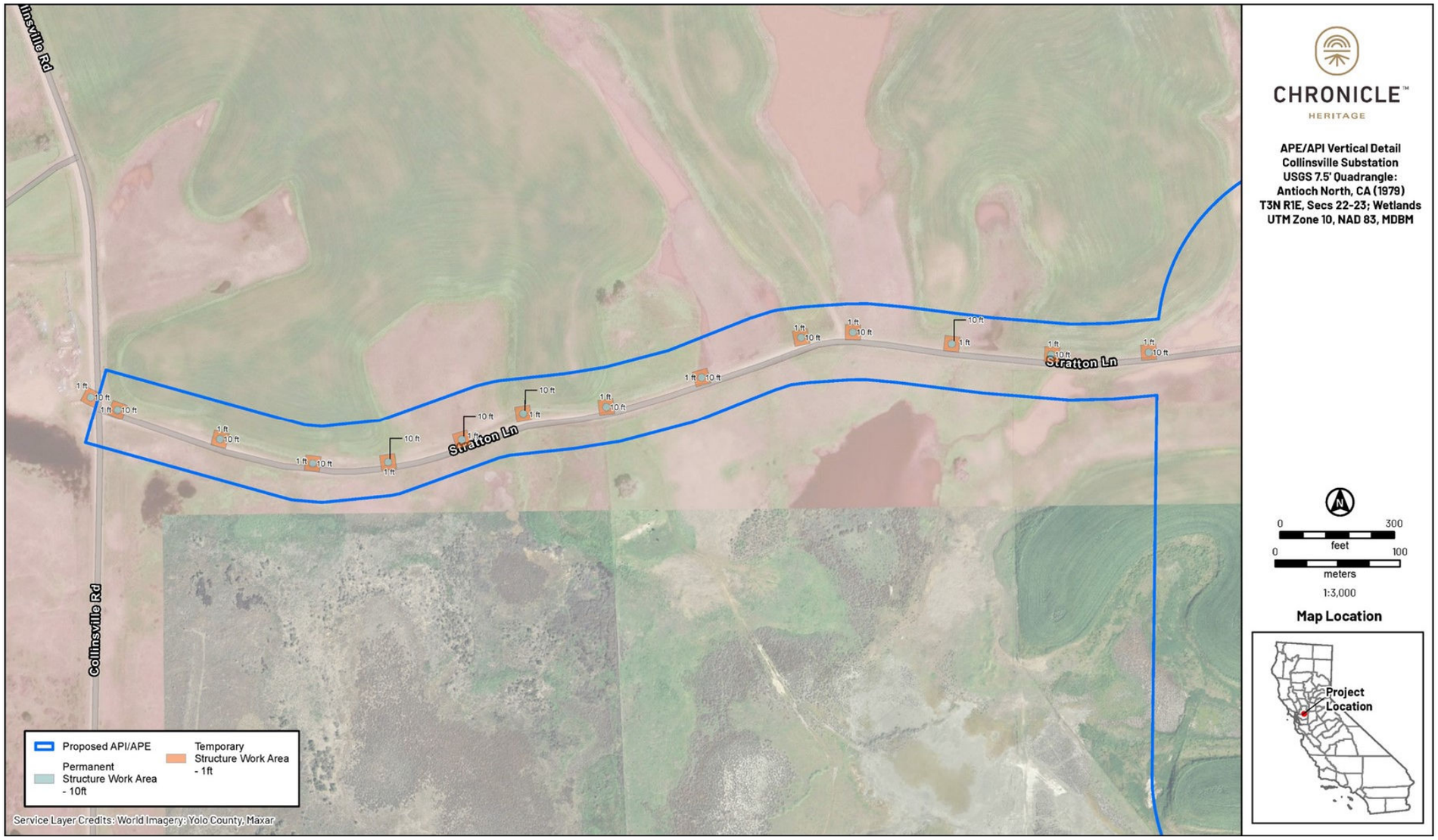


Figure 11. Proposed API/APE vertical detail map (7 of 12).

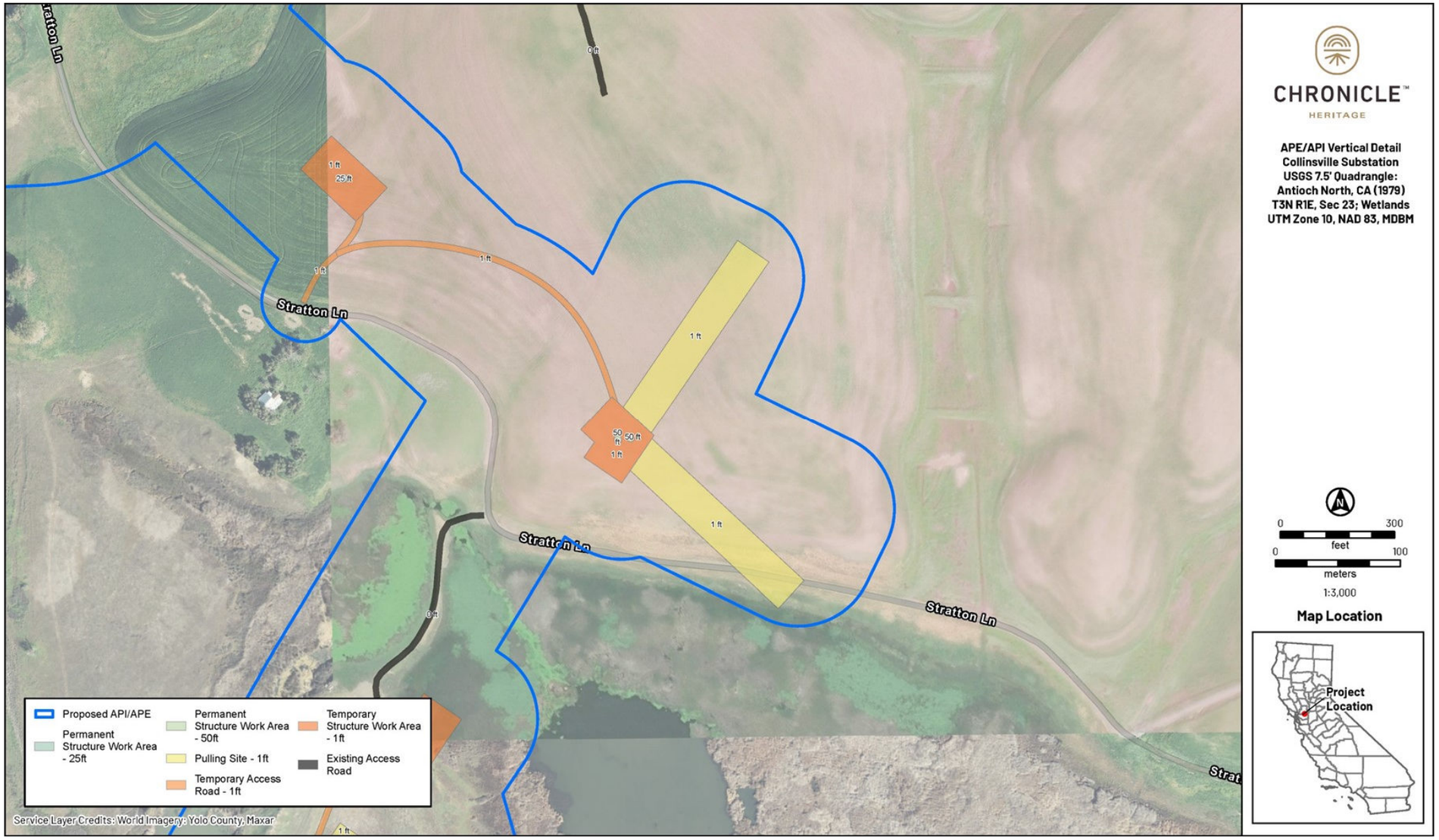


Figure 12. Proposed API/APE vertical detail map (8 of 12).

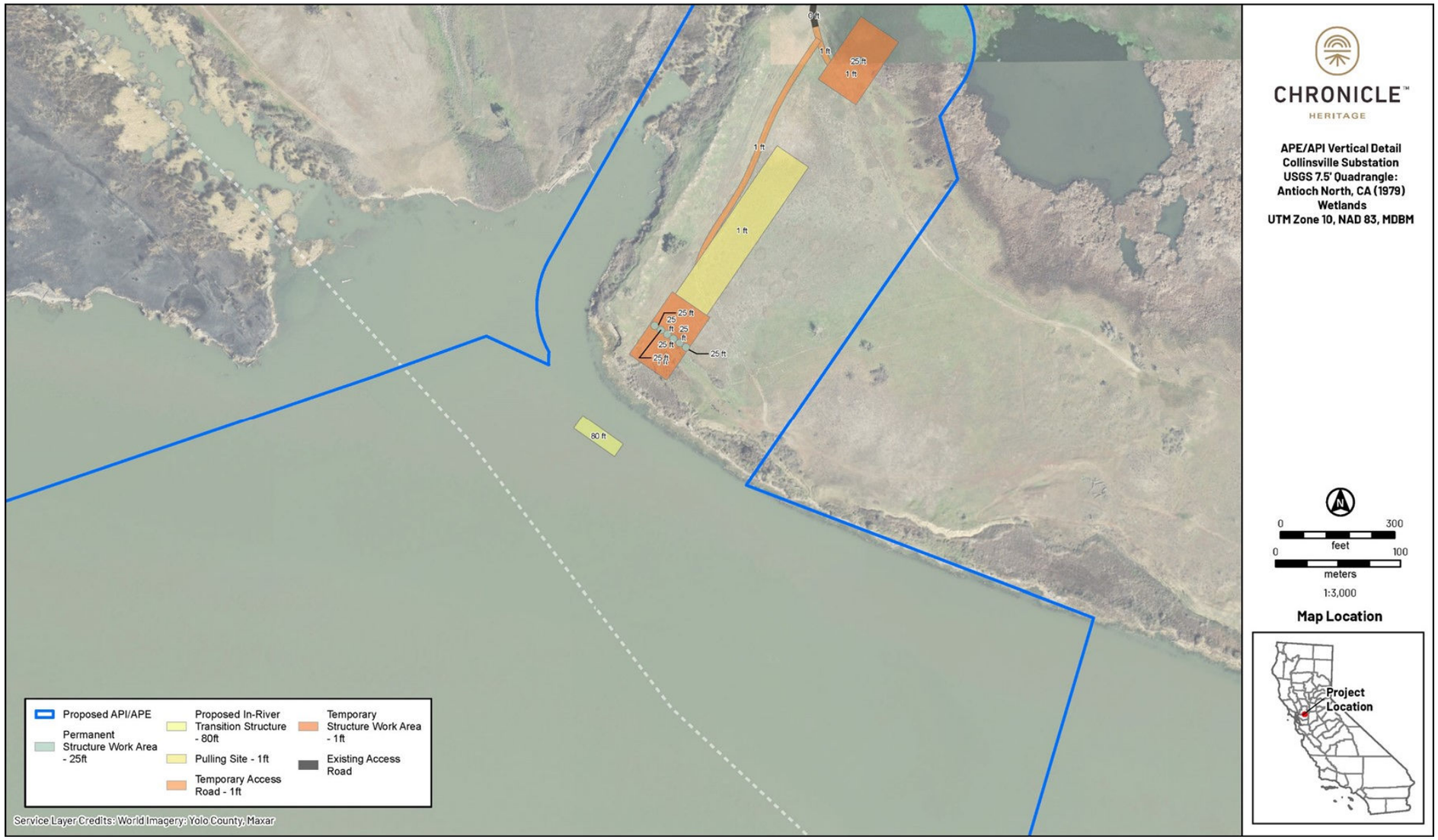


Figure 13. Proposed API/APE vertical detail map (9 of 12).

Figure 14. Proposed API/APE vertical detail map (10 of 12).

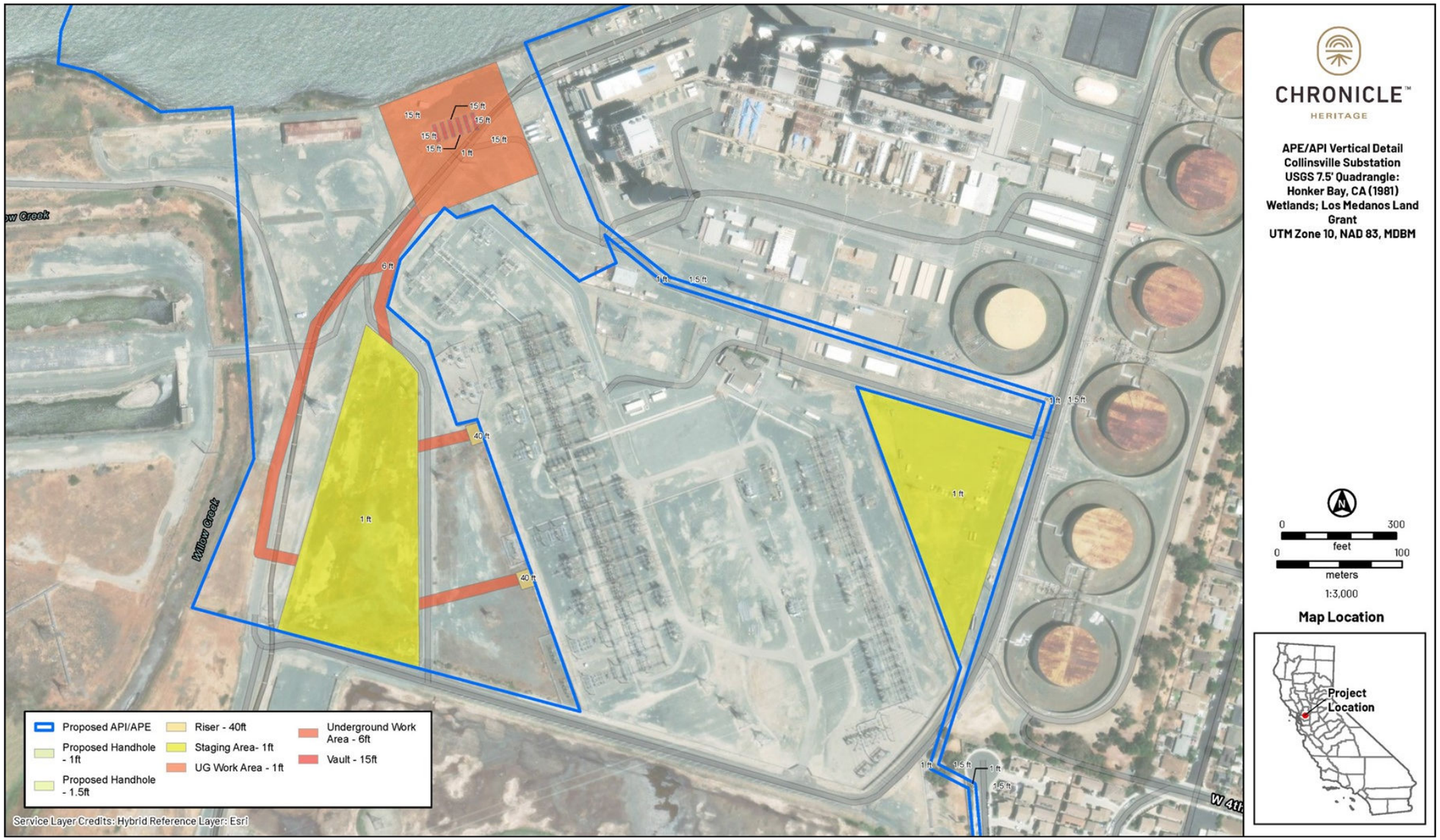


Figure 15. Proposed API/APE vertical detail map (11 of 12).

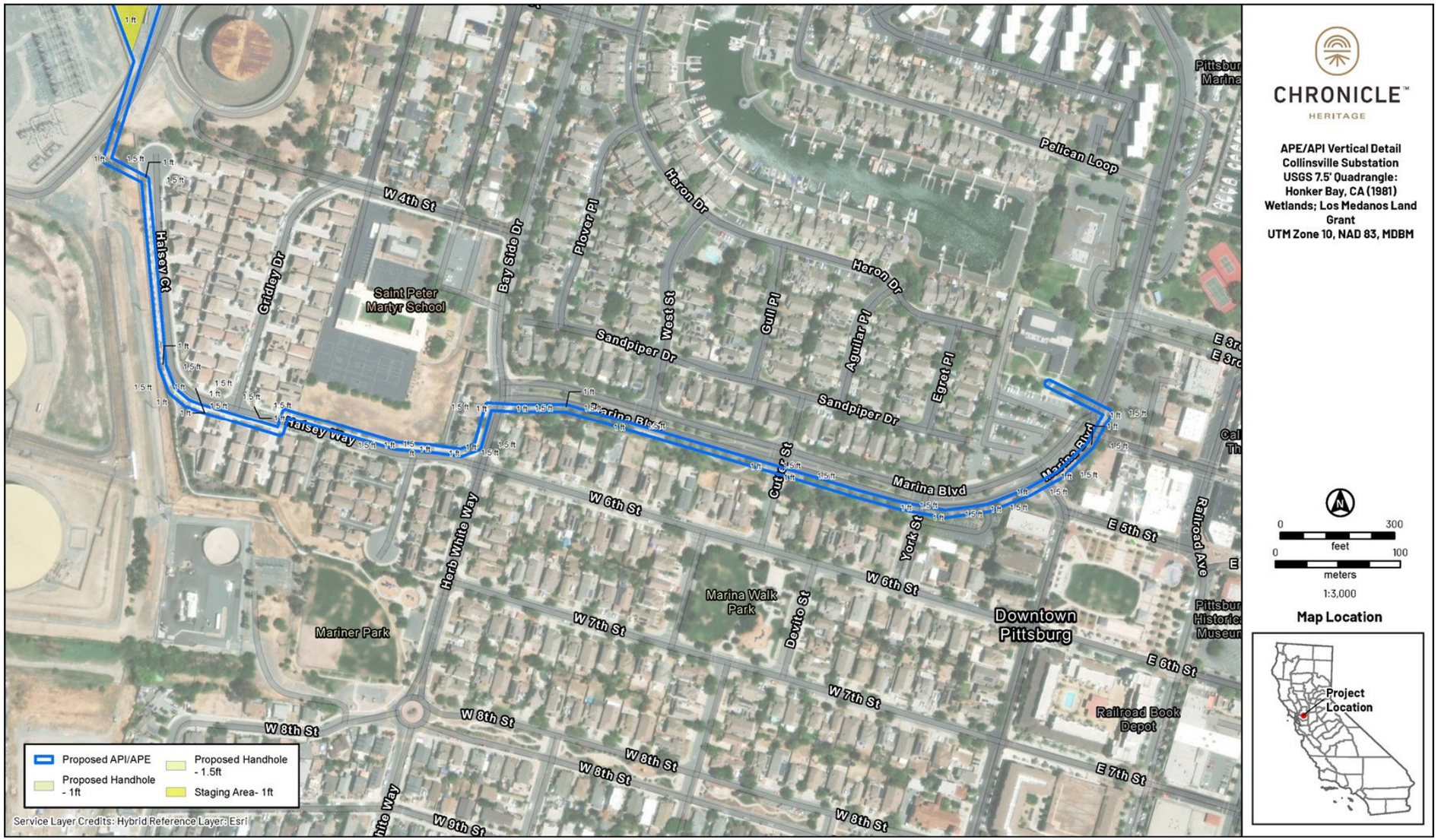


Figure 16. Proposed API/APE vertical detail map (12 of 12).

The Project involves four major components:

- The construction of the proposed 500/230 kV Collinsville Substation
    - 500 kV gas-insulated, four position, breaker-and-a-half switchyard
    - 500 kV series capacitor
    - Two 500/230 kV transformers
    - 230 kV gas-insulated, four position, breaker-and-a-half switchyard
- The installation of the new double-circuit 230 kV line from the proposed Collinsville Substation to the Pacific Gas and Electric (PG&E) existing Pittsburg substation
- The construction of a new 500 kV interconnection between the existing Vaca Dixon–Tesla 500 kV line and the proposed Collinsville Substation with possible adjustment to existing series capacitors at the Vaca Dixon substation (PG&E scope)
- Modification of PG&E's existing Pittsburg substation
- The installation of the new proposed telecommunications fiber optic line at the southern extent of the Proposed Project. The telecommunications line would be installed using horizontal direction drilling

The proposed Collinsville Substation will be located on property adjacent to PG&E's Vaca Dixon–Tesla 500 kV line. The preferred Collinsville substation site is approximately 30 acres and located off Talbert Lane in Suisun City, approximately 1 mile north of the Sacramento River Delta. The proposed Collinsville Substation is designed to be expandable to accommodate a total of eight 500 kV positions in four bays and ten 230 kV positions in five bays based on the CAISO's functional specification. The Project will establish a new entry access road from Straton Lane to the proposed Collinsville Substation site and will also have adequate space to accommodate parking for operation and maintenance personnel vehicles.

The new Collinsville to Pittsburg double-circuit 230 kV transmission line will be a combination of overhead and submarine components. The overhead transmission line is proposed to be approximately 1–2 miles long between the proposed Collinsville Substation and the northern edge of the Sacramento River. The overhead transmission line structures will be predominantly self-supporting, double-circuit tubular steel monopoles with a vertical conductor configuration and two optical ground wires. Structures are proposed approximately 100–120 feet (ft) tall. The overhead transmission line right-of-way (ROW) is planned to be approximately 150 ft wide. From the last onshore structures to the single proposed in-river transition structure, the planned ROW width increases to approximately 325 ft. Subsurface disturbance in the terrestrial portion of the proposed API/APE is expected to reach 50 feet (ft) below ground surface (bgs), is expected to reach 80 ft bgs in the submarine portion of the proposed API/APE (Figure 5, Figure 6, Figure 7, Figure 8, Figure 9, Figure 10, Figure 11, Figure 12, Figure 13, Figure 14, Figure 15, and Figure 16).

The submarine cable route is proposed to be approximately 4 miles long, running in a northeast–southwest direction across the Sacramento River Delta. Subject to detailed engineering, the submarine cable conductor is proposed to consist of approximately six 230 kV tri-core cables, each spaced approximately 70 ft apart. The submarine cable is proposed to be installed beneath the bay and riverbed to a depth of approximately 6 to 15 ft using jetting technology. Jet sled installation has short-term, localized impacts within the river and minimal disturbance to the environment and navigation. Near the southern edge of the river just outside of the existing Pittsburg Substation, four to six transition vaults will receive the submarine cables. From that

point, the lines will continue underground until terminating at two new riser poles adjacent to PG&E's existing Pittsburg Substation.

LSPGC's scope for the new 230 kV lines is proposed to stop at dead-end structures near PG&E's existing Pittsburg substation property line. PG&E will be responsible for bringing the new circuits from that point to the terminations within the Pittsburg substation, the final configuration of which will be determined and established in the Transmission Interconnection Agreement with PG&E. At the opposite end of the Project, PG&E will also be responsible for interconnecting the Vaca Dixon–Tesla 500 kV line to terminate at new dead-end structures near the proposed Collinsville Substation and to provide any required modifications to the existing series capacitors at Vaca Dixon.

Construction of the Project is planned to begin in early 2026 after necessary permits, agreements and land rights are received. The construction phase of the Project is anticipated to be approximately 24–30 months in duration concluding with the energization of the new Project facilities.

Regulatory Context

Paleontological resources (i.e., fossils) are considered nonrenewable scientific resources because, once destroyed, they cannot be replaced. As such, paleontological resources are afforded protection under state and local laws and regulations. Laws pertinent to this Project are discussed below.

State Laws and Regulations

California Environmental Quality Act

CEQA requires that public agencies and private interests identify the potential environmental consequences of their projects on any object or site of significance to the scientific annals of California (Division I, California Public Resources Code [PRC] Section 5020.1[j]). Appendix G in Section 15023 provides an Environmental Checklist of questions (Section 15023, Appendix G, Section XIV, Part A) that includes the following: "Would the project directly or indirectly destroy a unique paleontological resource or site or unique geological feature?"

California Public Resources Code

Section 5097.5 of the Public Resources Code (PRC) states:

> No person shall knowingly and willfully excavate upon, or remove, destroy, injure, or deface any historic or prehistoric ruins, burial grounds, archaeological or vertebrate paleontological site, including fossilized footprints, inscriptions made by human agency, or any other archaeological, paleontological, or historical feature, situated on public lands, except with the express permission of the public agency having jurisdiction over such lands. Violation of this section is a misdemeanor. As used in this PRC section, 'public lands' means lands owned by, or under the jurisdiction of, the state or any city, county, district, authority, or public corporation, or any agency thereof.

Consequently, public agencies are required to comply with PRC 5097.5 for their activities including construction and maintenance as well as for permit actions (e.g., encroachment permits) undertaken by others.

Local

The Contra Costa County General Plan Conservation Element (Contra Costa County, 2005) does not discuss paleontological resources, though fossil localities are discussed under "significant ecological resource areas." The General Plan (Contra Costa County, 2005) establishes the following goals and policies for ecological resources:

- **Overall Conservation Goal 8-A.** To preserve and protect the ecological resources of the County.
    - **Vegetation and Wildlife Policy 8-10.** Any development located or proposed within significant ecological resource areas shall ensure that the resource is protected.

The Solano County General Plan (County of Solano, 2008) does not discuss paleontological resources, though the Draft Environmental Impact Report (EDAW Inc., 2008) makes the following Mitigation Measure recommendations:

- **Mitigation Measures 4.10-7a and 4.10-7b:** Determine the Need for a Paleontological Resources Analysis and Implement Recommended Mitigation. The County shall implement the following measures:
    - (b) All projects in Solano County that are subject to a CEQA evaluation shall include a site-specific analysis of paleontological resources. At a minimum, the site-specific analysis shall include a review of the types of the geologic formation(s) present at the project site and a determination of the likelihood that those formation(s) would contain a "unique paleontological resource" as stated in Title 14, California Code of Regulations, Appendix G (the CEQA checklist). If the site-specific analysis determines that a project may have an adverse effect on a "unique paleontological resource," the County shall require that project-specific mitigation measures be implemented to address the following:
        - Retention by the project applicant of a qualified paleontologist to evaluate the resource and prepare a proposed mitigation plan, which may include some or all of the following elements: a field survey, construction monitoring, sampling and data recovery procedures, museum storage coordination for any specimen recovered, and a report of findings; and
        - Implementation of recommendations made by the paleontologist, where the lead agency for the project determines that said recommendations are necessary and feasible.

The Sacramento County General Plan Conservation Element (County of Sacramento, 2017) considers paleontological resources to be cultural resources, and establishes the following policies in Section III: Cultural Resources:

- **CO-161.** As a condition of approval for discretionary projects, require appropriate mitigation to reduce potential impacts where development could adversely affect paleontological resources.
- **CO-162.** Projects located within areas known to be sensitive for paleontological resources, should be monitored to ensure proper treatment of resources and to ensure crews follow proper reporting, safeguards, and procedures.
- **CO-163.** Require that a certified geologist or paleoresources consultant determine appropriate protection measures when resources are discovered during the course of development and land altering activities.

Paleontological Resource Potential

Absent specific agency guidelines, most professional paleontologists in California adhere to the guidelines set forth by SVP (2010) to determine the course of paleontological mitigation for a given project. These guidelines establish protocols for the assessment of the paleontological resource potential of underlying geologic units and outline measures to mitigate adverse impacts that could result from project development. Using baseline information gathered during a paleontological resource assessment, the paleontological resource potential of geologic units (or members thereof) underlying a project area can be assigned to one of four categories defined by SVP (2010). Although these standards were written specifically to protect vertebrate paleontological resources, all fields of paleontology have adopted the following guidelines.

High Potential (Sensitivity)

Rock units from which significant vertebrate or significant invertebrate fossils or significant suites of plant fossils have been recovered have a high potential for containing significant nonrenewable fossiliferous resources. These units include but are not limited to, sedimentary formations and some volcanic formations that contain significant nonrenewable paleontological resources anywhere within their geographical extent, and sedimentary rock units temporally or lithologically suitable for the preservation of fossils. Sensitivity comprises both (a) the potential for yielding abundant or significant vertebrate fossils or for yielding a few significant fossils, large or small, vertebrate, invertebrate, or botanical and (b) the importance of recovered evidence for new and significant taxonomic, phylogenetic, ecologic, or stratigraphic data. Areas which contain potentially datable organic remains older than recent, including deposits associated with nests or middens, and areas which may contain new vertebrate deposits, traces, or trackways are also classified as significant.

Low Potential (Sensitivity)

Sedimentary rock units that are potentially fossiliferous but have not yielded fossils in the past or contain common and widespread invertebrate fossils of well-documented and understood taphonomic, phylogenetic species, and habitat ecology are considered to have a low potential for containing significant nonrenewable fossiliferous resources. Reports in the paleontological literature or field surveys by a qualified vertebrate paleontologist may allow a determination that some areas or units have a low potential for yielding significant fossils before the start of construction. Generally, these units will be poorly represented by specimens in institutional collections and will not require protection or salvage operations. However, as excavation for

construction is underway, it is possible that significant and unanticipated paleontological resources might be encountered and require a change of classification from low to high potential and thus require monitoring and mitigation if the resources are found to be significant.

Undetermined Potential (Sensitivity)

Specific areas underlain by sedimentary rock units for which little information is available have undetermined fossiliferous potentials. Field surveys by a qualified vertebrate paleontologist to determine the rock units' potential are required before programs of impact mitigation for such areas can be developed.

No Potential

Rock units of metamorphic or igneous origin are commonly classified as having no potential for containing significant paleontological resources.

Methods

To assess whether a particular area has the potential to contain significant fossil resources in the subsurface, it is necessary to review published geologic mapping to determine the geology and stratigraphy of the area. Geologic units are considered sensitive for paleontological resources if they are known to contain significant fossils anywhere in their extent. Therefore, a search of pertinent local and regional museum repositories for paleontological localities within and nearby the Project area is necessary to determine whether fossil localities have been previously discovered within a particular rock unit. For this Project, a record search was requested of the Western Science Center, Hemet, California, collections. Record searches were also conducted of the online University of California Museum of Paleontology (UCMP) Collections, Paleobiology Database, FAUNMAP, and other published and unpublished geological and paleontological literature of the area.

Resource Context

Geologic Setting

The Project area is near the border of the Great Valley geomorphic province and the Coast Ranges geomorphic province. A geomorphic province is a region of unique topography and geology distinguished from other regions based on its landforms and tectonic history.

The Coast Ranges include north-northwest trending mountain ranges and valleys formed due to uplift along the active Pacific plate-North American plate boundary system. The basement rocks in the Coast Ranges consist of the Franciscan Complex and the Salinian Block plutonic igneous basement rocks. The metamorphic and marine rocks of the Franciscan Complex were primarily derived from erosion of a volcanic arc, subsequent deposition in a deep marine environment, and later accretion onto the continental margin of North America during the subduction of the Farallon Plate (Schemmann et al., 2008). Later, the topography and geology of the region were highly influenced by the development of the San Andreas Fault Zone on the Pacific plate-North American plate boundary beginning at least 30 million years ago [Ma] (Dickinson, 1981).

The Great Valley is a 50 mile wide by 400 mile long alluvial plain in the central part of California that has accumulated sediment since the Jurassic Period (201–145 Ma) (California Geological Survey [CGS], 2002). The Great Valley is influenced by two rivers, with the northern portion of the valley, the Sacramento Valley, being drained by the Sacramento River and the southern portion of the valley, the San Joaquin Valley, drained by the San Joaquin River (CGS, 2002). The depth of the sedimentary deposits, combined with associated regional tectonic forces, have produced extensive oil fields particularly in the southernmost San Joaquin Valley and along anticlinal uplifts on its southwestern margin (CGS, 2002).

Locally, the Project area crosses the Suisun Bay, an estuarine embayment at the intersection of the San Francisco Bay and Sacramento River Delta. Estuaries often act as sediment "traps" (McLusky, 1981), in this case resulting in accumulation of sediment in and near the river during the Pleistocene Epoch (2.58 Ma to 11,700 years ago) and Holocene Epoch (11,700 years ago to present). The northern portion of the Project area near the proposed Collinsville Substation is in the southern edge of the Montezuma Hills, which is the surficial result of a local deep, asymmetric, south-plunging graben of underlying sediment from the Paleogene Period (66–23 Ma) (Krug et al., 1992).

Site Specific Geology and Paleontology

The geology of the Project area is mapped by Graymer et al. (2002) at a scale of 1:100,000 (Figure 17, Figure 18, and Figure 19). The Project area is underlain by the following geologic units: Montezuma Formation (Qmz), alluvial fan deposits (Qpf), delta mud deposits (Qhdm), bay mud deposits (Qhbm), alluvial fan deposits (Qhf), artificial fill (af), and unmapped sedimentary deposits of the Suisun Bay and the Sacramento River Delta. The geologic units in the Project area are described in the following sections.

Montezuma Formation (Qmz) (Early Pleistocene)

The Montezuma Formation underlies the Montezuma Hills northeast of Collinsville and is composed of soft, brown, poorly sorted, quartz-lithic sand, silt, and pebble gravel with clasts including red chert and volcanics (Graymer et al., 2002). The Montezuma Formation underlies most of the northern portion of the Project area. In the area of Suisun Bay and the Sacramento River Delta, Pleistocene deposits, including the Montezuma Formation, have produced remains of bison, mammoth, horse, camel, ground sloth, deer, rodents, reptiles, amphibians, and cartilaginous and bony fish (UCMP, 2023), and would have a high paleontological sensitivity.

Alluvial Fan Deposits (Qpf) (Late Pleistocene)

Alluvial fan deposits from the late Pleistocene (Qpf) is composed of moderately to poorly sorted, moderately to poorly bedded sand, gravel, silt, and clay deposited where streams emanate from upland regions onto more gently sloping valley floors or plains (Graymer et al., 2002). The Pleistocene alluvial fan deposit underlies the fiber telecommunications line west of PG&E's existing Pittsburg Substation in the southern portion of the Project area. Regional Pleistocene fossils, discussed above with the Montezuma Formation, would give the alluvial fan deposits a high paleontological sensitivity as well.

Delta Mud Deposits (Qhdm) (Holocene)

Delta mud deposits (Qhdm) are composed of mud and peat with minor silt and sand deposited at or near sea level (Graymer et al., 2002). This unit underlies the lower-elevation, near-shore areas in the northern portion of the Project area. Holocene deposits are typically too young to have accumulated or preserved significant biological material and have a low paleontological sensitivity as a result.

Bay Mud Deposits (Qhbm) (Holocene)

Bay mud deposits from the Holocene (Qhbm) are composed of gray, green, blue, and black clay and silty clay underlying marshlands and tidal mud flats with lenses of well-sorted, fine sand and silt, shell, and peat (Graymer et al., 2002). This unit is mapped in the western edge of the northern portion of the Project area and the southwest corner of the southern portion of the Project area and may underlie more of the southern portion below the artificial fill (af, discussed below). Holocene deposits are typically too young to have accumulated or preserved significant biological material and have a low paleontological sensitivity as a result.

Alluvial Fan Deposits (Qhf) (Holocene)

Alluvial fan deposits from the Holocene Epoch (Qhf) are composed of moderately to poorly sorted, moderately to poorly bedded sand, gravel, silt, and clay deposited where streams emanate from upland regions onto more gently sloping valley floors or plains (Graymer et al., 2002). This unit may underlie the southern portion of the Project area below the artificial fill (af, discussed below). Holocene deposits are typically too young to have accumulated or preserved significant biological material and have a low paleontological sensitivity as a result.

Artificial Fill (af) (Holocene)

Artificial fill (af) is composed of undifferentiated, man-made deposit of various materials and ages including dredge spoils, levee fill, road embankments, earthen dams, and railroad grades (Graymer at al., 2002). This unit underlies PG&E's existing Pittsburg Substation in the southern portion of the Project area. Because of its man-made origin and recent age, artificial fill has no paleontological sensitivity.

Unmapped sedimentary deposits of the Suisun Bay and the Sacramento River Delta (Holocene)

The geologic units in the Project area underlying Suisun Bay and the Sacramento River Delta are not mapped by Graymer et al. (2002). Previous sampling of submarine bay and delta sediment showed clay, silt, and coarse sand of intertidal to subtidal environments were deposited on thick estuarine mud from the middle Holocene (Chin et al., 2002; Luoma et al., 1984). These sediments are similar to the bay mud deposits (Qhbm) and delta mud deposits (Qhdm), though there is likely also significant contamination in the surficial sediment by debris from the nineteenth and twentieth century, including from mining and agriculture (Capiella et al., 1999). Holocene deposits are typically too young to have accumulated or preserved significant biological material and have a low paleontological sensitivity as a result.

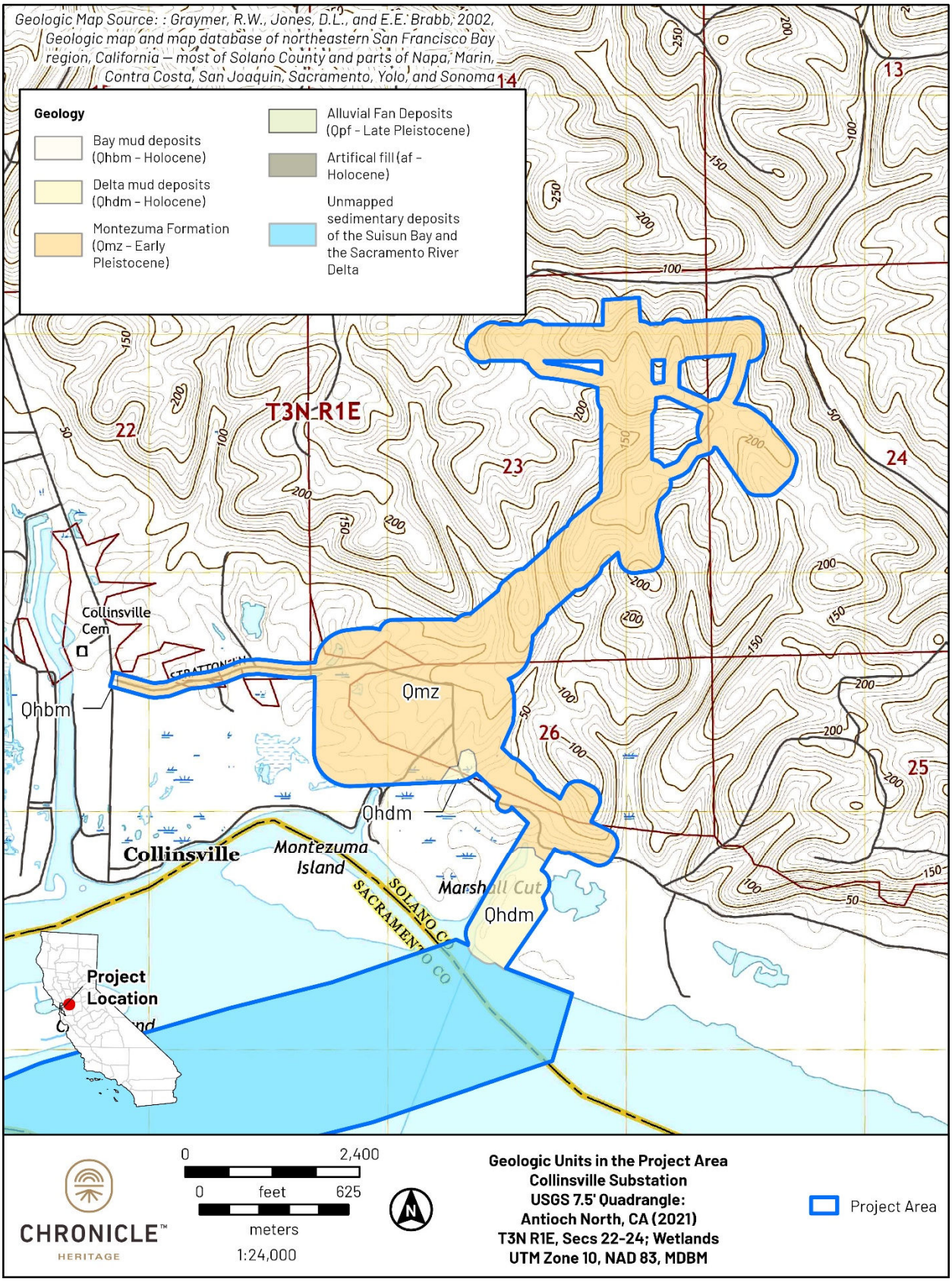


Figure 17. Project geology map (1 of 3), proposed Collinsville Substation.

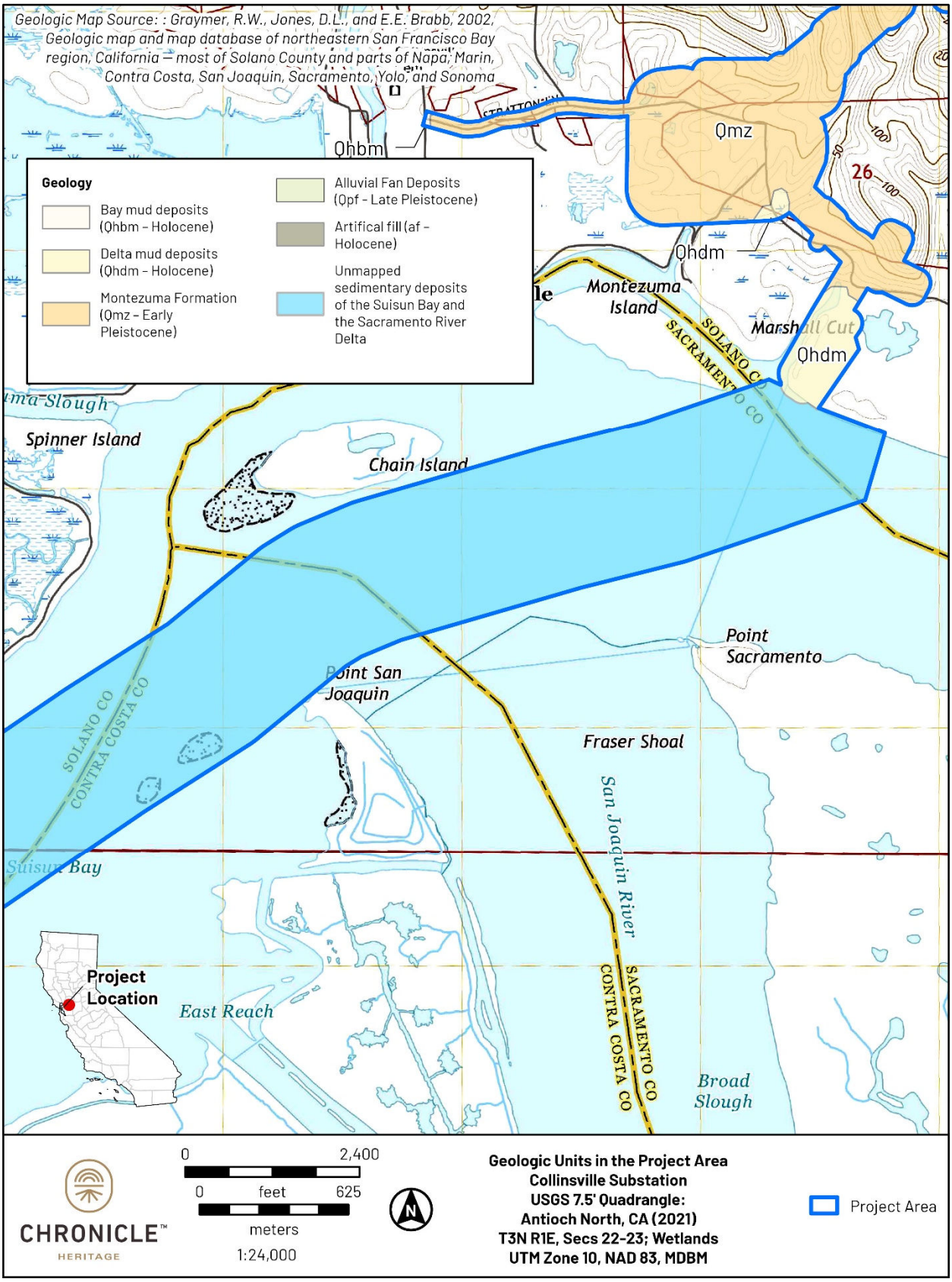


Figure 18. Project geology map (2 of 3), submerged alignment.

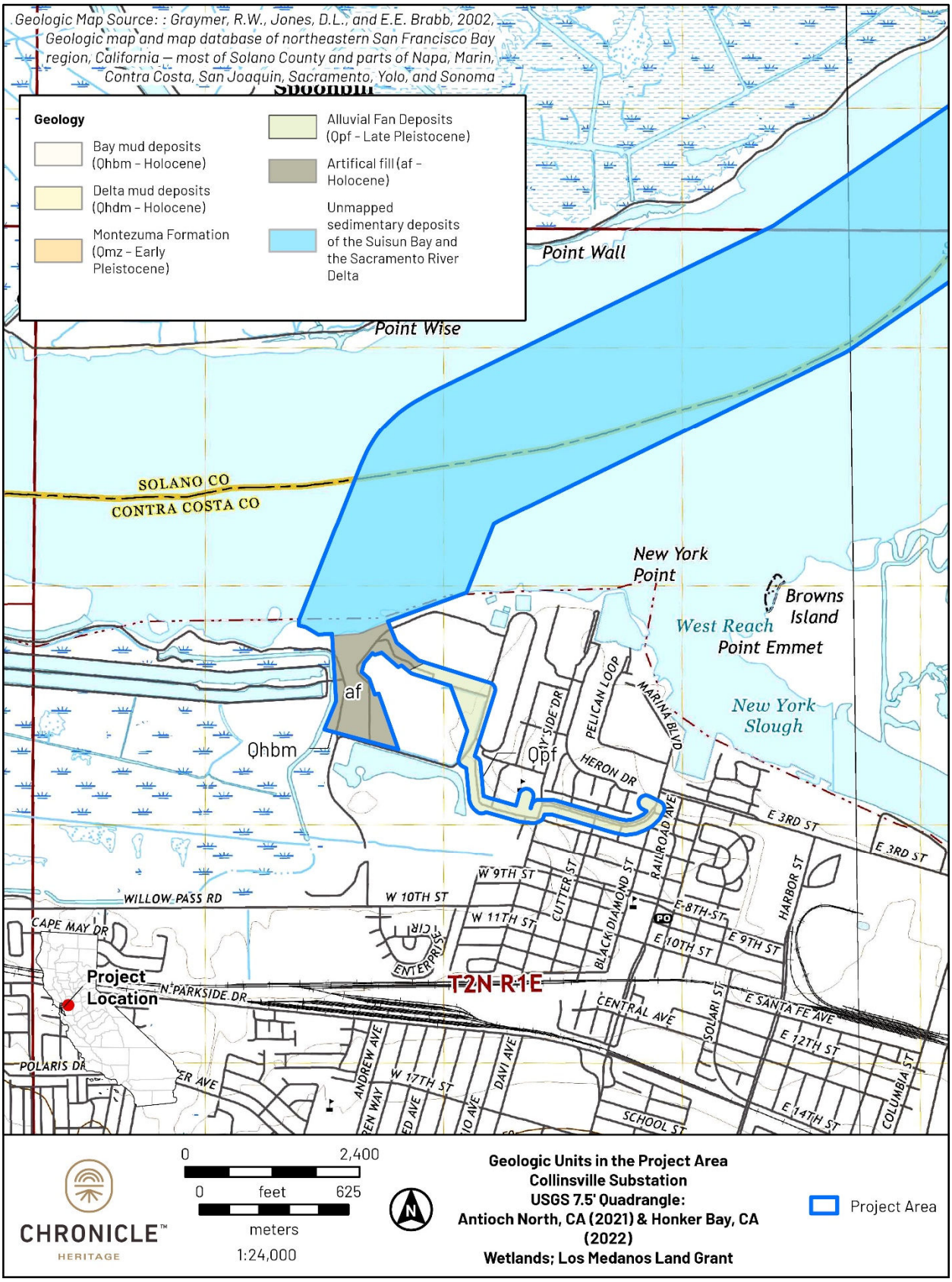


Figure 19. Project geology map (3 of 3), PG&E's existing Pittsburg Substation.

Records Search Results

The NHMLAC records search did not produce any fossil localities from within the Project or in the vicinity. Searches of online databases and other literature produced five fossil localities within 3 miles of the Project (Miller, 1971; Jefferson, 1991a, 1991b; Graham and Lundelius, 2010; iDigBio, 2023; Paleobiology Database [PBDB], 2023; SDNHM, 2023; UCMP, 2023)(Table 1).

Table 1. Vertebrate Localities Documented in Vicinity of Project

Locality No.	Age	Taxa	Formation	Depth
Antioch 2[1]	Pleistocene	Bison (*Bison* sp.), horse (*Hipparion* sp., *Equus* sp.), ground sloth (*Glossotherium* sp.)	Not specified	Not specified
Antioch 3[1]	Pleistocene	Feral horse (*Equus cabellus*, *Equus* sp.), badger (*Taxidae* sp.), deer (*Odocoileus* sp.), bison (*Bison* sp.)	Not specified	Not specified
Antioch General[1,2]	Pleistocene	Pacific mastodon (*Mammut pacificus*), mammoth (*Mammuthus* sp.)	Not specified	Not specified
Collinsville[1]	Pleistocene	Mammoth (*Mammuthus* sp.), horse (*Equus* sp.)	Not specified	Not specified
Montezuma Hills 1[1]	Pleistocene	Horse (*Equus* sp., *Hipparion* sp.), eutheria, elk (*Cervus* sp.), camelid (*Camelops* sp.)	Montezuma	Not specified

[1] UCMP (2023).

[2] Dooley et al., 2019.

Findings

This memorandum uses the SVP (2010) system to assess paleontological sensitivity and the level of effort required to manage potential impacts to significant fossil resources. Using this system, the sensitivity of geologic units was determined by the relative abundance and risk of adverse impacts to vertebrate fossils and significant invertebrates and plants.

Based on the literature review and museum records search results, and in accordance with the SVP (2010) sensitivity scale, the Montezuma Formation (Qmz) and Pleistocene alluvial fan deposits (Qpf) have a high paleontological sensitivity because similar deposits have yielded significant fossils in the vicinity. The delta mud deposits (Qhdm), bay mud deposits (Qhbm), Holocene alluvial fan deposits (Qhf), and unmapped sedimentary deposits of the Suisun Bay and Sacramento River Delta have a low paleontological sensitivity due to their young age. The Holocene deposits may transition into higher-sensitivity Pleistocene deposits at depth, but the Qhdm, Qhbm, and bay and delta deposits are likely very thick in the Project area, and Pleistocene deposits under those units are likely too deep to be impacted by Project-related ground disturbance (McDonald et al., 1978). The artificial fill (af) has no paleontological sensitivity (Figure 20, Figure 21, and Figure 22)(Table 2). Because of the presence of fossil localities in the vicinity, Project-related ground disturbance has the potential to impact paleontological resources in the Project area.

Table 2. Geologic Units in the Project Area and their Paleontological Sensitivity

Geologic Unit	Map Abbreviation[1]	Age	Typical Fossils[2]	Paleo Sensitivity
Artificial fill	af	Holocene	None	None
Alluvial fan deposits	Qhf		None	Low
Bay mud deposits	Qhbm		None	Low
Delta mud deposits	Qhdm		None	Low
Unmapped sedimentary deposits of the Suisun Bay and the Sacramento River Delta	n/a		None	Low
Alluvial fan deposits	Qpf	Late Pleistocene	Bison (*Bison* sp.), feral horse (*E. cabellus*), horse (*Hipparion* sp., *Equus* sp.), ground sloth (*Glossotherium* sp.), badger (*Taxidae* sp.), deer (*Odocoileus* sp.), Pacific mastodon (*M. pacificus*), mammoth (*Mammuthus* sp.), Eutheria, elk (*Cervus* sp.), and camelid (*Camelops* sp.)	High
Montezuma Formation	Qmz	Early Pleistocene		High

[1] Chin et al., 2002; Graymer et al., 2002; Luoma et al., 1984.

[2] UCMP, 2023; Dooley et al., 2019.

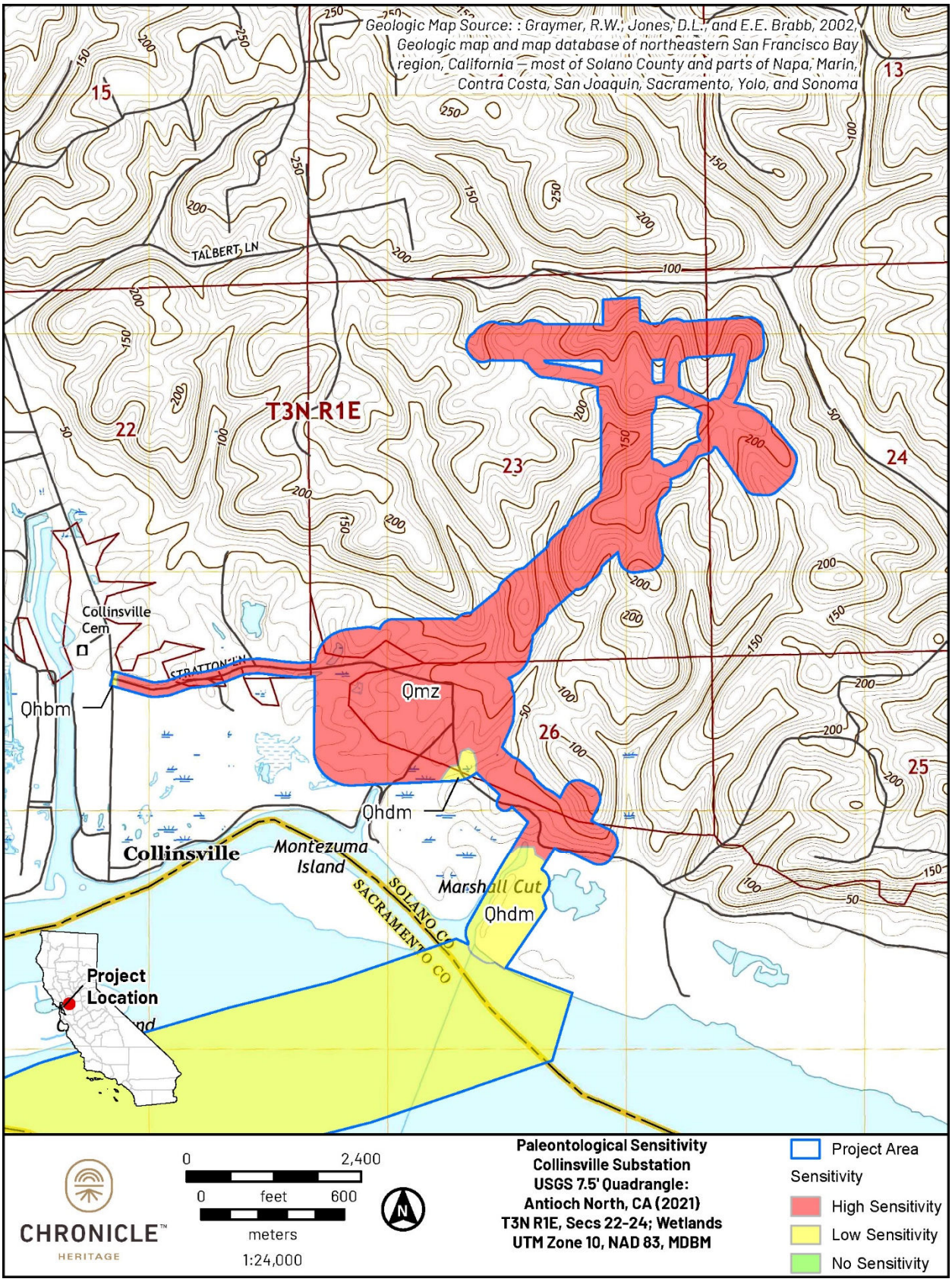


Figure 20. Paleontological sensitivity map (1 of 3), proposed Collinsville Substation.

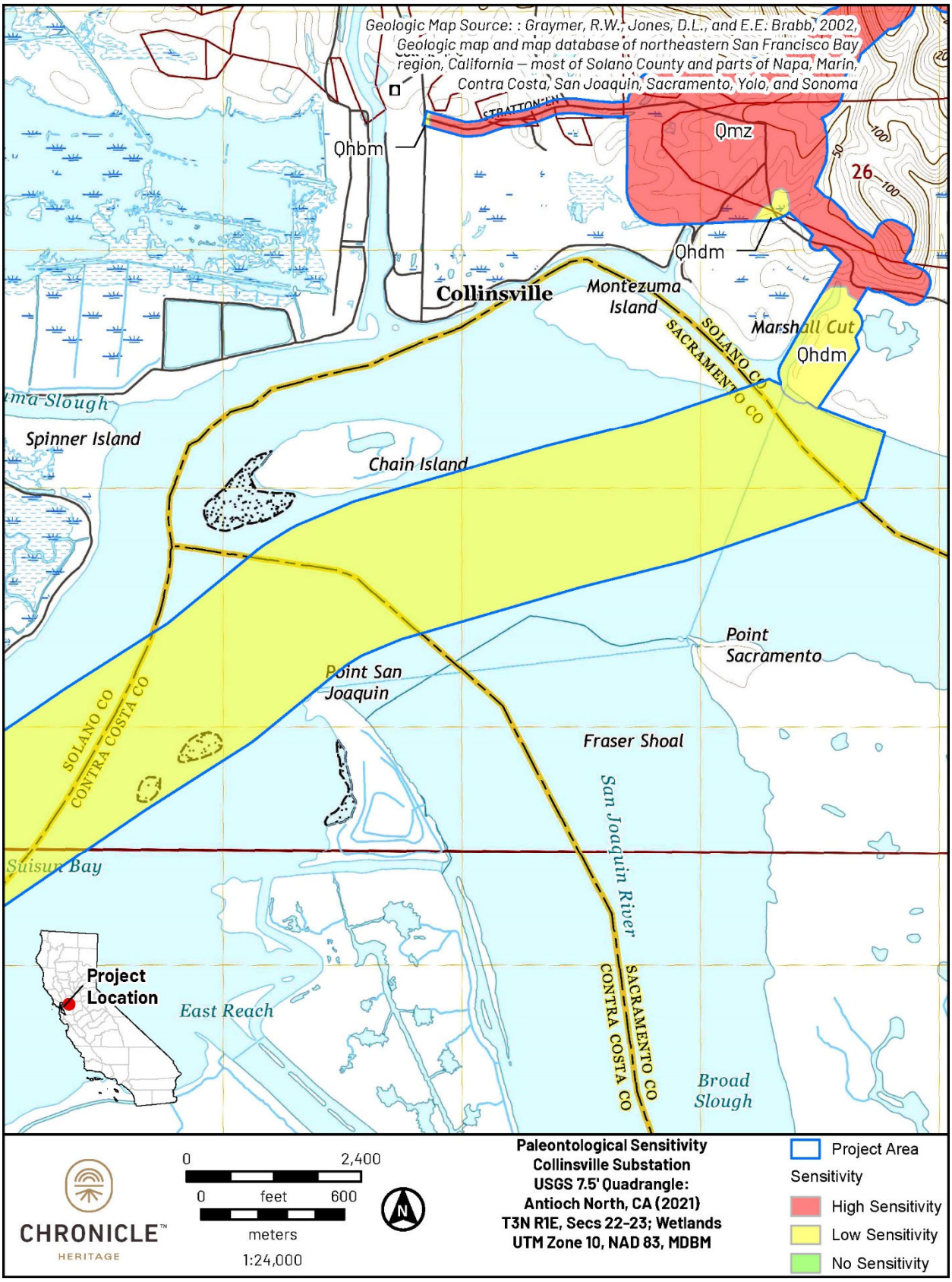


Figure 21. Paleontological sensitivity map (2 of 3), submerged alignment.

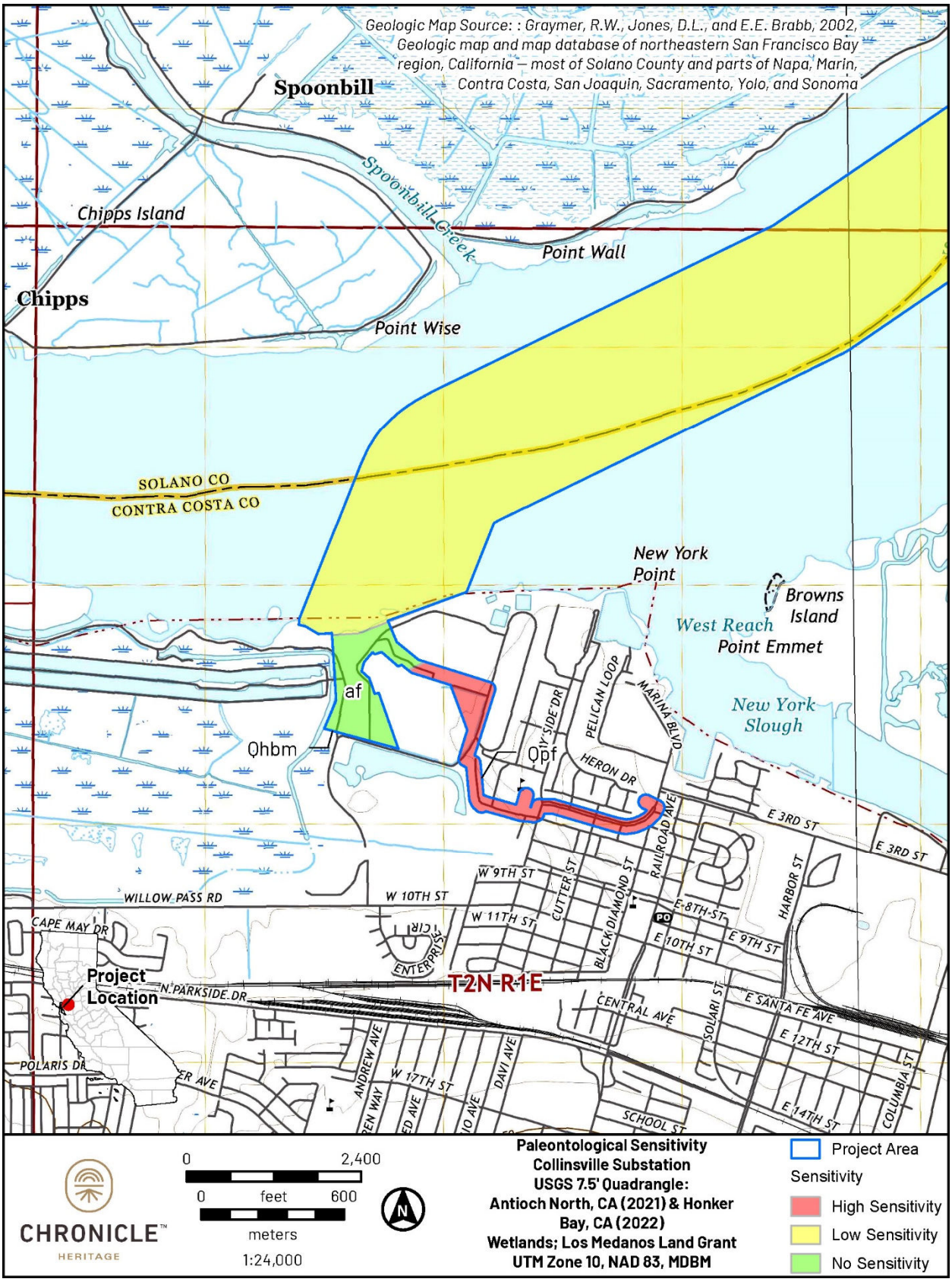


Figure 22. Paleontological sensitivity map (3 of 3), PG&E's existing Pittsburg Substation.

Recommendations

In general, the potential for a given project to result in negative impacts to paleontological resources is directly proportional to the amount of ground disturbance associated with the project; thus, the higher the amount of ground disturbances within geological deposits with a known paleontological sensitivity, the greater the potential for negative impacts to paleontological resources. Since this Project entails construction of a substation and installation of lines, significant ground disturbances are anticipated. The presence of high sensitivity units at the surface suggests that ground disturbance may result in significant impacts under CEQA to paleontological resources including destruction, damage, or loss of scientifically important paleontological resources. A qualified paleontologist should be retained to develop and implement the measures recommended below. These measures have been developed in accordance with SVP guidelines; if implemented, these measures will satisfy the requirements of CEQA.

Worker's Environmental Awareness Program (WEAP)

Prior to the start of the proposed Project activities, all field personnel should receive a worker's environmental awareness training on paleontological resources. The training should provide a description of the laws and ordinances protecting fossil resources, the types of fossil resources that may be encountered in the Project area, the role of the paleontological monitor, steps to follow if a fossil discovery is made, and contact information for the project paleontologist. The training will be developed by the project paleontologist and can be delivered concurrently with other training, including cultural, biological, safety, and others.

Paleontological Mitigation Monitoring

Construction monitoring is recommended within previously undisturbed sedimentary deposits for geologic units with high sensitivity, mapped as the Pleistocene Alluvial Fan Deposits (Qpf) and Montezuma Formation (Qmz), as shown in Table 2 and depicted in Figure 8 through Figure 10. Prior to the commencement of ground-disturbing activities, a professional paleontologist should be retained to prepare and implement a paleontological mitigation plan for the Project. The plan should describe the monitoring required during ground-disturbing activities in geologic units with high sensitivity. Monitoring should entail the visual inspection of excavated or graded areas and trench sidewalls. If the project paleontologist determines full-time monitoring is no longer warranted based on the geologic conditions at depth, they may recommend that monitoring be reduced or cease entirely.

Fossil Discoveries

If a paleontological resource is discovered, the monitor will have the authority to temporarily divert the construction equipment around the find until it is assessed for scientific significance and, if appropriate, collected. If the resource is determined to be of scientific significance, the project paleontologist shall complete the following steps:

1. **Salvage of Fossils.** If fossils are discovered, all work in the immediate vicinity should be halted to allow the paleontological monitor and project paleontologist to evaluate the discovery and determine if the fossil may be considered significant. If the fossils are determined to be potentially significant, the project paleontologist or paleontological monitor should recover them following standard field procedures for collecting paleontological resources as outlined in the paleontological mitigation plan for the Project. Typically, fossils can be safely salvaged

quickly by a single paleontologist and not disrupt construction activity. In some cases, larger fossils (such as complete skeletons or large mammal fossils) require more extensive excavation and longer salvage periods. In this case, the paleontologist should have the authority to temporarily direct, divert, or halt construction activity to ensure that the fossils can be removed in a safe and timely manner.

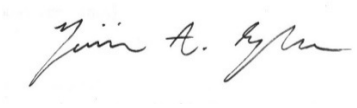
2. **Fossil Preparation and Curation.** The paleontological mitigation plan for the Project will identify the accredited repository that has agreed to accept fossils that may be discovered during Project-related excavations. Upon completion of fieldwork, all significant fossils collected will be prepared in a properly equipped laboratory to a point ready for curation. Preparation may include the removal of excess matrix from fossil materials and stabilizing or repairing specimens. During preparation and inventory, the fossils specimens will be identified to the lowest taxonomic level practical prior to curation at an accredited repository (usually a museum). The fossil specimens must be delivered to the accredited museum or repository no later than 30 days after all laboratory work is completed. The cost of curation will be assessed by the repository and will be the responsibility of the client.

Final Paleontological Mitigation Report

Upon completion of ground-disturbing activity and curation of fossils, if necessary, the project paleontologist should prepare a final mitigation and monitoring report outlining the results of the mitigation and monitoring program. The report should include a discussion of the location, duration, and methods of the monitoring; the stratigraphic sections; any recovered fossils; and the scientific significance of those fossils and where fossils were curated.

Thank you for contacting Chronicle Heritage for this Project. If you have any questions, please do not hesitate to contact us.

Sincerely,



Benjamin Scherzer | Senior Paleontologist

Heather Clifford | Senior Paleontologist

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