



August 4, 2023

Lacey Withers, ASLA
Principal, Landscape Architect
WITHERS & SANDGREN Landscape Architecture + Planning
20948 Tulsa St.
Chatsworth, CA 91311
Via e-mail to: lacey@withersandsandgren.com

RE: *Paleontological Assessment Memorandum for the Devil's Punchbowl Nature Center Project, Los Angeles County, California*

Dear Ms. Withers:

I have completed a thorough investigation on the potential to directly impact paleontological resources during the construction of the Devil's Punchbowl Nature Center Project. This investigation included a paleontological record search through the Natural History Museum of Los Angeles County (NHMLAC) of the Project area plus a one-mile radius, online database search through the University of California Museum of Paleontology (UCMP), online Paleobiology Database, and a desktop study of published and unpublished literature and maps of the geology and paleontology of the Project Area. The results indicate that there is potential for encountering fossils, including ancient horse, camel, antelope, skunk, and carnivore from the geologic unit referred to as the Punchbowl Formation found on site. The Project site is located off N6 on Devil's Punchbowl Road, approximately 4.8 miles southeast of Pearblossom, California in the Angeles National Forest on the northern slopes of the San Gabriel Mountains, Los Angeles County. The site can be located on the 7.5-minute Valyermo, CA topographic quadrangle (U.S. Geological Survey 1995) at Sec. 19, T4N, R9W.

GEOLOGIC UNITS

The Project site is located along the northern slopes of the San Gabriel Mountains, a mountain range that is part of the Transverse Ranges between the Los Angeles Basin and the Mojave Desert. Representing a plunging syncline, the rocks exposed near the Project site are part of the Punchbowl Formation consisting of nonmarine light gray sandstone, conglomerate, and thin shales derived from sediments deposited by water. These once horizontal layers were later squeezed and tilted to their present form by ongoing uplift along the Punchbowl and Pinyon faults (to the south and north, respectively) and by pressures along the San Andres Fault (to the north) [Devil's Punchbowl \(California\) - Geology \(liquisearch.com\)](#) [\(The Devil's Punchbowl Los Angeles County Park \(digital-desert.com\)\)](#). Fossils found at Devil's Punchbowl indicate an age of lower Pliocene to upper Miocene (approximately 5 to 10 million years before present [BP]).

The subsurface geology of the Project is composed of Quaternary older alluvium (Qoa) (Noble 1954) or Pleistocene nonmarine (Qc) (Jenkins 1967) (Figure 1) and is surrounded by the Punchbowl Formation (Mc) (Mid to Late Miocene; approximately 14 million years to 8 million BP) to the west. Running west to southeast is a complex assemblage of igneous intrusive and metamorphic rocks (gr). The Quaternary older

alluvium consists of irregular beds of unconsolidated, poorly sorted gravel, sand, and silt less than 100 feet in thickness (California Geological Survey 2003).

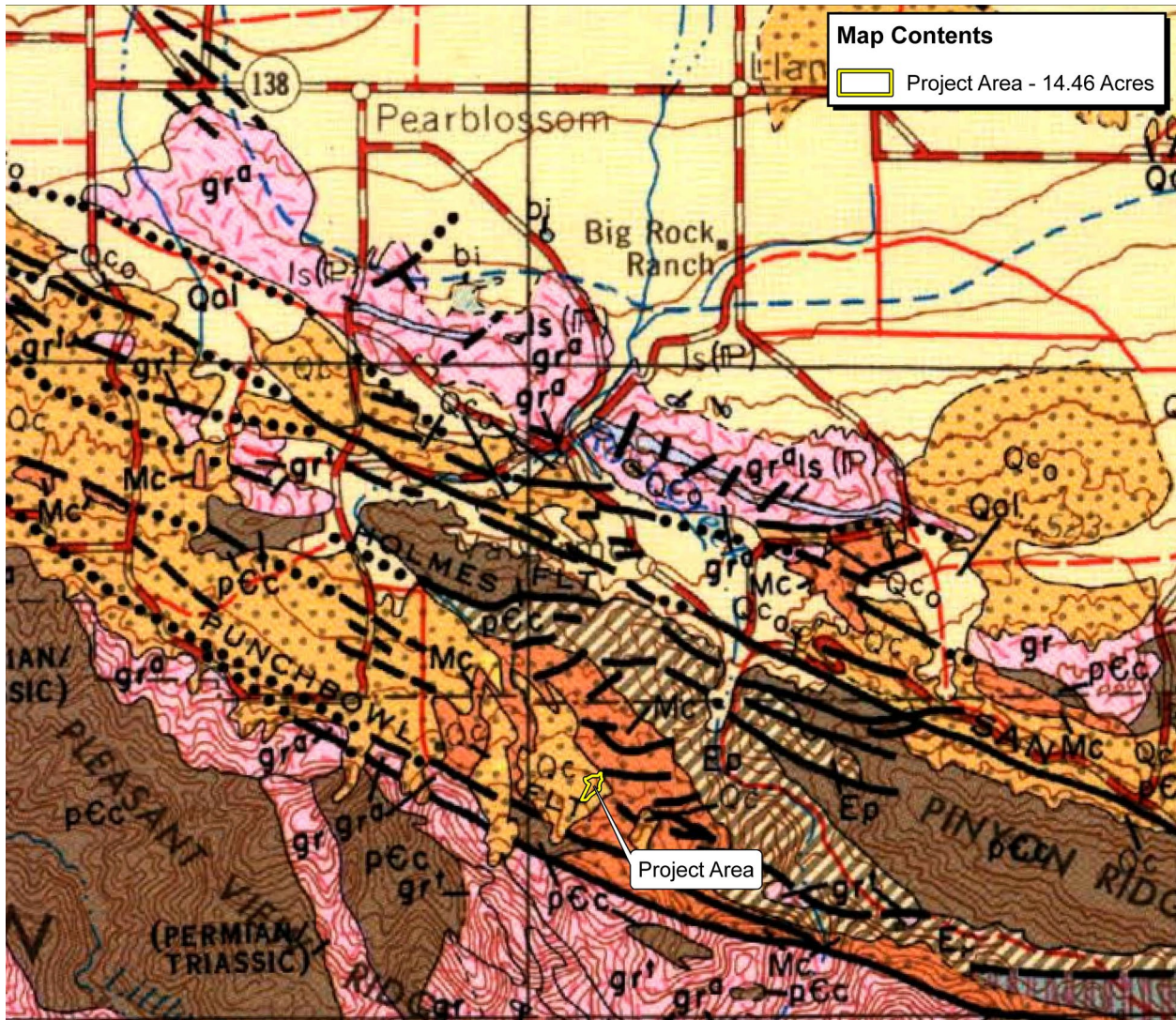


Figure 1. Geologic map showing project area and subsurface geologic unit (Qc = Pleistocene nonmarine) (Jenkins 1967).

RECORD SEARCH RESULTS

A paleontological record search was conducted through NHMLAC for the Project site including a one-mile radius. Although no fossils have been discovered directly from within the Proposed Project Area, terrestrial fossils have been discovered from the same sedimentary deposits as those that occur in the Proposed Project Area, either at the surface or at depth (Bell 2022). These findings are presented in Table 1. These fossils are of scientific significance because they reveal information about the past environment and types of organisms that occupied the area. In addition to the record search results, an online record search of the UCMP database and published and unpublished literature was also conducted. In addition to the three-toed horse (*Merychippus*), an ancient skunk-like animal, a primitive camel, and a small-sized

antelope from the late Miocene (approximately 11.6 million years ago to 5.3 million years BP) were discovered (The Historical Marker Database 2020). A search conducted through the Paleobiology Database produced a carnivore (*Borophagus cf. secundus*), artiodactyla (*Plioceros* sp. and a Camelidae), and Perissodactyla (Equini) from the Punchbowl Formation.

Table 1: Closest Known Fossil Localities

Locality Number	Location	Formation	Taxa	Location relative to Park	Depth
LACM VP 7502	Southeast corner of Devils Punchbowl State Park	Punchbowl Formation	Primitive horse (<i>Merychippus</i>)	Within a mile	Surface
LACM VP CIT 398	West of Holcomb Canyon in Devil's Punchbowl	Punchbowl Formation	Weasel family (<i>Mustelidae</i>) and other uncatalogues mammals	Within a mile	Unrecorded
LACM VP 1346	Southwest of Valyermo, CA	Punchbowl Formation	Primitive horse (<i>Merychippus</i>)	Within a mile	Surface
LACM VP CIT 451	Near intersection of E Barrel Springs Rd & 47 th St E	Harold Formation	Mastodon (Mammutidae), horse family (Equidae)	Within a mile	Unknown
LACM VP 5942-5950	Along Avenue S from Palmdale to Lake Los Angeles	Unknown formation	Kingsnake (<i>Lampropeltis</i>), Lizard (Lacertilia), leopard lizard (<i>Gambelia</i>); snake (Ophidia), gopher snake (<i>Pituophis</i>); rabbit (<i>Lagomorpha</i>), rodent (Rodentia), Pocket gopher (<i>Thomomys</i>), pocket mouse (<i>Chaetodippus</i>), kangaroo rat (<i>Dipodomys</i>); birds (Aves)	Within a mile	0-9 feet below ground surface

RECOMMENDATIONS

Given geologic units of high sensitivity to produce paleontological resources exist within the Project site and vicinity, a pedestrian survey may be beneficial prior to construction activities. In addition, the 2020 Bobcat Fire may have exposed fossils or soils previously not exposed. With the presence of both Quaternary older alluvium and the Punchbowl Formation, full-time monitoring by a qualified paleontologist is recommended in areas where these geologic units are present. A qualified paleontological monitor(s) is an individual who meet the qualifications/criteria as outlined by the Society of Vertebrate Paleontology (2010). No monitoring is required in disturbed soils or within artificial fill. Should any paleontological resources be encountered, the paleontologist has the authority to divert heavy machinery away from the find(s) until the scientific value of the fossil(s) can be assessed. If of scientific significance, all pertinent field data will be collected, and the fossil(s) salvaged. The fossil(s) will be transported to a laboratory facility for cleaning and preparation prior to being transported and deposited in an accredited repository, such as the NHMLAC, where they will be curated and made available for scientific study.

Sincerely,



Niranjala Kottachchi

Principal Paleontologist



REFERENCES

- Bell, A. 2022. Paleontological record search for the Devil's Punch Bowl Project (2022-124).
- California Geological Survey (CGS). 2003. Seismic Hazard Zone Report for the Valyermo 7.5-minute Quadrangle, Los Angeles County, California, 65p.
- The Historical Marker Database. 2020. The Devil's Punchbowl Department of Parks & Recreation, County of Los Angeles [The Devil's Punchbowl Historical Marker \(hmdb.org\)](https://www.hmdb.org).
- Jenkins, O.P. 1967. Geologic Map of California: San Bernardino Sheet 1:250,000.
- Noble, L.F. 1954. Geology of the Valyermo Quadrangle and vicinity, California 1:24,000.
- The Paleobiology Database [The Paleobiology Database \(paleobiodb.org\)](https://paleobiodb.org).
- [The Devil's Punchbowl Los Angeles County Park \(digital-desert.com\)](https://digital-desert.com)
- Society of Vertebrate Paleontologists (SVP). 2010. Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources. 11 pp. Website: https://vertpaleo.org/wp-content/uploads/2021/01/SVP_Impact_Mitigation_Guidelines-1.pdf
- U.S. Geological Survey (USGS). 1995. Valyermo, CA 7.5-minute Topographic Quadrangle.