

APPENDIX G

PALEONTOLOGICAL RESOURCES MEMORANDUM



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MEMORANDUM

DATE: November 6, 2024

To: Amanda Johnson, Senior Environmental Planner, LSA, Project Manager

FROM: Kelly Vreeland, M.Sc., Senior Paleontologist

SUBJECT: Results of Paleontological Resources Analysis for Inclusion in the Environmental Impact Report for the Dana Point Harbor Hotels Project (20241680)

INTRODUCTION

This memorandum documents the results of the paleontological analysis conducted for the proposed Dana Point Harbor Hotels Project (project) in Dana Point, Orange County, California. This analysis was conducted to determine the potential for the project to impact paleontological resources in compliance with all applicable State and City of Dana Point (City) regulations and requirements regarding paleontological resources, as well as the standards of the Society of Vertebrate Paleontology (SVP, 2010). The applicable regulations and requirements include the California Environmental Quality Act (CEQA): Public Resources Code (PRC) Division 13, Chapter 2.6; the *State CEQA Guidelines*: California Code of Regulations, Title 14, Chapter 3, Appendix G; PRC §5097.5; and the Conservation and Open Space Element from the City General Plan (City of Dana Point, 1997). Information from this paleontological memorandum is intended for incorporation in the Environmental Impact Report being prepared for the proposed project.

GEOLOGY AND SOILS

Methods

To assess the impacts of the project with respect to paleontological resources, LSA reviewed geologic maps of the project site and relevant geological and paleontological literature to determine which geologic units are present within the project site and whether fossils have been recovered within the project site or from those or similar geologic units elsewhere in the region. In addition, a fossil locality search was conducted through the Natural History Museum of Los Angeles County (NHMLAC) to determine the status and extent of previously recorded paleontological resources within and surrounding the project site.

Setting

Results of the literature review indicate that the project area is within the Peninsular Ranges Geomorphic Province, a 900-mile-long northwest-southeast trending structural block with similarly trending faults, that extends from the Transverse Ranges in the north to the tip of Baja California in

the south and includes the Los Angeles Basin (California Geological Survey, 2002; Norris and Webb, 1976). The total width of this province is 225 miles, extending from the Colorado Desert in the east, across the continental shelf, to the southern Channel Islands (Santa Barbara, San Nicolas, Santa Catalina, and San Clemente) in the west (Sharp, 1976). This province is characterized by a series of mountain ranges and valleys that trend in a northwest-southeast direction roughly parallel to the San Andreas Fault Zone (Norris and Webb, 1976; Sharp, 1976). It contains extensive pre-Cenozoic (more than 66 million years ago [Ma]) igneous and metamorphic rocks covered by Cenozoic (less than 66 Ma) sedimentary deposits (Norris and Webb, 1976).

Geologic mapping by Kennedy and Tan (2007) shows that the project site is underlain by Miocene (23.03 – 5.333 million years ago) Undivided Sedimentary Rocks in Offshore Region and early Pliocene to late Miocene (3.6–11.63 Ma) Capistrano Formation, Siltstone facies. While not mapped by Kennedy and Tan (2007), Artificial Fill is likely present from the prior construction of the harbor and adjacent roads. These geologic units and their paleontological sensitivities are described in more detail below. Dates for the geologic time intervals referenced in this report are derived from the *International Chronostratigraphic Chart* published by the International Commission on Stratigraphy (Cohen et al., 2023).

Artificial Fill

Artificial Fill consists of sediments that have been removed from one location and transported to another location by human activity, rather than by natural means. The transportation distance can vary from a few feet to many miles, and composition depends on the source and purpose. Artificial Fill will sometimes contain modern debris such as asphalt, wood, bricks, concrete, metal, glass, plastic, and even plant material.

Although Artificial Fill may contain fossils, these fossils have been removed from their original location and are thus out of stratigraphic context. Therefore, they are not considered important for scientific study, and Artificial Fill has no paleontological sensitivity.

Undivided Sedimentary Rocks in Offshore Region

The Miocene (23.03 – 5.333 million years ago) Undivided Sedimentary Rocks in Offshore Region consist of primarily well consolidated siltstone and bedded sandstone (Kennedy and Tan, 2007).

Miocene sediments within the Dana Point area have produced significant fossils, primarily from the Capistrano Formation. These fossils include sharks, fish, whales, sea lions, sea cows, marine birds (Barnes and Raschke, 1991; Deméré and Berta, 2005; Ebeling, 1962; Eisentraut and Cooper, 2002; Smith, 2011). As such, these deposits are considered to have high paleontological sensitivity.

Capistrano Formation

The marine Capistrano Formation was deposited during the early Pliocene to late Miocene (3.6–11.63 Ma) (Kennedy and Tan, 2007). In the vicinity of the project area, it has two facies that are distinguished by their depositional environments and corresponding compositions. The turbidite facies formed in marine channel and sub-sea fan environments; it is composed of coarse-grained, poorly bedded, weakly cemented sandstone and conglomeratic sandstone (Kennedy and Tan, 2007).

In contrast, the siltstone facies accumulated in deep shelf and slope environments and consists of white to pale gray, massive to poorly bedded, friable siltstone, mudstone, and diatomaceous shale (Kennedy and Tan, 2007). Only the siltstone facies are mapped within the project area.

This formation has produced abundant and diverse scientifically significant fossils, many of which come from the siltstone facies. These fossils include bony fish, sharks, whales, porpoises, sea lions, sea cows, and marine birds (Barnes and Raschke, 1991; Deméré and Berta, 2005; Ebeling, 1962; Eisentraut and Cooper, 2002; Smith, 2011). As such, these deposits are considered to have high paleontological sensitivity.

Fossil Locality Search

According to the locality search conducted by the NHMLAC, there are no known fossil localities within the boundaries of the project. However, this search noted a few of fossil localities near to the project within sediments similar to those found in the project area. Locality LACM VP 4012 produced remains of whale (Cetacea) at Capistrano Beach from the Capistrano Formation. Near Salt Creek trail in Salt Creek Corridor Regional Park, LACM VP 1115 produced Mammoth (Mammuthus) from Pleistocene Terrace Deposits. A copy of the NHMLAC fossil locality search results letter is included in Attachment A.

Impacts

Threshold 4.5.6: Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Less Than Significant Impact. As described above, the Paleontology Literature and Records Review obtained from the San Bernardino County Museum for the Dana Point Harbor Revitalization Project Program EIR (2006) indicates that Dana Point Harbor, including the project site, is underlain by sediments of the Capistrano Formation, which have yielded fossil remains of foraminifera, mollusks, echinoids, and marine vertebrates including sharks and whales. As described above, the results of the Geotechnical Investigations conducted for the Original Project have shown that the project site is underlain by artificial fill and marine deposits, which in turn overlie bedrock of the Capistrano Formation (see Appendix F, Geotechnical Investigations [GMU], to the 2021 Draft EIR). The depths of these materials vary slightly under each proposed hotel but generally, most of the area of disturbance is underlain by approximately 15 to 30 ft of surficial soils consisting of artificial fill atop marine deposits. A small area near Dana Point Harbor Drive has no fill and consists of the Capistrano Formation only. As described in Chapter 3.0, Project Description, excavation depths for the hotel would range up to 3 ft, and excavation for utility trenching may extend up to 10 ft. Therefore, construction activities are not anticipated to include excavation depths that have the potential to reach the Capistrano Formation underlying these surficial soils. However, as the Capistrano Formation has the potential to yield fossils, monitoring for paleontological resources where earth-moving or disturbing activities would occur would be required pursuant to Standard Condition 4.5-1 (SC 4.5-1) below. With implementation of SC 4.5-1, impacts to paleontological resources would be less than significant under the Modified Project, consistent with the determination regarding the Original Project. No mitigation is required.

References

- Barnes, Lawrence G., and Rodney E. Raschke. 1991. *Gomphotaria pugnax*, a New Genus and Species of Late Miocene Dusignathine Otariid Pinniped (Mammalia: Carnivora) from California. *Natural History Museum of Los Angeles County Contributions in Science* 426:1-16.
- California Geological Survey. 2002. California Geomorphic Provinces. *California Geologic Survey Note* 36. California Department of Conservation.
- City of Dana Point. 1997. Conservation and Open Space Element, City of Dana Point General Plan. Adopted July 9, 1991. Updated in 1997. Website: <http://www.danapoint.org/i-want-to-general-plan> (accessed October 2024).
- Cohen, K.M., S.C. Finney, P.L. Gibbard, and J.-X. Fan. 2023. The ICS International Chronostratigraphic Chart. Updated September 2023. *Episodes* 36: 199-204.
- Deméré, Thomas A., and Annalisa Berta. 2005. New skeletal material of *Thalassoleon* (Otariidae: Pinnipedia) from the Late Miocene-Early Pliocene (Hemphillian) of California. *Bulletin of the Florida Museum of Natural History* 45(4):379-411.
- Ebeling, Alfred W. 1962. *Scopelogadus* (?) *capistranensis*, a New Fossil Melamphaid (Pisces: Teleostei) from Capistrano Beach, California. *Postilla, Yale Peabody Museum of Natural History* 71:1-6.
- Eisentraut, P., and J. Cooper. 2002. Development of a Model Curation Program for Orange County's Archaeological and Paleontological Collections. Prepared by California State University, Fullerton and submitted to the County of Orange Public Facilities Resources Department/Orange County Harbors, Beaches, and Parks.
- Kennedy, Michael P., and Siang S. Tan. 2007. Geologic Map of the Oceanside 30 x 60' Quadrangle, California. Digital Preparation by Kelly R. Bovard, Rachel M. Alvarez, and Michael J. Watson. Prepared by the California Geological Survey in cooperation with the United States Geological Survey, Southern California Areal Mapping Project. *Regional Geologic Map Series*, Map #2. Map Scale 1:100,000.
- Norris, R.M., and R.W. Webb. 1976. *Geology of California*. John Wiley and Sons, Inc., Santa Barbara.
- Sharp, R.P. 1976. *Geology: Field Guide to Southern California*. Second Edition. Kendall/Hunt Publishing Company. p. 181.
- Smith, N. Adam. 2011. Taxonomic Revision and Phylogenetic Analysis of the Flightless Mancallinae (Aves, Pan-Alcidae). *ZooKeys* 91:1-116.

Society of Vertebrate Paleontology (SVP). 2010. Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources. Society of Vertebrate Paleontology. Impact Mitigation Guidelines Revision Committee. p. 11.

ATTACHMENT A

RESULTS OF THE FOSSIL LOCALITY SEARCH AT THE NATURAL HISTORY MUSEUM OF LOS ANGELES COUNTY

Natural History Museum
of Los Angeles County
900 Exposition Boulevard
Los Angeles, CA 90007

tel 213.763.DINO
www.nhm.org

Research & Collections

e-mail: paleorecords@nhm.org

September 8, 2024

LSA Associates, Inc.
Attn: Kelly Vreeland

re: Paleontological resources records search for the Dana Point Harbor Hotels Project (20241680)

Dear Kelly:

I have conducted a thorough search of our paleontology collection records for the locality and specimen data for proposed development at the Dana Point Harbor Hotels Project area as outlined on the portion of the Dana Point USGS topographic quadrangle map that you sent to me via e-mail on August 30, 2024. We do not have any fossil localities that lie directly within the proposed project area, but we do have fossil localities nearby from the same sedimentary deposits that may occur in the proposed project area, either at the surface or at depth.

The following table shows the closest known localities in the collection of the Natural History Museum of Los Angeles County (NHMLA).

Locality Number	Location	Formation	Taxa	Depth
LACM IP 24377	West side of Dana Point	San Onofre Breccia (Red and gray; sandy and earthy schist breccia)	Invertebrates (uncatalogued)	Unknown
LACM IP 29177	T8N; R8W; Dana Point quad	Unknown Formation	Invertebrates (uncatalogued)	Unknown
LACM IP 24757	150 feet west of Del Obispo Street and 0.7 mi. north of intersection of Del Obispo and US 101A; Dana Point	Niguel Formation	Invertebrates (uncatalogued)	Unrecorded, exposed in cut along creek at mouth of canyon
LACM VP 4012	Capistrano Beach near Salt Creek Trail in Salt Creek Corridor	Capistrano Formation	Marine mammal (Cetacea)	Unknown
LACM VP 1115	Regional Park; San Joaquin Hills	Pleistocene terrace deposit	Mammoth (<i>Mammuthus</i>)	Unknown

VP, Vertebrate Paleontology; IP, Invertebrate Paleontology; bgs, below ground surface

This records search covers only the records of the NHMLA. It is not intended as a

paleontological assessment of the project area for the purposes of CEQA or NEPA. Potentially fossil-bearing units are present in the project area, either at the surface or in the subsurface. As such, NHMLA recommends that a full paleontological assessment of the project area be conducted by a paleontologist meeting Federal (43 Code of Federal Regulations Part 49.110) or Society of Vertebrate Paleontology standards.

Sincerely,

A handwritten signature in black ink that reads "Alyssa Bell". The signature is written in a cursive style and is positioned above a light green rectangular highlight.

Alyssa Bell, Ph.D.
Natural History Museum of Los Angeles County

enclosure: invoice