September 28, 2022

Manuel Nieto
Nieto Consulting Engineers
5663 Balboa Avenue #386
San Diego, California 92111

Subject: Paleontological Resources Survey for the 929 Border Avenue Project, City of Del Mar, California

Dear Mr. Nieto:

This paleontological resources study reviews the geology and paleontology associated with the project, as well as potential significant paleontological resources that could be adversely impacted by the project in accordance with Ordinance No. 989 and Section 30.92.050 of the Del Mar Municipal Code (DMMC). This letter has been prepared to provide the City with sufficient information to support the proposed project and to satisfy the City's paleontological resources guidelines in support of the DMMC.

Geology

The project is mapped as overlying upper Pleistocene-aged old paralic (marine terrace) deposits, "Unit 6" (Kennedy and Tan 2008). These deposits, which are about 120,000 years old, are also known as the Bay Point Formation. Typical exposures of old paralic deposits of this age consist of light gray, friable to partially cemented, fine- to coarse-grained, massive to cross-bedded sandstone, which are locally overlain by nonmarine alluvium and/or colluvium. These deposits unconformably overlie the Torrey Sandstone at the project, which typically consists of yellowish-white, coarse-grained, locally cross-bedded, arkosic sandstones. Portions of the Torrey Sandstone were deposited in an ancient nearshore marine environment, while other parts of the deposit formed within a barrier island/protected lagoon setting (Kennedy and Tan 2008). Based upon its stratigraphic position, the Torrey Sandstone is considered to be early to middle Eocene in age, approximately 48 to 49 million years old. The thickness of the old paralic deposits is not known at the project, but may be plainly viewed along the beach bluff, where the contact between the old paralic deposits and the Torrey Sandstone is visible.

Paleontology

In coastal San Diego County, deposits of the Bay Point Formation have produced large and exceptionally diverse assemblages of well-preserved marine invertebrate fossils, primarily mollusks. Remains of fossil marine vertebrates (*i.e.,* sharks, rays, and bony fishes) and terrestrial vertebrates (*e.g.,* amphibians, pond turtles, lizards, snakes, birds), including important records of land mammals such as rodents, rabbits, horses, tapirs, camels, deer, bison, and ground sloths, have also been recovered (Deméré and Walsh 1993; unpublished San Diego Natural History Museum paleontological records). The closest known fossils from this formation were discovered during construction of the Flower Hill Promenade in 2011 and earlier (Deméré 1980). These localities produced an incredibly diverse assemblage of marine invertebrates, including bryozoans, foraminiferans, annelid worms, clams, oysters, snails, barnacles, crabs, sand dollars, and urchins. Also recovered was a diversity of marine bony fish, mostly gobies, and sparse isolated elements of terrestrial rodents. Other localities from the marine to estuarine facies produced similar faunas.

In San Diego County, deposits of the Torrey Sandstone have produced limited, but important, remains of fossil plants and marine invertebrates (Givens and Kennedy 1979; Squires 1989; Myers 1991). The well preserved fossil leaves known from the Torrey Sandstone in San Diego County are especially significant, as they represent taxa related to plant species that today live in subtropical and tropical regions of Southeast Asia and the southeastern United States (Myers 1991). The closest fossils yielded by this formation were collected by Hanna (1927) at the base of the beach bluff just below the project, consisting of extinct species of marine gastropods. Multiple localities of Eocene-aged marine mollusk fossils were also recovered at the Flower Hill Promenade Project.

Paleontological Sensitivity

The Bay Point Formation (old paralic deposits) is assigned a high paleontological resource potential based upon the existence of nearby fossil localities, as well as fossils known from these deposits elsewhere in northern San Diego County. The Torrey Sandstone is assigned a high paleontological resource potential based upon the recovery of scientifically significant fossils, particularly plant fossils, in northwestern San Diego County (Deméré and Walsh 1993; Stephenson et al. 2009).

Conclusions

Excavation activities at the project will likely impact the surficial Pleistocene old paralic deposits (Bay Point Formation) and, therefore, may adversely impact significant paleontological resources that may be present within the formation below the surface. Should excavation activities progress deep enough beyond the old paralic deposits and into the Torrey Sandstone, significant fossil resources that may be present in the Torrey Sandstone may also be adversely impacted.

Recommendations

Because of the potential to encounter buried significant paleontological resources, monitoring of grading is recommended in accordance with Section 30.92.050 (Mitigation, Monitoring, and Reporting) of the DMMC and Ordinance No. 989. Should potentially significant paleontological resources be discovered, mitigation measures will be implemented to reduce the effects of the grading impacts in accordance with Section 30.92.050(B)(4) of the DMMC. Paleontological monitoring by a qualified paleontologist should be required for all grading and trenching associated with the development based upon the requirements outlined in Section 30.92.050 of the DMMC.

Sincerely,

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Senior Paleontologist, California Professional Geologist
Brian F. Smith and Associates, Inc.

References

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