

Appendix I

LAX NORTHSIDE PLAN UPDATE

**Paleontological Resources Assessment**

May 2014

*Prepared for:*

Los Angeles World Airports  
One World Way  
Los Angeles, California 90045

*Prepared by:*

URS Corporation  
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# **PALEONTOLOGICAL RESOURCES ASSESSMENT FOR THE LOS ANGELES INTERNATIONAL AIRPORT (LAX) NORTHSIDE PLAN UPDATE IN LOS ANGELES COUNTY, CALIFORNIA**

**Prepared for:**

URS

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**GIS Mapping:**

Molly Valasik

**Principal Investigator:**

Sherri Gust

Qualified Principal Paleontologist

**September 2012**

***Project Number:*** 2246-001

***Type of Study:*** Paleontological Assessment

***Fieldwork Date:*** September 11, 2012

***Localities:*** none

***USGS 7.5' Quadrangles:*** Venice

***Area:*** ~340 acres

***Key Words:*** Quaternary older sand dunes, Quaternary older alluvium, artificial fill

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## EXECUTIVE SUMMARY

The purpose of this study was to determine the potential Project-related effects on paleontological resources of proposed construction activities related to the Los Angeles International Airport (LAX) Northside Plan Update (Project) in the City of Los Angeles, Los Angeles County, California. The Project consists of updating regulations for future development of facilities for employment, retail, restaurant, office, hotel, research and development, education, civic, airport support, recreation, and buffer uses within the Northside area of the LAX Specific Plan.

The proposed Project area is mapped as Quaternary dune sand, Quaternary older alluvium, and recent artificial fill. A records search was completed by the Natural History of Los Angeles County Museum. No fossil have been previously collected from within the Project area. However, fossil remains of mammoth, rodent, fish, horse, bison, and rabbit have been recovered from the older Quaternary dune sand and alluvial deposits within the 1 mile buffer zone. All fossils were from depths of 13 feet or greater below the surface.

Courtney Richards of Cogstone performed a field survey of the Project area on September 11, 2012. Ground visibility was very poor to poor due to vegetation cover. Where exposed, sediments consisted primarily of artificial fill from previous housing and building developments. No fossils, whole or fragmentary, were observed.

The project area contains two geologic units that are potentially sensitive for paleontological resources. These are Quaternary sand dunes and Quaternary older alluvium. Within one mile of LAX Northside previous fossils have been recovered only at deep levels of these sediments. The proposed development scenario for LAX Northside includes excavations up to 22 feet below the current surface for underground parking in Area 11.

We recommend that all excavations deeper than 12 ft. below the current surface should be spot checked by a qualified paleontologist during construction to determine if sediments conducive to fossil preservation are present. Monitoring should be implemented only if these types of sediments are present. If unanticipated paleontological resources are discovered during project construction activities, all work should halt within 50 feet of the find until it can be evaluated by a qualified paleontologist.

The mitigation measures in the LAX Master Plan EIR are appropriate if the paleontological resources management plan includes no paleontological work at less than 12 feet below the current ground surface and includes spot checking and monitoring below 12 feet.

## INTRODUCTION

### PURPOSE OF STUDY

The purpose of this study was to determine the potential Project-related effects on paleontological resources of proposed construction activities related to the Los Angeles International Airport (LAX) Northside Plan Update (Project) in the City of Los Angeles, Los Angeles County, California (Figure 1).

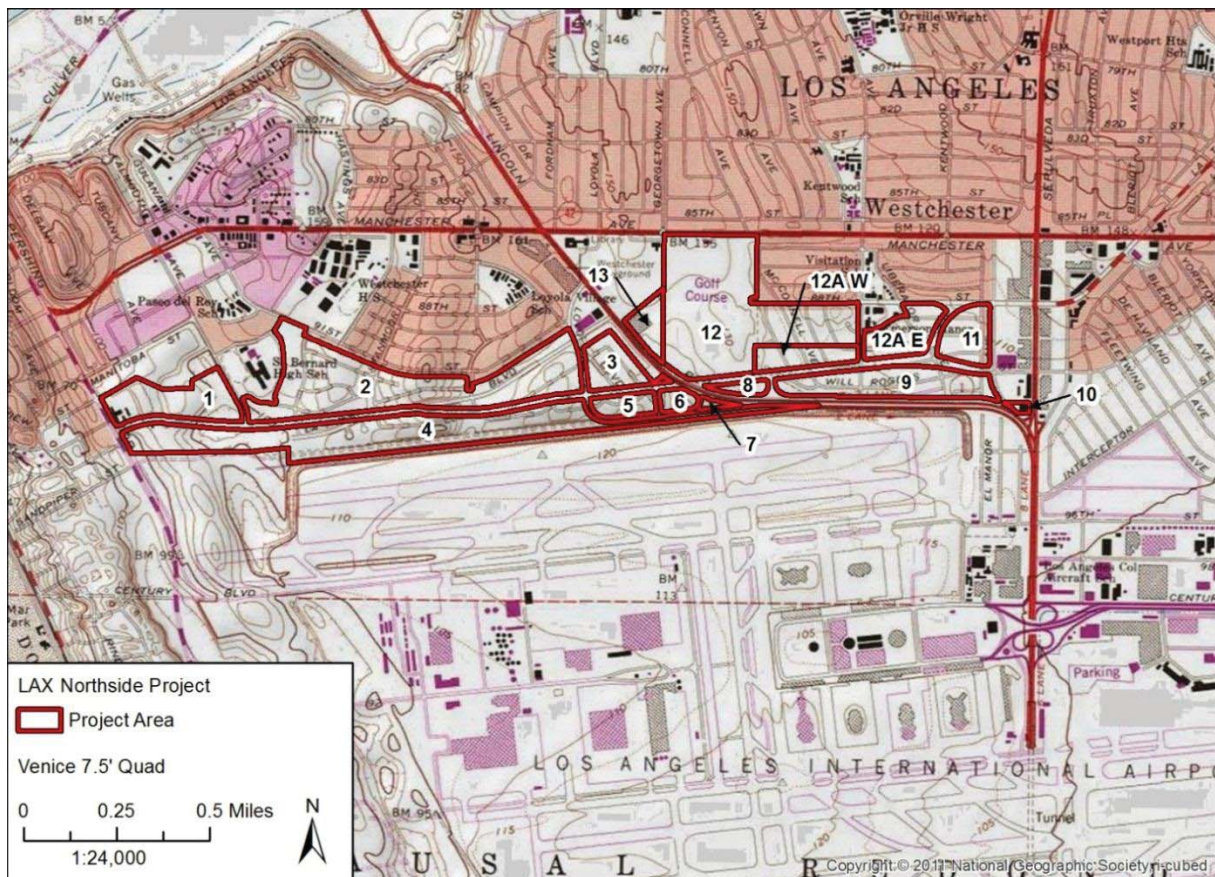


**Figure 1. Project vicinity**



## PROJECT DESCRIPTION

The proposed Project is located directly north of the LAX North Airfield in the City of Los Angeles, California in Sections 34, 35, and 36 of Township 2 South, Range 15 West of the Venice 7.5 minute USGS quadrangle (Figure 2). The Project area encompasses approximately 340 acres bounded by Pershing Drive to the west, Sepulveda Westway and Sepulveda Boulevard to the east, LAX to the north, and 91<sup>st</sup> Street, Manchester Avenue, and 88<sup>th</sup> Street to the north. consists of updating regulations for future development of facilities for employment, retail, restaurant, office, hotel, research and development, education, civic, airport support, recreation, and buffer uses within the Northside area of the LAX Specific Plan.



**Figure 2. Project location**

## **PROJECT PERSONNEL**

Cogstone Resource Management Inc. conducted the paleontological resource studies. Sherri Gust served as the Principal Investigator for the project, supervised all work, and wrote portions of this report including the recommendations. Gust is a Qualified Principal Paleontologist. She has a M.S. in Anatomy (Evolutionary Morphology) from the University of Southern California, a B.S. in Anthropology from the University of California at Davis and over 30 years of experience in California.

Courtney Richards performed the survey and wrote the portions of the report. Richards has a M.S. in Biological Sciences with an emphasis in Paleontology from Marshall University and a B.S. in Earth and Space Sciences from the University of Washington. Molly Valasik prepared the GIS maps. Valasik has a M.A. in anthropology from Kent State University in Ohio and more than two years of experience in Southern California archaeology. Further qualifications are provided (Appendix A).

## **REGULATORY ENVIRONMENT**

Paleontological resources are protected by state law. This protection covers all vertebrate fossils (animals with backbones) and any unique paleontological locality.

### **CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)**

CEQA (Chapter 1, Section 21002) states that: It is the policy of the state that public agencies should not approve projects as proposed if there are feasible alternatives or feasible mitigation measures available which would substantially lessen the significant environmental effects of such projects, and that the procedures required are intended to assist public agencies in systematically identifying both the significant effects of proposed projects and the feasible alternatives or feasible mitigation measures which will avoid or substantially lessen such significant effects.

If paleontological resources are identified during the initial project scoping studies as being within the proposed project area, the sponsoring agency must take those resources into consideration when evaluating project effects. The level of consideration may vary with the importance of the resource (Caltrans 2012).



## **BACKGROUND**

### **GEOLOGIC SETTING**

The proposed Project is located at the northwestern extent of the Peninsular Ranges Geomorphic Province within the Los Angeles Basin. The Peninsular Ranges Province is comprised of a series of mountain ranges separated by northwest trending valleys paralleling faults that branch off from the San Andreas Fault to the east. The physiographical, geological and ecological zones represented in the project area are best described as alluvial valleys of the Los Angeles basin. The basin is bounded to the north by the Santa Monica Mountains, to the east by the Santa Ana Mountains and associated hills (Puente/Chino, San Jose, and Repetto), to the south by the San Joaquin Hills and the Pacific Ocean and to the west by the Palos Verdes Hills and the Pacific Ocean (Wagner 2002).

### **STRATIGRAPHY**

The proposed Project is mapped almost entirely as older Quaternary dune sand with scattered regions of modern, artificial fill. The southeastern most project parcel (Area 10) is mapped as Quaternary older alluvium. Other deposits within the 1 mile buffer zone include Holocene beach sand, predeveloped marshlands, and alluvium; Quaternary landslide rubble; and Pleistocene San Pedro Sand, which will not be impacted by construction (Figure 3, Dibblee, 2007, Saucedo et al. 2003).

#### **QUATERNARY DUNE SAND**

Late Pleistocene (1.26 million – 11,700 years ago) dune sand deposits cover the majority of the project area. These eolian deposits are weakly consolidated and consist primarily of dense to very dense, well sorted, fine- to coarse-grained silty sand and silt (Saucedo et al. 2003).

#### **QUATERNARY OLDER ALLUVIUM**

Deposition of the older alluvium occurred during the late Pleistocene (1.26 million – 11,700 years ago). Sediments range in color from gray to light brown and are composed of unconsolidated to weakly consolidated, dissected, pebble-gravel, sand, and silt-clay (Dibblee 2007).

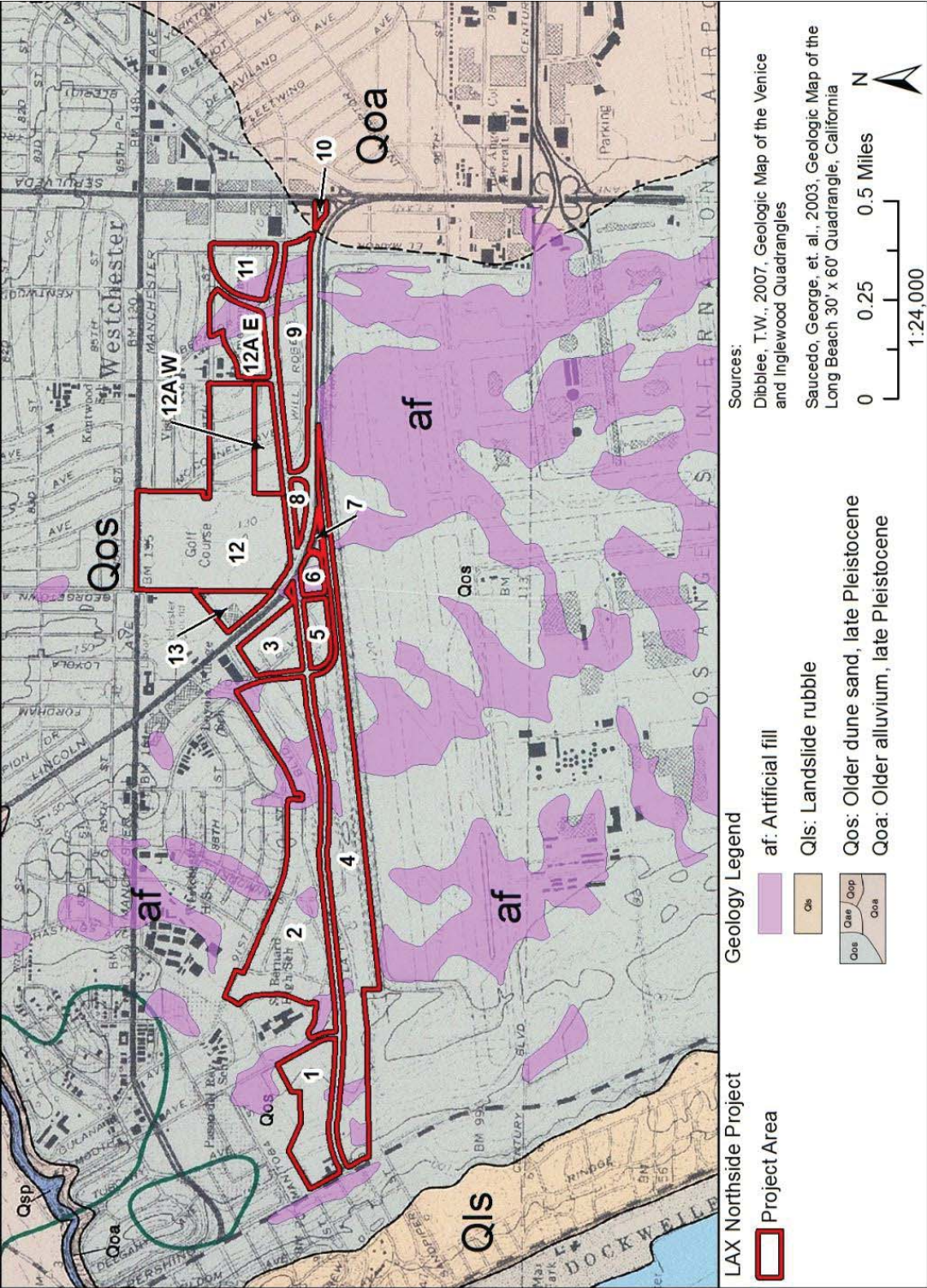


Figure 3. Project geology

## ARTIFICIAL FILL

Large deposits of fill imported by human activity (Saucedo et al 2003). Although these sediments may contain fossils, they have been moved from their original locations so they have lost most of their scientific value.

## RECORD AND LITERATURE SEARCH RESULTS

A paleontological records search performed by the Natural History Museum of Los Angeles County (LACM) determined that there are no vertebrate fossils known from within the proposed Project area. However, there are vertebrate fossils recorded from the same sediments within the 1 mile buffer zone (McLeod 2012, Appendix B).

Fossils found within the buffer zone were all recovered from depths of 13 feet or greater below the surface in Older Quaternary dune sands and alluvium. Specimens include mammoth, rodent, fish, horse, bison, and rabbit (Table 1, McLeod 2012).

**Table 1. Known fossils from Quaternary deposits within the 1 mile buffer zone**

Common name	Taxon	Formation	Depth	Locality	Source
elephant	Proboscidea	Older dune sand	25'	LACM 3264	LACM
mammoth	<i>Mammuthus</i>	Older alluvium	40'	LACM 7332	LACM
mammoth	<i>Mammuthus</i>	Older alluvium	14'	LACM 3789	LACM
rodent	Rodentia	Older alluvium	14'	LACM 3789	LACM
speckled sanddab	<i>Citharichthys stigmaeus</i>	Older alluvium	14'	LACM 3789	LACM
horse	<i>Equus</i>	Older alluvium	13-16'	LACM 1180 / 4942	LACM
mammoth	<i>Mammuthus</i>	Older alluvium	13-16'	LACM 1180 / 4942	LACM
bison	<i>Bison</i>	Older alluvium	13-16'	LACM 1180 / 4942	LACM
rabbit	<i>Lepus</i>	Older alluvium	13-16'	LACM 1180 / 4942	LACM



## RECONNAISSANCE RESULTS

Courtney Richards of Cogstone performed a field survey of the Project area on September 11, 2012. The field reconnaissance consisted of a windshield survey followed by intensive pedestrian survey of sediment exposures as encountered. Project areas 4 and 12 (Figure 2) were not surveyed as area 4 required additional security clearances and area 12 is an active golf course. Photographs were taken to document the condition of the proposed project. All scale bars are centimeter scales. Ground visibility in the proposed project area was very poor to poor, ranging between 1% and 25% open ground. Vegetation consisting primarily of Acacia trees, telegraph weeds, ice plants, and grasses obscured large portions of the project area (Figure 4).

Where exposed, sediments were mainly artificial fill from previous housing and building developments (Figure 5). However, a few exposures of Quaternary dune sand in the central portion of area 9 (Figure 6). No fossils, whole or fragmentary, were observed within the Project area.



**Figure 4. Example of vegetation cover in area 6**



**Figure 5. Concrete block in artificial fill of area 9**



**Figure 6. Quaternary dune sand in area 9**



## POTENTIAL FOSSIL YIELD CLASSIFICATION

The Potential Fossil Yield Classification (PFYC; BLM 2007) utilizes a multi-level scale based on knowledge of the geological formations, record search and survey results to determine the potential to yield significant paleontological resources. The number of localities is the primary determinant.

The recent, artificial fill has a PFYC value of 1 or very low (Table 2). While these sediments may contain fossils, they have been removed from their original location and lost their scientific value.

Due to the presence of known vertebrate fossils that are unevenly and unpredictably distributed, both the Quaternary dune sands and the Quaternary older alluvium are assigned a PFYC value of 3a or moderate sensitivity for significant paleontological resources.

**Table 2. Paleontological Sensitivity Results**

<b>Rock Units</b>	<b>5 very high</b>	<b>4 high</b>	<b>3a moderate; patchy</b>	<b>3b moderate; undemonstrated</b>	<b>2 low</b>	<b>1 very low</b>
Quaternary dune sand			X			
Quaternary older alluvium			X			
Artificial fill						X

## DEFINITION OF SIGNIFICANCE FOR PALEONTOLOGICAL RESOURCES

Only qualified, trained paleontologists with specific expertise in the type of fossils being evaluated can determine the scientific significance of paleontological resources. Fossils are considered to be significant if one or more of the following criteria apply:

1. The fossils provide information on the evolutionary relationships and developmental trends among organisms, living or extinct;
2. The fossils provide data useful in determining the age(s) of the rock unit or sedimentary stratum, including data important in determining the depositional history of the region and the timing of geologic events therein;
3. The fossils provide data regarding the development of biological communities or interaction between paleobotanical and paleozoological biotas;
4. The fossils demonstrate unusual or spectacular circumstances in the history of life;

5. The fossils are in short supply and/or in danger of being depleted or destroyed by the elements, vandalism, or commercial exploitation, and are not found in other geographic locations.

As so defined, significant paleontological resources are determined to be fossils or assemblages of fossils that are unique, unusual, rare, uncommon, or diagnostically important. Significant fossils can include remains of large to very small aquatic and terrestrial vertebrates or remains of plants and animals previously not represented in certain portions of the stratigraphy.

Assemblages of fossils that might aid stratigraphic correlation, particularly those offering data for the interpretation of tectonic events, geomorphologic evolution, and paleoclimatology are also critically important (Scott and Springer 2003, Scott et al. 2004).

## **PRELIMINARY SIGNIFICANCE EVALUATION**

The potential to impact any fossils varies with depth of impacts, previous disturbance and presence of non-fossiliferous sediments. Excavations into fill have no potential to yield fossils meeting significance criteria. Within a mile of the project, previous deep excavations have recovered fossils only at levels 13 or more feet below the surface. These fossils have often been single specimens but associations of fossils of multiple types of animals are also known.

Unidentifiable fossils will generally not meet significance criteria and should not be collected unless the amount and preservation is sufficient for dating purposes (criterion 5 above). For identifiable fossils, significance will need to be assessed subsequent to recovery but generally single fossils are isolated finds that will not meet significance criteria unless they represent previously unknown species in the area or they provide a useful radiocarbon date that assists with local sedimentary sequencing (criteria 2 and 5 above). This is because single fossils, such as a left bison tibia, do not have sufficient data potential to evaluate evolutionary relationships, development of biological communities, interaction between paleobotanical and paleozoological biotas, or unusual or spectacular circumstances in the history of life (criteria 1, 3 and 4 above). Associations of whole or partial skeletons of different animals are likely to meet multiple significance criteria.

## **ANALYSIS AND RECOMMENDATIONS**

The project area contains two geologic units that are potentially sensitive for paleontological resources. These are Quaternary sand dunes and Quaternary older alluvium. Within one mile of LAX Northside previous fossils have been recovered only at deep levels of these sediments. The proposed development scenario for LAX Northside includes excavations up to 22 feet below the current surface for underground parking in Area 11.

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The mitigation measures in the LAX Master Plan EIR are appropriate if the paleontological resources management plan includes no paleontological work at less than 12 feet below the current ground surface and includes spot checking and monitoring below 12 feet.

## REFERENCES

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## **APPENDIX A: QUALIFICATIONS**



**SHERRI GUST**

Project Manager & Principal Investigator, Paleontology

**EDUCATION**

1994 M. S., Anatomy (Evolutionary Morphology), University of Southern California, Los Angeles  
1979 B. S., Anthropology (Physical), University of California, Davis

**SUMMARY QUALIFICATIONS**

Gust has more than 30 years of experience in California, acknowledged credentials for meeting national standards, and is a certified/qualified principal paleontologist in all California cities and counties that maintain lists. She holds California and Nevada statewide BLM paleontology permits. Gust is an Associate of the Natural History Museum of Los Angeles County in the Vertebrate Paleontology and Rancho La Brea Sections. She is a Member of the Society of Vertebrate Paleontology and the Society of Economic Paleontologists and Mineralogists. She has special expertise in the identification and analysis of fossil bone.

**SELECTED PROJECTS**

**Plainsburg Interchange Project.** Paleontological Mitigation Plan with updated assessment for 5.5 mile new road segment and interchange on State Route 99 between Chowchilla and Merced. Project Manager and Principal Paleontologist. 2012. Subconsultant to URS.

**Westside Subway Exploratory Shaft Project.** Paleontological Mitigation Plan for deep exploration prior to excavation of new subway station near the La Brea tar pits. Project Manager and Principal Paleontologist. 2012. Subconsultant to PB.

**Santa Clara County Express Lanes Project.** Paleontological Evaluation Report and Mitigation Plan for 34 miles of State Route 85 in San Jose and Mountain View. Project Manager and Principal Paleontologist. 2012. Subconsultant to URS.

**Topock Groundwater Remediation Project.** Paleontological Resources Management Plan with updated evaluation for 794 acre project at energy facility on California-Arizona border. Project Manager and Principal Paleontologist. 2012. Subconsultant to Parus Consulting.

**Geospatial Paleontology Database.** Managed paleontological research and GIS database development for 15 counties in central and eastern California. Delivered detailed information about potential fossil yield, geological units, prior fossils and other information at cursor click. Project Manager and Principal Paleontologist. 2011-2012. Subconsultant to URS.

**Eldorado-Ivanpah Transmission Line.** Paleontological survey and Paleontological Resources Management Plan for 71 miles of electrical lines and associated telecommunications from Eldorado, NV to Ivanpah, CA across both BLM and private lands. Project Manager and Principal Paleontologist. 2010. Prime contractor.

**Mojave Water Agency Ground Water Replenishment Project.** Cultural and Paleontological Resources Management Plan was prepared, including an updated assessment, and submitted to SHPO. Cultural resources awareness training provided to all construction personnel and both archaeological and paleontological monitoring performed. Principal Archaeologist and Paleontologist and Project Manager. 2010-2012. Subconsultant to RBF.

**Downs Transmission Line.** Paleontological assessment of 72 miles of electrical lines and associated telecommunications from Trona to Ridgecrest, San Bernardino and Kern Counties, CA across mostly BLM lands. Project Manager and Principal Paleontologist. 2010. Prime contractor.

**COURTNEY RICHARDS**  
Paleontologist

**EDUCATION**

- 2011            M.S., Biological Sciences, Marshall University  
2006            B.S., Earth and Space Science, Biology Option, University of Washington

**SUMMARY QUALIFICATIONS**

Ms. Richards is a qualified paleontologist with extensive research, field, and laboratory experience. Richards completed her Bachelor's degree in Earth and Space Science at the University of Washington, where she studied bone microstructure in ornithischian and theropod dinosaurs. She earned her Master's degree in Biological Sciences with a paleontology focus at Marshall University. Her graduate studies consisted of an analysis of plesiosaur body shape and its implications on stability and buoyancy. Richards was a co-author of a study on the plesiosaur *Tatenectes*, which was published in the Journal of Vertebrate Paleontology. She is currently preparing a second manuscript for publication regarding her ongoing research on the captorhinid *Moradisaurus* and the evolution of herbivory in Permian reptiles. In addition to her publications, Richards has presented her work at the annual meeting of the Society of Vertebrate Paleontology, of which she is a member. She has also taught labs in biology and vertebrate anatomy at the university level and participated in several prospecting and field excavation projects throughout the western region.

**SELECTED PROJECTS**

**Caltrans Fossil Sensitivity Mapping for Central California.** Paleontology Technician. Performed geology research for extensive project to map paleontological sensitivity characteristics for over 3000 miles of proposed construction activities along major freeways in 15 Counties. Work performed for URS Corporation on behalf of Caltrans. 2011-Present

**High Speed Rail Project, Bakersfield to Palmdale Segment, CA.** Paleontologist. Participated in five-day paleontological survey of project study area that was determined sensitive for fossils. Survey results were negative. 2011

**State Route 57 Northbound Widening, Fullerton, CA.** Paleontology Lab Technician. Performed paleontological monitoring, sample processing, sorting and identifying of microfossils recovered from construction monitoring project in Orange County. 2011

**State Route 41 Rehabilitation Project, Kettleman City in Kings County, CA.** Paleontology Lab Technician. Prepared and identified fossils recovered from construction monitoring project. 2011

**Ranchero Road and SNSF Grade Separation Project, Hesperia, CA.** Paleontology Lab Technician. Processed paleontological samples recovered from mitigation monitoring project in San Bernardino County, CA. 2011

**Autry Way Project, Anaheim, CA.** Paleontology Lab Technician. Processed soil samples recovered from monitoring project in Orange County, CA. 2011

**Collections Management, Burke Museum of Natural History and Culture, Seattle, WA.** Vertebrate Paleontology Collections Assistant. Organized and maintained the vertebrate paleontology collection: cataloging, database management, archiving, and preparation of appropriate reports to Federal, State, and local agencies. Determined the land use status of historical fossil localities using BLM maps and Geocommunicator.  
2006-2009; 2003-2006

**MOLLY VALASIK**  
Qualified Archaeologist/ Cross-Trained Paleontologist

**EDUCATION**

2009                    M.A., Anthropology, Kent State University, Kent, Ohio  
2006                    B.A., Anthropology, Ohio State University, Columbus, Ohio

**SUMMARY QUALIFICATIONS**

Valasik is a qualified archaeologist with both professional and academic archaeological field and research experience. She is GIS proficient and currently supervises digitizing and mapping at Cogstone with the use of advanced Trimble software. She has completed more than eight hours of paleontological field training and logged one year's experience as a dual monitor for Cogstone.

**SELECTED PROJECTS**

**Tehachapi Renewable Transmission Project.** Archaeology/paleontology monitor, GIS specialist. Performed monitoring, survey and other duties as needed for installation of new electrical facilities in Los Angeles and Kern Counties. Participated in creating GIS layers for TRTP Segments 4-11 paleontological management plan. 939 hours on project. 2009

**High Speed Rail Project.** Paleontology field technician, GIS specialist. Performed pedestrian survey of roughly 59 miles, recorded survey area with Trimble GeoXH, produced weekly updates, and geo-referenced Dibley maps (geology formations). 135 hours on project. 2009

**Wildrose Road, Death Valley National Monument.** Archaeological field technician and GIS specialist. Assessment of construction activities on potential resources in Inyo County, requested by National Park Service. Performed 5-mile pedestrian survey identified previously recorded sites, recorded new site information with Trimble GeoXH. 58 hours on project. 2009

**State Route 178 Widening Project.** Archaeology field technician, GIS specialist. Caltrans District 8 highway project in San Bernardino County. Performed four-day archaeological pedestrian survey and relocated six archaeological sites. 37 hours on project. 2009

**Blessed Teresa of Calcutta Church Project.** Archaeology/paleontology field technician. Construction project in Riverside County. Phase II test excavation units of prehistoric milling area, extensive pedestrian survey, and recorded spatial information with Trimble GeoXH to document prehistoric features present. 24 hours on project. 2009

**Telecom Survey. (extension of Tehachapi Renewable Transmission Project).** Archaeological field technician. Documented archaeological sites, gathered GIS information, and produced maps for additional archaeological survey. Digitized and recorded sites and survey areas. 7 hours on project. 2009

**Körös Regional Archaeological Project, Hungary.** Field and Laboratory Assistant with Ohio State University and Kent State University. Worked with a team to excavate and process artifacts from an Early Copper Age settlement in Hungary. Participated in archaeological surveys of other possible Early Copper Age sites in the region. 2006

**Sunwatch Indian Village, Dayton, Ohio.** Field technician. Excavated a section of a Prehistoric Indian village for the Ohio State Boone-Shoft Museum of Discovery. Provided routine tours of the site to the public and museum board members. 2005

## **APPENDIX B: PALEONTOLOGICAL RECORDS SEARCH**



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

tel 213.763.DINO  
www.nhm.org

Vertebrate Paleontology Section  
Telephone: (213) 763-3325  
Fax: (213) 746-7431  
e-mail: [smcleod@nhm.org](mailto:smcleod@nhm.org)

9 August 2012

Cogstone Resource Management, Inc.  
1518 Taft Avenue  
Orange, CA 92865-4157

Attn: Sherri Gust

re: Vertebrate Paleontology Records Check for paleontological resources for the proposed  
LAX Northside Project, Cogstone Project # 2246, Los Angeles County, project  
area

Dear Sherri:

I have conducted a thorough search of our paleontology collection records for the locality and specimen data for the proposed LAX Northside Project, Cogstone Project # 2246, Los Angeles County, project area, as outlined on the portion of the Venice USGS topographic quadrangle map that you sent to me via e-mail on 18 July 2012. We do not have any vertebrate fossil localities that lie within the proposed project site boundaries, but we do have localities nearby from the same sedimentary units that occur in the proposed project area.

Almost the entire proposed project area has surficial deposits that are composed of older Quaternary dune sands. At the very southeastern portion of the proposed project area there are surface deposits consisting of older Quaternary Alluvium, and those deposits occur at relatively shallow depth in the rest of the proposed project area. Both of these types of deposits typically do not contain significant vertebrate fossils in the uppermost layers, but at relatively shallow depth they may well contain significant fossil vertebrate remains.

Our closest vertebrate fossil locality from these deposits is LACM 3264, south of the eastern portion of the proposed project area in the middle of the Los Angeles International Airport near what is now the Tom Bradley International Terminal, that produced a fossil



proboscidean, Proboscidea, at a depth of 25 feet below the surface. Another of our nearby vertebrate fossil localities is LACM 7332, east-southeast of the proposed project area just south of West 98<sup>th</sup> Street and west of Bellanca Avenue, that produced a fossil baby mammoth, *Mammuthus*, at a depth of 40 feet below street grade. Our other nearby vertebrate fossil localities include LACM 3789, further north of locality LACM 7332 at 8734 Bellanca Avenue south of Manchester Avenue, that produced fossil mammoth, *Mammuthus*, rodent, Rodentia, and even a speckled sanddab, *Citharichthys stigmaeus*, at a depth of 14 feet below the surface; and two localities, LACM 1180 and LACM 4942, immediately northwest of locality LACM 3789 on the northeast and southeast sides respectively of Airport Boulevard at the intersection with Manchester Avenue, that produced fossil specimens of horse, *Equus*, mammoth, *Mammuthus*, bison, *Bison*, and rabbit, *Lepus*, at depths of 13 to 16 feet below the surface.

Surface grading or very shallow excavations in the older Quaternary dune sands exposed in almost all of the proposed project area probably will not encounter significant fossil vertebrate remains. Deeper excavations in those portions of the proposed project area, as well as any excavations in the older Quaternary Alluvium in the very southeastern corner of the proposed project area, however, may well uncover significant vertebrate fossils. Any substantial excavations in the proposed project area, therefore, should be monitored closely to quickly and professionally recover any fossil remains discovered while not impeding development. Any fossils recovered during mitigation should be deposited in an accredited and permanent scientific institution for the benefit of current and future generations.

This records search covers only the vertebrate paleontology records of the Natural History Museum of Los Angeles County. It is not intended to be a thorough paleontological survey of the proposed project area covering other institutional records, a literature survey, or any potential on-site survey.

Sincerely,



Samuel A. McLeod, Ph.D.  
Vertebrate Paleontology

enclosure: invoice