# Appendix H-3: Paleontological Resource Record Search Update

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# PALEONTOLOGICAL RESOURCE RECORD SEARCH UPDATE FOR THE GREEN RIVER RANCH III PROJECT

## GREEN RIVER RANCH SPECIFIC PLAN SP00-001
## CITY OF CORONA, CALIFORNIA

**APNs 101-180-014, -015, -017, -035, -037,**
**and -038 and a portion of APN 101-190-034**

***Prepared on Behalf of:***

**Western Realco**
**500 Newport Center Drive, Suite 630**
**Newport Beach, California 92660**

***Submitted to:***

**City of Corona**
**400 South Vicentia Avenue**
**Corona, California 92882**

***Prepared by:***

**Brian F. Smith and Associates, Inc.**
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***August 4, 2020; Revised January 10, 2024***

# Paleontological Database Information

| | |
|---|---|
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| ***Consulting Firm:*** | Brian F. Smith and Associates, Inc.<br>14010 Poway Road, Suite A<br>Poway, California 92064<br>(858) 484-0915 |
| ***Report Date:*** | August 4, 2020; Revised January 10, 2024 |
| ***Report Title:*** | Paleontological Resource Record Search Update for the Green River Ranch III Project, Green River Ranch Specific Plan SP00-001, City of Corona, California (APNs 101-180-014, -015, -017, -035, -037, and -038, and a portion of APN 101-190-034) |
| ***Prepared on Behalf of:*** | Western Realco<br>500 Newport Center Drive, Suite 630<br>Newport Beach, California 92660 |
| ***Submitted to:*** | City of Corona<br>400 South Vicentia Avenue<br>Corona, California 92882 |
| ***Prepared by:*** | Brian F. Smith and Associates, Inc.<br>14010 Poway Road, Suite A<br>Poway, California 92064 |
| ***USGS Quadrangle:*** | *Prado Dam, California* and *Black Star Canyon, California* (7.5-minute) |
| ***Study Area:*** | Approximately 154.5 acres |
| ***Key Words****:* | Paleontological resources; Quaternary very old alluvial fan deposits; Sespe-Vaqueros Formation; Santiago Formation; Silverado Formation; High sensitivity; city of Corona, Riverside County. |

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# I. INTRODUCTION AND LOCATION

An updated paleontological resource record search has been completed for the Green River Ranch III Project, which was previously studied in 2000 by LSA Associates, Inc. (Reynolds 2000). The approximately 154.5-acre property is situated south of Highway 91 primarily southwest of the intersection of Green River Road and Dominguez Ranch Road within the city of Corona, in Riverside County, California (Figure 1). The project is identified as the Green River Ranch Specific Plan SP00-001 and includes Assessor's Parcel Numbers (APNs) 101-180-014, -015, -017, -035, -037, and -038, and a portion of APN 101-190-034. The project can be found within the unsectioned former La Sierra (Yorba) Grant (Township 3 South, Range 7 West, San Bernardino Base and Meridian [Projected]), as shown on the USGS *Prado Dam* and *Black Star Canyon* quadrangle topographic maps (Figure 2). The Green River Ranch Specific Plan was previously approved by the City of Corona in 2001 (City of Corona 2001).

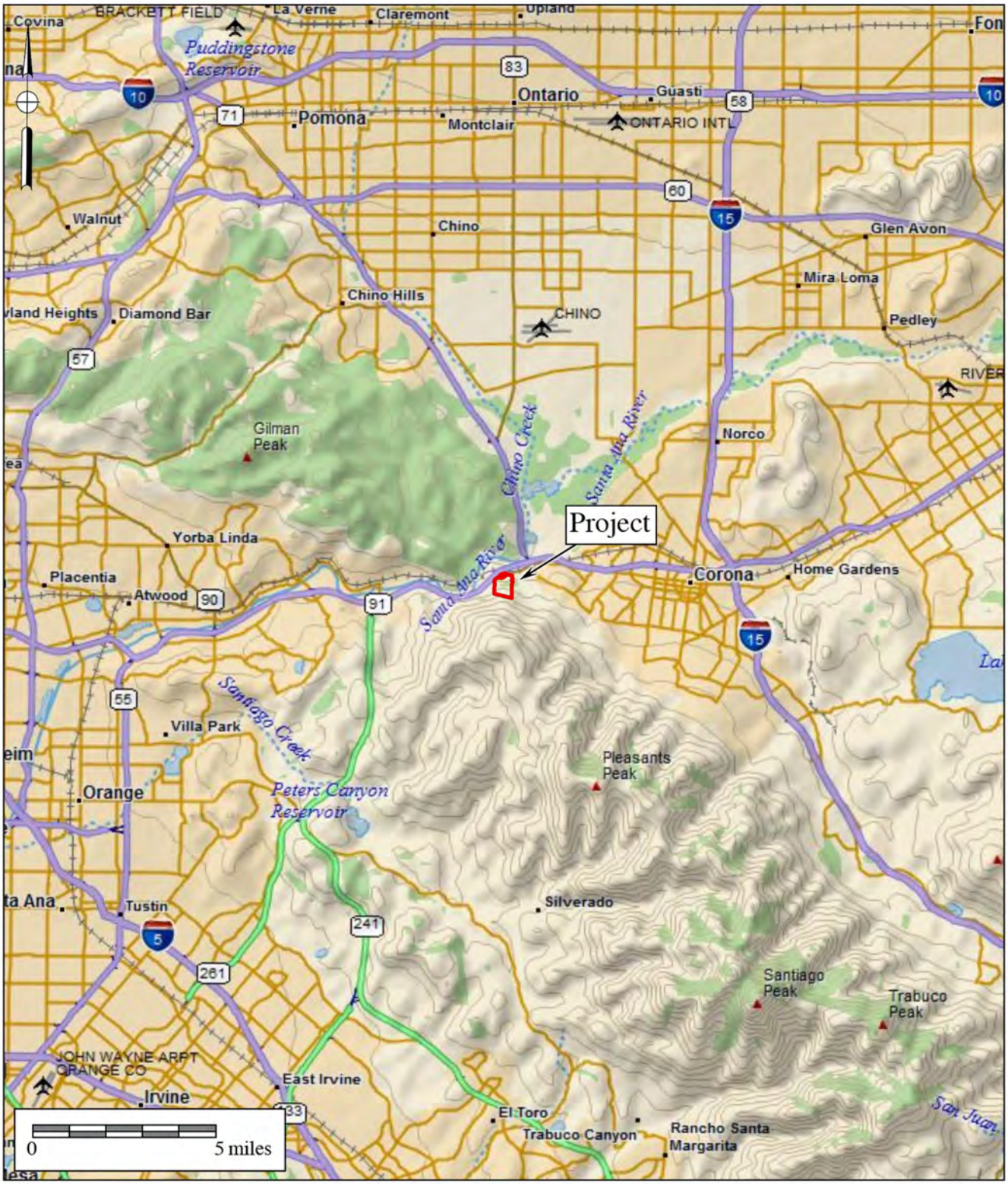
The proposed project includes the development of 49.31 acres in the project's northern area for super pads to facilitate commercial and industrial business, while the southern 20.39 acres are currently slated for residential development. The remaining acreage for the proposed project includes an access driveway, improvements to Fresno Road, open space, and potential widening of Green River Road.

# II. REGULATORY SETTING

The California Environmental Quality Act (CEQA), which is patterned after the National Environmental Policy Act, is the overriding environmental document that sets the requirement for protecting California's cultural and paleontological resources. The document does not establish specific rules that must be followed, but mandates that governing permitting agencies (lead agencies) set their own guidelines for the protection of nonrenewable paleontological resources under their jurisdiction.

***State of California***

Under Guidelines for the Implementation of CEQA, as amended March 29, 1999 (Title 1, Chapter 3, California Code of Regulations: 15000 et seq.), procedures define the type of activities, persons, and public agencies required to comply with CEQA. In the Environmental Checklist, one of the questions to answer is, "Will the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?" (Section 15023, Appendix G, Section XIV, Part a). California Public Resources Code (PRC) Section 5097.5 states:

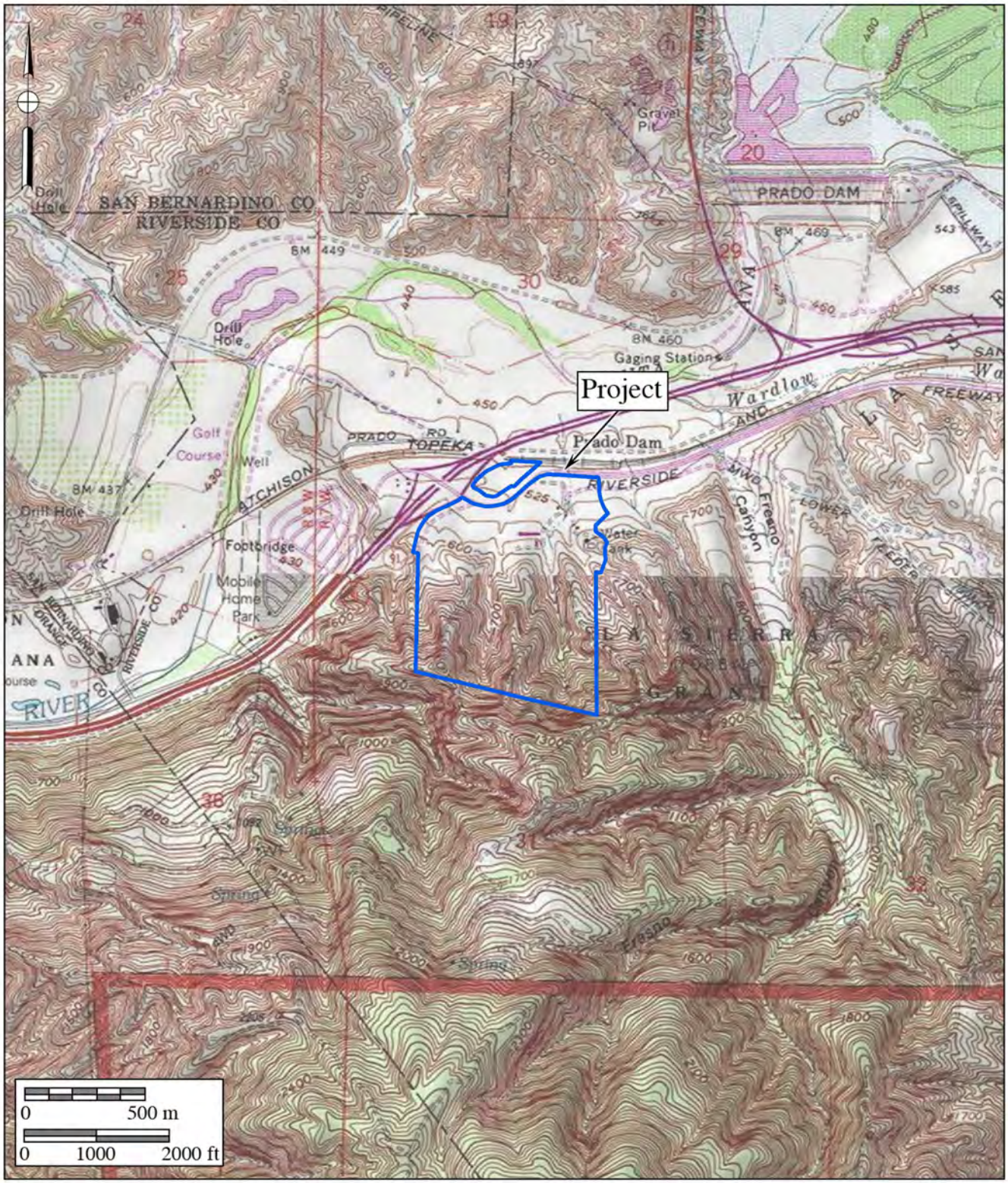



# Figure 1

## General Location Map

The Green River Ranch III Project

DeLorme (1:250,000)




# Figure 2

## Project Location Map

The Green River Ranch III Project

USGS *Prado Dam* and *Black Star Canyon* Quadrangles (7.5-minute series)

a) 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, rock art, 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.
b) As used in this 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.

***County of Riverside***

An online, interactive, paleontological sensitivity mapping database is maintained by the County of Riverside as a research tool to access the County's assignment of levels of paleontological sensitivity to the various geologic formations within the county (County of Riverside Land Information System n.d.). Paleontological resources are addressed under the 2008 Multipurpose Open Space Element of the Riverside County General Plan, Policy OS 19.9, which states:

> This policy requires that when existing information indicates that a site proposed for development may contain paleontological resources, a paleontologist shall monitor site grading activities, with the authority to halt grading to collect uncovered paleontological resources, curate any resources collected with an appropriate repository, and file a report with the Planning Department. (County of Riverside 2008)

The "SABER Policy" (Safeguard Artifacts Being Excavated in Riverside County), enacted in October 2011 by the Riverside County Board of Supervisors, requires that any paleontological resources found or unearthed in the county of Riverside be curated at the Western Science Center on Searl Parkway in the city of Hemet.

***City of Corona***

The City of Corona's General Plan Final Environmental Impact Report (City of Corona 2004) recognizes that ground disturbance activities within the planning area of the General Plan have the potential to significantly impact paleontological resources. However, policies and procedures are provided in the General Plan that, when implemented, would diminish adverse impacts to paleontological resources to a level below significant.

# III. GEOLOGY

The regional and local geology surrounding the project is summarized in Reynolds (2000) (Appendix B); however, a geologic map was not provided. In this report, the project is shown on Figure 3 with updated geologic mapping by Morton and Miller (2006). The map indicates the project is underlain by several geologic formations, summarized by increasing age below:

- Quaternary (Pleistocene) very old clayey alluvial fan deposits ($Qvof_c$) and very old arenaceous (very fine to very coarse-grained sandy) alluvial fan deposits ($Qvof_a$);
- Tertiary (Eocene to early Miocene) undifferentiated Sespe-Vaqueros Formation (Tvs);
- Tertiary (Eocene) Santiago Formation (Tsa);
- Tertiary (Paleocene) Silverado Formation (Tsi)

The Tertiary formations are described in the report by Reynolds (2000) in Appendix B and do not require further elaboration. However, since the report by Reynolds was issued, the Quaternary sedimentary units underlying the project have been reinterpreted by Morton and Miller (2006), described as very old alluvial fan deposits consisting of moderately to well consolidated silt, sand, gravel, and conglomerate. At the project, the unit has been subdivided, with a clay-rich northern half (roughly equivalent to the "older alluvium" of Gray [1961]) and a southern half dominated by sands (roughly equivalent to the "terrace deposits" of Gray [1961]). The age assigned by Morton and Miller (2006) to the very old alluvial fan deposits is middle to early Pleistocene, roughly a half million to 1.8 million years ago, using the time scale devised by the International Union of Geological Sciences at the time Morton and Miller (2006) published the map used herein as Figure 3 (Ricciardi 2009). Within the project, the very old alluvial fan deposits (Qvof) have buried the outcrops of the Sespe-Vaqueros Formation (Tvs) and northern portions of the Santiago Formation (Tsa) (Figure 3).

# IV. PALEONTOLOGICAL RESOURCES

## *Definition*

Paleontological resources are the remains of prehistoric life that have been preserved in geologic strata. These remains are called fossils and include bones, shells, teeth, and plant remains (including their impressions, casts, and molds) in the sedimentary matrix, as well as trace fossils such as footprints and burrows. Fossils are considered older than 5,000 years of age (Society of Vertebrate Paleontology 2010), but may include younger remains (subfossils) when viewed in the context of local extinction of the organism or habitat, for example. Fossils are considered a nonrenewable resource under state, county, and local guidelines (Section II of this report).


**Figure 3**

**Geologic Map**

The Green River Ranch III Project

Geology after Morton and Miller (2006)

***Updated Fossil Records Search***

In his report, Reynolds (2000; Appendix B) included a paleontological resources record search conducted by the San Bernardino County Museum (SBCM). The record search by the SBCM found several nearby Cretaceous-age and Silverado Formation fossil localities south of the project, and one onsite from the Silverado Formation. In addition, Reynolds discovered and documented several new localities on-site, all from the Silverado Formation. Reynolds also documented the presence of a Santiago Formation fossil locality just west of the project (Gray 1961). In summary, Reynolds concluded that all three of the Tertiary geologic formations present at the project have a high potential to yield significant paleontological resources.

For the current study, an updated in-house paleontological resource records search focused on nearby Pleistocene localities was conducted. No Pleistocene fossils are known from within the project. The nearest known Pleistocene fossil locality is Los Angeles County Museum of Natural History locality (LACM loc.) 1207, located about four and a half miles east of the current project, between Lincoln Avenue and Main Street, north of Highway 91, in the city of Corona, consisting of the remains of a deer (Jefferson 2009a). The next nearest Pleistocene fossil locality is about five miles north of the current project in the city of Chino, yielding the bones of mammoth, bison, and horse (Reynolds, in Aron et al. 2018). Approximately six miles southeast of the current project, in the Chase Ranch neighborhood of Corona, a large collection of over 1000 fossil leaves from about 16 species were recovered from Pleistocene deposits assigned as "older alluvium" (Fisk and Peck 2004, Jefferson 2009b). Jefferson (2009a) also listed a late Pleistocene, University of California, Riverside fossil locality (loc. 8601) from "Corona, Santa Ana River," consisting of the fossil remains of fish, lizard, rabbit, vole, mammoth, horse, camel, and bison. The exact location of this locality is not presently known, but potentially could be nearby the project.

***Analysis***

The Pleistocene "older alluvium" deposits mapped at the project by Gray (1961) are also mapped as yielding the fossil leaf locality of Fisk and Peck (2004) within Corona's Chase Ranch neighborhood (termed by Fisk and Peck as the "Triple M Ranch." The Chase Ranch Specific Plan [City of Corona 1989] was prepared, in part, for Triple M Development of Palos Verdes Estates, California). Morton and Miller (2006) revised Gray's (1961) geologic interpretation of the "older alluvium," in part, as "very old alluvial fan deposits." Both locations of older alluvium/very old alluvial fan deposits appear to be of the same approximate age and representative of similar tectonic and depositional environments (Morton and Miller 2006; Reynolds 2000 [Appendix B]).

# V. PALEONTOLOGICAL SENSITIVITY

***Overview***

The degree of paleontological sensitivity of any particular area is based on a number of factors, including the documented presence of fossiliferous resources on a site or in nearby areas,

the presence of documented fossils within a particular geologic formation or lithostratigraphic unit, and whether or not the original depositional environment of the sediments is one that might have been conducive to the accumulation of organic remains that might have become fossilized over time. Late Quaternary (Holocene, or "modern") alluvium is generally considered to be geologically too young to contain significant nonrenewable paleontological resources (i.e., fossils) and is therefore typically assigned a low paleontological sensitivity. Older Pleistocene (greater than 11,700 years old) alluvial and alluvial fan deposits in the Inland Empire, however, often yield important Ice Age terrestrial vertebrate fossils, such as extinct mammoths, mastodons, giant ground sloths, extinct species of horse, bison, and camel, saber-toothed cats, and others. These Pleistocene sediments are thus accorded a High paleontological resource sensitivity.

***Professional Standards***

The Society of Vertebrate Paleontology (2010) drafted guidelines outlining procedures that include:

> [E]valuating the potential for impacts of a proposed action on paleontological resources and for mitigating those impacts. Impact mitigation includes pre-project survey and salvage, monitoring and screen washing during excavation to salvage fossils, conservation and inventory, and final reports and specimen curation. The objective of these procedures is to offer standard methods for assessing potential impacts to fossils and mitigating these impacts.

The guidelines include four categories of paleontological sensitivity for geologic units (formations) that might be impacted by a proposed project, as listed below:

- *High Potential:* Rock units from which vertebrate or significant invertebrate, plant, or trace fossils have been recovered.
- *Undetermined Potential:* Rock units for which little information is available concerning their paleontological content, geologic age, and depositional environment, and that further study is needed to determine the potential of the rock unit.
- *Low Potential:* Rock units that are poorly represented by fossil specimens in institutional collections or based upon a general scientific consensus that only preserve fossils in rare circumstances.
- *No Potential:* Rock units that have no potential to contain significant paleontological resources, such as high-grade metamorphic rocks and plutonic igneous rocks.

# VI. RECOMMENDATIONS

The existence of Quaternary (middle to early Pleistocene) very old alluvial fan sediments

(Qvof) and three Tertiary sedimentary formations beneath the project, the High paleontological resource sensitivity assigned to these geologic units, and fossils recovered from within and nearby the project, support the recommendation that full-time paleontological monitoring be required in undisturbed formations starting at the surface during surficial grading, excavation, or utility trenching activities concomitant with the site preparation phase of the Green River Ranch III Project. This same conclusion was reached by the earlier investigation of the project by Reynolds (2000) (Appendix B). A drafted Mitigation Monitoring and Reporting Program (MMRP) is proposed and must be consistent with the provisions of CEQA, the City of Corona (2004), and those of the guidelines of the Society of Vertebrate Paleontology (2010). If implemented, the MMRP report would mitigate any adverse impacts (loss or destruction) to potential nonrenewable paleontological resources (fossils), if present, to a level below significant. Paleontological monitoring may be reduced if, based upon the observations and recommendations of the professional-level project paleontologist, the excavations are unlikely to yield paleontological resources. Goal 4.3 of the City of Corona General Plan (City of Corona 2004) has proposed the following policies that, when implemented, would reduce adverse impacts to paleontological resources to a level below significant:

**Goal 4.3** Recognize the importance of archeological and paleontological resources and ensure the identification and protection of those resources within the City of Corona.

- ***Policy 4.3.2*** Incorporate specific measures to identify, protect, and preserve cultural resources in the planning, environmental review, and development process.
- ***Policy 4.3.6*** Any project that involves earth-disturbing activities in soil or rock units known or reasonably suspected to be fossil-bearing shall require monitoring by a qualified paleontologist retained by the project applicant for the duration of excavation or trenching.
- ***Policy 4.3.7*** Paleontological resources found prior to or during construction shall be evaluated by a qualified paleontologist, and appropriate mitigation measures applied, pursuant to Section 21083.2 of CEQA, before the resumption of development activities. Any measures applied shall include the preparation of a report meeting professional standards, which shall be submitted to the Riverside County Museum of Natural History [i.e., the Western Science Center].

The proposed MMRP is outlined below, and should be followed in conjunction with those proposed in the report by Reynolds 2000 in Appendix B:

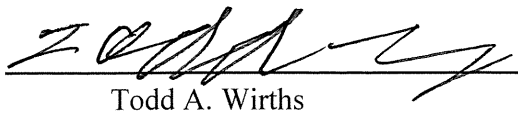
1) Monitoring of mass grading and excavation activities in areas identified as likely to contain paleontological resources by a qualified paleontologist or paleontological monitor. Full time monitoring of grading or excavation activities should be performed starting from the surface in undisturbed areas of very old Quaternary (middle to early Pleistocene) alluvial fan deposits, and the Tertiary-aged Sespe, Vaqueros, Santiago, and Silverado formations within the project. Paleontological monitors will be equipped to salvage fossils as they are unearthed to avoid construction delays and to remove samples of sediments that are likely to contain the remains of small fossil invertebrates and vertebrates. The monitor must be empowered to temporarily halt or divert equipment to allow for the removal of abundant or large specimens in a timely manner. Monitoring may be reduced if the potentially fossiliferous units are not present in the subsurface, or if present, are determined upon exposure and examination by qualified paleontological personnel to have a low potential to contain or yield fossil resources.
2) Paleontological salvage during trenching and boring activities is typically from the generated spoils and does not delay the trenching or drilling activities. Fossils are collected and placed in cardboard flats or plastic buckets and identified by field number, collector, and date collected. Notes are taken on the map location and stratigraphy of the site, and the site is photographed before it is vacated and the fossils are removed to a safe place. On mass grading projects, any discovered fossil site is protected by red flagging to prevent it from being overrun by earthmovers (scrapers) before salvage begins. Fossils are collected in a similar manner, with notes and photographs being taken before removing the fossils. Precise location of the site is determined with the use of handheld Global Positioning System units. If the site involves a large terrestrial vertebrate, such as large bone(s) or a mammoth tusk, that is/are too large to be easily removed by a single monitor, Brian F. Smith and Associates, Inc. (BFSA) will send a fossil recovery crew in to excavate around the find, encase the find within a plaster jacket, and remove it after the plaster is set. For large fossils, use of the contractor's construction equipment is solicited to help remove the jacket to a safe location before it is returned to the BFSA laboratory facility for preparation.
3) Particularly small invertebrate fossils typically represent multiple specimens of a limited number of organisms, and a scientifically suitable sample can be obtained from one to several five-gallon buckets of fossiliferous sediment. If it is possible to dry screen the sediment in the field, a concentrated sample may consist of one or two buckets of material. For vertebrate fossils, the test is usually the observed presence of small pieces of bones within the sediments. If present, as many as 20 to 40 five-gallon buckets of sediment can be collected and returned to a separate facility to wet-screen the sediment. In the laboratory, individual fossils are cleaned of extraneous matrix, any breaks are repaired, and

the specimen, if needed, is stabilized by soaking in an archivally approved acrylic hardener (e.g., a solution of acetone and Paraloid B-72).

4) Preparation of recovered specimens to a point of identification and permanent preservation, including screen washing sediments to recover small invertebrates and vertebrates, if necessary. Preparation of individual vertebrate fossils is often more time-consuming than for accumulations of invertebrate fossils.
5) Identification and curation of specimens into a professional, accredited public museum repository with a commitment to archival conservation and permanent retrievable storage (*e.g.*, the Western Science Center, 2345 Searl Parkway, Hemet, California 92543). The paleontological program should include a written repository agreement prior to the initiation of mitigation activities.
6) Preparation of a final monitoring and mitigation report of findings and significance, including lists of all fossils recovered and necessary maps and graphics to accurately record their original location. The report, when submitted to the appropriate lead agency (City of Corona), will signify satisfactory completion of the project program to mitigate impacts to any paleontological resources.
7) Decisions regarding the intensity of the MMRP will be made by the project paleontologist based upon the significance of the potential paleontological resources and their biostratigraphic, biochronologic, paleoecologic, taphonomic, and taxonomic attributes, not upon the ability of a project proponent to fund the MMRP.

## VII. CERTIFICATION

I hereby certify that the statements furnished above and in the attached exhibits present the data and information required for this paleontological report, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief, and have been compiled in accordance with CEQA criteria.



August 4, 2020; Revised January 10, 2024

Todd A. Wirths
Senior Paleontologist
California Professional Geologist No. 7588

Date

## VIII. REFERENCES

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# APPENDIX A

**Resumes of Key Personnel**

# Todd A. Wirths, MS, PG No. 7588

## Senior Paleontologist

Brian F. Smith and Associates, Inc.
14010 Poway Road • Suite A •
Phone: (858) 679-8218 • Fax: (858) 679-9896 • E-Mail: twirths@bfsa-ca.com

## Education

**Master of Science, Geological Sciences, San Diego State University, California** **1995**

**Bachelor of Arts, Earth Sciences, University of California, Santa Cruz** **1992**

## Professional Certifications

California Professional Geologist #7588, 2003
Riverside County Approved Paleontologist
San Diego County Qualified Paleontologist
Orange County Certified Paleontologist
OSHA HAZWOPER 40-hour trained; current 8-hour annual refresher

## Professional Memberships

Board member, San Diego Geological Society
San Diego Association of Geologists; past President (2012) and Vice President (2011)
South Coast Geological Society
Southern California Paleontological Society

## Experience

Mr. Wirths has more than a dozen years of professional experience as a senior-level paleontologist throughout southern California. He is also a certified California Professional Geologist. At BFSA, Mr. Wirths conducts on-site paleontological monitoring, trains and supervises junior staff, and performs all research and reporting duties for locations throughout Los Angeles, Ventura, San Bernardino, Riverside, Orange, San Diego, and Imperial Counties. Mr. Wirths was formerly a senior project manager conducting environmental investigations and remediation projects for petroleum hydrocarbon-impacted sites across southern California.

## Selected Recent Reports

2019 *Paleontological Assessment for the Eastvale Self Storage Project, City of Eastvale, Riverside County, California.* Prepared for Gossett Development, Inc. Report on file at Brian F. Smith and Associates, Inc., Poway, California.

2019 *Paleontological Resource Impact Mitigation Monitoring Program for the IPT Perris DC III Western/Nandina Project, Perris, Riverside County, California.* Prepared for IPT/Black Creek Group. Report on file at Brian F. Smith and Associates, Inc., Poway, California.

2019 *Paleontological Assessment for the 10407 Elm Avenue Project, City of Fontana, San Bernardino County, California*. Prepared for Advantage Environmental Consultants, Inc. Report on file at Brian F. Smith and Associates, Inc., Poway, California.

2019 *Paleontological Assessment for the 10575 Foothill Boulevard Project, City of Rancho Cucamonga, San Bernardino County, California*. Prepared for T&B Planning, Inc. Report on file at Brian F. Smith and Associates, Inc., Poway, California.

2019 *Paleontological Resource Impact Mitigation Program (PRIMP) for the Speedway TPM 37676 Project, Temescal Valley, Riverside County, California.* Prepared for Speedway Development. Report on file at Brian F. Smith and Associates, Inc., Poway, California.

2019 *Paleontological Assessment for the Natwar Project, Perris, Riverside County, California.* Prepared for Advantage Environmental Consultants, LLC. Report on file at Brian F. Smith and Associates, Inc., Poway, California.

2019 *Paleontological Resource and Mitigation Monitoring Assessment, Beyond Food Mart, City of Perris, Riverside County, California.* Prepared for T&B Planning, Inc. Report on file at Brian F. Smith and Associates, Inc., Poway, California.

2019 *Paleontological Assessment for the MorningStar Marguerite Project, Mission Viejo, Orange County, California.* Prepared for T&B Planning. Report on file at Brian F. Smith and Associates, Inc., Poway, California.

2019 *Paleontological Monitoring Report for the West Markham Project (TR 33587), City of Perris, Riverside County, California*. Prepared for Markham JP/ARA, LLC. Report on file at Brian F. Smith and Associates, Inc., Poway, California.

2019 *Paleontological Monitoring and Mitigation Report for the Artesa at Menifee Town Center Project Site, Sherman Road and La Piedra Road, Menifee, Riverside County, California.* Prepared for MBK Real Estate. Report on file at Brian F. Smith and Associates, Inc., Poway, California.

2019 *Paleontological Monitoring Report, Diarq Residence, La Jolla, City of San Diego, San Diego County, California.* Prepared for West Way Drive, LLC. Report on file at Brian F. Smith and Associates, Inc., Poway, California.

2019 *Paleontological Monitoring Report for the Nimitz Crossing Project, City of San Diego.* Prepared for Voltaire 24, LP. Report on file at Brian F. Smith and Associates, Inc., Poway, California.

2019 *Paleontological Resource Impact Mitigation Program (PRIMP) for the Jack Rabbit Trail Logistics Center Project, City of Beaumont, Riverside County, California.* Prepared for JRT BP 1, LLC. Report on file at Brian F. Smith and Associates, Inc., Poway, California.

2020 *Paleontological Monitoring Report for the Oceanside Beachfront Resort Project, Oceanside, San California.* Prepared for S.D. Malkin Properties. Report on file at Brian F. Smith and Associates, Inc., Poway, California.

2020 *Paleontological Resource Impact Mitigation Program for the Nakase Project, Lake Forest, Orange County, San California.* Prepared for Glenn Lukos Associates, Inc. Report on file at Brian F. Smith and Associates, Inc., Poway, California.

# APPENDIX B

**Paleontological Resource Assessment, Green River Ranch Specific Plan, Corona, Riverside County, California**

***(Prepared by LSA Associates, Inc. 2000)***

# PALEONTOLOGICAL RESOURCE ASSESSMENT

## GREEN RIVER RANCH SPECIFIC PLAN

### CORONA, RIVERSIDE COUNTY, CALIFORNIA

LSA Project No. CCR932

**SUBMITTED TO:**

City of Corona
815 West Sixth Street
Corona, California 91720

**PREPARED BY:**

LSA Associates, Inc.
3403 10th Street, Suite 520
Riverside, California 92562
909.781.9310

LSA

January 2, 2000

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# LIST OF FIGURE

## MANAGEMENT SUMMARY

LSA Associates, Inc. (LSA) was retained by the City of Corona to conduct a paleontological resource assessment for the proposed Green River Ranch project in southwestern Corona, Riverside County, California. A records and literature search for the subject property was conducted through the San Bernardino County Museum (SBCM), and a preconstruction survey of the parcel was completed in November, 1999. Fossils were located during the surface survey within the parcel boundaries. The records search identified paleontological resources immediately adjacent to the parcel, in sedimentary units that crop out on the parcel. LSA paleontologists reviewed literature that was pertinent to the project and noted that the project area is located on very fossiliferous sediments. The potential for encountering significant nonrenewable vertebrate fossils and associated invertebrates and plants during excavation was determined by the records search, and was substantiated by geologic reports and by the field assessment. A summary of the paleontological resource impact mitigation program that was recommended includes the following steps:

A. Full time monitoring of excavation by a qualified vertebrate paleontologic monitor to recover paleontological resources.

B. During monitoring, standard samples will be processed to locate microvertebrate fossils.

C. Preparation of recovered specimens will be to a point of identification, including processing of standard samples (a standard sample equals twelve cubic meters/yards, or 6000 lbs) of sediments to recover small fossil vertebrates.

D. Identification and curation of specimens into an established and recognized institutional repository with retrievable storage.

E. Preparation of a report of findings with an itemized inventory of specimens. The report and inventory, when submitted to the lead agency, signifies the completion of the impact mitigation program.

Compliance with these recommendations ensured that impacts to the paleontological resources are below a level of significance.

# PALEONTOLOGICAL RESOURCES ASSESSMENT FOR THE GREEN RIVER RANCH

## INTRODUCTION

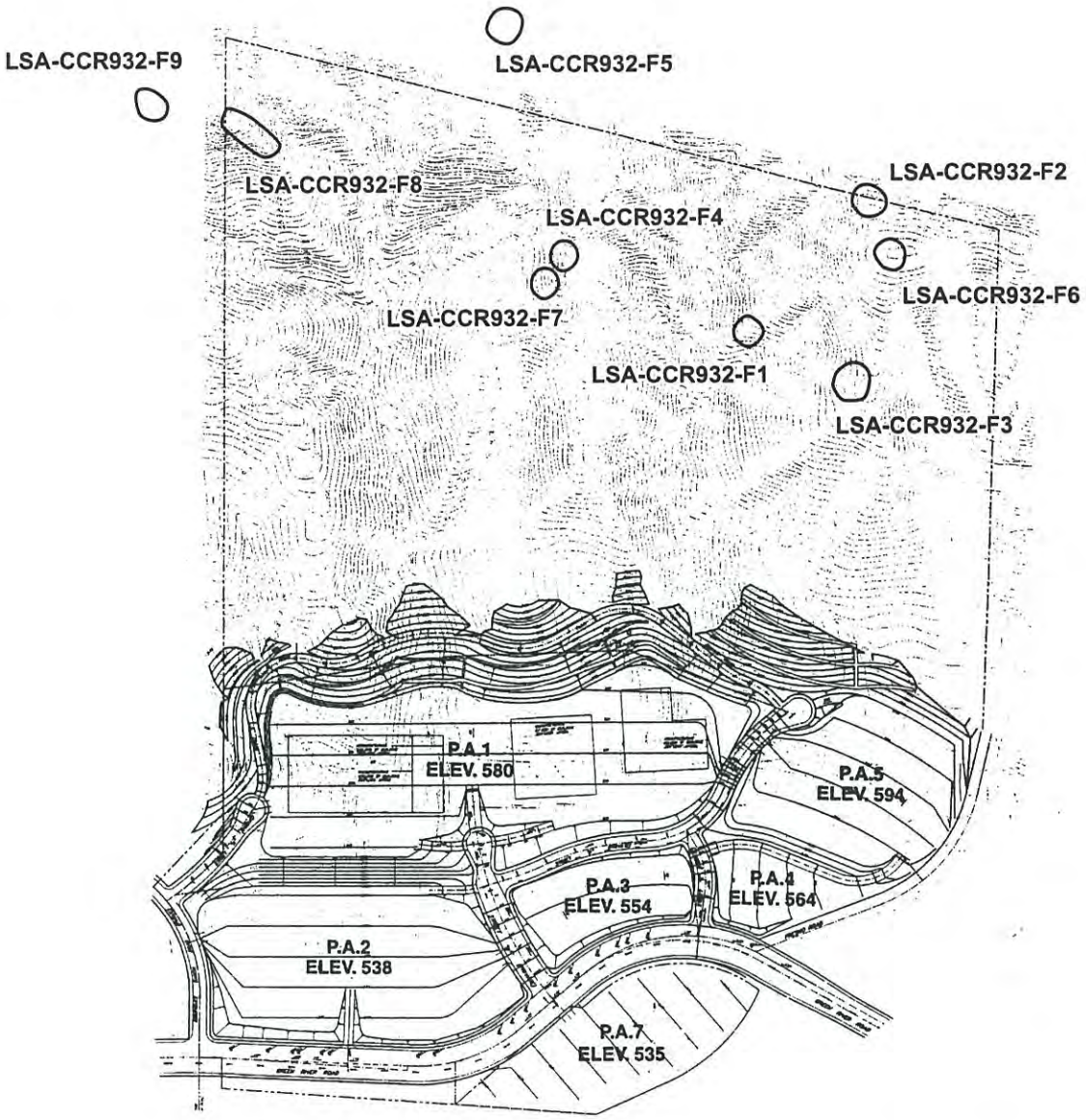
### *PROJECT DESCRIPTION*

The proposed Green River Ranch Project is located at the east end of Santa Ana Canyon in western Riverside County, within the sphere of influence of Corona. It is located immediately southeast of the intersection of Green River Road overpass, on the south side of Highway 91. Specifically, the parcel is located within the south half of Section 30, and the north half of Section 31, T. 3 S., R. 7 W., San Bernardino Baseline and Meridian, as shown on the Black Star Canyon, Ca., and Prado Dam, Ca., 7.5' USGS Quadrangle maps (Figure 1).

The parcel consists of flat lands and low slopes to the north and steep slopes to the south. Because of this diverse topography, the proposed development is zoned for greater density to the north. The proposed land use includes: Industrial, Mixed Use, Commercial, Estate Residential and Rural Residential.

### *PURPOSE OF INVESTIGATION*

Impacts to significant non-renewable paleontological resources are addressed for the proposed Green River Ranch project. The scope of work included review of paleontological resource locality records and pertinent literature, a field assessment and a report of findings with recommendations for impact mitigation consistent with guidelines of the County of Riverside, and guidelines of the Society of Vertebrate Paleontology (SVP).




Source: PBR, August 2000.

*9/11/00(CCR932/EIR/App C)*

Figure 1

LSA

0' 300' 600' N

*Green River Ranch Specific Plan EIR*

Paleontological Resource Location Map

# GEOLOGIC SETTING

## *STRUCTURAL GEOLOGY*

The subject parcel is located at the base of the northwestern Santa Ana Mountains, just south of the southeastern Puente Hills. To the south of the parcel lies the Whittier - Elsinore Fault Zone. This fault is called the Elsinore Fault south of the Santa Ana River in the Elsinore Trough. To the north of the Santa Ana River, on the west side of the Puente Hills, it is referred to as the Whittier Fault. South of Corona, the Chino Fault leaves the Elsinore Fault and runs northwesterly along the east side of the Puente (Chino) Hills. The subject property is located between the Whittier - Elsinore Fault Zone and the Chino Fault. The sedimentary formations on the property consist of early Tertiary sandstones and Pleistocene to Holocene alluvial deposits. The Tertiary rocks are overturned, so that the oldest sits highest, and lies in fault contact with Cretaceous sediments south of the parcel. The Pleistocene to Holocene alluvium is flat lying on the northern portions of the parcel and covers the younger of the early Tertiary rocks.

## *STRATIGRAPHY*

Paleontological resources are evaluated in the context of their depositional and stratigraphic occurrence, as presented in existing research studies and geologic mapping. Geological mapping in the vicinity of the proposed Green River Ranch project (Gray, 1961, Rogers, 1965) indicates that the parcel is located on six sedimentary units, four of which have high potential to contain significant paleontological resources. Recent alluvium in the area is considered to have low potential to contain fossils. Older alluvium comprising the flats at the north margin of the parcel is late Pleistocene or early Holocene in age, and may contain fossils. Overlying the Older alluvium are Pleistocene terrace deposits, which in part are fine grained soils that have potential to contain vertebrate fossils. Up slope, and stacked in reverse order of their age, are the Oligocene Sespe and Vaqueros Formations, the Eocene Santiago Formation and the Paleocene Silverado Formation (Gray, 1961).

# PALEONTOLOGICAL SETTING

## *PALEONTOLOGICAL RECORDS SEARCH*

A paleontological resource records search was conducted through the San Bernardino County Museum (SBCM), Section of Geological Sciences (Appendix B). This search indicates that nine paleontological resources localities are known from formations outside the southern margin of the parcel, and one of these is partially within the parcel. These localities are from within the Jurassic Holz Shale Member of the Ladd Formation and from the Paleocene Silverado Formation.

## *PALEONTOLOGICAL LITERATURE REVIEW*

LSA paleontologists have reviewed the records search and pertinent literature on paleontological resources in the area. Previous geologic mapping of the project vicinity (Durham and Yerkes, 1964; Gray, 1961; Rogers, 1965; Schoellhamer and others, 1981) indicates that the Silverado, Santiago and Sespe/Vaqueros Formations are present on the parcel. The ages of these sediments are Paleocene through Oligocene or early Miocene, respectively, as determined by the fossils that they contain. The Pleistocene Terrace deposits and the Older Alluvium, may, in part be Pleistocene in age, judging by their deformation and elevation above current drainage base level. The Pleistocene terrace deposits include old soils or paleosols and appear similar to other fossiliferous Pleistocene deposits on the margins of the Elsinore Fault Zone such as the Pauba Conglomerate (Kennedy, 1977; Reynolds and others, 1991)

The three Tertiary formations on the parcel are all known to contain fossils (Gray, 1961; Richmond, 1952; Lander, 1993; 1994; 1996). In the Pleistocene Older Alluvium, off site localities are most often in buried soil horizons (paleosols). The literature suggested that the following types of fossils might be expected in certain formations:

- Silverado Formation (Paleocene epoch) - Marine clams, oysters and snails
- Santiago Formation (Eocene epoch) - Marine clams and snails, occassional vertebrates.
- Vaqueros Formation (Oligocene and Miocene epochs) - Shark, bat ray, fish, turtle, whale, seal, clams, oysters and snails
- Sespe Formation (Oligocene and Miocene epochs) - Horse, oreodont,giant pig, rhino, camel, bird and reptile
- Terrace Deposits (Pleistocene epoch) Small and large Ice-Age mammals, birds and reptiles
- Older Alluvium (Pleistocene? epoch) Ice-Age mammals.

## *PALEONTOLOGICAL FIELD SURVEY*

A paleontologic field assessment of the 172-acre parcel was conducted by LSA paleontologists Kevin Buffington and Jeff Cassidy on November 4 and 5, 1999. The survey strategy called for foot

coverage of both steep slopes and the flats at the base of slopes. Visibility of the surface was poor due to ground cover, except on outcrop surfaces. The field survey located seven fossil localities within the parcel and two immediately outside the southern margin. The localities within the parcel were all in the Paleocene Silverado Formation and contained fossil pelecypods and well preserved plant, wood and leaf remains. The paleontological resource locality forms are attached in Appendix C, Confidential Localities, and their distribution should be kept internal to avoid compromise of the resource integrity.

The fossil locality in the Eocene Santiago Formation which had previously been reported off the west margin of the parcel (Gray, 1961) could not be relocated. The field survey verified that the Sespe-Vaqueros Formation was present on site, but, as indicated by previous mapping (Gray, 1961), was partially covered by terrace gravels. The field survey noted that exposures in gullies and washes revealed Older Alluvium beneath a thin cover of recent alluvium. The results of the field survey indicated that there was a high potential for paleontological resources to be present in four of the six sedimentary formations mapped on the parcel.

### *EXPECTED RESOURCES*

The paleontological literature review, records search, and the field survey indicated that large and small fossil resources could be expected on the parcel at surface exposures and in proposed cuts made by excavation equipment. The Paleocene and Eocene sandstones produce near shore mollusks and terrestrial plants. These plants are important because they provide the only look at ecosystems on the adjacent continental margin. The habitats represented indicate that there is also a potential for fossil land mammals and marine fish and sharks to be present. On other parcels, the red beds of the Sespe Formation and the white sands of the Vaqueros Formation have respectively produced small and land mammals and marine mammals, fish, sharks and mollusks. In the Elsinore trough, Pleistocene sediments similar to those on the subject parcel have produced a diverse fauna of large and small land mammals.

Knowing what kind of paleontologic resources to expect allows the paleontologist to plan for adequate and rapid removal of specimens. Large fossils or concentrations of fossils will be jacketed to avoid disruption during removal. The important remains of small mammals and fish can most effectively be recovered from sediments by wet screen washing. The recovery of oriented samples to ascertain magnetic polarity and sampling for invertebrate microfossils to determine foraminiferal stages will effectively provide a datable framework in which to constrain fossil occurrences.

## EXISTING GUIDELINES AND REGULATIONS

### *DISCUSSION*

Paleontologic remains are recognized as non-renewable resources significant to our culture, and as such are protected under provisions of the Antiquities Act of 1906 and subsequent related legislation, policies, and enacting responsibilities. The January 1, 1979 "Clean Water Grant Program for the Protection and Preservation of Cultural Resources" (California State Water Resources Control Board, Rev. 6-11), for example, defines cultural resources to include paleontologic values, and elucidates guidelines for preservation, summarizing some of the applicable legislation. Data recovery

techniques are discussed therein (Section 7.4). A summary of legislation is presented in Appendix A. A memorandum from Grissold E. Petty, Acting Associate Director of the Bureau of Land Management (1978) stated: "There is no universally accepted definition for a significant scientific paleontologic resource. A definite determination can only be made by a qualified, trained paleontologist. Using the following guidelines, a paleontologic resource is of significant, scientific, and educational value if it:

1. Provides important information of the evolutionary trends among organisms, relating living inhabitants of the earth to extinct organisms.

2. Provides important information regarding development of biological communities or interaction between botanical and zoological biotas.

3. Demonstrates unusual or spectacular circumstances in the history of life.

4. Is in short supply and in danger of being depleted or destroyed by the elements, vandalism, or commercial exploitation, and is not found in other geographic locations.

*All vertebrate fossils have been categorized as being of significant scientific value (emphasis added).*"

Significant paleontologic resources are fossils or assemblages of fossils that are unique, unusual, rare, uncommon, diagnostically or stratigraphically important, and those that add to an existing body of knowledge in specific areas, stratigraphically, taxonomically, or regionally. They include fossil remains of large to very small aquatic and terrestrial vertebrates, remains of plants and animals previously not represented in certain portions of the stratigraphy, and assemblages of fossils that might aid stratigraphic correlations, particularly those offering data for the interpretation of tectonic events, geomorphologic evolution, paleoclimatology, and the relationships of aquatic and terrestrial species. The fossils from the Green River Ranch parcel fall into the above categories and can thus be characterized as being very significant. Appendix A contains a summary of legislation applicable to management of nonrenewable paleontological resource.

## IMPACTS AND MITIGATION

### *THRESHOLDS OF SIGNIFICANCE*

The Green River Ranch parcel has the potential to produce vertebrate fossils, and is known to produce significant, diagnostic plant fossils. Therefore, the proposed project will produce **direct adverse impacts** to significant non-renewable paleontological resources. Additionally, **indirect adverse impacts** have been identified that will effect significant non-renewable paleontologic resources during or after project development.

### *Direct Adverse Impacts*

The effects of construction excavation on significant non-renewable paleontological resources will produce **direct adverse impacts** unless a program to provide impact mitigation is proposed as a condition and implemented during construction. This program is referred to as a Paleontologic Resource Impact Mitigation Program (PRIMP).

### *Indirect Adverse Impacts*

In addition, **indirect adverse impacts** to significant non-renewable paleontological resources may occur as the parcel is developed or after construction has ceased. Fossils that remain may be impacted as a result of increased erosion and runoff. Unauthorized collecting of fossil resources by site visitors not involved in the impact mitigation program might occur. These impacts must be addressed in the impact mitigation program that is specifically developed for the Green River Ranch parcel.

## *MITIGATION MEASURES*

### *Paleontological Resource Impact Mitigation Guidelines*

Paleontological resource impact measures used by the County of Riverside and by the City of Corona conform to the Society of Vertebrate Paleontology guidelines, summarized below.

The project proponent must retain a qualified vertebrate paleontologist to develop a Paleontological Resources Impact Mitigation Program (PRIMP). The PRIMP must include a field assessment, and project specific measures to reduce impacts to the fossils to a level less than significant. The program must include, but not be limited to:

A. A pre-construction field assessment to locate fossils at surface exposures. Salvage of fossils from known localities, including processing standard samples of matrix for the recovery of small vertebrate fossils, and trackway replication.

B. Monitoring of excavation by a qualified vertebrate paleontologic monitor to recover paleontological resources. The monitor must be empowered to temporarily divert construction equipment away from fossil resource localities. The monitor must be equipped to rapidly remove fossils to avoid prolonged delays to construction schedules.

C. Preparation of recovered specimens to a point of identification, including washing of standard samples (a standard sample equals twelve cubic meters/yards, or 6000 lbs) of sediments to recover small fossil vertebrates. Removal of surplus sediment from around the specimens reduces the volume of storage for the repository institution and the storage cost for the developer.

D. Identification and curation of specimens into an established and recognized institutional repository with retrievable storage.

E. Preparation of a report of findings with an appended, itemized inventory of specimens. The report and inventory, when submitted to the lead agency, signifies the completion of the program to mitigate impacts to paleontological resources.

The complete Guidelines of the Society of Vertebrate Paleontology "Standard Guidelines for Assessment and Mitigation of Adverse Impacts to Nonrenewable Paleontologic Resources" was published in the Society's News Bulletin in January of 1995. This was followed by "Conditions of Receivership for Paleontologic Resource Salvage Collections" which appeared in the News Bulletin in February, 1996.

### *Site Specific Mitigation*

The impact mitigation guidelines (above) are generic, and meant to be tailored by the project paleontologist to fit particular fossil resources that occur on a specific project with its own sedimentary formations. The Green River Ranch parcel is located on sediments with specific paleontological parameters, and the mitigation of impacts to significant paleontological resources can be customized.

## *PALEONTOLOGY OF THE GREEN RIVER RANCH PARCEL*

The Green River Ranch parcel contains sedimentary formations that range in age from 60 million years to 10,000 years in age. The older formations were deposited in marine conditions and the younger were deposited on the continent. The importance of these sediments in this time period is as follows:

1. The Silverado Formation is the earliest deposit representing the Age of Mammals in the local area. Consequently, any fossils found, such as the plants, help interpret the change from the Mesozoic, the Age of Dinosaurs to the Age of Mammals.

2. The Santiago Formation of Eocene age is important because it marks the transition between the Paleocene Period and the following, tectonically stable period of the Miocene. The conglomerates in the Santiago Formation may indicate an adjacent period of mountain building.

3. The Sespe-Vaqueros Formations represent time-transgressive deposition near the continental margin. Small mammal fossils in these sediments help determine the age of the depositional events. The most effective way to recover small mammal fossils from the Sespe-Vaqueros Formation is by washing standard samples of sediment and sorting the fossils from the concentrate (Lander, 1996).

4. The Pleistocene Terrace Deposits and Older Alluvium may contain fossils, and these fossils may help determine the age of these sediments. The age of these sediments is important in determining the timing of the development of Santa Ana Canyon and the activity on the Whittier - Elsinore Fault Zone.

*SITE AND PROJECT SPECIFIC MITIGATION TASKS*

A-1. The project paleontologist must conduct a pre-construction field assessment to locate fossils at surface exposures.

A-2. This survey must be followed by pre-excavation salvage of fossils from known localities, which includes processing standard samples of paleosol matrix for the recovery of small vertebrate fossils.

B. Excavation has potential to impact fossils on the Green River Ranch Parcel. A qualified vertebrate paleontologic monitor must be present full time to inspect fresh cuts and to recover paleontological resources. The monitor must be empowered to temporarily divert construction equipment away from fossil resource localities. The monitor must be equipped to rapidly remove fossils to avoid prolonged delays to construction schedules.

C-1. Specimens recovered must be prepared to a point where they are identifiable and stabilized. Removal of surplus sediment from around the specimens reduces the volume for storage in the repository institution and reduces the storage cost for the developer.

C-2. Preparation includes wet screen washing of sediments to recover small fossil vertebrates. Paleosols encountered have a high potential to contain fossils of small vertebrate animals. A standard sample of twelve cubic meters/yards (6,000 lbs.) must be collected from productive paleosols.

D. Specimens must be identified and curated into an institutional repository with retrievable storage. The repository institutions charge a one time fee based on volume so removing surplus sediment is important. The repository institution may be a local museum or university that has retrievable storage with controlled climate and entry. Examples of facilities that **do not** meet the qualifications of a repository are public schools and public storage units.

E. The PRIMP must include preparation of a report of findings with an appended, itemized inventory of specimens. The numbering system used in the inventory must be compatible with that of the repository institution. The report and inventory, when submitted to the lead agency, signifies the completion of the program to mitigate impacts to paleontological resources. The report and inventory and pertinent field notes must accompany the specimens to the repository.

F. Increased erosion to non-developed areas may impact paleontologic resources that remain on site after the excavation monitoring program is complete. The project paleontologist must draft a statement of site specific potential and recommend mitigation measures near the end of the grading project.

G. The potential for unauthorized collecting must be dealt with at the start of the grading program. This can be handled with other health and safety issues that deal with unauthorized entry. The project paleontologist must submit a statement that access control measures are adequate.

## *LEVEL OF SIGNIFICANCE AFTER MITIGATION*

The above paleontological resource impact measures are developed to be specific to the Green River Ranch Parcel. When followed, they will reduce the impacts to non-renewable paleontological resources to a level that is less than significant.

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# APPENDIX A

# SUMMARY OF STATUTES

# APPENDIX A - SUMMARY OF STATUTES

**Applicable to management of nonrenewable paleontological resources:**

*STATE OF CALIFORNIA*

**California Environmental Quality Act of 1970 (CEQA, 13 PRC, 2100 et seq).** Requires identification of potential adverse impacts of a project to any object or site of scientific importance (Div. 1, PRC 5020.1(b)).

**Guidelines for the Implementation of the California Environmental Quality Act, as amended May 10, 1980 (14 Cal. Admin. Code: 15000 et seq).** Requires mitigation of adverse impacts to a Paleontologic site from development on public land by construction monitoring.

**Guidelines for the Implementation of CEQA, 1992, Appendix G, section J (Significant effects).** Defines when a project will normally have a significant effect on the environment. Paleontology is specifically mentioned as a protected resource. "A project will normally have a significant effect on the environment if it will...disrupt or adversely affect a prehistoric or historic archaeological site or a property of historic or cultural significance to a community or ethnic or social group; or a paleontological site except as a part of a scientific study...."

**California Environmental Quality Act, State of California Public Resources Code, 2100-21177 as amended January 1, 1999, Appendix G - Environmental Checklist Form.** Impacts to known, important paleonto-logical resources are specifically covered under CEQA as potentially significant effects (i.e., the project will have a significant effect on the environment). Specifically, each California project must answer the question: Cultural Resource - would the project directly or indirectly destroy a unique paleontological resource or site or unique geological feature? There are four possible answers: Potentially Significant Impact, Potentially Significant Unless Mitigation Incorporated, Less than Significant Impact, No Impact.

**Warren-Alquist Act (PRC 25000 et seq).** Requires the California Energy Commission to evaluate energy facility siting in unique areas of scientific concern (Section 26627).

**Public Resources Code, Section 5097.5 (State 1965, c. 1136, p. 2792).** Prohibits excavation or removal of any "vertebrate paleontological site...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." Public lands are defined to include lands owned by or under the jurisdiction of the state or any city, county, district, authority or public corporation, or any agency thereof. Defines any unauthorized disturbance or removal of archaeological, historical, or paleontological materials or sites located on public lands as a misdemeanor.

**Public Resources Code, Section 30244.** Requires reasonable mitigation of adverse impacts to paleontological resources from development on public land.

*FEDERAL LEGISLATION*

**Federal Antiquities Act of 1906 (P.L. 59-202, 32 Stat. 255).** Forbids and establishes criminal sanctions for disturbance of any object of antiquity of federal land without a permit issued by an authorizing authority.

**1872 Mining Law, amended 1988.** Excludes fossils (including petrified wood) from claim or patent. U.S. Forest Service and Bureau of Land Management regulates surface effects of development under this law. BLM regulations specifically state that operators may not knowingly disturb or destroy any scientifically important paleontological remains on federal lands; that they notify an authorized officer of such finds; and that said officer shall take action to protect or remove the resource(s).

**Mineral Leasing Act of 1920 (sec. 30).** Requires and provides for the protection of interest of the United States. Natural resources, including paleonto-logic resources, are commonly regarded as such interests.

**National Natural Landmarks Program, established 1962, administered under Historic Sites Act of 1935 (P.L. 74-292, 16 U.S.C. 461-467).** A National Natural Landmark is defined as "an area of national significance... that contains an outstanding representative example(s) of the nation's natural heritage, including...geological features...or fossil evidence of the development of life on earth." National significance is defined as "...examples of the full range of ecological and geological features, the usual as well as the unique, which best represent the nation's heritage, the knowledge and appreciation of which are important for the perpetuation of their inherent natural values and for associated scientific, educational, recreational, or inspirational benefit" (36 CFR 62, 1985).

**National Environmental Policy Act of 1969 (NEPA) (P.L. 91-190, 83 Stat. 852, 42 USC 4321-4327).** Mandates evaluation of impacts in order to "preserve important historic, cultural, and natural aspects of our national heritage" (Section 101.b4).

**Executive Order 11593, May 31, 1971, Protection and Enhancement of the Cultural Environment (36 CFR 8921).** Requires federal agencies to inventory and protect properties under their jurisdiction. National Park Service regulations under 36 CFR provide that Paleontologic specimens may not be disturbed or removed without a permit.

**Archaeological and Historic Data Preservation Act of 1974 (P.L. 86-253, as amended by P.L. 93-921, 16 U.S.C. 469).Act of May 24, 1974 (88 Stat 174, sec. 3 a0, 4a).** Provides for the survey, recovery, and preservation of significant scientific, prehistoric, historic, archaeological, or paleontological data when such data may be destroyed or irreparably lost due to a federal, federally licensed, or federally funded project. A "Statement of Program Approach" was published in the *Federal Register* on March 26, 1979 (40 FR 18117) to advise the manner in which this law will be implemented.

**36 CFR Part 800 (39 FR 3365, January 25, 1974, and 44 FR 6068, January 30, 1979): Procedures for the Protection of Historic and Cultural Properties.** Establishes procedures to ensure that historic and cultural resources are given proper consideration in the preparation of environmental impact statements.

**Federal Land Management and Policy Act of 1976 (FLPMA, P.L. 94-579, 43 U.S.C. 1701-1782).** Provides authority for BLM to regulate lands under its jurisdiction, managed in a manner to "protect the quality of scientific, scenic, historic, ecological, environmental...and archaeological values." Authority is given to establish areas of critical environmental concern (ACEC).

**Surface Mining Control and Reclamation Act of 1977 (SMCRA, P.L. 95-87, 30 U.S.C. 1201-1328).** Regulates surface coal mining and provides designation as unsuitable for surface mining if mining would "...result in significant damage to important cultural, scientific, and esthetic values and natural systems...."

**Paleontological Resource Management 1998**, Handbook H-8270-1 General Procedural Guidance for Paleontological Management.

# APPENDIX B

# PALEONTOLOGICAL RECORDS REVIEW

5 November 1999

LSA Associates, Incorporated
attn: Robert Reynolds
3403 10th Street, Suite #520
Riverside, CA 92614

Dear Mr. Reynolds,

The Section of Geological Sciences of the San Bernardino County Museum (SBCM) has completed a records search for the above-named area in Riverside County. The proposed property is specifically located within section 31, Township 3 South, Range 7 West, San Bernardino Base and Meridian, as shown on the Black Star Canyon, CA 7.5' United States Geological Survey topographic quadrangle map (1967 edition).

Previous geologic mapping of the proposed project property (Rogers, 1965) indicates that four (4) geologic units are present within the boundaries of the property: Mesozoic metavolcanic rocks dating to the Triassic and Jurassic Periods; upper Cretaceous marine rocks of the Ladd Formation; Paleocene marine rocks of the Silverado Formation; and Eocene rocks of the Santiago Formation. Of these lithologies, all but the Mesozoic metavolcanic rocks have potential to contain significant nonrenewable paleontologic resources. The Ladd, Silverado and Santiago Formations all therefore have high paleontologic sensitivity.

A review of the Regional Paleontologic Locality Inventory (RPLI) was conducted by the staff of the Section of Geological Sciences, San Bernardino County Museum. The results of this review indicate that numerous paleontologic resource localities are recorded from within the boundaries of the proposed project property. Localities SBCM 05.005.004 - 05.005.005, recorded from the Baker Canyon and Holz Shale members of the Cretaceous Ladd Formation in the central portion of the property, have yielded fossil remains of plants (including water reeds and leaf fragments) and molluscs. Further, localities SBCM 05.005.008 - 05.005.011, recorded in the central and northern portions of the property from exposures of the Paleocene Silverado Formation, have yielded fossils of leaves of conifers and angiosperms as well as water reeds and wood with worm borings. Finally, locality SBCM 05.005.012, recorded in the northwestern corner of the Fresno Canyon property from the Eocene Santiago Formation, yielded fossil remains of Eocene molluscs. These localities confirm the high paleontologic sensitivity of outcrops of the Ladd, Silverado and Santiago Formations in the immediate vicinity of the proposed project property.

Additionally, two paleontologic resource localities are recorded from immediately west of the Fresno Canyon property. Locality SBCM 05.005.006, recorded from the Holz Shale member of the Ladd Formation, yielded fossil remains of water reeds. Locality SBCM 05.005.007, recorded from the Silverado Formation, yielded abundant pelecypods and gastropods. As with the localities present within the boundaries of the proposed project property, these localities confirm the high paleontologic sensitivity of outcrops of the Ladd and Silverado Formations near the project property.

The results of the review of the RPLI at the SBCM demonstrate that three lithologic units present on the property and in the near vicinity have high potential to contain significant nonrenewable paleontologic resources present in the subsurface: the Ladd Formation, the Silverado Formation and the Santiago Formation.

Please do not hesitate to contact us with any further questions you may have.

**References**

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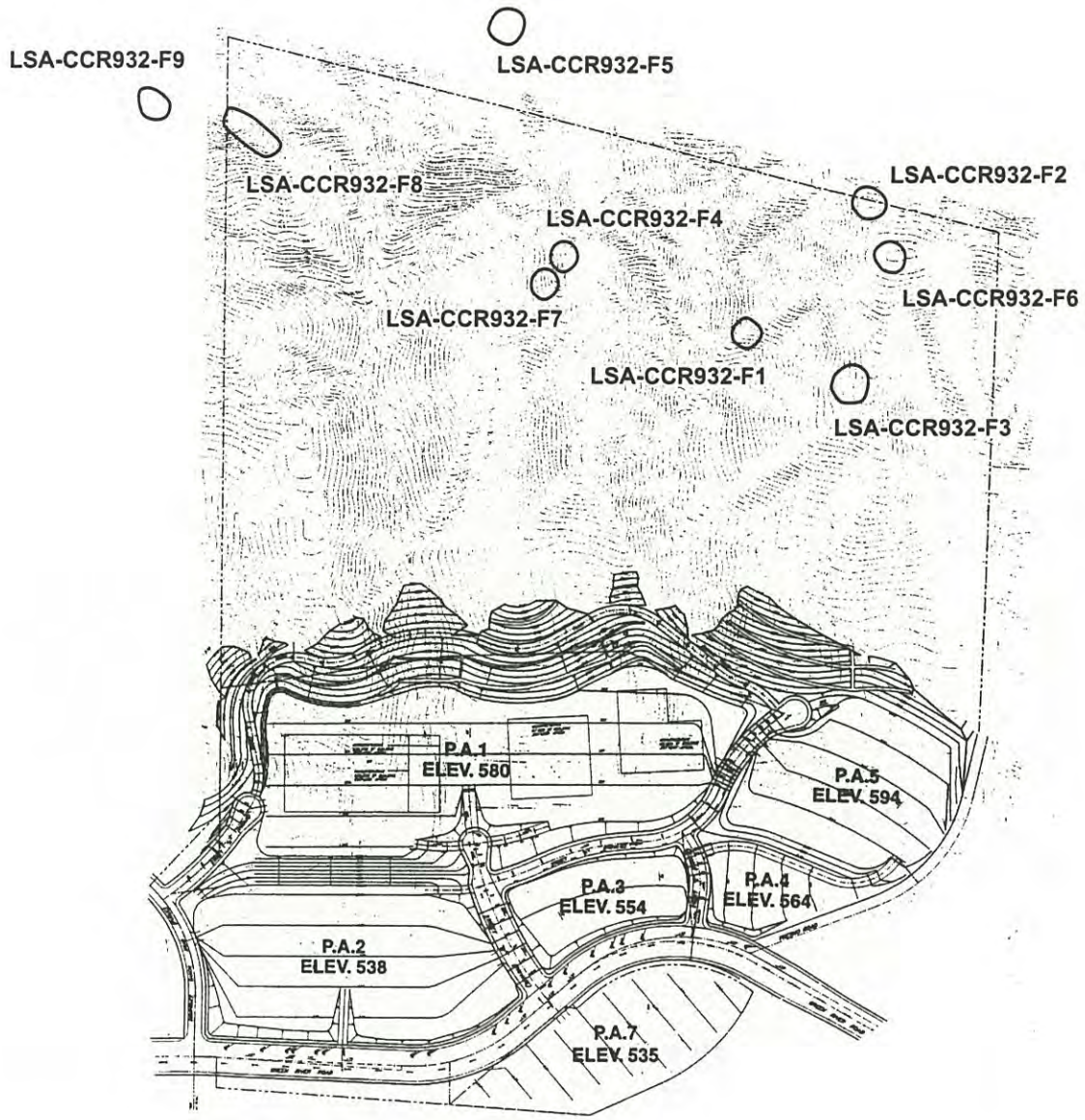
Sincerely,

Eric Scott, Curator of Paleontology
Section of Geological Sciences
San Bernardino County Museum

# APPENDIX C

# CONFIDENTIAL LOCALITIES




Source: PBR, August 2000.

*9/11/00(CCR932/EIR/App C)*

Figure 1

LSA

0' 300' 600' N

*Green River Ranch Specific Plan EIR*

Paleontological Resource Location Map

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