Supplement Analysis

For

**Paleontological Excavation
at the National Ignition Facility at
Lawrence Livermore National Laboratory**

December 19, 1997

DOE/EIS-0236-NIFSA-II

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1.0 Introduction

On December 15, 1997, contractor workers supporting the National Ignition Facility (NIF) construction uncovered bones suspected to be of paleontological importance. The NIF workers were excavating a utility trench near the southwest corner of the NIF footprint area, located at the northeast corner of the Lawrence Livermore National Laboratory (LLNL) Livermore Site, and were excavating at a depth of approximately 30 feet. Upon the discovery of bone fragments, the excavation in the immediate vicinity was halted and the LLNL archaeologist was notified. The archaeologist determined that there was no indication of cultural resources (human remains or artifacts of human origin). Mark Goodwin, Senior Curator for the University of California Museum of Paleontology at the University of California, Berkeley, was then contacted. Mr. Goodwin visited the site on December 16th and confirmed that the bones consisted of a section of the skull, a portion of the mandible, several teeth, upper palate, and possibly the vertebrae of a mammoth, genus *Mammuthus columbi*. (Goodwin, 1997). Attachment 1 is a photograph of the excavation site with the find. Although the exact age of the bones is not yet known (which prevents the exact identification of the subspecies of mammoth at this point), it was estimated that the find was somewhere in the range of 12,000 to 400,000 years old.

This supplement analysis evaluates the potential for adverse impacts of excavating skeletal remains, an activity that was only generally assessed by the NIF Project-Specific Analysis in the Final Programmatic Environmental Impact Statement for Stockpile Stewardship and Management (SS&M PEIS) published in September 1996 (DOE/EIS-0236) and its Record of Decision published on December 19, 1996. This supplement analysis has been prepared pursuant to the DOE regulations implementing the National Environmental Policy Act (10 CFR 1021.314).

The activities discussed in this supplement analysis (i.e., the excavation and preservation of paleontological resources) can be considered general ongoing activities which would occur throughout the Livermore Site, regardless of the project location or program affiliation of the element which unearthed the find. As such, the August 1992 Final Environmental Impact Statement and Environmental Impact Report for Continued Operation of Lawrence Livermore National Laboratory and Sandia National Laboratories, Livermore, DOE/EIS-0157, UC EIR SCH#90030847 (1992 Sitewide EIS/EIR) and its January 21, 1993 Record of Decision also may apply to such general actions. The 1992 Sitewide EIS/EIR discusses the potential for impacts to cultural and prehistoric resources and, if such resources are uncovered during excavation, outlines the mitigation measures that are currently being implemented to avoid adverse impacts and to ensure that DOE considers the potential for such impacts.

2.0 Impact Discussion

Prior to the start of NIF construction, there had been no important paleontological resources found in the area of the proposed NIF construction site. The partial, near-surface remains of modern-period livestock animals (e.g., cows) had been found during at least one routine infrastructure trenching activity at DOE's LLNL Livermore Site, but this site was not near the affected area of the proposed NIF construction site. Also, these bones were considered to be of no scientific value after study by the paleontology staff of the U.C. Museum of Paleontology.

Several paleontological resources have been identified at DOE's LLNL Site 300. In these cases, the paleontological staff of the UC Berkeley's Museum of Paleontology was consulted and the resources were either excavated for cleaning, study, accessioning (curating) by professional qualified paleontologists and returned for display, or were left in place and isolated from potential adverse impact so as to permit possible future excavation and study.

There is always a potential that cultural or paleontological resources might be found while conducting trenching, digging, or other ground-disturbing activities at any site or location. The DOE has routinely ensured that staff and contractor personnel engaged in ground-disturbance activities at LLNL are provided information on that potential, that finds of bone fragments are promptly reported, and that the ground-disturbing work is stopped until the proper evaluations are made. These procedures are considered as routine, ongoing actions that further implement mitigation measures to avoid adverse impacts from the normal continued operation of LLNL, as outlined in 1992 Final Environmental Impact Statement and Environmental Impact Report for Continued Operation of Lawrence Livermore National Laboratories, Livermore (DOE EIS-0157) and its January, 1993 Record of Decision. The normal sequence of followon actions to insure against adverse impact were also taken in the case of the NIF-location find:

- o Stopping immediate work at the location of the find
- o Protecting the resource
- o Notification of the archaeologist
- o Determination of whether the bones were human
- o Notification of State/Federal authorities
- o When determined not to be human, then contacting the professional staff of the UC Paleontology Museum for its assessment of the animal of origin, the importance of the find, and guidance on its excavation or preservation for further future study.

The preliminary analysis that the bones are of a well-known animal (mammoth) that is found fairly often in northern California. Since excavation of mammoth remains have been done often enough that techniques for its excavation that will best preserve the specimen for study and presentation can be applied by a qualified paleontologist, there are no significant environmental concerns about the potential for adverse impact to the resource during its excavation and preservation.

3.0 Resource Protective Measures

It is not expected that the proposed excavation would have an adverse impact on the resource. In fact, the proposed excavation of the bones is specifically for the purpose of preserving the resource for study.

During the excavation, measures would be taken to ensure that the find is not adversely impacted. Construction activities in the immediate vicinity would continue to be restricted to avoid damaging the existing bones or those which may be located immediately adjacent to the currently visible resource. The work would be conducted under the direct supervision of a qualified, experienced paleontologist recommended by the Senior Curator for the University of California Museum of Paleontology at the University of California, Berkeley. Construction crews working at the NIF site would be briefed on the importance of the find and the penalties for disturbing the site or removing bones.

If, after the exposure/removal of the skull portion, additional skeletal remains are found, DOE will decide whether to continue to have the paleontologist excavate. However, if there is an absence of additional remains, or those that are present are not deemed by the Senior Curator or qualified staff members from the U.C. Museum of Paleontology at the University of California, Berkeley, as important enough to excavate, the construction of NIF would proceed, providing that the known resources would not be impacted. Constructing over a known paleontological find is an acceptable form of preserving the resource, providing that it is not classified as a unique find and providing that the in-place resource would not be harmed by the construction. The location of the bones would be recorded and the resource would remain in place in the event that a decision is made to excavate at a future date.

4.0 Summary Conclusion

The uncovered paleontological resources identified at the site of the NIF construction project have been properly reported and protected from damage or adverse impact, in accordance with mitigation measures associated with routine ongoing activities at LLNL.

Protective measures are in place to continue to insure against adverse impact to the resource. Should the Government determine to excavate the find, arrangements to excavate, prepare, curate, and return the specimen to the Government by professionally qualified paleontologists under overall guidance from the UC Museum of Paleontology will assure its continued protection. Any portion of the specimen that is not excavated will remain fully "protected-in-place" until, and in case, future decisions are made to excavate and prepare any such remaining portion.

As a result, it is concluded that although the finding of such paleontological resources at the NIF construction site could not have been predicted based on any earlier data, the resource has been properly reported and protected and can also be excavated and/or preserved without adverse impact.

5.0 References

DOE 1996. Final Programmatic Environmental Impact Statement for Stockpile Stewardship and Management. DOE/EIS-0236, Volume III, Appendix I. U.S. Department of Energy, Washington, DC.

DOE 1992. Final Environmental Impact Statement and Environmental Impact Report for Continued Operation of Lawrence Livermore National Laboratory and Sandia National Laboratories, Livermore, DOE/EIS-0157, UC EIR SCH#90030847.

Goodwin 1997. Letter from Mark Goodwin, University of California Museum of Paleontology to Charles Taylor, Department of Energy, December 19, 1997.

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