

4.18 PALEONTOLOGICAL RESOURCES

4.18.1 Summary of Environmental Consequences

Each alternative may result in significant but mitigable impacts if earthmoving and construction activities encounter important fossils within the underlying formations and deposits.

4.18.2 Significance Criteria

Paleontological resource significance is assessed differently by various state and federal agencies. The broadest definition of paleontological significance suggests that significant nonrenewable resources include fossils that are rare or unique regionally, diagnostically, or taxonomically (Science Applications International 1994). This definition includes vertebrate fossils, invertebrate fossils that are previously unknown within the given context, or fossils that will aid in further scientific interpretations.

The BLM considers all vertebrate and some scientifically important invertebrate fossils to be valuable and significant resources (Cunkelman 1999). In 1978, Acting Associate Director of the BLM, Grissold Petty, developed a set of criteria that have been widely used by the BLM and other agencies as a guideline for assessing significance. This memorandum suggests that a paleontological resource is significant if any of the following holds true:

- It provides important information on the evolutionary trends of organisms;
- It provides important information regarding the development of biological communities or interaction between biota; or
- It is unusual, spectacular, or is in short supply and in danger of being depleted or destroyed.

A fossil may also be considered significant if it provides data useful in determining the age(s) of a rock unit or sedimentary stratum, therefore contributing to an increased knowledge of the depositional history of a region and the timing of geologic events therein (SBCM 1999). Adverse impacts to paleontological resources would include the physical destruction or damage of fossil-bearing geological formations and resulting loss of fossil resources. Other adverse impacts could occur with increased public accessibility to known fossil-bearing localities.

4.18.3 Assessment Methods

Impact assessments for paleontological resources are based on the type of fossil or fossil-bearing formation, significance of the fossil, the type of impact, and the extent of disturbance to the fossil or fossil-bearing formation from the project.

4.18.4 No Action Alternative

No significant impacts to paleontological resources are expected because no construction or earthmoving activities would occur with the No Action Alternative.

4.18.5 Alternative 1

Effect of Alternative 1 with Current Inflow Conditions

Significant but mitigable impacts may occur if earthmoving and construction activities encounter important fossils within Lake Cahuilla Deposits.

Effect of Alternative 1 with Reduced Inflows Conditions (1.06 maf/yr)

Significant but mitigable impacts may occur if earthmoving and construction activities encounter important fossils within Lake Cahuilla Deposits. Activities associated with the construction of the North Wetland Habitat, and the Displacement Dike increase the possibility that important fossils within Lake Cahuilla Deposits would be encountered.

4.18.6 Alternative 2

Effect of Alternative 2 with Current Inflow Conditions

Significant but mitigable impacts may occur if earthmoving and construction activities associated with the EES encounter important fossils within the Borrego Formation, the Brawley Formation, Lake Cahuilla Deposits or Pliocene-Pleistocene Nonmarine Sedimentary Deposits. Five documented fossil localities are located within the project area of the Bombay Beach EES. These localities have produced important vertebrate fossil finds from the Brawley Formation. Further localities are likely to be discovered during earthmoving or construction activities.

Effect of Alternative 2 with Reduced Inflow Conditions (1.06 maf/yr)

Significant but mitigable impacts are the same as described for the Current Inflow Conditions, but increased amounts of earthmoving and construction activities associated with the Displacement Dike and the various ponds increase the possibility that important fossils within Lake Cahuilla Deposits would be encountered.

4.18.7 Alternative 3

Effect of Alternative 3 with Current Inflow Conditions

Significant but mitigable impacts may occur if earthmoving and construction activities within the Test Base encounter important fossils within the Brawley Formation, the Borrego Formation, or the Palm Springs Formation. While no localities have been identified in the project area of this alternative, it is likely that new localities may be uncovered during ground-disturbing activities.

Effect of Alternative 3 with Reduced Inflow Conditions (1.06 maf/yr)

Significant but mitigable impacts are the same as described for the Current Inflow Conditions, but activities associated with the construction of the Displacement Dike and various ponds increase the possibility that important fossils within Lake Cahuilla Deposits would be encountered.

4.18.8 Alternative 4

Effect of Alternative 4 with Current Inflow Conditions

Significant but mitigable impacts may occur if earthmoving and construction activities within the Test Base encounter important fossils within the Brawley Formation, the Borrego Formation, or the Palm Springs Formation. While no localities have been identified in the project area of this alternative, it is likely that new localities would be uncovered during ground-disturbing activities

Effect of Alternative 4 with Reduced Inflow Conditions (1.06 maf/yr)

Significant yet mitigable impacts are the same as described for the Current Inflow Conditions, but activities associated with the construction of the Displacement Dike and various ponds increase the possibility that important fossils within Lake Cahuilla Deposits would be encountered.

4.18.9 Alternative 5

Effect of Alternative 5 with Current Inflow Conditions

Significant but mitigable impacts may occur if earthmoving and construction activities within the Test Base encounter important fossils within the Brawley Formation, the Borrego Formation, or the Palm Springs Formation. While no localities have been identified in the project area of this alternative, it is likely that new localities would be uncovered during ground-disturbing activities. Significant but mitigable impacts may occur if activities associated with the construction of various ponds encounter significant fossils within Lake Cahuilla Deposits.

Effect of Alternative 5 with Reduced Inflow Conditions (1.06 maf/yr)

Significant but mitigable impacts are the same as described for the Current Inflow Conditions but activities associated with the construction of the Displacement Dike increase the possibility that important fossils within Lake Cahuilla Deposits would be encountered.

4.18.10 Cumulative Effects

Several of the projects identified for the cumulative effects analysis in the Salton Sea watershed consist of the preparation of management or planning documents. These projects do not include construction or ground-disturbing activities. Therefore, these projects, when considered with the restoration alternatives, would not result in cumulative impacts to paleontological resources within the watershed.

Projects involving construction or expansion of new facilities, such as the Mexicali Wastewater System Improvements Project, the Mesquite Regional Landfill Project, the Newmont Gold Company's Expansion of the Mesquite Gold Mine Project, the Heber Wastewater Treatment System Project, the Lewis Drain Treatment Facility Project, and the Brawley Wetlands Construction and Research Facility projects, are the most likely projects to result in ground-disturbing activities. Paleontological resources are affected primarily via subsurface soil disturbances, which include the construction of dikes,

moats, levees, evaporation ponds, canals, or road construction activities. These activities, considered with potential impacts of the Salton Sea Restoration Project, could result in a cumulative decrease in the overall amount and density of these nonrenewable resources. Because not all project areas have been defined for the cumulative projects, the extent of affected paleontological resources is unknown. It is possible that implementing all of the regional projects could result in significant but mitigable cumulative impacts to the regional paleontological resource base. Avoiding important paleontological resources, to the greatest extent possible, for all of the projects within the watershed could reduce the impact to a less than significant level. When avoidance is not possible, compliance with all relevant federal, state, and local laws pertaining to paleontological resources would be implemented.

4.18.11 Mitigation Measures

Reclamation and the Authority will comply with all applicable federal, state, and local laws, regulations, and policies pertaining to paleontological resources. When specific project activities and locations have been determined, project areas will be assessed for their potential to contain fossil-bearing strata. If fossil-bearing strata are likely to exist, a qualified paleontologist will conduct a field inspection and prepare a report of findings. The report should address the fossil-bearing potential/sensitivity of the area and make recommendations as the appropriate measures to take to mitigate impacts to significant fossils that may be present. Specific mitigation measures might include the following:

- Construction monitoring by a qualified paleontologist may be recommended for project locations within paleontologically sensitive sediments, such as within the Brawley Formation or near known fossil localities;
- If paleontological resources are encountered, monitors must have the authority to temporarily suspend or divert construction activities until such resources are recovered;
- In areas where paleontological monitors are not needed full-time during earth-moving activities, provisions may be made for the instruction of construction personnel regarding the potential for encountering paleontological resources, and procedures must be established to notify a qualified paleontologist if a fossil is encountered;
- Paleontological resources collected during monitoring activities must be appropriately processed and curated in a scientific institution such as a museum or university; and
- A final report must be generated for all monitoring activities that summarizes the results of the monitoring efforts, includes a list and description of any resources found, and outlines the context and condition of these resources. Maps of the localities and field notes must accompany any collected specimens to the scientific institution of curation.

4.18.12 Potentially Significant Unavoidable Impacts

By implementing the above mitigation measures, no potentially significant unavoidable impacts on paleontological resources are expected.