DOCKETED	
Docket Number:	19-SPPE-04
Project Title:	SJ2
TN #:	243991
Document Title:	OCA Comments - FEIR San Jose Data Center
Description:	N/A
Filer:	System
Organization:	Shute, Mihaly & Weinberger LLP/Ada Marquez
Submitter Role:	Public
Submission Date:	7/11/2022 1:52:11 PM
Docketed Date:	7/11/2022

Comment Received From: Ada Marquez
Submitted On: 7/11/2022
Docket Number: 19-SPPE-04

FEIR San Jose Data Center

Additional submitted attachment is included below.

SHUTE, MIHALY & WEINBERGER LLP

396 HAYES STREET, SAN FRANCISCO, CA 94102
T: (415) 552-7272 F: (415) 552-5816
www.smwlaw.com

ADA E. MÁRQUEZ
Urban Planner
amarquez@smwlaw.com

July 11, 2022

Via E-filing and E-Mail

Patricia Monahan
Commissioner and Presiding Member
Kourtney Vaccaro
Commissioner and Associate Member
Lisa Worrall
Project Manager
California Energy Commission
Docket number: 19-SPPE-04
715 P Street, MS-14
Sacramento, California 95814
E-mail: lisa.worrall@energy.ca.gov;
publicadvisor@energy.ca.gov

Re: Final Environmental Impact Report (FEIR) San Jose Data Center
(Docket Number 19-SPPE-04)
Applicant Microsoft Corporation-Small Power Plant Exemption (SPPE)

Dear Commissioner Monahan, Commissioner Vaccaro, and Ms. Worrall:

These comments are submitted on behalf of Organización Comunidad de Alviso ("OCA"). We have reviewed the Final Environmental Impact Report ("FEIR") prepared in connection with Microsoft's proposed San Jose Data Center Project ("Project"). Our client remains deeply concerned about the FEIR's approach to analyzing the Project's impacts in the disadvantaged and low-income community of Alviso.[1]

After carefully reviewing the FEIR, we have concluded that it fails to comply with the requirements of the California Environmental Quality Act ("CEQA"), Public Resources Code section 21000 et seq. The FEIR follows a similarly inadequate Draft Environmental Impact Report ("DEIR"). Prior comments submitted by Ada E. Márquez are by this reference incorporated herein in their entirety, including all

[1] California Climate Investments Priority Populations 2022 CES 4.0

attachments (TN# 241474, 241475, 241476, 241477, 241478, 241479, 241480, 241481, 241482, 241511, 242481, 240572, 240562, 240189, 236959, and 236718). Those comments documented numerous substantive inadequacies in the DEIR's analysis.

The FEIR perpetuates and fails to correct the failings of the DEIR. Moreover, we emphasize with evidence that Staff's responses are not sufficient to address either the DEIR's flaws or the Project's significant, adverse environmental and health impacts. As a result, the Commission cannot lawfully make the findings required to approve this Project pursuant to Public Resources Code section 25541.

I. The FEIR Fails to Comply with CEQA.

A. The FEIR Fails to Adequately Describe Existing Baseline Conditions (Staff Response B-1).

Staff claims that "[t]he DEIR contains detailed description of the environmental setting and baseline conditions at the beginning of each technical area emphasizing aspects of the environmental setting most relevant to the technical area." Response B-1, Part 2, FEIR at 7-36. Staff is incorrect. The environmental baseline conditions described in section 4.3, Air Quality, at 4.3-1 to 4.3-23 do not provide the information necessary to evaluate the Project's direct and cumulative air quality impacts. CEQA Guidelines §15125.[2]

For example, the FEIR fails to disclose the Project's disproportionate environmental impacts in Alviso. As explained in the DEIR comments referenced above,[3]

[2] CEQA Guidelines § 15125(a) provides: "(a) An EIR must include a description of the physical environmental conditions in the vicinity of the project. This environmental setting will normally constitute the baseline physical conditions by which a lead agency determines whether an impact is significant. The purpose of this requirement is to give the public and decision makers the most accurate and understandable picture practically possible of the project's likely near-term and long-term impacts." Subdivision (c) of the same section provides: "Knowledge of the regional setting is critical to the assessment of environmental impacts. Special emphasis should be placed on environmental resources that are rare or unique to that region and would be affected by the project. The EIR must demonstrate that the significant environmental impacts of the proposed project were adequately investigated and discussed and it must permit the significant effects of the project to be considered in the full environmental context."

[3] (TN# 241474, 241475, 241476, 241477, 241478, 241479, 241480, 241481, 241482, 241511, 242481, 240572, 240562, 240189, 236959, and 236718)

Alviso residents are disproportionately affected by ground water contamination, air pollution, and many cumulative environmental issues: the former South Bay Asbestos Area on the National Priority List (NPL), the Union Pacific Railroad, Highway 237, methane vapor from the Newby Island Landfill and Zanker Recycling Zero Waste Energy, the Calpine Energy Plant, facilities with hazardous wastes, large Google warehouses, the Approved Rezoning Development 237 Industrial Center (now the Microsoft San Jose Data Center), RWF Cogeneration Project for the San Jose/Santa Clara Water Pollution Control Plant (WPCP), numerous unpermitted business with diesel trucks, and the Topgolf Entertainment Center.

The proposed Project is also located adjacent to the Los Esteros Critical Energy Facility. The City of San Jose completed the DEIR for Los Esteros Critical Energy Facility/US Dataport in 2000 for the "Planned Development Rezoning from a (PD) Planned Development District to allow installation of 180 megawatt (MW) Natural Gas fired power plant in addition to the previously approved 2.2 million square foot telecommunication equipment facility on a 174 gross acre site." In 2002, the CA Energy Commission issued the license for this project. Since then, several amendments and phases have approved authorization to operate as a 320 MW combined-cycle facility. The conversion of this peak power plant to a base load power plant was significant for this small community. Although a Title V Facility is incompatible with the City of San Jose's zoning requirements, the CA Energy Commission approved this expansion without any regards to the City's environmental and health concerns.

The FEIR also misleadingly and incorrectly downplays the extent to which Alviso is a disadvantaged community. Section 4.2, Environmental Justice, at 7-36 claims, "Census tract 6085504602, which covers the community of Alviso, is not identified under the current version of CalEnviroScreen (4.0) as a disadvantaged community as the overall percentile for this census tract, 67 percent, is below the top 25th percentile used to identify a disadvantaged community based on to the most recent designation in 2017 pursuant to Senate Bill 535." Alviso is as much as 15 feet below sea level and is within the most impacted area known as Economic Impact Area 11.[4] CalEPA's Disadvantaged Communities (DACs) Map[5] clearly shows the Alviso census tract as both disadvantaged

[4] South San Francisco Bay Shoreline Study, https://southbayshoreline.org/.

[5] *See* California Climate Investments Priority Populations 2022 CES 4.0. In this designation, CalEPA formally designated four categories of geographic areas as disadvantaged: (1) Census tracts receiving the highest 25 percent of overall scores in CalEnviroScreen 4.0 (1,984 tracts); (2) Census tracts lacking overall scores in

and low-income (Figure 1).

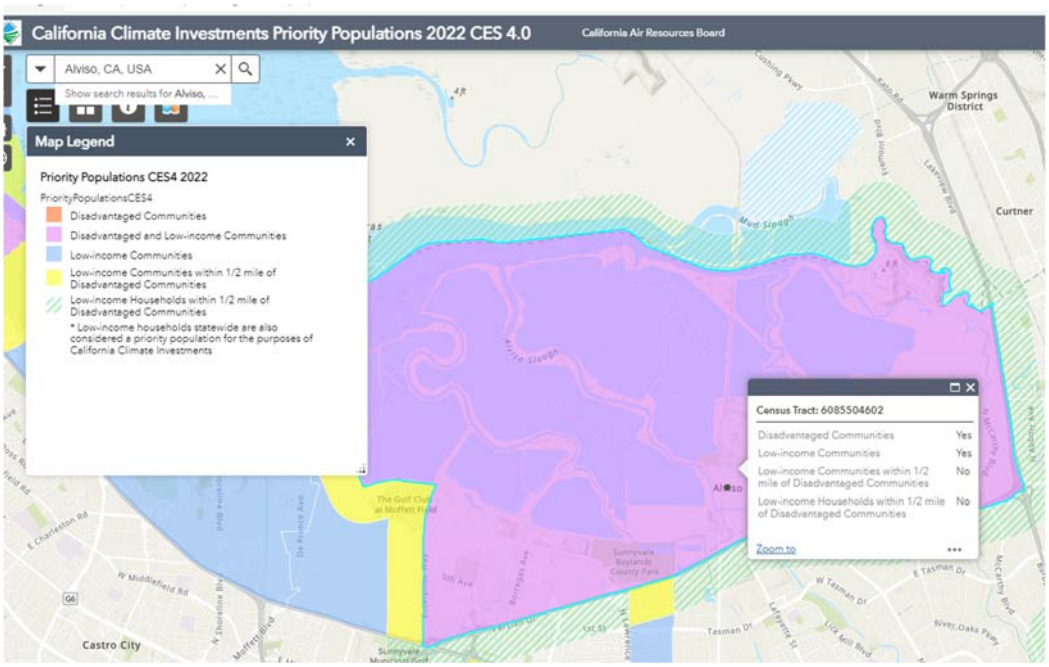

Figure 1: Alviso is both a disadvantaged and low-income community.

An EIR's description of the environmental setting must contain sufficient information to "permit the significant effects of the project to be considered in the full environmental context." CEQA Guidelines § 15125(c). "If the description of the environmental setting 'is inaccurate, incomplete or misleading, the EIR does not comply with CEQA.'" *Cleveland National Forest Foundation v. San Diego Assn. of Governments*, 17 Cal.App.5th 413, 439 (2017) (citation omitted). An accurate description of the environmental setting is critical, because the significance of an activity may vary with the setting. CEQA Guidelines, § 15064(b). A "project that is ordinarily insignificant in its impact on the environment may in a particularly sensitive environment be significant." CEQA Guidelines § 15300.2(a); *see also Kings County Farm Bureau v. City of Hanford*, 221 Cal. App. 3d 692, 718, 721 (1990). *Sierra Club v. State Bd. of Forestry*,

---

CalEnviroScreen 4.0 due to data gaps, but receiving the highest 5 percent of CalEnviroScreen 4.0 cumulative pollution burden scores (19 tracts); (3) Census tracts identified in the 2017 DAC designation as disadvantaged, regardless of their scores in CalEnviroScreen 4.0 (307 tracts); and (4) Lands under the control of federally recognized Tribes.

7 Cal. 4th 1215, 1228 (1994); Pub. Res. Code § 21160.

Absent accurate and complete information about the environmental setting for this Project, meaningful analysis of the Project's impacts is impossible. The Commission thus cannot lawfully conclude on the basis of this FEIR that the Project will not have a significant environmental impact.

B. The FEIR Improperly Delegates the Commission's Responsibility for Enforcing Mitigation (Staff Response B-2).

The staff response at page 7-37 of the FEIR fails to address or remedy an unlawful delegation of the Commission's ultimate responsibility as lead agency for Project mitigation. The FEIR contemplates in section 2.4.3 that the City of San Jose and the Bay Area Air Quality Management District would be responsible for enforcing Project mitigation as *responsible* agencies. A letter dated May 4, 2022, on behalf of the City of San Jose similarly states that "The City of San José will serve as the enforcement agency for the MMRP, ensuring the San José Data Center complies with all requirements outlined in the MMRP."[6]

As explained in the prior comments referenced above, the FEIR's approach violates CEQA. CEQA Guidelines § 15097(a) provides that "[a] public agency may delegate reporting or monitoring responsibilities to another public agency or to a private entity which accepts the delegation; however, *until mitigation measures have been completed the lead agency remains responsible for ensuring that implementation of the mitigation measures occurs* in accordance with the program" (emphasis added). Ms. Worrell's letter, moreover, was submitted prior to the project approval and the certification of the FEIR. The Commission cannot delegate its ultimate responsibility for Project mitigation to a responsible agency until mitigation is complete. As a result of the FEIR's improper delegation, Project mitigation cannot be considered adequate or enforceable, and cannot form the basis of the findings required by either CEQA or Public Resources Code section 25541.

C. The FEIR Improperly Confines its Analysis to the Project Footprint, and Thus Fails to Analyze the Environmental Impacts of the Project on Offsite Infrastructure Alignment Areas (Staff Response B-3).

As explained in the prior comments referenced above, the EIR fails to analyze the impacts of offsite "linear facilities" or "linears" required for the Project. According to

[6] TN242932.

Figure 3-2 at FEIR 3-3, these "linears" include a proposed storm drain, water lines, and other infrastructure improvements that extend from the Data Center's proposed buildings to Zanker Road and to Nortech Parkway. The FEIR claims that "[t]he DEIR addresses the impacts of the linears in the relevant technical areas. (See pages: 1-1 Project Summary, 4.4-32 Mitigation Measures BIO-17, BIO-18, BIO-19, BIO-20, 4.5-9 Cultural and Tribal Cultural Resources, 4.5.1 Environmental Setting, 4.15-6 Parks Construction, 4.20-2 Mandatory Findings of Significance.)" FEIR at 7-38. The FEIR also claims that construction-phase impacts, including linear facilities, were addressed in the DEIR's Project Description, and that mitigation measure AQ-1 would apply. Yet none of the DEIR pages cited above contains the *analysis* of the environmental impacts of offsite infrastructure alignment areas required by CEQA Guidelines §§ 15126 and 15126.2. A mere description of the Project is not in itself an adequate analysis of the Project's impacts. Moreover, the FEIR cannot rely on mitigation measures to supply the missing analysis; analysis of impacts informs development of mitigation, not the other way around. Absent adequate analysis, neither the public nor decisionmakers can make informed decisions about the Project's impacts. The EIR must be revised to provide the assessment of the short-term, long-term, direct, and indirect impacts to the environment that CEQA requires.

D. The FEIR Does Not Provide an Adequate Environmental Justice Analysis (Staff Response B-4 and B-5).

Despite community representatives having met with CEC Staff and submitted numerous letters on the DEIR, the FEIR's environmental justice analysis still improperly excludes the community of Alviso. The Alviso census tract, 6085504602, is within a 6-mile radius of the proposed Project. In addition to all the maps and figures included in the DEIR comment letter, the maps below provide evidence the proximity of the project to the elementary school (~1.79 miles) (Figure 2) and the community of Alviso (~1.94 miles) (Figure 3). The FEIR at 7-45 acknowledges that "the residential area in the Alviso community is an environmental justice population" and claims that "staff considered potential project impacts to this community and the other environmental justice populations residing within a six-mile radius of the project site. See DEIR Section 4.21 covering environmental justice." However, the referenced DEIR sections (4.21 at 4.21-1 to 4.21-23) completely avoid any documentation or analysis of the Alviso community (census tract 6085504602). DEIR Figure 4.21-1 and the FEIR at 4.21-8 (Minority Population and Disadvantaged Communities) clearly show Alviso within a six-mile radius of the Project. However, FEIR Tables 4.21-4 and 4.21-5 (CALENVIROSCREEN INDICATOR PERCENTILES FOR POLLUTION BURDEN and POPULATION CHARACTERISTICS FOR DISADVANTAGED COMMUNITIES), only show results

for percentile 90 or above, and thus do not include Alviso.

The EIR's omission of any environmental impact analysis of Alviso because it does not exceed the 90th percentile in CalEnviroScreen is incorrect and misleading. Per the Senate Bill (SB) 535, Alviso's census tract 6085504602[7] is a disadvantaged community; per Assembly Bill (AB) 1550, the tract is low-income as well.[8] SB 535 Disadvantaged communities in California are designated to receive investments and proceeds from the state's Cap-and-Trade Program (Figure 4). Other power plant facilities with significant emissions are also located withing the vicinity (Figure 5). CalEPA designates the disadvantaged communities for SB 535 and AB 1550. Low-income communities and households are defined as "the census tracts and households, respectively, that are either at or below 80 percent of the statewide median income, or at or below the threshold designated by the California Department of Housing and Community Development (HCD)." Under Title VI of the federal Civil Rights Act, any state agency that receives funds from the EPA is "legally prohibited from discriminating on the basis of race, color or national origin."[9] Under state law: "[E]nvironmental justice" means the fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies. (Gov. Code, § 65040.12, subd. (e)).[10]The FEIR must be revised to resolve these deficiencies and recirculated for public review and comment.

---

[7] https://webmaps.arb.ca.gov/PriorityPopulations/

[8] The CalEnviroScreen 4.0 Report states that "Census tracts with unreliable estimates received no score for the indicator (null). The indicator was not factored into that tract's overall CalEnviroScreen score." (Office of Environmental Health Hazard Assessment (OEHHA), CalEnviroScreen 4.0, 2021, p. 183.) https://oehha.ca.gov/media/downloads/calenviroscreen/report/calenviroscreen40reportf2021.pdf

[9] *See* https://www.epa.gov/environmentaljustice/title-vi-and-environmental-justice#:~:text=Under%20Title%20VI%2C%20EPA%20has,Title%20VI%20regulations%20since%201973; *see also* Gov. Code § 11135(a) (prohibiting discrimination in "any program or activity that is conducted, operated, or administered by the state or any state agency").

[10] *See* https://oag.ca.gov/environment/justice.

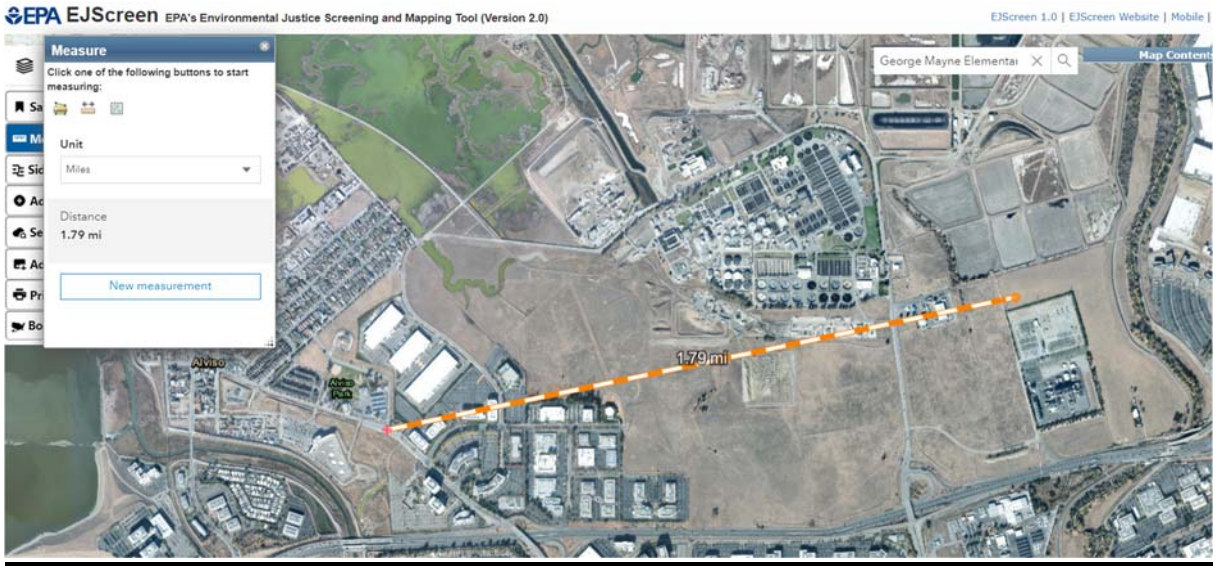

Figure 2: The distance from the Project to George Mayne Elementary School is approximately 1.79 miles.

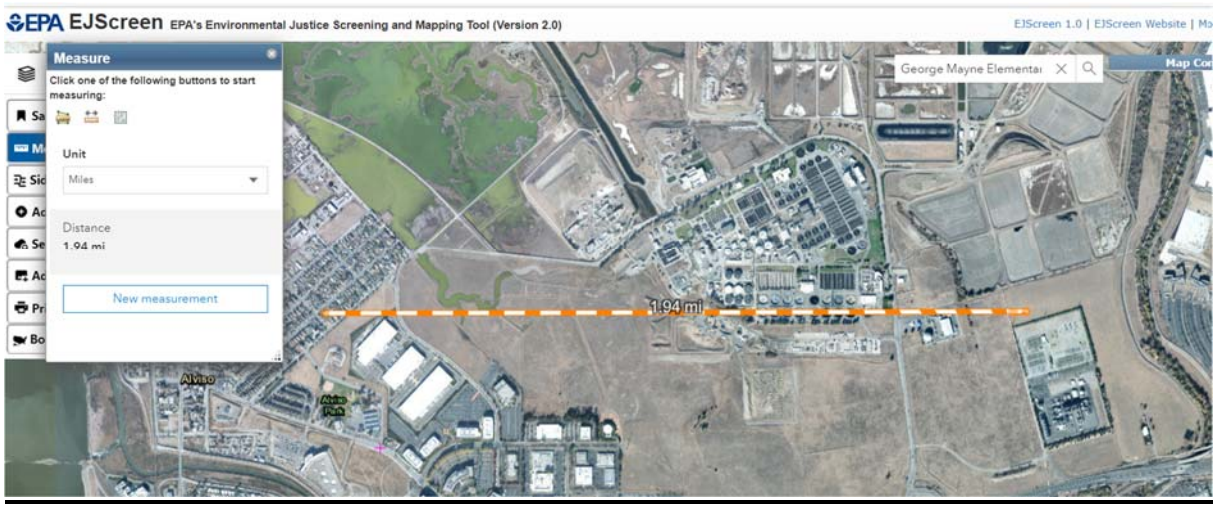

Figure 3: The distance from the Project to the Alviso residential area is approximately 1.94 miles.

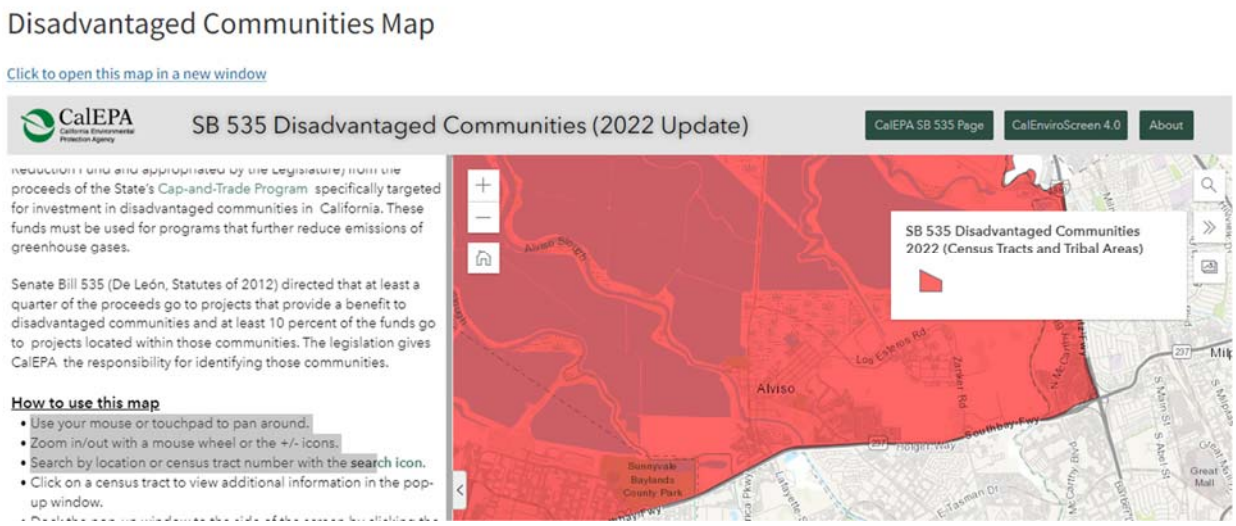

Figure 4: Per CalEPA, Alviso is identified as a disadvantaged community.[11]

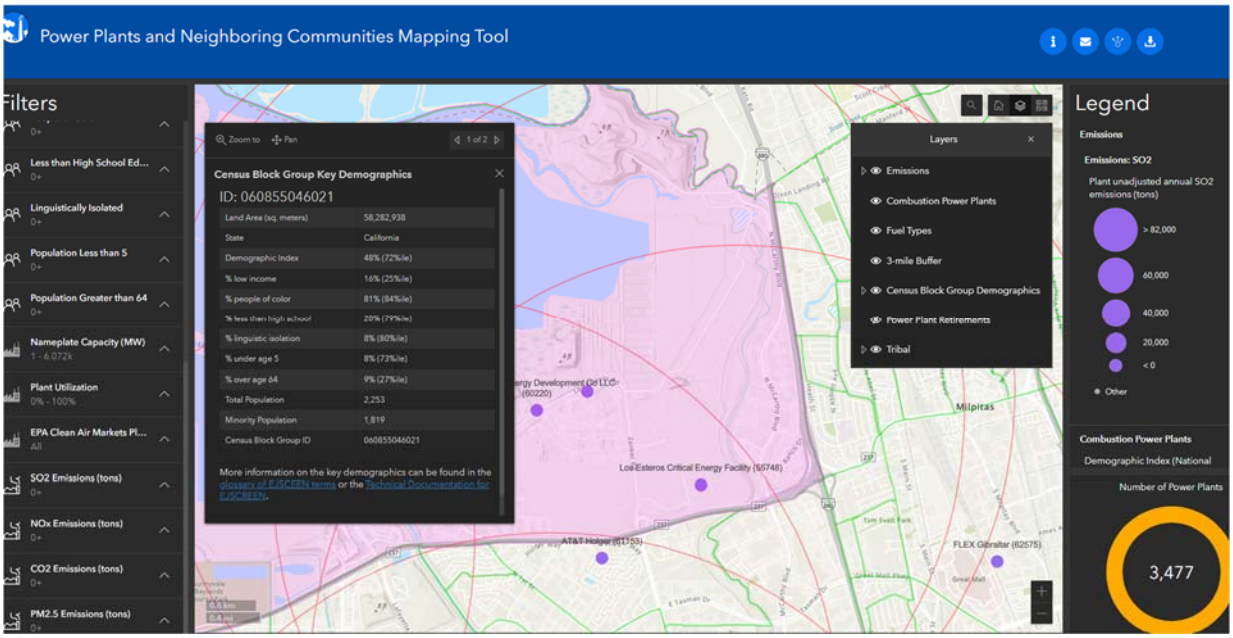

Figure 5: Several facilities are located within the Project and the Alviso community.

[11] SB 535 Disadvantaged Communities | OEHHA (ca.gov)

E. The FEIR's Analysis and Mitigation for Air Quality Impacts are Inadequate (Staff Responses B-6, B-7, B-8, B-9, B-10, B-11, B-12).

As discussed in prior comments, the EIR relies on outdated air quality significance thresholds to dismiss evidence that the Project's air quality impacts are significant. Staff incorrectly concludes, "The commenter seems to imply that the BAAQMD's 2017 CEQA Air Quality Guidelines are inadequate to determine the significance of potential air emissions because the BAAQMD has not fully updated methodologies and some technical information related to the updated Air Quality Guidelines. No changes to the DEIR are required in response to this comment." FEIR at 7-39. Per CEQA Guidelines section 15064, however, compliance with a significance threshold "does not relieve a lead agency of the obligation to consider substantial evidence indicating that the project's environmental effects may still be significant." There is ample evidence that air pollution levels below established thresholds affects public health.[12]

As stated in prior comments, the BAAQMD thresholds (2017) of significance for air quality analysis were adopted in 2010. Those thresholds do not reflect significant court cases, legislative requirements, and updated methodologies since 2010.[13] Staff also

---

[12] The scientific evidence of air pollutant levels below government thresholds impacting public health is well documented across various disciplines (including public health, environmental health sciences, environmental engineering, toxicology, and epidemiology.). For example, BAAQMD held a symposium on October 28, 2019, at which Dr. Christopher Frey demonstrated that the current standards for $PM_{2.5}$ annual and 24-hour standards are not adequate to protect public health. See https://www.baaqmd.gov/news-and-events/conferences/pm-conference; see also ac_particulate_matter_reduction_strategy_report.pdf (baaqmd.gov).

[13] Some examples used for CEQA not reflected in the BAAQMD CEQA Guidelines (2017) document: Warehouse Projects: Best Practices and Mitigation Measures to Comply with the California Environmental Quality Act; General Plan Guidelines - Chapter 8 (ca.gov); Climate Change; 2017 Scoping Plan Documents | California Air Resources Board; 2017 Scoping Plan, Appendix B Local Action ; 2030 Scoping Plan, Appendix C Vibrant Communities and Strategies to Reduce VMT (ca.gov); SB 743, CEQA Guidelines § 15064.3, Determining the Significance of Transportation Impacts. Assembly Bill (AB 617) also requires air districts and communities with disproportionate impacts from air pollution to adopt and implement a community emissions reduction plan. The cumulative exposure to air pollutants has a significant impact to human health, especially to sensitive receptors. The District adopted the West Oakland Community

concludes that the Supreme Court's Friant Ranch[14] decision does not apply to this project. FEIR at 7-41 and 7-44. This conclusion is legally incorrect. A ruling from the California Supreme Court applies to any CEQA project, because CEQA requires lead agencies to disclose and inform the public and decisionmakers about the health impacts of all projects. The EIR must be revised to comply with the Friant Ranch decision. In particular, it must identify the location of sensitive receptors within the community of Alviso that will be adversely impacted by the Project (including by the offsite infrastructure improvements), and must meaningfully address how the air pollutant emission increases from the project may affect public health at those locations. The cumulative impacts analysis also must analyze any additional air emissions from the Los Esteros Power Plant and other past, present, and reasonably foreseeable future projects. Finally, it light of this revised analysis, the EIR must evaluate mitigation measures and/or alternatives to avoid air quality impacts. **(Attachment A: Los Esteros Power Plant)**

F. The FEIR Fails to Analyze and Mitigate Biological Resources (Staff Responses B-13 and B-14).

The FEIR fails to accurately depict the biological resources setting and understates the severity of the Project's impacts to wildlife, specifically golden eagles. FEIR at 7-50 to 7-52. Staff asserts that it has complied with CEQA by providing an "overview of the regulatory framework, including those specific to golden eagles." FEIR at 7-50. Staff also claims "Golden eagles are adequately protected by mitigation measures BIO-1 through BIO3, BIO-13 and BIO-20." FEIR at 7-51. "As staff has conducted extensive outreach to USFWS and other local agencies without having concerns expressed, no changes to golden eagle mitigation have been made." FEIR at 7-51. Per the California and Nevada Golden Eagle Working Group: The word "raptor" is the term used for a group of birds consisting of hawks, falcons, kites, eagles, vultures and owls. Raptors, also referred to as "birds of prey", are a valuable resource to the State of California, and therefore all raptors

---

Action Plan (2019) which analyzed the sources, PM2.5, diesel PM, and toxic air contaminants (TACs) emissions to develop an integrated multi-pollutant plan to eliminate air pollution disparities and protect public health. Prior to AB 617, the District's air toxics program was established to address the adverse health effects from exposure to TACs. The Community Air Risk Evaluation (CARE) Program identified areas in the Bay Area with high levels of air pollution, to reduce local health impacts, and develop strategies to protect health. Regulation 11, Rule 18: Reduction from Air Toxic Emissions at Existing Facilities adopted in 2017, requires screening analyses for facilities, HRA's, and require Best Available Retrofit Control Technology for significant sources of TAC pollutants.

[14] *Sierra Club v. County of Fresno*, 6 Cal.5th 502, 521 (2018).

are protected under State law (See Fish and Game Code, Sections 3503, 3503.5, 3505 and 3513, and California Code of Regulation, Title 14, Sections 251.1, 652 and 783-786.6). Fully Protected species may not be taken or possessed at any time and no licenses or permits may be issued for their take. (Raptors of California)

Staff's conclusions are unsupported. The FEIR does not provide any biological studies for golden eagles within the Project site and the offsite infrastructure improvement areas. An overview of the regulatory framework, ambiguous mitigation measures, and the mere absence of explicit objections from other government agencies does not provide scientific documentation or substantial evidence to conclude the biological impacts would be reduced to less than significant level. **(Attachment B: Biological Resources)** The permanent destruction of habitat must be fully analyzed and mitigation must be supported with substantial evidence. The FEIR fails to meet these requirements.

G. The FEIR Fails to Analyze Cumulative Impacts and Mitigate the Significant Impacts of the Project per CEQA Guidelines §15130 (Staff Responses B-14, B-15, B-16).

The EIR's failure to undertake an analysis of the Project's cumulative effects in compliance with CEQA's clear requirements is another fatal flaw requiring that the FEIR be revised and recirculated.[15] An EIR shall discuss cumulative impacts of a project when the project's incremental effect is cumulatively considerable. According to CEQA Guidelines section 15065(a)(3), "[t]he incremental effects of an individual project are cumulatively considerable if the effects are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects." The FEIR lacks facts and analysis to support its conclusion that the contribution will be less than cumulatively considerable for environmental justice, air quality,[16] and biological resources.

Finally, Staff's responses do not adequately address prior comments and evidence regarding the impacts of this Project. Appendices A-D in prior comments on the DEIR provide evidence that the DEIR failed to disclose the severity of environmental impacts from data centers, legal evidence from other data centers, and other current scientific evidence and methodologies omitted by Staff. The FEIR cursorily dismisses this evidence, stating that "Staff has reviewed these documents and find they are either not

[15] *Kings County Farm Bureau v. City of Hanford,* 221 Cal. App. 3d 692, 717-18 (1990).

[16] *See* ARB's Community Health: Air Quality and Land Use (ca.gov).

relevant to the project or do not result in the need to make any changes to the DEIR." FEIR at 7-54. Staff is incorrect because the attached appendices contain scientific evidence from government agencies applicable for CEQA compliance and data centers. The EIR must consider this evidence in connection with determining whether the Project will have significant environmental effects.

H. The FEIR Fails to Analyze or Provide Adequate Mitigation for Greenhouse Gas Emissions.

The FEIR's conclusion that the Project's greenhouse gas emissions would be less than significant is unsupported. The Project would result in significant greenhouse gas emissions from both construction and operation. The FEIR used the BAAQMD CEQA Guidelines numeric threshold of 10,000 MTCO2e/yr to analyze stationary sources requiring permits from the BAAQMD (BAAQMD 2017b) as significance criteria. FEIR at 4.8-11.This BAAQMD numeric threshold was approved in 2010 to comply with the AB 32 Scoping Plan 2020 goals. This aforementioned BAAQMD numeric threshold does not show compliance with California's 2030, 2045, and 2050 climate goals, as documented by BAAQMD NOP's comment letter dated March 1, 2021. FEIR Table 4.8-3, Greenhouse Gas Emissions from Project Stationary Sources, shows that operation of the Project's natural gas-fired generators will emit a total of 33,577 metric tons CO2-equivalent per year (MTCO2e/yr), which exceeds outdated BAAQMD's Thresholds. FEIR 4.8-13. The project triggers the Cap-and Trade Program threshold of 25,000 MTCo2e/yr. As stated previously, the community of Alviso is both identified per SB 535 and AB 1550. The FEIR must also disclose any other Cap-and-Trade facilities in Alviso.

For all project related GHG emission sources, the FEIR cites the City of San Jose 2030 GHG Reduction Strategy as a significance criteria. FEIR at 4.8-11. The FEIR does not provide evidence that the City of San Jose can provide at the Total Green[17] level (100 percent carbon-free electricity) for the life time of the project to comply with carbon neutrality by 2045 (EO B-55-18) and 80% below 1990 levels by 2050 (EO B-30-15 and EO S-3_05). In addition, the site of San Jose Data Center (237 Industrial Center Project) Special Use Permit (File No. SP16-053) expired on October 24th, 2020. TN#237358. Therefore, the Natural Gas Prohibition Exemption from the City of San Jose is not valid per Municipal Code CHAPTER 17.845 - Prohibition of Natural Gas Infrastructure in Newly Constructed Buildings. TN#241513. The record does not support the FEIR's conclusion that mitigation measures GHG-1 and GHG-2 will reduce this impact to a less-than-significant level. Indeed, the mitigation proposed in the FEIR is both legally

[17] *See* https://sanjosecleanenergy.org/energy-sources/.

deficient and without substantial evidentiary support.

The Project proposes to use "renewable natural gas and renewable diesel to the maximum extent feasible" to increase the portion of biogenic CO2 emitted by the project. FEIR at 4.8-14 (quoting Jacobs 2021o, pg. 3.8-9). Based on this proposal, Staff "conclude[d] the measure is sufficient to reduce impacts." *Id.* However, mitigation measure GHG-1 does not contain the enforceable commitment to mitigation that CEQA requires. Changes to the DEIR removed the requirement that the Project actually *use* renewable natural gas, and replaced it with a vague requirement that the project owner "*purchase* renewable natural gas in an amount equivalent to the total energy use" of the generators, "which *may* require securing renewable fuel from PG&E and other suppliers." FEIR at 4.8-26. Nowhere does measure GHG-1 address what the "project owner" will do with its "purchased" renewable natural gas. Nor does measure GHG-1 represent a commitment to use even a single cubic foot of renewable natural gas as part of this Project. CEQA requires a clear, enforceable commitment to mitigation in order to support a conclusion that project impacts have been mitigated to a less-than-significant level. *See* CEQA Guidelines § 15126.4 ("Mitigation measures must be fully enforceable through permit conditions, agreements, or other legally binding instruments. In the case of the adoption of a plan, policy, regulation, or other public project, mitigation measures can be incorporated into the plan, policy, regulation, or project design."). CEQA also requires that mitigation measures be described in terms sufficient for the public and decision-makers to evaluate their effectiveness. *See King and Gardiner Farms v. County of Kern*, 45 Cal. App. 5th 814, 869-70 (2020). The FEIR fails to meet all of these standards.

Nor is there substantial evidence to support a conclusion that measure GHG-1 can or will be implemented. As the FEIR itself concedes, "[t]he potential providers of renewable natural gas and renewable diesel are presently unknown, and staff did not request evidence of the project's ability to secure these supplies." FEIR at 4.8-15. Staff thus effectively *admits* that the evidence necessary to support conclusions based on measure GHG-1 is missing. CEQA requires that mitigation measures actually be implemented, "not merely adopted and then neglected or disregarded." *Federation of Hillside and Canyon Ass'ns v. City of Los Angeles*, 83 Cal. App. 4th 1252, 1261. Like the uncertain traffic mitigation measures in *Federation*, Measure GHG-1 similarly lacks the evidence necessary to support a binding commitment to implementation. *See id.* at 1260-62.

Nor does the FEIR offer any evidentiary basis for its conclusion that the CO2e emissions from combustion of natural gas may be completely disregarded in the significance analysis. For example, the FEIR does not even attempt to identify the

possible sources of "renewable" natural gas, the feedstocks from which it might be derived, the emissions associated with its production and transmission, or the relative carbon intensity of whatever "renewable" gas the "project owner" might decide to purchase. At best, the FEIR merely cites the BAAQMD CEQA Guidelines. But those guidelines similarly do not explain or support the basis for completely disregarding the greenhouse gas emissions that will result from combustion of even 100% renewable natural gas at this facility.

Measure GHG-1 is also deficient with respect to use of renewable diesel in the Project's "administrative" generators. The measure requires use of renewable diesel only "to the extent feasible." FEIR at 4.8-26. This is plainly inadequate under CEQA, which requires a commitment to actual, feasible mitigation at the time of project approval, not just a promise to do whatever the applicant decides is "feasible" in the future. *See King & Gardiner Farms*, 45 Cal. App. 5th at 857-58 (promise to maximize reuse of oil and gas wastewater to the extent feasible unlawfully deferred mitigation contrary to CEQA).

The Project also fails to analyze and mitigate refrigerant use. "The proposed data center buildings would use refrigerants in the operation of two packaged air handling units and up to 72 split system condensing units used for administrative purposes or generator cooling. The applicant review of manufacturer data indicates that the facility's systems would have a total capacity of 1,396 pounds of R-410A, which qualifies as a high-GWP refrigerant. Assuming a conservatively high annual leak rate for commercial cooling equipment of up to 20 percent (Jacobs 2021s, Appendix 3.3B, Table 16), and the ARB-default GWP for R- 410A of 2,088, the fugitive emissions would occur at a refrigerant leak rate of approximately 279 pounds of R-410A per year or 264 metric tons of CO2e per year." FEIR at 4.8-16. Per the CA Air Resources Board, refrigerants are regulated under the Refrigerant Management Program (RMP) as defined in Title 40 of the Code of Federal Regulations, Part 82, and "any compound with a global warming potential (GWP) value equal to or greater than 150 GWP."[18] Facilities with 50 pounds of high GWP refrigerant must register with the RMP. Annual reporting and additional requirements apply to facilities with at least 200 pounds of high GWP.[19] Since refrigerants are thousands of times more polluting than carbon dioxide, the FEIR must show compliance with California's GHG reduction targets, Senate Bill 1383 Short-Lived Climate Pollutant Strategy, and California Code of Regulations, Title 17, Division 3,

[18] https://ww2.arb.ca.gov/resources/documents/high-gwp-refrigerants

[19] *See* https://ww2.arb.ca.gov/our-work/programs/refrigerant-management-program.

Chapter 1, Subchapter 10 Climate Change, Article 4.[20]

The maximum GHG emissions from electricity use, mobile sources, and facility upkeep totals 83,078 MTCO2e/yr. In combination with the 33,577 MTCO2e/yr from the natural gas generators, the Project will have total *actual* emissions of 116,655 MTCO2e/yr. The FEIR's mitigation measures are both legally deficient and unsupported by substantial evidence and thus do not comply with CEQA. The Commission cannot approve the Project or make the findings required by Public Resources Code section 25541 on the basis of this FEIR.

II. The EIR Must Be Revised and Recirculated.

CEQA requires recirculation of an EIR when significant new information is added to the document after notice and opportunity for public review was provided. Pub. Res. Code § 21092.1; CEQA Guidelines § 15088.5. "Significant new information" includes: (1) information showing a new, substantial environmental impact resulting either from the project or from a mitigation measure; (2) information showing a substantial increase in the severity of an environmental impact not mitigated to a level of insignificance; (3) information showing a feasible alternative or mitigation measure that clearly would lessen the environmental impacts of a project and the project proponent declines to adopt the mitigation measure; or (4) instances where the draft EIR was so fundamentally and basically inadequate and conclusory in nature that public comment on the draft EIR was essentially meaningless. *Laurel Heights Improvements Ass'n v. Regents of Univ. of Cal*, 6 Cal. 4th 1112, 1130 (1993).

Here, the flaws in the DEIR and FEIR are extensive, impeding the ability of the public to meaningfully comment. As discussed in the prior comments referenced above, the FEIR must be revised and recirculated to comply with CEQA. Unless and until the Commission prepares an EIR that meets CEQA's requirements, the Project cannot lawfully be approved.

Thank you for your consideration of our comments.

[20] *See* https://ww2.arb.ca.gov/our-work/programs/refrigerant-management-program/about.

Very truly yours,

SHUTE, MIHALY & WEINBERGER LLP

/s/ *Ada E. Márquez*

Ada E. Márquez, Urban Planner

AEM/dhw

Attachment A: Los Esteros Power Plant

Attachment B: Biological Resources

1532597.4

ATTACHMENT A

Detailed Facility Report

Facility Summary

LOS ESTEROS CRITICAL ENERGY FACILITY

800 THOMAS FOON CHEW WAY, SAN JOSE, CA 95134

FRS (Facility Registry Service) ID: 110013666425
EPA Region: 09
Latitude: 37.425
Longitude: -121.9319
Locational Data Source: CAMDBS
Industries: Utilities
Indian Country: N

Enforcement and Compliance Summary

Statute	CAA
Compliance Monitoring Activities (5 years)	2
Date of Last Compliance Monitoring Activity	04/14/2021
Compliance Status	No Violation Identified
Qtrs in Noncompliance (of 12)	0
Qtrs with Significant Violation	0
Informal Enforcement Actions (5 years)	--
Formal Enforcement Actions (5 years)	2
Penalties from Formal Enforcement Actions (5 years)	$5,000
EPA Cases (5 years)	--
Penalties from EPA Cases (5 years)	--

Statute	CWA
Compliance Monitoring Activities (5 years)	--
Date of Last Compliance Monitoring Activity	--
Compliance Status	No Violation Identified
Qtrs in Noncompliance (of 12)	0
Qtrs with Significant Violation	0
Informal Enforcement Actions (5 years)	--
Formal Enforcement Actions (5 years)	--
Penalties from Formal Enforcement Actions (5 years)	--
EPA Cases (5 years)	--
Penalties from EPA Cases (5 years)	--

Statute	RCRA
Compliance Monitoring Activities (5 years)	--
Date of Last Compliance Monitoring Activity	--
Compliance Status	No Violation Identified
Qtrs in Noncompliance (of 12)	0
Qtrs with Significant Violation	0
Informal Enforcement Actions (5 years)	--
Formal Enforcement Actions (5 years)	--
Penalties from Formal Enforcement Actions (5 years)	--
EPA Cases (5 years)	--
Penalties from EPA Cases (5 years)	--

Regulatory Information

Clean Air Act (CAA): Operating Major (CABAA00006085B3289)

Clean Water Act (CWA): Minor, Permit Expired (CAZ184310)

Resource Conservation and Recovery Act (RCRA): Active LQG, (CAL000275218), Active SQG, (CAR000218420)

Safe Drinking Water Act (SDWA): No Information

Go To Enforcement/Compliance Details
Known Data Problems

Other Regulatory Reports

Air Emissions Inventory (EIS): 9991311

Greenhouse Gas Emissions (eGGRT): 1000175

Toxic Releases (TRI): No Information

Compliance and Emissions Data Reporting Interface (CEDRI): No Information

Facility/System Characteristics

Facility/System Characteristics

System	Statute	Identifier	Universe	Status	Areas	Permit Expiration Date	Indian Country	Latitude	Longitude
FRS		110013666425					N	37.425	-121.9319
ICIS-Air	CAA	CABAA00006085B3289	Major Emissions	Operating	CAASIP, CAATVP		N	37.425	-121.931889
CAMDBS	CAA	55748		ACTIVE			N		
EIS	CAA	9991311					N	37.42501	-121.93214
GHGRP	CAA	1000175	Direct Emitter	Reporting Year 2020: Reporting and meeting Verification requirements.	Electricity Generation		N		
ICIS-NPDES	CWA	CAZ184310	Minor: General Permit Covered Facility	Expired	Industrial Stormwater	06/30/2020	N	37.25084	-121.79569
RCRAInfo	RCRA	CAL000275218	LQG	Active (H)			N	37.422706	-121.936793
RCRAInfo	RCRA	CAR000218420	SQG	Active (H)			N	37.422706	-121.936793

Facility Address

System	Statute	Identifier	Facility Name	Facility Address	Facility County
FRS		110013666425	LOS ESTEROS CRITICAL ENERGY FACILITY	800 THOMAS FOON CHEW WAY, SAN JOSE, CA 95134	Santa Clara County
ICIS-Air	CAA	CABAA00006085B3289	LOS ESTEROS CRITICAL ENERGY FACILITY	800 THOMAS FOON CHEW WAY, SAN JOSE, CA 95134	Santa Clara County
CAMDBS	CAA	55748	LOS ESTEROS CRITICAL ENERGY FACILITY	CA	Santa Clara County
EIS	CAA	9991311	LOS ESTEROS CRITICAL ENERGY FACILITY	800 THOMAS FOON CHEW WAY, SAN JOSE, CA 95134	Santa Clara County
GHGRP	CAA	1000175	Los Esteros Critical Energy Fac	800 THOMAS FOON CHEW WAY, SAN JOSE, CA 95134	Santa Clara County
ICIS-NPDES	CWA	CAZ184310	LOS ESTEROS CRITICAL ENERGY FACILITY LLC	800 THOMAS FOON CHEW WY, SAN JOSE, CA 95134	Santa Clara County
RCRAInfo	RCRA	CAL000275218	LOS ESTEROS CRITICAL ENERGY FACILITY	800 THOMAS FOON CHEW WAY, SAN JOSE, CA 95134	Santa Clara County
RCRAInfo	RCRA	CAR000218420	LOS ESTEROS CRITICAL ENERGY FACILITY PHASE 2	800 THOMAS FOON CHEW WAY, SAN JOSE, CA 95134	Santa Clara County

Facility SIC (Standard Industrial Classification) Codes

System	Identifier	SIC Code	SIC Description
CAMDBS	55748	4911	Electric Services
ICIS-Air	CABAA00006085B3289	4911	Electric Services
ICIS-NPDES	CAZ184310	4911	Electric Services

Facility NAICS (North American Industry Classification System) Codes

System	Identifier	NAICS Code	NAICS Description
GHGRP	1000175	221112	Fossil Fuel Electric Power Generation
CAMDBS	55748	221112	Fossil Fuel Electric Power Generation
EIS	9991311	221112	Fossil Fuel Electric Power Generation
ICIS-Air	CABAA00006085B3289	221112	Fossil Fuel Electric Power Generation
RCRAInfo	CAL000275218	221112	Fossil Fuel Electric Power Generation
RCRAInfo	CAR000218420	221112	Fossil Fuel Electric Power Generation

Facility Industrial Effluent Guidelines

Identifier	Effluent Guideline (40 CFR Part)	Effluent Guideline Description

No data records returned

Facility Tribe Information

Reservation Name	Tribe Name	EPA Tribal ID	Distance to Tribe (miles)

No data records returned

Enforcement and Compliance

Compliance Monitoring History

Last 5 Years

Statute	Source ID	System	Activity Type	Compliance Monitoring Type	Lead Agency	Date	Finding (if applicable)
CAA	CABAA00006085B3289	ICIS-Air	Inspection/Evaluation	PCE Title V CCR	Local	07/06/2021	
CAA	CABAA00006085B3289	ICIS-Air	Inspection/Evaluation	FCE On-Site	Local	04/14/2021	

Entries in italics are not counted in EPA compliance monitoring strategies or annual results.

Compliance Summary Data

Statute	Source ID	Current SNC (Significant Noncompliance)/HPV (High Priority Violation)	Current As Of	Qtrs with NC (Noncompliance) (of 12)	Data Last Refreshed
CAA	CABAA00006085B3289	No	07/02/2022	0	07/01/2022
CWA	CAZ184310	No	03/31/2022	0	07/01/2022
RCRA	CAL000275218	No	07/02/2022	0	07/01/2022
RCRA	CAR000218420	No	07/02/2022	0	07/01/2022

Three-Year Compliance History by Quarter

Statute	Program/Pollutant/Violation Type	QTR 1	QTR 2	QTR 3	QTR 4	QTR 5	QTR 6	QTR 7	QTR 8	QTR 9	QTR 10	QTR 11	QTR 12+
CAA (Source ID: CABAA00006085B3289)		07/01-09/30/19	10/01-12/31/19	01/01-03/31/20	04/01-06/30/20	07/01-09/30/20	10/01-12/31/20	01/01-03/31/21	04/01-06/30/21	07/01-09/30/21	10/01-12/31/21	01/01-03/31/22	04/01-06/30/22
	Facility-Level Status	No Violation Identified	No Violation Identified	No Violation Identified	No Violation Identified	No Violation Identified	No Violation Identified	No Violation Identified	No Violation Identified	No Violation Identified	No Violation Identified	No Violation Identified	No Violation Identified
	HPV History												
	Violation Type / Agency / Programs / Pollutants												

Statute	Program/Pollutant/Violation Type	QTR 1	QTR 2	QTR 3	QTR 4	QTR 5	QTR 6	QTR 7	QTR 8	QTR 9	QTR 10	QTR 11	QTR 12	QTR 13+
CWA (Source ID: CAZ184310)		04/01-06/30/19	07/01-09/30/19	10/01-12/31/19	01/01-03/31/20	04/01-06/30/20	07/01-09/30/20	10/01-12/31/20	01/01-03/31/21	04/01-06/30/21	07/01-09/30/21	10/01-12/31/21	01/01-03/31/22	04/01-07/01/22
	Facility-Level Status	No Violation Identified	No Violation Identified	No Violation Identified	No Violation Identified	No Violation Identified	No Violation Identified	No Violation Identified	No Violation Identified	No Violation Identified	No Violation Identified	No Violation Identified	No Violation Identified	Undetermined
	Quarterly Noncompliance Report History													

Statute	Program/Pollutant/Violation Type	QTR 1	QTR 2	QTR 3	QTR 4	QTR 5	QTR 6	QTR 7	QTR 8	QTR 9	QTR 10	QTR 11	QTR 12+
RCRA (Source ID: CAL000275218)		07/01-09/30/19	10/01-12/31/19	01/01-03/31/20	04/01-06/30/20	07/01-09/30/20	10/01-12/31/20	01/01-03/31/21	04/01-06/30/21	07/01-09/30/21	10/01-12/31/21	01/01-03/31/22	04/01-06/30/22
	Facility-Level Status	No Violation Identified	No Violation Identified	No Violation Identified	No Violation Identified	No Violation Identified	No Violation Identified	No Violation Identified	No Violation Identified	No Violation Identified	No Violation Identified	No Violation Identified	No Violation Identified
	Violation / Agency												
RCRA (Source ID: CAR000218420)		07/01-09/30/19	10/01-12/31/19	01/01-03/31/20	04/01-06/30/20	07/01-09/30/20	10/01-12/31/20	01/01-03/31/21	04/01-06/30/21	07/01-09/30/21	10/01-12/31/21	01/01-03/31/22	04/01-06/30/22
	Facility-Level Status	No Violation Identified	No Violation Identified	No Violation Identified	No Violation Identified	No Violation Identified	No Violation Identified	No Violation Identified	No Violation Identified	No Violation Identified	No Violation Identified	No Violation Identified	No Violation Identified
	Violation / Agency												

Informal Enforcement Actions

Last 5 Years

Statute	System	Source ID	Type of Action	Lead Agency	Date

No data records returned

Entries in italics are not counted as "informal enforcement actions" in EPA policies pertaining to enforcement response tools.

Formal Enforcement Actions

Last 5 Years

Statute	System	Law/Section	Source ID	Type of Action	Case No.	Lead Agency	Case Name	Issued/Filed Date	Settlements/Actions	Settlement/Action Date	Federal Penalty Assessed	State/Local Penalty Assessed	Penalty Amount Collected	SEP Cost	Comp Action Cost
CAA	ICIS-Air	OTHER	AIR/CABAA00006085B3289	Administrative - Formal	CABAAA200178886	Local	NOV A54141B	08/24/2017	1	08/24/2017	$0	$0	$0	$0	$0
CAA	ICIS-Air	OTHER	AIR/CABAA00006085B3289	Administrative - Formal	CABAAA200178882	Local	NOV A54141A	08/24/2017	1	08/24/2017	$0	$5,000	$5,000	$0	$0

Environmental Conditions

Watersheds

12-Digit WBD (Watershed Boundary Dataset) HUC (RAD (Reach Address Database))	WBD (Watershed Boundary Dataset) Subwatershed Name (RAD (Reach Address Database))	State Water Body Name (ICIS (Integrated Compliance Information System))	Beach Closures Within Last Year	Beach Closures Within Last Two Years	Pollutants Potentially Related to Impairment	Watershed with ESA (Endangered Species Act)-listed Aquatic Species?
180500030302	Canoas Creek	--	No	No	--	Yes

Assessed Waters From Latest State Submission (ATTAINS)

State	Report Cycle	Assessment Unit ID	Assessment Unit Name	Water Condition	Cause Groups Impaired	Drinking Water Use	Aquatic Life	Fish Consumption Use	Recreation Use	Other Use

No data records returned

Air Quality Nonattainment Areas

Pollutant	Within Nonattainment Status Area?	Nonattainment Status Applicable Standard(s)	Within Maintenance Status Area?	Maintenance Status Applicable Standard(s)
Ozone	Yes	1-Hour Ozone (1979); 8-Hour Ozone (1997); 8-Hour Ozone (2008); 8-Hour Ozone (2015)	No	--
Lead	No	--	No	--
Particulate Matter	Yes	PM-2.5 (2006)	No	--
Carbon Monoxide	No	--	Yes	Carbon Monoxide (1971)
Sulfur Dioxide	No	--	No	--

Pollutants

Toxics Release Inventory History of Reported Chemicals Released in Pounds per Year at Site

Air Pollutant Report

TRI Facility ID	Year	Total Air Emissions	Surface Water Discharges	Off-Site Transfers to POTWs (Publicly Owned Treatment Works)	Underground Injections	Releases to Land	Total On-Site Releases	Total Off-Site Transfers

No data records returned

Toxics Release Inventory Total Releases and Transfers in Pounds by Chemical and Year

Chemical Name
No data records returned

Community

EJScreen EJ Indexes

Twelve environmental justice (EJ) indexes of EJScreen, EPA's screening tool for EJ concerns. EPA uses these indexes to identify geographic areas that may warrant further consideration or analysis for potential EJ concerns. The index values below are for the Census block group or 1-mile maximum (US or State) in which the facility is located. Note that use of these indexes does not designate an area as an "EJ community" or "EJ facility." EJScreen provides screening level indicators, not a determination of the existence or absence of EJ concerns. For more information, see the EJScreen home page.

Show EJ Indexes calculated based on: Census Block Group - US

Census Block Group - US EJ Indexes (percentile)	
Particulate Matter 2.5	81.9
Ozone	76
Diesel Particulate Matter	75.4
Air Toxics Cancer Risk	77.6
Air Toxics Respiratory Hazard Index	78.3
Traffic Proximity	84
Lead Paint	84.9
Risk Management Plan (RMP) Facility Proximity	86.5
Hazardous Waste Proximity	91.9
Superfund Proximity	98.3
Underground Storage Tanks (UST)	70.8
Wastewater Discharge	94.2

Number of EJ Indexes Above 80th Percentile
7

View EJScreen Report (US/regional/state percentiles, 1-mile average)

Demographic Profile of Surrounding Area (1 mile)

This section provides demographic information regarding the community surrounding the facility. ECHO compliance data alone are not sufficient to determine whether violations at a particular facility had negative impacts on public health or the environment. Statistics are based upon the 2010 U.S. Census and 2015 - 2019 American Community Survey (ACS) 5-year Summary and are accurate to the extent that the facility latitude and longitude listed below are correct. EPA's spatial processing methodology considers the overlap between the selected radii and the census blocks (for U.S. Census demographics) and census block groups (for ACS demographics) in determining the demographics surrounding the facility. For more detail about this methodology, see the DFR Data Dictionary.

General Statistics (U.S. Census)	
Total Persons	2,136
Population Density	691/sq.mi.
Housing Units in Area	695

General Statistics (ACS (American Community Survey))	
Total Persons	6,267
Percent People of Color	78%
Households in Area	2,138
Households on Public Assistance	20
Persons With Low Income	717
Percent With Low Income	12%

Geography	
Radius of Selected Area	1 mi.
Center Latitude	37.425
Center Longitude	-121.9319
Land Area	100%
Water Area	0%

Income Breakdown (ACS (American Community Survey)) - Households (%)	
Less than $15,000	83 (3.88%)
$15,000 - $25,000	27 (1.26%)
$25,000 - $50,000	142 (6.64%)
$50,000 - $75,000	157 (7.34%)
Greater than $75,000	1,729 (80.87%)

Age Breakdown (U.S. Census) - Persons (%)	
Children 5 years and younger	136 (6%)
Minors 17 years and younger	472 (22%)
Adults 18 years and older	1,664 (78%)
Seniors 65 years and older	187 (9%)

Race Breakdown (U.S. Census) - Persons (%)	
White	913 (43%)
African-American	55 (3%)
Hispanic-Origin	559 (26%)
Asian/Pacific Islander	785 (37%)
American Indian	15 (1%)
Other/Multiracial	367 (17%)

Education Level (Persons 25 & older) (ACS (American Community Survey)) - Persons (%)	
Less than 9th Grade	251 (5.54%)
9th through 12th Grade	80 (1.77%)
High School Diploma	911 (20.11%)
Some College/2-year	504 (11.13%)
B.S./B.A. (Bachelor of Science/Bachelor of Arts) or More	2,534 (55.95%)

CAA Pollutant Report

Facility Summary

LOS ESTEROS CRITICAL ENERGY FACILITY

800 THOMAS FOON CHEW WAY, SAN JOSE, CA 95134-1100

Facility Information (FRS)

FRS ID: 110013666425
EPA Region: 09
Latitude: 37.425
Longitude: -121.9319
Locational Data Source: CAMDBS
Industry: Fossil Fuel Electric Power Generation
ICIS-Air Source ID: CABAA00006085B3289
ICIS-Air Facility Status: Operating Major Emissions

Emission Inventories

- ☑ National Emissions Inventory (NEI): 9991311
- ☑ Greenhouse Gas Reporting Program (GHGRP): 1000175
- ☑ Toxics Release Inventory (TRI): No Information
- ☑ Clean Air Markets Division (CAMD): 55748

Related Reports

Detailed Facility Report
Search for Excess Emission Reports
Search for Spills

Emissions

Please read important information about emissions data sources and reported values

Total Aggregate Emissions Data

Program	Pollutant	Units	Trend	2011	2012	2013	2014	2015	2016	2017	2018	2019
CAMD	CAMD - CO2	Pounds		80,130,060.00		374,045,554.00	244,393,182.00	350,812,540.00	159,603,968.00	226,444,236.00	355,946,650.00	217,199,872.00
CAMD	CAMD - NOx	Pounds		16,128.00		209,670.00	9,066.00	16,494.00	10,980.00	16,936.00	17,646.00	9,904.00
CAMD	CAMD - SO2	Pounds		406.00		1,890.00	1,234.00	1,774.00	804.00	1,142.00	1,798.00	1,098.00
GHG	Total GHGs	MTCO2e		36,384.71	.00	169,841.36	110,969.88	159,290.41	72,470.23	102,818.52	161,621.90	98,622.23
NEI	Total CAPs	Pounds		48,362.20			280,301.64			6,054.60		
NEI	Total HAPs	Pounds		3,138.43			3,001.32			6.91		
NEI	Total VOCs	Pounds		1,762.30			6,700.57			38.83		

Emissions Data

Program	Pollutant Type	Pollutant	Units	Trend	2011	2012	2013	2014	2015	2016	2017	20
CAMD		Carbon dioxide	Pounds		80,130,060.00		374,045,554.00	244,393,182.00	350,812,540.00	159,603,968.00	226,444,236.00	355,946
CAMD		Nitrogen oxides	Pounds		16,128.00		209,670.00	9,066.00	16,494.00	10,980.00	16,936.00	17,64
CAMD		Sulfur dioxide	Pounds		406.00		1,890.00	1,234.00	1,774.00	804.00	1,142.00	1,79
GHG		Carbon dioxide	MTCO2e		36,346.90	.00	169,666.00	110,855.90	159,128.20	72,396.80	102,713.30	161,4
GHG		Methane	MTCO2e		17.25		80.00	52.00	74.00	33.50	48.00	75.
GHG		Nitrous oxide	MTCO2e		20.56		95.36	61.98	88.21	39.93	57.22	90.
NEI	HAP (Hazardous air pollutant)/VOC (Volatile organic compound)	2-Methylnaphthalene	Pounds					.00			.00	
NEI	HAP (Hazardous air pollutant)/VOC (Volatile organic compound)	Acetaldehyde	Pounds		33.44			120.48			.48	
NEI	HAP (Hazardous air pollutant)/VOC (Volatile organic compound)	Acrolein	Pounds		5.35			20.52			.07	
NEI	HAP (Hazardous air pollutant)/VOC (Volatile organic compound)	Anthracene	Pounds		.00						.00	
NEI	HAP (Hazardous air pollutant)	Arsenic	Pounds					.04			.00	
NEI	HAP (Hazardous air pollutant)/VOC (Volatile organic compound)	Benz[a]anthracene	Pounds		.00						.00	
NEI	HAP (Hazardous air pollutant)/VOC (Volatile organic compound)	Benzene	Pounds		18.33			36.14			.52	
NEI	HAP (Hazardous air pollutant)	Beryllium	Pounds								.00	
NEI	HAP (Hazardous air pollutant)	Cadmium	Pounds					.22			.00	
NEI	CAP (Criteria air pollutant)	Carbon monoxide	Pounds		3,534.00			44,565.04			299.75	
NEI	HAP (Hazardous air pollutant)	Chromium(III)	Pounds					.27			.00	
NEI	HAP (Hazardous air pollutant)	Chromium(VI)	Pounds					.01			.00	
NEI	HAP (Hazardous air pollutant)/VOC (Volatile organic compound)	Chrysene	Pounds		.00						.00	
NEI	HAP (Hazardous air pollutant)	Cobalt	Pounds					.02			.00	
NEI	HAP (Hazardous air pollutant)/VOC (Volatile organic compound)	Ethylbenzene	Pounds		26.75			96.38			.36	
NEI	HAP (Hazardous air pollutant)/VOC (Volatile organic compound)	Fluoranthene	Pounds		.00			.00			.00	
NEI	HAP (Hazardous air pollutant)/VOC (Volatile organic compound)	Fluorene	Pounds		.00			.00			.00	

Program	Pollutant Type	Pollutant	Units	Trend	2011	2012	2013	2014	2015	2016	2017	20
NEI	HAP (Hazardous air pollutant)/VOC (Volatile organic compound)	Formaldehyde	Pounds		2,919.96			2,138.49			4.44	
NEI	HAP (Hazardous air pollutant)/VOC (Volatile organic compound)	Hexane	Pounds								.28	
NEI	CAP (Criteria air pollutant)	Lead	Pounds								.00	
NEI	HAP (Hazardous air pollutant)	Manganese	Pounds					.08			.00	
NEI	HAP (Hazardous air pollutant)	Mercury	Pounds								.00	
NEI	HAP (Hazardous air pollutant)/VOC (Volatile organic compound)	Naphthalene	Pounds		1.09			3.92			.02	
NEI	HAP (Hazardous air pollutant)	Nickel	Pounds		.00			.42			.01	
NEI	CAP (Criteria air pollutant)	Nitrogen oxides	Pounds		7,156.00			63,081.48			339.25	
NEI	HAP (Hazardous air pollutant)/VOC (Volatile organic compound)	Phenanthrene	Pounds		.00			.00			.00	
NEI	CAP (Criteria air pollutant)	Primary PM10, filterable portion only	Pounds		5,526.00			25,282.69			1,581.39	
NEI	CAP (Criteria air pollutant)	Primary PM10 (filterables and condensibles)	Pounds		10,054.13			46,275.39			1,658.97	
NEI	CAP (Criteria air pollutant)	Primary PM2.5, filterable portion only	Pounds		5,525.75			25,191.49			986.93	
NEI	CAP (Criteria air pollutant)	Primary PM2.5 (filterables and condensibles)	Pounds		10,053.88			46,184.19			1,064.52	
NEI	CAP (Criteria air pollutant)	Primary PM condensible portion, less than 1 micron	Pounds		4,528.13			20,992.70			77.59	
NEI	HAP (Hazardous air pollutant)/VOC (Volatile organic compound)	Pyrene	Pounds		.00			.00			.00	
NEI	CAP (Criteria air pollutant)	Sulfur dioxide	Pounds		222.00			2,028.09			7.38	
NEI	HAP (Hazardous air pollutant)/VOC (Volatile organic compound)	Toluene	Pounds		80.00			391.55			.00	
NEI	CAP (Criteria air pollutant)/VOC (Volatile organic compound)	Volatile organic compounds	Pounds		1,762.30			6,700.57			38.83	
NEI	HAP (Hazardous air pollutant)/VOC (Volatile organic compound)	Xylene	Pounds		53.50			192.77			.73	

The Air Pollutant Report presents ten years of EPA air emissions data from the National Emissions Inventory (NEI), Greenhouse Gas Reporting Program, Toxics Release Inventory, and Clean Air Markets Programs for a selected facility. Emissions are presented by pollutant for each program and each year that values are available. Each of these programs is governed by a different regulatory authority and performs a distinct function. The NEI program includes both facility-reported and government-augmented emissions, while the other programs include exclusively emissions reported by facilities. While each program is distinct, there is some overlap in pollutants covered by the different programs. Where the same pollutant exists in multiple programs, the Air Pollutant Report will list each program's emissions estimates. Emissions values reported under multiple programs are not exclusive and should not be added together. Due to programmatic differences in calculation methods and how "facility" is defined, there may be significant discrepancies in emissions values between programs. By consolidating emissions data from four different EPA programs into one report, the Air Pollutant Report provides a single source for users looking to understand a facility's full suite of pollutants and the range of possible emissions associated with a given pollutant depending on the emissions program.

Environmental Conditions

Air Quality Nonattainment Areas

Pollutant	Within Nonattainment Status Area?	Nonattainment Status Applicable Standard(s)	Within Maintenance Status Area?	Maintenance Status Applicable Standard(s)
Ozone	Yes	1-Hour Ozone (1979); 8-Hour Ozone (1997); 8-Hour Ozone (2008); 8-Hour Ozone (2015)	No	
Lead	No		No	
Particulate Matter	Yes	PM-2.5 (2006)	No	
Carbon Monoxide	No		Yes	Carbon Monoxide (1971)
Sulfur Dioxide	No		No	

ATTACHMENT B

Interim Golden Eagle Inventory and Monitoring Protocols; and Other Recommendations

Joel E. Pagel, Ph.D.[1],

Diana M. Whittington[2],

George T. Allen, Ph.D.[2].

U.S. Fish and Wildlife Service

February, 2010

[1] **Ecological Services, U.S. Fish and Wildlife Service, Carlsbad, California**
[2] **Division of Migratory Bird Management, U.S. Fish and Wildlife Service, Arlington, Virginia**

Interim Golden Eagle Inventory and Monitoring Protocols; and Other Recommendations

Table of Contents:

Recommended citation:

Pagel, J.E., D.M. Whittington, and G.T. Allen. 2010. Interim Golden Eagle inventory and monitoring protocols; and other recommendations. Division of Migratory Bird Management, U.S. Fish and Wildlife Service.

I. Purpose

This document identifies the minimum inventory and monitoring effort recommended for determining and evaluating potential Golden Eagle (*Aquila chrysaetos canadensis*) use of habitat including nest sites, roosts, and territories, as well as the rationale for identifying and evaluating foraging locations during breeding and non-breeding periods. It also outlines the minimum monitoring techniques to ascertain occupancy and reproductive success at territories. These field efforts are the mutual responsibility of agencies authorizing activities and their permittees (i.e. action agency; see Glossary). They are essential components for avoiding and minimizing disturbance and other kinds of take, including lethal take, and are a necessary component of short and long-term site specific monitoring and management of local Golden Eagles and regional Golden Eagle populations. The data gathered will provide information on the baseline circumstances for evaluation of permit applications and foundation for permit conditions, as well as assist planners so they may conduct informed impact analyses and mitigation during the National Environmental Policy Act (NEPA) process. Data collected via this effort will also help:

1. Determine the fate and reproductive trends of regional nesting populations via collating information from observed territories;
2. Document and list historical and unsurveyed habitat for future analysis to assist in determining local and regional population trajectories;
3. Provide information to document whether local Golden Eagle conservation efforts are meeting goals for improvements in the status of the species; and
4. Provide a foundation for evaluation of whether and which activities or conditions may be affecting Golden Eagles.

II. Background

Golden Eagles are protected by the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act (Eagle Act), both of which prohibit take. Take means *pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, destroy, molest,* or *disturb*. When the Bald Eagle (*Haliaeetus leucocephalus*) was delisted under the Endangered Species Act (ESA), and in order to improve management of both species of eagles under the Eagle Act, the U.S. Fish and Wildlife Service (Service) undertook a series of management actions, including:

- **Codifying a regulatory definition of "disturb"** under the Eagle Act (see 72 FR 31132, June 5, 2007). *Disturb* means to agitate or bother a Bald Eagle or a Golden Eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest

abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior.

- **Proposing permit regulations** to (1) Create a new permit type to authorize take of Bald Eagles and Golden Eagles that is associated with, but not the purpose of, the activity; and (2) Create a second new permit type to authorize purposeful take of eagle nests that pose a threat to human or eagle safety (subsequently broadened to accommodate additional circumstances). The regulations were finalized on September 11, 2009 (74 FR 43686).

Summary of the new regulations.

Permits issued under 50 CFR § 22.26 authorize take of Bald Eagles and Golden Eagles, where the take is associated with, but not the purpose of the activity, and cannot practicably be avoided. Most take authorized under this section will be in the form of disturbance; however, permits may authorize lethal take that results from, but is not the purpose of, an otherwise lawful activity. Purposeful take will not be authorized under § 22.26.

The second new permit regulation, at 50 CFR 22.27, establishes permits for removing eagle nests where (1) necessary to alleviate a safety hazard to people or eagles, (2) necessary to ensure public health and safety, (3) the nest prevents the use of a pre-existing human-engineered structure, or (4) the activity, or mitigation for the activity, will provide a net benefit to eagles. Only inactive nests during the non-breeding season may be taken, except in the case of safety emergencies.

Regulations under § 22.27 authorize removal and/or relocation of active and inactive eagle nests in cases where genuine safety concerns for people, eagles, or both, necessitate the take. Examples include: (1) a nest tree that appears likely to topple onto a residence; (2) at airports to avoid collisions between eagles and aircraft; and (3) to relocate a nest built within a reservoir that will be flooded.

Both regulations are provided for by the Eagle Act which gives the Secretary of the Interior the authority to permit the limited take of Bald Eagles and Golden Eagles "for the protection of... other interests in any particular locality." Additionally, both new regulations:

- Are applicable to Golden Eagles as well as Bald Eagles.
- Authorize take only where it is compatible with the preservation of the eagle. For purposes of these regulations, "compatible with the preservation of the Bald Eagle and the Golden Eagle" means consistent with the goal of stable or increase of breeding populations.
- Authorize take only where it cannot practicably be avoided.

- Include provisions for programmatic take. Programmatic take (take that is recurring and not in a specific, identifiable timeframe and/or location) will be authorized only where it is unavoidable despite implementation of comprehensive measures developed in cooperation with the Service to reduce the take below current levels.

Additional needs for Golden Eagle information and evaluation.

As part of an adaptive management approach to the permits and eagle management, the Service will assess, at least every five years, overall population trends along with annual report data from permittees and other information to assess how likely future activities are to result in the loss of one or more eagles, a decrease in productivity of Golden Eagles, and/or the permanent loss of a nest site, territory, or important foraging area. Therefore, implementation of the new permit regulations will entail requirements for cumulative effects analyses and identifying the impacts of an activity. We include them here to provide the context and framework for the protocols and recommendations in this document.

Cumulative effect considerations.

Whether the take is compatible with eagle preservation includes consideration of the cumulative effects of other permitted take and additional factors affecting eagle populations. Cumulative effects are defined as: *"the incremental environmental impact or effect of the proposed action, together with impacts of past, present, and reasonably foreseeable future actions"* (50 CFR 22.3). Numerous relatively minor disruptions to eagle behaviors from multiple activities, even if spatially or temporally distributed, may lead to disturbance that would not have resulted from fewer or more carefully sited activities. The accumulation of multiple land development projects or siting of multiple infrastructures that may be hazardous to eagles can cumulatively reduce the availability of alternative sites suitable for breeding, feeding, or sheltering, resulting in a greater than additive risk of take to eagles.

To ensure that impacts are not concentrated in particular localities to the detriment of locally-important eagle populations, cumulative effects need to be considered at the population management level—*Service Regions* for Bald Eagles and *Bird Conservation Regions* for Golden Eagles—and, especially for project-specific analyses, at local area population levels (the population within the average natal dispersal distance of the nest or nests under consideration). Eagle take that is concentrated in particular areas can lead to effects on the larger management population because 1) disproportionate take in local populations where breeding pairs are 'high' producers may reduce the overall productivity of the larger population; and 2) when portions of the management population become isolated from each other the productivity of the overall management population may decrease.

Identifying the Impacts of the Activity

The applicant for an Eagle Act permit (who can be a project proponent or the agency preparing the NEPA), has four subtasks to determine the likely effects of a project or activity on eagles:

a. Collection and synthesis of biological data. The applicant is responsible for providing up-to-date biological information about eagles that breed, feed, shelter, and/or migrate in the vicinity of the activity that may potentially be affected by the proposed activity. Biological information can include locations and distribution of nests, delineation of territories, prey base, general composition and relative abundance, and productivity data.

b. Identifying activities that are likely to result in take. As part of the permit application, the applicant must include a complete description of the actions that: (1) are likely to result in eagle take, and (2) for which the applicant or landowner has some form of control. For most applications, the activity will be specific and well-defined (e.g., home construction; water use development) or land use activity (e.g., forestry). For larger-scale permits, each applicant will need to determine the extent of impacts to include in the permit authorization and, if necessary, which ones to exclude.

c. Avoidance and minimization measures. An application for a § 22.26 permit must document the measures to which the applicant will commit to avoid and minimize the impacts to eagles to the maximum degree practicable.

d. Quantifying the anticipated take. The take authorized under a permit will depend on a variety of factors, including: (1) the number of eagles that breed, feed, shelter, and or migrate within the activity area, (2) the degree to which the eagles depend on that area for breeding, feeding, or sheltering, or migration, and thus are more likely to be present and affected, (3) the potential of that type of activity in general to take eagles, (4) the scale of the activity, and (5) the measures the applicant will undertake to avoid and minimize the take.

Federal agencies have additional responsibilities to Golden Eagles under Executive Order 13186 (66 FR 3853, January 17, 2001), which reinstated the responsibilities of Federal Agencies to comply with the Migratory Bird Treaty Act of 1918. The Executive Order establishes a process for Federal Agencies to conserve migratory birds by avoiding or minimizing unintentional take and taking actions that benefit species to the extent practicable. Agencies are expected to take reasonable steps that may include restoring and enhancing habitat. Environmental analyses of Federal actions required by NEPA or other environmental review processes must evaluate the effects of actions and Federal agency plans on migratory birds, including Golden Eagles.

Golden Eagle populations are believed to be declining throughout their range in the contiguous United States (Harlow and Bloom 1989, Kochert and Steenhof 2002, Kochert et al. 2002, Good et al. 2007, Farmer et al. 2008, Smith et al. 2008, 74 FR 46836-46879). The Service has modeled current data (USFWS 2009, Appendix C), employing Moffat's equilibrium (Hunt 1998) and Millsap and Allen's (2006) analysis of anthropogenic demographic removal, and estimated that the floating (non-breeding and surplus) component of the Golden Eagle population in some areas may be limited at this time. Data from the Western EcoSystems Technology Inc. surveys from 2006 through 2009 suggest a decline since 2006 in the total Golden Eagle population within the area covered by the surveys (Neilson et al. 2010, USFWS 2009, Appendix C). Significant Golden Eagle breeding failures have been reported in some areas of the southwestern United States (WRI 2009), and declines in counts of migrating Golden Eagles have been reported in most areas in the western United States (Farmer et al. 2008, Smith et al. 2008), although it is unclear if the latter is linked to a decrease in the number of eagles.

III. Management Need

Prior to initiating inventory and monitoring efforts, land management agencies and/or proponents of land use activities should first assess all existing recent and historical data available on eagles, including their nests, reproductive activity and chronologies, natal dispersal, pertinent data from VHF and satellite telemetry, winter roosts, migration corridors, and foraging habitats contained by and 4 - 10 + miles of areas slated for development or authorizations for increased human activity. This background search of available information may yield few data, but is necessary to alert project proponents and regulatory staff about data gaps, and existing knowledge of Golden Eagles for that area. Inventory, monitoring, and research activities may then be identified and funded to fill in site specific information gaps to avoid take of Golden Eagles. Specific recommendations for the number of years needed for baseline data and measures to avoid take should be developed in coordination with the Service, and, to reduce redundancy between management and permitting requirements, consistent with permit requirements outlined in the Draft Implementation Guidelines for the new rules (expected fall 2010).

Projects in Golden Eagle breeding home ranges on federal, state, and private land possibly will have direct, indirect, and cumulative effects associated with or exacerbated by, factors such as: recreation disturbance, electrocution, urbanization, illegal shooting, invasive species altering prey densities, lead poisoning, other contaminants, climate change, and prolonged drought which affects predator and prey abundance and distribution. In many cases, existing data may not be adequate for NEPA, planning, or permitting purposes. Therefore, inventory and subsequent monitoring of Golden Eagles and components of their habitats are important to 1) develop a baseline prior to project planning and prior to project development in Golden

Eagle habitat, 2) analyze impacts to the species, 3) continue to evaluate and report on the effects of the action and mitigation on Golden Eagles, 4) essential to adaptive management approaches, and 5) provide information that may be required for permits.

Project design, type, and siting of project footprint and infrastructure are critical to avoid disturbance and take of Golden Eagles. In the Final Environmental Assessment on the rule and in the draft Implementation Guidance, the Service recommended that when planning locations of infrastructure and project boundaries, action agencies and project proponents consider life-history components such as productivity, age-class survival, dispersal, migration, winter-concentration behavior, and foraging behavior during breeding and non-breeding seasons to avoid lethal take. The Service recommends use of the best available or gathered information applicable to the location of the project or plan, but also encourages efforts to conduct further research. For permitting purposes however, and to determine the likelihood and magnitude of take, as well as effectiveness of mitigation, monitoring will need to yield productivity information.

Note: This document does not address site specific observations for transitory or wintering eagles; these protocols will be forthcoming. Although the life history for transitory and wintering eagles is not discussed at length here, that does not imply a lack importance for site-specific observations from the Service's perspective. The document provides general recommendations for factors to consider outside nesting, until more specific protocols are developed.

IV. Basic Golden Eagle Ecology

This account is not intended as a compendium of Golden Eagle natural history, biology, ethology, or ecology; please refer to Watson (1997), Palmer (1988) and Kochert et al. (2002) for more detailed information.

Where they exist, Golden Eagles are an upper-trophic aerial predator, and eat small to mid-sized reptiles, birds, and mammals up to the size of mule deer fawns and coyote pups (Bloom and Hawks 1982). They also are known to scavenge and utilize carrion (Kochert et al. 2002).

Golden Eagles nest in high densities in open and semi-open habitat, but also may nest at lower densities in coniferous habitat when open space is available, (e. g. fire breaks, clear-cuts, burned areas, pasture-land, etc.). They can be found from the tundra, through grasslands, woodland-brushlands, and forested habitat, south to arid deserts, including Death Valley, California (Kochert et al. 2002). Historically, Golden Eagles bred in the Plains and Great Lake states. Golden Eagles currently breed in and near much of the available open habitat in North America west of the 100th Meridian, as well as in eastern United States in the northern Appalachian Mountains (Palmer 1988, Kochert et al. 2002). The Lee and Spofford (1990) review

of the literature for the eastern portion of the United States suggested historical nesting Golden Eagles south of New York in the Appalachians was unlikely. Nesting of introduced Golden Eagles has been reported in Tennessee and northwestern Georgia (Kochert et al. 2002), but we do not know if those territories are still extant.

A nesting territory for the purpose of this monitoring protocol is an area that contains, or historically contained, one or more nests within the home range of a mated pair. It is a confined locality where nests are found, usually in successive years, and where no more than one pair is known to have bred at one time (Steenhof and Newton 2007).

Golden Eagles avoid nesting near urban habitat and do not generally nest in densely forested habitat. Individuals will occasionally nest near semi-urban areas where housing density is low and in farmland habitat; however Golden Eagles have been noted to be sensitive to some forms of anthropogenic presence (Palmer 1988). Steidl et al. (1993) found when observers were camped 400 meters from nests of Golden Eagles, adults spent less time near their nests, fed their juveniles less frequently, and fed themselves and their juveniles up to 67% less food than when observers were camped 800 meters from nests. In studies of Golden Eagle populations in the southwest (New Mexico and Texas) and the Front Range of the Rocky Mountains (New Mexico, Colorado and Wyoming), Boeker and Ray (1971) reported that human disturbance accounted for at least 85% of all known nest losses. Breeding adults are sometimes flushed from the nest by recreational climbers and researchers, sometimes resulting in the loss of the eggs or juveniles due to nest abandonment, exposure of juveniles or eggs to the elements, collapse of the nest, eggs being knocked from the nest by startled adults, or juveniles fledging prematurely. However, Golden Eagles rarely flushed from the nest during close approaches by fixed-wing aircraft and helicopters during various surveys in Montana, Idaho, and Alaska (Kochert et al. 2002).

Golden Eagles nest on cliffs, in the upper one third of deciduous and coniferous trees, or on artificial structures (windmills, electricity transmission towers, artificial nesting platforms, etc.; Phillips and Beske 1990, Kochert et al. 2002). Golden Eagles build nests on cliffs or in the largest trees of forested stands that often afford an unobstructed view of the surrounding habitat (Beecham 1970, Menkens and Anderson 1987). Usually, sticks and soft material are added to existing nests, or new nests are constructed to create a strong, flat or bowl shaped platform for nesting (Palmer 1988, Watson 1997, Kochert et al. 2002). Sometimes Golden Eagle will decorate multiple nests in a single year; continuing to do so until they lay eggs in the selected nest. The completed nest structure(s) can vary from large and multi-layered; or a small augmentation of sticks in caves with little material other than extant detritus (Ellis et al. 2009). Most Golden Eagle territories have up to 6 nests, but they have been found to contain up to 14 nests (Palmer 1988, Watson 1997, Kochert et al. 2002).

Onset of courtship and nesting chronology

Courtship for Golden Eagles involves stick-carrying, display flights, and vocalization (Ellis 1979, Kochert et al. 2002). Golden Eagles partake in undulating flight, however undulating flight has been observed year-round and is thought to be associated more with aggression and territory defense than with courtship (Newton 1979, Harmata 1982, Collopy and Edwards 1989, Watson 1997).

Nesting chronologies vary however there are some generalities. In California and in Texas, courtship at territories start in mid to late December (Palmer 1988, Hunt et al. 1997, D. Bittner pers. com); in Texas eggs have been detected as early as November (Olberholser and Kincaid 1974, *in lit.*). In Utah, courtship can commence in January. In northern tier states at upper latitudes and higher elevation sites, egg laying can occur as early as February and March, before late winter snows and storms have abated (Palmer 1988).

Golden Eagles lay 1 to 4 eggs, with 4 egg clutches rare. Most nests have 2 eggs. The laying interval between eggs ranges between 3 to 5 days. Incubation commences as soon as the first egg is laid, and hatching is asynchronous and can begin as early as late January in southern California (Dixon 1937, Hickman 1968), mid April to late May in southwest Idaho (Kochert et al. 2002) and late March–early May in central and northern Alaska (McIntyre 1995, Young et al. 1995; Fig. 3). In Texas, eggs have been noted from November to June (Oberholser and Kincaid 1974, in lit.). In the northeast United States, eggs have been laid in March/April (Palmer 1988). For more detail, please refer to Kochert et al. (2002, Appendix 2).

Migration and Wintering

Golden Eagles will migrate from the Canadian provinces and northern tier and northeastern states to areas that are milder in the winter and/or may have less snow cover. Wintering Golden Eagles have been noted in all states in the continental U.S. (Wheeler 2003, 2007). Some segments of the population can be found near their nest sites throughout the year. See Kochert et al. (2002) for detailed listing of winter range.

Roosts or gathering behavior

Golden Eagles are not known to roost communally as is common with wintering Bald Eagles in some areas of the United States, but will gather together if local food sources are abundant. A caveat to this is that Golden Eagles have perched with bald eagles where there have been large concentrations of waterfowl or carrion (Palmer 1988).

V. Golden Eagle Responses to Disturbance

Golden Eagles,visibly display behavior that signifies disturbance when they are stressed by anthropogenic activities; whether it is a lone hiker walking 1000 meters or more from a nest, or extended construction or recreation activities 2000 – 5000 meters from a territory. These postures, movements and behaviors can be overt. However with Golden Eagles, disturbance behaviors are often subtle and require an experienced observer. Olendorff (1971), Fyfe and Olendorff (1976), and Olsen and Olsen (1978) identified considerations when human interactions may disturb nesting activities, and how to ascertain critical distances to avoid agitating nesting, roosting, and foraging raptors. Factors affecting critical distances included:

1. Mannerisms of intruder,
2. Size of intruder,
3. Stage of breeding cycle, and
4. Topography and exposure of intruder in relation to bird.

Golden eagle behavior varies among individuals and can be affected by previous experiences. However, some behavioral generalities relative to direct and indirect disturbance include the following:

1. Agitation behavior (displacement, avoidance, and defense),
2. Increased vigilance at nest sites,
3. Change in forage and feeding behavior, and/or
4. Nest site abandonment.

Of the preceding behaviors, nest-site abandonment constitutes take under the Eagle Act, as it is specifically cited in the definition of 'disturb'. The other behaviors, when considered cumulatively, may be evidence that activities are interfering with normal breeding behavior and are likely to lead to take. Human intrusions near Golden Eagle nest sites have resulted in the abandonment of the nest; high nestling mortality due to overheating, chilling or desiccation when young are left unattended; premature fledging; and ejection of eggs or young from the nest (Boeker and Ray 1971, Suter and Joness 1981).

VI. Overall Objectives of the Golden Eagle Survey Protocol

This survey protocol is intended to standardize procedures to inventory and monitor Golden Eagles within the direct and indirect impact areas of planned or ongoing projects where disturbance or lethal take from otherwise permitted human activities is possible. This protocol will identify eagle use areas and identify and minimize potential observer-related disturbance to Golden Eagles by surveys when conducted by qualified and experienced raptor biologists.

Additionally, data collected using this protocol may be used for, at a minimum, 1), sampling other geographic areas where suitable habitat may be present; 2) short and long-term analysis of Golden Eagle occupancy and productivity at known nest sites, and historical locations where observation to determine occupancy maybe necessary; 3) identification and evaluation of potential disturbance factors. This protocol will standardize data collection for potential local and regional analysis of long-term occupancy, productivity and eagle use trends. It was developed as minimum standards, and as such may require additional area-specific detail if used for research purposes.

Objectives of inventory and monitoring

The first objective of these surveys is to provide methods to identify areas occupied by Golden Eagles and select factors their behavior ecology. Additional objectives of these surveys include the following.

1. Record and report occupancy and productivity of local Golden Eagle territories.
2. Document and list historical and unsurveyed habitat for future analysis to assist in determining local and regional population trajectories.
3. Determine nesting chronologies.
4. Provide information to document whether local Golden Eagle conservation efforts meet permit conditions or goals for improvements in the status of Golden Eagles.
5. Provide a foundation to evaluate whether and which activities or conditions may be affecting Golden Eagles.
6. Document foraging behavior, diet and habitat use within breeding and non-breeding home ranges.

VII. Inventory Techniques

CAUTION

Golden Eagles are one of several cliff and tree dwelling species sensitive to human disturbance. Monitoring eagles in a manner that 'disturbs' them, and causes them to be 'agitated or bothered' can cause nesting failure, and permanent site abandonment, constituting take under the Eagle Act.

These monitoring protocols should facilitate observer caution and identify techniques that will minimize potential for take of Golden Eagles. For additional information regarding preventing observer disturbance while surveying raptors, please refer to Fyfe and Olendorff (1976).

Inventory

Inventories for Golden Eagles should occur if nesting, roosting, and foraging habitat are contained within the project boundary and exist within 10 miles of the project boundary. Local and regional Golden Eagle habitat variability will dictate the distance from the project boundary where surveys will occur; distances will be greater in xeric or other habitats where local prey may not be abundant. The Service will be basing its site-specific evaluations and final determinations on local conditions, not national averages.

Nesting habitat

This account is not intended as a compendium of Golden Eagle habitat available and used in North America; please refer to Palmer (1988) and Kochert et al. (2002) for more detailed information.

Golden Eagles use a wide variety of habitat throughout North America. Small xeric mountain ranges in the Mohave and Great Basin deserts, forested habitat in the Pacific coastal, southern desert, Great Basin, Rocky, Sierra, and Cascade Mountain ranges are also key nesting areas. Local and regional variation of nesting habitat should be considered prior to surveys; however should include cliff, desert scrub, juniper woodland, and forested habitat. For example, in the northern Great Basin, Golden Eagles nest on cliff and in scrub-forest habitat; surveys of both types of substrates are urged prior to projects that have a potential to affect eagles. Identification criteria for nesting habitat at the local scale should take place in coordination with the Service, State, or Tribal wildlife agencies, and raptor experts.

VII.a. Procedures for aerial and ground inventory and monitoring surveys

Golden Eagles generally show strong fidelity to the nesting area annually. Occupancy determination is the most important goal of nest searches. Considerable suitable habitat exists in western North America that has never been adequately surveyed. Inventory surveys should examine habitat where Golden Eagles are not currently known to exist but habitat may be present, as well as previously inventoried areas to detect new activity. Monitoring surveys examine all historical and extant territories where Golden Eagles have been detected either previously or in the current survey.

A nesting territory or inventoried habitat should be designated as unoccupied by Golden Eagles ONLY after at least 2 complete aerial surveys in a single breeding season. In circumstances where ground observation occurs, at least 2 ground observation periods lasting at least 4 hours or more are necessary to designate an inventoried habitat or territory is unoccupied as long as all potential nest sites and alternate nests are visible and monitored. These observation periods should be at least 30 days apart for inventory, and at least 30 days apart for monitoring

of known territories. Intervals between observations at occupied nesting territories may need to be flexible and should be based on the behavior of the adults observed, the age of any young observed, and the data to be collected (see below, Section IX). Dates of starting and continuing inventory and monitoring surveys should be sensitive to local nesting (i.e. laying, incubating, and brooding) chronologies, and would be conducted during weather conditions favorable for aerial survey and/or monitoring from medium to long range distances (+ 300 – 700 meters).

The first inventory and monitoring surveys should be conducted during courtship when the adults are mobile and conspicuous. When survey of historical territories is conducted, observers should focus their search on known alternative nests, and also carefully examine the habitat for additional nests which may have been overlooked or recently constructed. A 'decorated' nest will be sufficient evidence to indicate the probable location of a nesting attempt. If a decorated nest or pair of birds is located, the search can then be expanded to inventory likely habitat adjacent to the discovered territory to see if additional golden eagle territories can be observed.

Note: Identification of alternate nests will be required by the Service for determination of relative value of individual nests to a territory in cases of applications for permits to take 'inactive' nests, and when determining whether abandonment of a particular nest is likely to result in abandonment of a territory. The Service has determined that territory loss or permanent abandonment of a territory is a greater impact to populations than temporary abandonment of a nest.

Weather: Avoid searching potential and known nesting locations during periods of heavy rain, snow, high winds, or severe cold weather. Golden Eagles should not be induced to flush at any time during the survey period. Flushing when the adults are incubating or have small young can be particularly hazardous for successful nesting, and could constitute lethal disturbance take. High temperatures also may cause problems for successful viewing over long distances due to heat waves. Further, observer related incidences of causing flight of adults that are shading young to prevent overheating during high temperatures may cause mortality of the young. Observation for Golden Eagles during inclement weather is impractical, uncomfortable, and unsafe for Golden Eagles and observers. Weather will be recorded by the observer.

Time of day: Aerial surveys should be conducted at the beginning of the day if winds permit. Likewise, ground surveys should be initiated, where possible, in morning hours when the air is still to avoid heat waves. Prime observation periods are around dawn, or shortly thereafter. In some cases the angle of the sun in relation to the cliff can be a more important issue, and some cliffs are better observed in

afternoon light, however observations of adult behavior that are used to determine nesting chronologies may be conducted during most of the day. Observers should be aware of the angle of the sun in relation to the observation post and the nest. Some sites are plagued by afternoon winds, heat waves, or dust storms; local observation conditions should be taken into account prior to establishing viewing periods. Time of day will be recorded by the observer.

Time of year: Breeding surveys for Golden Eagles are latitude and elevation dependent; however, their nesting season ranges in the contiguous United States from 01 January to 31 August (Kochert et al. 2002). Nesting failures and seasonal variations should be considered as potential anomalies to 'normal' behavior and nesting chronologies. Dates to be used as a cut-off period for observation and reporting of nesting failures or non-nesting status will vary per region. The dates listed below are to be used as general guides, and should not be used as final nest site failure survey determination dates. Location-specific determination dates should be developed in coordination with the Service, State, or Tribal wildlife agencies, and raptor experts.

Duration of stay at observation points: Ground observers will survey from observation points for a minimum of 4 hours, unless observations yield Golden Eagle presence, or Golden Eagle behavior indicate eggs or young, or observation suggests the observer is disturbing the birds. Slowly walking and observing all potential nesting substrate can be used to completely inventory potential habitat. Observation periods may last longer as longer observation periods may be necessary to accurately determine nesting chronologies. Duration of stay at known or suspected territories during helicopter reconnaissance, or during ground observation periods will be recorded by the observer.

VII.b Aerial surveys

Helicopters are an accepted and efficient means to monitor large areas of habitat to inventory potential habitat and monitor known territories only if accomplished by competent and experienced observers. They can be the primary survey method, or can be combined with follow-up ground monitoring. Disturbance to eagles is minimal only WHEN accepted aerial practices and techniques are followed. NOTE: Ground surveys can be used when their use is more efficient, or when other circumstances (e.g. bighorn sheep lambing areas) require this method.

Coordination between state and federal agencies is an important aspect of aerial surveys to develop acceptable search criteria to be used for identifying likely suitable nesting habitat and

locating nests, as well as to be become acquainted with potential hazards and air space restrictions. Survey pilots should be aware of potential ground hazards within the habitat to be examined, including marked and unmarked transmission and wires. Other hazards to surveyors include rock-fall or tree fall from above the helicopter, raptors or other birds colliding with the helicopter, and collision with other aircraft. Although pilots are often the first to note a flying raptor during surveys, some accidents involving wildlife researchers have been attributed to the pilots focusing on the survey, rather than giving their complete attention to flying the helicopter.

Helicopters used for surveying Golden Eagle habitat should be light utility, small to medium sized (such as the MD-500/520, Eurocopter 145, Bell Jet-Ranger 206, or UH-72). The aircraft should be capable of vertical mobility in warm temperatures and at higher elevations. Inventories for raptors can be conducted with the main observer door(s) removed (which may provide more lateral and horizontal visibility), or with the doors closed. The decision regarding observer doors should remain a personal choice, with the safety of pilots and observers as the primary determinant.

Cliffs should be approached from the front, rather than flying over from behind, or suddenly appearing quickly around corners or buttresses. Inventories should be flown at slow speeds, ca. 30 – 40 knots. However, detection of nests may require slower speeds, e.g. 20 knots, while between nest speeds can be higher (+ 60 knots). All potentially suitable nesting habitats (as identified in coordination with the Service) should be surveyed; multiple passes at several elevation bands may be necessary to provide complete coverage when surveying potential nesting habitat on large cliff complexes, escarpments, or headwalls. Hovering for up to 30 seconds no closer than a horizontal distance of 20 meters from the cliff wall or observed nests may be necessary to discern nest type, document the site with a digital photograph of the nest, and if possible, allow for the observer to read patagial tags, count young, and age young in the nest (Hoechlin 1976). Confirmation of nest occupancy may be confirmed during later flights at a greater horizontal distance.

Re-nesting is rare, but Golden Eagles may fail at their first nest attempt, and move to, or create, an alternate nest site. Multiple visits to known or potential nesting habitat may be necessary to provide complete observation and coverage of habitat.

To inventory for the purpose of documenting presence/absence of Golden Eagles in potential habitat, at least 2 aerial observation flights of habitat are necessary. These flights will be spaced no closer than 30 days apart. Additional inventory work in the territory is not necessary after nests have been located where Golden Eagles are found incubating, or where eggs or young and number of eggs or young are noted. At this point, the observation effort should

switch to monitoring of the known territory. The nest location should be documented (see territory/nest naming convention, pp. 20.

Inventory and monitoring flights will be based on local knowledge of known nesting chronologies for that latitude and elevation, and should be timed to be the most efficient to reduce the number of visits to the nest site. Flights may occur preferentially during a) late courtship, b) egg-laying though hatch, and/or c) when the young are between 20 and 51 days old. Productivity surveys are best scheduled when the young are 51 days old or more, but prior to fledging. Aerial visits at known nests may be augmented or replaced by ground observation (see below).

Other raptors or special status species may be observed during the flight, and should be recorded/reported. Coordination with state and federal agencies will be necessary when state or federally listed Threatened, Endangered or special status (species of concern, sensitive, etc.) species are present in the flight survey area (i.e. big-horn sheep, peregrine falcons, etc.). Bighorn sheep share the same type of cliff complexes Golden Eagles use for nesting, and are hyper-sensitive to helicopters (Weyhausen 1980, Bleich et al. 1990). Specifically for bighorn sheep lambing areas, helicopter reconnaissance and surveys for Golden Eagles are not possible as these flights will induce unpermitted take during the lambing season; all helicopter survey work for Golden Eagles should be avoided in known lambing areas. Ground observation will be necessary for inventory of cliff complexes and monitoring of potential and known Golden Eagle territories in bighorn sheep lambing areas.

Most Golden Eagle respond to fixed wing aircraft and helicopters by remaining on their nests, and continuing to incubate or roost (DuBois 1984, McIntyre 1995). Perched birds may flush. During aerial surveys, deference to flying eagles should be given at all times. Flights at nest sites should be terminated and the helicopter should bank away and move to the next location if Golden Eagles appear to be disturbed; i.e. behavior that indicates the birds are agitated by the presence of the helicopter. In short, observers should obtain their data, and leave as soon as possible.

Any disturbance behavior observed should be noted so that consecutive aerial surveys would be sensitive to Golden Eagles at that location. Aerial reconnaissance to inventory/survey for potential habitat and additional visits at known nests may be augmented/replaced by ground observation from a safe distance (see below). Ground observation may be the recommended alternative to additional survey flights due to convenience or necessitated by other sensitive wildlife species. Follow-up ground observation from a safe distance may also be the recommended alternative for additional nest site monitoring.

Observers in helicopters have specific duties. At least two observers may be best for aerial surveys; one the lead observer, the other(s) supplement survey effort. One observer is assigned to record data on a recorder (unless the verbal interchange can be recorded on the helicopters internal communication system), and the other briefly records data on hard-copy and with digital photographs. Aerial observation routes should be recorded, downloaded, and reported using Global Positioning System track routes or applicable software programs. Observation locations and time-on-site should be recorded on applicable maps to ascertain coverage of cliff systems and other potentially suitable habitat.

Summary:

- Qualified observer(s) (as defined in section VIII).
- No closer than 10-20 meters from cliff; no farther than 200 meters from cliff (safety dependent).
- Close approach and extended hovering is allowed when there are no birds on the nest to allow observers to count eggs, dead young, or confirm nest failure.
- Multiple passes or 'bands' (back and forth at different elevations above ground level) of observation across cliff habitat may be necessary to achieve complete coverage of a large cliff complex.
- Occupied territories and current and alternative nest sites will be documented; nests containing fresh branches should also be delineated.
- After a nest with eggs, young, or an incubating adult has been located, there is no need to search for other nests within the territory.
- Minimal hovering time at a known or potential nest should be less than 30 seconds.
- At least 2 surveys of previously unsurveyed habitat will be spaced at least 30 days apart.

VII.c. Ground Surveys

Ground surveys of potential habitat

Ground surveys for Golden Eagles in potential habitat may be achieved without aerial support, or may be used to augment extant aerial surveys. Ground surveys to detect Golden Eagle nests and the selected nest at known territories are effective in habitat where observation points are established to observe areas on cliffs, utility towers, or in trees suspected to be nesting habitat. As with aerial surveys, identification criteria for nesting habitat should take place in coordination with the Service, State or Tribal wildlife agencies, and raptor specialists.

Observation posts (OPs) are established during initial reconnaissance of potential or known nest cliffs, and are established in locations that are far enough from the potential nest site to

effectively observe the behavior of the adults (if present) without disturbing nesting behavior. Well-placed OPs provide unobstructed viewing of the potential nest location or of the area to be surveyed; including a broad panorama of the surrounding habitat. Multiple OPs or walking surveys may be necessary to observe potential nest sites. OPs located in front of, and below the potential nest cliff or tree are best. Placing OPs below the potential nest cliff reduces stress if an incubating adult may be present. The distance from an OP to the potential nest site may range from 300 – 1600 meters (latter represents extreme circumstances) from the cliff base to the observer, and generally no greater than 700 meters.

Golden Eagles may use alternative nests. Detection of previously unknown alternate nests and observation of all known alternative nests will become important if Golden Eagles fail in their initial nesting attempt, or are not observed at the probable nest location.

Ground monitoring; known territories

Monitoring to document nesting success at known territories may occur solely via ground observations. Observation of known territories should use the methodology described for ground monitoring of potential habitat (see section VIIc). Dates of all visits to the nesting territory will be recorded; date of confirmation of nesting failure will be key data for site specific and regional analysis.

Nesting outcomes

Fledging success will be determined via the observation of young that are at least 51 days of age, or are known to have fledged from the observed nest. If there is whitewash (Golden Eagle defecation) and a well worn nest, young were previously observed in the nest to be > 4 weeks old during a previous visit, and the young would have been > 51 days old at the time of the visit, and no dead young are found after a thorough ground search, the nesting attempt can be deemed successful.

Nesting failure occurs when a nest where eggs were laid or where incubation behavior was observed fails to have any young reach 51 days of age. If necessary, nesting failure will be confirmed by using a spotting scope to view the nest to determine if dead young are observed. Nesting failures may also be determined if observations of the nest prior to the projected fledge date yields no young or fledglings where eggs or young were previously observed. In these instances observation periods should last 4 hours (consecutively), or are confirmed by aerial survey. If dead young are observed in the nest (i.e. all young are dead), monitoring efforts may cease. Nest failures may also be confirmed by an approach (walk-in) to the nest no more than 4 weeks after fledging was scheduled to occur. Observers will look for dead chicks at the base of the nest cliff or tree, where access is reasonable and safe.

Observers must document the criteria they use to conclude that success or failure occurred.

Summary

- Observation posts for monitoring known territories will be no closer than 300 meters for extended observations, and generally no further than 700 meters, where terrain allows. Maximum OP distance would be 1600 meters.
- To inventory and determine occupancy of cliff systems, there will be *at least* 2 observation periods per season. To determine fledging success, additional observations may (or may not) be necessary.
    - Observation periods will last at least 4 hours for known nest sites, or until territory occupancy can be confirmed.
    - Observation periods will last for at least 4 hours per 1.6 km of cliff system, based from the center point of that cliff complex.
    - Observation periods will be at least 30 days apart for monitoring efforts.
- To collect monitoring data at a known nest territory, there will be at least 2 observation periods per season.
    - Observation periods from ground observation points will last at least 4 hours for known nest sites or until nesting chronology can be confirmed per visit. Observation periods will be at least 30 days apart.

VIII. Observer qualifications

Surveyor experience affects the results of protocol-driven raptor surveys. All observers should have the equivalent of 2 seasons of intensive experience conducting survey and monitoring of Golden Eagle and/or cliff dwelling raptors. That experience may include banding, intensive behavioral monitoring, or protocol-driven survey work. Experience should be detailed and confirmed with references, and provided to action and regulatory agencies. All surveyors should be well-versed with raptor research study design and Golden Eagle behavior and sign, including nests, perches, mutes, feathers, prey remains, flight patterns, disturbance behavior, vocalizations, age determination, etc. **Aerial surveys will be conducted by raptor specialists who have at least 3 field seasons experience in helicopter-borne raptor surveys around cliff ecosystems.**

In lieu of limited or no Golden Eagle experience, ground surveyors should attend at least a 2-day Golden Eagle training session convened with classroom and field components; trainers will be designated by the USFWS/USGS. Inexperienced or limited experience surveyors will be mentored by Golden Eagle specialists for at least 1-2 field seasons, depending on their experience level, and should assist with the preparation of at least 3 surveys and reports over at least 3 years. A Golden Eagle specialist is defined as a biologist or ecologist with 5 or more years of Golden Eagle or cliff dwelling raptor research/survey experience, possession of

state/federal permit allowing capture, handling, and/or translocation of Golden Eagles and/or cliff dwelling raptors; and/or relevant research on raptors published in the peer reviewed literature.

IX. Documentation and accepted notation of territory/nest site and area surveyed

Data for each territory/nest site(s) and area visited will be reported annually to the applicable regional office of the USFWS Division of Migratory Bird Management for collation into a national database.

Minimum data collected at known Golden Eagle territories

Observation of potential sites and known nest territories will produce data helpful to determine territory occupancy, productivity, and fate of the nesting attempt. Each observation and all site specific data collected should include at least;

a) Date of observation,
b) Time of observation(s),
c) Weather during observation,
d) Duration of observation,
e) Name of observer(s),
f) Location of observation,
g) Description of observation.

Data collected during inventory and monitoring will include (at least) the following:

- Territory status [Unknown; Vacant; Occupied-1 eagle; Occupied-2 eagles- laying or non-laying; Breeding successful (chick observed to be at least +51 days-fledging), Breeding unsuccessful (failed-nesting attempt failed after eggs were laid)].
- Nest location (decimal degree lat/long or UTM).
- Nest elevation.
- Age class of Golden Eagles observed.
- Document nesting chronology;
    - Date clutch complete (estimated). Describe incubation behavior observed to derive this date, and/or use backdating from known nestling age);
    - Hatch date (estimated from age of nestlings);
    - Fledge date (known or estimated; see nesting outcomes, pp. 18);
    - Date nesting failure first observed and/or confirmed;
    - Number of young at each visit and at >51 days of age;
    - Digital photographs; a) landscape view of area inventoried, b) landscape view of territory, and c) nest(s); and
    - Substrate upon which the nest is placed (tree species, cliff, or structure).

Additional data that can be collected include (but are not limited to):

- Presence or absence of bands (USGS and VID), patagial tags (number and color), or telemetry unit;
- Forage location (if known);
- Prey items noted (if discerned);
- Height of nest on cliff or in tree, and description of technique used to estimate height;
- Species of tree, type of rock, or type of structure used to support the nest;
- Overall cliff or tree height, and description of technique used to estimate height;
- Nest aspect; and
- Other nesting raptors present nearby.

Each area surveyed under the requirements of this protocol, including surveyed habitat, occupied nesting territory, historical territory, and suspected/alternative nests will be recorded in a standardized manner to allow local, regional, and national data analysis.

Recommended Golden Eagle Territory/site naming convention:

XX^1-XXX^2-XXXXX/XX^3-XXX^4-XX^5 Territory name

XX^1 = State (two letter alpha)

XXX^2 = County (three letter alpha)

XX^3= USGS Quad [five numeric/two letter alpha] (when the territory straddles adjacent quad maps, the quad in which the first nest was found will be used to describe the territory; XX^5 is used to document the locations of alternate nests within a territory)

XXX^4=Assigned Territory number within USGS quad (three numeric)

XX^5=Assigned Nest number within territory in instances of alternate nests (two numeric)

Site name=traditional site name, or if new, use local naming convention (e.g. Upper fork Amundsen Creek, Fort Peck flatland, Farmer Jane's back 40)

Example CA-KER-38512/DG-03-02 Abbot Creek

X. Additional considerations

This interim document primarily contains methods for inventorying and monitoring at nest sites, but the prohibitions against take and the new regulations apply at nest sites and foraging areas, as well as during migration and other non-breeding times. The Service will develop or adopt recommendations for surveys applicable to non-nesting in other documents.

Suitable foraging habitat

Golden Eagles forage close to and far from their nests, i.e. < 6 km from the center of their territories, but have been observed to move 9 km from the center of their territories in favorable habitat (McGrady et al. 2002). These distances may be further in xeric habitat.

Suitable wintering habitat

During winter, Golden Eagles are found throughout the contiguous United States. Inventories for wintering Golden Eagles will encompass all habitat where Golden Eagles have been known to nest, roost, and forage. Refer to Wheeler (2003, 2007) for maps elucidating suitable wintering range.

Winter surveys

Survey information gathered during the non-breeding period is needed to identify foraging areas and determine numerical estimates of use by Golden Eagles. Presence of Golden Eagles during winter surveys does not necessarily mean that breeding individuals are present; however follow-up surveys during the breeding season are necessary to denote occupancy at suspected or known territories.

Migration surveys

The location of migration routes or areas in relation to a proposal that are likely to take Golden Eagles through injury or mortality may have critical implications. Therefore, evaluations should assess whether migratory or transient Golden Eagles are likely to be present during the construction and the life of the project. Other factors to consider include numbers of Golden Eagles moving through the project area, movement patterns (including a three-dimensional spatial analysis), time of day, and seasonal patterns. In the case of wind development, surveys will need to identify the locations of migration routes and movements during migration in relation to proposed turbines and rotor-swept area.

XI. Acknowledgments.

The authors are indebted to the expertise, experience, effort and kindness expended on all phases of this protocol by Dr. Mark Fuller (USGS), Mike Kochert (USGS Emeritis), and Karen Steenhof (USGS Retired). We greatly appreciate the time they took to review multiple drafts, and provide sound advice and guidance where necessary regarding all aspects of Golden Eagle inventory and monitoring. Robert Murphy's comments on earlier drafts were also appreciated. We also appreciated Peter Bloom's input and good humor regarding his observations of Golden Eagle natural history and monitoring, and the cover photograph of a Golden Eagle taken from beneath a calf carcass while he was in a southern California pit trap.

XII Literature Cited

BEECHAM, J.J. AND M.N. KOCHERT. 1975. Breeding biology of the golden eagle in southwestern Idaho. Wilson Bull. 87:506-513.

BLEICH, V. C., R. T. BOWYER, A. M. PAULI, R. L. VERNOY, AND R. W. ANTHES. 1990. Responses of mountain sheep to helicopter surveys. Calif. Fish and Game 76:197-204.

BLOOM, P.H. AND S.J. HAWKS. 1982. Food habits of nesting Golden Eagles in North-east California and North-west Nevada. J. Raptor Res. 16: 110-115.

BLOOM, P.H. AND W.S. CLARK. 2001. Molt and sequence of plumages of golden eagles, and a technique for in-hand ageing. N. Am. Bird Bander 26:97-116.

BOEKER, E. L. and T .D. RAY. 1971. Golden eagle population studies in the southwest. Condor 73:463-467.

BOEKER, E.L. 1974. Status of golden eagle surveys in the western states. Wildl. Soc. Bull. 2:46-49.

COLLOPY, M.W. AND T.C. EDWARDS. 1989. Territory size, activity budget, and the role of undulation flight in nesting Golden Eagles. J. Field Ornithol. 60:43-51.

DEGROOT, D.S. 1928. Record sets of eggs of California raptores [sic]. Condor 30:360-361.

DIXON, J.B. 1937. The Golden Eagle in San Diego County, California. Condor 39:49-58.

DUBOIS, K. 1984. Rocky Mountain Front raptor survey, December 1982-November 1983, Fin. Rep. Montana Dep. Fish, Wildl., Parks, Helena.

ELLIS, D.H. 1979. Development of behavior in the golden eagle. Wildlife Monogr. No. 43.

ELLIS, D.H., T.CRAIG, E. CRAIG, S. POSTUPALSKY, C.T. LARUE, R.W. NELSON, D.W. ANDERSON, C.J. HENNY, J. WATSON, B.A. MILSAP, J.W. DAWSON, K.L. COLE, E.M. MARTIN, A. MARGALIDA, AND P. KUNG. 2009. Unusual raptor nests around the world. J. Raptor Res. 43:175-198.

FARMER, C.J., L.J. GOODRICH, E. RUELAS INZUNZA, AND J.P. SMITH. 2008. Conservation status of North America's birds of prey. Pp. 303 – 420 IN K.L. BILDSTEIN, J.P. SMITH, E. RUELAS INZUNZA AND R.R. VEIT (eds.). State of North America's birds of prey. Series in Ornith. # 3, Nuttall Ornith. Club and the Am. Ornith. Union.

FYFE, R.W. AND R.R. OLENDORFF. 1976. Minimizing the dangers of nesting studies to raptors and other sensitive species. Canadian Wildl. Serv., Occas. Paper # 23.GOOD, R.E., R.M. NIELSON, H. SAWYER, AND L.L. MCDONALD. 2007. A population estimate for golden eagles in the western United States. J. Wildl. Manage. 71:395-402.

GOOD, R.E., R.M. NIELSON, H. SAWYER AND L.L. MCDONALD. 2007. A population estimate for Golden Eagles in the western United States. J. Wildl. Manage. 71:395-402.

HARLOW, D.L. AND P.H. BLOOM. 1989. *Buteos* and the Golden Eagle. Pp. 102-110 in B.G. Pendleton, ed. Proceedings of the western raptor management symposium and workshop. Natl. Wildl. Fed. Scien. Tech. Ser. No. 12.

HARMATA, A.R. 1982. What is the function of undulating flight display in Golden Eagles? Raptor Res. 16:103-109.

HICKMAN, G.L. 1968. The ecology and breeding biology of the golden eagle in southwestern Idaho and southeastern Oregon. Draft number 2, U.S. Dept. Int. Bur. Sport Fish. and Wildl. Washington, D.C.

HOECHLIN, D.R. 1976. Development of golden eagles in southern California. Western Birds 7:137-152.

HUNT, G.W., R.E. JACKMAN, T.L. BROWN, D.E. DRISCOLL, AND L. CULP. 1997. A population study of golden eagles in the Altamont Pass Wind Resource Area; second-year progress report. Predatory Bird Research Group, Long Marine Lab., UC Santa Cruz.

HUNT, G.W. 1998. Raptor floaters at Moffats equilibrium. Oikos 82:191-197.

KOCHERT, M.N. AND K. STEENHOF. 2002. Golden eagles of the U.S. and Canada: status, trends and conservation challenges. J. Raptor Res. 36(S1):32-40.

KOCHERT, M.N. K. STEENHOF, C.L. MCINTYRE AND E.H. CRAIG. 2002. Golden Eagle (Aquila chrysaetos). In A. Poole and F. Gill (eds). The Birds of North America, # 684. The Birds of North America, Inc. Philadelphia, PA.

LEE, D.S. AND W.R. SPOFFORD. 1990. Nesting of golden eagles in the central and southern Appalachians. Wilson Bull. 102:693-698.

NIELSON, R.M., T. RINTZ, M.B. STAHL, R.E. GOOD, L.L. MCDONALD AND T.L. MCDONALD. 2010. Results of the 2009 survey of golden eagle (*Aquila chrysaetos*) in the western United States. Western Ecosystems Tech. Inc. Contract # 201818C027 for the USFWS.

NEWTON, I. 1979. Population ecology of raptors. T&AD Poyser, London.

MCINTYRE, C.L. 1995. Nesting ecology of migratory golden eagles (Aquila chrysaetos) in Denali National Park, Alaska. M.S. thesis, Univ. Alaska, Fairbanks.

MCGRADY, M.J., J.R. GRANT, I.P. BAINBRIDGE, AND D.R.A. MCLEOD. 2002. A model of golden eagle (Aquila chrysaetos) ranging behavior. J. Raptor Res. 36 (1 Supplement):62-69.

MENKENS, G.E., JR. AND S.H. ANDERSON. 1987. Nest site characteristics of a predominantly tree-nesting population of golden eagles. J. Field Ornithol. 58:22-25.

MILLSAP, B.A. AND G.T. ALLEN. 2006. Effects of falconry harvest on wild raptor populations in the United States: theoretical considerations and management recommendations. Wildl. Soc. Bull. 34:1392-1400.

OBERHOLSER, H.C. AND E.B. KINCAID, JR. 1974. The bird life of Texas. 2 Volumes. Univ. Texas Press, Austin.

OLENDORFF, R.R. 1971. Falconiform reproduction; a review. Part 1. The pre-nestling period. Raptor Res. Foundation Report # 1. Vermillion, SD.

OLSEN, P. AND J. OLSEN. 1978. Alleviating the impact of human disturbance on the breeding peregrine falcon: ornithologists. Corella 2:1-7.

PALMER, R.S. 1988. Golden eagle. IN R.S. PALMER (ed.). Handbook of North American birds. Yale Univ. Press.

PHILLIPS, R.L. AND A.E. BESKE. 1990. Distribution and abundance of golden eagles and other raptors in Campbell and Converse Counties, Wyoming. U.S. Dept. Int. Fish and Wildlife Service Tech. Rept. 27. Washington DC.

PHILLIPS, R.L., A.H. WHEELER, J.M. LOCKHART, T.P. MCENEANEY, N.C. FORRESTER. 1990. Nesting ecology of golden eagles and other raptors in southeastern Montana and northern Wyoming. U.S. Dept. Int. Fish and Wildlife Service Tech. Rept. 26. Washington, DC.

SMITH, J.P., C.J. FARMER, S.W. HOFFMAN, G.S. KALTENECKER, K.Z. WOODRUFF, AND P.F. SHERRINGTON. 2008. Trends in autumn counts of migratory raptors in western North America. Pages 217-254 IN K.L. BILDSTEIN, J.P. SMITH, E. RUELAS INZUNZA AND R.R. VEIT (eds.). State of North America's birds of prey. Series in Ornith. # 3, Nuttall Ornith. Club and the Am. Ornith. Union.

STEENHOF, K. AND I. NEWTON. 2007. Assessing nesting success and productivity. Pages 181-191 IN D.M. BIRD AND K.L. BILDSTEIN (eds.). Raptor research and management techniques. Hancock House, Surrey B.C.

STEIDL, R. J., K. D. KOZIE, G. J. DODGE, T. PEHOVSKI and E. R. HOGAN. 1993. Effects of human activity on breeding behavior of golden eagles in Wrangell-St. Elias National Park and Preserve; a preliminary assessment. National Park Service, Wrangell-St. Elias National Park and Preserve, Copper Center, Alaska, WRST Research and Resource Report; no. 93-3.

USFWS [U.S. FISH AND WILDLIFE SERVICE]. 2009. Final environmental assessment; Proposal to permit take as provided under the Bald and Golden Eagle Protection Act. Division of Migratory Bird Management, USFWS, Washington, DC.

WATSON, J. 1997. The golden eagle. T&AD Poyser, London.

WEHAUSEN, J.D. 1980. Sierra Nevada bighorn sheep: history and population ecology. PhD Dissertation. University of Michigan.

WRI [WILDLIFE RESEARCH INSTITUTE, INC.]. 2009. Western Mohave 2008 raptor survey; BLM Johnson Valley and Stoddard Valley open areas and environs. WRI for U.S. Bureau of Land Management, Moreno Valley, CA.

WHEELER, B.K. 2003. Raptors of western North America; the Wheeler Guides. Princeton Univ. Press.

WHEELER, B.K. 2007. Raptors of eastern North America; the Wheeler Guides. Princeton Univ. Press.

YOUNG, D.D., JR., C.L. MCINTYRE, P.J. BENTE, T.R. MCCABE AND R.E. AMBROSE. 1995. Nesting by golden eagles on the north slope of the Brooks Range in northeastern Alaska. Journal of Field Ornithology 66: 373-379.

XIII Glossary

Action agency – an agency or entity authorizing an action or plan, or providing funding for actions and plans.

Active nest (from the regulations**) —** a Golden Eagle nest characterized by the presence of any adult, egg, or dependent young at the nest in the past 10 consecutive days immediately prior to, and including, at present. Applies only to applications for permits to take eagle nests.

Breeding home ranges - the spatial extent or outside boundary of the movement of individuals from Golden Eagle pairs during the course of everyday activities during the breeding season.

Inactive nest (from the regulations**) —** a Golden Eagle nest that is not currently being used by eagles as determined by the continuing absence of any adult, egg, or dependent young at the nest for at least 10 consecutive days immediately prior to, and including, at present. An inactive nest may become active again and remains protected under the Eagle Act.

Inventory –systematic observations of the numbers, locations, and distribution of Golden Eagles and eagle resources such as suitable habitat and prey in an area.

Local area population — the population within the average natal dispersal distance of the nest or nests under consideration (43 miles for bald eagles, 140 miles for golden eagles). Effects to the local area population are one consideration in the evaluation of the direct, indirect, and cumulative effects of take, and the mitigation for such take, under eagle take permits.

Migration corridors - the routes or areas where eagles may concentrate during migration. Golden Eagles begin migrating across a broad front, but tend to concentrate along leading lines (geographical features such mountain ridges) as they move between geographic locations. Golden Eagles are observed in largest numbers along north-south oriented mountain ranges where they soar on mountain updrafts. The species typically avoids lengthy water-crossings. In North America, migrating Golden Eagles concentrate along the Appalachian Mountains in the East and Rocky Mountains in the West.

Management agency - see Action Agency.

Monitoring - inventories over intervals of time (repeated observations), using comparable methods so that changes can be identified. Monitoring includes analysis of inventory data or measurements to evaluate change within or to defined metrics. Monitoring also includes repeated observations of a known nesting territory.

Occupied Nest – a nest used for breeding in the current year by a pair. Presence of an adult, eggs, or young, freshly molted feathers or plucked down, or current years' mutes (whitewash) suggest site occupancy. Additionally, for the purposes of these guidelines, all breeding sites

within a breeding territory are deemed occupied while raptors are demonstrating pair bonding activities and developing an affinity to a given area. If this culminates in an individual nest being selected for use by a breeding pair, then the other nests in the nesting territory will no longer be considered occupied for the current breeding season. A nest site remains occupied throughout the periods of initial courtship and pair-bonding, egg laying, incubation, brooding, fledging, and post-fledging dependency of the young.

Unoccupied Nests - those nests not selected by raptors for use in the current nesting season. Nests would also be considered unoccupied for the non-breeding period of the year. The exact point in time when a nest becomes unoccupied should be determined by a qualified wildlife biologist based upon observations and that the breeding season has advanced such that nesting is not expected. Inactivity at a nest site or territory does not necessarily indicate permanent abandonment.

Productivity — the mean number of individuals fledged per occupied nest annually.

Survey –is used when referring to inventory and monitoring combined.