FINAL

Environmental Impact Report for the Bear River Sediment Removal at Rollins Reservoir

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APPENDICES

EXECUTIVE SUMMARY

ES.1 INTRODUCTION

The Nevada Irrigation District (NID) has prepared this ~~Draft~~ <u>Final</u> Environmental Impact Report (EIR) to provide the public and responsible agencies information about the potential adverse effects on the local and regional environment associated with the proposed Bear River Sediment Removal at Rollins Reservoir Project (proposed project). The purpose of the project is to restore water storage capacity in Rollins Reservoir and remove transported gravels and sediments from the Bear River. This ~~Draft~~ EIR has been prepared pursuant to the California Environmental Quality Act (CEQA) of 1970 (as amended), codified at California Public Resources Code Section 21000 et seq., and the CEQA Guidelines in the California Code of Regulations, Title 14, Section 15000 et seq. A Notice of Preparation (NOP) was circulated for public and agency review from May 24 through July 9, 2013. The NOP and comment received during the scoping period are included as Appendix A to this EIR.

<u>The Draft EIR was circulated for public review and comment for a period of 45 days. Four comment letters were received during this review period. The comments, and responses to comments, can be found in Chapter 8 of this Final EIR. The NID Board of directors will use this Final EIR in considering the environmental effects of the project, and in deciding whether or not to approve the project.</u>

~~This Draft EIR is being circulated for public review and comment for a period of 45 days. During this period, the general public, organizations, and public agencies can submit comments to the lead agency on the Draft EIR's accuracy and completeness. Release of this Draft EIR marks the beginning of a 45-day public review period pursuant to CEQA Guidelines Section 15105. The 45-day public review period for the Draft EIR begin when the Notice of Availability is published. The public can review the Draft EIR at the following address during normal business hours (Monday through Friday, 8 a.m. to 4 p.m.) or on the NID website at http://www.nidwater.com/projects.~~

~~Nevada Irrigation District~~
~~1036 West Main Street~~
~~Grass Valley, California 95945~~

~~NID encourages all commenters on the Draft EIR to submit their comments in writing. All comments or questions regarding the Draft EIR should be addressed to:~~

~~Lisa Francis Tassone, Board Secretary~~
~~Nevada Irrigation District~~
~~1036 West Main Street~~
~~Grass Valley, California 95945~~
~~530.273.6185~~
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~~Following the public review period, NID will prepare a Final EIR, which will include responses to all written comments received during the Draft EIR public review period. NID's Board of Directors may use this Draft EIR to approve the proposed project, make findings regarding identified impacts, and if necessary, adopt a Statement of Overriding Considerations regarding these impacts.~~

ES.2 BACKGROUND

Following completion of construction of the Rollins Reservoir Dam in 1965, aggregate and sediment transported from the Bear River and Steephollow Creek watersheds began to accumulate in Rollins Reservoir reducing the reservoir's volume. Between 1965 and 2002 gravel skimming operations were used in the Bear River near the mouth of the reservoir to maintain reservoir capacity while accommodating recreational boating and fishing. Gravel skimming operations were suspended in 2001/2002 and resulted in the accumulation of gravel and sediments in the reservoir and the Bear River channel. Since its completion in 1965, it is estimated that 10,000 acre-feet of storage capacity has been lost to sedimentation in Rollins Reservoir, from its original capacity of 65,998 acre-feet.

In 2002, the Nevada Irrigation District (NID) prepared and circulated an initial study/mitigated negative declaration (IS/MND) in accordance with the California Environmental Quality Act to analyze the environmental effects of continued aggregate mining operations. The IS/MND was recirculated in 2003. However, due to issues raised during the public hearings, the NID Board of Directors did not certify the MND or enter into the proposed gravel lease.

NID has an existing mining right for the project site, and the site is currently designated as an "idle mine" by Nevada County, in consultation with the California State Office of Mine Reclamation. The approved 1989 Reclamation Plan, therefore, remains in place, along with current financial assurances and an Interim Management Plan (approved May 31, 2013).

ES.3 PROJECT LOCATION

The project is located in unincorporated Nevada County and Placer County, approximately 6 miles northeast of the City of Colfax. The approximately 75-acre project site is located on the Bear River between the confluence of the Bear River and Steephollow Creek and Rollins Reservoir, approximately latitude 39°10′35″ and longitude 120°53′40″. The property is identified by the following Assessor's Parcel Numbers: Nevada County 65-240-37-000, 65-240-35-000, 65-260-02-001, 65-260-02-002, and Placer County 063-150-024-000.

ES.4 PROJECT OVERVIEW

The proposed project reestablishes aggregate removal on the Bear River between Rollins Reservoir and Steephollow Creek. The ultimate goal is to restore storage capacity in Rollins Reservoir and reduce available material from the Bear River channel that continues to be deposited in the reservoir. The project would benefit water storage capacity, river restoration, and recreation. Project design and operation considers the need to minimize impacts to water quality and biological resources.

Aggregate transport and deposition in the Bear River and Rollins Reservoir is an annual process, which requires continual aggregate removal to meet the project goals. Therefore, NID cannot predicate an end date. As such, the operation is considered to be on-going.

Aggregate removal would occur when water levels in the river and reservoir are at their lowest annual levels. This method allows a dry mining operation (material removal would not occur more than 6 inches below groundwater levels) using scrapers and front-end loaders (no dredging). The project area would be isolated from the perennial stream channel by constructing a dike system. Gravel skimming operations would shift between the north and south bank on an "as needed" basis. Through the use of the dikes and dry gravel skimming, the project would minimize impacts to water quality. Aggregate removal operations would be conducted during the period of lowest water levels (typically a 60–120 day period of the year between April 1 and November 15).

Extracted aggregate would be screened for size, but not otherwise processed, and placed in stockpiles. A secondary stockpile and surge area would allow material to be screened, sold, and transported throughout the active project season. Water would only be used on site for dust control.

Temporary bridges crossing Steephollow Creek and/or the Bear River would be placed at the beginning of the project season, and as-necessary, to allow access between the skimming area and the primary stockpile and staging area (the bridges would be removed at the end of the season). The material would be sold and loaded onto trucks from the primary stockpile, weighed, and transported on Chicago Park Powerhouse Road to Interstate 80. NID would continue to maintain the access road; widening, resurfacing, or other reconstruction activities would be limited to address safety needs.

Cofferdams will be used in select locations to reduce scouring that could result in damage to important NID assets within the Bear River canyon. Proposed cofferdams would be installed below the Chicago Park Powerhouse, where the right riverbank has been reinforced with gunite, and at the Chicago Park Powerhouse Road Bridge, where additional protection of the bridge supports is needed. The effects of scouring may increase as downstream gravel deposits are removed, thus creating a need for additional protection.

Ancillary features of the project include a staging area with fuel storage, office, maintenance shop, equipment storage, truck scales, and restrooms. The area would be lit for security purposes and the proposed mining activity is expected to discourage trespassing in the project area.

Approvals Required

NID has an existing mining right in the project area and received confirmation of an idle mine extension status (which includes Reclamation Plan RP88-03, approved by the County of Nevada in 1990) in May, 2013. This EIR will address actions by NID to reestablish aggregate removal operations, including acquisition of portions of the Chicago Park Powerhouse Road as an access road and haul route. The approved Reclamation Plan has been updated to reflect the proposed aggregate extraction operations.

It is anticipated that the EIR will be used by responsible agencies that may have jurisdiction over elements of the project. State and local agencies that may have jurisdiction over the proposed project include the following:

- Central Valley Regional Water Quality Control Board – Section 401 Clean Water Act Certification and/or Stormwater Pollution Prevention Plan.
- California Department of Fish and Wildlife (CDFW) – Section 1600 Streambed Alteration Permit.
- Nevada County – Approval of updated Reclamation Plan; approval of Hazardous Waste Business Plan and/or Spill Prevention and Control Plan (if necessary).
- Placer County Air Pollution Control District – review of emissions for activities on the north side of the Bear River, including screening, storage, and loading.
- Northern Sierra Air Quality Management District – if necessary, to review all activities on the south side of Bear River, including gravel skimming and the haul route.

In addition to state and local agencies, federal agencies may have jurisdiction over project components. A Section 404 Clean Water Permit is required from the U.S. Army Corps of Engineers (ACOE) for any activity within the waterway that would be considered “fill.” A portion of the project, including the stockpile area and possible road widening, is within land under the jurisdiction of the Bureau of Land Management (BLM). NID has a lease with BLM for this purpose. The filing of notices and posting of a bond for activities within BLM land may be required along with separate approvals if road widening activities include land administered by the BLM.

ES.5 PROJECT OBJECTIVES

The objective of the project is to improve water supply maintenance to prevent the accumulation of transported gravels and sediments in Rollins Reservoir. The project constitutes a public necessity and is intended to be ongoing as long as gravels and sediments migrate from the Bear River and Steephollow Creek watersheds into Rollins Reservoir.

The project objectives are as follows:

1. Maintain and improve storage capacity in Rollins Reservoir.
2. Remove the aggregate deposits from the Bear River below the confluence of the Bear River and Steephollow Creek.
3. Minimize impacts to the foothill yellow-legged frog (*Rana boylii*) during mining operations.
4. Protect the Chicago Park Powerhouse from undermining due to scouring.
5. Protect the Chicago Park Powerhouse Road Bridge abutments in the Bear River from scouring.
6. Acquire full rights to portions of the Chicago Park Powerhouse Road to establish a safe and efficient haul route and provide a permanent access to and from NID facilities.
7. Improve recreational opportunities and boat access to the upper reach of Rollins Reservoir.
8. Reclaim the site in accordance with revised Reclamation Plan RP88-03.

ES.6 SUMMARY OF IMPACTS

Table ES-1 presents a summary of the potentially significant environmental impacts that could result from the project, proposed mitigation measures, and the level of significance of the impact after the implementation of the mitigation measures.

Table ES-1
Summary of Potentially Significant Environmental Impacts

Impact	Mitigation Measures	Level of Significance After Mitigation
	Aesthetics	
Impact 3.1-4: Uncontrolled, project lighting could introduce a new light source and contribute to “sky glow” – the cumulative reduction in the quality of night sky views.	**MM-AES-1:** Nighttime security lighting fixtures shall be full or semi cutoff. Overall lighting levels shall be limited to that necessary to illuminate the operations site. Incandescent and mercury vapor light sources are discouraged.	Less than significant
	Air Quality	
Impact 3.2-2: The project would potentially violate an air quality standard or contribute substantially to an existing or projected air quality violation. Daily operational emissions would exceed the PCAPCD threshold for NO_x.	**MM-AQ-1:** During aggregate collection, sorting, and on-site hauling activities, site watering shall be conducted at least twice daily to control on-site fugitive dust.	Significant and unavoidable
Impact 3.2-3: The project would result in a cumulatively considerable new increase of a criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard	**MM-AQ-2:** To reduce the project’s contribution to cumulative NOx emissions, NID (or subsequent operator) shall participate in the Placer County Air Pollution Control District’s (PCAPCD’s) oxides of nitrogen (NOx) mitigation program. The purpose of this program is to provide NOx reduction (offsets) elsewhere, either	Significant and unavoidable

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Impact	Mitigation Measures	Level of Significance After Mitigation
(including releasing emissions which exceed quantitative threshold emissions which exceed quantitative thresholds for ozone precursors).	within the applicant's operations or elsewhere within PCAPCD's jurisdiction to compensate for cumulative NOx emissions..	
	Biological Resources	
Impact 3.3-1: The project could have a substantial adverse effect on a range of wildlife species and their habitat, including the foothill yellow-legged frog, western pond turtle, and bald eagle, which are special-status species.	**MM-BIO-1**: Workers Environmental Awareness Program. All workers shall receive worker environmental awareness training (WEAP) conducted by a qualified biologist or an environmentally trained foreman. WEAP may also be conducted through a video created by a qualified biologist specifically for this project. WEAP shall instruct workers to recognize all life stages of foothill yellow-legged frog (*Rana boylii*), their habitat, and the nature and purpose of protective measures including best management practices (BMPs) and other required mitigation measures. **MM-BIO-2:** Delineation of Project and Foothill Yellow-Legged Frog Habitat Areas. Before starting work each season, the Operator shall consult with a qualified biologist to survey and delineate those areas in the vicinity of the confluence with Steephollow Creek where foothill yellow-legged frog egg masses, tadpoles, young-of-the year frogs, or suitable breeding habitat is present. Survey methods should follow protocols provided in Seltenrich and Pool's "A Standardized Approach for Habitat Assessments and Visual Encounter Surveys for the Foothill Yellow-Legged Frog (*Rana boylii*)" (2002). Any other environmentally sensitive areas where foothill yellow-legged frogs are occupying shall also be delineated. The biologist shall prepare a survey report and submit to NID and the California Department of Fish and Wildlife (CDFW) for review. The Operator shall restrict all work to within the delineated boundaries. Delineation of work boundaries and environmentally sensitive areas may be in the form of a CDFW-approved map and must be on site at all times. **MM-BIO-3:** Work Period. The time period for skimming within Bear River shall be restricted to periods of low flow (which, depending on natural flows, could include periodic full releases from the Chicago Park Powerhouse) and dry weather, no earlier than April and no later than December, and consistent with other timing restrictions. Skimming activities shall be timed with awareness of precipitation forecasts and releases from the Chicago Park Powerhouse, and resultant likely increases in flow. Prior to forecasted storm events and known water releases from upriver dams, mining activities within the floodplain shall cease until all reasonable erosion control measures, inside and outside the floodplain, have been implemented. **MM-BIO-4**: Biological Monitor. During channelization, a	Less than significant

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Impact	Mitigation Measures	Level of Significance After Mitigation
	biological monitor shall monitor all activities related to channelizing the Bear River. The monitor shall have the authority to immediately stop any activity that is likely to impact special-status species (especially foothill yellow-legged frog) or order any reasonable measure to avoid or minimize impacts to fish and wildlife resources. If frog egg masses are observed on cobbles within a disturbance area, the biological monitor shall, if possible, relocate those cobbles to undisturbed areas of Steephollow Creek. The egg mass and associated substrate shall be gently placed into a container filled with creek water and immediately relocated to a calm-water location (velocity <5 centimeters (2 inches) per second) in the creek. The egg mass should be placed in an area with sufficient water depth to avoid desiccation at lower flows. Care must be taken while handling to avoid separating the egg mass from the attachment substrate. If any previously unknown special-status species are found within the project area during channelization, the monitor shall inform the CDFW within 1 day. If a breeding area avoidance plan (MM BIO 6) is implemented, the biological monitor will visit the site weekly when operations ae underway to confirm adherence to the plan. **MM-BIO-5**: Stranded Aquatic Life. The Operator shall ensure that aquatic life is not stranded in areas cut off from the remaining river channel during channelization. All reasonable efforts shall be made to capture and move all stranded aquatic life observed. A biological monitor (MM-BIO-4) shall conduct all relocations of aquatic life. Capture methods may include fish landing nets, dip nets, buckets, and hand capture. Captured aquatic life shall be released as soon as possible within the main channel at a reasonable distance from the active working area. This measure does not allow for the take or disturbance of any state or federally listed species. **MM-BIO-6**: Annual Breeding Area Avoidance. If breeding foothill yellow-legged frogs are found in the project area during MM-BIO-2, the Operator shall work with the biological monitor to ensure the project design (including setbacks) avoids negative impacts to the population within the channel. The Operator shall coordinate with the biological monitor to develop a breeding area avoidance plan t (to include work boundaries, timing, etc.) prior to sending to the survey report to CDFW for review and approval. **MM-BIO-7**: Restricting Channelization to South Bank of Bear River Channel. During channelization of the Bear River, the channel shall be located as near as practicable to the south bank of the Bear River channel to avoid potential breeding populations of foothill yellow-legged frogs in the vicinity of	

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Impact	Mitigation Measures	Level of Significance After Mitigation
	Steephollow Creek. **MM-BIO-8**: Riparian Vegetation Planting. Should the aggregate removal operation be terminated or suspended for more than 5 years, the site is undergoing reclamation under an approved reclamation plan, the Operator shall plant willows along the edge of the riverbed to compensate for willow riparian areas removed by project operations. Alternatively, the Operator may replant outside the project area, upstream in either Steephollow Creek or the Bear River, with the concurrence of CDFW. NID may also pay in-lieu fees for removal of willow and alder habitat (MM-BIO-10). **MM-BIO-9**: Gravel Depth. The Operator shall retain at least 12 inches of gravel above formational, non-alluvial material following aggregate removal, to allow for fish spawning. If gravel is removed to or below the depth of formational, non-alluvial material, sufficient gravel will be replaced in those areas to reach the minimum depth of 12 inches. **MM-BIO-10**: Willow Riparian Habitat In-Lieu Fees. The Operator may pay in-lieu fees to the U.S. Army Corps of Engineers (ACOE), CDFW, and Regional Water Quality Control Board according to their established fee structures to compensate for the removal of willow and alder riparian habitat within the Bear River channel. Such payment would replace, in whole or in part, the requirements of on- or off-site riparian vegetation planting (MM-BIO-8). If willow riparian habitat becomes reestablished within the disturbance area after payment of fees, removal of the reestablished willow riparian habitat would not require payment of fees. **MM-BIO-11**: Access Road Construction Habitat Protection. During improvements to the site access road (MM-TRA-1), construction crews will implement BMPs to limit dust generation from construction vehicles; contain any releases of fuel, oil, or other toxic compounds; and limit removal of trees to those designated on approved site plans. Prior to construction, any culverts under the access road will be clearly marked and protected so that runoff cannot enter watercourses. No construction will occur within 24 hours after rainfall that exceeds 1 inch in a 24-hour period.	
Impact 3.3-2: The project would have a substantial adverse effect on a riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife	**MM-BIO-8** and **MM-BIO-10**, above.	Less than significant

Table ES-1
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Impact	Mitigation Measures	Level of Significance After Mitigation
or U.S. Fish and Wildlife Service. The project would impact up to 60 acres of riparian habitat, including areas of willow riparian vegetation within the skimming area.		
Impact 3.3-5: The project would conflict with local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.	**MM-BIO-8** and **MM-BIO-10,** above.	Less than significant
	Cultural Resources	
Impact 3.4-1: There is a potential that subsurface historical or prehistoric resources or human remains could be encountered during skimming operations. Due to the type of activity it is highly unlikely any resource would be unearthed; however, if such resources are encountered during construction associated with the proposed project, they could be damaged, destroyed, or removed, resulting in a loss of integrity.	**MM-CUL-1:** Proper Handling of Archaeological Resources. If any cultural resources, such as structural features, unusual amounts of bone or shell, artifacts, human remains, or architectural remains are encountered during any construction activities, work shall be suspended within 100 feet of the find, and the project applicant shall immediately notify the Nevada County Planning Director (if located within Nevada County) or the Placer County Community Development Director (if located within Placer County) and coordinate any necessary investigation of the site with a qualified archaeologist as needed to assess the resources (i.e., whether it is a "historical resource" or a "unique archaeological resource") and provide proper management recommendations should potential impacts to the resources be found to be significant. Possible management recommendations for historical or unique archaeological resources could include resource avoidance or, where avoidance is infeasible in light of the project or is unnecessary to avoid significant effects, data recovery excavations. In consultation with the archaeologists, the contractor shall implement any measures deemed by the appropriate County staff to be necessary and feasible to avoid or minimize significant effects to the cultural resources. **MM-CUL-2:** Accidental Discovery of Human Remains. Pursuant to Section 5097.98 of the State Public Resources Code and Section 7050.5 of the State Health and Safety Code, as well as California Environmental Quality Act Guidelines Section 15064.5(e), in the event of the discovery of human remains, the appropriate County Coroner shall be immediately notified. If the remains are determined to be Native American, guidelines of the Native American Heritage Commission shall be adhered to in the treatment and disposition of the remains.	Less than significant
	Greenhouse Gas Emissions	
No significant impacts.	No mitigation required.	N/A

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Hazards and Hazardous Materials		
Impact 3.6-1: The project would create a potential hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.	**MM-HAZ-1:** Prior to operation, all contractor and subcontractor project personnel shall receive training regarding the appropriate work practices necessary to effectively comply with the applicable environmental laws and regulations, including, without limitation, hazardous materials spill prevention and response measures. **MM-HAZ-2:** Hazardous materials shall not be disposed of or released onto the ground, the underlying groundwater, or any surface water. Totally enclosed containment shall be provided for all trash. All construction waste, including trash and litter, garbage, other solid waste, petroleum products and other potentially hazardous materials, shall be removed to an appropriate waste facility permitted or otherwise authorized to treat, store, or dispose of such materials. **MM-HAZ-3:** A hazardous substance management plan shall be prepared and implemented. The plan should: • Identify all hazardous materials. • Identify spill response materials. • Specify procedures for notification and reporting, including internal management and local agencies (e.g., fire department, Department of Environmental Health), as needed. • Specify measures to be taken to protect worker and public health and safety. • Specify measures to be taken to manage and remediate wastes, as needed. **MM-HAZ-4:** Hazardous materials spill kits shall be maintained on site for small spills.	Less than significant
Impact 3.6-8: The project may expose people or structures to a significant risk of loss, injury or death involving wildland fires, including, where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.	**MM-HAZ-5:** Project operation areas, including the stockpiles, fuel and equipment storage, scales, offices, and accessory buildings, shall be cleared of dried vegetation or other materials that could serve as fire fuel. Any vehicles or equipment that normally include a spark arrester shall be equipped with an arrester in good working order.	Less than significant
Hydrology and Water Quality		
Impact 3.7-1: The proposed gravel-skimming operation has the potential to adversely affect channel form and function, either through direct modification of the channel or inducement of channel incision that could propagate to upstream areas.	**MM-HYD-1**: Hydrologic Management Plan. A California Professional Engineer (PE) or Geologist (PG) with appropriate expertise in surface water hydrology and geomorphology shall develop and implement a hydrologic management plan (HMP) with the objective of avoiding project-induced channel incision and avulsion and maintaining sustainable levels of sediment within the river corridor above the high water level of the Rollins Reservoir. The HMP shall outline yearly incision/avulsion	Less than significant

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Impact	Mitigation Measures	Level of Significance After Mitigation
	monitoring activities, flexible limits on annual gravel extraction above the high water level of the Rollins Reservoir, seasonal decommissioning procedures, and a schedule of compliance/reporting activities necessary to achieve HMP objectives. The HMP shall be consistent with the recommendations contained in the Hydrology, Geomorphology, and Water Quality of the Bear River at the Chicago Park Powerhouse memorandum prepared by Balance (Appendix G), including the following elements: Repeat topographic surveys shall be conducted to inform annual gravel extraction limits, monitor incision rates, and measure the effectiveness of decommissioning procedures. NID shall conduct a baseline topographic survey prior to the first season of gravel removal and perform repeat surveys as needed. The frequency with which repeat topographic surveys are performed shall be determined by the PE/PG responsible for the Hydrologic Management Plan, and shall be sufficient to meet HMP objectives. Monitoring methods shall include detailed thalweg surveys sufficient in point resolution to capture individual pools, riffles, and headcuts, and shall extend from the reservoir pool to the Chicago Park Powerhouse. Seasonal decommissioning procedures shall include, at a minimum, removal of all operational equipment located within the limits of the 100-year flood, including removal of surge piles, berms, temporary roads and bridges, dikes, and diversion channels. In years where winter flows have substantially changed the condition of the river corridor (to be determined by the PE/PG responsible for the Hydrologic Management Plan), the Operator shall map the general location, size and shape of channels, bars and terraces prior to the mining season to establish a standard for how the site should decommissioned at the end of the season. To the extent feasible, the Operator shall match grades to the surrounding topography and grade skimmed areas to eliminate abrupt slope breaks that could lead to development of a headcut—primarily on steepened upstream ends of skimming areas. Where the upstream slopes of excavated areas exceed 3%, armoring with boulders shall be required. The annual gravel extraction rate from the Bear River above the high water level of the Rollins Reservoir shall initially not exceed 72,670 cubic yards per year (based on current estimates of the average annual sediment delivery to the project reach). This limit may be modified thereafter based on repeat topographic surveys	

Table ES-1
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Impact	Mitigation Measures	Level of Significance After Mitigation
	of the project reach or a detailed geomorphic analysis that includes a site-specific bedload rating curve. Incision monitoring shall be conducted by the PG/PE to monitor incision rates based on annual topographic surveys and comparisons to data from prior years. The PE/PG shall standardize data collection methods and quantify thresholds for remedial action, such as installation of grade control structures. Every year, the PE/PG shall recommend gravel removal strategies that would minimize incision based on prevailing conditions and knowledge gained from repeat surveys (e.g., reservoir level, sediment volume, location of geomorphic features). Additional engineered grade control(s) shall be installed, based on the recommendation of the PE/PG, if monitoring data indicates gravel extraction has resulted in incision or avulsion that threatens permanent infrastructure. The HMP shall be developed by a California PE/PG and reviewed and approved by NID. **MM-HYD-2** Channel Design Specifications. Operator shall design the channelized portion of the Bear River during gravel removal operations to carry a full release from the Chicago Park Powerhouse without significant risk of channel incision or avulsion. The channelized portion of the Bear River shall be constructed to meet the following specifications: Where the channel top width is wide at 1,100 cubic feet per second (cfs), it may be narrowed to 125 feet with minimal risk of eroding the bed. Where the channel is less than 125 feet wide at 1,100 cfs, it shall not be narrowed with berms to mitigate the risk of incision. If the channel is to be diverted entirely, it shall be sized to convey 1,100 cfs without substantially eroding its boundaries throughout the mining season (i.e., 125 feet wide and 3 feet deep, assuming no freeboard). In no case shall the slope of the diversion channel be greater than 1.5%; where possible, it should be lower.	
Impact 3.7-2: The effects of mining and associated activities (cofferdams, temporary roads and bridges, stockpiling, hauling) have the potential to adversely affect water quality in the Bear River and downstream in Rollins Reservoir.	**MM-HYD-1:** See above. **MM-HYD-2:** See above. **MM-HYD-3:** Stormwater Pollution Prevention Plan. Operator shall develop and implement a stormwater pollution prevention plan (SWPPP) in accordance with State Water Resources Control Board and Central Valley RWQCB requirements. The	Less than significant

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Impact	Mitigation Measures	Level of Significance After Mitigation
	SWPPP shall specify the location, type, and maintenance requirements for best management practices (BMPs) necessary to prevent stormwater runoff from carrying construction-related pollutants. BMPs shall be implemented to address potential release of fuels, oil, and/or lubricants from operational vehicles and equipment (e.g., drip pans, secondary containment, washing stations), as well as release of fine sediment from material stockpiles (e.g., sediment barriers, soil binders). The SWPPP shall be developed and implemented by a Construction General Permit Qualified SWPPP Practitioner (QSD) / Qualified SWPPP Developer (QSP) and submitted to the RWQCB as part of obtaining regulatory approval for the proposed activities (i.e., the Industrial General Permit). **MM-HYD-4:** Exceedance of Water Quality Standard (50 ng/L) for Mercury. Should monitoring data indicate a statistically significant increase in mercury concentrations or methylmercury downstream of the proposed project relative to the baseline measurements upstream, and if such measurements exceed 50 ng/L, the Operator shall temporarily halt operations, allow standing water to infiltrate, and notify the RWQCB of the exceedance. In consultation with the RWQCB, the operator shall modify operations or implement remedial measures as necessary to ensure project contributions to mercury or methyl mercury in the Bear River and Rollins Reservoir remain below regulatory thresholds. **MM-HAZ-1** through **MM-HAZ-4:** See above.	
Land Use and Planning		
No significant impacts.	No mitigation required.	N/A
Noise		
No significant impacts.	No mitigation required. Voluntary measures incorporated into project: **MM-NOI-1:** When purchasing or replacing equipment, NID will use the latest, and least intrusive, backup warning devices available while maintaining compliance with the Mine Safety and Health Administration (MSHA) standards. **MM-NOI-2:** The stockpile and scale area shall be designed to minimize the need for haul trucks to back up by providing a continuous loop for loading, weighing, and exiting. **MM-NOI-3:** Signs shall be posted to limit horn use unless required for employee and public safety. **MM-NOI-4:** Noise minimization shall be a standard topic at operations meetings.	N/A
Public Utilities and Services		
No significant impacts.	No mitigation required.	N/A

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Impact	Mitigation Measures	Level of Significance After Mitigation
Transportation and Traffic		
Impact 3.11-4: The project would potentially increase hazards due to a design feature or incompatible use. The proposed project would substantially increase hazards on the Chicago Park Powerhouse Road through the introduction of two-way truck traffic on a roadway that has limited width and sight distance in certain areas.	**MM-TRA-1**: The narrow sections of the Chicago Park Powerhouse Road identified on Figure 3.11-6, shall be widened and paved to a width of at 19 feet or in accordance with the guidelines presented in the American Association of State Highway and Transportation Officials publication "A Policy on Geometric Design of Highways and Streets" and "Guidelines for Geometric Design of Very Low Volume Local Roads (ADT < 400)." The horizontal curves along the Chicago Park Powerhouse Road route that have a relatively small radius (60 to 110 feet) shall be signed appropriately with warning signs to indicate the degree of curvature and advisory speed (example – W4-10(CA) sign with 15 mile per hour advisory speed). These curves shall also be delineated with directional "chevron" warning arrows along the back of the curves to aid in negotiating the curves in darkness. Additionally, the small trees and vegetation immediately off the roadway on the inside of these curves shall be removed to improve sight distance through the curves. **MM-TRA-2 (Voluntary Measure not Required to Reduce a Significant Impact):** Truck operators shall exercise caution when merging onto I-80.	Less than significant

ES.7 ANALYSIS OF ALTERNATIVES

ES.7.1 Alternatives Considered

Two alternatives to the proposed project, including the No Project Alternative, were considered in Chapter 5, Alternatives. The No Project Alternative is a required element of an EIR pursuant to Section 15126.6(e) of the CEQA Guidelines that examines the environmental effects that would occur if the project were not to proceed. The other alternatives are discussed as part of the "range of reasonable alternatives" selected by NID. The alternatives addressed in Chapter 5 are listed below, followed by a description of each:

- **No Project Alternative:** Under the No Project Alternative, no sediment removal would occur and the mine status would remain idle. The lack of sediment removal would result in an increased sediment flow into Rollins Reservoir and continued reduction in storage capacity of the reservoir. In addition, the No Project Alternative would not provide scour protection for the Chicago Park Powerhouse and the Chicago Park Powerhouse Road Bridge.

- **Reduced Production Alternative:** The Reduced Production Alternative would involve sediment removal operations similar to the proposed project, but with a reduced maximum production amount of 206,000 tons per year. All other components of the proposed project would be identical under the Reduced Production Alternative.
- **Dewatering Channel Alternative**: The Dewatering Channel Alternative would create a dewatering channel, 125 feet wide and 3 feet deep, within the Bear River channel. The channel would accommodate peak flow releases during the aggregate removal season, would maintain water quality by inhibiting methylation of mercury, and would lower the water level in the riverbed to facilitate the dry removal of aggregate.

ES.7.2 Environmentally Superior Alternative

The No Project Alternative would result in the least environmental impacts and would be the environmentally superior alternative. All impacts associated with the proposed project would be reduced under the No Project Alternative. However, none of the project objectives would be achieved by the No Project Alternative. Section 15126.6(e)(2) of the CEQA Guidelines states that if the environmentally superior alternative is the No Project Alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives. In this case, the environmentally superior alternative is the Dewatering Channel Alternative, which would reduce potentially significant impacts related to water quality and hydrology. By incorporating the hauling limits of the reduced project alternative, it would also avoid a significant and unavoidable air quality impact due to NO_x emissions. The Dewatering Channel Alternative would achieve all of the project objectives.

ES.8 AREAS OF CONTROVERSY

Section 15123 (b)(2) of the CEQA Guidelines requires the Executive Summary of an EIR to disclose areas of controversy known to the lead agency that have been raised by the agencies and the public. NID circulated a Notice of Preparation (NOP) to solicit agency and public comments on the scope and environmental analysis to be included in the EIR. A total of 10 comment letters were received during the NOP public review period. Copies of the NOP and the NOP comment letters received by NID are included in Appendix A to this EIR. The following issues were raised in the written responses to the NOP:

- Noise
- Security and trespass
- Lighting
- Impacts to 100-year floodplain
- Water quality (mercury)

- Hazardous material spills
- Impacts to foothill yellow-legged frog, direct and indirect effects to riparian and wetland habitat, rare plants

Noise was also identified as a primary concern in the comment letters received during the Draft EIR review period.

ES.9 ISSUES TO BE RESOLVED BY LEAD AGENCY

Section 15123(b)(3) of the CEQA Guidelines requires that an EIR contain a discussion of issues to be resolved. With respect to the proposed project, the key issues to be resolved include decisions by NID, as lead agency, as to:

- Selection of feasible project alternatives.
- Feasibility of the recommended mitigation measures.
- Whether or not to proceed with the proposed project.
- Potential use of eminent domain to obtain full material hauling rights for Chicago Powerhouse Road.

CHAPTER 1
INTRODUCTION

1.1 PROJECT BACKGROUND

Following completion of construction of the Rollins Reservoir Dam in 1965, aggregate and sediment transported from the Bear River and Steephollow Creek watersheds began to accumulate in Rollins Reservoir reducing the reservoir's volume. Between 1965 and 2002 gravel skimming operations were used in the Bear River near the mouth of the reservoir to maintain reservoir capacity while accommodating recreational boating and fishing. Gravel skimming operations were suspended in 2001/2002 and resulted in the accumulation of gravel and sediments in the reservoir and the Bear River channel. Since its completion in 1965, it is estimated that 10,000 acre-feet of storage capacity has been lost to sedimentation in Rollins Reservoir, from its original capacity of 65,998 acre-feet. In 2002, the Nevada Irrigation District (NID) prepared and circulated an initial study/mitigated negative declaration (IS/MND) in accordance with the California Environmental Quality Act to analyze the environmental effects of continued aggregate mining operations. The IS/MND was recirculated in 2003. However, due to issues raised during the public hearings, the NID Board of Directors did not certify the MND or enter into the proposed gravel lease.

NID has mining rights for the project site, which is currently designated as an "idle mine" by Nevada County and the California State Office of Mine Reclamation (OMR). This mine site has an approved Reclamation Plan and Financial Assurance Mechanism, with an accepted Interim Management Plan, in accordance with the requirements of the 1975 California Surface and Mining Reclamation Act (SMARA; California Public Resources Code, Section 2710 et seq.). This particular operation is an in-stream sand/gravel extraction operation, which doubles as a reservoir maintenance project intended to keep the aggregates from filling up the Rollins Reservoir (which is also an NID facility). The last operator left the site in 2002, removing all of its equipment in the process; only a few power lines, concrete slabs, and stockpiled material remain on site for the proposed subsequent mining operations. Nevertheless, it has always been NID's intention to maintain or restore the gravel removal operation. Moreover, NID is committed to removing the sediment intrusion to restore valuable water storage capacity that has been lost in the past, and prevent further losses in capacity, if sediment removal operations are not continued. In 2013, Nevada County approved an extension of the idle mine status under the provisions of SMARA Section 2774(d)(1) and Senate Bill 108.

The Bear River Sediment Removal at Rollins Reservoir Project (proposed project) would reestablish aggregate removal on the Bear River between Rollins Reservoir and Steephollow Creek. The need for the project is created by the ongoing migration of sediment into Rollins Reservoir. The project would provide benefits to water storage capacity, water quality, and recreation. NID provides water to 25,000 homes and farms in western Placer and Nevada counties. Rollins Reservoir is an important component of the regional water supply. Due to the annual nature of gravel and sediment deposition, the project is a reservoir maintenance activity and there is no anticipated end point or end date for the operation. As such, the operation is considered to be an on-going maintenance activity.

1.2 PURPOSE AND INTENDED USE OF THIS EIR

The NID has prepared this ~~Draft~~ Final Environmental Impact Report (EIR) to inform the general public, the local community, responsible agencies, trustee agencies, other interested public agencies, and NID's decision-making body (Board of Directors) regarding the potential significant environmental effects resulting from implementation of the proposed project, and to identify measures or alternatives that would reduce or avoid those significant effects. This EIR was prepared in compliance with the California Environmental Quality Act (CEQA) (California Public Resources Code, Section 21000 et seq.) and the CEQA Guidelines (14 CCR 15000 et seq.). This EIR is a "Project EIR," pursuant to CEQA Guidelines, Section 15161.

As described in the CEQA Guidelines, Section 15121(a), an EIR is an informational document that assesses potential environmental impacts of a proposed project, as well as identifying mitigation measures and alternatives to a proposed project that could reduce or avoid adverse environmental impacts. As the CEQA lead agency for this project, NID is required to consider the information in the EIR along with any other available information in deciding whether to approve or carry out the proposed project. The basic requirements for an EIR include providing information that establishes the environmental setting (or project baseline) and identifying environmental impacts, mitigation measures, project alternatives, growth-inducing impacts, and cumulative impacts. In a practical sense, an EIR functions as a method of fact-finding, allowing the public, other public agencies, and agency staff an opportunity to collectively review and evaluate baseline conditions and project impacts through a process of full disclosure. Additionally, this EIR provides the primary source of environmental information for the lead agency to consider when exercising any permitting authority or approval power directly related to implementation of this project. It is not the intent of an EIR to recommend either approval or denial of a project.

1.3 TYPE OF EIR

This Final EIR~~, composed of the Draft EIR and Final EIR,~~ provides a project-level analysis for the proposed project "focusing primarily on the changes in the environment that would result from the development project" (14 CCR 15161). As further stated in Section 15161 of the CEQA Guidelines, a project-specific EIR "shall examine all phases of the project including planning, construction, and operation." The environmental impact analysis is located in Chapter 3 of the ~~Draft~~ EIR. Environmental issues found not to be potentially significant are discussed in Chapter 4.

1.4 LEAD, RESPONSIBLE, AND TRUSTEE AGENCIES

1.4.1 Lead Agency

In accordance with CEQA Guidelines, Sections 15050 and 15367, the NID is the “lead agency,” which is defined as the “public agency which has the principal responsibility for carrying out or disapproving a project.” The lead agency is responsible for determining the scope of the environmental analysis, preparing the EIR, and responding to comments received on the Draft EIR. Prior to making a decision to approve a project, the lead agency is required to certify that the EIR has been completed in compliance with CEQA, that the decision-making body has reviewed and considered the information in the EIR, and that the EIR reflects the independent judgment of the lead agency.

1.4.2 Responsible Agencies

Responsible agencies are state and local public agencies other than the lead agency that have some authority to carry out or approve a project or that are required to approve a portion of the project or approve a permit for which a lead agency is preparing or has prepared an EIR or IS/MND (14 CCR 15813). The following agencies would potentially act as responsible agencies for the purposes of this project:

- California Department of Fish and Wildlife
- California State Lands Commission
- Central Valley Regional Water Quality Board
- Nevada County
- Northern Sierra Air Quality Management District
- Placer County Air Pollution Control District

The potential permits and approvals required from these agencies are described in Section 2.7.

1.4.3 Trustee Agencies

Trustee agencies are designated public agencies with legal jurisdiction over natural resources that are held in trust for the people of California and that would be affected by a project, whether or not the agencies have authority to approve or implement the project (14 CCR 15386). In addition to their potential permit roles noted above, the California Department of Fish and Wildlife and the State Lands Commission are also trustee agencies under CEQA.

1.5 EIR PROCESS

1.5.1 Notice of Preparation

In accordance with the CEQA Guidelines, Section 15082, a Notice of Preparation (NOP) was circulated for review from November 1 through December 2, 2013 (included as Appendix A to this EIR). The purpose of the NOP was to provide notification that an EIR for the proposed project was being prepared and to solicit guidance on the scope and content of the document. A summary of the comments received on the NOP is included in the Executive Summary, as well as in the introduction of each technical section. The NOP comments are included in Appendix A. Comments from agencies and the public in response to the NOP are also provided in Appendix A. General concerns and issues raised in response to the NOP are summarized in the Executive Summary and addressed in applicable sections of this EIR.

1.5.2 Draft EIR

A Notice of Availability for the Draft EIR was released on June 11, 2015. The Draft EIR review process is described below:

This Draft EIR is being circulated for public review and comment for a period of 45 days. During this period, the general public, organizations, and public agencies can submit comments to the lead agency on the accuracy and completeness of the Draft EIR. Release of this Draft EIR marks the beginning of a 45-day public review period pursuant to CEQA Guidelines, Section 15105. The 45-day public review period for the Draft EIR will begin on the day the Notice of Availability is published. The public can review the Draft EIR at the following address during normal business hours (Monday through Friday, 8 a.m. to 4 p.m.) or on the NID website at http://www.nidwater.com/projects.

Nevada Irrigation District
1036 West Main Street
Grass Valley, California 95945

The NID encourages all commenters on the Draft EIR to submit their comments in writing. All comments or questions regarding the Draft EIR should be addressed to:

Bear River Sediment Removal at Rollins Reservoir
c/o Lisa Francis Tassone, Board Secretary
Nevada Irrigation District
1036 West Main Street
Grass Valley, California 95945
530.273.6185
E-mail: BRsedimentremoval@nidwater.com

1.5.3 Final EIR

Upon completion of the Draft EIR public review period on July 27, 2015, ~~a~~ the Final EIR ~~will be~~ was prepared that ~~will~~ includes written comments on the Draft EIR received during the public review period and the NID's responses to those comments. The comments/responses, combined with the Draft EIR and any minor revisions, ~~shall~~ compose the Final EIR.

Four written comment letters were received during the Draft EIR review period. These letters, and the responses to the comments, comprise Chapter 8 of this Final EIR.

Before NID can approve the project, it must first certify that the EIR has been completed in compliance with CEQA, that the Board of Directors has reviewed and considered the information in the EIR, and that the EIR reflects the independent judgment of the NID. The Board of Directors would be required to adopt findings for each significant impact identified in the EIR. If the project would result in significant and/or unavoidable impacts, despite implementation of feasible mitigation measures or alternatives, the Board of Directors must adopt a Statement of Overriding Considerations if it approves the proposed project (see also California Public Resources Code, Section 21081).

1.5.4 Mitigation Monitoring and Reporting Program

Section 21081.6 of the California Public Resources Code requires lead agencies to "adopt a reporting and mitigation monitoring program for the changes to the project which it has adopted or made conditions of project approval in order to mitigate or avoid significant effects on the environment." Any mitigation measures adopted by NID will be included in a Mitigation Monitoring and Reporting Program to verify implementation. The Mitigation Monitoring and Reporting Program will be adopted by the Board of Directors should the Board approve the proposed project.

1.5.5 EIR Adequacy

The level of detail contained throughout this EIR is consistent with Section 15151 of the CEQA Guidelines, which states the following:

> An EIR should be prepared with a sufficient degree of analysis to provide decision makers with information which enables them to make a decision which intelligently takes account of the environmental consequences. An evaluation of the environmental effects of a proposed project need not be exhaustive, but the sufficiency of an EIR is to be reviewed in the light of what is reasonably feasible. Disagreement among experts does not make an EIR inadequate, but the EIR should summarize the main points of disagreement among the experts. The courts have looked not for perfection but for adequacy, completeness, and a good faith effort at full disclosure (14 CCR 15151).

1.5.6 Environmental Baseline

The existing physical conditions, at the time the NOP is published, shall constitute the environmental baseline. The environmental baseline is used by the lead agency in determining the significance of an impact (an adverse change in the physical conditions of the area) associated with a project it proposes to undertake. The NOP for this EIR was published in November 2013.

1.6 MINE RECLAMATION

1.6.1 Surface Mining and Reclamation Act

SMARA was enacted by the state legislature in 1975 and is the state's response to the need for a continuing supply of mineral resources while preventing damage from mining activities to public health, property, and the environment (California Public Resources Code, Section 2710 et seq.). SMARA requires the preparation of a reclamation plan and annual mine inspections, as well as the maintenance of a financial assurances cost estimate to guarantee post-mining reclamation of the mine site.

Nevada County is the local SMARA lead agency (this should not be confused with the CEQA lead agency, which, as the public agency proposing to carry out the activity, is NID). Nevada County approved the original reclamation plan in 1990, and will review the proposed amended reclamation plan.

The Office of Mined Land Reclamation (OMR) and the State Mining and Geology Board are jointly charged with ensuring proper administration of the SMARA requirements. The State Mining and Geology Board promulgates regulations to clarify and interpret the SMARA provisions, and also serves as a policy and appeals board. The OMR provides ongoing technical assistance for lead agencies and operators, maintains a database of mine locations and operational information statewide, and is responsible for compliance-related matters.

One of the mandates of SMARA requires the California Geological Survey to identify and evaluate the mineral resources of the state, including sources of construction aggregate. Local agencies are required to use the classification information when developing land use plans and when making land use decisions. Based on the State Mining and Geology Board guidelines, the California Geological Survey is authorized to map regions within the state to locate and classify areas with significant aggregate resources

1.6.2 Reclamation Plan

NID has existing and on-going mining rights in the project area, and Nevada County approved Reclamation Plan RP88-03 in 1990. The historical gravel skimming operation on the Bear River is currently in idle status (CA Mine ID# 91-39-0020). The approved 1990 Reclamation Plan will be updated to reflect proposed operations with a more limited gravel skimming area, in addition to technical changes to SMARA since 1990. The updated plan, included in this ~~Draft~~ EIR as Appendix B, will be submitted to Nevada County for approval. Nevada County must also provide the revised plan to OMR for a 30-day comment period. As a portion of the proposed sediment removal area is within Placer County, Placer County may also be a participant in the review process.

1.6.3 Financial Assurances

SMARA requires surface mining operators to obtain a lead agency-approved financial assurance mechanism for the reclamation of mined lands so the public will not bear the cost of reclaiming abandoned operations. Financial assurances may take the form of surety bonds, irrevocable letters of credit, or trust funds, and must be accessible by the SMARA lead agency or the state in cases of mine abandonment. In the event of financial incapability by the operator, the financial assurance funds would be used by the lead agency (or State Mining and Geology Board) to reclaim the mined site.

SMARA regulations require the following in the calculation of financial assurance:

- An analysis of the activities necessary to implement the approved reclamation plan
- The unit costs for each activity
- The number of units
- Contingency costs and administrative costs

The financial assurances cost estimate is reviewed annually and adjusted, if necessary, to reflect changes in the cost of reclamation activities, lands reclaimed the previous year, and the lands to be disturbed the next year. NID currently has financial assurances in place with Nevada County, which would be reviewed and adjusted, if necessary, following approval of the revised reclamation plan.

1.7 ORGANIZATION OF THIS EIR

Executive Summary—Summarizes the proposed action, the potential environmental effects, and the mitigation measures and project alternatives that would reduce or avoid those effects. The summary includes areas of known controversy related to the proposed project, and issues to be resolved, including the choice among alternatives and whether or how to mitigate potentially significant effects.

Chapter 1, Introduction—Provides an introduction and overview of the EIR process and describes the intended use of the EIR and the review process.

Chapter 2, Project Description—Provides a detailed description of the proposed project, including its location, background information, project history, project objectives, and technical characteristics.

Chapter 3, Environmental Impacts and Mitigation Measures—Describes the baseline environmental setting and provides an assessment of potential project impacts for each technical issue area presented. Each section is divided into six subsections: Existing Conditions; Relevant Plans, Policies, and Ordinances; Thresholds of Significance; Impacts Analysis; Mitigation Measures; and Level of Significance After Mitigation. The impacts discussion includes direct, indirect, short-term, long-term, and cumulative effects of the proposed project.

Chapter 4, Other CEQA Considerations—Provides information required by CEQA regarding impacts that would result from the proposed project, including impacts found not to be significant, significant and unavoidable effects of the project, and potential impacts resulting from growth inducement.

Chapter 5, Alternatives—Describes and compares the proposed project alternatives to the proposed project.

Chapter 6, References—Provides a list of references used in preparation of the environmental analysis.

Chapter 7, List of Preparers—Lists report authors who provided technical assistance in the preparation and review of the EIR.

Chapter 8, Response to Comments—Reprints all comment letters received on the Draft EIR, and provides responses to all environmental issues raised in those comment letter.

Appendices—Include various technical studies and data that support the analysis presented in the EIR.

CHAPTER 2
PROJECT DESCRIPTION

The Bear River Sediment Removal at Rollins Reservoir Project (proposed project) is intended to restore and maintain reservoir capacity in Rollins Reservoir and reestablish aggregate removal operations between Rollins Reservoir and the Bear River/Steephollow Creek confluence. The proposed project would also stabilize the banks of the Bear River below the Chicago Park Powerhouse and the Chicago Park Powerhouse Road Bridge abutments over the Bear River. The proposed project includes the establishment of Chicago Park Powerhouse Road as a permanent access route to haul excavated materials from the project area to Interstate 80 (I-80).

2.1 PROJECT LOCATION

The proposed project is located in unincorporated Nevada County and Placer County, approximately 6 miles northeast of the City of Colfax (Figure 2-1, Regional Map). The project site is located on the Bear River between the confluence of the Bear River and Steephollow Creek and Rollins Reservoir (Figure 2-2, Project Location Map), approximately latitude 39°10'35" and longitude 120°53'40". The project site is approximately 75 acres in size, and includes parcels in Nevada County and Placer County. The project site is located in portions of Sections 6 and 7, Township 15 north, Range 10 east on the Chicago Park 7.5-minute quadrangle U.S. Geological Survey date).

The property is identified by the following Assessor's Parcel Numbers: Nevada County 65-240-37-000, 65-240-35-000, 65-260-02-001, and 65-260-02-002, and Placer County 063-150-024-000. These parcels are owned by Nevada Irrigation District (NID), with the exception of 65-240-35-000, which is owned by the U.S. Bureau of Land Management (BLM). NID has a lease on this property, which would include the proposed stockpile area. Portions of Chicago Park Powerhouse Road (proposed haul route) are owned by NID, BLM, and various private owners (Figure 2-3, Site Plan).

2.2 PROJECT SETTING

The project site is located upstream of Rollins Reservoir, and includes an approximately 1-mile reach of the Bear River channel and an 800-foot reach of Steephollow Creek. The Chicago Park Powerhouse is overlooking the Bear River, on the north side of the Bear River upstream of the Steephollow Creek confluence.

Access to the site is via the Chicago Park Powerhouse Road, north of Interstate-80 (I-80). A bridge over the Bear River provides access to the Chicago Park Powerhouse and the north bank of the Bear River.

Project elevations range from 2,200 to 2,400 feet above mean sea level. The project site consists of perennial streams surrounded primarily by mixed coniferous forest, with some disturbed areas and mining tailings.

2.3 PROJECT BACKGROUND

Following completion of construction of the Rollins Reservoir Dam in 1965, aggregate and sediment transported from the Bear River and Steephollow Creek watersheds began to accumulate in Rollins Reservoir reducing the reservoir's volume. Between 1965 and 2002 gravel skimming operations were used in the Bear River near the mouth of the reservoir to maintain reservoir capacity while accommodating recreational boating and fishing. Gravel skimming operations were suspended in 2001/2002 and resulted in the accumulation of gravel and sediments in the reservoir and the Bear River channel. Since its completion in 1965, it is estimated that 10,000 acre-feet of storage capacity has been lost to sedimentation in Rollins Reservoir, from its original capacity of 65,998 acre-feet.

In 2002, NID prepared and circulated an initial study/mitigated negative declaration (IS/MND) to analyze the environmental effects of entering into an agreement with a new mining operator to continue aggregate removal. The IS/MND was recirculated in 2003. However, due to issues raised during the public hearings, the NID Board of Directors did not certify the MND or enter into the proposed gravel lease.

NID has a current mining right for the project site, and the site has been designated as an "idle mine" by Nevada County, in consultation with the Office of Mine Reclamation. The approved 1990 Reclamation Plan remains in place, along with current financial assurances and the recent approval of an extension of the Interim Management Plan (approved May 31, 2013).

2.4 PROJECT OVERVIEW

The proposed project would reestablish aggregate removal on the Bear River between Rollins Reservoir and Steephollow Creek (see Figure 2-3). The ultimate goal is to restore water storage capacity in Rollins Reservoir and to prevent further sedimentation of Rollins Reservoir and the Bear River (see reservoir water levels noted on Figure 2-3). The project would provide benefits to water storage capacity, water quality, and recreation. Due to the annual nature of sediment deposition, there is no anticipated end point or end date for the operation. As such, the operation is considered to be on-going.

Removal of aggregate from the riverbed would occur annually when water levels are low, to allow for a dry mining operation (material removal would not occur more than 6 inches below standing or flowing water) using scrapers and front-end loaders (no dredging). The downstream project limits depicted on Figure 2-3 are dependent on the water levels in Rollins Reservoir.

When conditions allow (i.e. water levels are low enough to allow for dry removal of material), excavation may occur further downstream. The operational period would be from April 1 to November 15, with removal activities concentrated during the period of lowest water levels (typically 60 – 120 days of the year) in the summer or fall. The project site would be isolated from the perennial stream by moving aggregates to form temporary channels and dikes (channel and dike system). Mining would occur “in the dry” bank area on the north or south sides of the channel and dike system, by excavating to a depth that does not exceed 6 inches below standing water. Through the use of the channel and dike system and dry removal, the project would minimize turbidity and other potential impacts to water quality in the lake or river. The material would be stockpiled in one of two main areas, plus a surge area for additional material, above the normal high water line (Figure 2-3). Operations conducted above the normal high water mark, such as loading and weighing trucks, sales, security, etc. would be done year-round, depending on demand for aggregate.. Material would be screened, but not otherwise processed, and placed in the primary stockpile. A secondary stockpile and surge area would allow material to be screened, sorted, sold, and transported throughout the respective periods described above. Water would only be used on site for dust control. Unlike previous mining operations, no crushing or washing of aggregate would be done on site.

Temporary bridges crossing Steephollow Creek and/or the Bear River would be placed at the beginning of the removal season to allow access between the skimming area and the primary stockpile and staging area (the bridges would be removed at the end of the removal season). The material would be sold and loaded onto trucks from sorted stockpiles, weighed, and transported on trucks using the Chicago Park Powerhouse Road and Secret Town Road to access I-80. The establishment of permanent truck hauling rights on Powerhouse Road between the project site and Secret Town Road would be required. NID would continue to maintain the Chicago Park Powerhouse Road.

Cofferdams would be used in two different locations to reduce scouring effects. Proposed cofferdam areas include the following: (a) the area below the Chicago Park Powerhouse tail-race, where the riverbank has previously been reinforced with gunite, and (b) across the Bear River immediately downstream of the Chicago Park Powerhouse Road Bridge, to protect bridge abutments from being undermined due to river scour. The potential for scouring downstream of the bridge may increase as material is removed, creating the need for additional cofferdam protection as part of the project. Consequently, the project includes a series of cofferdams crossing the Bear River at strategic intervals, if needed. Ancillary features of the project include a staging area with fuel storage, office, maintenance shop, equipment storage, truck scales, parking, and restrooms. The area would be lit for security purposes and the proposed additional activity is expected to reduce unauthorized or illegal use of the project site. These features would be located above the normal high water elevation on or near the BLM lease area.

2.5 PROJECT OBJECTIVES

The overall purpose of the project is to restore and maintain NID's water storage capacity and to prevent the accumulation of transported sediments in Rollins Reservoir. The project constitutes a public necessity and is intended to be on-going, due to continual migration of sediment from the Bear River and Steephollow Creek watersheds into Rollins Reservoir.

The project objectives are as follows:

1. Maintain and improve storage capacity in Rollins Reservoir.
2. Remove the aggregate deposits from the Bear River below the confluence of the Bear River and Steephollow Creek.
3. Minimize impacts to the foothill yellow-legged frog (*Rana boylii*) during mining operations.
4. Protect the Chicago Park Powerhouse from undermining due to scouring.
5. Protect the Chicago Park Powerhouse Road Bridge abutments in the Bear River from scouring.
6. Acquire full rights to portions of the Chicago Park Powerhouse Road to establish a safe and efficient haul route and provide a permanent access to and from NID facilities.
7. Improve recreational opportunities and boat access within the upper reach of Rollins Reservoir.
8. Reclaim the site in accordance with revised Reclamation Plan RP88-03.

2.6 PROJECT COMPONENTS

2.6.1 Aggregate Removal Operations

Operations within the river banks would occur between April 1 and November 15 (the removal season). Active sediment removal would occur during a 2-month window during the removal season—typically late summer or early fall when water levels are at their lowest. Certain supporting activities (the year-round activities) would be done on a year-round basis, depending on weather. It is estimated that up to 250,000 tons of material could be removed per year, depending on market demand, although a typical year (based on previous history) would be closer to 50,000 tons per year.

Channelizing and Sediment Removal

Preliminary sediment removal operations, including channelization of the Bear River and installation of temporary bridge crossings, would occur during the summer and/or fall season, after winter storm flows subside and water levels are low. As the course of the Bear River shifts during high flows each year, the resulting watercourse (at low flows) tends to meander within the riverbanks. The low-flow river would be channelized with gravel berms designed to direct and maintain the channel of the river during sediment removal operations; this would separate the gravel removal operation from the perennial stream. After the river is channelized, a dry bank is created on one or both sides of the channel that is generally 1 to 3 feet above the flowing water surface elevation. Gravel would be removed from the Bear River using scrapers, excavators, and/or front-end loaders. No dredging would be done directly in the active channel of the Bear River. Excavation would occur to a level no greater than 6 inches below the standing water level.

Material hauling would be routed to the side bank of the Bear River during removal operations as much as possible to minimize equipment crossing the channel (north or south bank). Temporary bridges would be placed over the channels where frequent crossings are needed and in the main equipment routes across Steephollow Creek or the Bear River. These main route bridges would be placed at the beginning of the removal season to allow regular access between the skimming area and the primary stockpile and staging area.

The temporary bridge crossings would be designed by a civil engineer and would be sized and positioned so as not to impede the passage of aquatic species (fish or amphibians) or to increase the velocity of water flows. The bridge (most likely a flatbed or railroad car) would be buried below grade at the ends to facilitate wheeled access.

There are two proposed stockpile areas and one proposed surge pile to store excavated sediments. The primary stockpile area is located on the east side of Steephollow Creek above the confluence of the Bear River (see Figure 2-3). Excavated material would be screened on the west side of Steephollow Creek using a “grizzly” screened hopper,[1] and transported by conveyor belts for additional screening and stockpiling on the east side of Steephollow Creek. All stockpiled material would be stored by material size for transport off-site. The material may be used off-site for landscaping or other unprocessed uses, or may be delivered to a facility for processing (including use in asphalt or concrete cement). Fines (fine sediment) would be captured in the screening process to prevent water quality impacts, stored in either a truck trailer or railcar, and shipped off site for processing.

An existing secondary stockpile area is located on the north side of the Bear River, approximately 1,800 feet downriver of Steephollow Creek and 3,000 feet upstream of Rollins Reservoir. This stockpile is proposed as an intermediary location for aggregate removed from Rollins Reservoir, particularly in dry years when water levels are low and larger volumes of aggregate can be excavated. Material would then be moved to the primary stockpile areas as space and weather conditions allow.

1 Coarse screening or scalping device that prevents oversized bulk material from entering a material transfer system.

A surge pile would be established on the west side of Steephollow Creek to provide ready material for loading on the conveyor as needed, depending on the space available in the primary stockpile area.

At the end of the annual active mining operations season, the temporary bridge crossings and all equipment (including grizzly, conveyors, screens, and mobile equipment) will be removed from the streambeds. The gravel berms and haul roads would be allowed to move with changes in the river during the following winter season.

Sorting, Loading, Weighing, Hauling, and Sales

During the removal season and throughout the remainder of the year, ancillary mining activities (the year-round activities) would occur above the normal high water elevation, on the east side of the river confluence (see Figure 2-3). These activities would include loading trucks for off-haul, weighing material and trucks, sales, maintenance of equipment, fueling equipment and trucks, and general office work.

2.6.2 Facilities and Equipment

Excavated material would be loaded onto a grizzly on the west side of Steephollow Creek. The grizzly would prevent debris and large rocks (6 inches or greater) from passing through. A containment system, such as a flatbed truck or other container, may be placed under the grizzly to prevent fine material from escaping. The contained material would be returned to the grizzly for rescreening and conveyance, or if the containment is dominated by silt-size aggregates, it would be transported to an off-site processing center for disposal.

The aggregate would be screened through various-sized mesh screens for stockpiling. The aggregate would be transported from the grizzly by a conveyor system to the east side of Steephollow Creek, where it would be screened into various sizes and placed in stockpiled. Typical screening sizes may be 1 inch minus, 1 inch plus, and 2 inch plus. From the stockpiles, material would be loaded into trucks by front-end loaders. The trucks would be weighed at a scale before leaving the materials handling area.

There would be no on-site crushing or washing of excavated materials. The only on-site process would consist of screening and sorting of materials and removal of debris. Water would be applied to material being stockpiled and loaded as required to reduce fugitive dust. Water use would be limited to dust suppression and would be applied in a manner to prevent direct runoff into Steephollow Creek and the Bear River. The water would be supplied on site using NID's surface water in the project area.

The east side of Steephollow Creek would be graded to accommodate the equipment for the stockpiling and sale of materials. The graded primary stockpile area would vary between 200 to 300 feet in width and 900 feet in length. An asphalt concrete containment area would be installed in the stockpile area in order to prevent fine material from washing back into the waterways. The graded operations area would be set back from a point equal to or greater than a 1.5 percent slope as measured from a point 1 foot above the normal high water elevation of Steephollow Creek.

A graded parking area for employees and miscellaneous vehicles and equipment storage would be provided on the east side of the confluence area (Steephollow Creek and Bear River). Portable restrooms would be placed on site by a licensed vendor and operated in accordance with Nevada County Environmental Health requirements.

Fuel would be temporarily stored on the east side of Steephollow Creek during operations. Fuel would either be stored in a tank with a double wall construction, or within an impervious bermed fuel storage area (12-inch berm on concrete pad), or stored in a mobile tanker truck. The design of the fuel storage area would be in conformance with Nevada County Environmental Health standards.

Other ancillary buildings would include a metal prefabricated maintenance shop (approximately 1,000 square feet) and a mobile office. Yard and security lights would be installed within the building and equipment storage area.

Mobile equipment would include front-end loaders, excavators, dump trucks/yukes, and scrapers to move material to the stockpiles; loaders would be used to pick up loaded materials for off-site transport.

2.6.3 Access/Haul Route

Chicago Park Powerhouse Road provides access to the project site from I-80. Access across the Bear River Bridge would be restricted to authorized vehicles only. The road would not be open to the public beyond the Bear River Bridge and the existing security gate on the west end of the bridge would be locked during off hours, federal holidays and Sundays.

NID constructed the Chicago Park Powerhouse Road in 1964 to support of the Yuba Bear project. NID has used the road for access to and from the Chicago Park Powerhouse since 1965 for routine powerhouse operation and maintenance. The road was also used for hauling aggregate products from the Bear River gravel skimming and processing operation between 1965 and 2002.

NID must obtain permanent access rights on Chicago Park Powerhouse Road to accomplish the project objectives, and to ensure permanent access to and from the Chicago Park Powerhouse. The use of eminent domain may be required to acquire access rights for all purposes over the entire road. NID would continue to maintain Chicago Park Powerhouse Road; widening, resurfacing, or other road reconstruction would be limited to safety needs.

2.6.4 Time of Operation and Employees

During the active annual mining season, aggregate removal operations (including installation of berms, temporary access roads and bridges, and portable equipment) would begin no earlier than April 1 of each year, depending on flows in the Bear River. Aggregate removal would occur ~~during the irrigation water delivery season~~ from April 1 through November 15 (removal season) of each year, when stormwaters are not present. This would overlap the irrigation water delivery season, which runs from mid-April to mid-October. Temporary facilities would be removed by November 15, unless dry conditions allow for a longer work period (but no later than December 31).

Stockpiled materials may be sold year-round, although construction material demand in the wet season (November through March) may be reduced, compared to the rest of the year.

During all operations, working hours would be 7 a.m. to 7 p.m., Monday through Saturday. No work on Sundays or federal holidays would occur except during emergencies. Approximately five employees would typically be on site, depending on the level of activity. ~~If needed, a~~ A night watchman would be on duty during non-work hours (between 7 p.m. and 7 a.m. and all day on Sundays and federal holidays), on an as-needed basis determined by NID.

2.6.5 Phasing

Due to the annual migration of aggregate into the project area from the Bear River and Steephollow Creek, the operation is ongoing. As a result, the operation is not "phased" in the sense that aggregate would be removed in a certain geographical order, or that a certain amount of material must be removed before operations move to a new area. Ideally, aggregate removal would be prioritized to occur at the mouth of the Bear River at Rollins Reservoir, in order to minimize the amount of aggregate flowing into Rollins Reservoir and further reducing its storage capacity. The ability to operate close to Rollins Reservoir would depend on the water level, which in turn depends on the amount of water released into the Bear River by NID and Pacific Gas & Electric (PG&E). For example, when PG&E or NID stop water releases from the Dutch Flat Afterbay while releases continue from Rollins Reservoir, water levels in the reservoir would drop, allowing aggregate removal closer to Rollins Reservoir.

2.6.6 Cofferdams

Two cofferdams would be constructed within the Bear River, east of the confluence with Steephollow Creek. The first would be constructed on the north side of the Bear River at the Chicago Park Powerhouse. The second would be constructed below the Chicago Park Powerhouse Road Bridge. Both dams would be installed to protect and prevent undermining of these facilities, which have been previously protected with concrete and/or air-blown mortar. The cofferdams would consist of interlocking sheet piles, each accompanied with a concrete cap.

Additional sheet pile cofferdams would be installed below the bridge as needed to maintain a −10 percent average gradient. The bridge cofferdam would be constructed to allow resident fish passage to the Upper Bear River. Anadromous fish are precluded access to the river system above Rollins Reservoir Dam, and other downstream dams and obstructions.

2.6.7 Reclamation

The proposed project is on-going in nature, due to the annual migration of aggregate into the project area from the Bear River and Steephollow Creek. The ultimate condition of the project area would be the pre-1965 condition (following construction of Rollins Reservoir). The pre-1965 condition reflects substantial disturbance due to the history of hydraulic mining in the area since the late 19th century.

The existing Reclamation Plan, RP88-03, has been updated to reflect revisions to the on-going mining operation, including the reduced mining area. All equipment and temporary structures, below the high water elevation, are removed at the end of each season. All debris is removed during the course of aggregate removal operations. In the event that the mining operation is deemed to have ceased, all equipment and structures and associated paved areas (stockpile containment or storage areas) would be removed and the site restored to pre-project conditions. Any utility connections (PG&E electrical service) would be removed. As the operations are limited to the graveled areas of the river, minimal vegetation is affected. If, however, natural regrowth does not result in adequate coverage of the stream banks, resembling the pre-project conditions, manual replanting may occur under the guidance of CDFW.

2.7 APPROVALS REQUIRED

NID has current mining rights in the project area, and has received confirmation of idle mine status for the historical gravel skimming operation. Therefore, Reclamation Plan RP88-03, approved by the County of Nevada in 1990, remains in effect. The EIR will address actions by NID to reestablish gravel removal operations, including establishment of a permanent haul route. The 1990 Reclamation Plan has been updated as part of this project to reflect proposed operations with a more limited gravel skimming area, and without on-site processing (other than screening and stockpiling). The proposed amended reclamation plan is included as Appendix B of this EIR. <u>The updated plan will be submitted to Nevada County for approval. Nevada County must also provide the revised plan to OMR for a 30-day comment period. As a portion of the proposed sediment removal area is within Placer County, Placer County may also be a participant in the review process.</u>

It is anticipated that the EIR will be used by responsible agencies that may have jurisdiction over elements of the project. State and local agencies that may have jurisdiction over the proposed project include the following:

- California Department of Fish and Wildlife – Approval of a Section 1600 Streambed Alteration Permit will be required for mining activities within the Bear River channel.
- California State Lands Commission – The State Lands Commission has jurisdiction over the beds of navigable waters. Approval/amendment of a permit or lease may be required for the proposed installation of erosion control structures.
- Central Valley Regional Water Quality Board – The project would require issuance of a Clean Water Act Section 401 Certification. Approval of a stormwater pollution prevention plan may be required for grading and construction in the stockpile area.
- Nevada County – Approval of the updated reclamation plan. The Environmental Health Department may require a hazardous waste business plan and/or spill prevention and control plan to be filed.
- Northern Sierra Air Quality Management District – ~~Although no facilities are proposed within this district, permits may be necessary for portable mining equipment on the south side of the Bear River.~~ Permits may be required for construction of temporary facilities, and operation of portable and temporary stationary equipment.
- Placer County Air Pollution Control District – ~~Permits may be required for construction of temporary facilities, and operation of portable and temporary stationary equipment.~~ Although no facilities are proposed within this district, permits may be necessary for portable mining equipment on the south side of the Bear River.

In addition to state and local agencies, federal agencies may have jurisdiction over project components.

- A Section 404 Clean Water Permit is required from the U.S. Army Corps of Engineers for any activity within the waterway that would be considered “fill.”
- Portions of the project site, including the stockpile area and sections of the haul route, are located on land under the jurisdiction of BLM. NID has a lease with BLM. The filing of notices and posting of a bond for activities within BLM land may be required.
- Placement of cofferdams at the Chicago Powerhouse site may require review from BLM (the property owner), and/or the Federal Energy Regulatory Commission (the licensing agency).

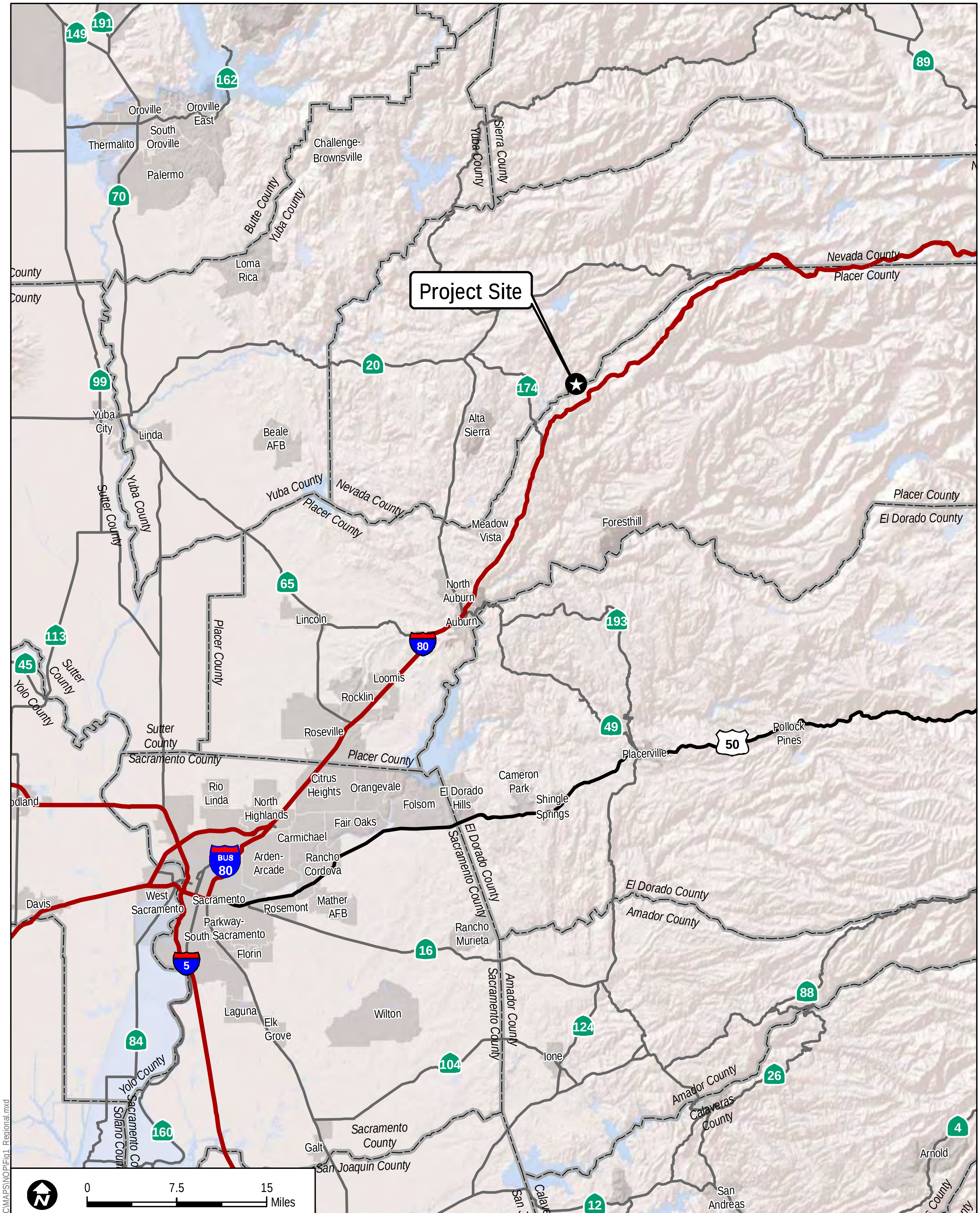

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FIGURE 2-1
Regional Map

BEAR RIVER SEDIMENT REMOVAL AT ROLLINS RESERVOIR EIR

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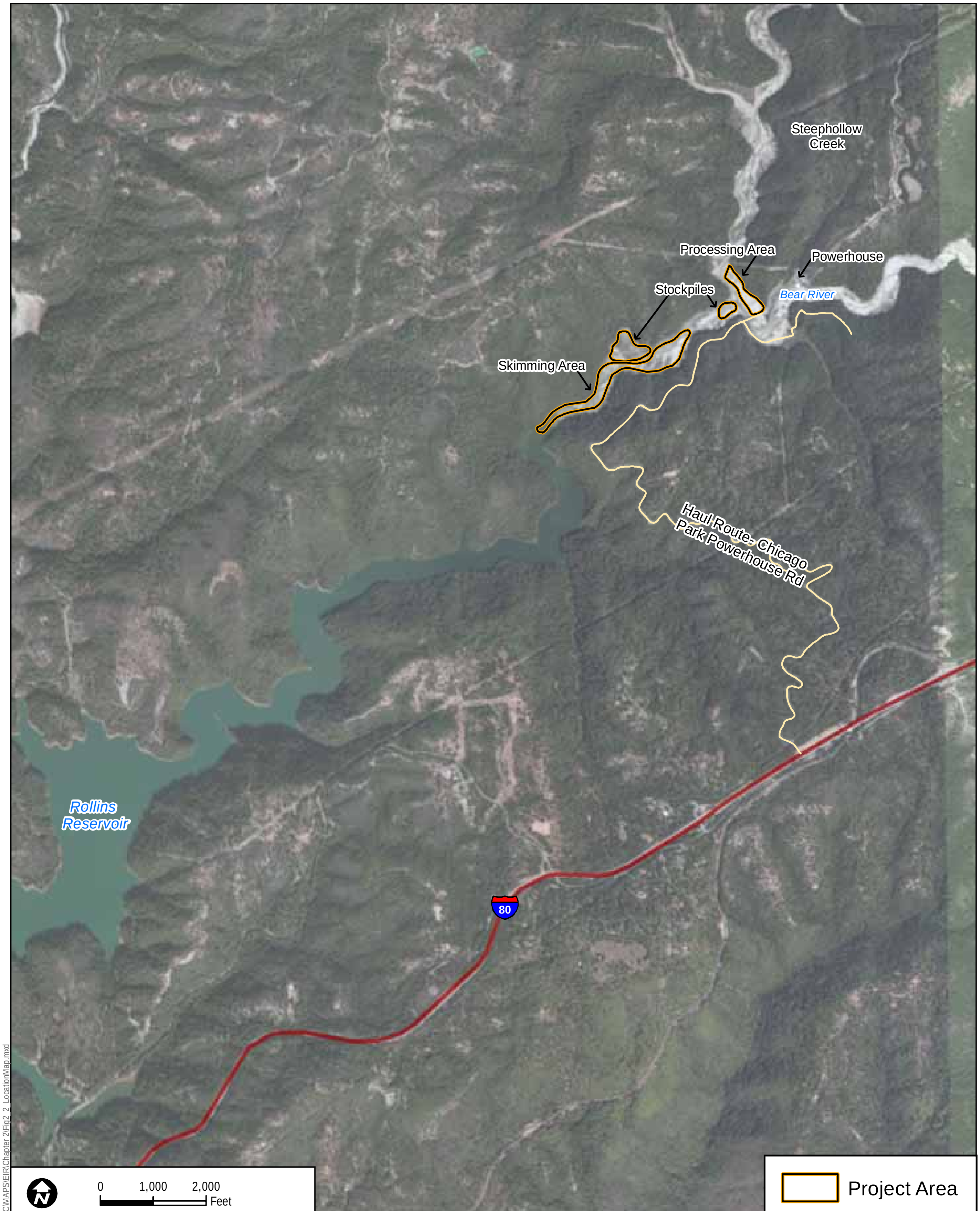

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SOURCE: ESRI; Nevada and Placer County

FIGURE 2-2
Project Location Map

BEAR RIVER SEDIMENT REMOVAL AT ROLLINS RESERVOIR EIR

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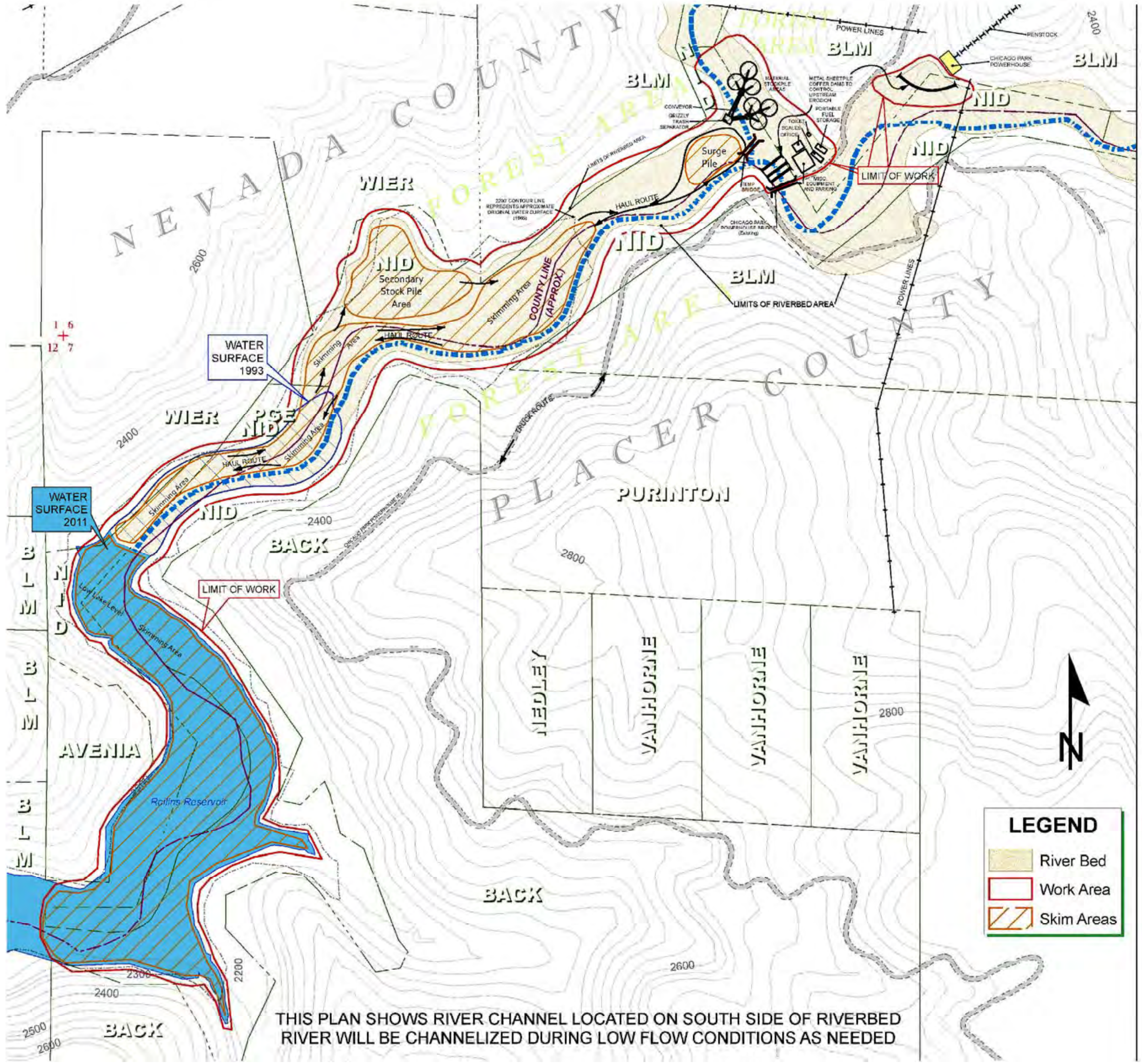

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SOURCE: Nevada Irrigation District 2014

FIGURE 2-3

Site Plan

BEAR RIVER SEDIMENT REMOVAL AT ROLLINS RESERVOIR EIR

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CHAPTER 3
ENVIRONMENTAL ANALYSIS

3.1 AESTHETICS

This section describes the existing visual setting of the project site and vicinity, identifies associated regulatory requirements, evaluates potential impacts, and identifies mitigation measures related to implementation of the proposed project. Site visits and photography were conducted on May 30, 2013 and August 2, 2014.

3.1.1 Existing Conditions

3.1.1.1 Regional Setting

The project site is located in the Sierra Foothills, within the watershed of the Bear River and Steephollow Creek, upstream from Rollins Reservoir, a manmade water body. The project vicinity is characterized by mountains and valleys covered in coniferous forest. Elevations in the project vicinity vary from 2,175 feet above mean sea level (msl), the approximate level of Rollins Reservoir, to 2,900 feet msl. Scattered single-family rural residences are located in the project vicinity. Primary access to the project area is from Interstate 80 (I-80) at Secret Town Road. Nevada Irrigation District (NID) maintains an office and equipment facility near this interchange.

3.1.1.2 Project Site

The project area consists of a 1.25-mile reach of the Bear River from the Chicago Park Powerhouse to the delta of Rollins Reservoir, which includes the confluence of Steephollow Creek and the Bear River (Figure 3.1-1, Steephollow Creek and Bear River Confluence). Both the powerhouse and the project site are accessed via the Chicago Park Powerhouse Road Bridge, which crosses the Bear River approximately 1,500 feet downstream of the powerhouse (Figure 3.1-2, Chicago Powerhouse Road Bridge). The confluence of Steephollow Creek and the Bear River is approximately 500 feet downstream of the bridge. Roughly 2,000 feet downstream of the Steephollow Creek / Bear River confluence, there is a high terrace on the right bank that has been used to store previous mine gravels and is currently proposed as a secondary stockpile area for the proposed project.

This stretch of the Bear River is characterized by a fairly steep river valley and a fairly wide channel (300 to 700 feet) with patches of riparian vegetation. The vegetation adjacent to the river consists of coniferous forest. At low flow, the Bear River has one or more narrow meandering channels. At high flow, all but the highest gravel bars in the river will be submerged. There are also several disturbed areas, including roadways, the secondary stockpile described above, and the former gravel processing area northeast of the Steephollow Creek/Bear River confluence (Figure

3.1-3, Former Gravel Processing Area). Chicago Park Powerhouse Road is a winding, paved road between the Powerhouse and Secret Town Road. Between Secret Town Road and the bridge, the roadside is heavily vegetated, which obscures most views of the project area. Chicago Park Powerhouse Road continues upstream from the bridge to the powerhouse (Figure 3.1-4, Chicago Park Powerhouse).

Views of the project site have a moderate to high level of vividness (see Definitions below), due to the strong landforms and the strong lines of the Bear River and Steephollow Creek channels. The strong visual effect of the vegetation is somewhat diminished by the gravel stockpiles and graded areas – a remnant of previous mining activity. The powerhouse, and the roadways also reduce the visual intactness of the project area from high to moderate. Visual unity of the project area is moderate to high, with the scale of man-made structures generally in keeping with the natural landscape.

Definitions

Vividness: The visual power or memorability of landscape components as they combine in distinctive visual patterns.

Intactness: The visual integrity of the natural and man-built landscape and its freedom from encroaching elements. It can be present in well-kept urban and rural landscapes, as well as natural settings.

Unity: The visual coherence and compositional harmony of the landscape considered as a whole. It frequently attests to the careful design of individual components in the landscape (FHWA 1981).

3.1.1.3 Viewer Groups

Potential viewers of the project site include NID personnel and Bureau of Land Management (BLM) employees. The project site is not accessible to the public, although unauthorized entry into the project area is a problem described in several scoping comments (see Appendix A).

The nearest residential uses to the project area are between 1,300 and 3,500 feet from the project (see Section 3.9, Noise, Figure 3.9-2). The nearest residence to the haul route is 500 feet east of the road. Due to the heavy vegetation, views of the road itself are limited. Residential viewers are normally considered to have a high level of sensitivity; however, direct views of the site from a residential unit are limited, or non-existent, resulting in low exposure.

3.1.2 Relevant Plans, Policies, and Ordinances

3.1.2.1 Federal

Bureau of Land Management

In order to meet its responsibility to maintain the scenic values of the public lands, BLM has developed a visual resource management (VRM) system. The VRM system provides a way to identify and evaluate scenic values to determine the appropriate levels of management. It also provides a way to analyze potential visual impacts and apply visual design techniques to ensure that surface-disturbing activities are in harmony with their surroundings. BLM's VRM system consists of two stages: inventory and analysis.

Inventory (Visual Resource Inventory). The inventory stage involves identifying the visual resources of an area and assigning them to inventory classes using BLM's visual resource inventory process. The process involves rating the visual appeal of a tract of land, measuring public concern for scenic quality, and determining whether the tract of land is visible from travel routes or observation points

Analysis (Visual Resource Contrast Rating). The analysis stage involves determining whether the potential visual impacts from proposed surface-disturbing activities or developments will meet the management objectives established for the area, or whether design adjustments will be required. A visual contrast rating process is used for this analysis, which involves comparing the project features with the major features in the existing landscape using the basic design elements of form, line, color, and texture.

3.1.2.2 State

California Scenic Highway Program

The state scenic highway system includes a list of highways that are either eligible for designation as scenic highways or have been so designated. These highways are identified in Section 263 of the Streets and Highways Code.

There are no officially designated scenic highways within Placer County. Highway 49, located west of the site, is eligible for designation. I-80 within Nevada County, east of the project site, is eligible. Neither of these eligible segments provides views of the project site.

3.1.2.3 Local

Nevada County General Plan

The Nevada County General Plan includes an Aesthetics Element (Chapter 18), which gives an overview of the county's visual resources and identifies goals, objectives, and policies related to aesthetics. Many of the policies relate to development standards relate to development and signage. However, the following overall goal is relevant to the proposed project:

Goal 18.1: Promote and provide for aesthetic design in new development which reflects existing character (County of Nevada 1996).

Placer County General Plan

The Placer County General Plan contains goals and policies to protect scenic resources, and to develop a system of scenic routes within the county. Goals and policies relevant to the proposed project include the following:

Goal 1.K: To protect the visual and scenic resources of Placer County as important quality of life amenities for County residents and principal asset in the promotion of recreation and tourism.

Policy 1.K.1: The County shall require that new development in scenic areas (e.g. river canyons, lake watersheds, scenic highway corridors, ridgelines and steep slopes is planned and designed in a manner which employs design, construction, and maintenance techniques that:

a. Avoids locating structures along ridgelines and steep slopes;

b. Incorporates design and screening measures to minimize the visibility of structures and grades areas;

c. Maintains the character and visual quality of the area (County of Placer 2013).

3.1.3 Thresholds of Significance

The significance criteria used to evaluate the project impacts to aesthetics are based on Appendix G of the CEQA Guidelines (14 CCR 15000 et seq.). According to Appendix G of the CEQA Guidelines, a significant impact related to aesthetics would occur if the project would:

1. Have a substantial adverse effect on a scenic vista.
2. Substantially damage scenic resources, including, but not limited to trees, rock outcroppings, and historic buildings within a state scenic highway.
3. Substantially degrade the existing visual character or quality of the site and its surroundings.
4. Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.

3.1.4 Impacts Analysis

Impact 3.1-1. The project would not have a substantial adverse effect on a scenic vista.

The project site does not include an identified state or local scenic vista. The project would therefore have **no impact** on a scenic vista. However, the scenic value of the project site is considered in Impact 3.1-3.

Impact 3.1-2. The project would not substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway.

There are no officially designated scenic highways within Placer County. Highway 49, located west of the site, is eligible. I-80 within Nevada County, east of the project site, is eligible. Neither of these eligible segments provides views of the project site.

Therefore, the project would have **no impact**.

Impact 3.1-3. The project would not substantially degrade the existing visual character or quality of the site and its surroundings.

The proposed project would reintroduce aggregate mining activities in the project area. As shown in Figure 2-3, Site Plan, aggregate stockpiles and a few small accessory structures would be located in the disturbed area above the Steephollow Creek / Bear River confluence on a year-round basis. There would also be mobile loading equipment and aggregate transport trucks frequenting the site. Seasonal activities would include the placement of a temporary bridge, channelization of the Bear River waterway, a conveyor and aggregate screening system, and off-road mining equipment. Channelization and active aggregate removal may occur for approximately 2 months of the year (at the time of lowest water flows), while screening, stockpiling, and hauling would occur for a longer period of the year (April–November).

While riparian vegetation reestablishes itself within the project area, the reclamation plan calls for replanting riparian vegetation as necessary. Upon final reclamation, all structures, equipment, and stockpiles would be removed, and revegetation would be carried out as needed.

The construction of the scour protection (sheet piles) would be visible during low flows. The height of the piles would be roughly at the ordinary high water mark. The piles would not introduce a significant vertical element. The protection at the powerhouse would be similar, but much lower, to the existing concrete reinforcement. The protection at the bridge would be located sufficiently downstream to not interfere visually with the bridge, but would be visible from the short stretch of the Bear River between the bridge and the confluence with Steephollow Creek.

The visual quality of the project area is moderate to high. Gravel skimming operations have occurred at the site for almost four decades; the site is clearly not in the same condition as it would have been when the site was in use or when it was abandoned. While the earthen embankments that compose the reservoir are still in their original locations, most of the ground surface of the site has been heavily disturbed by the previous gravel skimming activities. The gravel skimming proposed by the current project would occur in locations previously impacted and affected by the gravel skimming that occurred prior to 2002. The visual effect of the project would be low to moderate, depending on the season. Mining activity and equipment would be most intense during the late summer (low water levels), but year-round activity would be low. Year-round visual elements would include stockpiles, scales, and the maintenance shop/office. Effects to viewers would be low, as few, if any, residential uses have a direct line of view to the project site, including the haul route. Therefore, the overall visual impact of the project would be **less than significant**.

Impact 3.1-4. The project could create a new source of substantial light or glare which would adversely affect day- or nighttime views in the area.

The project operations occur during daylight hours, so the aggregate removal area would not be lit. The area containing the stockpiles, scales, office, and ancillary structures would have security lighting. Light sources in the project area are otherwise limited, consisting of rural residences and the powerhouse. Project lighting could introduce a new light source and contribute to "sky glow"—the cumulative reduction in the quality of night-sky views. This impact would be **potentially significant**. A mitigation measure (MM) is recommended in Section 4.1.5 (MM-AES-1) to reduce potential impacts to a level below significance.

3.1.5 Mitigation Measures

MM-AES-1 Nighttime security lighting fixtures shall be full or semi cutoff. Overall lighting levels shall be limited to that necessary to illuminate the operations site. Incandescent and mercury vapor light sources are discouraged.

3.1.6 Level of Significance After Mitigation

With the implementation of MM-AES-1, the potential of the project to either create light trespass on surrounding areas or contribute to "sky glow" would be substantially reduced, resulting in direct and cumulative impacts that would be **less than significant**.

Figure 3.1-1 Steephollow Creek and Bear River Confluence

Figure 3.1-2 Chicago Powerhouse Road Bridge

Figure 3.1-3 Former Gravel Processing Area

Figure 3.1-4 Chicago Park Powerhouse

3.2 AIR QUALITY

This section describes the existing air quality setting of the project area and identifies associated regulatory requirements. Further, this section evaluates potential conflicts with applicable air quality plans, the potential for the project to result in violations of any air quality standards and to therefore result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard, exposure of sensitive receptors to substantial pollutant concentrations, or creation of objectionable odors affecting a substantial number of people. Finally, the section identifies mitigation measures related to implementation of the proposed Bear River Sediment Removal at Rollins Reservoir Project (proposed project).

3.2.1 Existing Conditions

3.2.1.1 Climate and Topography

The project site is located in unincorporated Nevada County and Placer County. The project site is entirely located within the Mountain Counties Air Basin (MCAB), while some of the truck hauling activity associated with the project would occur in the Sacramento Valley Air Basin (SVAB). The MCAB is composed of seven air districts: the Northern Sierra Air Quality Management District (NSAQMD), a portion of the Placer County Air Pollution Control District (PCAPCD), a portion of the El Dorado County Air Quality Management District, the Amador County Air Pollution Control District (APCD), the Calaveras County APCD, the Tuolumne County APCD, and the Mariposa County APCD. A portion of the proposed project site is within the NSAQMD in the MCAB; the remainder of the project site is within PCAPCD in the MCAB.

Air quality conditions in Nevada County are regulated by the NSAQMD and air quality conditions in Placer County are regulated by the PCAPCD. The climate is characterized by hot, dry summers and cool, rainy winters.

The general climate of the MCAB varies considerably with elevation and proximity to the mountain ranges of the Sierra Nevada. The western portions of the basin slope relatively gradually, with deep river canyons running from southwest to northeast toward the crest of the Sierra Nevada. The slopes in the Sierra Nevada are steeper, but river canyons are relatively shallow in the eastern portion of the basin.

Prevailing winds are from the south and southwest, and as a result, air quality in western Placer County is influenced by mobile and stationary air pollution sources located upwind in the Sacramento Metropolitan Area. The inland location and surrounding mountains shelter the valley from much of the ocean breeze that keeps the coastal regions moderate in temperature. The only breach in the mountain barrier is the Carquinez Strait, which exposes the midsection of the valley to the coastal air mass. Air flow into the SVAB through the Carquinez Strait also carries pollutants from the San Francisco Bay Area into the SVAB.

Air quality in project area is also affected by inversion layers, which occur when a layer of warm air traps a layer of cold air, preventing vertical dispersion of air contaminants. The presence of an inversion layer results in higher concentrations of pollutants near ground level. Summer inversions are strong and frequent, but are less troublesome than those that occur in the autumn. Autumn inversions, formed by warm air subsiding in a region of high pressure, have accompanying light winds that do not provide adequate dispersion of air pollutants.

Air quality in the proposed project area is affected by various emission sources (e.g., mobile vehicles along Interstate 80 and other distant roadways) and atmospheric conditions, such as wind speed, wind direction, temperature, and rainfall, as well as geography. As noted above, air quality in western Placer County is also influenced by pollutants transported to the area from the Sacramento Metropolitan Area and the San Francisco Bay Area.

3.2.1.2 Sensitive Receptors

Air quality varies as a direct function of the amount of pollutants emitted into the atmosphere, the size and topography of the air basin, and the prevailing meteorological conditions. Air quality problems arise when the rate of pollutant emissions exceeds the rate of dispersion. Reduced visibility, eye irritation, and adverse health impacts, particularly for people termed "sensitive receptors," are the most serious hazards of existing air quality conditions in the area. Some land uses are considered more sensitive to changes in air quality than others, depending on the population groups and the activities involved. People most likely to be affected by air pollution, as identified by the California Air Resources Board (CARB), may include children, the elderly, athletes, and people with cardiovascular and chronic respiratory diseases. Sensitive receptors may include residences, schools, playgrounds, childcare centers, long-term healthcare facilities, rehabilitation centers, convalescent centers, and retirement homes.

The closest sensitive receptor to the proposed project area is a residential use approximately 1,300 feet away and the nearest receptor to the proposed haul route is a residential use approximately 500 feet away (see Figure 3.9-2). There is a campground located approximately 2.5 miles southwest of the project area.

3.2.1.3 Pollutants and Effects

Criteria air pollutants are defined as pollutants for which the federal and state governments have established ambient air quality standards, or criteria, for outdoor concentrations to protect public health. The federal and state standards have been set, with an adequate margin of safety, at levels above which concentrations could be harmful to human health and welfare. These standards are designed to protect the most sensitive persons from illness or discomfort. Pollutants of concern include ozone (O_3), nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), particulate matter with an aerodynamic diameter less than or equal to 10 microns in size (PM_{10}), particulate matter with an aerodynamic diameter less than or equal to 2.5 microns in size ($PM_{2.5}$), and lead. These pollutants, as well as toxic air contaminants (TACs), are discussed below.[1] In California, sulfates (SO_4), vinyl chloride, hydrogen sulfide, and visibility-reducing particles are also regulated as criteria air pollutants.

Ozone. O_3 is a strong-smelling, pale blue, reactive, toxic chemical gas consisting of three oxygen atoms. It is a secondary pollutant formed in the atmosphere by a photochemical process involving the sun's energy and O_3 precursors, such as hydrocarbons and oxides of nitrogen (NO_x). These precursors are mainly NO_x and volatile organic compounds (VOCs; also referred to as reactive organic gases (ROGs)). The maximum effects of precursor emissions on O_3 concentrations usually occur several hours after they are emitted and many miles from the source. Meteorology and terrain play major roles in O_3 formation, and ideal conditions occur during summer and early autumn, on days with low wind speeds or stagnant air, warm temperatures, and cloudless skies. O_3 exists in the upper atmosphere ozone layer (stratospheric ozone) as well as at the Earth's surface in the troposphere (ozone). O_3 in the troposphere causes numerous adverse health effects; short-term exposures (lasting for a few hours) to O_3 at levels typically observed in Southern California can result in breathing pattern changes, reduction of breathing capacity, increased susceptibility to infections, inflammation of the lung tissue, and some immunological changes. These health problems are particularly acute in sensitive receptors such as the sick, the elderly, and young children.

Nitrogen Dioxide. NO_2 is a brownish, highly reactive gas that is present in all urban atmospheres. The major mechanism for the formation of NO_2 in the atmosphere is the oxidation of the primary air pollutant nitric oxide (NO), which is a colorless, odorless gas. NO_x plays a major role, together with VOCs, in the atmospheric reactions that produce O_3. NO_x is formed from fuel combustion under high temperature or pressure. In addition, NO_x is an important precursor to acid rain and may affect both terrestrial and aquatic ecosystems. The two major emissions sources are transportation and stationary fuel combustion sources such as electric utility and industrial boilers. NO_2 can irritate the lungs, cause bronchitis and pneumonia, and lower resistance to respiratory infections.

Carbon Monoxide. CO is a colorless, odorless gas formed by the incomplete combustion of hydrocarbon, or fossil, fuels. CO is emitted almost exclusively from motor vehicles, power plants, refineries, industrial boilers, ships, aircraft, and trains. In urban areas such as the project location, automobile exhaust accounts for the majority of CO emissions. CO is a non-reactive air

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1 The descriptions of health effects for each of the criteria air pollutants associated with project construction and operations are based on the U.S. Environmental Protection Agency's *Six Common Air Pollutants* (EPA 2012) and CARB's *Glossary of Air Pollution Terms* (CARB 2010).

pollutant that dissipates relatively quickly; therefore, ambient CO concentrations generally follow the spatial and temporal distributions of vehicular traffic. CO concentrations are influenced by local meteorological conditions—primarily, wind speed, topography, and atmospheric stability. CO from motor vehicle exhaust can become locally concentrated when surface-based temperature inversions are combined with calm atmospheric conditions, a typical situation at dusk in urban areas from November to February. The highest levels of CO typically occur during the colder months of the year, when inversion conditions are more frequent. In terms of adverse health effects, CO competes with oxygen, often replacing it in the blood, thus reducing the blood's ability to transport oxygen to vital organs. The results of excess CO exposure can include dizziness, fatigue, and impairment of central nervous system functions.

Sulfur Dioxide. SO_2 is a colorless, pungent gas formed primarily from incomplete combustion of sulfur-containing fossil fuels. The main sources of SO_2 are coal and oil used in power plants and industries; as such, the highest levels of SO_2 are generally found near large industrial complexes. In recent years, SO_2 concentrations have been reduced by the increasingly stringent controls placed on stationary source emissions of SO_2 and limits on the sulfur content of fuels. SO_2 is an irritant gas that attacks the throat and lungs and can cause acute respiratory symptoms and diminished ventilator function in children. When combined with particulate matter, SO_2 can injure lung tissue and reduce visibility and the level of sunlight. SO_2 can also yellow plant leaves and erode iron and steel.

Particulate Matter. Particulate matter pollution consists of very small liquid and solid particles floating in the air, which can include smoke, soot, dust, salts, acids, and metals. Particulate matter can form when gases emitted from industries and motor vehicles undergo chemical reactions in the atmosphere. $PM_{2.5}$ and PM_{10} represent fractions of particulate matter. Fine particulate matter ($PM_{2.5}$) is roughly 1/28 the diameter of a human hair. $PM_{2.5}$ results from fuel combustion (e.g., from motor vehicles and power generation and industrial facilities), residential fireplaces, and woodstoves. In addition, $PM_{2.5}$ can be formed in the atmosphere from gases such as sulfur oxides (SO_x), NO_x, and VOCs. Respirable particulate matter, or coarse particulate matter (PM_{10}), is about 1/7 the thickness of a human hair. Major sources of PM_{10} include crushing or grinding operations; dust stirred up by vehicles traveling on roads; wood-burning stoves and fireplaces; dust from construction, landfills, and agriculture; wildfires and brush/waste burning; industrial sources; windblown dust from open lands; and atmospheric chemical and photochemical reactions.

$PM_{2.5}$ and PM_{10} pose a greater health risk than larger-size particles. When inhaled, these tiny particles can penetrate the human respiratory system's natural defenses and damage the respiratory tract. $PM_{2.5}$ and PM_{10} can increase the number and severity of asthma attacks, cause or aggravate bronchitis and other lung diseases, and reduce the body's ability to fight infections. Very small particles of substances such as lead, sulfates, and nitrates can cause lung damage directly or be absorbed into the blood stream, causing damage elsewhere in the body. Additionally, these substances can transport absorbed gases such as chlorides or ammonium into the lungs, also causing injury. Whereas PM_{10} tends to collect in the upper portion of the respiratory system, $PM_{2.5}$ is so tiny that it can penetrate deeper into the lungs and damage lung tissue. Suspended particulates also damage and discolor surfaces on which they settle, as well as producing haze and reducing regional visibility.

People with influenza, people with chronic respiratory and cardiovascular diseases, and the elderly may suffer worsening illness and premature death as a result of breathing particulate matter. People with bronchitis can expect aggravated symptoms from breathing in particulate matter. Children may experience a decline in lung function due to breathing in PM_{10} and $PM_{2.5}$. Other groups considered sensitive are smokers, people who cannot breathe well through their noses, and exercising athletes (because many breathe through their mouths).

Lead. Lead in the atmosphere occurs as particulate matter. Sources of lead include leaded gasoline; the manufacturing of batteries, paints, ink, ceramics, and ammunition; and secondary lead smelters. Prior to 1978, mobile emissions were the primary source of atmospheric lead. Between 1978 and 1987, the phaseout of leaded gasoline reduced the overall inventory of airborne lead by nearly 95 percent. With the phaseout of leaded gasoline, secondary lead smelters, battery recycling, and manufacturing facilities are becoming lead-emission sources of greater concern.

Prolonged exposure to atmospheric lead poses a serious threat to human health. Health effects associated with exposure to lead include gastrointestinal disturbances, anemia, kidney disease, and in severe cases, neuromuscular and neurological dysfunction. Of particular concern are low-level lead exposures during infancy and childhood. Such exposures are associated with decrements in neurobehavioral performance, including intelligence quotient performance, psychomotor performance, reaction time, and growth. Children are highly susceptible to the effects of lead.

Volatile Organic Compounds. Hydrocarbons are organic gases that are formed from hydrogen and carbon and sometimes other elements. Hydrocarbons that contribute to formation of O_3 are referred to and regulated as VOCs (also referred to as ROGs). Combustion engine exhaust, oil refineries, and fossil-fueled power plants are the sources of hydrocarbons. Other sources of hydrocarbons include evaporation from petroleum fuels, solvents, dry cleaning solutions, and paint.

The primary health effects of VOCs result from the formation of O_3 and its related health effects. High levels of VOCs in the atmosphere can interfere with oxygen intake by reducing the amount of available oxygen through displacement. Carcinogenic forms of hydrocarbons, such as benzene, are considered TACs. There are no separate health standards for VOCs as a group.

Toxic Air Contaminants. A substance is considered toxic if it has the potential to cause adverse health effects in humans, including increasing the risk of cancer upon exposure, or acute and/or chronic non-cancer health effects. A toxic substance released into the air is considered a TAC. TACs are identified by federal and state agencies based on a review of available scientific evidence. In the state of California, TACs are identified through a two-step process that was established in 1983 under the Toxic Air Contaminant Identification and Control Act. This two-step process of risk identification and risk management and reduction was designed to protect residents from the health effects of toxic substances in the air. In addition, the California Air Toxics "Hot Spots" Information and Assessment Act, Assembly Bill (AB) 2588, was enacted by the legislature in 1987 to address public concern over the release of TACs into the atmosphere. The law requires facilities emitting toxic substances to provide local air pollution control districts with information that will allow an assessment of the air toxics problem, identification of air toxics emission sources, location of resulting hotspots, notification of the public exposed to significant risk, and development of effective strategies to reduce potential risks to the public over 5 years.

Examples include certain aromatic and chlorinated hydrocarbons, certain metals, and asbestos. TACs are generated by a number of sources, including stationary sources, such as dry cleaners, gas stations, combustion sources, and laboratories; mobile sources, such as automobiles; and area sources, such as landfills. Adverse health effects associated with exposure to TACs may include carcinogenic (i.e., cancer-causing) and non-carcinogenic effects. Non-carcinogenic effects typically affect one or more target organ systems and may be experienced on either short-term (acute) or long-term (chronic) exposure to a given TAC.

Diesel Particulate Matter. Diesel particulate matter is part of a complex mixture that makes up diesel exhaust. Diesel exhaust is composed of two phases, gas and particle, both of which contribute to health risks. CARB classified "particulate emissions from diesel-fueled engines" (i.e., diesel particulate matter) as a TAC in August 1998. Diesel particulate matter is emitted from a broad range of diesel engines: on-road diesel engines of trucks, buses, and cars, and off-road diesel engines including locomotives, marine vessels, and heavy-duty construction equipment, among others. Approximately 70 percent of all airborne cancer risk in California is associated with diesel particulate matter (CARB 2000). To reduce the cancer risk associated with diesel particulate matter, CARB adopted a diesel risk reduction plan in 2000 (CARB 2000).

3.2.2 Relevant Plans, Policies, and Ordinances

3.2.2.1 Federal

The federal Clean Air Act, passed in 1970 and last amended in 1990, forms the basis for the national air pollution control effort. The U.S. Environmental Protection Agency (EPA) is responsible for implementing most aspects of the Clean Air Act, including setting National

Ambient Air Quality Standards (NAAQS) for major air pollutants; setting hazardous air pollutant standards; approving state attainment plans; setting motor vehicle emission standards; issuing stationary source emission standards and permits; and establishing acid rain control measures, stratospheric O_3 protection measures, and enforcement provisions. NAAQS are established for criteria pollutants under the Clean Air Act, which are O_3, CO, NO_2, SO_2, PM_{10}, $PM_{2.5}$, and lead.

The NAAQS describe acceptable air quality conditions designed to protect the health and welfare of the citizens of the nation. The NAAQS (other than for O_3, NO_2, SO_2, PM_{10}, $PM_{2.5}$, and those based on annual averages or arithmetic mean) are not to be exceeded more than once per year. NAAQS for O_3, NO_2, SO_2, PM_{10}, and $PM_{2.5}$ are based on statistical calculations over 1- to 3-year periods, depending on the pollutant. The Clean Air Act requires the EPA to reassess the NAAQS at least every 5 years to determine whether adopted standards are adequate to protect public health based on current scientific evidence. States with areas that exceed the NAAQS must prepare a state implementation plan that demonstrates how those areas will attain the standards within mandated time frames.

3.2.2.2 State

The federal Clean Air Act delegates the regulation of air pollution control and the enforcement of the NAAQS to the states. In California, the task of air quality management and regulation has been legislatively granted to CARB, with subsidiary responsibilities assigned to air quality management districts and air pollution control districts at the regional and county levels. CARB, which became part of the California Environmental Protection Agency (CalEPA) in 1991, is responsible for ensuring implementation of the California Clean Air Act of 1988, responding to the federal Clean Air Act, and regulating emissions from motor vehicles and consumer products.

CARB has established California Ambient Air Quality Standards (CAAQS), which are generally more restrictive than the NAAQS. The CAAQS describe adverse conditions; that is, pollution levels must be below these standards before a basin can attain the standard. Air quality is considered “in attainment” if pollutant levels are continuously below the CAAQS and violate the standards no more than once each year. The CAAQS for O_3, CO, SO_2 (1-hour and 24-hour), NO_2, PM_{10}, $PM_{2.5}$, and visibility-reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded. The NAAQS and CAAQS are presented in Table 3.2-1, Ambient Air Quality Standards.

Table 3.2-1
Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards[a]	National Standards[b]	
		Concentration[c]	*Primary*[c,d]	*Secondary*[c,e]
O_3	1-hour	0.09 ppm (180 μg/m^3)	—	Same as primary standard
	8-hour	0.070 ppm (137 μg/m^3)	0.075 ppm (147 μg/m^3)	
CO	8-hour	9.0 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	None
	1-hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	
NO_2	Annual arithmetic mean	0.030 ppm (57 μg/m^3)	0.053 ppm (100 μg/m^3)	Same as primary standard
	1-hour	0.18 ppm (339 μg/m^3)	0.100 ppm (188 μg/m^3)	
SO_2	1-hour	0.25 ppm (655 μg/m^3)	0.075 ppm (196 μg/m^3)	—
	3-hour	—	—	0.5 ppm (1,300 μg/m^3)
	24-hour	0.04 ppm (105 μg/m^3)	0.14 ppm (for certain areas)[g]	—
	Annual	—	0.030 ppm (for certain areas)[g]	—
PM_{10}	24-hour	50 μg/m^3	150 μg/m^3	Same as primary standard
	Annual arithmetic mean	20 μg/m^3	—	
$PM_{2.5}$	24-hour	No separate state standard	35 μg/m^3	Same as primary standard
	Annual arithmetic mean	12 μg/m^3	12.0 μg/m^3	15.0 μg/m^3
Lead (Pb)[f]	30-day average	1.5 μg/m^3	—	—
	Calendar quarter	—	1.5 μg/m^3 (for certain areas)[h]	Same as primary standard
	Rolling 3-month average	—	0.15 μg/m^3	
Hydrogen sulfide	1-hour	0.03 ppm (42 μg/m^3)	—	—
Vinyl chloride[f]	24-hour	0.01 ppm (26 μg/m^3)	—	—
Sulfates (SO_4)	24-hour	25 μg/m^3	—	—
Visibility-reducing particles	8-hour (10:00 a.m. to 6:00 p.m. PST)	Insufficient amount to produce an extinction coefficient of 0.23 per kilometer due to particles when the relative humidity is less than 70%	—	—

Source: CARB 2013a.

Notes: O_3 = ozone; ppm= parts per million by volume; μg/m^3 = micrograms per cubic meter; CO = carbon monoxide; mg/m^3 = milligrams per cubic meter; NO_2 = nitrogen dioxide; SO_2 = sulfur dioxide; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; PST = Pacific Standard Time.

a California standards for O_3, CO, SO_2 (1-hour and 24-hour), NO_2, suspended particulate matter—PM_{10}, $PM_{2.5}$, and visibility-reducing particles, are values that are not to be exceeded. All others are not to be equaled or exceeded. CAAQS are listed in the Table of Standards in 17 CCR 70200.

b National standards (other than O_3, NO_2, SO_2, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The O_3 standard is attained when the fourth-highest 8-hour concentration measured at each site in a year, averaged over 3 years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 μg/m^3 is equal to or less than one. For $PM_{2.5}$, the 24-hour standard is attained when 98% of the daily concentrations, averaged over 3 years, are equal to or less than the standard.

[c] Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25 degrees Celsius (°C; 77 degrees Fahrenheit (°F)) and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C (77°F) and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

[d] National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.

[e] National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

[f] CARB has identified lead and vinyl chloride as toxic air contaminants (TACs) with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

[g] On June 2, 2010, a new 1-hour SO_2 standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 parts per billion (ppb). The 1971 SO_2 national standards (24-hour and annual) remain in effect until 1 year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.

[h] The national standard for lead was revised on October 15, 2008, to a rolling 3-month average. The 1978 lead standard (1.5 μg/m^3 as a quarterly average) remains in effect until 1 year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.

Toxic Air Contaminants

California's air toxics control program began in 1983 with the passage of the Toxic Air Contaminant Identification and Control Act, AB 1807, better known as the Tanner Bill. The Tanner Bill established a regulatory process for the scientific and public review of individual toxic compounds. When a compound becomes listed as a TAC under the Tanner process, CARB normally establishes minimum statewide emission-control measures to be adopted by air quality management districts and air pollution control districts. All of the 189 federal hazardous air pollutants have been listed by CARB as state TACs.

The second major component of California's air toxics program, supplementing the Tanner process, was provided by the passage of AB 2588, the Air Toxics "Hot Spots" Information and Assessment Act of 1987. AB 2588 currently regulates over 600 compounds, including all the Tanner-designated TACs.

Applicable CARB Regulations

The following CARB regulations will be applicable to sources at the proposed project site.

Idling of Commercial Heavy Duty Trucks

In July 2004, CARB adopted an Airborne Toxic Control Measure (ATCM) (13 CCR 2485) to control emissions from idling trucks. The ATCM prohibits idling for more than 5 minutes for all commercial trucks with a gross vehicle weight rating over 10,000 pounds. The ATCM contains an exception that allows trucks to idle while queuing or involved in operational activities.

In-Use Off-Road Diesel-Fueled Fleets

In July 2007, CARB adopted an ATCM for in-use off-road diesel vehicles (13 CCR 2449 et seq.). This regulation establishes specific fleet average requirements for NO_x and particulate matter emissions. Where average requirements cannot be met, best available control technology (BACT) requirements apply. The regulation also included several recordkeeping and reporting requirements. In response to AB 8 2X, the regulations were revised in July 2009 (effective December 3, 2009) to allow a partial postponement of the compliance schedule in 2011 and 2012 for existing fleets. On December 17, 2010, CARB adopted additional revisions to further delay the deadlines reflecting reductions in diesel emissions due to the poor economy and overestimates of diesel emissions in California. The revisions delayed the first compliance date until no earlier than January 1, 2014, for large fleets, with final compliance by January 1, 2023. The compliance dates for medium fleets would be delayed until an initial date of January 1, 2017, and final compliance date of January 1, 2023. The compliance dates for small fleets would be delayed until an initial date of January 1, 2019, and a final compliance date of January 1, 2028. Correspondingly, the fleet average targets were made more stringent in future compliance years. The revisions would also accelerate the phaseout of older equipment in existing large and medium fleets over time, requiring the addition of Tier 2 or higher engines starting on March 1, 2011, with some exceptions: Tier 2 or higher engines on January 1, 2013, without exception; and Tier 3 or higher engines on January 1, 2018 (January 1, 2023, for small fleets).

On December 14, 2011, the Office of Administrative Law approved amendments to the regulation. The amendments included revisions to the applicability section and additions and revisions to the definition. The initial date for requiring the addition of Tier 2 or higher engines for large and medium fleets, with some exceptions, was revised to January 1, 2012. New provisions would allow removal of emission control devices for safety or visibility purposes. The regulation was amended to combine the particulate matter and NO_x fleet average targets under one, instead of two, sections. The amended fleet average targets are based on the fleet's NO_x fleet average, and the previous section regarding particulate matter performance requirements was deleted completely. The BACT requirements, which apply if a fleet cannot comply with the fleet average requirements, were restructured and clarified. Other amendments to the regulations included minor administrative changes to the regulatory text.

In-Use On-Road Diesel-Fueled Vehicles

On December 12, 2008, CARB adopted an ATCM to reduce NO_x and particulate matter emissions from most in-use on-road diesel trucks and buses with a gross vehicle weight rating (GVWR) greater than 14,000 pounds (13 CCR 2025). The original ATCM regulation required fleets of on-road trucks to limit their NO_x and particulate matter emissions through a combination of exhaust retrofit equipment and new vehicles. The regulation limited particulate matter emissions for most fleets by 2011, and limited NO_x emissions for most fleets by 2013. The regulation did not require any vehicle to be replaced before 2012, and never required all vehicles in a fleet be replaced. In December 2009, the CARB governing board directed staff to evaluate amendments that would provide additional flexibility for fleets adversely affected by the poor California economy. On December 17, 2010, CARB revised this ATCM to delay its implementation along with limited relaxation of its requirements. Starting on January 1, 2015, lighter trucks with a GVWR of 14,001 to 26,000 pounds with 20-year-old or older engines would need to be replaced with newer trucks (2010 model year emissions equivalent, as defined in the regulation). Trucks with a GVWR greater than 26,000 pounds with 1995 model year or older engines must be replaced as of January 1, 2015. Trucks with 1996–2006 model year engines must install a Level 3 (85 percent control) diesel particulate filter starting on January 1, 2012, to January 1, 2014, depending on the model year, and then must be replaced after 8 years. Trucks with 2007–2009 model year engines have no requirements until 2023, at which time they must be replaced with 2010 model year emissions equivalent engines as defined in the regulation. Trucks with 2010 model year engines would meet the final compliance requirements. The ATCM provides a phase-in option under which a fleet operator would equip a percentage of trucks in the fleet with diesel particulate filters, starting at 30 percent as of January 1, 2012, with 100 percent by January 1, 2016. Under each option, delayed compliance is granted to fleet operators who have complied or will comply with requirements before the required deadlines.

On September 19, 2011 (effective December 14, 2011), the Executive Officer approved amendments to the regulations, including revisions to the compliance schedule for vehicles with a GVWR of 26,000 pounds or less to clarify that *all* vehicles must be equipped with 2010 model year emissions equivalent engines by 2023. The amendments included revised and additional credits for fleets that have downsized; implement early particulate matter retrofits; incorporate hybrid vehicles, alternative-fueled vehicles, and vehicles with heavy-duty pilot ignition engines; and implement early addition of newer vehicles. The amendments included provisions for additional flexibility, such as for low-usage construction trucks, and revisions to previous exemptions, delays, and extensions. Other amendments to the regulations included minor administrative changes to the regulatory text, including recordkeeping and reporting requirements related to other revisions.

3.2.2.3 Local

Ozone Attainment Plan

Placer County has been designated nonattainment for the federal 8-hour ozone standard. Accordingly, the Sacramento Regional 8-Hour Ozone Attainment and Reasonable Further Progress Plan (Ozone Attainment Plan) was prepared to describe and demonstrate how Placer County, as well as the Sacramento nonattainment area, would attain the required federal 8-hour ozone standard by the proposed attainment deadline. The Ozone Attainment Plan demonstrates how existing and new control strategies would provide the necessary future emission reductions to meet the federal Clean Air Act requirements, including the NAAQS. Adoption of all reasonably available control measures is required for attainment. Measures could include, but are not limited to, the following: regional mobile incentive programs, urban forest development programs, and local regulatory measures for emission reductions related to architectural coatings, automotive refinishing, natural gas production and processing, asphalt concrete, and various others. The Ozone Attainment Plan is the currently adopted and applicable air quality plan for the region. Therefore, the PCAPCD, along with other local air districts in the Sacramento region, is required to comply with and implement the Ozone Attainment Plan.

Triennial Progress Report

To comply with the planning requirements of the California Clean Air Act, the PCAPCD has prepared several triennial progress reports that build upon the Air Quality Attainment Plan adopted in 1991. The *2012 Triennial Progress Report* (PCAPCD 2013) is the most recent report. The triennial progress report, like the Ozone Attainment Plan, includes a current emission inventory and projected future inventories of ROG and NO_x emissions in Placer County. The future inventories reflect future growth rates of population, travel, employment, industrial/ commercial activities, and energy use, as well as control imposed through local, state, and federal emission reduction measures. The triennial report assess the progress made towards attaining the state air quality standards in Placer County from the evaluation period of 2009 to 2011, discusses incentive programs that have been implemented, and other measures that would supplement those in the Ozone Attainment Plan to achieve the required 5 percent or more per year reduction required by the California Clean Air Act.

Placer County Air Pollution Control District CEQA Air Quality Handbook

Local air quality management agencies were established by the 1976 Lewis Air Quality Management Act. Significant authority for air quality control has been given to local air pollution control districts or air quality management districts, which regulate stationary source emissions and develop local attainment plans. PCAPCD has the authority to manage many air pollutant sources and is responsible for implementing certain programs and regulations for controlling air pollutant emissions to improve air quality in order to attain the NAAQS and CAAQS. Specifically, the PCAPCD regulates air quality by establishing local air quality rules and regulations, permitting stationary sources, and planning activities related to air quality.

Various projects have the potential to generate air pollutants that would result in adverse environmental impacts. Through its enhanced California Environmental Quality Act (CEQA) review process and its New Source Review Rule, PCAPCD has developed significance thresholds for land use projects that generate air pollutants. These thresholds apply to both short-and long-term air pollutant emissions. Projects that generate emissions exceeding the thresholds would have a significant impact on air quality. If the project's impact exceeds any of the significance criteria, various mitigation measures are available depending on the nature of the air quality impact. The PCAPCD's *CEQA Air Quality Handbook* includes the recommended significance thresholds, as listed in Table 3.2-2, PCAPCD-Recommended Thresholds of Significance, to evaluate air quality impacts associated with development projects.

Table 3.2-2
PCAPCD-Recommended Thresholds of Significance

Pollutant	Construction/Operational Threshold (lb/day)	Cumulative Threshold (lb/day)
ROGs	82	10
NO_X	82	10
PM_{10}	82	N/A
CO	550	N/A

Source: PCAPCD 2012.
Notes: lb/day = pounds per day; ROGs = reactive organic gases; NO_x = oxides of nitrogen; PM_{10} = coarse particulate matter; CO = carbon monoxide; N/A = not applicable.

Appendices B and D of the PCAPCD *CEQA Air Quality Handbook* present rules and regulations required for all projects. In addition, a complete listing of all PCAPCD rules and regulations can be found at http://www.placer.ca.gov/Departments/Air/Rules.aspx.

Each lead agency is responsible for compliance with the rules and regulations, whether requiring implementation through mitigation, conditions of approval, or standard notes on improvement plans, grading plans, or design review permits. The key PCAPCD rules and regulations applicable to the proposed project are presented in the following paragraphs.

Rule 202 – Visible Emissions

Rule 202 restricts discharging into the atmosphere emissions of any single source of air contaminant for a period(s) of more than 3 minutes in any 1 hour that is a certain shade of darkness or is of such opacity as to obscure an observer's view to a certain degree.

Rule 207 – Particulate Matter

Rule 207 restricts a person from releasing or discharging any source with particulate matter in excess of 0.1 grains per cubic foot of gas at District standard conditions, into the SVAB and MCAB portion of APAPCD atmosphere.

Rule 210 – Specific Contaminants

Rule 210 restricts a person from discharging the following contaminants into the atmosphere:

1. Sulfur dioxide (SO_2) – 0.2 percent by volume for the SVAB and MCAB portions of the PCAPCD and/or 500 parts per million (ppm) by volume for the Lake Tahoe Air Basin portion of the PCAPCD.
2. Combustion contaminants – Wood fired boilers and incinerators in the SVAB and MCAB portions of the PCAPCD: 0.2 grains per cubic foot of gas calculated to 12 percent CO_2 at standard conditions and/or all other combustion sources in the SVAB and MCAB portions of the PCAPCD and all combustion sources in the Lake Tahoe Air Basin portion of the District: 0.1 grains per cubic foot of gas calculated at 12 percent CO_2 at standard conditions.

Rule 214 – Transfer of Gasoline into Vehicle Fuel Tanks

Rule 214 provides provisions for the transfer of gasoline from any stationary storage tank into any motor vehicle fuel tank.

Rule 217 – Cutback and Emulsified Asphalt Paving Materials

Rule 217 restricts a person from discharging VOCs to the atmosphere that are caused by the use or manufacture of cutback or emulsified asphalts for paving, road construction, or road maintenance, unless such manufacture or use complies with the provisions under this rule.

Rule 224 – Aggregate Containing Asbestos

Rule 224 restricts a person from using aggregate containing asbestos in any application or use except for which the aggregate is permanently buried or sealed or used as a road base where the surface and edge berms are to be permanently sealed with asphaltic concrete, concrete, chip seal, and the public is not allowed access to the road prior to it being sealed. Rule 224 does not apply to private right-of-ways and does not apply to right-of-ways that are comprised of aggregate containing asbestos that the Air Pollution Control Officer determines not to be a threat to human health.

Rule 228 – Fugitive Dust

Rule 228 reduces the amount of particulate matter entrained in the ambient air, or discharged into the ambient air, as a result of man-made fugitive dust sources by requiring actions to prevent, reduce, or mitigate fugitive dust emissions.

Northern Sierra Air Quality Management District

The NSAQMD *Guidelines for Assessing and Mitigating Air Quality Impacts of Land Use Projects* (NSAQMD 2009) provides a tiered approach to analyzing criteria pollutant emissions impacts. Thresholds of significance are based on a source's projected impacts and are a basis from which to apply mitigation measures. The NSAQMD's tiered approach to significance determination levels is divided into Levels A, B, and C. A project with emissions meeting Level A thresholds will require the most basic mitigation measures. Projects with projected emissions in the Level B range will require more extensive mitigation measures. Projects that exceed Level C thresholds will require the most extensive mitigation measures. The tiered thresholds from Levels A, B, and C are provided in Table 3.2-3, NSAQMD-Recommended Thresholds of Significance.

Table 3.2-3
NSAQMD-Recommended Thresholds of Significance
(pounds per day)

ROGs	NO_x	PM_{10}
Level A		
<24	<24	<79
Level B		
24–136	24–136	79–136
Level C		
>136	>136	>136

Source: NSAQMD 2009.
Notes: NSAQMD = Northern Sierra Air Quality Management District; ROG = reactive organic gas; NOx = oxides of nitrogen; PM10 = coarse particulate matter.

If emissions for NO_x, ROGs, and PM_{10} exceed 136 pounds per day (Level C), then NSAQMD advises the lead agency that the project is likely to result in a significant impact to air quality. Impacts below Level C are considered potentially significant prior to implementation of mitigation.

Local Air Quality

Placer County Attainment Designation

An area is designated "in attainment" when it is in compliance with the NAAQS and/or CAAQS. These standards are set by the EPA or CARB for the maximum level of a given air pollutant that can exist in the outdoor air without unacceptable effects on human health or the public welfare with a margin for safety.

The criteria pollutants of primary concern considered in this air quality assessment include O_3, NO_2, CO, SO_2, PM_{10}, $PM_{2.5}$, and lead. Although there are no ambient standards for VOCs (also referred to as ROGs) or NO_x, they are important because they are precursors to O_3.

The attainment classifications for these criteria pollutants are outlined in Table 3.2-4, Placer County Attainment Classification.

Table 3.2-4
Placer County Attainment Classification

Pollutant	Averaging Time	State Designation/ Classification	National Designation/Classification
O_3	1-hour 8-hour	Nonattainment Nonattainment	— Nonattainment/severe 15
NO_2	1-hour Annual arithmetic mean	Attainment	Unclassified/attainment
CO	1-hour 8-hour	Unclassified/attainment	Attainment
SO_2	1-hour 24-hour Annual arithmetic mean	Attainment	Unclassified/attainment
PM_{10}	24-hour Annual arithmetic mean	Nonattainment	Unclassified —
$PM_{2.5}$	24-hour Annual arithmetic mean	Unclassified/attainment	Nonattainment Unclassified/attainment
Lead (Pb)	Quarter	—	Unclassified/attainment
	3-month average	—	Unclassified/attainment
	30-day average	Attainment	—
Sulfates (SO_4)	24-hour	Attainment	—
Hydrogen sulfide (H_2S)	1-hour	Unclassified	—
Vinyl chloride[a]	24-hour	Unclassified	—
Visibility-reducing particles	8-hour (10:00 a.m.– 6:00 p.m.)	Unclassified	—

Sources: CARB 2013b (state designation/classification); EPA 2014a (national designation/classification).
Notes: O_3 = ozone; NO_2 = nitrogen dioxide; CO = carbon monoxide; SO_2 = sulfur dioxide; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter.
[a] CARB has identified lead and vinyl chloride as TACs with no threshold level of exposure for adverse health effects determined.

As shown in Table 3.2-4, Placer County, within the MCAB and SVAB, is non-attainment area for both federal and state O_3 standards, the state PM_{10} standards, and the federal 24-hour standard for $PM_{2.5}$. Placer County is also designated unclassified (meaning there is not enough data to classify the region attainment or non-attainment) for the for the federal 24-hour standard for PM_{10}, and state standard for hydrogen sulfide, vinyl chloride, and visibility-reducing particles. Placer County has been designated as an attainment area for all other criteria air pollutants.

Nevada County Attainment Designation

The attainment classifications for these criteria pollutants are outlined in Table 3.2-5, Nevada County Attainment Classification.

Table 3.2-5
Nevada County Attainment Classification

Pollutant	Averaging Time	State Designation/ Classification	National Designation/Classification
O_3 (2008 Standard)	1-hour 8-hour	Nonattainment Nonattainment	— Nonattainment/marginal (Western Nevada County); Unclassified/attainment (Eastern Nevada County)
NO_2	1-hour Annual arithmetic mean	Attainment	Unclassified/attainment
CO	1-hour 8-hour	Unclassified	Unclassified/attainment
SO_2	1-hour 24-hour Annual arithmetic mean	Attainment	Unclassified
PM_{10}	24-hour	Nonattainment	Unclassified
$PM_{2.5}$	24-hour	Unclassified	Unclassified/attainment
Lead (Pb)	30-day average	Attainment	Unclassified/attainment
Sulfates (SO_4)	24-hour	Attainment	—
Hydrogen sulfide (H_2S)	1-hour	Unclassified	—
Vinyl chloride[a]	24-hour	—	—
Visibility-reducing particles	8-hour (10:00 a.m.– 6:00 p.m.)	Unclassified	—

Sources: CARB 2013b (state designation/classification); EPA 2014a (national designation/classification).
Note: O_3 = ozone; NO_2 = nitrogen dioxide; CO = carbon monoxide; SO_2 = sulfur dioxide; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter.
[a] CARB has identified lead and vinyl chloride as TACs with no threshold level of exposure for adverse health effects determined.

As shown in Table 3.2-5, Nevada County, within the MCAB, is a non-attainment area for both federal (Western Nevada County only) and state O_3 standards and the state PM_{10} standards. Nevada County is also designated unclassified or unclassified/attainment (meaning there is not enough data to classify the region attainment or non-attainment) for the for the federal 24-hour standard for PM_{10}, NO_2, CO, SO_2, $PM_{2.5}$, and lead; and the state standard for CO, $PM_{2.5}$, hydrogen sulfide, and visibility-reducing particles. Nevada County has been designated as an attainment area for all other criteria air pollutants.

Air Quality Monitoring Data

Since the project site is located within MCAB and a portion of project-related emissions would be generated within the SVAB, the project area's local ambient air quality is monitored by

PCAPCD, NSAQMD, and CARB. CARB monitors ambient air quality at approximately 250 air quality monitoring stations across the state. Air quality monitoring stations usually measure pollutant concentrations 10 feet above ground level; therefore, air quality is often referred to in terms of ground-level concentrations. The Colfax–City Hall monitoring station within the MCAB (at 33 South Main Street Colfax, California 95713) is the nearest air quality monitoring station to the project area, approximately 6.2 miles southwest of the project site. The data collected at this station are considered representative of the air quality experienced in the project vicinity. Air quality data from 2011 through 2013 for the Colfax–City Hall monitoring station are provided in Table 3.2-6, Ambient Air Quality Data. Because NO_2 is not monitored at the Colfax–City Hall monitoring station, NO_2 measurements were taken from the Grass Valley–Litton Building monitoring station (200 Litton Drive Grass Valley, California 95945, approximately 9.1 miles northeast of the project site). Because information for CO and SO_2 are not available within the MCAB, the SVAB monitoring stations were used to obtain ambient air quality near the project area. The North Highlands–Blackfoot Way monitoring station (at 7823 Blackfoot Way, North Highlands 95843, approximately 41 miles southwest of the project site) was selected to measure CO and the Sacramento–Del Paso Manor monitoring station (at 2701 Avalon Drive Sacramento, California, 95821, approximately 46 miles southwest of the project site) was selected to measure SO_2. The number of days exceeding the ambient air quality standards is shown in Table 3.2-7, Frequency of Air Quality Standard Violations.

Table 3.2-6
Ambient Air Quality Data
(parts per million unless otherwise indicated)

Pollutant	Averaging Time	2011	2012	2013	Most Stringent Ambient Air Quality Standard	Monitoring Station
O_3	1-hour	0.104	0.097	0.083	0.09	Colfax–City Hall
	8-hour	0.087	0.085	0.077	0.070	
NO_2	1-hour	0.283	N/A	N/A	0.100	Grass Valley–Litton Building
	Annual	N/A	N/A	N/A	0.030	
CO	1-hour	2.3	2.1	1.9	20	North Highlands–Blackfoot Way
	8-hour	1.87	1.54	N/A	9.0	
SO_2	24-hour	0.001	0.002	0.002	0.04	Sacramento–Del Paso Manor
	Annual	0.000	N/A	N/A	0.030	
PM_{10}	24-hour	N/A	31.7 μg/m³	57.5 μg/m³	50 μg/m³	Colfax–City Hall
	Annual	N/A	13.7 μg/m³	17.3 μg/m³	20 μg/m³	
$PM_{2.5}$	24-hour	N/A	23.6 μg/m³	55.8 μg/m³	35 μg/m³	Colfax–City Hall

Table 3.2-6
Ambient Air Quality Data
(parts per million unless otherwise indicated)

Pollutant	Averaging Time	2011	2012	2013	Most Stringent Ambient Air Quality Standard	Monitoring Station
	Annual	N/A	6.4 μg/m³	7.4 μg/m³	12 μg/m³	

Sources: CARB 2013c; EPA 2014b (for 1-hour CO).
Notes: O_3 = ozone; NO_2 = nitrogen dioxide; CO = carbon monoxide; SO_2 = sulfur dioxide; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; μg/m³ = micrograms per cubic meter; N/A = not applicable because insufficient data available to determine the value.
Data taken from CARB iADAM (2013c) or EPA AirData (2014b) represent the highest concentrations experienced over a given year.

Table 3.2-7
Frequency of Air Quality Standard Violations

Year	Number of Days Exceeding Standard			
	State 1-Hour O_3	*State 8-Hour O_3*	*National 8-Hour O_3*	*State 24-Hour PM_{10}*
2011	1	13	2	0
2012	1	16	7	0
2013	0	5	1	2

Source: CARB 2013c.
Notes: Exceedances of federal and state standards are only shown for ozone. All other criteria pollutants did not exceed either federal or state standards during the years shown.

Placer County General Plan

The Placer County General Plan Natural Resources section provides countywide goals and policies aimed at improving air quality. The air quality goals and policies applicable to the analysis of the proposed project's air quality impacts are as follows:

Goal 6.F: To protect and improve air quality in Placer County.

Policy 6.F.1: The County shall cooperate with other agencies to develop a consistent and effective approach to air quality planning and management.

Policy 6.F.4: The County shall solicit and consider comments from local and regional agencies on proposed projects that may affect regional air quality.

Policy 6.F.6: The County shall require project-level environmental review to include identification of potential air quality impacts and designation of design and other appropriate mitigation measures or offset fees to reduce impacts. The County shall dedicate staff to work with project proponents and other agencies in identifying, ensuring the implementation of, and monitoring the success of mitigation measures.

Policy 6.F.7: The County shall encourage development to be located and designed to minimize direct and indirect air pollutants.

Policy 6.F.8: The County shall submit development proposals to the PCAPCD for review and comment in compliance with CEQA prior to consideration by the appropriate decision-making body (County of Placer 2013).

Nevada County General Plan

Chapter 14, Air Quality, of the Nevada County General Plan provides citywide goals, objectives and policies aimed at improving air quality. The air quality goals and policies applicable to the analysis of the proposed project's air quality impacts are as follows:

Goal 14.1: Attain, maintain and ensure high air quality.

Objective 14.1: Establish land use patterns that minimize impacts on air quality.

Policy 14.1: Cooperate with the Air Quality Management District (currently the NSAQMD), during review of development proposals. As part of the site plan review process, require applicants of all subdivisions, multi-family, commercial, and industrial development projects to address cumulative and long-term air quality impacts, and request the District enforce appropriate land use regulations to reduce air pollution.

Objective 14.2: Implement standards that minimize impacts on and/or restore air quality.

Policy 14.3: Where it is determined necessary to reduce short-term and long-term cumulative impact, the County shall require all new discretionary projects to offset any pollutant increases. Wherever possible, such offsets shall benefit lower-income housing (County of Nevada 1996).

3.2.3 Thresholds of Significance

The significance criteria used to evaluate the project impacts to air quality are based on Appendix G of the CEQA Guidelines (14 CCR 15000 et seq.). According to Appendix G of the CEQA Guidelines, a significant impact related to air quality would occur if the project would:

1. Conflict with or obstruct implementation of the applicable air quality plan.
2. Violate any air quality standard or contribute substantially to an existing or projected air quality violation.

3. Result in a cumulatively considerable new increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative threshold emissions which exceed quantitative thresholds for ozone precursors).
4. Expose sensitive receptors to substantial pollutant concentrations.
5. Create objectionable odors affecting a substantial number of people.

3.2.4 Impacts Analysis

Impact 3.2-1: The project would not conflict with or obstruct implementation of the applicable air quality plan.

As stated in Section 3.2.2, Placer County has developed an Ozone Attainment Plan to describe and demonstrate how Placer County, as well as the Sacramento nonattainment area, would attain the required federal 8-hour ozone standard by the proposed attainment deadline. The Ozone Attainment Plan demonstrates how existing and new control strategies would provide the necessary future emission reductions to meet the federal Clean Air Act requirements, including the NAAQS. In addition, Placer County continually updates the Triennial Progress Report. The 2012 Triennial Progress Report (PCAPCD 2013) is the most recent report. The Triennial Progress Report, like the Ozone Attainment Plan, includes a current emission inventory and projected future inventories of ROG and NO_x emissions in Placer County. The future inventories reflect future growth rates of population, travel, employment, industrial/commercial activities, and energy use, as well as control imposed through local, state, and federal emission reduction measures.

These plans primarily rely on CARB and county-supplied data and information, including mobile and area source emissions, as well as information regarding projected growth in Placer County and the cities in the county, to project future emissions and then determine from those projections the strategies necessary for reducing emissions through regulatory controls. CARB mobile source emission projections and county growth projections are based on current population, population, and vehicle trends and land use plans developed by Placer County and the cities in the county as part of the development of their general plans. As such, projects that propose development that is consistent with the growth anticipated by local plans would be consistent with the local air quality plans. However, if a project proposes development that is greater than that anticipated in the local plan and the county's growth projections, the project might be in conflict with the local air quality plan and may contribute to a potentially significant cumulative impact on air quality.

As the proposed project would not contribute to local population growth or substantial employment growth and associated vehicle miles traveled on local roadways, the proposed project is considered to have been accounted for in the local Ozone Attainment Plan and Triennial Progress Report, and the project would not conflict with or obstruct the implementation with local air quality plans. Impacts would be considered **less than significant**. However, mining activity is not specifically identified in the Ozone Attainment Plan and Triennial Progress Report, and a further consideration of consistency is the exceedance of relevant air district thresholds. The quantified project emissions and the relevant thresholds are discussed under Impact 3.2-2.

Impact 3.2-2: The project would potentially violate an air quality standard or contribute substantially to an existing or projected air quality violation.

Construction Impacts

Construction of the proposed project would primarily consist of setting up the site for aggregate removal and stockpiling operations, and would not require heavy-duty construction equipment or substantial hauling trips to bring materials or personnel to the site for construction. Temporary bridges crossing Steephollow Creek and/or the Bear River would be placed at the beginning of the project season to allow access between the skimming area and the primary stockpile and staging area (the bridges would be removed at the end of the season). Additionally, gravel berms would be installed to channelize the river, as the Bear River shifts throughout the year. Additional ancillary features of the project would include a staging area with fuel storage, office, maintenance shop, equipment storage, truck scales, and restrooms. Therefore, because site setup activities would not require heavy-duty construction equipment or haul or vendor trips and would not involve substantial numbers of personnel travelling to the site, these activities would generate negligible emissions. As such, impacts during site setup would be considered less than significant.

In addition to seasonal construction activity, a one-time construction operation would be conducted for the placement of scour protection in the locations described in Chapter 2, Project Description. Scour protection, which would involve the placement of prefabricated metal sheet piling, held in place by concrete, would be similar to the setup activities for a typical gravel removal season. These activities would not be concurrent, and as such, impacts related to scour protection would be considered less than significant.

Operational Impacts

After the river is channelized, gravel will be removed on one side of the Bear River using scrapers and front-end loaders. No dredging would be done in the Bear River, as excavation would occur to a level no greater than 6 inches below the water level. The estimated maximum amount of material removed annually is 250,000 tons. Average annual removal is expected to be closer to 50,000 tons per year. There will be no on-site processing or washing of excavated materials.

Material hauling would be confined to the same side of the Bear River as aggregate removal operations to avoid equipment crossing the contained channel. A temporary bridge crossing Steephollow Creek or the Bear River (to connect the skimming area with the primary stockpile and the haul route) would be placed at the beginning of the project season to allow access between the skimming area and the primary stockpile and staging area. Once the aggregate is collected, it would be loaded onto a conveyor belt and screened through various-sized mesh screens for stockpiling. For the purposes of air emissions modeling, it was assumed that the screening and stockpiling process would involve three screening cycles prior to loading of the sorted aggregate onto a haul truck for transport off site. Material could be hauled to multiple locations in the region, depending on demand for aggregate and the location of construction or maintenance projects in any particular year. Conservatively, the modeling assumes two primary destinations, Auburn, located in the SVAB approximately 26 miles from the project site, or Meadow Vista (Bear River Aggregates, formerly Chevreaux), located in the MCAB approximately 21 miles from the project site. Because emissions would occur in both the SVAB and the MCAB, emissions within each basin were estimated. It was assumed that 50% of the aggregate would be transported to Auburn and 50% of the aggregate would be transported to Meadow Vista.[2] Emissions of all pollutants from on-road haul trucks and passenger vehicles, including off-site and idling emissions, were estimated using emission factors derived using CARB's motor vehicle emission inventory program, EMFAC2011 (CARB 2011), available online (http://www.arb.ca.gov/msei/ modeling.htm). Up to five employees would typically be on site during operational activities. See Appendix C for complete results.

Aggregate skimming emissions were estimated using emission factors from AP-42, Section 11.19.2, Crushed Stone Processing. Although no processing of aggregate material would occur on site (aggregate would only be screened and sorted on site), emission factors for activities described in Section 11.19.2 of AP-42 were appropriate for analyzing on-site operational emissions. Emissions generated from conveyor belt to screening and sorting activities were estimated using emission factors from AP-42, Section 13.2.4, Aggregate Handling and Storage Piles. Fugitive dust emissions generated from unpaved road travel were estimated using AP-42, Section 13.2.2, Unpaved Roads. See Appendix C for complete results.

No stationary sources are proposed as part of the project; therefore, stationary source permitting would not be required. All stationary equipment, including the screens and conveyers described above, would operate on electrical power.

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2 At the time of the Notice of Preparation, the Chevreaux Auburn Plant, was in operation. Despite the closing of this plant, Auburn is still identified as a major market for aggregate in the region, and a destination for project aggregate.

Emissions from off-road operational equipment, including scrapers, off-highway haul trucks, and front-end loaders, were estimated using the California Emissions Estimator Model (CalEEMod) Version 2013.2.2, available online at www.caleemod.com. See Appendix C for complete results.

Table 3.2-8, Estimated Daily Maximum Operational Emissions – NSAQMD Jurisdiction, presents the maximum daily emissions associated with the operation of the proposed project within the NSAQMD, including aggregate collecting, sorting, and on-site hauling activities.[3] Table 3.2-9 presents the maximum daily emissions associated with the operation of the proposed project within the PCAPCD jurisdiction, which consists solely of haul truck emissions during transport of aggregate to the processing plant facilities.

Table 3.2-8
Estimated Daily Maximum Operational Emissions – NSAQMD Jurisdiction
(pounds per day)

	VOCs	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
Aggregate Processing	—	—	—	—	2.97	0.38
Off-Road Equipment	5.09	61.53	32.37	0.06	2.42	2.23
Motor Vehicles	0.01	0.06	0.02	0.00	0.00	0.00
Unpaved Roads	—	—	—	—	122.17	12.22
Maximum Daily Emissions	**5.10**	**61.59**	**32.39**	**0.06**	**127.57**	**14.83**
Pollutant Threshold (NSAQMD)	*<24 (Level A)*	*24–136 (Level B)*	*N/A*	*N/A*	*79–136 (Level B)*	*N/A*
Threshold Exceeded?	No	No	No	No	No	No

Source: See Appendix C for complete results.
Notes: NSAQMD = Northern Sierra Air Quality Management District; VOCs = volatile organic compounds; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; N/A = not applicable.

As shown, daily operational emissions would not exceed the NSAQMD Level A threshold for VOCs, and would not exceed the NSAQMD Level B thresholds for NO_x and PM_{10}; therefore, impacts associated with criteria pollutant emissions within the NSAQMD jurisdiction would be **less than significant**. Due to the nature of the project, no mitigation measures recommended in the NSAQMD *Guidelines for Assessing and Mitigating Air Quality Impacts of Land Use Projects* for Level B thresholds would apply to the proposed project (NSAQMD 2009).

[3] While gravel removal activity may seasonally occur on the south side of the Bear River (Placer County), screening and stockpiling will occur on the north side. The thresholds used by NSAQMD and PCAPCD are slightly different (Level B for PM_{10} and NO_x under NSAQMD and potentially significant for PM_{10} under PCAPCD). Implementation of feasible dust control measures required under Level B conditions would reduce the impact to less than significant under either district's criteria.

Table 3.2-9
Estimated Daily Maximum Operational Emissions – PCAPCD Jurisdiction
(pounds per day)

	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
Motor Vehicles	3.32	98.82	15.17	0.15	1.67	1.54
Paved Roads	—	—	—	—	3.05	0.70
Maximum Daily Emissions	**3.32**	**98.82**	**15.17**	**0.15**	**4.72**	**2.24**
Pollutant Threshold (PCAPCD)	*82*	*82*	*550*	*N/A*	*82*	*N/A*
Threshold Exceeded?	No	**Yes**	No	No	No	No

Source: See Appendix C for complete results.
Notes: PCAPCD = Placer County Air Quality Management District; VOCs = volatile organic compounds; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; N/A = not applicable.

As shown in Table 3.2-9, daily operational emissions would not exceed the PCAPCD thresholds for VOCs, CO, SO_x, PM_{10}, or $PM_{2.5}$; therefore, impacts associated with these criteria pollutant emissions within the PCAPCD would be less than significant. However, daily operational emissions would exceed the PCAPCD threshold for NO_x, and impacts would be potentially significant. Significant NO_x emissions would be generated from haul trucks transporting aggregate off site and as such, no mitigation is available to reduce NO_x emissions during hauling activities. The operational period would be from April 1 to November 15, with removal activities concentrated during the period of lowest water levels (typically 60 – 120 days of the year) in the summer or fall. Temporary facilities would be removed by November 15, unless dry conditions allow for a longer work period (but no later than December 31). Although, stockpiled materials may be sold year-round, the operational season, and the period of greatest construction demand, occurs during April 1 through November 15. This is also the period of greatest air quality concern for NOx emissions.[4] Air quality impacts, at maximum production levels during the operational season, would be considered a **significant** air quality impact. Proposed mitigation measures (MMs) are provided in Section 3.2.5 (MM-AQ-1 and MM-AQ-2) and the level of significance after mitigation is shown in Section 3.2.6. It should be noted that the modeling assumes skimming, screening, and hauling of 250,000 tons of aggregate each year, the maximum allowed under the Reclamation Plan (see Appendix B). However, it is expected that in most years the actual amount of aggregate handled would be much less. In years where production is less than approximately 206,000 tons, the NO_x emissions would be expected to be less than the PCAPCD threshold of 82 pounds per day. Typical removal levels are expected to be near 50,000 tons per year.

4 The air quality modeling for haul trucks assumes 250,000 tons (the maximum scenario) hauled over a 200 work-day period from April 1 to November 15, consistent with the traffic modeling for the project.

Impact 3.2-3: The project would result in a cumulatively considerable new increase of a criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative threshold emissions which exceed quantitative thresholds for ozone precursors).

In analyzing cumulative impacts from the proposed project, the analysis must specifically evaluate a project's contribution to the cumulative increase in pollutants for which the MCAB or SVAB are designated as nonattainment for the CAAQS and NAAQS. If the proposed project does not exceed thresholds and is determined to have less than significant project-specific impacts, it may still contribute to a significant cumulative impact on air quality if the emissions from the project, in combination with the emissions from other proposed or reasonably foreseeable future projects, would be in excess of established thresholds. However, the project would only be considered to have a significant cumulative impact if the project's contribution would account for a significant proportion of the cumulative total emissions (i.e., it would represent a "cumulatively considerable contribution" to the cumulative air quality impact).

The MCAB has been designated as a federal and state nonattainment area for O_3, a state nonattainment area for PM_{10}, and federal nonattainment area for $PM_{2.5}$. PM_{10} and $PM_{2.5}$ emissions associated with construction generally result in near-field impacts. The nonattainment status is the result of cumulative emissions from all sources of these air pollutants and their precursors within the MCAB. As discussed previously, the emissions of all criteria pollutants would be below the significance levels. Construction activities would be negligible. Once the project site is prepared for operational activities, operational emissions generated by the proposed project would not result in a significant impact. As such, the proposed project would result in less than significant impacts to air quality relative to operational emissions.

As stated in Section 3.2.2, the Ozone Attainment Plan and Triennial Progress Report are based on Placer County growth projections based on population and vehicle trends and land use plans developed by the cities and by the county as part of the development of their general plans. Therefore, projects that propose development that is consistent with the growth anticipated by local plans would be consistent with the Ozone Attainment Plan and Triennial Progress Report. The proposed project is consistent with the existing zoning designation for the site; thus, it would be consistent at a regional level with the underlying growth forecasts in the Ozone Attainment Plan and Triennial Progress Report.

In addition, PCAPCD has adopted cumulative thresholds for NO_x, VOCs, and particulate matter of 10 pounds per day. As shown in Table 3.2-9, the project's emissions of VOCs and particulate matter would remain below this threshold while the project's emissions of NO_x would exceed the cumulative threshold. As a result, the proposed project would result in a cumulatively considerable contribution to regional O_3 concentrations. The cumulative impacts related to NO_x emissions would be **significant**. Implementation of MM-AQ-2 would address this impact (see Section 3.2.5); the level of significance after mitigation is shown in Section 3.2.6. In addition, PCAPCD has implemented a mitigation program for cumulative NO_x emissions. Participation in this regional program, if feasible, would reduce the project's cumulative contribution to NO_x emissions.

Impact 3.2-4: The project would not expose sensitive receptors to substantial pollutant concentrations.

In addition to impacts from criteria pollutants, project impacts may include emissions of pollutants identified by the state and federal government as TACs or hazardous air pollutants. State law has established the framework for California's TAC identification and control program, which is generally more stringent than the federal program and is aimed at TACs that are a problem in California. The state has formally identified more than 200 substances as TACs, including the federal hazardous air pollutants, and is adopting appropriate control measures for sources of these TACs.

Asbestos is a known human carcinogen and is classified as a TAC by CARB (OPR 2008). Naturally occurring asbestos is most commonly associated with serpentinite and/or ultramafic rock. Serpentinite and/or ultramafic rock are known to be present in 44 of California's 58 counties, including Placer and Nevada Counties. A review of maps prepared by the California Geological Survey indicate that while naturally occurring asbestos is moderately likely to occur east of the project site, the project site is classified as low risk (CGS 2006, 2008). This information, combined with the lack of on-site crushing or other processing, indicates that health risks related to naturally occurring asbestos would be **less than significant.**

The greatest potential for TAC emissions during construction would be diesel particulate emissions from heavy equipment operations and heavy-duty trucks and the associated health impacts to sensitive receptors. The nearest sensitive receptor consists of an individual single-family residence located over 500 feet west of the haul route. The closest residence to the edge of the skimming area is located 1,300 feet northwest of the project site (see Figure 3.9-1). Both residences are surrounded by dense tree vegetation.

Health effects from carcinogenic air toxics are usually described in terms of cancer risk. The PCAPCD recommends an incremental cancer risk threshold of 10 in a million. "Incremental cancer risk" is the likelihood that a person continuously exposed to concentrations of TACs resulting from a project over a 70-year lifetime will contract cancer based on the use of standard risk-assessment methodology. The proposed project would not require the extensive use of heavy-duty equipment, which is subject to a CARB ATCM for in-use diesel construction equipment to reduce diesel particulate emissions, and all diesel trucks would also be subject to an

ATCM. Operation of the project would not persist throughout the year, as operational activities would be seasonal in nature. Once seasonal activities end in the winter months, project-related TAC emissions would cease. Thus, the proposed project would not result in a constant, long-term source of TAC emissions. Additionally, sensitive receptors, including several scattered rural residences in the project vicinity, are completed surrounded by dense tree vegetation and are not located near the proposed haul routes. As such, the exposure of sensitive receptors to project-related TAC emission impacts would be **less than significant**.

Impact 3.2-5: The project would not create objectionable odors affecting a substantial number of people.

Odor issues are very subjective by the nature of odors themselves and due to the fact that their measurements are difficult to quantify. As a result, this guideline is qualitative, and each project is reviewed on an individual basis, focusing on the existing and potential surrounding uses and location of sensitive receptors.

Land uses and industrial operations that are associated with odor complaints include agricultural uses, wastewater treatment plants, food processing plants, chemical plants, composting, refineries, landfills, dairies, and fiberglass molding facilities. The proposed project would not be associated with a land use or activity that would generate objectionable odors within the project vicinity. Operation of proposed project would result in the emission of diesel fumes and other odors typically associated with aggregate collection and distribution activities. These compounds would be emitted in varying amounts on the project site depending on where operational activities are occurring and the extent of operations on a given day. Sensitive receptors located in the vicinity of the project site may be affected. Odors are highest near the source and would quickly dissipate off site. As such, the project would not generate objectionable odors off site, nor would significant odors be generated during aggregate surface mining or sorting. Thus, impacts associated with odors would be **less than significant**.

3.2.5 Mitigation Measures

Implementation of the following mitigation measures (MMs) would ensure that the project's potential contributions to air quality standard violations and fugitive dust emissions remain below a level of significance.

MM-AQ-1 During aggregate collection, sorting, and on-site hauling activities, site watering shall be conducted at least twice daily to control on-site fugitive dust.

MM-AQ-2 To reduce the project's contribution to cumulative NOx emissions, NID (or subsequent operator) shall participate in the Placer County Air Pollution Control District's (PCAPCD's) oxides of nitrogen (NO_x) mitigation program. The purpose of this program is to provide NO_x reduction (offsets) elsewhere, either within the applicant's operations or elsewhere within PCAPCD's jurisdiction to compensate for cumulative NO_x emissions.

3.2.6 Level of Significance After Mitigation

MM-AQ-1 would ensure that fugitive dust emissions remain below a level of significance during aggregate collection, sorting, and hauling activities. During hauling activities, NO_x emissions would exceed the PCAPCD thresholds at maximum operations (above 206,000 tons per year). As the haul trucks would be from a variety of construction companies and independent contractors, it would be infeasible to implement measures such as Tier 4 engines or alternative engine technologies. Impacts related to NO_x emissions (Impact 3.2-2) would therefore remain **significant and unavoidable**.

Cumulative emissions of NO_x (Impact 3.2-3) would exceed the PCAPCD thresholds and result in **significant and unavoidable** cumulative impacts. Mitigation Measure AQ-2 would provide mitigation in the form of NOx offsets elsewhere in the air district. However, it is not known if sufficient offsets can be identified to reduce the project's contribution to a less-than-significant level. In addition, if NID undertakes aggregate removal directly (rather than entering an agreement with a mining operator), it may not be financially feasible to fund offsets. Due to the need to preserve and restore water storage capacity, this would result in a significant and unavoidable cumulative impact if aggregate hauling exceeds 25,000 tons during the year.

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3.3 BIOLOGICAL RESOURCES

This section describes the existing biological resources of the project site, identifies associated regulatory requirements, evaluates potential impacts, and identifies mitigation measures related to implementation of the proposed Bear River Sediment Removal at Rollins Reservoir Project (proposed project). The approximately 203-acre study area for biological resources (see Figure 3.3-1) includes the Bear River channel between the existing access bridge (Chicago Park Powerhouse Road Bridge) and the 1993 lower lake level for Rollins Lake, areas identified for processing infrastructure on the elevated bench area, a portion of Steephollow Creek below the elevated bench area, a 50-foot buffer surrounding the river channel, and a 50-foot buffer centered on the access road (Chicago Park Powerhouse Road), including areas proposed for widening (see MM TRA-1 in Section 3.11, Transportation). The analysis below also refers to an approximately 155-acre “primary disturbance area.” This is the area evaluated in the Salix study (see below), and is the area where most of the activity will occur in a typical operating season.

3.3.1 Existing Conditions

Field assessments of the study area were conducted by Salix Consulting Incorporated (Salix) biologists on March 7, 2012 (botany and wetlands), and November 15, 2012 (wildlife, botany, and wetlands) (Salix 2013), and by Dudek biologists on October 6, 2014 (see Appendix D to this EIR for a copy of all three reports). A site visit was also made by Dudek biologists in January 2014 to verify the findings of the Salix reports. The primary purpose of the field assessments was to evaluate the study area for habitats present, including waters of the United States, and determine the potential for occurrence of special-status species known from the project region. The Salix report did not include investigation of the access road alignment nor the upper Rollins Lake area, but these areas were investigated by Dudek biologists in October 2014.

Biological Communities

Four major habitat types occur within the study area and include mixed coniferous forest, perennial stream, barren areas, and developed/disturbed (see Figure 3.3-1).

Mixed Coniferous Forest

Mixed coniferous forest is the primary vegetation type throughout the region. This community occupies approximately 72 acres along the perimeter of the primary disturbance area, bordering the channels of the Bear River and Steephollow Creek. The access road to the site also traverses mixed coniferous forest. Mixed coniferous forest consists mostly of tall, dense stands of trees, but thinner areas are present. Common trees include Douglas-fir (*Pseudotsuga menziesii*), ponderosa pine (*Pinus ponderosa*), canyon live oak (*Quercus chrysolepis*), and California black oak (*Quercus kelloggii*). Incense cedar (*Calocedrus decurrens*), valley oak (*Quercus lobata*), and canyon maple (*Acer grandidentatum*) also occur, but are less common. Common shrub species in more open areas within this vegetation type include toyon (*Heteromeles arbutifolia*), whiteleaf manzanita (*Arctostaphylos manzanita*), and Pacific poison oak (*Toxicodendron diversilobum*). Herbaceous cover varies within forested areas, depending upon the density of the overstory and shrub layer and existing levels of disturbance.

Perennial Stream

Approximately 60 acres of the study area are mapped as perennial stream, including the channel of the Bear River and the lowermost reach of Steephollow Creek. Riparian vegetation occurs in scattered locations within the channels of these two streams. Where riparian vegetation does occur, it is generally confined to narrow bands and is patchy in distribution. Larger patches of riparian vegetation occur along the floodplain areas of the Bear River approximately midway along the study area. White alder (*Alnus rhombifolia*), dogwood (*Cornus* sp.), Fremont cottonwood (*Populus fremontii*), arroyo willow (*Salix lasiolepis*), Goodding's willow (*Quercus gooddingii*), and narrowleaf willow (*Salix exigua*) were the most common tree and shrub species observed along the banks of the Bear River and Steephollow Creek. Common understory species present included Douglas' sagewort (*Artemisia douglasiana*), seep monkeyflower (*Mimulus guttatus*), curly dock (*Rumex crispus*), hairy willowherb (*Epilobium hirsutum*), tall annual willowherb (*E. brachycarpum*), and grasses.

Calm waters in this wide stretch of the Bear River riverbed provide natural passage opportunities (i.e., swimming or wading) for a range of mobile wildlife species. When Pacific Gas & Electric (PG&E) and Nevada Irrigation District (NID) are not releasing water from the Chicago Park Powerhouse, the natural banks on the left side of the river provide escape opportunities into the adjoining forest. However, daily summer releases from the Chicago Powerhouse of 500 to 1,100 cubic feet per second into the Bear River flow channel typically occur from April through October when demand for energy production and irrigation water is at its highest. These releases can substantially alter hydrological conditions within the project area. Winter releases from the Chicago Park Powerhouse are also common and up to 1,100 cubic feet per second can be released, generally when reservoirs spill.

Barren Areas

Barren areas have undergone previous gravel mining activities and are composed mostly of mine tailings (deposits of either processed or stockpiled gravel that are the result of past mining activities). Vegetation in barren areas tends to be very sparse, and includes a few scattered shrubs and sparse grasses. Approximately 18 acres of barren areas occur on the project site. The two largest barren areas occur in the eastern portion of the study area at the confluence of

Steephollow Creek and the Bear River, and in the western portion of the study area along the northern side of the Bear River.

Developed/Disturbed

Developed/disturbed habitats are generally associated with areas adjacent to roadways and buildings and other structures. These areas are highly disturbed and support sparse and ruderal vegetation (vegetation types that quickly colonize disturbed areas), including annual grasses and weedy annual forbs such as yellow star-thistle (*Centaurea solstitialis*), mustard (*Brassica* sp.), and spiny sowthistle (*Sonchus asper*). Approximately 5 acres of these habitats occur in association with existing internal circulation roads near Chicago Park Powerhouse Road and at the Chicago Park Powerhouse in the eastern portion of the study area.

Wetlands

No formal wetland delineation has been conducted on the project site. However, biologists walked the site and drew the approximate limits of waters of the United States (Salix 2013). This informal mapping indicated that waters of the United States in the 155-acre primary disturbance area are confined to the areas located below the ordinary high water mark of the Bear River and Steephollow Creek, approximately 60 acres. The remainder of the study area was examined by Dudek biologists (Appendix D) in October 2014; waters were confined to the area between the ordinary high water marks of the Bear River channel. The channels of both the Bear River and Steephollow Creek support scattered patches of riparian scrub, including willow and alder thickets. The substrate is almost entirely gravelly and rocky in the upper part of the study area, with sand increasing in the middle portion of the study area and silty sediments becoming prevalent in the lowest reach of the study area. The channel bottoms are quite flat laterally and the active flow channels migrate frequently. All areas below the ordinary high water mark of the Bear River and Steephollow Creek, approximately 60 acres within the study area, would be considered federally protected wetlands (Waters of the U.S.) under the Clean Water Act pending a formal delineation to U.S. Army Corps of Engineers (ACOE) standards. Activities that affect Waters of the U.S. would require a permit from the ACOE pursuant to Section 404 of the federal Clean Water Act. Impacts to the bed, bank, or channel of streams or ponds would require a Lake and Streambed Alteration Agreement (Section 1602) with the California Department of Fish and Wildlife (CDFW).

Wildlife

The study area provides important habitat for a variety of wildlife species known from the region, both on a year-round and seasonal basis. Important habitat features located within or near the study area include potential nesting sites, escape and thermal cover, a variety of food sources, and a perennial source of water. Forest communities, such as those located within and adjacent to the study area are important for animal cover and provide excellent roosting and nesting opportunities for birds and shelter for mammals. Snags located throughout the site provide nesting cavities for birds such as owls, woodpeckers, tree swallows, nuthatches, and bluebirds. Patches of riparian scrub located along the Bear River and Steephollow Creek likely provide habitat for nesting songbirds, including various migratory species. Taller trees in the study area provide good nesting habitat for raptors such as great horned owl (*Bubo virginianus*), red-tailed hawk (*Buteo jamaicensis*), red-shouldered hawk (*B. lineatus*), and Cooper's hawk (*Accipiter cooperii*).

The following birds were observed or detected in scattered portions of the study area during field surveys conducted in November 2012 (Salix 2013) and October 2014 (Dudek 2014): dark-eyed junco (*Junco hyemalis*), American dipper (*Cinclus mexicanus*), American kestrel (*Falco sparverius*), killdeer (*Charadrius vociferus*), belted kingfisher (*Megaceryle alcyon*), northern flicker (*Colaptes auratus*), western scrub-jay (*Aphelocoma californica*), common raven (*Corvus corax*), black phoebe (*Sayornis nigricans*), red-tailed hawk, and white-breasted nuthatch (*Sitta carolinensis*). Tracks, scat, or other sign of mule deer (*Odocoileus hemionus*), coyote (*Canis latrans*), and raccoon (*Procyon lotor*) were found in various locations throughout the study area, particularly along exposed banks of the Bear River and Steephollow Creek. Amphibians and reptiles observed during the field survey included Sierran treefrog (*Pseudacris sierra*), western fence lizard (*Sceloporus occidentalis*), and common gartersnake (*Thamnophis sirtalis*).

During the November 2012 and October 2014 site visits, numerous juvenile foothill yellow-legged frogs (*Rana boylii*), a California State Species of Concern (CSC), were also found along the banks of Steephollow Creek and the Bear River. The life history and status of this species is discussed in further detail in the following section.

Although anadromous fishes (fish that are spawned in freshwater, migrate to the sea, and return to spawn when they reach adulthood) are prevented from accessing the project area by the dam at Rollins Reservoir, a variety of fish species are known or expected to occur in association with the Bear River and Steephollow Creek. Native species that could occur in aquatic habitats of the study area include Sacramento sucker (*Catostomus occidentalis*), hardhead (*Mylopharodon conocephalus*), Sacramento pikeminnow (*Ptychocheilus grandis*), hitch (*Lavinia exilicauda*), and prickly sculpin (*Cottus asper*). Rollins Lake and the inlet drainages such as the Bear River also support some wild trout (steelhead rainbow trout (*Oncorhynchus mykiss*)). Many larger non-native fish species commonly occur in Rollins Reservoir and then move upstream to spawn in feeder drainages such as the Bear River. Non-native species known to occur in Rollins Reservoir and expected to occur at least seasonally in the upper Bear River and Steephollow Creek include brown trout (*Salmo trutta*), largemouth bass (*Micropterus salmoides*), smallmouth bass (*M. dolomieu*), and various species of sunfish.

Hatchery-raised steelhead rainbow trout are also routinely stocked in Rollins Reservoir by CDFW and therefore are likely to also occur in the study area.

Special-Status Species

To determine which special-status species could occur within or near the study area, the California Natural Diversity Database (CNDDB) (CDFW 2014a) and the California Native Plant Society Inventory (CNPS 2014) were queried for reported occurrences of special-status fish, wildlife, and plant species in the region surrounding the study area. The nine-quadrangle search area included the Chicago Park, Nevada City, North Bloomfield, Washington, Grass Valley, Dutch Flat, Combie Reservoir, Colfax, and Foresthill quadrangles. The following special-status species lists for the project vicinity were also reviewed:

- U.S. Fish and Wildlife Service (USFWS) list of federal endangered and threatened species for the Chicago Park USGS quadrangle
- USFWS list of federal endangered and threatened species for Placer and Nevada Counties
- California Department of Fish and Game (CDFG)[1] list of special animals (CDFG 2011)
- CNDDB 9-quad query (CDFW 2014a)
- Birds of conservation concern (USFWS 2008) for Region 32
- California bird species of special concern (Shuford and Gardali 2008)
- Range maps in California Wildlife Habitat Relationships (CDFW 2014b)
- Range maps in *California Herps: A Guide to the Amphibians and Reptiles of California* (Nafis 2014)
- Range maps in *Mammals of the Pacific States* (Ingles 1965)

For the purposes of this EIR, special-status species are those that fall into one or more of the following categories:

- Listed as endangered or threatened (FE or FT) under the federal Endangered Species Act (ESA) (or candidate species, or formally proposed for listing)
- Protected under the Bald and Golden Eagle Protection Act (BAGEPA)
- Listed as endangered or threatened (SE or ST) under the California Endangered Species Act (CESA) (or proposed for listing)

[1] As of January 2013, the California Department of Fish and Game (CDFG) has officially changed its name to the California Department of Fish and Wildlife. In this document, references to guidance or documents from the agency before 2013 use CDFG, whereas references after the official name change use CDFW.

- Designated as rare, protected, or fully protected pursuant to the California Fish and Game Code
- Designated a Species of Special Concern (CSC) by the CDFW
- Designated as California Rare Plant Rank (CRPR) 1B, 2, or 3 by the California Native Plant Society
- Listed as a Sensitive Species (BLM-S) by the Bureau of Land Management (BLM) (2010)

The habitat requirements of the species identified by this process were compared to the habitat types available in the study area, which eliminated 9 of the 11 plant species and 13 of 18 animal species (Table 3.3-1, Special-Status Wildlife Species with Known or Potential Occurrence in the Vicinity of the Proposed Project). The 5 special-status wildlife species that occur or could occur in the study area, as well as 2 special-status plant species with potential to occur, are described in detail after Table 3.3-1.

Table 3.3-1
Special-Status Wildlife Species with Known or Potential Occurrence in the Vicinity of the Proposed Project

Common Name	Scientific Name	Federal/State Status	California Distribution/Range	Habitat Associations	Potential to Occur in the Project Area
Invertebrates					
Gold rush hanging scorpionfly	*Orobittacus obscurus*	None / State S1	Known only from the two localities above, on the western slopes of the central Sierra Nevada. This species has not been observed in similar habitats to the north and south of El Dorado and Placer Counties.	This species inhabits darkly shaded crannies with high humidity, i.e. under tree roots, in overhanging banks, below rock outcrops, and along streams; and are frequently found hanging at rest on spider webs. During the day *Orobittacus obscurus* is frequently found in darkly shaded sheltered areas with high humidity, such as beneath tree roots in overhanging riverbanks, beneath fallen logs and rock outcrops, and along streams underneath large boulders. At the type locality, the forest is dominated by ponderosa pine, incense cedar, and Douglas-fir. Other tree species include bigleaf maple (*Acer macrophyllum*), dogwood, hazelnut (*Corylus cornuta*), occasional oaks, and white alder and willow (*Salix* sp.) along the stream banks. At the Shirttail Creek site, Jeffrey pine (*Pinus jeffreyi*), California black oak, and canyon live oak are also common on the steeper, slightly drier slopes.	Low to moderate potential to occur, since the type localities are in Placer and El Dorado Counties and suitable habitat is present within the project area. **CNDDB query**: No occurrences within 5 miles of the project area. **Project area habitat**: Suitable habitat appears to be present within the project area. **Project-specific survey results:** Surveys were not conducted for this species.
Spiny rhyacophilan caddisfly	*Rhyacophila spinata*	None / State S1S2	Known from New York Ravine (Yuba River tributary), Sierra County, California, and recollected nearby. Also Lady's Canyon, Placer County and Granite Gulch near Tobin, Plumas County. This species has also been found in the North Fork Feather, Upper Yuba, North Fork American (Shirttail Creek), and South Fork American River watersheds.	Rhyacophilids prefer cool running water. Larvae are predaceous and do not build cases, except for crude pupal shelters. Little is known of this insect's life history, although the usual habitat for this genus is clear, cool creeks.	Low potential to occur. **CNDDB query**: No occurrences within 5 miles of the project area. **Project area habitat**: Suitable habitat may be present within Steephollow Creek. **Project-specific survey results:** Surveys were not conducted for this species.
Shirttail Creek stonefly	*Megaleuctra sierra*	None / State S1	USFWS files in 1987 indicated species known only from Shirttail Creek, Placer County, California.	Habitat probably is really spring/brook but possibly creeks. Presumably, habitat is similar to that of all other *Megaleuctra*, which inhabit springs.	No to low potential to occur. **CNDDB query**: No occurrences within project area; only known from Shirttail Creek. **Project area habitat**: Suitable habitat may be present within Steephollow Creek. **Project-specific survey results:** Surveys were not conducted for this species.
Western pearlshell	*Margaritifera falcata*	None / State S2S3	The range of this species extends from Alaska and British Columbia south to California and east to Nevada, Wyoming, Utah, and Montana.	This species inhabits cold creeks and rivers with clean water and sea-run salmon or native trout. Prefers lower velocity waters. Documented host fishes for *M. falcata* include: cutthroat trout (*Oncorhynchus clarki*), steelhead rainbow trout, Chinook salmon (*O. tshawytscha*), and brown trout, and a number of other fish are considered potential hosts.	No to low potential to occur. **CNDDB query**: No occurrences within 5 miles of the project area. **Project area habitat**: Suitable habitat is likely present in the Bear River and Steephollow Creek within the project area. **Project-specific survey results:** Surveys were not conducted for this species.

Table 3.3-1
Special-Status Wildlife Species with Known or Potential Occurrence in the Vicinity of the Proposed Project

Common Name	Scientific Name	Federal/State Status	California Distribution/Range	Habitat Associations	Potential to Occur in the Project Area
Amphibians					
Foothill yellow-legged frog	*Rana boylii*	BLM-S / CSC	This species occurs in the Coast Ranges from the Oregon border south to the Transverse Mountains in Los Angeles County, in most of Northern California west of the Cascade Crest, and along the western flank of the Sierra Nevada south to Kern County. Isolated populations are also known from the mountains of Los Angeles County. This species generally occurs in rivers and streams up to approximately 5,000 feet above mean sea level (msl).	The foothill yellow-legged frog is found in or near perennial or seasonal streams with boulder and cobble substrates in a variety of habitats including valley–foothill hardwood, valley–foothill hardwood/conifer, valley–foothill riparian, ponderosa pine, mixed conifer, coastal scrub, mixed chaparral, and wet meadow types. Breeding generally occurs from late March to June near the end of the spring runoff period. This aquatic species is rarely found far from water.	This species is present within the project area, in both the Bear River and Steephollow Creek. **CNDDB query**: Numerous occurrence records are present within 5 miles of the project area, including within the Bear River and Steephollow Creek in the project area. **Project area habitat**: High-quality habitat is present within Steephollow Creek and the Bear River in and adjacent to the project area. **Project-specific survey results:** Surveys conducted for this species in October 2014 (Appendix D) found high abundances in and near Steephollow Creek, with scattered occurrences of mostly subadults in the central portion of the study area.
California red-legged frog	*Rana draytonii*	FT / CSC	The historical range of this species extended through Pacific slope drainages from Shasta County, California, to Baja, Mexico, and included the Coast Ranges and the west slope of the Sierra Nevada at elevations below 5,000 feet msl (1,548 meters msl). The current range is greatly reduced, with most remaining populations occurring along the coast from Marin County to Ventura County and in several isolated locations in the foothill region of the west slopes of the Sierra Nevada.	California red-legged frogs occur in different habitats depending on their life stage, the season, and weather conditions. Breeding habitat includes coastal lagoons, marshes, springs, permanent and semi-permanent natural ponds, and ponded and backwater portions of streams. These frogs also breed in artificial impoundments, including stock ponds, irrigation ponds, and siltation ponds. Creeks and ponds with dense growths of woody riparian vegetation, especially willows (*Salix* spp.), are preferred (Hayes and Jennings 1988), although the absence of vegetation at an aquatic site does not rule out the possibility of occupancy. Adult frogs prefer dense, shrubby or emergent riparian vegetation near deep (≥2 to 3 feet (0.6 to 0.9 meter)), still or slow-moving water, especially where dense stands of overhanging willow and an intermixed fringe of cattail (*Typha* sp.) occur adjacent to open water.	Extremely low potential to occur. No known occurrences within 5-mile radius of site. Suitable aquatic habitat is not present within the project area. **CNDDB query**: There are no occurrence records within 5 miles of the project area. **Project area habitat**: Suitable habitat is not present within the project area. **Project-specific survey results:** Surveys were not conducted for this species.
Reptiles					
Blainville's horned lizard	*Phrynosoma blainvillii*	BLM-S / CSC	Sacramento Valley, including Sierra foothills, south to Southern California; Coast Ranges south from Sonoma County; below 4,000 feet msl in Northern California.	Grasslands, brush lands, woodlands, and open coniferous forest with sandy or loose soil (prefers gabbro soils), including sandy washes with low shrubs. Requires open areas for sunning, bushes for cover, patches of loose soil for burial, and abundant supply of ants and other insects.	Low potential to occur; no suitable habitat is present within study area. **CNDDB query**: Known occurrences within 5-mile radius of site, directly to east and southwest. **Project area habitat**: No suitable habitat in or near the project area. **Project-specific survey results:** Surveys were not conducted for this species.

Table 3.3-1
Special-Status Wildlife Species with Known or Potential Occurrence in the Vicinity of the Proposed Project

Common Name	Scientific Name	Federal/State Status	California Distribution/Range	Habitat Associations	Potential to Occur in the Project Area
Western pond turtle	*Actinemys marmorata*	None / CSC	Occurs widely in the Sierra Nevada foothills.	Occurs in woodlands, grasslands, and open forests in a variety of wetland habitats, including ponds, rivers, lakes, marshes, reservoirs, stock ponds, and irrigation ditches that contain aquatic vegetation (Zeiner et al. 1990; Stebbins 2003). Spends its time in water or at basking sites along the banks of streams or ponds. A thoroughly aquatic turtle of ponds, marshes, rivers, streams, and irrigation ditches, usually with aquatic vegetation, below 6000 feet msl. Needs basking sites and suitable upland habitat (sandy banks or grassy open fields) up to 0.5 kilometer (0.3 mile) from water for egg-laying.	Moderate potential to occur; suitable habitat is present and they have been recorded in the vicinity. **CNDDB query:** Known occurrences within 5-mile radius of site. **Project area habitat**: Suitable riparian habitat is present within the project area, but basking sites are limited. Nesting and estivation (summer dormancy) habitat is present in upland areas adjacent to the river. **Project-specific survey results**: Surveys were not conducted for this species. However, during surveys conducted for relicensing of the Chicago Park Powerhouse (NID and PG&E 2010), western pond turtles were observed upriver of the project area in the Bear River. None were observed during a field survey conducted in October 2014.
			Birds		
Bald eagle	*Haliaeetus leucocephalus*	Delisted, BLM-S, BAGEPA / SE, FP	Nests in Nevada and Placer Counties and in Lake Tahoe Basin; reintroduced into central coast; winter range includes rest of California except southeastern deserts, very high elevations in the Sierra Nevada, and east of Sierra Nevada south of Mono County; statewide breeding range is expanding.	Lives near large bodies of open water such as lakes, marshes, estuaries, sea coasts, and rivers, where fish are abundant. Usually nests within 1 mile of water in tall trees with open branchwork bordering lakes or large rivers (Zeiner et al. 1990; Fix and Bezener 2000). In Central California, bald eagles prefer foothill pines for nesting. The population is expanding in California, and population size is expected to increase over the 30-year permit term (Beeler, pers. comm. 2013).	High potential to occur, as bald eagles have been sighted at Rollins Reservoir and suitable foraging, roosting, and breeding habitat is present in the project area. **CNDDB query:** No occurrence records within 5 miles of the project area. **Project area nesting habitat**: Suitable nesting habitat exists in tall conifers on both sides of the Bear River in the project area, as well as around Rollins Reservoir. **Project area foraging habitat**: Rollins Reservoir and the entire Bear River are suitable foraging habitats. **Project-specific survey results:** Surveys were not conducted for this species.
Northern goshawk	*Accipiter gentilis*	BLM-S / CSC	Permanent resident in Sierra Nevada south to Kern County, as well as the Klamath and Cascade Ranges, north Coast Ranges from Del Norte to Mendocino Counties; winters in Modoc, Lassen, Mono, and northern Inyo Counties; rare in Southern California.	Nests and roosts in older stands of mixed-conifer, red fir, Jeffrey pine, lodgepole pine, and aspen forests; hunts in forests and in forest clearings and meadows. Nests are usually in large trees, often on north-facing slopes, and situated near a source of water (Beedy and Pandolfino 2013).	Moderate potential to forage in the project area; nesting habitat is limited by the steep slopes and lack of meadows or forest clearings. **CNDDB query**: No breeding occurrences near the project area; winter observations near the Bear River about 5 miles from the project area (Beedy, pers. obs. n.d.). **Project area nesting habitat**: No suitable breeding habitat. **Project area foraging habitat**: Suitable foraging habitat on the edges of the oak/conifer forest on both sides of the Bear River. **Project-specific survey results:** Surveys were not conducted for this species.

Table 3.3-1
Special-Status Wildlife Species with Known or Potential Occurrence in the Vicinity of the Proposed Project

Common Name	Scientific Name	Federal/State Status	California Distribution/Range	Habitat Associations	Potential to Occur in the Project Area
Black swift	*Cypseloides niger*	None / CSC	Breeds locally in Sierra Nevada and Cascade Ranges; San Gabriel, San Bernardino, and San Jacinto Mountains; and coastal bluffs from San Mateo County to near San Luis Obispo County.	Breeds in small colonies on cliffs behind or adjacent to waterfalls in deep canyons and sea-bluffs above the surf; forages widely in interior steep mountain canyons, especially cliffs adjacent to waterfalls (Zeiner et al. 1990; Fix and Bezener 2000). Also forages above forests and woodlands, canyons, valleys, and savannas in the vicinity of nesting locations.	Moderate potential to occur, as foraging birds travel large distances, but no suitable waterfall nesting habitat near the project area on the Bear River. **CNDDB query**: No documented records from the project area. **Project area nesting habitat**: No suitable nesting habitat. **Project area foraging habitat**: Suitable foraging habitat, but no known nesting colonies near the project area. **Project-specific survey results:** Surveys were not conducted for this species.
California yellow warbler	*Setophaga petechia brewsteri*	None / CSC	Uncommon nester over most of California except Central Valley, Mojave Desert, and high elevations of Sierra Nevada; winters along lower Colorado River and in parts of Imperial and Riverside Counties; two small resident populations in San Diego and Santa Barbara Counties (Shuford and Gardali 2008).	Summer breeding habitat includes lowland riparian woodlands, isolated willow stands, dry montane chaparral with scattered trees, and montane coniferous forests with a brushy understory (Beedy and Pandolfino 2013); usually nest in the upright fork of a deciduous tree or a small shrub branch or sapling. Feeds on insects and spiders (Zeiner et al. 1990; Fix and Bezener 2000).	Low potential to occur. **CNDDB query**: No occurrences listed. **Project area nesting habitat**: No suitable nesting habitat. **Project area foraging habitat**: Moderate-quality foraging habitat for migrants only. **Project-specific survey results**: Surveys were not conducted for this species.
Yellow-breasted chat	*Icteria virens*	None / CSC	Nests in isolated locations on low-elevation streams throughout the Sierra Nevada foothills (Beedy and Pandolfino 2013).	Occurs in dense riparian thickets of willow and other brushy tangles bordering watercourses, small ponds and swampy ground dominated by tangled vines, and lush low shrubbery interspersed by taller trees; sometimes breeds in extensive hillside bramble patches. Bezener and Bishop (2005) found that this species requires a minimum width of 20 meters (66 feet) of riparian habitat for breeding. Normally places nest in low dense shrubs or small trees near streams or rivers (Zeiner et al. 1990; Shuford and Gardali 2008). Feeds mainly on small insects and spiders.	Low potential to occur. **CNDDB query:** No occurrence records within 5 miles of the project area. **Project area nesting habitat**: No suitable nesting habitat in the project area. **Project area foraging habitat**: Marginally suitable foraging habitat in the project area. **Project-specific survey results**: Surveys were not conducted for this species.
Mammals					
American badger	*Taxidea taxus*	None / CSC	Most of California except extreme north coastal regions of Humboldt, Del Norte, and Siskiyou Counties.	Species habitat includes many plant community types in California, but badgers are most common in annual grassland, savanna desert scrub, and mountain meadows near timberline. Requires sufficient food, friable soils, and relatively open, uncultivated ground (Williams 1986).	Moderate potential to occur. **CNDDB query**: No occurrences within 5 miles of the project area. **Project area habitat**: Some suitable habitat. **Project-specific survey results**: Surveys were not conducted for this species.

Table 3.3-1
Special-Status Wildlife Species with Known or Potential Occurrence in the Vicinity of the Proposed Project

Common Name	Scientific Name	Federal/State Status	California Distribution/Range	Habitat Associations	Potential to Occur in the Project Area
Fisher – West Coast DPS	*Martes pennanti*	BLM-S / SCT, CSC	Coastal mountains from Del Norte to Sonoma Counties, through Cascades to Lassen County; south in Sierra Nevada to Kern County.	North coast coniferous forest with intermediate to large-tree stages of coniferous forests and deciduous-riparian areas with high percent canopy closure. Uses cavities, snags, logs, and rocky areas for cover and denning. Needs large areas of mature, dense forest.	Low potential to occur. **CNDDB query**: No occurrences within 5 miles of the project area; observed at Fisher Creek and Blackwood Creek area of Tahoe National Forest and in American River Canyon near Iowa Hill (CDFW 2013); possibly observed in headwaters basin of North Fork American River in 2000. **Project area habitat**: Some suitable foraging habitat. **Project-specific survey results:** Surveys were not conducted for this species.
Sierra Nevada red fox	*Vulpes vulpes necator*	None / ST	Cascade Range east to Sierra Nevada, south to Tulare County.	Historically found from the Cascades down to the Sierra Nevada. Found in a variety of habitats from wet meadows to forested areas. Use dense vegetation and rocky areas for cover and den sites. Prefer forests interspersed w/ meadows or alpine fell-fields.	Low potential to occur. **CNDDB query**: Within species' known distribution (Verner and Boss 1980; Zeiner et al. 1990); no Tahoe National Forest, Museum of Vertebrate Zoology, or CNDDB records in the vicinity of the project area. **Project area habitat**: Low-suitability habitat; all records at higher elevations. **Project-specific survey results:** Surveys were not conducted for this species.
Pallid bat	*Antrozous pallidus*	BLM-S / CSC	Potential to occur statewide at elevations below about 1,000 feet msl (Zeiner et al. 1990).	Day roosts are in caves, crevices, mines, and occasionally in hollow trees and buildings, preferably with access to open areas for foraging. Pallid bats forage for a variety of insects, including flightless arthropods picked up from the ground (e.g., scorpions and ground crickets), insects gleaned from vegetation (e.g., cicadas), insects taken in flight, and small vertebrates such as horned lizards and pocket mice that are taken on the ground. Although the species is capable of flying more than 18 miles, most foraging occurs within about 2 miles of the diurnal (daytime) roost. Roosting sites are usually established in crevices or man-made structures, in colonies (Hermanson and O'Shea 1983). The selection of crevices may vary seasonally in relation to adaptive hypothermia in the species.	Low potential to occur, since the project area is well above the upper elevational limit of this species. **CNDDB query**: No occurrences within 5 miles of the project area. **Project area habitat**: Limited potential for foraging habitat; above the known range of the species. **Project-specific survey results:** Surveys were not conducted for this species. Calls that could have been from pallid bat were recorded during acoustics monitoring in 2010 (NID and PG&E 2010), but those could also have been from two non-special-status bat species.
Western red bat	*Lasiurus blossevillii*	None / CSC	Shasta County to the Mexican border, west of the Sierra Nevada / Cascade Crest and deserts. The winter range includes western lowlands and coastal regions south of San Francisco Bay.	Forages along open streams and rivers; roosts in tree canopy in forest, woodland, riparian, mesquite bosque, and orchards, including fig, apricot, peach, pear, almond, walnut, and orange.	Known to occur. **CNDDB query**: No occurrences within 5 miles of the project area. **Project area habitat**: Foraging habitat present within the project area; potential for roosting habitat in adjacent forest. **Project-specific survey results:** Surveys were not conducted for this species, but it was detected near the Chicago Park Powerhouse during acoustic monitoring conducted in 2010 (NID & PG&E 2010).

Status Definitions

S1 = NatureServe Element Ranking of Critically Imperiled in the State
S1S2 = NatureServe Element Ranking of Between Critically Imperiled and Imperiled in the State
S2S3 = NatureServe Element Ranking of Between Imperiled and Vulnerable in the State
BLM-S = Considered a Sensitive Species by the BLM
CSC = Considered a Species of Special Concern by the CDFW
FT = Federally Threatened
BAGEPA = Protected under the federal Bald Eagle and Golden Eagle Protection Act
SE = State Endangered
FP = Fully Protected under the California Fish and Game Code
SCT = State Candidate Threatened
ST = State Threatened

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Foothill Yellow-Legged Frog (BLM-S, CSC)

Foothill yellow-legged frog (*Rana boylei*) is found in partially shaded, shallow rocky streams in a variety of habitats throughout the foothills of the Sierra Nevada, up to 6,700 feet above mean sea level (msl) (Kupferberg 1996; Van Wagner 1996; Yarnell 2005). This species is rarely found far from permanent water. The habitat requirements for foothill yellow-legged frog are closely linked to seasonal variation in stream habitats and can be divided into three main categories: breeding and rearing habitat, non-breeding habitat, and overwintering habitat.

Breeding commences between mid-March and May at locations that provide suitable velocities and depths over a relatively broad range of discharge volumes, including small tributaries and large rivers (Kupferberg 1996; Lind and Yarnell 2008). However, in wet years, initiation of breeding can be delayed until June or July, depending on outflow volume and associated water temperature (Seltenrich, pers. comm. 2014). Eggs are deposited in clusters and attached to the lee (i.e., flow protected) side of cobbles, boulders, or bedrock near river margins in shallow and relatively slow habitat (see Lind and Yarnell 2008 for range of depths and velocities; Kupferberg 1996). Eggs hatch in about 5 days. Tadpoles reach a size of about 2 inches and transform in approximately 3 to 4 months. Larvae are found in the same habitat as egg masses, and require protection from scouring flows, particularly immediately after hatching and as larvae near metamorphosis (Kupferberg et al. 2009a). For aquatic habitats to be considered suitable, surface water must be present in scattered locations for at least 15 weeks to allow for metamorphosis.

After metamorphosis, foothill yellow-legged frogs remain in terrestrial riparian and riverine habitat adjacent to the wetted channel during the non-breeding season (Bourque 2008; Kupferberg 1996; Lind et al. 1996; Moyle 1973; Van Wagner 1996; Zweifel 1955). Adults often bask on exposed rocks near streams and dive into the water to take refuge beneath rocks when disturbed. The typical diet of foothill yellow-legged frog consists of both aquatic and terrestrial invertebrates.

Overwintering habitat is not well known for the foothill yellow-legged frog. Van Wagner (1996) observed foothill yellow-legged frogs both in the water and along the stream-edge habitat beneath rocks, leaf litter, and sedge, and found frogs appeared to be active whenever ambient conditions were favorable. Habitat use in large rivers may vary compared to Van Wagner’s observations, and foothill yellow-legged frogs may move into smaller lateral tributaries to avoid risk of scouring (Kupferberg 1996), or move into adjacent terrestrial habitat to avoid winter flood events altogether.

Threats to foothill yellow-legged frogs and their habitat include land use change, shifts in precipitation and climate (Lind 2005; Kupferberg et al. 2009b), parasites and disease (Kupferberg et al. 2009a), toxins/pesticides (Davidson et al. 2002, 2007; Hothem et al. 2009;

Sparling and Fellers 2008), invasive species (Moyle 1973; Kupferberg 1997), and habitat alteration (including fire/fuel management, habitat fragmentation, and mining). Research demonstrates that foothill yellow-legged frog is adversely affected by aseasonal pulse flows, which create stressful or fatal velocity conditions for early life stages (e.g., Kupferberg et al. 2009a, 2009b). Changes in flow regime may also have long-term impacts, including vegetation encroachment, altered channel morphology, and reduced breeding habitat (Kupferberg et al. 2009b). However, within regulated rivers, there are opportunities to improve flow management to meet the ecological requirements of this species. Within the project area, the output from the Chicago Park Powerhouse has the potential to create aseasonal pulse flows if releases are timed to coincide with breeding season.

Surveys for foothill yellow-legged frogs were conducted within the study area during Federal Energy Regulatory Commission relicensing for NID and PG&E hydroelectric facilities (NID and PG&E 2010). Those surveys found large numbers of tadpoles and post-metamorphic foothill yellow-legged frogs, especially within Steephollow Creek (Figure 3.3-1). The area immediately downriver of the Chicago Park Powerhouse was also found to contain tadpoles and post-metamorphic foothill yellow-legged frogs. Most of the study area had lower densities of post-metamorphic foothill yellow-legged frogs, which had likely moved down from the dense Steephollow Creek population. During the November 2012 field survey (Salix 2013), numerous foothill yellow-legged juveniles (recently metamorphosed tadpoles) were observed in various locations throughout the study area in association with Steephollow Creek and the Bear River. Most frogs were found along Steephollow Creek and along backwater areas and side channels of the Bear River. Some individual frogs were observed on gravel bars several feet from water, but most frogs occurred within a foot of the water's edge. Similar results were found during a field survey conducted by Dudek in October 2014 (see Appendix D), but an expanded survey coverage downriver indicated presence of mostly subadult frogs in scattered locations down to roughly the lower lake level. The CNDDB documents numerous occurrences of foothill yellow-legged frog within the broader project region, with some occurrences in the study area (CDFW 2014a).

Based on extensive surveys conducted throughout the Sierra Nevada foothills as part of the relicensing studies for all PG&E Federal Energy Regulatory Commission hydroelectric projects as well as for other hydroelectric companies, the foothill yellow-legged frog population within the project region is considered to be one of the most robust populations anywhere in the Sierra Nevada foothills (Seltenrich, pers. comm. 2014).

Western Pond Turtle (CSC)

Western pond turtle (*Actinemys marmorata*) occurs in association with streams, rivers, and ponds containing suitable cover and basking sites. This species can be associated with both permanent and ephemeral water sources, including perennial and intermittent streams. Suitable basking sites along streams or ponds include partially submerged logs, rocks, mats of floating vegetation, or open stream banks. Western pond turtles may overwinter and nest in uplands adjacent to the river channel. Nests are typically located on unshaded upland slopes in dry substrates with clay or silt soils (Jennings and Hayes 1994). Eggs are laid from March to August, depending on local climate and water conditions, and incubation occurs for 73 to 80 days (Zeiner et al. 1988). Adult western pond turtles may access uplands at all times of the year, and over-winter under leaf litter in uplands up to 500 meters (1,640 feet) from the active stream.

Western pond turtles were observed in the Bear River during surveys conducted in the Bear River during Federal Energy Regulatory Commission relicensing for the Chicago Park Powerhouse (NID and PG&E 2009). Neither of the two occurrences was within the study area. The CNDDB (CDFW 2014a) also documents two occurrences of western pond turtle within the nine-quadrangle area enclosing the study area, but those were far removed from the study area. Individual pond turtles that likely occur in association with Rollins Reservoir may move up and down the inlets depending on water conditions. Portions of Steephollow Creek and upriver sections of the Bear River likely support individuals of this species on a periodic basis; however, basking sites within the project area are limited to overhanging shrubs and the only suitable nesting substrate is subject to seasonal flooding, which prevents its use for nesting (NID and PG&E 2009).

Bald Eagle (BAGEPA, BLM-S, ST, FP)

Bald eagles typically nest in large trees in forested areas, often in conifers, but also in hardwoods such as sycamores and oaks, or on cliff faces (Anthony et al. 1982; USFWS 1986; CDFG 2012a). They usually nest within 2 kilometers (approximately 1.24 miles) of water, often much closer, and are generally isolated from human activity and disturbance; they also often nest in one of the largest trees in a stand and in a prominent location providing vistas over the surrounding area (Buehler 2000; USFWS 1986). In winter, bald eagles typically inhabit areas below 500 meters (1,625 feet) msl, but may be found up to 2,500 meters (8,125 feet) msl in some western states (Buehler 2000). The study area contains suitable foraging and nesting habitat for this species. Bald eagles are known to forage and nest around Rollins Reservoir and have been observed flying along the Bear River in the general project region (NID and PG&E 2010).

The quality of foraging habitat associated with large bodies of water depends on such factors as abundance of the fish that bald eagles prey upon; the presence of shallow water, which may increase the availability of prey; and the level of human disturbance (Buehler 2000; Stalmaster and Kaiser 1998; Watson et al. 1991; Garrett et al. 1993). The presence of suitable perch sites is also an important factor. In addition to being near water with ample prey, perch sites tend to be those that provide good views of the surrounding area and are often the highest site available (USFWS 1986). In arid climates, reservoirs provide important foraging habitat during both the breeding season and winter (CDFG 2012a; Lehman 1994; Roberson 2002; Unitt 2004). The size of defended territories varies with nesting density and food supply, having been recorded from 0.5 to 4.0 square kilometers (0.2 to 1.5 square miles) (Buehler 2000). Given the small size of the study area, no more than one individual or pair would be expected to forage or nest within the study area at any time.

The bald eagle feeds primarily on fish in most parts of its range, although food preferences vary according to region and season, and may reflect locally available resources. Bald eagles in the Pacific states rely heavily on runs of anadromous fish such as salmon. At reservoirs in California, warmwater and nongame fish species are the most important dietary items for breeding bald eagles (USFWS 1986). Prey items collected at California nests also include a variety of water-dependent birds, as well as ring-necked pheasant (*Phasianus colchicus*), American crow (*Corvus brachyrhynchos*), common muskrat (*Ondatra zibethicus*), jackrabbits (*Lepus* spp.), and ground squirrels (*Spermophilus* spp.) (USFWS 1986).

Migratory patterns of bald eagles are complex and reflect a variety of circumstances, including age of the individual, location of the breeding site, severity of climate, and food availability (Buehler 2000). In inland areas of Northern and Central California, wintering bald eagles from northern latitudes generally arrive in October or November and remain until March or April (Lehman 1994; Roberson 2002; Unitt 2004; Linthicum et al. 2007).

Nesting eagles generally build their nests between January and March and lay eggs in February through April. Clutches range from one to three eggs (Buehler 2000). Incubation lasts approximately 35 days, and young depart the nest anywhere from 8 to 14 weeks of age (Buehler 2000). Young associate with their parents for as long as 11 weeks after fledging, although pairs radio-tagged in Northern California left between 2 and 5 weeks after fledging, or 14 to 17 weeks after hatching (Buehler 2000; Hunt et al. 1992). Departure dates in Northern California ranged from July 19 to August 22 (Hunt et al. 1992).

Since federal listing in 1967 and the ban of the pesticide dichlorodiphenyltrichloroethane (DDT) in 1972, populations have greatly increased. The estimated number of pairs in the contiguous 48 states rose from 417 in 1963 to more than 5,000 by 1997 (Buehler 2000; 64 FR 36456–36464). Gains in California were more modest, increasing from 40 occupied territories in 1977 to 65 in 1984, and then dropping to 59 in 1985 (USFWS 1986). Yearly estimates increased during the 1990s, from a low of 90 occupied territories in 1991 to a high of 151 in 1999, but fluctuated for much of the following decade, before falling again to 105 in 2009 and 2010 (CDFG 2012b). Midwinter surveys conducted in California in 2011 and 2012 observed 179 and 274 adult bald eagles, respectively (Steenhof et al. 2014).

Degradation of breeding and wintering habitat is now considered the most important threat to the bald eagle, particularly through loss of nesting, roosting, and perching habitat near shorelines and of aquatic foraging habitat (Buehler 2000). A variety of studies also demonstrate how human activities can disrupt bald eagle foraging, roosting, nesting, and perching (USFWS 2007). Recreational activities that can negatively affect eagles include hiking, boating, tubing, and off-road vehicle operation (Brown and Stevens 1997; Grubb and King 1991; Stalmaster and Kaiser 1998). Electrocution through contact with power lines has long been, and still remains, a threat to bald eagles (USFWS 1986; Buehler 2000). Other threats to bald eagles include ingestion of microtrash, collisions with motor vehicles, and entanglement in fishing nets (Buehler 2000).

Western Red Bat and other Potentially Occurring Special-Status Bat Species

In 2009, mist net surveys and other observations were made for bats within the study area (NID and PG&E 2010). Bats were observed in flight under the access bridge, and staining was found under the road deck and buttresses of the bridge. Also, guano was observed inside the storage shed at Chicago Park Powerhouse. Mist netting captured a bat that was identified as either a Californian myotis (*Myotis californicus*) or a western small-footed myotis (*M. ciliolabrum*), neither of which are protected species under the federal ESA or state law. Active acoustic monitoring conducted at the Chicago Park Powerhouse confirmed the presence of western red bat (*Lasiurus blossevillii*, CSC). Calls were also recorded that could be pallid bat (*Antrozous pallidus*, BLM-S, CSC) or small-footed myotis (CSC), but the call frequencies were not specific to these species and could be other non-special-status myotis bat species. Further information is provided for western red bat, as conservation measures for that species would apply to any other special-status bat species potentially occurring at the project site.

The western red bat occurs in the western United States, Mexico, Central Mexico, and possibly South America (Cryan 2003; Pierson et al. 2006). Although the species has a wide range, relatively few records for the western red bat exist outside of California (Pierson et al. 2006). In California, most of the records are from the Central Valley, which is the breeding center for the western red bat in the state. About 83% of the breeding records for western red bat in California are from the Sacramento and San Joaquin Rivers, with other breeding records from the San Diego, Santa Ana, and Los Angeles Rivers (Pierson et al. 2006). Individuals appear to stay in California year-round, because there are occurrence records for every month of the year (Pierson et al. 2006).The distributions of males and females in California differ seasonally. Males are dispersed throughout the state during the reproductive season, while females are concentrated in the Central Valley (Pierson et al. 2006). During the non-reproductive season, both males and females in California are more dispersed, with 54% of the records along the coast south of Humboldt County, 24% in the Central Valley, and 21% in Southern California (Pierson et al. 2006). Winter records are mostly from areas that rarely freeze. Most records are from elevations below 200 meters (656 feet) msl (Pierson et al. 2006). There are scattered records for the western

Sierra Nevada foothills, and records from higher elevations (a maximum of 2,484 meters (8,150 feet) msl) are most likely for males (Pierson et al. 2006).

The western red bat occurs primarily in the low and middle elevations in broadleaf tree communities (Pierson et al. 2006). In the Central Valley, it is closely associated with well-developed riparian habitats that provide suitable roosting sites (Pierson et al. 2006). For example, in a study sampling different riparian zones along the Sacramento and San Joaquin Rivers and some tributaries and other sites, most detections of western red bat were in riparian zones at least 50 meters (164 feet) wide and supporting Fremont cottonwood, western sycamore (*Platanus racemosa*), and/or valley oak (Pierson et al. 2006). Pierson et al. (2006) also observed foraging along gravel bars within rivers but only where the gravel bars were at least 50 meters (164 feet) wide and several hundred meters long. Although well-developed riparian zones are most suitable for roosting, western red bats have also been observed in orchard trees, including fig (*Ficus carica*), apricot (*Prunus armeniaca*), peach (*Prunus persica*), pear (*Pyrus communis*), almond (*Prunus amygdalus*), walnut (*Juglans regia*), and orange trees (*Citrus sinensis*) (Benson 1945, as cited in Pierson et al. 2006; Constantine 1959; Grinnell 1918, as cited in Pierson et al. 2006; Pierson et al. 2006). They have also been observed to use other non-native trees, including African hemp (*Sparmannia Africana*), eucalyptus (*Eucalyptus* spp.), Chinaberry (*Melia azedarach*), mulberry (*Morus rubra*), and tamarisk (*Tamarix* spp.) (Constantine 1959; Dalquest, as cited in Pierson et al. 2006; Grinnell 1918, as cited in Pierson et al. 2006; Orr 1950; Pierson et al. 2006).

Red bats appear to select prey by size rather than taxonomic groups (e.g., in contrast to bats that are moth specialists). They feed on a variety of prey, including Lepidoptera (moths), Homoptera (e.g., cicadas and leafhoppers), Coleoptera (beetles), Hymenoptera (wasps), Diptera (flies), and Orthoptera (e.g., crickets and grasshoppers) (Shump and Shump 1982).

The primary threat to western red bat is loss and degradation of well-developed riparian zones that support larger, mature trees. Human activities may also affect roosting and reproduction. Constantine (1959) reported that human activities in orchards caused bats to fly from the roosts, although they returned the next day. Human talking and walking around roost sites did not appear to substantially disturb bats, but any attempt to handle the bat did.

Scadden Flat Checkerbloom (SE, CRPR 1B.1)

Scadden Flat checkerbloom (*Sidalcea stipularis*) is an herbaceous perennial member of the mallow family (Malvaceae). This species occurs in marshes and swamps, including wet montane marshes often fed by springs. Under most circumstances, this species almost always occurs in wetlands in the Sierra Nevada foothills up to 2,300 feet msl. It blooms from June through August (Salix 2013). The CNDDB documents two occurrences of this species within the project region, with both occurrences being from wet montane marshes (CDFW 2014a). Occurrence of this rare plant has been documented by the CNDDB from areas just to the west of the study area. Field surveys conducted on the project site in March and November 2012 did not observe any suitable habitat for this species (Salix 2013) and none was observed during a brief field visit by Dudek biologists in 2014 (see Appendix D); however, not all of the study area was surveyed, so the occurrence of this species cannot be ruled out.

Sierra Blue Grass (CRPR 1B.3)

Sierra blue grass (*Poa sierrae*) is an herbaceous perennial member of the grass family (Poaceae). It has no state or federal status, but it has a CRPR of 1B.3. This species occurs along shady, moist slopes often on mossy rocks in canyons and forest of the northern Sierra Nevada foothills. Generally this species is found between 1,148 and 4,921 feet msl. It blooms from April through June (Salix 2013). The CNDDB documents three occurrences of this species within the nine-quadrangle area enclosing the study area, with occurrences documented along the American River, the South Yuba River, and near Baxter (CDFW 2014a). Two of the documented occurrences of this species are from within a 5-mile radius of the study area. The project site contains suitable habitat for this species, but it was not detected during site surveys (Salix 2013; Appendix D).

3.3.2 Relevant Plans, Policies, and Ordinances

Federal

Federal Endangered Species Act

The U.S. Congress passed the federal ESA in 1973 (16 U.S.C. 1531 et seq.), as amended, and the implementing regulations (50 CFR 17.1 et seq.) are administered by the USFWS for most plant and animal species and by the National Oceanic and Atmospheric Administration National Marine Fisheries Service (NOAA Fisheries) for certain marine species, to provide a means for listing and protecting endangered and threatened species and their designated critical habitats, if applicable.

Section 9 of the ESA and federal regulations pursuant to Section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without an exemption permit. “Take” under the ESA is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. “Harm” is further defined by USFWS to include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. “Harass” is defined by USFWS as intentional or negligent actions or omissions that create the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns that include, but are not limited to, breeding, feeding, or sheltering. "Incidental take" is defined as any take otherwise prohibited, if such take is incidental to, and not the purpose of, carrying out an otherwise lawful activity.

ESA Section 7 requires federal agencies to formally consult with USFWS and/or NOAA Fisheries and obtain a biological opinion prior to carrying out any federal program or agency action that may adversely affect threatened or endangered species or may adversely modify designated critical habitat. The formal Section 7 consultation and biological opinion process includes an evaluation of whether a project federal action is likely to jeopardize the continued existence of any endangered or threatened species or result in the "destruction or adverse modification" of critical habitat, and requires the inclusion of reasonable and prudent measures in the implementation of a project or agency action in order to minimize any impact (16 U.S.C. 1536).

Bald and Golden Eagle Protection Act

BAGEPA (16 U.S.C. 668–668(d)) is the primary law protecting bald and golden eagles. BAGEPA prohibits anyone, without a permit issued by the Secretary of the Interior, from "taking" bald eagles, including their parts, nests, or eggs. "Take" under this statute is defined as to "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, or molest or disturb." "Disturb" is defined as "to agitate or bother a bald or 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" (50 CFR 22.3).

In addition to immediate impacts to individuals or occupied nests, the "take" definition also covers impacts from human alterations to an area around a previously used nest site during a time when eagles are not present, "if, upon the eagle's return, such alterations agitate or bother an eagle to a degree that interferes with or interrupts normal breeding, feeding, or sheltering habits, and causes injury, death or nest abandonment" (USFWS 2012).

In 2009, USFWS finalized a new rule that allows authorization of "take" of bald and golden eagles and eagle nests in particular circumstances by issuing permits under BAGEPA. Authorizations of limited take must include mitigation that will result in net benefits to the affected eagle species (74 FR 46836–46879).

Violating BAGEPA can result in a fine of $100,000 ($200,000 for organizations) or imprisonment for 1 year, or both, for a first offense. Penalties increase substantially for additional offenses, and a second violation of this act is a felony.

Migratory Bird Treaty Act

The federal Migratory Bird Treaty Act (MBTA) of 1918, as amended (16 U.S.C. 703–712), protects migratory birds and their nests, eggs, young, and parts from possession, sale, purchase, barter, transport, import, export, and take. For purposes of the MBTA, take is defined as "to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to pursue, hunt, shoot, wound, kill, trap, capture, or collect" (50 CFR 10.12). The MBTA applies to migratory birds identified in 50 CFR 10.13. In general, the MBTA protects all birds occurring in the United States except for house (English) sparrow (*Passer domesticus*), European starlings (*Sturnus vulgaris*), rock doves (pigeons; *Columba livia*), any recently listed unprotected species in the Federal Register, and non-migratory upland game birds. The USFWS has regulatory authority over implementation and enforcement of the MBTA. For species listed under both the ESA and the MBTA, the USFWS has the authority to authorize incidental take with special terms and conditions under Section 10(a)(1)(B) of the ESA and have this permit also serve as a Special Purpose Permit under the MBTA (50 CFR 21.27). Special Purpose Permits are required in the event that an action would take, possess, or involve the sale or transport of birds protected by the MBTA.

Bureau of Land Management

Under the authority of the Federal Land Policy and Management Act of 1976 (43 USC 1732), a 4.7-acre portion of the study area just north of the confluence between Steephollow Creek and the Bear River is leased by NID from the BLM (CA Serial Number 41834). The lease authorizes the uses associated with a gravel processing facility, including a weigh station, gravel separation, blending equipment, and miscellaneous equipment. The lease does not authorize a fuel station or any other storage or usage of hazardous materials or toxic substances on BLM property. Lease conditions direct how tenants will prevent site contamination, dispose of sewage and solid waste, prevent cutting of trees or shrubs, and, at the conclusion of the lease, restore the site contours to be consistent with surrounding topography.

State

California Endangered Species Act

The California Endangered Species Act (CESA) is similar in many ways to the federal ESA. The CDFW administers CESA, which prohibits the take of plant and animal species designated by the California Fish and Game Commission as endangered or threatened in the State of California. CDFW regulations are set forth in the California Fish and Game Code. Under CESA, take is defined as to "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." CESA Section 2053 stipulates that state agencies may not approve projects that will "jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat essential to the continued existence of those species, if there are reasonable and prudent alternatives available consistent with conserving the species or its habitat which would prevent jeopardy." Animal species designated as endangered or threatened under CESA are listed in 14 CCR 670.5. Plant species designated as endangered or threatened under CESA, or designated as a rare plant species under the California Native Plant Protection Act (California Fish and Game Code, Section 1900 et seq.), are listed in 14 CCR 670.2. CESA is administered by CDFW. Section 2081 of CESA authorizes the take of endangered, threatened, or candidate species if take is incidental to otherwise lawful activity and if specific criteria are met. These provisions also require CDFW to coordinate consultations with the USFWS for actions involving federally listed species that are also state-listed species. In certain circumstances, CESA allows CDFW to adopt a federal ESA incidental take authorization as satisfactory for California Environmental Quality Act (CEQA) purposes based on findings that the federal permit adequately protects the species and is consistent with state law. These criteria closely mirror the issuance criteria established for the federal Habitat Conservation Plan program under ESA Section 10. A CESA permit may not authorize the take of FP species that are protected in other provisions of the California Fish and Game Code.

California Fish and Game Code

California Fish and Game Code Sections 3511 (birds), 4700 (mammals), 5050 (reptiles and amphibians), and 5515 (fish) designate certain species as FP and provide that those species may not be taken or possessed except pursuant to an approved Natural Communities Conservation Plan or a permit from CDFW for "necessary scientific research, including efforts to recover FP, threatened, or endangered species." CDFW cannot authorize take or possession of FP species for necessary scientific research if that research is conducted in connection with mitigation for a project (California Fish and Game Code, Sections 3511, 4700, 5050, and 5515).

In addition to CESA and Section 3511, the California Fish and Game Code includes other provisions for protection of birds, nests, and eggs. It is generally unlawful to take, possess, or needlessly destroy the nests or eggs of any bird and to take or possess any migratory nongame bird designated in the MBTA, except as allowed by the MBTA (California Fish and Game Code, Sections 3503 and 3513). It is unlawful to take, possess, or destroy any birds of prey, or to take, possess, or destroy nests or eggs of such birds (California Fish and Game Code, Section 3503.5). Birds of prey refer to species in the orders Falconiformes and Strigiformes.

California Environmental Quality Act

CEQA (California Public Resources Code, Section 21000 et seq.), as applied to biological resources, requires identification of a project's potentially significant impacts on biological resources and ways that such impacts can be avoided, minimized, or mitigated. CEQA also provides guidelines and thresholds for use by lead agencies for evaluating the significance of proposed impacts.

CEQA Guideline 15380(b)(1) defines endangered animals or plants as species or subspecies whose "survival and reproduction in the wild are in immediate jeopardy from one or more causes, including loss of habitat, change in habitat, overexploitation, predation, competition, disease, or other factors" (14 CCR 15380(b)(1)). A rare animal or plant is defined in CEQA Guideline 15380(b)(2) as a species that, although not presently threatened with extinction, exists "in such small numbers throughout all or a significant portion of its range that it may become endangered if its environment worsens; or … [t]he species is likely to become endangered within the foreseeable future throughout all or a significant portion of its range and may be considered 'threatened' as that term is used in the federal Endangered Species Act." Additionally, an animal or plant may be presumed to be endangered, rare, or threatened if it meets the criteria for listing, as defined further in CEQA Guideline 15380(c).

Section IV, Appendix G (Environmental Checklist Form) of the CEQA Guidelines (14 CCR 15000 et seq.) requires an evaluation of impacts to "any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or the U.S. Fish and Wildlife Service."

Local

Nevada County General Plan

The Nevada County General Plan (County of Nevada 1996) contains several policies and objectives related to protection of biological resources. Selected policies and objectives relevant to the proposed project are presented below.

Policy 13.2B Development projects which have the potential to remove natural riparian or wetland habitat of 1 acre or more shall not be permitted unless:

a. No suitable alternative site or design exists for the land use;
b. There is no degradation of the habitat or reduction in the numbers of any rare, threatened, or endangered plant or animal species as a result of the project;
c. Habitat of superior quantity and superior or comparable quality will be created or restored to compensate for the loss; and
d. The project conforms with regulations and guidelines of the U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers, California Department of Fish and Game, and other relevant agencies.

Objective 13.2 Minimize impacts to corridors to ensure movement of wildlife.

Policy 17.15 Surface mining is conditionally permitted only in compatible General Plan designations as defined herein and on parcels zoned "ME." Said mining shall be allowed only after impacts on the environment and nearby land uses have been adequately reviewed and found to be in compliance with CEQA. Of particular importance shall be the impact of the operation on nearby land uses, water quantity and quality, noise and vibration impacts, and traffic associated with the operation. All other related impacts shall also be addressed.

Policy 17.22 Aggregate extraction may be allowed in rivers and floodplains provided environmental impacts associated therewith are addressed through the CEQA process.

Placer County General Plan

The Placer County General Plan (County of Placer 2013) contains several policies related to protection of biological resources. Selected policies relevant to the proposed project are presented below.

Policy 6.B.1 The County shall support the "no net loss" policy for wetland areas regulated by the U.S. Army Corps of Engineers, the U.S. Fish and Wildlife Service, and the California Department of Fish and Game. Coordination with these agencies at all levels of project review shall continue to ensure that appropriate mitigation measures and the concerns of these agencies are adequately addressed.

Policy 6.B.2 The County shall require new development to mitigate wetland loss in both regulated and non-regulated wetlands to achieve "no net loss" through any combination of the following, in descending order of desirability: (1) avoidance; (2) where avoidance is not possible, minimization of impacts on the resource; or (3) compensation, including use of a mitigation banking program that provides the opportunity to mitigate impacts to rare, threatened, and endangered species and/or the habitat which supports these species in wetland and riparian areas.

Policy 6.B.4 The County shall strive to identify and conserve remaining upland habitat areas adjacent to wetlands and riparian areas that are critical to the survival and nesting of wetland and riparian species.

Policy 6.B.5 The County shall require development that may affect a wetland to employ avoidance, minimization, and/or compensatory mitigation techniques. In evaluating the level of compensation to be required with respect to any given project, (a) on-site mitigation shall be preferred to off-site, and in-kind mitigation shall be preferred to out-of-kind; (b) functional replacement ratios may vary to the extent necessary to incorporate a margin of safety reflecting the expected degree of success associated with the mitigation plan; and (c) acreage replacement ratios may vary depending on the relative functions and values of those wetlands being lost and those being supplied, including compensation for temporal losses. The County shall continue to implement and refine criteria for determining when an alteration to a wetland is considered a less than-significant impact under CEQA

Policy 6.C.9 The County shall require new private or public developments to preserve and enhance existing native riparian habitat unless public safety concerns require removal of habitat for flood control or other public purposes. In cases where new private or public development results in modification or destruction of riparian habitat for purposes of flood control, the developers shall be responsible for acquiring, restoring, and enhancing at least an equivalent amount of like habitat within or near the project area.

Placer County Tree Preservation Ordinance

Placer County Code Chapter 12, Article 12.16, provides language concerning general tree preservation policy throughout the county, mainly "to preserve trees wherever feasible, through the review of all proposed development activities where trees are present on either public or private property, while at the same time recognizing individual rights to develop private property in a reasonable manner . . . this article does not categorically prohibit tree removal and contains numerous exemptions for specific types of activities. It is also recognized, that due to the extremely diverse terrain and vegetation within the county, different policies may be applicable to specific areas of the county." The ordinance is applicable to all native, landmark trees, riparian zone trees, and certain commercial firewood operations, except as exempted in cases of public safety, designated commercial lots (e.g., Christmas tree farms), and bona fide active agricultural uses.

All activities subject to this ordinance require permits and/or commercial licenses, and environmental impact review and all applicable regulatory permitting must be completed before issuing a permit or other discretionary approval. However, reservoir maintenance activities by a water district that could affect trees are not subject to local ordinances.

3.3.3 Thresholds of Significance

The significance criteria used to evaluate the project impacts to biological resources are based on Appendix G of the CEQA Guidelines (14 CCR 15000 et seq.). According to Appendix G, a significant impact related to biological resources would occur if the project would:

1. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service.
2. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service.
3. Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.
4. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.
5. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.
6. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

3.3.4 Impacts Analysis

Impact 3.3-1. The project would have a substantial adverse effect, either directly or through habitat modifications, on a species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service.

The project could have a substantial adverse effect on a range of wildlife species and their habitat, including three special-status wildlife species that are known to occur or are highly likely to occur within the project area. Direct adverse impacts could result from operations and movement of heavy equipment, haul trucks, and other vehicles on, into, and out of the mining sites. These operations include gravel skimming, transferring and stockpiling of materials, loading haul trucks, haul truck trips on the access road leading to Interstate 80 (I-80), accessing gravel bars, installation of river crossings, and installation of cofferdams. General impacts that could affect all wildlife species are presented first below, followed by information specific to the special-status species known or likely to be present in the project area.

General Impacts to Wildlife

Increased human presence and activity within the study area could affect a range of wildlife species by impeding access to drinking water for species living in adjacent woodlands, increasing noise level or lighting, and general harassment.

In general, noise impacts are discussed in Section 3.9, Noise, of this EIR. The project would generate noise during construction (e.g., heavy equipment laying bridges, bringing in supplies, and grading surfaces; use of power and hand tools assembling structures) and operation (e.g., scrapers and loaders skimming gravel, gravel dumping, loading of transport trucks, transport truck movement). Noise and vibration can impact wildlife in a variety of ways. Effects can include abandonment of existing habitat areas (Kuck et al. 1985), disruption of feeding activity (Knight 1984), reduced reproductive success (Halfwerk et al. 2011), and physiological stress. Documented noise effects on amphibian species like the foothill yellow-legged frog are limited, but traffic noise has been demonstrated to alter the vocalizations of male frogs and the ability of females to locate calls, potentially changing mating success (Parris et al. 2009; Bee and Swanson 2007). Noise has also been implicated in patterns of reduced species richness and abundance near a highway (Eigenbrod et al. 2009). Brattstrom and Bondello (1983) found that estivating (dormant during the summer) spadefoots (*Scaphiopus couchi*) left their burrows in response to motorcycle sounds, which could be harmful if it occurred at the wrong time of year. According to residents of the project vicinity who commented on the Notice of Preparation for this EIR, sound generated within the study area propagates widely upslope into the surrounding forest with minimal attenuation. Thus, noise from the project has the potential to affect species occupying the surrounding forest lands.

The applicant proposes that aggregate removal and hauling operations would operate between 7 a.m. and 7 p.m., which would minimize the need for operational lighting given that most activity would occur during the summer. However, security lighting would be installed at the processing plant and associated infrastructure area. The applicant states that gravel sales and hauling could occur throughout the year, including the winter months when light fades well before 7 p.m., so there is a potential for lighting impacts from operational lighting in the loading area, as well as headlights from the trucks entering and exiting the project site.

Releases of pollutants such as oil from machinery or gasoline spills can adversely affect aquatic species. Significant releases could cause acute and chronic toxicity to aquatic organisms and adversely affect reproductive ability. Immediate mortality could result with the release of highly toxic chemicals or extensive release of chemicals with lower toxicities. Moderate effects such as decrease in essential body functions and reproductive failure can lead to population decreases. Both foothill yellow-legged frogs and western pond turtles could be negatively affected by a variety of pollutant releases, as could a range of non-special-status plant and wildlife species. Bald eagles could be affected through consumption of prey species that have accumulated pollutants within their tissues.

Foothill Yellow-Legged Frog

Depending on the location of the channel, channelization of the Bear River in preparation for aggregate removal operations could remove habitat for foothill yellow-legged frogs. However, based on the general absence of suitable foothill yellow-legged frog breeding and larval development habitat and the low numbers of frogs observed within the Bear River downstream of the confluence with Steephollow Creek, the majority of the potential impacts to this species resulting from aggregate removal operations will likely occur in the area around the mouth of Steephollow Creek and for a limited distance downstream along the creek prior to entering the Bear River. Impacts to this species within the Bear River itself are anticipated to be minimal since very little breeding habitat appears to be present in this area (see Appendix D), and the majority of the foothill yellow-legged frogs observed in this zone were highly mobile subadults that can avoid much of the aggregate removal operations. At the lowest zone of the study area, annual inundation by Rollins Lake precludes it as potential habitat for this species.

In the event that the channelized area occurs near the mouth of Steephollow Creek on the north side of the river rather than the south side, the channel that is created may create higher water velocities with fewer boulders, cobbles, and other locations protected from direct flow as compared to natural conditions. This potential reduction in protected surfaces could substantially limit the number of potential breeding sites and areas suitable for larval rearing (i.e., low velocity water to a maximum of <10 centimeters (4 inches) per second), which could negatively affect the stability of egg masses and the success rate of foothill yellow-legged frog tadpoles. Aggregate removal would also remove boulders and cobbles from the river channel, which could reduce future locations for foothill yellow-legged frogs to deposit their eggs after the river reconfigures from heavy flows. However, any cobbles that are removed during skimming would be placed at the upstream area of the excavation area at the end of the skimming season. Winter flows would then be expected to redistribute displaced cobbles and any boulders to a new equilibrium location.

Foothill yellow-legged frogs generally breed in the study area in April or early May, with larval development generally occurring into August (Seltenrich, pers. comm. 2013). Therefore, aggregate removal activities that are proposed to occur from April through October have the potential to substantially interfere with the large population of foothill yellow-legged frogs that are present near the mouth of Steephollow Creek. Heavy equipment could disturb or kill adult frogs and any changes in water quality near Steephollow Creek could affect developing eggs or larval forms.

Based on past surveys (NID and PG&E 2010; Salix 2014; Dudek 2014 (see Appendix D)), the greatest density of adult foothill yellow-legged frogs within the study area appears to be within Steephollow Creek, upstream of the confluence with the Bear River. This area is not proposed for skimming or gravel storage, and would thus not be subject to direct disturbance. Since foothill yellow-legged frogs are highly aquatic, they are not likely to travel farther than 15 feet from the active river channel, thus minimizing the area of potential indirect effect. However, juvenile and adult frogs often forage in terrestrial habitat adjacent to streams; consequently, it should be assumed that foothill yellow-legged frogs could be anywhere within the project area within 15 feet of water.

Placement of temporary bridges has the potential to alter flow velocities near the bridge. The applicant proposes to use flatbed train cars or a similar type of bridge that would not have in-water support structures. If so, the bridges would have little or no impacts to flow velocities. The installation of cofferdams to prevent erosion around NID infrastructure and the proposed processing area would also potentially alter flows. However, flow velocities in this segment of the Bear River are dominated by releases from the Chicago Park Powerhouse, so any changes in flow velocities related to the project would be minimal in comparison.

The proposed aggregate removal has the potential to remove and/or disturb small amounts of mercury that is associated with the gravel (refer to Section 3.7 of this EIR, Hydrology and Water Quality). The toxicity of mercury to amphibians is not well documented (Wolfe et al. 1998). However, foothill yellow-legged frogs from Northern California creeks have been shown to accumulate methyl mercury, a bioavailable form of mercury, in their tissues to levels that exceed U.S. Environmental Protection Agency and Food and Drug Administration criteria for human consumption of fish (Hothem et al. 2009). These levels of methyl mercury in frog tissues may pose more of a threat to predators (e.g., raptors) than to the frogs themselves.

Western Pond Turtle

Because the project area has limited basking sites for western pond turtle, it is unlikely that the project site provides more than temporary habitat. However, they have been observed in the project vicinity and it is highly likely that they at least move through the project area. The increase in human activity and heavy equipment usage could interrupt their movement through the project area. Because it is a slow-moving animal, if a western pond turtle were present in the area of gravel movement (for channelizing the river) or gravel skimming, it could be crushed by the wheels of heavy equipment and be killed or injured, or could be smothered with gravel.

Turtle nests in uplands adjacent to the river channel could be affected if they are located near the haul road. As described above for foothill yellow-legged frog, methyl mercury can accumulate in tissues of western pond turtles that forage in areas with elevated levels of the toxin, and mercury has been demonstrated to disrupt thyroid hormone function in this species (Meyer et. al 2014).

Bald Eagle

The study area is within the known winter and breeding range of the bald eagle. Nesting bald eagles have been reported from Rollins Reservoir immediately southwest of the project area (NID and PG&E 2010) and at Hell Hole Reservoir in Placer County (PCWA 2008). No nests were identified during field visits (Salix 2013) and none have been recorded in the study area; however, no intensive raptor surveys were conducted for this project. Due to the small size of the study area, no more than one individual or pair of eagles would be expected to use the study area for foraging or nesting, and a nesting pair located at Rollins Reservoir would likely defend the project area as their territory.

Increased human activity related to aggregate removal operations could result in inadvertent harassment of bald eagles feeding on prey or perching in trees adjacent to the Bear River or Steephollow Creek. Proposed road paving and other road improvements along Chicago Park Powerhouse Road, as well as increased operational truck trips along the access road, could also disturb bald eagles roosting in trees upslope from the river. Disturbance of bald eagles, including flushing eagles from foraging and/or roost sites, can result in both increased energy expenditure due to avoidance flights and decreased energy intake due to interference with feeding activities (Stalmaster 1983). Such harassment, depending upon the extent, frequency, and distance from eagles, could cause disruption of normal feeding or perching behavior by individual bald eagles. However, the project site does not contain high-quality foraging habitat and it is expected that any bald eagle inadvertently displaced would find replacement foraging habitat nearby. No bald eagle nests are known to be present in the study area; therefore, no loss of bald eagle nests is expected as a result of the project.

Impacts to Special-Status Plant Species

Although neither of the two special-status plant species potentially occurring on the project site have been observed (Scadden Flat checkerbloom and Sierra blue grass), they are known to occur in the project vicinity and suitable habitat is present. If they are present, they would be subject to project activities that would directly damage them, and also to changes in hydrological connectivity that might eliminate an area of wet montane marsh (high-quality habitat for Scadden Flat checkerbloom). Sierra blue grass, if present, is less likely to be affected as it would be located more within upland areas of the project site, which would experience little or no physical disturbance.

Summary

Impacts to foothill yellow-legged frog from proposed aggregate removal operations and infrastructure development near the mouth of Steephollow Creek would be **significant**, but would be reduced to less than significant levels with implementation of mitigation described in Section 3.3.5, Mitigation Measures. Impacts to other species would be less than significant.

Impact 3.3-2. The project would have a substantial adverse effect on a riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service.

The project would impact up to 60 acres of riparian habitat, including areas of willow riparian vegetation within the skimming area. Although much of this area has little or sparse vegetation, an area toward the middle of the skimming area on the Bear River hosts relatively intact and denser clusters of willow and associated species. These riparian plants provide cover for riparian birds, amphibians, reptiles, and other species; therefore, impacts would be **potentially significant**. The previous adopted Reclamation Plan for the project area assumed that revegetation would generally occur naturally, but does require planting of willows along the riverbank after conclusion of aggregate removal activities. The proposed secondary stockpile would be located in a barren area, which appears devoid of vegetation and presents little to no habitat value. With the implementation of mitigation in Section 3.3.5 requiring riparian revegetation, this impact would be less than significant.

Impact 3.3-3. The project would not have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.

The project would involve altering the course of the Bear River from a dispersed multi-channel river to a single-channel river. This would be accomplished by forming a shallow channel and gravel berms to direct the flow just south of the confluence with Steephollow Creek. All areas below the ordinary high water mark of the Bear River and Steephollow Creek, approximately 60 acres within the study area, would be considered federally protected wetlands under the Clean Water Act. Therefore, the proposed activities would constitute an adverse effect on federally protected wetlands. However, the existing condition of a graveled river channel is largely a consequence of historical mining upriver that generated large quantities of gravel, as well as the construction of Rollins Reservoir, and is therefore not a natural condition. Further, this river channel has been subject to similar activities until 2002. Therefore, this impact would be **less than significant** and no mitigation is required.

Impact 3.3-4. The project would not interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.

The project area was identified in previous studies (NID and PG&E 2010) as a suitable movement corridor for large mammals (e.g., mule deer, American black bear (*Ursus americanus*), cougar (*Puma concolor*)). It may also act as a movement corridor for aquatic species travelling between Rollins Reservoir and upper portions of the Bear River or Steephollow Creek. The characteristics that make this area suitable for movement are the wide channel, periods of low flow velocity, and adjacent natural bank on the north side for entry and exit. The project could potentially impact this corridor by increased human presence during the aggregate removal season, including heavy equipment use. However, the changes in the river channel that would result from aggregate removal would not be expected to reduce its utility as a movement corridor, as it would remain wide, with periods of low flow rates and adjacent natural habitat. Therefore, this impact would be **less than significant** and no mitigation is required.

Impact 3.3-5. The project would conflict with local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.

No local policies specifically address the project site; however, Placer County and Nevada County each require projects to comply with ACOE and CDFW guidelines for "no net loss" of wetland and riparian habitat. Because the aggregate removal operation may adversely impact the willow riparian habitat within the project site, the project would conflict with these requirements, which would be a **significant** impact. However, with the implementation of mitigation described in Section 3.3.5 to revegetate riparian vegetation, impacts would be reduced to less than significant.

Impact 3.3-6. The project would not conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

Although Placer County is currently preparing a Habitat Conservation Plan / Natural Community Conservation Plan, it has not yet been completed or approved. Therefore, no Habitat Conservation Plan, Natural Community Conservation Plan, or other approved habitat conservation plan applies to the study area, and no conflict with such a plan would occur. This impact would be **less than significant**.

3.3.5 Mitigation Measures

The following mitigation measures (MMs) would be required to address potentially significant project impacts to riparian habitat and foothill yellow-legged frog.

MM-BIO-1 *Workers Environmental Awareness Program.* All workers shall receive worker environmental awareness training (WEAP) conducted by a qualified biologist or an environmentally trained foreman. WEAP may also be conducted through a video created by a qualified biologist specifically for this project. WEAP shall instruct workers to recognize all life stages of foothill yellow-legged frog (*Rana boylii*), their habitat, and the nature and purpose of protective measures including best management practices (BMPs) and other required mitigation measures.

MM-BIO-2 *Delineation of Project and Foothill Yellow-Legged Frog Habitat Areas.* Before starting work each season, the Operator shall consult with a qualified biologist to survey and delineate those areas in the vicinity of the confluence with Steephollow Creek where foothill yellow-legged frog egg masses, tadpoles, young-of-the year frogs, or suitable breeding habitat is present. Survey methods should follow protocols provided in Seltenrich and Pool's "A Standardized Approach for Habitat Assessments and Visual Encounter Surveys for the Foothill Yellow-Legged Frog (*Rana boylii*)" (2002). Any other environmentally sensitive areas where foothill yellow-legged frogs are occupying shall also be delineated. The biologist shall prepare a survey report and submit to NID and the California Department of Fish and Wildlife (CDFW) for review. The Operator shall restrict all work to within the delineated boundaries. Delineation of work boundaries and environmentally sensitive areas may be in the form of a CDFW-approved map and must be on site at all times.

MM-BIO-3 *Work Period.* The time period for skimming within Bear River shall be restricted to periods of low flow (which, depending on natural flows, could include periodic full releases from the Chicago Park Powerhouse) and dry weather, no earlier than April and no later than December, and consistent with other timing restrictions. Skimming activities shall be timed with awareness of precipitation forecasts and releases from the Chicago Park Powerhouse, and resultant likely increases in flow. Prior to forecasted storm events and known water releases from upriver dams, mining activities within the floodplain shall cease until all reasonable erosion control measures, inside and outside the floodplain, have been implemented.

MM-BIO-4 *Biological Monitor.* During channelization, a biological monitor shall monitor all activities related to channelizing the Bear River. The monitor shall have the authority to immediately stop any activity that is likely to impact special-status species (especially foothill yellow-legged frog) or order any reasonable measure to avoid or minimize impacts to fish and wildlife resources. If frog egg masses are observed on cobbles within a disturbance area, the biological monitor shall, if possible, relocate those cobbles to undisturbed areas of Steephollow Creek. The egg mass and associated substrate shall be gently placed into a container filled with creek water and immediately relocated to a calm-water location (velocity <5 centimeters (2 inches) per second) in the creek. The egg mass should be placed in an area with sufficient water depth to avoid desiccation at lower flows. Care must be taken while handling to avoid separating the egg mass from the attachment substrate. If any previously unknown special-status species are found within the project area during channelization, the monitor shall inform the CDFW within 1 day. If a breeding area avoidance plan (MM-BIO-6) is implemented, the biological monitor will visit the site weekly when operations are underway to confirm adherence to the plan..

MM-BIO-5 *Stranded Aquatic Life.* The Operator shall ensure that aquatic life is not stranded in areas cut off from the remaining river channel during channelization. All reasonable efforts shall be made to capture and move all stranded aquatic life observed. A biological monitor (MM-BIO-4) shall conduct all relocations of aquatic life. Capture methods may include fish landing nets, dip nets, buckets, and hand capture. Captured aquatic life shall be released as soon as possible within the main channel at a reasonable distance from the active working area. This measure does not allow for the take or disturbance of any state or federally listed species.

MM-BIO-6 *Annual Breeding Area Avoidance.* If breeding foothill yellow-legged frogs are found in the project area during MM-BIO-2, the Operator shall work with the biological monitor to ensure the project design (including setbacks) avoids negative impacts to the population within the channel. The Operator shall coordinate with the biological monitor to develop a breeding area avoidance plan (to include work boundaries, timing, etc.) prior to sending to the survey report to CDFW for review and approval.

MM-BIO-7 *Restricting Channelization to South Bank of Bear River Channel*. During channelization of the Bear River, the channel shall be located as near as practicable to the south bank of the Bear River channel to avoid potential breeding populations of foothill yellow-legged frogs in the vicinity of Steephollow Creek.

MM-BIO-8 *Riparian Vegetation Planting*. Should the aggregate removal operation be terminated or suspended for more than 5 years, the site is undergoing reclamation under an approved reclamation plan, the Operator shall plant willows along the edge of the riverbed to compensate for willow riparian areas removed by project operations. Alternatively, the Operator may replant outside the project area, upstream in either Steephollow Creek or the Bear River, with the concurrence of CDFW. NID may also pay in-lieu fees for removal of willow and alder habitat (MM-BIO-10).

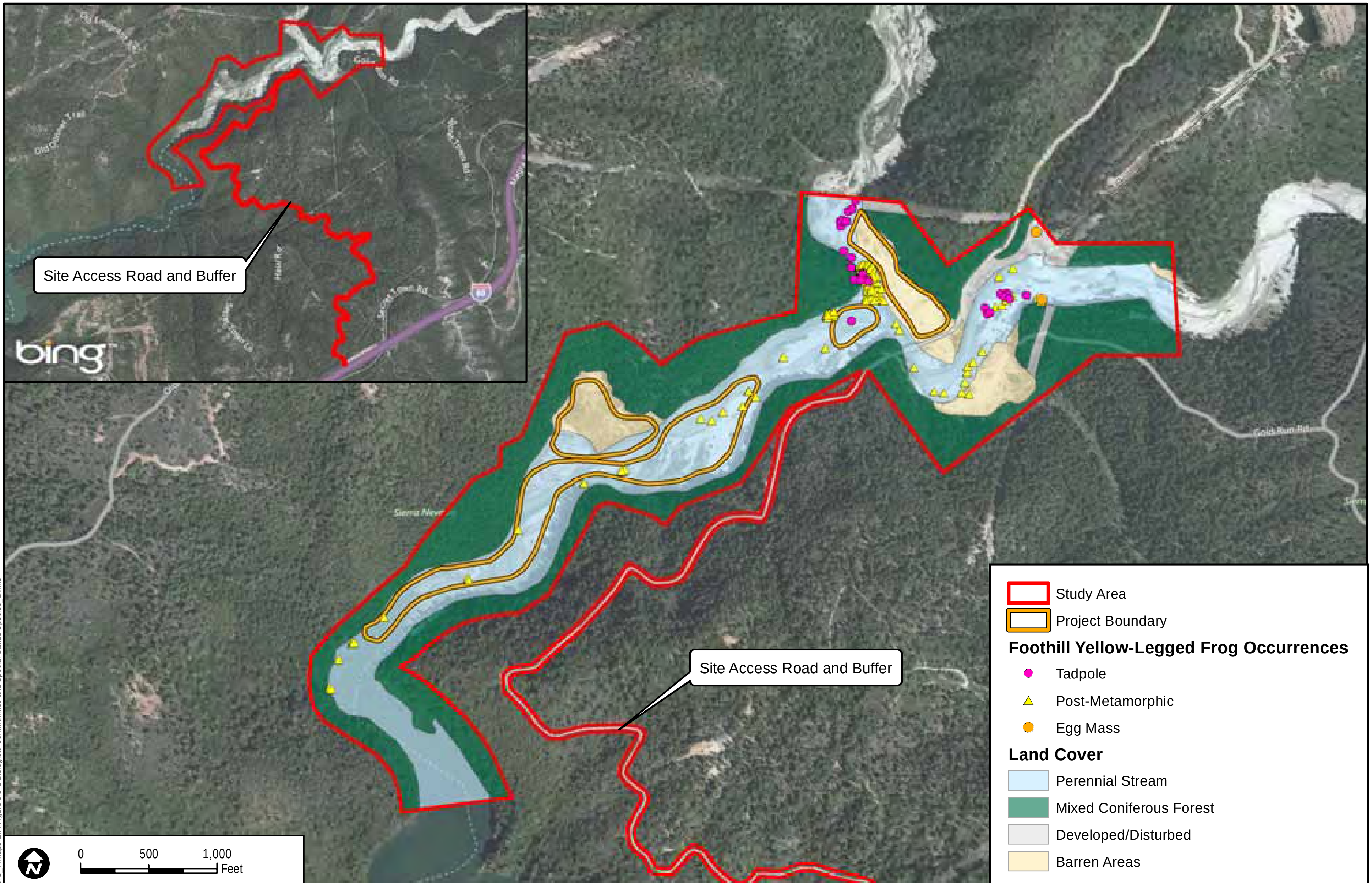
MM-BIO-9 *Gravel Depth*. The Operator shall retain at least 12 inches of gravel above formational, non-alluvial material following aggregate removal, to allow for fish spawning. If gravel is removed to or below the depth of formational, non-alluvial material, sufficient gravel will be replaced in those areas to reach the minimum depth of 12 inches.

MM-BIO-10 *Willow Riparian Habitat In-Lieu Fees*. The Operator may pay in-lieu fees to the U.S. Army Corps of Engineers (ACOE), CDFW, and Regional Water Quality Control Board according to their established fee structures to compensate for the removal of willow and alder riparian habitat within the Bear River channel. Such payment would replace, in whole or in part, the requirements of on- or off-site riparian vegetation planting (MM-BIO-8). If willow riparian habitat becomes reestablished within the disturbance area after payment of fees, removal of the reestablished willow riparian habitat would not require payment of fees.

MM-BIO-11 *Access Road Construction Habitat Protection*. During improvements to the site access road (MM-TRA-1), construction crews will implement BMPs to limit dust generation from construction vehicles; contain any releases of fuel, oil, or other toxic compounds; and limit removal of trees to those designated on approved site plans. Prior to construction, any culverts under the access road will be clearly marked and protected so that runoff cannot enter watercourses. No construction will occur within 24 hours after rainfall that exceeds 1 inch in a 24-hour period.

3.3.6 Level of Significance After Mitigation

The proposed mitigation would reduce impacts to protected species, waters of the United States, and biological communities (Impacts 3.3-1, 3.3-2, and 3.3-5) to a less than significant level. Some impacts to foothill yellow-legged frogs would occur due to the heavy equipment activity and disturbance of the river channel; however, avoidance of occupied low flow channels near Steephollow Creek, careful location and timing of channelization, and relocation of egg masses from disturbance areas would ensure that these impacts would be less than significant with mitigation. Further, the extensive population of foothill yellow-legged frogs that is present within Steephollow Creek would ensure that foothill yellow-legged frogs would persist in this location.. If western pond turtles are present during project activities, they would be noted by the biological monitor and relocated out of harm's way, reducing impacts to **less than significant**.



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SOURCE: Bing Maps 2014, Dudek 2014, Salix Consulting 2013, Nevada Irrigation District and PG&E 2010

FIGURE 3.3-1

Biological Communities and Occurrences of Foothill Yellow-Legged Frog in the Study Area

BEAR RIVER SEDIMENT REMOVAL AT ROLLINS RESERVIOR

NOTE: Locations of Foothill Yellow-legged Frog occurrences are approximate

Path: Z:\Projects\j797401\MAPS\GIS_Wmaps\EIR\Figure 3.3-1 Biological Communities and Special Status Species_2.mxd

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3.4 CULTURAL RESOURCES

This section evaluates prehistoric, historical, and paleontological resources that could be damaged or destroyed as a result of development of the proposed Bear River Sediment Removal at Rollins Reservoir Project (proposed project). Prehistoric resources include sites and artifacts associated with the indigenous, non-Euro-American population, generally prior to contact with people of European descent. Historical resources consist of structures, features, artifacts, and sites that date from Euro-American settlement of the region. Paleontological resources are subsurface flora and fauna fossil resources from the Plio-Pleistocene era, less than 600,000 years ago.

No comments regarding cultural resources were received during the notice of preparation (NOP) comment period. Copies of the NOP and the comment letters received are included in Appendix A.

Information to prepare this section is based on the *Cultural Resources Inventory Report for the Bear River Restoration at Rollins Reservoir Project* (Cultural Resources Report) prepared by Dudek in August 2014. This report is included as Appendix E to this ~~Draft~~ Environmental Impact Report (EIR).

3.4.1 Existing Conditions

The proposed project is located directly within and immediately adjacent to a portion of the Bear River. Sediments primarily consist of well sorted sandy and gravelly alluvium within high-flow areas and raised banks of accumulated cobbles and gravel along the river edges. The project area was the site of gravel mining operations from 1965 to 2002. Steep, forested slopes bound the project area on all sides.

Cultural Context

Human occupation of the Sierra Nevada is likely to have occurred at least 9,000 years ago; however, only a handful of Paleo-Indian period lithic bifacial points have been recorded. The nearest of these fluted points were found in Sierra Valley (west of Reno, Nevada), Ebbett's Pass (south of Lake Tahoe), and at the Sailor Flat site (in the Tahoe National Forest). Fluted points from this area have generally been recorded as isolated finds, or recovered from contexts of mixed provenience. The primary examples of the Paleo-Indian pattern, to which such fluted and stemmed points are generally assigned, have been recorded east of the Sierra Nevada. The typical assemblage includes large stemmed projectile points, high proportions of formal lithic tools, bifacial lithic reduction strategies, and relatively small proportions of groundstone tools.

The Tahoe Reach is currently the most commonly applied cultural temporal sequence within the region. The sequence includes the Washoe Lake Phase, Tahoe Reach Phase, Spooner Phase, Martis Complex, and Kings Beach Complex. Of these, the Martis Complex and the Kings Beach Complex are most applicable to the project area.

Martis Complex (3000 BC–AD 500)

The Martis Complex has been identified to extend from Lassen County to Alpine County. The date range 3000 BC to approximately 500 AD has been substantiated by obsidian hydration and radiocarbon dates provided by Elsasser and Gortner (1991). Subsistence during the Martis Complex was based on a hunting and seed collecting economy, with highly mobile populations that exploited both upper and lower regions based on the relative seasonal abundance of resources. Projectile points are variable during this period, and were most commonly heavy with low formality, providing some resemblance to those identified in the Great Basin regions. Temporally representative tools include finger-held drills or punches, retouched volcanic flake scrapers, spokeshave-notched tools, and large biface blades and cores. During this period there is a more intensive exploitation of local materials, rather than non-local cherts (sedimentary rock) and obsidian, for the manufacture of formed flaked tools.

Kings Beach Complex (AD 500–Historic Contact)

Similar to the Martis Complex, the Kings Beach Complex was characterized by populations that migrated between upper areas in the warmer months and lower elevations during the fall and winter. Subsistence during this period shifted toward a focus on fishing and gathering. A reduction in size and weight of projectile points corresponded with adoption of bow and arrow technology. Typical point forms within this region included Desert Side-Notched, Cottonwood, and Rosegate series. Obsidian and chert replaced volcanic materials such as basalt as the preferred materials for the manufacture of lithic tools. As neither high-quality cherts nor obsidian is local, the greater presence of such exotic materials suggests that there was an increase in trade with neighboring tribes during this period.

The Kings Beach Complex additionally included a greater reliance on exploitation of acorns. This trend is exemplified by the increased presence of bedrock mortars and pestles formed from local cobbles. It should be noted that while bedrock mortars were predominantly used for crushing and grinding acorns, they were also employed for the processing of a variety of other foods, including deer meat, camas roots, and seeds. While the creation of mortars indicated a relatively high investment of time and energy, such bedrock milling features are found at sites with limited to no subsurface cultural deposits just as frequently as at intensive use occupation areas with well-developed midden soils.

Ethnohistoric (post-AD 1750)

The region surrounding the project area would have been in Hill Nisenan (also known as the southern Maidu) tribal territory during the ethnohistoric period. This group inhabited the Yuba, Bear, and American River watersheds, extending from the Sierra Nevada summit to the Sacramento River. Ethnographic work in this region identified 18 named villages along the Bear River alone.

Nisenan habitation areas were most commonly situated near primary drainages, along ridgelines with mild slopes and south-facing exposures. Traditional village features included bedrock milling stations, granaries, conical house structures, and sweat and ceremonial houses. The dead were typically cremated and buried within the boundaries of the habitation area. Tribal groups included extended and unmarried relatives. Groups of Hill Nisenan did have defined chiefs; however, these individuals were chosen based on wealth and popularity rather than hereditary descent. Intertribal conflict did occur over resources, and the Hill Nisenan would attack small hunting parties of Washoe that encroached too far into their territory.

The Nisenan subsistence strategy was centered on fishing, hunting, and collecting vegetative resources. This group was highly mobile, with larger central habitation areas and surrounding satellite sites used during hunting excursions and for preprocessing of collected plant resources such as acorns. Common food items included deer, rabbits, birds, bear, rodents, and other mammals of small and moderate size, as well as various insects. Common tools included the bow and arrow, traps, harpoons, hooks, nets, portable and stationary grinding implements, and pestles and handstones. A number of goods were made using fibrous plants, including canoes constructed from tule balsa or logs. Imported items included shell ornaments and beads (particularly disk beads as a monetary unit), green pigment, tobacco, steatite (soapstone) items, and obsidian. Exported items included bows and arrows, animal skins, pine nuts, and other local resources.

The Historic Period

Spanish Period (1769–1822)

Gaspar de Portolá entered the San Francisco Bay in 1769. Additional explorations of the San Francisco Bay and the plains to the east were conducted by father Pedro Fages in 1772 and Juan Bautista de Anza in 1776. In 1808, Lieutenant Gabriel Moragain led the first Spanish expedition into the Sacramento Valley. This group explored areas along the American, Calaveras, Cosumnes, Feather, Merced, Mokelumne, Sacramento, and Stanislaus River watersheds. The most recent Spanish expedition into this region was conducted by Luis Arguello in 1817. This group traveled up the Sacramento River to the mouth of the Feather River.

The Spanish "missionization" of Alta California was initiated in San Diego (1769). A total of 21 missions were constructed by the Dominican and Franciscan orders between 1769 and 1823. Missions in the region included San Francisco de Asís (1776), Santa Clara de Asís (1776), San José de Guadalupe (1797, in Alameda County), San Rafael Arcángel (1817, in Marin County), and San Francisco Solano (1823, in Sonoma County). While missionization had a detrimental effect on tribes throughout the region, there is no record of forcible transport of Nisenan communities by the Spanish to the missions.

Mexican Period (1822–1848)

Mexico's separation from the Spanish empire in 1821 and the secularization of the California missions in the 1830s caused further disruptions to native populations. Following the establishment of the Mexican republic, the government seized many of the lands belonging to Native Americans, providing them as parts of larger land grants to affluent Mexican citizens and rancheros. Captain John Sutter was granted the two largest areas of land in the Sacramento Valley area. Sutter founded New Helvetia, a trading and agricultural empire, in 1839. The headquarters was located within Valley Nisenan territory at the confluence of the Sacramento and American Rivers. No Mexican land grants were awarded in the County of Nevada. The 1833 Secularization Act passed by the Mexican Congress ordered half of all mission lands to be transferred to the Native Americans, and the other half to remain in trust and managed by an appointed administrator. These orders were never implemented due to several factors that conspired to prevent the Native Americans from regaining their patrimony.

American fur trappers and traders conducted a number of exploratory intrusions into west Sierra Nevada Mexican territory. Notably, in 1826, Jedediah Smith led a small party of trappers in an expedition along the Sierra Nevada, eventually entering the Sacramento Valley in 1827. This group covered the area along the American and Cosumnes Rivers. From these travels, maps of this inhospitable terrain were created and disseminated, providing direction for the waves of European prospectors, ranchers, and settlers that would come in the following decades.

American Period (Post –1848)

The project area is located just southwest of an area once known as the township of Little York, which is situated on a narrow ridge between Steephollow Creek and the Bear River. Until 1852, miners did not reside permanently in Little York Township. While gold was present throughout the watercourses in decent quantities, it was not enough to satisfy the visions of grandeur for those who came to the region in search of a quick fortune, although some emigrants were able to maintain a successful mining operation in the area. In the winter of 1850, a small group of miners traveled up the ravine and built a cabin (which would become the first house to be built on the ridge); by the time they packed up and left in the spring, the men had made just under

$10,000. Seeing the success of the traveling miners inspired other miners to pursue work in the gravel beds, which were exposed in an extensive cut of blue cement or blue lead. While gold was clearly visible across the entire face of the cut, the crude mining methods of this period made extraction of such small pieces of gold nearly impossible.

In the spring of 1852, William Starr and John Robinson came to the area to prospect in the gravel banks near the head of the ravine, avoiding the channel of blue cement. Starr and others began to dig to the first tunnel into the gravel hills. The men quickly discovered that there was not enough water to wash their drift dirt, and little could be accomplished in their claims that season. Meanwhile, Robinson had begun prospecting lower down from Starr and company along the face of what was known as Cousin Hill. After only tunneling for a short distance, Robinson realized that he had found a place where money could be made. It did not take long for the miners to locate the entire gravel range, which was extensive and traveled through many nearby hills. Soon the township was divided up and lots were distributed among the miners.

A ditch was constructed to convey water from the Bear River to the mines. Sawmills, stores, saloons, mechanic's shops, a meeting house, and even a theater were also in the works. A town meeting was called in August of 1852 to elect a Recorder and to formally name the township. By September of 1852, Little York had nearly all the amenities of a large town and a population of approximately 600.

Secret Town Mine

On January 8, 1863, ground was officially broken at Sacramento to begin construction of the Central Pacific Railroad. The first rail was officially laid on October 27, 1863, and the 18-mile segment between Sacramento and Roseville was completed by the end of the year. By 1866, an additional 66 miles of railroad was completed to reach Secret Town, and rail cars began running to Secret Town just 1 month later. One of the richest ledges of quartz ever found in the area had recently been discovered approximately 4 miles from the town of Willow Creek by a Mexican laborer. By 1870, plans were already in the works to cut a tunnel through the Colfax Divide near Secret Town, low enough to tap into the Bear River and build a sluice off of the substantial tailings that ran alongside the river for several miles.

In 1890, the *Colfax Sentinel* reported that F.C. Gayety & Son established a quartz claim near Secret Town, approximately 7 miles north of Colfax, that had promise of becoming a good quartz mine. By 1896 the Secret Town Mine appeared in the California State Mining Bureau's State Mineralogist Report, described as a quartz mine located 3 miles south of Gold Run at an elevation of 2,875 feet above mean sea level (amsl), with a 2-foot quartz vein striking northwest and dipping 60 degrees northeast in a slate formation. In 1903, it was reported that work would proceed at the Planet Consolidated Drift Mine, located between Steephollow Creek and the Bear River.

Chicago Park Colony

In 1887, plans were announced to start dividing up a large number of tracts and lots throughout the Nevada County Bartlett pear belt, an area which was becoming increasingly more lucrative. This area included a new area known as the Chicago Park Colony, located along the narrow-gauge railroad line between Sacramento and Grass Valley near the town of Colfax. It was purported to be "the first real colony in the northern part of this State" and to be populated by "actual new settlers, most of whom will come from the city of Chicago or its immediate vicinity." Once enough land in the colony had been sold, Chicago Park was touted as a success, with the sale of its lands "doubly assured." According to a report in the *Sacramento Daily Union*, the colony was established by Morris Lobner and W.B. Hayford of Colfax, who convinced nine men from Chicago to join them in a syndicate, which purchased 6,700 acres of land approximately 3 miles from Colfax on the Nevada County side of the Bear River. "It is a rolling land with rich soil, well adapted to the production of apples, pears, grapes, and the more marketable varieties of fruit." A total of 80 acres were reserved for the town site, with a small portion in the center reserved for a public square. Lot sizes averaged around 40 × 125 feet, and the streets were named after well-known streets in Chicago, such as Calumet and La Salle Avenues. Larger lots were reserved for the construction of two churches and a schoolhouse. An additional 5 acres was reserved just outside town for the development of a hotel. Large lots were sold on the condition that at least 5 acres be improved and planted in the coming year. By 1887, approximately 2,000 acres had already been sold to support at least 100 families. The Chicago Park Colony was viewed as a place that would draw attention to the Sierra Foothills (SDU 1887).

Hydroelectric Power in Placer and Nevada Counties

In the early 1850s, Pacific Gas & Electric (PG&E) began construction of an elaborate system of canals, ditches, and pipelines to supply water for hydraulic mining. Miners desperately needed a reliable water supply to wash gravel and pick out the precious gold flecks hidden within. In 1853 there were three primary water companies in the region, who were constantly battling in court over claims, counterclaims, and rights-of-way: Rock Creek, Deer Creek, and South Yuba Canal Companies. The later managed to remain intact over the years and eventually became the South Yuba Water Company, which by 1905 was taken over as an essential component of PG&E. Hydroelectric power generation first gained attention in 1902, when the Central California Electric Company (a subsidiary of the South Yuba Water Company) completed construction of the Alta Power House. Now that PG&E was in the picture, plans were soon underway for an extensive water system to generate electric power. In the beginning there were delays, especially after the 1906 San Francisco earthquake, which caused the region to fall into a financial depression. Development would not get underway until 1912. By 1913, Spaulding Dam had been completed and Drum Power Plant in the Bear River Gorge was in operation. Not long after, additional plants were erected, including the Halsey Plant in Christian Valley and the Wise Plant in Auburn Ravine.

Tribal Consultation

The Native American Heritage Commission was contacted by Dudek on December 11, 2013, to request a search of the Sacred Lands File. The Native American Heritage Commission responded on December 19, 2013, indicating that the search failed to identify any Native American resources in the vicinity of the project area and providing a list of individuals and organizations to contact that may have additional information. Letters were sent to each of the contacts to request information on resources in the area on February 12, 2014. No responses have been received to date. Tribal correspondence documents are included in the cultural report provided in Appendix E. If any responses are received in the future, they will be forwarded to Nevada Irrigation District (NID).

Records Search Results

The records search conducted for the project by the North Central Information Center identified 16 previous studies that have been performed in the same area; of these, 5 have covered a least a portion of the project area, as shown in Table 3.4-1, Previous Cultural Resource Studies. In total, approximately 25% of the project area has been previously surveyed. The records search also identified 12 cultural resources within the records search area; of these, 5 are located within the project area (see Table 3.4-2, Previously Recorded Cultural Resources, and Figure 3.4-1, Records Research Results Map). Of the 5 previously recorded resources, 4 were combined into a single resource during a previous study and have been subsumed under a single Primary number, P-29-002740, leaving only 2 distinct resources in the area of potential effect (APE). All previously recorded resources are historic- period sites and isolates; no prehistoric resources were identified.

Table 3.4-1
Previous Cultural Resource Studies

Report Number	Year	Title	Author
Studies Covering Portions of the Record Search Area			
01602	1997	Confidential Archaeological Addendum for Timber Operations on Non-Federal Lands in California for Secret Town Amendment THP	Gillett, L.
03109	1996	Sacre THP	Allen, R.W.
03110	1996	Secret Town THP	Gillett, L., and J. Calvert
05131	1989	Archaeological Reconnaissance of the Drum–Rio Transmission Line	Dames and Moore
05763	1998	Confidential Archaeological Addendum for Timber Operations on Non-Federal Lands in California: Gearhart Ranch THP	Leonhard
05768	1996	Archaeological and Historical Resources Survey and Impact Assessment: Venture 11	Ferrier, D.C.

Table 3.4-1
Previous Cultural Resource Studies

Report Number	Year	Title	Author
07853	2006	An Archaeological Survey Report for the Wier Timber Harvesting Plan, Nevada County, California	Rogers, T.
08137	2006	An Archaeological Survey Report for the Neocochea THP	Rogers, T.
08625	2007	An Archaeological Survey Report for the Add-On to Wier Timber Harvesting Plan, Nevada County, California	Rogers, T.L.
09958	1949	Overland Emigrant Trail	Henning, A.E.
11080	2012	Cultural Resources Constraints Study of the Drum–Higgins 115 kV Wood Pole Replacement Project, Nevada and Placer Counties, California	Parus Consulting
Studies Covering a Portion of the Project Area			
00038	1964	Nevada Irrigation District Archaeological and Historical Survey (Rollins Reservoir Portion only)	Lutes, E.
05766	1994	Archaeological and Historical Resources Survey and Impact Assessment: Venture 11	Whitlock, K.
10412	2010	Report No. 10439: NRHP Evaluation, NID's Yuba-Bear Hydroelectric System, FERC No. 2266, Nevada, Sierra, and Placer Counties, California	Lloyd, J.B. et al.
10412	2009	Cultural Resources survey for the Nevada Irrigation District Yuba–Bear Hydroelectric Relicensing Project (FERC Project No. 2266), Nevada, Placer, and Sierra Counties, California, and Subsequent Addendums	Lloyd, J.B. et al.
10866	2011	Addendum To: Cultural Resources Inventory, National Register of Historic Places Evaluations, and Finding of Effect for Nevada Irrigation District's Yuba-Bear Hydroelectric Project Relicensing (FERC No. 2266)	Flint, S.S. et al.

Source: Dudek 2014 (see Appendix E).
Notes: THP = Timber Harvest Plan; NRHP = National Register of Historic Places; NID = Nevada Irrigation District; FERC = Federal Energy Regulatory Commission.

Table 3.4-2
Previously Recorded Cultural Resources

Trinomial	Period	Type	NRHP/CRHR Status	Description
Resources within the APE				
P-29-002740	Historic	Mining complex	No formal recommendation	Pits, dam/reservoir, tailings, refuse scatter, portion of Southern Pacific Railroad boxcar; incorporates P-29-003954, P-29-003955, and P-29-003956
P-29-003954	Historic	Mining camp	No formal recommendation	Incorporated into P-29-002740
P-29-003955	Historic	Railroad boxcar	No formal recommendation	Incorporated into P-29-002740
P-29-003956	Historic	Mining scar/pit	No formal recommendation	Incorporated into P-29-002740
P-29-004315	Historic	Mining road	No formal recommendation	Dirt road, retaining walls, adit, check dam

Table 3.4-2
Previously Recorded Cultural Resources

Trinomial	Period	Type	NRHP/CRHR Status	Description
Resources within the 0.5 Mile Records Search Area				
P-29-000732	Historic	Trail	Determined eligible for NRHP in 2005	Overland Emigrant Trail / Donner Trail
P-29-002165	Historic	Water ditch	No formal recommendation	Earthen ditch, 5 rock retaining walls
P-29-004363	Historic	Survey marker	No formal recommendation	Metal pipe
P-31-005475	Historic	Water ditch	No formal recommendation	Earthen ditch, 3 rock walls
P-31-005592	Historic	Mining road	No formal recommendation	Earthen cut road; prospecting pit; skid trail
P-31-005594	Historic	Survey marker	No formal recommendation	Metal pipe
P-31-005595	Historic	Isolate	No formal recommendation	One piece of sheet metal

Source: Dudek 2014.
Notes: trinomial = unique identification number assigned by North Central Information Center; NRHP = National Register of Historic Places; CRHR = California Register of Historical Resources; APE = area of potential effect.

Previously Recorded Resources

P-29-002740, -003954, -003955, -003956

This resource consists of a historic period mining complex covering an area 223 × 290 meters (730 × 950 feet). Terry Rogers originally recorded P-29-002740 in 2006 as an earthen reservoir. P-29-003954, -003955, and -003956 were recorded as three distinct resources in 2011 by Applied Earthworks. These resources, a prospecting pit and historic- refuse scatter, a railroad boxcar, and a mining scar, were later merged into a single site with P-29-002740 in 2012 by HDR, Inc. (HDR). The site is situated on a small terrace along the north bank of the Bear River where it converges with Steephollow Creek. Based on statements in the existing site records, the mining activities in this location likely occurred in the late 19th and early 20th centuries. Archival research indicates this is the location of an unnamed gold mine in Little York Township that operated from 1850 through at least the early 1870s (Lester 1873, cited in Western Mining History 2012). Topographic maps from 1902 to the present do not show a mine at this location, indicating that it was out of use by the turn of the century.

During the current survey, all of the previously recorded site features were relocated and found to be in the same general condition as last reported. No new features or artifacts were observed. The reported refuse scatter was not observed at this time, nor was it seen at the time of the 2012 survey.

P-29-004315

This resource is a historic-mining road / earthen ditch located along the northern bank of the Bear River. The resource was originally recorded in by HDR in 2012. The road/ditch consists of 15 non-contiguous segments (recorded as Segments A–O), which appear on topographic maps as early as 1949, and may be on the 1883 plat map (HDR 2012). In addition to the road and ditch segments, other historic- features include 22 rock retaining walls, a check dam, an adit (mine entrance), and two terraces cut into the hill slope to control the flow of water. Segment O and the northernmost portion of Segment J intersect with the southern extent of the current project area. Within the project area, these segments consist only of earthen ditches; none of the rock walls or other features associated with the site are located here. Two artifacts, a metal pipe and sheet metal, are located near the southern end of Segment O.

During the current survey, the earthen ditch and artifacts were observed to be in the same condition as previously reported, and no new features or artifacts were observed. The 1949 Chicago Park U.S. Geological Survey Quadrangle depicts the road/ditch extending north from the existing recorded boundary, along the northern edge of the Bear River, and then into the riverbed just south of the Bear River's confluence with Steephollow Creek. At the confluence, the road turns into a double-line trail/road and proceeds north up Steephollow Creek. No portion of the trail was observed north of the recorded boundary, as it appears to have been destroyed, either through natural forces, or through mining / gravel skimming operations in the past. Gravel skimming operations will be restricted to the riverbed itself and will not encroach upon the riverbank; therefore, the road/ditch will not be impacted or affected by project implementation.

New Recorded Resources

Chicago Park Powerhouse Road Bridge

The Chicago Park Powerhouse Road Bridge was constructed in 1963 by Ebasco Services Incorporated, New York (As-Built Drawings) and is owned and operated by the NID. The bridge is a four-span pre-stressed concrete girder bridge measuring 169 feet in length and 20 feet in width. The substructure is composed of three tapered concrete piers supported by spread tiered concrete footings, with abutments placed on either side of the Bear River embankment. Each span is 42.3 feet in width. The superstructure consists of five concrete box beams between each span, with a paved asphalt deck and metal guard rails on both sides. The bridge appears to be in original condition and no alterations were noted; the current condition of the bridge can be seen in Figures 3.4-2 and 3.4-3.

The bridge was constructed around the same time as the NID hydroelectric plant as part of the Yuba–Bear River Development Project in Chicago Park. In the 1950s, PG&E prompted an initiative to harness the powers of the Yuba and Bear Rivers. As a result, NID partnered with

PG&E to develop the Yuba–Bear Hydroelectric Project. The new partnership led to bigger and better opportunities, including the ability for NID to offer power generation services. As California began to embrace the idea of hydroelectric power plants to help meet the state's high demand for energy, NID district leaders rallied enough support to pass a $65 million bond to construct the Yuba–Bear River Power Project in 1962. The project includes four areas of development: Bowman, Dutch Flat, Chicago Park, and Rollins (NID 2014). Groundbreaking for the project took place on August 23, 1963, at what would become the site of Rollins Reservoir. The groundbreaking ceremony included the destruction of the 810-foot-long trestle railroad bridge, which once carried the trains of the Nevada County Narrow-Gauge Railroad (Barrett 2008). Most of the project was completed between 1963 and 1966 (NID 2014).

The Chicago Park Powerhouse Road Bridge was constructed as an access road for vehicles transporting materials to the powerhouse. As-built plans indicate that the bridge was under construction in 1963 and was built as part of the Yuba–Bear River Development Project.

The Chicago Park Powerhouse Road Bridge is located at the eastern edge of the northernmost section of the current project area. As the bridge is still in use, gravel skimming operations will not occur directly adjacent to the bridge in order to avoid disturbing its structural integrity. Therefore, project implementation will not directly impact or affect the bridge. Gravel skimming operations as proposed would restart industrial operations that were associated with the original construction of the bridge and occurred in the area for almost four decades. The bridge piers have been reinforced over time to mitigated scour effects caused by post-1965 gravel mining. The proposed project would include installation of cofferdams downstream of the bridge to provide a more permanent protection. The cofferdams would not be connected to the bridge and would not indirectly impact or affect the bridge. Project operations would not alter the setting or other characteristics of the resource.

Paleontological Resources

The Placer County General Plan Final EIR indicates that fossil remains have been found in sedimentary rocks and volcanic formations throughout western Placer County (County of Placer 1994). Fossilized animal remains could also exist in limestone caves in the central portion of the Sierra Nevada foothills. Paleontological resources are associated with sedimentary, metasedimentary, and alluvial geology, which primarily exists in western Placer County and does not include the project area.

The Nevada County General Plan EIR or background documents do not include any information on paleontological resources (County of Nevada 1995). There is not a high likelihood that paleontological resources would be present in the project area.

3.4.2 Relevant Plans, Policies, and Ordinances

The treatment of cultural resources is governed by federal, state, and local laws and guidelines. There are specific criteria for determining whether prehistoric and historic- sites or objects are significant and/or protected by law. Federal and state significance criteria generally focus on the resource's integrity and uniqueness, its relationship to similar resources, and its potential to contribute important information to scholarly research. Some resources that do not meet federal significance criteria may be considered significant by state criteria. The laws and regulations seek to mitigate impacts on significant prehistoric or historic- resources. The federal, state, and local laws and guidelines for protecting historical resources are summarized below.

Federal

Historical Resources

The National Historic Preservation Act of 1966 established the National Register of Historic Places (NRHP) as the official federal list of cultural resources that have been nominated by state offices for their historical significance at the local, state, or national level. Properties listed in the NRHP, or determined eligible for listing, must meet certain criteria for historical significance and possess integrity of form, location, and setting. Under Section 106 of the act and its implementing regulations, federal agencies are required to consider the effects of their actions, or those they fund or permit, on properties that may be eligible for listing or that are listed in the NRHP. The regulations in 36 CFR 60.4 describe the criteria to evaluate cultural resources for inclusion in the NRHP. Properties may be listed in the NRHP if they possess integrity of location, design, setting, materials, workmanship, feeling, and association, and they:

A. Are associated with events that have made a significant contribution to the broad patterns of our history;
B. Are associated with the lives of persons significant in our past;
C. Embody the distinctive characteristics of a type, period, or method of construction, or represent the work of a master, or possess high artistic values, or represent a significant and distinguishable entity whose components may lack individual distinction; or
D. Have yielded, or may be likely to yield, information important in prehistory or history (36 CFR 60.4).

These factors are known as "Criteria A, B, C, and D."

In addition, the resource must be at least 50 years old, except in exceptional circumstances. Eligible properties must meet at least one of the criteria and exhibit integrity, which is measured by the degree to which the resource retains its historical properties and conveys its historical character, the degree to which the original fabric has been retained, and the reversibility of the changes to the property. Archaeological sites are generally evaluated under Criterion D, which concerns the potential to yield information important in prehistory or history.

For projects that may affect waters of the United States, the Section 106 review process is typically undertaken between the U.S. Army Corps of Engineers (as part of issuing a Section 404 permit) and the State Historic Preservation Officer, and involves a four-step procedure:

- Initiate the Section 106 process by establishing the undertaking, developing a plan for public involvement, and identifying other consulting parties.
- Identify historic properties by determining the scope of efforts, identifying cultural resources, and evaluating their eligibility for inclusion in the NRHP.
- Assess adverse effects by applying the criteria of adverse effect on historic properties (resources that are eligible for inclusion in the NRHP).
- Resolve adverse effects by consulting with the State Historic Preservation Officer and other consulting agencies, including the Advisory Council on Historic Preservation, if necessary, to develop an agreement that addresses the treatment of historic properties.

The Department of the Interior has set forth Standards and Guidelines for Archaeology and Historic Preservation. These standards and guidelines are not regulatory and do not set or interpret agency policy. A project that follows the standards and guidelines generally shall be considered mitigated to a less than significant level, according to Section 15064.5(b)(3) of the California Environmental Quality Act (CEQA) Guidelines (14 CCR 15000 et seq.).

Paleontological Resources

Paleontological resources are classified as non-renewable scientific resources and are protected by several federal and state statutes, most notably by the 1906 Federal Antiquities Act (PL 59-209; 16 U.S.C. 431 et seq.; 34 Stat. 225), which calls for protection of historic landmarks, historic and prehistoric structures, and other objects of historic- or scientific interest on federal lands.

State

Historical and Archaeological Resources and Human Remains

<u>California Environmental Quality Act</u>

Under CEQA (California Public Resources Code, Section 21000 et seq.), public agencies must consider the effects of their actions on both "historical resources" and "unique archaeological resources." Pursuant to Section 21084.1, a "project that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment.” Section 21083.2 of CEQA requires agencies to determine whether proposed projects would have effects on “unique archaeological resources.”

“Historical resource” is a term of art with a defined statutory meaning (see California Public Resources Code 21084.1 and 14 CCR 15064.5(a) and 15064.5(b)). The term embraces any resource listed in or determined to be eligible for listing in the California Register of Historical Resources (CRHR). The CRHR includes resources listed in or formally determined eligible for listing in the NRHP, as well as some California State Landmarks and Points of Historical Interest.

Properties of local significance that have been designated under a local preservation ordinance (local landmarks or landmark districts) or that have been identified in a local historical resources inventory may be eligible for listing in the CRHR and are presumed to be “historical resources” for purposes of CEQA unless a preponderance of evidence indicates otherwise (California Public Resources Code 5024.1 and 14 CCR 4850). Unless a resource listed in a survey has been demolished or has lost substantial integrity, or there is a preponderance of evidence indicating that it is otherwise not eligible for listing, a lead agency should consider the resource potentially eligible for the CRHR.

In addition to assessing whether historical resources potentially impacted by a proposed project are listed or have been identified in a survey process, lead agencies have a responsibility to evaluate them against the CRHR criteria prior to making a finding as to a proposed project’s impacts to historical resources (California Public Resources Code 21084.1 and 14 CCR 15064.5(a)(3)). In general, a historical resource, under this approach, is defined as any object, building, structure, site, area, place, record, or manuscript that:

A. Is historically or archaeologically significant, or is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, or cultural annals of California; and

B. Meets any of the following criteria:

    1. Is associated with events that have made a significant contribution to the broad patterns of California’s history and cultural heritage;

    2. Is associated with the lives of persons important in our past;

    3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or

    4. Has yielded, or may be likely to yield, information important in prehistory or history (14 CCR 15064.5(a)(3)).

These factors are known as "Criteria 1, 2, 3, and 4" and parallel Criteria A, B, C, and D under the National Historic Preservation Act. The fact that a resource is not listed or determined to be eligible for listing does not preclude a lead agency from determining that it may be a historical resource (California Public Resources Code 21084.1 and 14 CCR 15064.5(a)(4)).

CEQA also distinguishes between two classes of archaeological resources: archaeological sites that meet the definition of a historical resource, as described above, and "unique archaeological resources." Under CEQA, an archaeological resource is considered unique if it:

- Contains information needed to answer important scientific research questions and there is a demonstrable public interest in that information;
- Has a special and particular quality such as being the oldest of its type or the best available example of its type; or
- Is directly associated with a scientifically recognized important prehistoric or historic event or person (California Public Resources Code 21083.2(g)).

CEQA states that if a proposed project would result in an impact that might cause a substantial adverse change in the significance of a historical resource, then an EIR must be prepared and mitigation measures and alternatives must be considered. A substantial adverse change in the significance of a historical resource means physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of a historical resource would be materially impaired (14 CCR 15064.5(b)(1)).

The CEQA Guidelines (14 CCR 15064.5(c)) also provide specific guidance on the treatment of archaeological resources, depending on whether they meet the definition of a historical resource or a unique archaeological resource. If the site meets the definition of a unique archaeological resource, it must be treated in accordance with the provisions of California Public Resources Code 21083.2.

CEQA Guidelines Section 15126.4(b) sets forth principles relevant to the means of mitigating impacts on historical resources. It provides as follows:

(1) Where maintenance, repair, stabilization, rehabilitation, restoration, preservation, conservation or reconstruction of the historical resource will be conducted in a manner consistent with the Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings (1995), Weeks and Grimmer, the project's impact on the historical resource shall generally be considered mitigated below a level of significance and thus is not significant.

(2) In some circumstances, documentation of an historical resource, by way of historic narrative, photographs or architectural drawings, as mitigation for the effects of demolition of the resource will not mitigate the effects to a point where clearly no significant effect on the environment would occur.

(3) Public agencies should, whenever feasible, seek to avoid damaging effects on any historical resource of an archaeological nature. The following factors shall be considered and discussed in an EIR for a project involving such an archaeological site:

(A) Preservation in place is the preferred manner of mitigating impacts to archaeological sites. Preservation in place maintains the relationship between artifacts and the archaeological context. Preservation may also avoid conflict with religious or cultural values of groups associated with the site.

(B) Preservation in place may be accomplished by, but is not limited to, the following:

1. Planning construction to avoid archaeological sites;
2. Incorporation of sites within parks, greenspace, or other open space;
3. Covering the archaeological sites with a layer of chemically stable soil before building tennis courts, parking lots, or similar facilities on the site.
4. Deeding the site into a permanent conservation easement.

(C) When data recovery through excavation is the only feasible mitigation, a data recovery plan, which makes provision for adequately recovering the scientifically consequential information from and about the historical resource, shall be prepared and adopted prior to any excavation being undertaken. Such studies shall be deposited with the California Historical Resources Regional Information Center. Archaeological sites known to contain human remains shall be treated in accordance with the provisions of Section 7050.5 Health and Safety Code. If an artifact must be removed during project excavation or testing, curation may be an appropriate mitigation.

(D) Data recovery shall not be required for an historical resource if the lead agency determines that testing or studies already completed have adequately recovered the scientifically consequential information from and about the archaeological or historical resource, provided that the determination is documented in the EIR and that the studies are deposited with the California Historical Resources Regional Information Center (14 CCR 15126.4(b)).

CEQA and the California Public Records Act restrict the amount of information regarding cultural resources that can be disclosed in an EIR in order to avoid the possibility that such resources could be subject to vandalism or other damage (*Clover Valley Foundation v. City of Rocklin* (2011) 197 Cal.App.4th 200, 219). The CEQA Guidelines prohibit an EIR from including "information about the location of archaeological sites and sacred lands, or any other information that is subject to the disclosure restrictions of Section 6254 of the Government Code [part of the California Public Records Act]" (14 CCR 15120(d)). In turn, California Government Code, Section 2654 of the California Public Records Act, lists as exempt from public disclosure any records "of Native American graves, cemeteries, and sacred places and records of Native American places, features, and objects described in Sections 5097.9 and 5097.933 of the [California] Public Resources Code maintained by, or in the possession of, the Native American Heritage Commission, another state agency, or a local agency" (California Government Code, Section 6254(r)).

California Public Resources Code Sections 5097.9 and 5097.993 list the Native American places, features, and objects, the records of which are not to be publicly disclosed under the California Public Records Act: "any Native American sanctified cemetery, places of worship, religious or ceremonial site, or sacred shrine located on public property" (Section 5097.9) and any "Native American historic, cultural, or sacred site, that is listed or may be eligible for listing in the California Register of Historic Resources…, including any historic or prehistoric ruins, any burial ground, any archaeological or historic site, any inscriptions made by Native Americans at such a site, any archaeological or historic Native American rock art, or any archaeological or historic feature of a Native American historic, cultural, or sacred site" (California Public Resources Code Section 5097.993(a)(1)).

The California Public Records Act also generally prohibits disclosure of archaeological records. California Government Code Section 6254.10 provides: "Nothing in [the California Public Records Act] requires disclosure of records that relate to archaeological site information and reports maintained by, or in the possession of … a local agency, including the records that the agency obtains through a consultation process between a California Native American tribe and a state or local agency."

CEQA Guidelines, Section 15064.5(e), requires that excavation activities be stopped whenever human remains are uncovered and that the county coroner be called in to assess the remains. If the county coroner determines that the remains are those of Native Americans, the Native American Heritage Commission must be contacted within 24 hours. At that time, the lead agency must consult with the appropriate Native Americans, if any, as identified in a timely manner by the Native American Heritage Commission. Section 15064.5 of the CEQA Guidelines directs the lead agency (or applicant), under certain circumstances, to develop an agreement with the Native Americans for the treatment and disposition of the remains.

Senate Bill 297

This law addresses the disposition of Native American burials in archaeological sites and protects such remains from disturbance, vandalism, or inadvertent destruction; establishes procedures to be implemented if Native American skeletal remains are discovered during construction; and establishes the Native American Heritage Commission to resolve disputes regarding the disposition of such remains. The law has been incorporated into Section 15064.5(e) of the CEQA Guidelines.

Paleontological Resources

Consideration of paleontological resources is required by CEQA (see Appendix G of the CEQA Guidelines). Other state requirements for paleontological resource management are found in California Public Resources Code Chapter 1.7, Section 5097.5, Archaeological, Paleontological, and Historical Sites. This statute specifies that state agencies may undertake surveys, excavations, or other operations as necessary on state lands to preserve or record paleontological resources. This statute does not apply to the project because none of the property is state owned.

No state or local agencies have specific jurisdiction over paleontological resources. No state or local agency requires a paleontological collecting permit to allow for the recovery of fossil remains discovered as a result of construction-related earthmoving on state or private land on a project site.

In the absence of state or federal laws addressing how to identify and mitigate impacts on paleontological resources, lead agencies under CEQA are free to rely on guidelines developed by the Society of Vertebrate Paleontology (SVP) as found in its *Standard Procedures for the Assessment and Mitigation of Adverse Impacts to Paleontological Resources* (2010). These guidelines reflect the accepted standard of care for paleontological resources. The SVP guidelines identify two key phases in the process for protecting paleontological resources from project impacts:

- Assess the likelihood that the project's area of potential effect contains significant nonrenewable paleontological resources that could be directly or indirectly impacted, damaged, or destroyed as a result of the project.
- Formulate and implement measures to mitigate potential adverse impacts.

An important strength of SVP's approach to assessing potential impacts on paleontological resources is that the SVP guidelines provide some standardization in evaluating a study area's paleontological sensitivity. Table 3.4-3, SVP-Recommended Treatment of Paleontological Resources, defines the SVP's sensitivity categories for paleontological resources and summarizes SVP's recommended treatments to avoid adverse effects in each sensitivity category.

Table 3.4-3
SVP-Recommended Treatment of Paleontological Resources

Sensitivity Category	Mitigation Treatment
High or undetermined	An intensive field survey and surface salvage prior to earth moving, if applicable
	Monitoring by a qualified paleontological resource monitor of excavations
	Salvage of unearthed fossil remains and/or traces (e.g., tracks, trails, burrows)
	Screen washing to recover small specimens, if applicable
	Preliminary survey and surface salvage before construction begins
	Preparation of salvaged fossils to a point of being ready for curation (i.e., removal of enclosing matrix, stabilization and repair of specimens, and construction of reinforced support cradles where appropriate)
	Identification, cataloging, curation, and provision for repository storage of prepared fossil specimens
	A final report of the finds and their significance
Low or no	Rock units with low or no potential typically will not require impact mitigation measures to protect fossils

Source: SVP 2010.

SVP's guidelines also provide a working definition of *significance* as applied to paleontological resources. According to SVP, significant paleontological resources are those that fulfill one or more of the following criteria:

- Provide important information shedding light on evolutionary trends or helping to relate living organisms to extinct organisms.
- Provide important information regarding the development of biological communities.
- Demonstrate unusual circumstances in the history of life.
- Represent a rare taxon or a rare or unique occurrence; are in short supply and in danger of being destroyed or depleted.
- Have a special and particular quality, such as being the oldest of their type or the best available example of their type.
- Provide important information used to correlate strata for which it may be difficult to obtain other types of age dates (SVP 2010).

Significant paleontological resources may include vertebrate fossils and their associated taphonomic (fossilization-related) and environmental indicators, invertebrate fossils, or plant fossils.

Local

Nevada County General Plan

The Nevada County General Plan includes a chapter on cultural resources which includes goals and policies designed to protect any resources identified in the County. The County does not have a historic- resources ordinance. The goals and policies from the general plan that are applicable to the proposed project are listed below.

Goal 19.1 Identify and protect and where economically feasible restore significant archaeological and historic resources.

Objective 19.1 Encourage the inventory, protection and interpretation of the cultural heritage of Nevada County, including historical and archaeological landscapes, sites, buildings, features, artifacts.

Objective 19.2 Implement development standards, including the preservation of open space, to protect identified significant cultural sites.

Policy 19.6 Require all applications for discretionary project permits, and all applications for ministerial project permits except single family residences on individual lots shall be accompanied by a Site Sensitivity Literature Review, prepared by a qualified archaeologist or entity such as the North Central Information Center, Department of Anthropology, California State University at Sacramento.

Where review indicates significant archaeological or historical sites or artifacts are, or are likely, present, on-site field review shall be required. If a site or artifacts are discovered, the find shall be evaluated and potential significance determined. If significant cultural resources may be directly or indirectly impacted by proposed development, appropriate mitigation shall be developed and implemented in accordance with California Environmental Quality Act standards, including Appendix K, prior to onset of ground disturbance. Avoidance of significant cultural resources shall be considered the mitigation priority. Excavation of such resources shall be considered only as a last resort when sufficient planning flexibility does not permit avoidance. On-site field review, evaluation of site significance, and development of mitigation measures, as identified above, shall be performed by a qualified professional archaeologist.

Objective 19.3 Include in the development review process consideration of historic, cultural, and Native American concerns and values.

Policy 19.7 Cooperate with local historical societies and the Native American Indian community to protect significant historical, cultural and archaeological artifacts, improve access to and interpretation of unrestricted resources and archaeological history by involving them in the development review process (County of Nevada 1996).

Placer County General Plan

The Placer County General Plan includes numerous goals and policies designed to protect cultural resources. Applicable policies are listed below. The County does not have a historic resources ordinance.

Goal 5.D To identify, protect, and enhance Placer County's important historical, archaeological, paleontological, and cultural sites and their contributing environment.

5.D.3 The County shall solicit the views of the Native American Heritage Commission, State Office of Historic Preservation, North Central Information Center, and/or the local Native American community in cases where development may result in disturbance to sites containing evidence of Native American activity and/or to sites of cultural importance.

5.D.6 The County shall require that discretionary development projects identify and protect from damage, destruction, and abuse, important historical, archaeological, paleontological, and cultural sites and their contributing environment. Such assessments shall be incorporated into a Countywide cultural resource data base, to be maintained by the Division of Museums.

5.D.7 The County shall require that discretionary development projects are designed to avoid potential impacts to significant paleontological or cultural resources whenever possible. Unavoidable impacts, whenever possible, shall be reduced to a less than significant level and/or shall be mitigated by extracting maximum recoverable data. Determinations of impacts, significance, and mitigation shall be made by qualified archaeological (in consultation with recognized local Native American groups), historical, or paleontological consultants, depending on the type of resource in question (County of Placer 2013).

3.4.3 Thresholds of Significance

Methods of Analysis

The Cultural Resources Report prepared by Dudek in August 2014 consisted of a records search of the project area within a 0.5-mile radius of the site, and an intensive pedestrian survey of the APE (December 13, 2013). The APE is approximately 75 acres in size and includes parcels in both Nevada County and Placer County. The records search identified two resources in the APE with an additional seven identified outside the APE. The resources within the APE include P-29-002740, a mining complex (tailings, adits, earthen reservoir, etc.), and P-004315, a historic road/ditch. The pedestrian survey located both of these resources and identified one new historic period resource, the Chicago Park Powerhouse Road Bridge. A copy of the Cultural Resources Report is included in Appendix E (note that confidential information regarding archaeological resources is not included in the public copy of Appendix E).

Implementation of the proposed project would not require any off-site infrastructure improvements; therefore, impacts related to the damage or destruction of historical, archaeological, prehistoric, or paleontological resources during construction of off-site infrastructure are not discussed in this section. In addition, because there are no structures on the project site, impacts associated with removal of historically significant properties and/or the loss of historic integrity of such resources are not addressed. As noted above, the Chicago Park Powerhouse Road Bridge is located at the eastern edge of the northernmost section of the project area. Gravel skimming operations will not occur directly adjacent to the bridge, in order to avoid disturbing its structural integrity.

The significance criteria used to evaluate the project impacts to cultural resources are based on Appendix G of the CEQA Guidelines. According to Appendix G of the CEQA Guidelines, a significant impact related to cultural resources would occur if the project would:

A. Cause a substantial adverse change in the significance of a historical resource as defined in CEQA Guidelines Section 15064.5.

B. Cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines Section 15064.5.

C. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

D. Disturb any human remains, including those interred outside of formal cemeteries.

3.4.4 Impacts Analysis

Impact 3.4-1. The proposed project could cause a substantial adverse change in the significance of a historical or archaeological resource or unearth unknown historical or archaeological resources as well as human remains.

As discussed in Section 3.4.1, Existing Conditions, a records search for an area encompassing the proposed project site plus a 0.5-mile radius was conducted by the North Central Information Center in December 2013 and a cultural resources inventory for the project site was completed in August 2014. The records search for the project area revealed three historic period cultural resources, none of which have been formally evaluated. The two previously recorded resources consist of a mining complex and a road/earthen ditch. The mining complex (P-29-002740) appears to be the remains of an unnamed mine associated with the Little York mining camp and Little York Township. Proposed gravel skimming operations would remove rock and sediments from within the site boundary, as occurred from 1965 to 2002 before gravel skimming operations were ceased. Gravel skimming operations have occurred at the site for almost four decades; the site is clearly not in the same condition as it would have been when the site was in use or when it was abandoned. While the earthen embankments that compose the reservoir are still in their original locations, tailing piles and most of the ground surface of the site have been heavily disturbed by the previous gravel skimming activities. The gravel skimming proposed by the current project would occur in locations previously impacted and affected by the gravel skimming that occurred prior to 2002. Therefore, restarting the same skimming operations would not adversely affect or impact historical resources on the site.

The road/earthen ditch (P-29-004315) is located along the western bank of the river, above the elevation where gravel skimming operations would occur. The resource may have been an access road into the mine area, or may have been a water conveyance ditch associated with hydraulic mining at P-29-002740. In either case, it does not show up on topographic maps until 1949, which indicates it may be much more recent than the mine. At this time it is not possible to make a direct connection between the road/ditch and the mine, although it would be reasonable to conclude they are related. As this resource is located above the proposed skimming operations, it will not be impacted or affected by the project.

The Chicago Park Powerhouse Road Bridge, a newly recorded resource, was built in 1963 to service operations in association with the Rollins Reservoir and the Chicago Park Powerhouse, including hauling rock and sediments removed from the river during gravel skimming prior to 2002. The bridge, which is located at the edge of the proposed gravel skimming operation location, is currently in use. Gravel skimming will not occur directly adjacent to the bridge and will not directly impact or affect the bridge. As gravel skimming operations were part of the original activities associated with the bridge construction, restarting such activities would not be considered an indirect effect nor would it adversely impact the resource; the setting of the resource would also not be altered in any way.

Scour protection would be placed downstream of the existing bridge, at approximately the same height as the existing concrete bases of the two bridge piers. The scour protection will be metal sheet piles placed perpendicular to the stream and backfilled with aggregate. While the scour protection would introduce a new visual element to the stream, it would not be connected to the existing structure and would not extend vertically above the existing pier bases. Therefore, placement of scour protection would not have a significant effect on this resource. It will however, have the positive effect of protecting the integrity of this resource.

A review of relevant policies from the Placer County and Nevada County General Plans indicate that the project is consistent with the goals and policies from both plans and the project applicant has conducted the required site analysis to identify the presence (or absence) of any archaeological or historical resources.

The records search results indicate that the proposed project site has a moderate sensitivity for identifying subsurface prehistoric archaeological sites and historic period cultural resources, most likely in closer proximity to the Bear River. Although there are no known resources on the proposed project site, recorded resources are documented in the vicinity. There is a potential that subsurface historic or prehistoric resources or human remains could be encountered during skimming operations or minor roadway repair on the haul route (per MM-TRA-1). Due to the type of activity, it is highly unlikely any resource would be unearthed; however, if such resources are encountered during construction associated with the proposed project, they could be damaged, destroyed, or removed, resulting in a loss of integrity. This would be considered a **potentially significant impact**. Recommended mitigation measures (MMs) are provided in Section 3.4.5 (MM-CUL-1 and MM-CUL-2) and the level of significance after mitigation is shown in Section 3.4.6.

Impact 3.4-2. The proposed project could directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

As discussed in Section 3.4.1, Existing Conditions, no significant paleontological resources have been recorded in or around the project area. In areas where the geological formations are not exposed, paleontological resources would typically not be visible where the ground has not been disturbed and the formations exposed. However, paleontological resources could be damaged or destroyed during skimming operations, similar to archaeological resources. The potential for discovery and disturbance of paleontological resources exists throughout the project area.

As discussed above, there are geological units that could contain fossils or other resources of paleontological value. Field surveys and record searches have not identified these resources within the project area; therefore, it is not likely they could be damaged or destroyed during skimming operations. There is no evidence that the soils underlying the project area contain any geologic formations that could contain fossilized resources. Therefore, this would be considered a **less than significant impact.**

3.4.5 Mitigation Measures

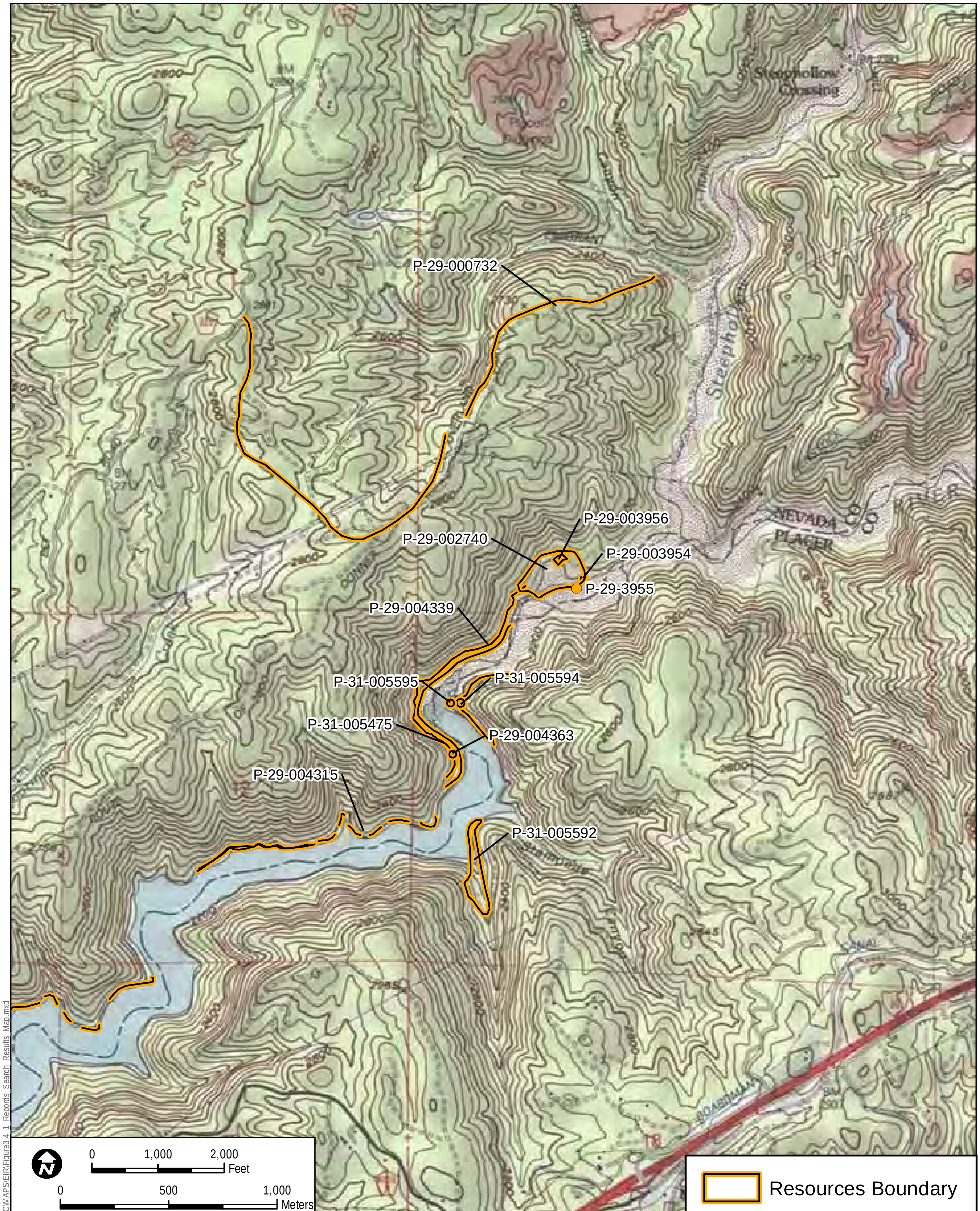
If evidence of historic or prehistoric artifacts or sites or human remains are uncovered during skimming operations, MM-CUL-1 would require that all work cease within 100 feet of the find so that artifacts or remains are not disturbed by equipment. MM-CUL-1 reduces impacts to unknown cultural resources that qualify as either historical resources or unique archaeological resources by requiring avoidance, where feasible, or appropriate study, handling, and recordation of such resources. MM-CUL-2 also calls for following the procedures established in the Health and Safety Code with regard to human remains.

MM-CUL-1 **Proper Handling of Archaeological Resources.** If any cultural resources, such as structural features, unusual amounts of bone or shell, artifacts, human remains, or architectural remains are encountered during any construction activities, work shall be suspended within 100 feet of the find, and the project applicant shall immediately notify the Nevada County Planning Director (if located within Nevada County) or the Placer County Community Development Director (if located within Placer County) and coordinate any necessary investigation of the site with a qualified archaeologist as needed to assess the resource (i.e., whether it is a "historical resource" or a "unique archaeological resource") and provide proper management recommendations should potential impacts to the resource be found to be significant. Possible management recommendations for historical or unique archaeological resources could include resource avoidance or, where avoidance is infeasible in light of the project or is unnecessary to avoid significant effects, data recovery excavations. In consultation with the archaeologists, the contractor shall implement any measures deemed by the appropriate county's staff to be necessary and feasible to avoid or minimize significant effects to the cultural resources.

MM-CUL-2 **Accidental Discovery of Human Remains.** Pursuant to Section 5097.98 of the California Public Resources Code and Section 7050.5 of the California Health and Safety Code, as well as California Environmental Quality Act Guidelines Section 15064.5(e), in the event of the discovery of human remains, the appropriate County Coroner shall be immediately notified. If the remains are determined to be Native American, guidelines of the Native American Heritage Commission shall be adhered to in the treatment and disposition of the remains.

3.4.6 Level of Significance After Mitigation

Compliance with MM-CUL-1 and MM-CUL-2 would reduce Impact 3.4-1 to **less than significant**.



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SOURCE: USGS 7.5-Minute Series Chicago Park Quadrangle.

FIGURE 3.4-1

Records Search Results Map

BEAR RIVER SEDIMENT REMOVAL AT ROLLINS RESERVOIR EIR

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Figure 3.4-2 Chicago Park Powerhouse Bridge, Facing Northwest

Figure 3.4-3 Chicago Park Powerhouse Bridge, Detail Photo, Facing Northeast

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3.5 GREENHOUSE GAS EMISSIONS

This section describes the characteristics of global climate change, identifies associated regulatory requirements, and evaluates potentially adverse impacts related to greenhouse gas (GHG) emissions during construction and operation of the proposed Bear River Sediment Removal at Rollins Reservoir Project (proposed project). As no significant impacts related to GHG emissions were identified during the analysis, no mitigation measures are required.

3.5.1 Existing Conditions

Climate change refers to any significant change in measures of climate, such as temperature, precipitation, or wind, lasting for an extended period (decades or longer). The Earth's climate has undergone many changes during its history, ranging from ice ages to long periods of warmth. Natural factors such as volcanic eruptions, changes in the Earth's orbit, and the amount of energy received from the Sun have affected global temperatures and thus the Earth's climate. Gases that trap heat in the atmosphere are often called GHGs. The greenhouse effect traps heat in the troposphere through a threefold process: short-wave radiation emitted by the Sun is absorbed by the Earth; the Earth emits a portion of this energy in the form of long-wave radiation; and GHGs in the upper atmosphere absorb this long-wave radiation and emit it into space and back toward the Earth. This "trapping" of the long-wave (thermal) radiation emitted back toward the Earth is the underlying process of the greenhouse effect.

The greenhouse effect is a natural process that contributes to regulating the Earth's temperature. Without it, the temperature of the Earth would be about 0 degrees Fahrenheit (°F) (−18 degrees Celsius (°C)) instead of its current 57°F (14°C). Global climate change concerns are focused on whether human activities are leading to an enhancement of the greenhouse effect.

Principal GHGs include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), ozone (O_3), and water vapor (H_2O). Some GHGs, such as CO_2, CH_4, and N_2O, can occur naturally and are emitted into the atmosphere through natural processes and human activities. Of these gases, CO_2 and CH_4 are emitted in the greatest quantities from human activities. Emissions of CO_2 are largely byproducts of fossil-fuel combustion, whereas CH_4 results mostly from off-gassing associated with agricultural practices and landfills. Man-made GHGs, which have a much greater heat-absorption potential than CO_2, include fluorinated gases, such as hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF_6), and nitrogen trifluoride (NF_3), which are associated with certain industrial products and processes (CAT 2006).

The effect each GHG has on climate change is measured as a combination of the mass of its emissions and the potential of a gas or aerosol to trap heat in the atmosphere, known as its global warming potential (GWP). The GWP varies between GHGs; for example, the GWP of CH_4 is 21, and the GWP of N_2O is 310. Total GHG emissions are expressed as a function of how much warming would be caused by the same mass of CO_2. Thus, GHG gas emissions are typically measured in terms of pounds or tons of CO_2 equivalent (CO_2E).[1]

Contributions to Greenhouse Gas Emissions

In 2012, the United States produced 6,526 million metric tons (MMT) of CO_2E (EPA 2014). The primary GHG emitted by human activities in the United States was CO_2, representing approximately 82 percent of total GHG emissions.

According to the 2012 GHG inventory data compiled by California Air Resources Board (CARB) for the California Greenhouse Gas Inventory for 2000–2012, California emitted 458.67 MMT CO_2E of GHGs, including emissions resulting from out-of-state electrical generation (CARB 2014a). The primary contributors to GHG emissions in California are transportation, electric power production from both in-state and out-of-state sources, industry, agriculture and forestry, and other sources, which include commercial and residential activities. These primary contributors to California's GHG emissions and their relative contributions in 2012 are presented in Table 3.5-1, GHG Sources in California.

Table 3.5-1
GHG Sources in California

Source Category	Annual GHG Emissions (MMT CO_2E)	% of Total[a]
Agriculture	37.86	8.3%
Commercial and residential uses	42.28	9.2%
Electricity generation	95.09[b]	20.7%
Industrial uses	89.16	19.4%
Recycling and waste	8.49	1.9%
Transportation	167.38	36.5%
High GWP substances	18.41	4.0%
Totals	**458.67**	**100%**

Source: CARB 2014a.
Notes: MMT CO_2E = million metric tons of carbon dioxide equivalent; GWP = global warming potential.
[a] Percentage of total has been rounded.
[b] Includes emissions associated with imported electricity, which account for 44.07 MMT CO_2E annually.

Potential Effects of Human Activity on Climate Change

According to CARB, some of the potential impacts in California of global warming may include loss of snowpack, sea level rise, more extreme heat days per year, more high O_3 days, more large forest fires, and more drought years (CARB 2006). Several recent studies have attempted to explore the possible negative consequences that climate change, left unchecked, could have in

[1] The CO_2 equivalent for a gas is derived by multiplying the mass of the gas by the associated GWP, such that metric tons of CO_2E = (metric tons of a GHG) × (GWP of the GHG). For example, the GWP for CH_4 is 21. This means that emissions of 1 metric ton of CH_4 are equivalent to emissions of 21 metric tons of CO_2.

California. These reports acknowledge that climate scientists' understanding of the complex global climate system and the interplay of the various internal and external factors that affect climate change remains too limited to yield scientifically valid conclusions on such a localized scale. Substantial work has been done at the international and national level to evaluate climatic impacts, but far less information is available on regional and local impacts.

The primary effect of global climate change has been a rise in average global tropospheric temperature of 0.2°C (0.36°F) per decade, determined from meteorological measurements worldwide between 1990 and 2005. Climate change modeling using emission rates from the year 2000 shows that further warming would occur, which would induce further changes in the global climate system during the current century. Changes to the global climate system and ecosystems and to California are expected to include, but would not be limited to, the following:

- The loss of sea ice and mountain snowpack, resulting in higher sea levels and higher sea surface evaporation rates with a corresponding increase in tropospheric water vapor due to the atmosphere's ability to hold more water vapor at higher temperatures (IPCC 2007)
- A rise in global average sea level primarily due to thermal expansion and melting of glaciers and ice caps and the Greenland and Antarctic ice sheets (IPCC 2007)
- Changes in weather that include widespread changes in precipitation, ocean salinity, and wind patterns and more energetic aspects of extreme weather, including droughts, heavy precipitation, heat waves, extreme cold, and increased intensity of tropical cyclones (IPCC 2007)
- A decline of Sierra snowpack, which accounts for approximately half of the surface water storage in California, by 70 percent to as much as 90 percent over the next 100 years (CAT 2006)
- An increase in the number of days conducive to O_3 formation by 25 percent to 85 percent (depending on the future temperature scenario) in high O_3 areas of Los Angeles and the San Joaquin Valley by the end of the 21st century (CAT 2006)
- A high potential for erosion of California's coastlines and seawater intrusion into the delta and levee systems due to the rise in sea level (CAT 2006).

3.5.2 Relevant Plans, Policies, and Ordinances

Regulation of GHGs in the United States and California is relatively recent, beginning early in the 2000s. In the absence of major federal efforts, California's former governor, Arnold Schwarzenegger, and the legislature took the initiative to establish goals for reductions of GHG emissions in California and to prescribe a regulatory approach to ensuring that the goals would be met. The federal government, primarily through actions of the U.S. Environmental Protection

Agency (EPA), has also begun to regulate GHG emissions, although not as comprehensively. This section provides a brief foundation for these regulatory efforts and discusses the key federal, state, and local regulatory efforts that could apply to development under the project and the users of such development.

Federal Activities

Massachusetts v. EPA. On April 2, 2007, in *Massachusetts v. EPA*, the U.S. Supreme Court directed the EPA administrator to determine whether GHG emissions from new motor vehicles cause or contribute to air pollution that may reasonably be anticipated to endanger public health or welfare, or whether the science is too uncertain to make a reasoned decision. In making these decisions, the EPA administrator is required to follow the language of Section 202(a) of the Clean Air Act. On December 7, 2009, the administrator signed a final rule with two distinct findings regarding GHGs under Section 202(a) of the Clean Air Act:

- The administrator found that elevated concentrations of GHGs—CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6—in the atmosphere threaten the public health and welfare of current and future generations. This is referred to as the "endangerment finding."
- The administrator further found the combined emissions of GHGs—CO_2, CH_4, N_2O, and HFCs—from new motor vehicles and new motor vehicle engines contribute to the GHG air pollution that endangers public health and welfare. This is referred to as the "cause or contribute finding."

These two findings were necessary to establish the foundation for regulation of GHGs from new motor vehicles as air pollutants under the Clean Air Act.

Energy Independence and Security Act. On December 19, 2007, President George W. Bush signed the Energy Independence and Security Act of 2007. Among other key measures, the act requires the following, which would aid in the reduction of national GHG emissions:

1. Increase the supply of alternative fuel sources by setting a mandatory Renewable Fuel Standard requiring fuel producers to use at least 36 billion gallons of biofuel in 2022.
2. Set a target of 35 miles per gallon (mpg) for the combined fleet of cars and light trucks by model year 2020 and direct National Highway Traffic Safety Administration (NHTSA) to establish a fuel economy program for medium- and heavy-duty trucks and create a separate fuel economy standard for work trucks.
3. Prescribe or revise standards affecting regional efficiency for heating and cooling products and procedures for new or amended standards, energy conservation, energy

efficiency labeling for consumer electronic products, residential boiler efficiency, electric motor efficiency, and home appliances.

EPA and NHTSA Joint Final Rule for Vehicle Standards. On April 1, 2010, the EPA and NHTSA announced a joint final rule to establish a national program consisting of new standards for light-duty vehicles model years 2012 through 2016. The joint rule is intended to reduce GHG emissions and improve fuel economy. The EPA approved the first-ever national GHG emissions standards under the Clean Air Act, and NHTSA approved Corporate Average Fuel Economy (CAFE) standards under the Energy Policy and Conservation Act (75 FR 25324–25728).

The EPA GHG standards require new passenger cars, light-duty trucks, and medium-duty passenger vehicles to meet an estimated combined average emissions level of 250 grams of CO_2 per mile in model year 2016, equivalent to 35.5 mpg if the automotive industry were to meet this CO_2 level through fuel economy improvements alone. The CAFE standards for passenger cars and light trucks will be phased in between 2012 and 2016, with the final standards equivalent to 37.8 mpg for passenger cars and 28.8 mpg for light trucks, resulting in an estimated combined average of 34.1 mpg. Together, these standards will cut GHG emissions by an estimated 960 MMT and save 1.8 billion barrels of oil over the lifetime of the vehicles sold under the program. The rules will simultaneously reduce GHG emissions, improve energy security, increase fuel savings, and provide clarity and predictability for manufacturers (EPA 2010).

In August 2012, the EPA and NHTSA approved a second round of GHG and CAFE standards for model years 2017 and beyond (77 FR 62624–63200). These standards will reduce motor vehicle GHG emissions to 163 grams of CO_2 per mile, which is equivalent to 54.5 mpg if this level were achieved solely through improvements in fuel efficiency, for cars and light-duty trucks by model year 2025. A portion of these improvements, however, will likely be made through reductions in air conditioning leakage and through the use of alternative refrigerants, which would not contribute to fuel economy. The first phase of the CAFE standards (for model year 2017 to 2021) is projected to require, on an average industry fleet-wide basis, a range from 40.3 to 41.0 mpg in model year 2021. The second phase of the CAFE program (for model years 2022 to 2025) is projected to require, on an average industry fleet-wide basis, a range from 48.7 to 49.7 mpg in model year 2025. The second phase of standards has not been finalized due to the statutory requirement that the NHTSA set average fuel economy standards not more than 5 model years at a time. The regulations also include targeted incentives to encourage early adoption and introduction into the marketplace of advanced technologies to dramatically improve vehicle performance, including the following:

- Incentives for electric vehicles, plug-in hybrid electric vehicles, and fuel-cell vehicles
- Incentives for hybrid technologies for large pickup trucks and for other technologies that achieve high fuel economy levels on large pickup trucks

- Incentives for natural gas vehicles
- Credits for technologies with potential to achieve real-world GHG reductions and fuel economy improvements that are not captured by the standard test procedures

State of California

AB 1493. Assembly Bill (AB) 1493 (Pavley), enacted on July 22, 2002, required CARB to set GHG emission standards for passenger vehicles, light-duty trucks, and other vehicles determined by the state board to be vehicles whose primary use is noncommercial personal transportation in the state. The bill required that CARB set GHG emission standards for motor vehicles manufactured in 2009 and all subsequent model years. CARB adopted the standards in September 2004. It is expected that compliance with the standards for model years 2009–2012 resulted in a reduction of about 22 percent in GHG emissions compared to the emissions from the 2002 fleet, while the mid-term (2013–2016) standards will result in a reduction of about 30 percent.

Before these regulations could go into effect, the EPA had to grant California a waiver under the federal Clean Air Act, which ordinarily preempts state regulation of motor vehicle emission standards. The waiver was granted by Lisa Jackson, the EPA administrator, on June 30, 2009. On March 29, 2010, the CARB executive officer approved revisions to the motor vehicle GHG standards to harmonize the state program with the national program for 2012–2016 model years (see EPA and NHTSA Joint Final Rule for Vehicle Standards). The revised regulations became effective April 1, 2010.

SB 1078. Approved by Governor Gray Davis in September 2002, Senate Bill (SB) 1078 (Sher) established the Renewal Portfolio Standard program, which requires an annual increase in renewable generation by the utilities equivalent to at least 1 percent of sales, with an aggregate goal of 20 percent by 2017. This goal was subsequently accelerated, requiring utilities to obtain 20 percent of their power from renewable sources by 2010 (see SB 107 and Executive Orders S-14-08 and S-21-09.)

Executive Order S-3-05. In June 2005, Governor Schwarzenegger established California's GHG emissions reduction targets in Executive Order S-3-05. The executive order established the following goals: GHG emissions should be reduced to 2000 levels by 2010, GHG emissions should be reduced to 1990 levels by 2020, and GHG emissions should be reduced to 80 percent below 1990 levels by 2050. The California Environmental Protection Agency secretary is required to coordinate efforts of various agencies to collectively and efficiently reduce GHGs. The California Climate Action Team is responsible for implementing global warming emissions reduction programs. Representatives from several state agencies compose the California Climate Action Team. Under the executive order, the California Environmental Protection Agency secretary is directed to report biannually on progress made toward meeting the GHG targets and the impacts to California due to global warming, including impacts to water supply, public health, agriculture, the coastline, and forestry. The California Climate Action Team fulfilled its initial report requirements through the 2006 *Climate Action Team Report to Governor Schwarzenegger and the Legislature* (CAT 2006).

The 2009 *Climate Action Team Biennial Report* (CAT 2010a), published in April 2010, expands on the policy outlined in the 2006 assessment. The 2009 report provides new information and scientific findings regarding the development of new climate and sea level projections using new information and tools that have recently become available and evaluates climate change within the context of broader social changes, such as land use changes and demographics. The 2009 report also identifies the need for additional research in several different aspects that affect climate change in order to support effective climate change strategies. The aspects of climate change determined to require future research include vehicle and fuel technologies, land use and smart growth, electricity and natural gas, energy efficiency, renewable energy and reduced carbon energy sources, low-GHG technologies for other sectors, carbon sequestration, terrestrial sequestration, geologic sequestration, economic impacts and considerations, social science, and environmental justice.

Subsequently, the 2010 *Climate Action Team Report to Governor Schwarzenegger and the California Legislature* (CAT 2010b) reviews past Climate Action Milestones including voluntary reporting programs, GHG standards for passenger vehicles, the Low Carbon Fuel Standard (LCFS), a statewide renewable energy standard, and the cap-and-trade program. Additionally, the 2010 report includes cataloguing of recent research and ongoing projects; mitigation and adaptation strategies identified by sector (e.g., agriculture, biodiversity, electricity, and natural gas); actions that can be taken at the regional, national, and international levels to mitigate the adverse effects of climate change; and today's outlook on future conditions. The 2010 report also focuses on case studies involving collaborative efforts among multiple agencies on research projects related to climate change and policy development.

SB 107. Approved by Governor Arnold Schwarzenegger on September 26, 2006, SB 107 (Simitian) requires investor-owned utilities such as Pacific Gas & Electric, Southern California Edison, and San Diego Gas & Electric to generate 20 percent of their electricity from renewable sources by 2010. Previously, state law required that this target be achieved by 2017 (see SB 1078).

AB 32. In furtherance of the goals established in Executive Order S-3-05, the legislature enacted AB 32 (Núñez and Pavley), the California Global Warming Solutions Act of 2006, which Governor Schwarzenegger signed on September 27, 2006. The GHG emissions limit is equivalent to the 1990 levels, which are to be achieved by 2020.

CARB has been assigned to carry out and develop the programs and requirements necessary to achieve the goals of AB 32. Under AB 32, CARB must adopt regulations requiring the reporting and verification of statewide GHG emissions. This program will be used to monitor and enforce compliance with the established standards. CARB is also required to adopt rules and regulations to achieve the maximum technologically feasible and cost-effective GHG emission reductions. AB 32 allows CARB to adopt market-based compliance mechanisms to meet the specified requirements. Finally, CARB is ultimately responsible for monitoring compliance and enforcing any rule, regulation, order, emission limitation, emission reduction measure, or market-based compliance mechanism adopted.

The first action under AB 32 resulted in the adoption of a report listing early-action GHG emission reduction measures on June 21, 2007. The early actions include three specific GHG control rules. On October 25, 2007, CARB approved an additional six early-action GHG reduction measures under AB 32. The three original early-action regulations meeting the narrow legal definition of "discrete early action GHG reduction measures" consist of the following:

1. A low-carbon fuel standard to reduce the "carbon intensity" of California fuels
2. Reduction of refrigerant losses from motor vehicle air conditioning system maintenance to restrict the sale of "do-it-yourself" automotive refrigerants
3. Increased methane capture from landfills to require broader use of state-of-the-art methane capture technologies

The additional six early-action regulations, which were also considered "discrete early action GHG reduction measures," consist of the following:

1. Reduction of aerodynamic drag, and thereby fuel consumption, from existing trucks and trailers through retrofit technology
2. Reduction of auxiliary engine emissions of docked ships by requiring port electrification
3. Reduction of PFC emissions from the semiconductor industry
4. Reduction of propellants in consumer products (e.g., aerosols, tire inflators, and dust removal products)
5. Requirements that all tune-up, smog check, and oil change mechanics ensure proper tire inflation as part of overall service in order to maintain fuel efficiency
6. Restriction on the use of SF_6 from non-electricity sectors if viable alternatives are available

As required under AB 32, on December 6, 2007, CARB approved the 1990 GHG emissions inventory, thereby establishing the emissions limit for 2020. The 2020 emissions limit was set at 427 MMT CO_2E. In addition to the 1990 emissions inventory, CARB also adopted regulations requiring mandatory reporting of GHGs for the large facilities that account for 94 percent of GHG emissions from industrial and commercial stationary sources in California. About 800 separate sources fall under the new reporting rules and include electricity generating facilities, electricity retail providers and power marketers, oil refineries, hydrogen plants, cement plants, cogeneration facilities, and other industrial sources that emit CO_2 in excess of specified thresholds.

On December 11, 2008, CARB approved the *Climate Change Proposed Scoping Plan: A Framework for Change* (Scoping Plan; CARB 2008) to achieve the goals of AB 32. The Scoping Plan establishes an overall framework for the measures that will be adopted to reduce California's GHG emissions. The Scoping Plan evaluates opportunities for sector-specific reductions, integrates all CARB and CAT early actions and additional GHG reduction measures by both entities, identifies additional measures to be pursued as regulations, and outlines the role of a cap-and-trade program.

The key elements of the Scoping Plan include the following:

- Expanding and strengthening existing energy efficiency programs as well as building and appliance standards
- Achieving a statewide renewables energy mix of 33 percent
- Developing a California cap-and-trade program that links with other Western Climate Initiative partner programs to create a regional market system and caps sources contributing 85 percent of California's GHG emissions
- Establishing targets for transportation-related GHG emissions for regions throughout California, and pursuing policies and incentives to achieve those targets
- Adopting and implementing measures pursuant to existing state laws and policies, including California's clean car standards, goods movement measures, and the LCFS
- Creating targeted fees, including a public goods charge on water use, fees on high GWP gases, and a fee to fund the administrative costs of the State of California's long-term commitment to AB 32 implementation

The First Update to the Climate Change Scoping Plan (Scoping Plan Update) was approved by the CARB Board on May 22, 2014. The Scoping Plan Update builds upon the initial Scoping Plan with new strategies and recommendations. The update identifies opportunities to leverage existing and new funds to further drive GHG emission reductions through strategic planning and targeted low carbon investments. The update defines CARB's climate change priorities for the next 5 years and sets the groundwork to reach California's long-term climate goals set forth in Executive Orders S-3-05 and B-16-2012. The update highlights California's progress toward meeting the near-term 2020 GHG emission reduction goals defined in the initial Scoping Plan. These efforts were pursued to achieve the near-term 2020 goal and have created a framework for ongoing climate action that can be built upon to maintain and continue economic sector-specific reductions beyond 2020, as required by AB 32. The Scoping Plan Update identifies nine key focus areas or sectors: energy, transportation, agriculture, water, waste management, and natural and working lands, along with short-lived climate pollutants, green buildings, and the cap-and-trade program (CARB 2014b). The update also recommends that a statewide mid-term target and mid-term and long-term sector targets be established toward meeting the 2050 goal established by Executive Order S-3-05 to reduce California's GHG emissions to 80 percent below 1990 levels, although no specific recommendations are made.

SB 1368. In September 2006, Governor Schwarzenegger signed SB 1368, which requires the California Energy Commission (CEC) to develop and adopt regulations for GHG emissions performance standards for the long-term procurement of electricity by local publicly owned utilities. These standards must be consistent with the standards adopted by the California Public Utilities Commission (CPUC). This effort will help protect energy customers from financial risks associated with investments in carbon-intensive generation by allowing new capital investments in power plants whose GHG emissions are as low as or lower than new combined-cycle natural gas plants by requiring imported electricity to meet GHG performance standards in California and by requiring that the standards be developed and adopted in a public process.

Executive Order S-1-07. Issued on January 18, 2007, Executive Order S-1-07 sets a declining LCFS for GHG emissions measured in CO_2E grams per unit of fuel energy sold in California. The target of the LCFS is to reduce the carbon intensity of California passenger vehicle fuels by at least 10 percent by 2020. The carbon intensity measures the amount of GHG emissions in the lifecycle of a fuel, including extraction/feedstock production, processing, transportation, and final consumption, per unit of energy delivered. CARB adopted the implementing regulation in April 2009. The regulation is expected to increase the production of biofuels, including those from alternative sources, such as algae, wood, and agricultural waste. In addition, the LCFS would drive the availability of plug-in hybrid, battery electric, and fuel-cell power motor vehicles. The LCFS is anticipated to lead to the replacement of 20 percent of the fuel used in motor vehicles with alternative fuels by 2020.

SB 97. In August 2007, the legislature enacted SB 97 (Dutton), which directs the Governor's Office of Planning and Research to develop guidelines under the California Environmental Quality Act (CEQA) for the mitigation of GHG emissions. On April 13, 2009, the Office of Planning and Research submitted to the Secretary for Natural Resources its proposed amendments to the CEQA Guidelines (14 CCR 15000 et seq.). On July 3, 2009, the California Natural Resources Agency (CNRA) commenced the Administrative Procedure Act rulemaking process for certifying and adopting the proposed amendments, starting the public comment period. The CNRA adopted the amendments to the guidelines on December 30, 2009. The amendments were approved by the Office of Administrative Law and submitted to the Secretary of State on February 16, 2010. The amendments became effective on March 18, 2010.

The amendments added and revised several sections of the CEQA Guidelines, providing guidance for addressing analysis and mitigation of the effects of GHG emissions. The changes included the following:

- Requiring a lead agency to "make a good faith effort, based to the extent possible on scientific and factual data, to describe, calculate or estimate the amount of greenhouse gas emission resulting from a project" (Section 15064(a))
- Providing a lead agency with the discretion to determine whether to use quantitative or qualitative analysis or performance standards to determine the significance of GHG emissions resulting from a particular project (Section 15064.4(a))
- Requiring a lead agency to consider the following factors when assessing the significant impacts from GHG emissions on the environment:
    - The extent to which the project may increase or reduce GHG emissions as compared to the existing environmental setting
    - Whether the project emissions exceed a threshold of significance the leady agency determines applies to the project
    - The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions (Section 15064.4(b))
- Allowing lead agencies to consider feasible means of mitigating the significant effects of GHG emissions, including reductions in emissions through the implementation of project features or off-site measures, including offsets that are not otherwise required (Section 15126.4(c))

The amended guidelines also establish two new guidance questions regarding GHG emissions in the Environmental Checklist set forth in CEQA Guidelines, Appendix G:

- Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?
- Would the project conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

The adopted amendments do not establish a GHG emission threshold; instead, they allow a lead agency to develop, adopt, and apply its own thresholds of significance or those developed by other agencies or experts.[2] The CNRA also acknowledges that a lead agency may consider compliance with regulations or requirements implementing AB 32 in determining the significance of a project's GHG emissions.[3]

SB 375. In August 2008, the legislature passed, and on September 30, 2008, Governor Schwarzenegger signed, SB 375 (Steinberg), which addresses GHG emissions associated with the transportation sector through regional transportation and sustainability plans. Regional GHG reduction targets for the automobile and light-truck sector for 2020 and 2035, as determined by CARB, are required to consider the emission reductions associated with vehicle emission standards (see SB 1493), the composition of fuels (see Executive Order S-1-07), and other CARB-approved measures to reduce GHG emissions. Regional metropolitan planning organizations will be responsible for preparing a Sustainable Communities Strategy (SCS) within their Regional Transportation Plan. The goal of the SCS is to establish a development plan for the region, which, after considering transportation measures and policies, will achieve the GHG reduction targets, if feasible. If an SCS is unable to achieve the GHG reduction target, a metropolitan planning organization must prepare an alternative planning strategy demonstrating how the GHG reduction target would be achieved through alternative development patterns, infrastructure, or additional transportation measures or policies. SB 375 provides incentives for streamlining CEQA requirements by substantially reducing the requirements for "transit priority projects," as specified in SB 375, and eliminating the analysis of the impacts of certain residential projects on global warming and the growth- inducing impacts of those projects when the projects are consistent with the SCS or alternative planning strategy. On September 23, 2010, CARB adopted the SB 375 targets for the regional metropolitan planning organizations.

Executive Order S-13-08. Governor Schwarzenegger issued Executive Order S-13-08 on November 14, 2008. The executive order is intended to hasten California's response to the impacts of global climate change, particularly sea level rise. It directs state agencies to take specified actions to assess and plan for such impacts. It directs the CNRA, in cooperation with the California Department of Water Resources, CEC, California's coastal management agencies, and the Ocean Protection Council, to request that the National Academy of Sciences prepare a Sea Level Rise Assessment Report by December 1, 2010. The Ocean Protection Council, California Department of Water Resources, and CEC, in cooperation with other state agencies,

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2 "The CEQA Guidelines do not establish thresholds of significance for other potential environmental impacts, and SB 97 did not authorize the development of a statement threshold as part of this CEQA Guidelines update. Rather, the proposed amendments recognize a lead agency's existing authority to develop, adopt, and apply their own thresholds of significance or those developed by other agencies or experts" (CNRA 2009a, p. 84).

3 "A project's compliance with regulations or requirements implementing AB 32 or other laws and policies is not irrelevant. Section 15064.4(b)(3) would allow a lead agency to consider compliance with requirements and regulations in the determination of significance of a project's greenhouse gas emissions" (CNRA 2009a, p. 100).

are required to conduct a public workshop to gather information relevant to the Sea Level Rise Assessment Report. The Business, Transportation, and Housing Agency was ordered to assess within 90 days of the order the vulnerability of the state's transportation systems to sea level rise. The Governor's Office of Planning and Research and the CNRA are required to provide land use planning guidance related to sea level rise and other climate change impacts. The order also requires the other state agencies to develop adaptation strategies by June 9, 2009, to respond to the impacts of global climate change that are predicted to occur over the next 50 to 100 years. A discussion draft adaptation strategies report was released in August 2009, and the final adaptation strategies report was issued in December 2009. To assess the state's vulnerability, the report summarizes key climate change impacts to the state for the following areas: public health, ocean and coastal resources, water supply and flood protection, agriculture, forestry, biodiversity and habitat, and transportation and energy infrastructure. The report then recommends strategies and specific responsibilities related to water supply, planning and land use, public health, fire protection, and energy conservation.

Executive Order S-14-08. On November 17, 2008, Governor Schwarzenegger issued Executive Order S-14-08. This Executive Order focuses on the contribution of renewable energy sources to meet the electrical needs of California while reducing GHG emissions from the electrical sector. The governor's order requires that retail suppliers of electricity in California serve 33 percent of their load with renewable energy by 2020. Furthermore, the order directs state agencies to take appropriate actions to facilitate reaching this target. The CNRA is directed to lead this effort, through collaboration with the CEC and California Department of Fish and Game (CDFG).[4] Pursuant to a Memorandum of Understanding between the CEC and CDFG creating the Renewable Energy Action Team, these agencies will create a "one-stop" process for permitting renewable energy power plants.

Executive Order S-21-09. On September 15, 2009, Governor Schwarzenegger issued Executive Order S-21-09. This Executive Order directed CARB to adopt a regulation consistent with the goal of Executive Order S-14-08 by July 31, 2010. CARB is further directed to work with the CPUC and CEC to ensure that the regulation builds upon the Renewable Portfolio Standard program and is applicable to investor-owned utilities, publicly-owned utilities, direct access providers, and community choice providers. Under this order, CARB is to give the highest priority to those renewable resources that provide the greatest environmental benefits with the least environmental costs and impacts on public health, and that can be developed most quickly in support of reliable, efficient, cost-effective electricity system operations.

[4] In January 2013, the California Department of Fish and Game (CDFG) officially changed its name to the California Department of Fish and Wildlife (CDFW). In this document, references to guidance or documents from the department before the name change use CDFG, whereas references after 2012 use CDFW.

Senate Bill X1 2. On April 12, 2011, Governor Jerry Brown signed SB X1 2 in the First Extraordinary Session, which would expand the Renewable Portfolio Standard by establishing a goal of 20 percent of the total electricity sold to retail customers in California per year by December 31, 2013, and 33 percent by December 31, 2020, and in subsequent years. Under the bill, a renewable electrical generation facility is one that uses biomass, solar thermal, photovoltaic, wind, geothermal, fuel cells using renewable fuels, small hydroelectric generation of 30 megawatts or less, digester gas, municipal solid waste conversion, landfill gas, ocean wave, ocean thermal, or tidal current and that meets other specified requirements with respect to its location. In addition to the retail sellers covered by SB 107, SB X1 2 adds local publicly owned electric utilities to the Renewable Portfolio Standard. By January 1, 2012, the CPUC is required to establish the quantity of electricity products from eligible renewable energy resources to be procured by retail sellers in order to achieve targets of 20 percent by December 31, 2013; 25 percent by December 31, 2016; and 33 percent by December 31, 2020. The statute also requires that the governing boards for local publicly owned electric utilities establish the same targets and that the governing boards be responsible for ensuring compliance with these targets. The CPUC will be responsible for enforcement of the Renewable Portfolio Standard for retail sellers, while the CEC and CARB will enforce the requirements for local publicly owned electric utilities.

Local

Placer County Air Pollution Control District

A portion of the project is within Placer County, which is under the jurisdiction of the Placer County Air Pollution Control District (PCAPCD). The PCAPCD currently has not established a threshold of significance for construction- or operation-related GHG emissions; however, the PCAPCD recommends using a threshold of 10,000 tons of CO_2E per year for industrial projects (PCAPCD n.d.).

Northern Sierra Air Quality Management District

A portion of the project is under the jurisdiction of Nevada County, which is within the Northern Sierra Air Quality Management District (NSAQMD). The NSAQMD comprises three contiguous, mountainous, rural counties in northeastern California (Nevada, Sierra, and Plumas Counties). The NSAQMD has not yet established significance thresholds for GHG emissions from project operations and recommends use of the threshold recommended by PCAPCD.

3.5.3 Thresholds of Significance

Cumulative Nature of Climate Change

Global climate change is a cumulative impact; a project contributes to this potential impact through its incremental contribution combined with the cumulative increase of all other sources of GHGs. There are currently no established thresholds for assessing whether the GHG emissions of an individual project would be considered a cumulatively considerable contribution to global climate change; however, all reasonable efforts should be made to minimize a project's contribution to global climate change.

While the project would result in emissions of GHGs during construction and operation, no guidance exists to indicate what level of GHG emissions would be considered substantial enough to result in a significant adverse impact on global climate. However, it is generally believed that an individual project is of insufficient magnitude by itself to influence climate change or result in a substantial contribution to the global GHG inventory, as scientific uncertainty regarding the significance of a project's individual and cumulative effects on global climate change remains.

Thus, GHG impacts are recognized as exclusively cumulative impacts; there are no non-cumulative GHG emission impacts from a climate change perspective (CAPCOA 2008). This approach is consistent with that recommended by the CNRA, which noted in its public notice for the proposed CEQA amendments that the evidence indicates that in most cases, the impact of GHG emissions should be considered in the context of a cumulative impact, rather than a project-level impact (CNRA 2009b). Similarly, the *Final Statement of Reasons for Regulatory Action on the CEQA Amendments* confirms that an EIR or other environmental document must analyze the incremental contribution of a project to GHG levels and determine whether those emissions are cumulatively considerable (CNRA 2009a). Accordingly, further discussion of the project's GHG emissions and their impact on global climate is included below.

CEQA Guidelines

CEQA Guidelines Appendix G, *Environmental Checklist Form*, includes the following questions for evaluating environmental impacts related to GHG emissions:

1. Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?
2. Would the project conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

Status of Proposed PCAPCD and NSAQMD Thresholds

As previously mentioned, neither the PCAPCD nor the NSAQMD has established a threshold of significance for construction- or operations-related GHG emissions; however, the PCAPCD has recommended the use of 10,000 tons per year as a threshold for project operations.

3.5.4 Impacts Analysis

Impact 3.5-1. The project would not generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment.

Construction Impacts

Construction of the proposed project would primarily consist of setting up the site for skimming and dry mining operations, and would not require heavy-duty construction equipment or substantial hauling trips to bring materials or personnel to the site. Temporary bridges crossing Steephollow Creek and/or the Bear River would be placed at the beginning of the project season to allow access between the skimming area and the primary stockpile and staging area (the bridges would be removed at the end of the season). Additionally, gravel berms would be installed to channelize the river as the Bear River would shift throughout the year. Additional ancillary features of the project would include a staging area with fuel storage, office, maintenance shop, equipment storage, truck scales, and restrooms. Therefore, because site setup activities would not require heavy-duty construction equipment or haul or vendor trips and would not involve substantial numbers of personnel travelling to the site, these activities would generate negligible GHG emissions. As such, impacts during site setup would be considered **less than significant**.

Operational Impacts

Operation of the proposed project would produce GHG emissions associated with employee vehicles, heavy-duty diesel haul trucks, and off-road diesel equipment. GHG emissions from natural gas use and creation of solid waste are not associated with the proposed project. Electricity consumption for project operations is anticipated to be minimal.

Emissions of CO_2 were estimated using factors derived from the California Climate Action Registry's General Reporting Protocol (CCAR 2009). The results were adjusted to estimate CH_4 and N_2O emissions in addition to CO_2. The CO_2 emissions from off-road equipment and vehicles and delivery trucks, which are assumed to be diesel fueled, were adjusted by a factor derived from the relative CO_2, CH_4, and N_2O for diesel fuel as reported in the General Reporting Protocol for transportation fuels and the GWP for each GHG to estimate the emissions in units of CO_2E. The CO_2 emissions associated with worker trips were multiplied by a factor based on the assumption that CO_2 represents 95 percent of the CO_2E emissions associated with passenger vehicles (EPA 2005). The results were then converted from tons per year to metric tons per year. Table 3.5-2, Estimated Construction GHG Emissions, shows the estimated annual GHG emissions associated with the proposed project.

Table 3.5-2
Estimated Construction GHG Emissions
(metric tons CO_2E/year)

Source	Metric Tons per Year			
	CO_2	*CH_4*	*N_2O*	*CO_2E*
Off-Road Equipment	534	0.16	--	537
Motor Vehicles – On-Site				
Haul Trucks	0.51	--	--	0.51
Motor Vehicles – Off-Site				
Haul Trucks	1,358	--	--	1,359
Employee Vehicles	12	--	--	13
Total				**1,910**

Source: See Appendix C for complete results.
Notes: CO_2E = carbon dioxide equivalent; CO_2 = carbon dioxide; CH_4 = methane; N_2O = nitrous oxide.

As shown, operational emissions would not exceed the PCAPCD's industrial source threshold of 10,000 metric tons CO_2E per year. Impacts would be **less than significant**.

Impact 3.5-2. The project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs.

The proposed project is not considered a significant contributor of GHG emissions, and would not result in growth-inducing impacts or substantial population or employment growth in the region that would increase vehicle trips associated with the generation of GHG emissions. Additionally, the Nevada and Placer Counties have not developed local Climate Action Plans or climate change strategies to which the project would be subject. As such, no plans created for the purposes of reducing GHG emissions would be applicable to the proposed project. Impacts would be **less than significant**.

3.5.5 Mitigation Measures

No significant impacts would occur; therefore, no mitigation is required.

3.5.6 Level of Significance After Mitigation

All impacts related to GHG emissions would be considered **less than significant** without mitigation.

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3.6 HAZARDS AND HAZARDOUS MATERIALS

This section describes the existing hazardous materials within the vicinity of the project site, identifies associated regulatory requirements, evaluates potential impacts, and identifies mitigation measures related to implementation of the Bear River Sediment Removal at Rollins Reservoir Project (proposed project). This section also analyzes hazards related to airport safety, emergency access/evacuation, and wildland fires.

3.6.1 Existing Conditions

Site Description

The project is located in unincorporated Nevada County and Placer County, approximately 6 miles northeast of the City of Colfax. The approximately 155-acre project site is located just upstream of Rollins Reservoir, and includes an approximately 1-mile reach of the Bear River channel and an 800-foot reach of Steephollow Creek. The Chicago Park Powerhouse is located near the upstream end of the study area, to the north of the Bear River channel.

Access to the site is via the Chicago Park Powerhouse Road, off Interstate 80 (I-80). A bridge over the Bear River provides access to the Chicago Park Powerhouse and the north bank of the Bear River.

Environmental Database Resources Report

A review of federal, state, and local regulatory agency database records was used to evaluate environmental conditions of potential concern within the project site and surrounding properties within a 1-mile search radius. The search performed for this assessment was conducted by Environmental Data Resources (EDR) on August 8, 2014. No mapped sites were found in the EDR's search of available government records either on the project site or within the American Society for Testing and Materials (ASTM) standard search radius from the project site. Therefore, it does not appear that any reported hazardous materials releases have occurred in the project vicinity.

Site History

Following construction of the Rollins Reservoir Dam in 1965, sediments transported from the upper watershed have accumulated in Rollins Reservoir and the Bear River. Gravel skimming was employed between 1965 and 2002 to maintain reservoir capacity and allow for recreational use, such as boating and fishing. Suspension of mining activity in 2001/2002 has allowed the accumulation of gravel and sediments.

Nevada Irrigation District has mining rights for the project site, and the site has been designated as an "idle mine" by Nevada County, in consultation with the Office of Mine Reclamation. The approved Reclamation Plan therefore remains in place, along with current financial assurances and an Interim Management Plan (approved May 31, 2013).

Additional site history was established by reviewing topographic maps from www.historicaerials.com and aerial photographs obtained from EDR.

Aerial photos for the years 1946, 1952, 1962, 1978, 1984, 1987, 1998, 2005, 2009, 2010, and 2012 were reviewed. In the 1946 photograph, the project site is a part of a river and a wide wash. Adjacent and surrounding areas appear to be undeveloped. In photographs from 1952, 1962, and 1978, the project site and surrounding areas appear to be unchanged. In the 1984 photograph, a building is visible northeast of the subject property. In the photographs from 1987, 1998, 2005, 2009, 2010, and 2012, the project site and surrounding areas appear to be similar to the 1984 photograph.

Topographic maps for the years 1902, 1905, 1910, 1914, 1922, 1930, 1934, 1938, 1941, 1950, 1951, 1953, 1956, 1961, 1966, 1967, 1976, 1978, 1980, and 2003 were reviewed on www.historicaerials.com. In the topographic maps from 1902 through 1938, the project site is depicted at the border of Nevada and Placer Counties. A river that flows in a southwest–northeast direction runs through the project site. The Southern Pacific Railroad is depicted south of the project site and runs parallel to the river. In the 1941 map, the project site is a part of a river and I-80 runs parallel to the river. In topographic maps from 1950, 1951, 1953, 1956, 1961, 1966, and 1967, the project site and surrounding areas are similar to the 1941 topographic map. In the 1976 map, a dry lake is depicted at the southwesternmost part of the project site. The project site appears to be unchanged in 1978 and 1980. In the 2003 topographic map, the project site is depicted in a wide wash area. The lake is no longer depicted as dry and it is identified as Rollins Reservoir.

Wildland Fire Hazard

The proposed project is located within a California Department of Forestry and Fire Protection (CAL FIRE) state responsibility area and is designated as a "High Fire Hazard" severity zone (CAL FIRE 2007). Additional information on fire response is located in Section 3.10, Public Utilities and Services, of this Environmental Impact Report.

3.6.2 Relevant Plans, Policies, and Ordinances

Federal

Hazardous Waste Management

The Federal Toxic Substances Control Act (1976) and the Resource Conservation and Recovery Act of 1976 established a program administered by the U.S. Environmental Protection Agency

(EPA) for the regulation of the generation, transportation, treatment, storage, and disposal of hazardous waste. The Resource Conservation and Recovery Act was amended in 1984 by the Hazardous and Solid Waste Act, which affirmed and extended the "cradle to grave" system of regulating hazardous wastes. The use of certain techniques for the disposal of some hazardous wastes was specifically prohibited by the Hazardous and Solid Waste Act.

Hazardous Substances, Materials, and Waste

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), commonly known as Superfund, was enacted by Congress on December 11, 1980. This law provided broad federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment. CERCLA established requirements concerning closed and abandoned hazardous waste sites; provided for liability of persons responsible for releases of hazardous waste at these sites; and established a trust fund to provide for cleanup when no responsible party could be identified. CERCLA also enabled the revision of the National Contingency Plan, which provided the guidelines and procedures needed to respond to releases and threatened releases of hazardous substances, pollutants, or contaminants. The National Contingency Plan also established the National Priorities List, which is a list of contaminated sites warranting further investigation by the EPA. CERCLA was amended by the Superfund Amendments and Reauthorization Act (SARA) on October 17, 1986.

Under Title 40 of the Code of Federal Regulations (CFR), Part 112, specific facilities must prepare, amend, and implement spill prevention control and countermeasure (SPCC) plans. The SPCC rule is part of the Oil Pollution Prevention regulation, the purpose of which is to prevent oil discharges to navigable waters and adjoining shorelines. The SPCC rule applies to facilities that are engaged in drilling, producing, gathering, storing, processing, refining, transferring, distributing, using, or consuming oil and that store oil aboveground or belowground in volumes greater than 1,320 U.S. gallons or 42,000 U.S. gallons, respectively. The California Environmental Protection Agency has published a fact sheet, dated December 2007, outlining the requirements for preparing and implementing SPCC plans in California.

U.S. Department of Transportation

Transportation of hazardous materials is regulated by the U.S. Department of Transportation's Office of Hazardous Materials Safety. The office formulates, issues, and revises hazardous materials regulations under the Federal Hazardous Materials Transportation Law. The hazardous materials regulations cover hazardous materials definitions and classifications, hazard communications, shipper and carrier operations, training and security requirements, and packaging and container specifications. The hazardous materials transportation regulations are codified in 49 CFR 100–185.

The hazardous materials transportation regulations require carriers transporting hazardous materials to receive required training in the handling and transportation of hazardous materials. Training requirements include pre-trip safety inspections, use of vehicle controls and equipment including emergency equipment, procedures for safe operation of the transport vehicle, training on the properties of the hazardous material being transported, and loading and unloading procedures. All drivers must possess a commercial driver's license as required by 49 CFR 383. Vehicles transporting hazardous materials must be properly placarded. In addition, the carrier is responsible for the safe unloading of hazardous materials at the site, and operators must follow specific procedures during unloading to minimize the potential for an accidental release of hazardous materials.

State

California Hazardous Waste Control Law

The California Hazardous Waste Control Law is administered by the California Environmental Protection Agency to regulate hazardous wastes. While the Hazardous Waste Control Law is generally more stringent than the Resource Conservation and Recovery Act, until the EPA approves the California program, both the state and federal laws apply in California. The Hazardous Waste Control Law lists 791 chemicals and about 300 common materials that may be hazardous; establishes criteria for identifying, packaging, and labeling hazardous wastes; prescribes management controls; establishes permit requirements for treatment, storage, disposal, and transportation; and identifies some wastes that cannot be disposed of in landfills.

The California Code of Regulations (CCR), Title 22, Chapter 11, Article 2, Section 66261, defines hazardous waste as:

> [A] waste that exhibits the characteristics that may: (1) cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible or incapacitating reversible, illness; or (2) pose a substantial present or potential hazard to human health or environment when improperly treated, stored, transported or disposed or otherwise managed.

According to Title 22 of the CCR, substances having a characteristic of toxicity, ignitability, corrosivity, or reactivity are considered hazardous waste. Hazardous wastes are hazardous substances that no longer have a practical use, such as material that has been abandoned, discarded, spilled, or contaminated, or that is being stored prior to proper disposal.

Toxic substances may cause short-term or long-lasting health effects, ranging from temporary effects to permanent disability or death. For example, toxic substances can cause eye or skin irritation, disorientation, headache, nausea, allergic reactions, acute poisoning, chronic illness, or other adverse health effects if human exposure exceeds certain levels (the level depends on the substance involved). Carcinogens (substances known to cause cancer) are a special class of toxic substances. Examples of toxic substances include most heavy metals, pesticides, and benzene (a carcinogenic component of gasoline). Ignitable substances are hazardous because of their flammable properties. Gasoline, hexane, and natural gas are examples of ignitable substances. Corrosive substances are chemically active and can damage other materials or cause severe burns upon contact. Examples include strong acids and bases such as sulfuric (battery) acid or lye. Reactive substances may cause explosions or generate gases or fumes. Explosives, pressurized canisters, and pure sodium metal (which reacts violently with water) are examples of reactive materials.

Other types of hazardous materials include radioactive and biohazardous materials. Radioactive materials and wastes contain radioisotopes, which are atoms with unstable nuclei that emit ionizing radiation to increase their stability. Radioactive waste mixed with chemical hazardous waste is referred to as "mixed wastes." Biohazardous materials and wastes include anything derived from living organisms. They may be contaminated with disease-causing agents, such as bacteria or viruses.

California Occupational Safety and Health Administration

The California Occupational Safety and Health Administration (Cal/OSHA) is the primary agency responsible for worker safety in the handling and use of chemicals in the work place. Cal/OSHA standards are generally more stringent than federal regulations. The employer is required to monitor worker exposure to listed hazardous substances and notify workers of exposure (8 CCR 337–340). The regulations specify requirements for employee training, availability of safety equipment, accident prevention programs, and hazardous substance exposure warnings.

Cal/OSHA is the agency responsible for enforcement of the construction safety orders of 8 CCR 1529 related to asbestos removal and cleanup. Section 1529 regulates construction-related asbestos exposure involving demolition of structures, removal of asbestos-containing materials, asbestos cleanup, or excavation activities that may involve exposure to asbestos.

State Water Resources Control Board

The State Water Resources Control Board protects water quality in California by setting statewide policy. The State Water Resources Control Board supports the nine Regional Water Quality Control Boards, which, within their areas of jurisdiction, protect surface and groundwater from pollutants discharged or threatened to be discharged to the waters of the state. This protection is carried out by the Regional Water Quality Control Boards through the issuance and enforcement of National Pollutant Discharge Elimination System permits, regulation of leaking underground storage tanks and contaminated properties through the Leaking

Underground Storage Tank program and the Spills, Leaks, Investigation, and Cleanup program, respectively. Underground storage tanks are regulated under Chapter 6.7 of the California Health and Safety Code and 23 CCR 16.

California Health and Safety Code

The handling and storage of hazardous materials is regulated on the federal level by the EPA under CERCLA, as amended by SARA. Under SARA Title III, a nationwide emergency planning and response program was established that imposed reporting requirements for businesses which store, handle, or produce significant quantities of hazardous or acutely toxic substances as defined under federal laws. SARA Title III requires each state to implement a comprehensive system to inform federal authorities, local agencies, and the public when a significant quantity of hazardous, acutely toxic substances are stored or handled at a facility.

Ammonia is an example of an acutely hazardous material that is regulated by the California Office of Emergency Services under the California Accidental Release Program, the EPA under the Risk Management Program (40 CFR 68), and the OSHA under the Process Safety Management Program (OSHA 1910.119). The California Accidental Release Program and Risk Management Program require that all facilities that store, handle, or use acutely hazardous materials above a minimum quantity, known as the threshold planning quantity, are required to develop a plan and prepare supporting documentation that summarizes the facility's potential risk to the local community and identifies safety measures to reduce potential risks to the public.

In California, the handling and storage of hazardous materials is regulated by Chapter 6.95 of the California Health and Safety Code. Under Sections 25500–25543.3, facilities handling hazardous materials are required to prepare a hazardous materials business plan (HMBP). The plan provides information to the local emergency response agency regarding the types and quantities of hazardous materials stored at a facility and provide detailed emergency planning and response procedures in the event of a hazardous materials release. In the event that a facility stores quantities of specific acutely hazardous materials above the thresholds set forth by the California code, facilities are also required to prepare a Risk Management Plan and California Accidental Release Plan, which provides information on the potential impact zone of a worst-case release and requires plans and programs designed to minimize the probability of a release and mitigate potential impacts.

In California, transportation of hazardous waste is regulated under Chapter 6.5 of the California Health and Safety Code. Under Section 21560, hazardous waste generators must complete a manifest for the waste before it is transported or offered for transportation. A manifest is a shipping document that is signed by the hazardous waste generator and contains the necessary information to be in compliance with all state and federal regulations. The purpose of the manifest is to allow for the waste to be tracked from point of origin through point of disposal and for the generator or regulatory agency to verify that the waste is properly delivered without incurring any loss along the way. The enforcement agencies for the transportation of hazardous materials regulations are the California Highway Patrol and California Department of Transportation (Caltrans).

Local

Nevada County Department of Environmental Health

The Nevada County Department of Environmental Health (DEH) is the Certified Unified Program Agency for all cities and unincorporated areas within Nevada County. The DEH is responsible for carrying out a diverse range of programs with environmental protection and public health as their focus. The DEH uses California Health and Safety Codes as guidance, as well as county codes, when conducting plan reviews and inspections.

Hazardous Materials Business Plan

The purpose of the HMBP is to provide information to not only emergency response personnel such as fire and police departments, but also to the employees as to the type, quantity, and location of hazardous materials stored on site, emergency response capability of the business, and procedures for the employees. Businesses must complete an HMBP for the safe storage and use of chemicals. In general, a business must submit an HMBP if it stores/handles hazardous material equal to or greater than the minimum reportable quantities, which are 55 gallons of a liquid, 200 standard cubic feet of a compressed gas, or 500 pounds of a solid.

Nevada County Multi-Hazard Mitigation Plan (2006)

The Multi-Hazard Mitigation Plan for Nevada County is a multi-jurisdictional plan that identifies the goals, objectives, and measures for hazard mitigation and risk reduction for disasters such as earthquakes, flooding, dam or levee failure, hazardous material spills, fires, severe weather, and airborne hazards.

Nevada County Local Hazard Mitigation Plan (2011–2016)

The Local Hazard Mitigation Plan (LHMP) for the Nevada County is a document that provides the participants with a clear understanding of local risks and mitigation plans for reducing or eliminating long-term risk to people and property from natural and human-caused hazards. The Nevada LHMP identified the greatest hazard risks and vulnerabilities to Nevada County as those associated with wildland fire and flood. Hazardous materials incidents were found to be the greatest human-caused risk to the county.

Nevada County and Nevada Operational Area Emergency Operations Plan

The Nevada County and Nevada Operational Area Emergency Operations Plan, published in June 2011, describes the organization, responsibilities, and concept of operations of the Emergency Services Organization, and delineates responsibilities for each county department, agency, office, and individual in response to and recovery from a natural disaster or a man-caused incident. The Emergency Operations Plan provides the guidelines needed for emergency response planning, training, and execution throughout Nevada County. The plan also comprises the standard operating procedures for the flow of information and data within the Emergency Operations Center.

Placer County and Placer Operational Area Emergency Operations Plan

The Placer County and Placer Operational Area Emergency Operations Plan, published in December 2010, is much the same as the plan for Nevada County; however, this plan also discusses in detail the policies and responsibilities in the event of a release of solid, liquid, or gaseous hazardous materials.

Placer County Local Hazard Mitigation Plan

The purpose of the Placer County LHMP, published in April 2010, is to reduce or eliminate long-term risk to people and property from hazards. The Placer County LHMP is an update to the 2005 Placer County Multi-Hazard Mitigation Plan. The plan identifies the hazards that pose a risk to Placer County (such as dam failure, earthquakes, flooding, soil hazards, extreme weather, and wildfires) and requires mitigation measures.

Hazardous Materials Response

Placer County has a seven-person hazardous material emergency response team, four of whom are trained first responders and three of whom also received Occupational Safety and Health Administration 40-Hour Hazardous Waste Operations and Emergency Response training.

3.6.3 Thresholds of Significance

The significance criteria used to evaluate the project impacts related to hazards and hazardous materials are based on Appendix G of the California Environmental Quality Act (CEQA) Guidelines (14 CCR 15000 et seq.). According to Appendix G, a significant impact related to hazards and hazardous materials would occur if the project would:

1. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.

2. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.
3. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.
4. Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as result, would is create a significant hazard to the public or the environment.
5. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area.
6. For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area.
7. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.
8. Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including, where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.

3.6.4 Impacts Analysis

Impact 3.6-1. The project would create a potential hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.

During construction of the proposed project, fuel would be used at the site. In general, a small amount of this material would be on site at any one time. No acutely hazardous materials would be used on site during construction of the project. The materials handled would not pose a significant risk to off-site residents or workers. However, spills of hazardous materials during construction activities would potentially cause soil or groundwater contamination. This impact would be **potentially significant**. Mitigation Measure (MM) HAZ-1 through MM-HAZ-4 would address impacts associated with hazardous substance spills during construction (see Section 3.6.5, Mitigation Measures).

Approximately 5,000 gallons of fuel is expected to be stored on site during operation of the proposed project. The project may use a stationary aboveground tank or a mobile tanker truck. Fuel will be supplied to the site during the active season via tanker truck. Since the quantity of fuel storage on the project site is greater than 55 gallons during operation, an HMBP must be prepared, pursuant to Chapter 6.95, Division 20 of the California Health and

Safety Code. The completed HMBP would be submitted to the DEH via the California Environmental Reporting System.

Additionally, an SPCC Plan must be prepared in accordance with 40 CFR 112, since fuel storage on the project site is anticipated to be greater than 1,320 gallons.

Diesel fuel would be transported to the site via tanker trucks. The frequency of delivery is not currently known. Diesel fuel is classified as hazard class 3. Travel route for delivery would be via Chicago Park Powerhouse Road, which connects to Secret Town Road and I-80. The travel distance from I-80 to the project site is approximately 3.05 miles.

According to the report "Comparative Risks of Hazardous and Non-Hazardous Materials Truck Shipment Accidents/Incidents" (Battelle 2001), the hazardous materials transport accident/ incident risk per mile is estimated at 0.507 in a million for all types of hazardous materials. The hazardous materials transport accident/incident risk per mile specific to hazard class 3 (flammable liquids) is 0.708 in a million. The route from the I-80 along Chicago Park Powerhouse Road to the project site is approximately 3.05 miles each way; thus, the probability of a hazardous material incident occurring on this route is 2.15 in a million for each fuel delivery. This estimate is conservative in that it accounts for the higher risk per mile rate (0.708 instead of 0.507).

The travel route from I-80 along Chicago Park Powerhouse to the project site passes by a light rural area at the Secret Town Road exit. No schools are within the vicinity of the travel route. Transportation of hazardous materials will comply with all U.S. Department of Transportation, Caltrans, EPA, Department of Toxic Substances Control, California Highway Patrol, and California State Fire Marshal regulations. Thus, impacts associated with hazardous materials handling and deliveries would represent a **less than significant** impact.

Impact 3.6-2. The project would not create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.

The materials handled would not pose a significant risk to off-site residents or workers. However, spills of fuel would potentially cause soil, groundwater, or surface water contamination.

Nevada and Placer Counties regulate storage of chemicals through their HMBP program. As the quantity of petroleum product to be stored is greater than 55 gallons, an HMBP will need to be produced for the proposed project. Additionally, as quantities of fuel are anticipated to be greater than or equal to 1,320 gallons, an SPCC Plan must be prepared in accordance with 40 CFR 112. The SPCC plan will detail the fuel storage areas and measures to be implemented to limit and control fuel spills. These measures may include the use of bermed storage areas, equipment inspections, fueling and refueling procedures, and the use and placement of spill kits. The SPCC plan will also detail reporting requirements for fuel spills. Adherence to the requirements of existing county and federal programs and regulations would ensure that impacts would be **less than significant**.

Impact 3.6-3. The project would not emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school.

No schools or known proposed schools are located within one-quarter mile of the project site; therefore, **no impact** would occur.

Impact 3.6-4. The project would not be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as result, would is create a significant hazard to the public or the environment.

The project site is not included in the list of site compiled pursuant to California Government Code Section 65962.5. The project site is also not listed in the databases searched by EDR. Therefore, **no impact** would occur.

Impact 3.6-5. The project is not located within an airport land use plan or within two miles of a public airport or public use airport, and would not result in a safety hazard for people residing or working in the project area.

No airports are located within 2 miles of the project site; therefore, **no impact** would occur.

Impact 3.6-6. No private airstrips are within the vicinity of the project and the project would not result in a safety hazard for people residing or working in the project area.

No private airstrips are located within 2 miles of the project site; therefore, **no impact** would occur.

Impact 3.6-7. The project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.

Access to and from the gravel removal and stockpiling site will be via Chicago Park Powerhouse Road, which connects to Secret Town Road and I-80. Access across the bridge will be restricted to authorized vehicles only. The road will not be open to the public. The gate will be locked during off hours, federal holidays, and Sundays.

Therefore, the project would not impair or physically interfere with the county's evacuation plan; impacts would be **less than significant**.

In the event of an emergency at the project site, the closest fire station is Fire Station No. 30 at 24020 Fowler Road. This fire station is approximately 9 miles southwest of the project site. Table 3.6-1, Fire Stations in the Project Area, lists the closest fire stations, along with the approximate distances and response times for response to an incident at the project site. Also, according to the Placer County HMBP, the Central Hazmat Team is staffed with a hazmat team that would respond in the event of a hazardous materials emergency.

Table 3.6-1
Fire Stations in the Project Area

Fire Station	Approximate Distance to Site (miles)	Response Time (minutes)*
Placer County		
Station No. 30 – Colfax Station 24020 Fowler Road Colfax, California 95713	9	Under 6
Station No. 33 – Alta Station 33752 Alta Forestry Road Alta, California 95701	10	10–12
Central Hazmat Team Fire Station No. 10 – Bowman Station – CAL FIRE Unit Headquarters 13760 Lincoln Way Auburn, California 95603	21.5	25–30
Nevada County		
Station No. 57 18934 Colfax Highway Grass Valley, California 95945	10.5	6

Note: Response time represents the minutes to arrival at scene after dispatch.

Emergency vehicle access routes to the project site would be from I-80. The exit from I-80 would be Secret Town Road heading northwest, and then turn west onto Haul Road, which continues as Chicago Park Powerhouse Road to the project site.

Impact 3.6-8. The project may expose people or structures to a significant risk of loss, injury or death involving wildland fires, including, where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.

The project site is located within a high fire hazard severity zone. As described above, there are fire protection services within a reasonable response time of the site. The project would not introduce new residents or residential structures. It would introduce small accessory structures, including an office, restrooms, and equipment and fuel storage. Construction and operational activities, including the use of off-road vehicles and haul trucks, introduces a potential fire risk, given the high hazard rating of the surrounding area. During the fire season, which would coincide with project activities, this is considered a **potentially significant** impact. MM-HAZ-5 would address impacts associated with wildland fire risk as a result of project implementation (see Section 3.6.5).

3.6.5 Mitigation Measures

The following mitigation measures would reduce potentially significant impacts associated with hazardous substance spills during construction and operation (Impact 3.6-1).

MM-HAZ-1 Prior to operation, all contractor and subcontractor project personnel shall receive training regarding the appropriate work practices necessary to effectively comply with the applicable environmental laws and regulations, including, without limitation, hazardous materials spill prevention and response measures.

MM-HAZ-2 Hazardous materials shall not be disposed of or released onto the ground, the underlying groundwater, or any surface water. Totally enclosed containment shall be provided for all trash. All construction and maintenance waste, including trash and litter, garbage, other solid waste, petroleum products, and other potentially hazardous materials (including equipment lubricants, solvents, and cleaners), shall be removed to an appropriate waste facility permitted or otherwise authorized to treat, store, or dispose of such materials.

MM-HAZ-3 A hazardous substance management plan shall be prepared and implemented. The plan should:

- Identify all hazardous materials.
- Identify spill response materials.
- Specify procedures for notification and reporting, including internal management and local agencies (e.g., fire department, Department of Environmental Health), as needed.
- Specify measures to protect worker and public health and safety.
- Specify measures to manage and remediate wastes, as needed.

MM-HAZ-4 Hazardous materials spill kits shall be maintained on site for small spills.

The following mitigation measure would reduce potentially significant impacts associated with wildland fire risk during construction and operation (Impact 3.6-8).

MM-HAZ-5 Project operation areas, including the stockpiles, fuel and equipment storage, scales, offices, and accessory buildings, shall be cleared of dried vegetation or other materials that could serve as fire fuel. Any vehicles or equipment that normally include a spark arrester shall be equipped with an arrester in good working order.

3.6.6 Level of Significance After Mitigation

MM-HAZ-1 through MM-HAZ-4 describe the planning, training, and cleanup operations for potential hazardous material spills. Implementation of these measures would reduce Impact 3.6-1 to a level that is less than significant. MM-HAZ-5 would reduce the potential effects of Impact 3.6-4 to **less than significant**.

3.7 HYDROLOGY AND WATER QUALITY

This section describes the existing hydrology and water quality of the project site, identifies associated regulatory requirements, evaluates potential impacts, and identifies mitigation measures related to implementation of the Bear River Sediment Removal at Rollins Reservoir Project (proposed project). This section is based primarily on information, research, and analysis contained in a report titled *Draft Hydrology, Geomorphology, and Water Quality of the Bear River at the Chicago Park Powerhouse* (Hydrology Report) completed in support of the EIR by Balance Hydrologics Inc. (Balance) (see Appendix G to this Environmental Impact Report (EIR)). Additional information from public agency information sources—such as the Central Valley Regional Water Quality Control Board (RWQCB), U.S. Geological Survey (USGS), and the Federal Emergency Management Agency (FEMA)—was gathered where necessary to supplement the analysis.

3.7.1 Existing Conditions

Regional Setting and Climate

The project is located at an elevation of approximately 2,200 feet above mean sea level (msl) in the western foothill region of the Sierra Nevada. Regionally, the area is known as being part of a northwest-trending belt of metamorphic rocks that locally feature gold-bearing quartz veins (i.e., the Mother Lode) (CGS 2002). The general setting is characterized by steep river canyons, mixed coniferous forests, relatively moderate temperatures, and distinct wet and dry seasons. The average annual rainfall in the watershed[1] is about 62 inches per year, although there is substantial variation in rainfall amounts based on elevation (with rainfall increasing with elevation and proximity to the Pacific Crest). Precipitation in the project area mostly occurs between the months of November and April, predominantly in the form of rain. Accumulating snowfall in the winter and convective thunderstorms in the summer do occur in the project area, albeit rarely. Regionally, all watersheds on the western slope of the Sierra Nevada drain toward the Sacramento and San Joaquin Valleys, eventually reaching the San Francisco Bay and Pacific Ocean.

Surface Water Features and Facilities

The perennial[2] surface water features within or adjoining the project include the Bear River, Steephollow Creek (a tributary to the Bear River), and Rollins Reservoir. With the exception of the Steephollow Creek watershed, surface waters in the general region are highly regulated

[1] A *watershed* is an area of land that drains all the streams and rainfall to a common outlet such as the outflow of a reservoir, mouth of a bay, or any point along a stream channel. The word watershed is sometimes used interchangeably with drainage basin or catchment.

[2] A *perennial stream* or *perennial river* is a stream or river (channel) that has continuous flow in parts of its stream bed all year round during years of normal rainfall.

through a system of dams, diversions, canals, conduits, and powerhouses that collectively make up Nevada Irrigation District's (NID's) Yuba–Bear River Hydroelectric Project and Pacific Gas & Electric's Drum–Spaulding Project (Appendix G). In addition to generating hydroelectric power, these facilities serve important functions for agricultural and municipal water supplies, flood control, and recreation. While most of the rivers and streams coming out of the Sierra Nevada into the foothills have lengthy segments of unimpaired flow, nearly all major rivers are dammed in multiple locations and are subject to man-made diversions and discharges at various locations along their lengths.

The project site consists of a 1.25-mile reach of the Bear River, bounded upstream by the Chicago Park Powerhouse and downstream by the Rollins Reservoir, whose storage (and elevation) varies based on drought conditions, water demands, electric demands, and upstream releases. The powerhouse—a component of the NID Yuba-Bear River project—generates electricity using water from the Upper Bear River stored behind the Dutch Flat Afterbay Dam, and diverted flow from the South and Middle Yuba River drainages. Steephollow Creek joins the Bear River about 2,000 feet downstream from the powerhouse and 500 feet downstream of the Chicago Park Powerhouse Road Bridge. At this location, both perennial streams converge before eventually discharging into Rollins Reservoir at variable distances downstream (depending on the level of Rollins Reservoir). The maximum level of Rollins Reservoir is estimated to be 2,185 feet msl; this contour is roughly 2,000 feet downstream from the Steephollow Creek / Bear River confluence (see Appendix G).

Due to the low gradient of the river in this location, seemingly minor changes in reservoir level produce considerable changes in the location of the reservoir shoreline. Monthly average reservoir storage is presented in Table 3.7-1, Monthly Statistics for Reservoir Storage in Rollins Reservoir, which illustrates the seasonality of water levels in the reservoir. The reservoir storage estimates in Table 3.7-1 are based on the original topography within the reservoir and do not account for the build-up of sediment that has occurred since the reservoir was originally constructed. During wet periods, the reservoir level may remain at or near its maximum throughout the year, but during dry periods, reservoir levels may fall and stay below the maximum storage level for extended periods at a time. As indicated in Table 3.7-1, reservoir storage has been reported to be as low as 720 acre-feet in November 1976 and as high as 68,600 acre-feet in December 2005. During the summer of 2014, when field work was performed by Balance, the reservoir stage was measured to be 2,164 feet (see Appendix G). As of October 2014, the reservoir stage further declined to just over 2,150 feet msl (NID 2014). Given fluctuations in reservoir levels since 2005, the distance from the confluence of the Bear River and Steephollow Creek to the reservoir shoreline has varied from 2,000 feet to roughly 5,000 feet.

Table 3.7-1
Monthly Statistics for Reservoir Storage in Rollins Reservoir

Month	Maximum Storage (acre-feet)	Minimum Storage (acre-feet)	Average Storage (acre-feet)	Average Stage (feet)
January	67,700	7,770	58,309	2,141
February	67,200	8,940	60,440	2,149
March	67,600	13,600	62,922	2,153
April	67,340	12,500	63,367	2,159
May	66,800	10,100	62,874	2,163
June	66,800	11,400	61,300	2,166
July	66,600	12,800	59,809	2,167
August	66,600	7,910	58,286	2,166
September	66,400	5,510	46,795	2,164
October	66,900	5,170	45,183	2,162
November	67,450	720	50,553	2,160
December	68,600	6,500	54,066	2,143

Source: Appendix G. Data derived from California Data Exchange Center (CDEC) Station RLL for period from December 1964 to July 2014 and USGS Gage 11421800 for period October 1987 to October 1996.

In addition to the perennial surface waters described above, several minor ephemeral and intermittent streams enter the Bear River at various junctures along the project reach.

Watershed Characteristics

Surface water through the project reach originates from three primary sources: the Bear River upstream of the powerhouse (a 27.1-square-mile catchment), Steephollow Creek (a 23.9-square-mile catchment), and Chicago Park Powerhouse (see Figure 3.7-1). The hillsides on either side of the project reach (1.7 square miles) also contribute a small amount of runoff to the Bear River. Both the Bear River and Steephollow Creek watersheds are slender in shape, leading to low drainage densities.[3] The headwaters of the Bear River and Steephollow Creek are located roughly 15 miles northeast of the project site near Emigrant Gap, where elevations reach up to 5,800 feet msl. The majority of both watersheds are forested, with a few service roads and small privately owned parcels. Although the Yuba–Bear River Hydroelectric Project has a relatively small physical footprint when compared to the total watershed area, it has an appreciable effect not only on the frequency and magnitude of flows within the Bear River, but also on the origin of the water being discharged. For example, water from the South Yuba River watershed is diverted from Lake Spaulding and transported to the Bear River watershed through the Drum Canal. In this case, man-made improvements have facilitated the transport of water across a major watershed divide. In general, reaches located downstream of dams and/or diversions are

[3] *Drainage density* is the ratio of channel length to watershed area, and is meant to measure how efficiently water and sediment is transported within and discharged out of the watershed.

particularly susceptible to incision because the water is "sediment starved"; that is, they are more likely to dissipate energy by eroding the channel boundary since the sediment supply is low (Appendix G).

Erosion, transport and deposition of sediment, which includes clay, silt, sand, gravel, cobbles and boulders, occurs naturally in all streams and rivers at varying rates depending on factors such as watershed size, topography/relief, drainage density, climate, vegetation, soils and geology. The Gold Rush has had a profound, albeit decreasing, influence on the watershed. When gold-bearing gravels were discovered in the upper watersheds, extensive hydraulic mining operations began upstream of the project site. High-pressure jets of water (diverted from the Bear River, Steephollow Creek, and their tributaries) were used to dislodge large volumes of sand, silt, and gravel—often perched on hillsides—to search for gold. Mercury was added to the process to recover the gold as amalgam. Hydraulic mining was most intense from the 1850s to 1880s, and by 1890, mining activity ceased altogether, but not before thousands of tons of sediment were washed into the Bear River and Steephollow Creek channels (Appendix G).

The past and continuing effects of mining, as well as the regulation (damming) of the watershed, have contributed to several periods of change along the project reach, summarized from Appendix G of this EIR as follows:

- **Pre-Mining Era (pre-1850).** Scientists believe the pre-mining era channels were bedrock and boulder dominated, (Gibert 1917 and Curtis 1999, as cited in Appendix G). The river channel is thought to have been generally stable (i.e., no major changes in course or elevation), at least on a human time-scale.
- **Mining-Related Aggradation[4] (mid- to late 1800s).** As miners washed thousands of cubic yards of gravel and sediment (i.e., mine tailings) into the Bear River watershed, mine tailings mixed with natural erosion sediment settled in the lower-gradient project reach and caused the Bear River channel to aggrade by tens of feet until the 1880s (James 1989, as cited in Appendix G). Mine tailings and erosion debris continued to aggrade as high flows continued to periodically send pulses of sediment down from the upper reaches of the watershed. Field surveys of remnant terraces suggest maximum aggradation reached elevations 25 to 30 feet higher than the present-day channel bed. Aggradation is a process that continues today, especially with the presence of the ~~Rawlins~~ Rollins Reservoir, but the rate and volume of aggradation was especially pronounced following the period during which hydraulic gold mining operations occurred.

4 *Aggradation* occurs in areas in which the supply of sediment is greater than the amount of material that the hydrologic system is able to transport, leading to sediment buildup. It also occurs when storm flow velocities drop out as in the case of a river meeting a reservoir.

- **Post-Mining Incision (late 1800s to 1930s).** With the effective prohibition of hydraulic mining, channel response to the mining episode began, with incision progressing through the mine tailings and developing remnant terraces from the leftover channel fill. Based on evidence that pre-mining-era channels were bedrock and boulder dominated, it is understood that the bulk of present-day channel fill material is dominated by reworked hydraulic mining deposits.
- **General Equilibrium (mid-1900s).** The Bear River is thought to have largely equilibrated to the post-mining sediment pulse by the 1930s such that throughout the mid-1900s, sediment transport into the project reach was roughly equal to sediment transport out of the reach, estimated to have averaged 72,670 cubic yards per year (Knudsen 1995, as cited in Appendix G).
- **A New Base Level[5] (mid-1960s).** With the construction of the Rollins Reservoir Dam, a new base level was established at the downstream end of the project reach. The presence of the reservoir has led to the development of deltaic deposits and has likely led to a decrease in the gradient of the Bear River near its confluence with the reservoir along with a decrease in the reservoir capacity. Recent geophysical surveys indicate the current maximum depth of sediment to be as much as 50 feet (NorCal Geophysical 2014, as cited in Appendix G). Irrespective of the magnitude of peak flows, the downstream end of the project reach likely aggrades when reservoir levels are high (i.e., a higher base level).
- **Modern Period (late 1900s to present).** The topographic profile, sediment content, and planform[6] of the project reach continues to respond to natural variability in peak flow rates in addition to historic and ongoing anthropogenic factors. Knudsen (1995, as cited in Appendix G) estimates that gravel mining operations removed approximately 65 percent of the annual volume of gravel and sediments transported within the project reach between 1978 to 1994. R.J. Miles Company ceased gravel mining operations in 2001, though constructed terraces and stockpiles remain on-site from this past activity. Furthermore, with the commission of the Drum Afterbay and Chicago Park Powerhouse, a notable period of localized incision began immediately downstream as sediment-free discharges (combined with the effects of gravel mining) are thought to have caused the channel to incise up to 18 feet at the Chicago Park Powerhouse Road Bridge.

Overall, the past and present effects of human or human-related activities in the watershed, including historic gold mining, construction of the Rollins Reservoir Dam, commission of the

5 *Base level* is the limit below which a stream cannot erode. Upon entering a still body of water, a stream's velocity is checked and it loses its eroding power; hence, the approximate level of the surface of the still water body is the stream's base level.

6 *Planform* in geomorphology refers to the shape/characteristics of a stream system when viewed top-down from a distance (as opposed to in profile or cross-section).

Drum Afterbay and Chicago Park Powerhouse, and recent gravel mining operations, have affected both aggradation and incision in the project reach in various locations and on different time scales. Flows carrying sediment eroded from higher up in the watershed continue to periodically replenish the project reach with gravels and sediment during peak flows. The rate and volume of aggradation within the project reach is particularly high when reservoir levels are high, and when long-lasting and high magnitude peak flow events occur (i.e., "atmospheric river" types of storms, such as those that occurred in December 2005, February 1982, January 1997, and February 1986).

Flow Regimes

Based on observations of the geomorphology of the project reach and USGS stream gauge records, Balance has established three flow magnitudes as baseline information central to assessing the impacts of proposed activities along the project reach (presented in Table 3.7-2, Primary Flow Regimes):

- **Half Releases**: A half release from Chicago Park Powerhouse is a frequent flow that can inundate lower gravel bars. The discharge from these flows is estimated to be 550 cubic feet per second (cfs).
- **Full Releases**: A full release from Chicago Park Powerhouse is a frequent flow that can inundate a second set of higher elevation "middle" gravel bars. The discharge from these flows is estimated to be 1,100 cfs, and has been documented to occupy a corridor 150 feet wide below the Bear River confluence with Steephollow Creek.
- **The 100-Year Flood**: The 100-year flood is an infrequent flow that is anticipated to inundate all but the high terraces within the Bear River valley. The discharge from this flow is estimated to be 11,300 cfs.

The frequency and duration of the flood flows are such that they are considered to be a primary control on channel geometry and form downstream of the powerhouse. Table 3.7-2 lists the primary flow regimes and describes their magnitude, frequency, and typical effects on sediment transport.

On certain years, particularly drought years, the annual peak flow may be represented by the full releases from the powerhouse. For instance, in 8 of the 48 years of record for USGS Gauge No. 11421790 (located at Bear River below Dutch Flat), the annual peak was less than 100 cfs, and gauging records for nearby unregulated streams indicates that Steephollow peak flows would also have been less than 900 cfs7. During these dry years, when naturally-occurring peaks are regulated by upstream impoundments, annual peak flows on the Bear River may occur in

[7] Based on watershed scaling from Poorman Creek near Washington, California (USGS Gage No. 11417100).

September or October, when reservoirs are typically draining due to high irrigation and domestic water demands without much inflow from upper reservoirs. Without upstream flow regulation, Steephollow Creek annual peak flows nearly always occur during the wet season. The volume and velocity of the lower annual peak flows are generally insufficient to mobilize coarse bedload or result in gravel replenishment along the project reach.

On the other hand, well over half of the years on record have had peak flows controlled by high precipitation events during the winter/spring season in both the Bear River and Steephollow Creek systems. It is these wet-season flows that tend to initiate sediment transport, result in replenishment of the project reach, and control the presence/distribution of immature riparian vegetation. Such flows may cause the river channel to shift its alignment (e.g., to secondary or previously abandoned channels) and may affect the distribution of low sand/gravel bars. However, Curtis (1999, as cited in Appendix G) has concluded that only a small subset of the annual peak flows have been sufficient in magnitude to influence higher bars or fully disrupt the coarse sediment (gravels and cobbles) that make up the armored surface layer of the river channel. On these relatively rare occasions, such as the atmospheric river type events that occurred in December 2005, January 1997, February 1986, and February 1982, flows are sufficient in magnitude to generate sediment production upstream of the project site, substantially rework the morphology of the river system, control the location and maturity of riparian vegetation, and result in substantial sediment transport along the project reach. Upstream of the reservoir, such flows not only have the power to disrupt the coarse armored layer, but can completely change the location of the river channel (as confined by bedrock slopes) and rearrange all but the highest (remnant) gravel/sand bars. As indicated earlier, it is thought that such events may also result in periodic aggradation of sediment in the project reach.

Table 3.7-2
Primary Flow Regimes

Name	Approximate Frequency	Magnitude (cfs)	Typical Season	Description
Baseflow	Yearly	<25	Summer/Fall	Prevailing flow during the dry season or dry years when no releases are occurring, including baseflow. These flows have insufficient power to mobilize bed materials, and would be narrow in width, occupying only the lowest part of the channel.
Half-Release	Daily	550	Summer/Fall	Approximate flow during a half release from the powerhouse, including baseflow. This flow has insufficient power to mobilize bed materials. The flow at half release begins to inundate the low bars of the channel.
Full-Release	Daily	1,100	Summer/Fall	Approximate flow during a full release from the powerhouse, including baseflow. These flows generally have insufficient power to mobilize coarse sediments, but may mobilize fines (silt and clay particles) if present at the surface. The flow at full release begins to inundate the middle bars of the channel.

Table 3.7-2
Primary Flow Regimes

Name	Approximate Frequency	Magnitude (cfs)	Typical Season	Description
Channel/Bank-Forming Flow	10% Annual Chance	4,900	Winter/Spring	These flows have sufficient power to mobilize channel sand and gravels, and disrupt the armored surface layer of the channel bed. These flows may cause lateral incision (e.g., scour) at the edges of high bars, and may substantially rearrange the geometry of the active channel bed (e.g., channel thalweg and the low and middle bars).
100-Year Flow	1% Annual Chance	11,300	Winter/Spring	Bear River and Steephollow Creek 100-year floods + Full Release from NID powerhouse. The 100-year flow would inundate all but the highest terraces within the Bear River Valley, and would totally rearrange the channel bed geometry. Only the remnant terraces left over from and man-made piles from past gravel mining activities would remain out of the floodplain.

Source: Appendix G.
Notes: cfs = cubic feet per second; thalweg = a line drawn to join the lowest points along the entire length of a stream bed or valley in its downward slope, defining its deepest channel

Geomorphology

In March and June of 2014, staff from Balance visited the site to map key geomorphic features, record the size and composition of channel bed materials, and survey 18 cross sections along the project reach (shown on Figure 3.7-2) (Appendix G). Based on this work, Balance staff observed that the project reach had low and middle bars whose location and height that appeared to relate to the area inundated by the full and half releases from the powerhouse (Table 3.7-2). Balance developed a hydraulic model supporting such a link, although NID releases have a negligible influence on wet year peak flows that tend to rearrange the channel bed. Balance mapped several abandoned and/or secondary channels, many of which remain dry until storm flows, or possibly large releases from the powerhouse, change the channel course. As mapped on Figure 3.7-2, the low bars correspond to the surfaces that may become inundated during a half release, and the middle bars correspond to the surfaces that may become inundated during a full release. The low and middle bars are the more active set of bars—both are actively reworked during wintertime/springtime peak flows in wet (non-drought) years. Based on the presence and distribution of 15- to 20-year-old willow and alder thickets, the high bars are thought to have been formed by the peak flows that occurred in 1995 and/or 1997. The highly infrequent nature of such flows means that, in some locations, the toes of high bar deposits may be removed and/or reworked by more frequent flows within the active river channel.

The low part of terraces and abandoned stockpiles mapped on Figure 3.7-2 are thought to be inundated only on extremely rare occasions (Appendix G). These features are interpreted to represent the maximum extent of valley fill which occurred in the late 1800s, as well as the relics from past gravel mining operations (namely abandoned stockpiles). The highest terraces, located in the vicinity of the Chicago Park Powerhouse Road Bridge and east of the Steephollow Creek / Bear River confluence are out of the 100-year floodplain calculated by Balance (see Surface Water Quality section). However, the southern fringe of the terrace located about 2,000 feet downstream of the Steephollow Creek / Bear River confluence may become inundated in a 100-year flood, particularly if Rollins Reservoir happens to be at maximum capacity (see Cross Section 2609 in Figure 3.7-2 and Figure 3.7-3). The elevation (above the channel bed) of these terraces decreases with proximity to the reservoir, presumably as a result of sediment deposition within the channel in the vicinity of the reservoir.

In terms of bed composition, Balance found an armored surface layer that was fairly persistent throughout the project reach, although bed material on bars was measured to be finer than within the active channel. The surface of the river corridor consists of coarse gravels and small cobbles, and a subsurface layer of gravels, sands, and fines (i.e., silt and clay). As the reservoir water level falls, channel steepening has led to headward (upstream) erosion of the toe of these delta deposits. These headcuts are shown on Figure 3.7-2 in the vicinity of the lowest terrace, and are likely to continue to migrate upstream so long as the level of the Rollins Reservoir remains low and no major channel-forming flows or floods occur.

Scour around the base of the powerhouse has required a number of remedial efforts to protect the foundation. High flows and historic mining activity on the Bear River have created a localized scour pool in this area, and the erosive effect of these flows is thought to extend approximately 1,500 feet downstream from the powerhouse, where the Chicago Park Powerhouse Road Bridge crosses the Bear River. Channel scour has undermined the bridge pier foundations. The pier foundations have been fortified with a mix of concrete, sheet piles, and gabions, which on certain piers have more than doubled their widths.

Flood Hazards

The entire project reach is within a FEMA Special Flood Hazard Area. FEMA Flood Insurance Rate Map Panels 06057C0675E (effective date February 3, 2010) and 06061C0125F (effective date June 8, 1998) show the Special Flood Hazard Area as Zone A (Figure 3.7-3). Zone A designation means the area is subject to inundation by the 1 percent annual chance flood event (i.e., 100-year flood), but FEMA did not do the detailed hydraulic analysis necessary to determine precise base flood elevations or flood depths. Moreover, the magnitude of the 100-year flood used for inundation mapping is not presented in flood insurance studies for Placer or Nevada County.

Typical of flood maps in rural areas, the project site was mapped from low-resolution topographic data, and shows implausible overlap of the inundation extents with and areas of higher elevation and steep terrain. Balance therefore used the 100-year flow estimates shown in Table 3.7-2, combined with field surveys, geomorphic mapping, and construction of a one -dimensional hydraulic model to estimate the extents associated with the 100-year flood along the project reach. Figure 3.7-3 compares results for the 100-year flood inundation extents as mapped with the hydraulic model for this study with inundation extents as mapped by FEMA. The difference in the inundation extent shows discrepancies in floodplain mapping, largely due to the accuracy and resolution of the FEMA map, along with changes in channel bed topography between 2010 and 2014.

Although FEMA maps the entire area as being within a Special Flood Hazard Area, more detailed mapping based on peak flow magnitudes and topographic surveying show that the 100-year floodplain is largely confined to the low, mid, and high bars mapped on Figure 3.7-2. Only when Rollins Reservoir is at its maximum capacity could floodwater begin to inundate the adjacent terrace. References to the 100-year floodplain will hereafter refer to the floodplain as mapped by Balance.

Surface Water Quality

The Central Valley RWQCB is responsible for the protection of the beneficial uses of waters within the project area. The RWQCB uses its planning, permitting, and enforcement authority to meet this responsibility and has adopted the *Water Quality Control Plan for the Sacramento and San Joaquin River Basins* (Basin Plan) to implement plans, policies, and provisions for water quality management (Central Valley RWQCB 2010). The Basin Plan also includes water quality objectives that are protective of the identified beneficial uses. The beneficial uses and water quality objectives collectively make up the water quality standards for the region. The existing beneficial uses for the Bear River, Steephollow Creek, and Rollin Reservoir include municipal and domestic supply agricultural supply, hydropower generation, recreation (contact, non-contact, and canoeing), and freshwater habitat (warm and cold). The existing beneficial uses *do not* include migration of aquatic organisms or spawning, reproduction, and/or early development. However, these are listed as "potential" beneficial uses (Central Valley RWQCB 2010).

Section 303(d) Impairments

The objective of the Clean Water Act (described in Section 3.7.2) is "to restore and maintain the chemical, physical, and biological integrity of the nation's waters." Under Section 303(d) of the Clean Water Act, the State of California is required to develop a list of water-quality limited (i.e., impaired) waters that do not meet water quality standards and objectives. Being "water quality limited" means that a water body is "not reasonably expected to attain or maintain water quality standards" without additional regulation. The law requires that the U.S. Environmental Protection Agency develop total maximum daily loads (TMDLs) for each impaired water body in the nation, which specifies the maximum amount of a pollutant that a water body can receive and still meet water quality standards. A total maximum daily load may also include a plan for bringing an impaired water body back within standards.

The Central Valley RWQCB has set water quality objectives for all surface waters in the Sacramento Basin for constituents including ammonia, bacteria, biostimulatory substances, color, dissolved oxygen, floating material, oil and grease, pH, pesticides, radioactivity, salinity, sediment, settleable material, suspended material, tastes and odors, temperature, toxicity, and turbidity. In addition, specific objectives for concentrations of chemical constituents are applied to bodies of water based on their designated beneficial uses (Central Valley RWQCB 2010). The most recently approved Section 303(d) List of Water Quality Limited Segments, as listed in the 2010 Integrated Report, identifies Rollins Reservoir and the Bear River below Rollins Reservoir as impaired for mercury (SWRCB 2014). This is based on numerous water quality and tissue studies indicated past mining activities have introduces substantial mercury concentrations into the Bear River and Rollins Reservoir. The Central Valley RWQCB has a fish consumption advisory for mercury in catfish within the Rollins Reservoir (Monahan 2014).

Mercury/Methylmercury

Elemental mercury (quicksilver) was used extensively for the recovery of gold at both placer and hardrock mines throughout the western United States. In placer mine operations, loss of mercury during gold recovery was reported to be as high as 30% (USGS 1999). According to the USGS (1999), "in the Dutch Flat mining district located in the Sierra Nevada region of California, placer mines processed more than 100 million cubic yards of gold-bearing gravel. The placer ore was washed through mercury-charged ground sluices and drainage tunnels from 1857 to about 1900, during which time many thousands of pounds of mercury were released into the environment."

According to a study by USGS (1999), mine waters sampled in 1998 had total unfiltered mercury concentrations ranging from 40 to 10,400 nanograms per liter (ng/L) (0.04 to 10.4 ppb), concentrations of unfiltered methylmercury ranged from 0.01 to 1.12 ng/L (0.00001 to 0.001 ppb). Mercury concentrations in sluice-box sediments ranged from 600 to 26,000 micrograms per gram (µg/g) (26,000 parts per million (ppm), which is in excess of applicable hazardous waste criteria (20 µg/g (20 ppm)). These concentrations indicate that hundreds to thousands of pounds of mercury may remain at sites affected by hydraulic gold mining. Elevated mercury concentrations have been detected previously in fish and invertebrate tissues downstream of the placer mines. Extensive transport of remobilized placer sediments in the Bear River and other Sierra Nevada watersheds has been well documented (USGS 1999).

Previous studies in the northwestern Sierra Nevada have shown that the highest average levels of mercury bioaccumulation occur in the Bear and South Fork Yuba River watersheds; the USGS (1999) study demonstrated a positive correlation of mercury bioaccumulation with intensity of hydraulic gravel mining.

As described in Appendix G, scientists sampled 40 sites in the Greenhorn Creek system (the next watershed to the north from Steephollow Creek), and found the highest concentrations of mercury to be associated with former mining infrastructure. Based on regional correlations of hydraulic mining and elevated mercury concentrations, it is reasonable to conclude that Steephollow Creek also delivers mercury to the Bear River. Mercury concentrations tend to be greatest in mixtures dominated by silt- and clay-sized material (less than 0.0625 millimeter) because (1) small globules of mercury are transported in suspension with similar-sized material, and (2) fine sediment has adsorptive qualities that attract mercury. Once a sediment-mercury mixture is mobilized and deposited on the surface, the mercury is more readily converted from its elemental form to an organic form (e.g., methylmercury), at which point it may enter the food web. Even small amounts of mercury entering the food web is problematic since mercury concentration increases with higher trophic levels through biomagnification (Appendix G).

Aside from mercury and methylmercury, water quality is affected by increased turbidity from fine sediment. Water in the Bear River was extremely clear when Balance performed fieldwork in the summer of 2014; however, fine-grained delta deposits were observed, indicating large quantities of fine sediment are implicit to the system (Appendix G). High levels of turbidity are normal during peak flows, and NID has observed high levels of turbidity within the Bear River typically lasting until June.

Groundwater

No groundwater data was readily available for the project reach, and there are no public or private groundwater supply wells in or adjacent to the project reach. The region is not identified by the California Department of Water Resources as a groundwater basin; instead, it consists of a fractured rock aquifer, in which yield is highly variable and based on the extent, pervasiveness, width, and connectivity of fracture zones. Regionally, residents either connect to small municipal water systems or install private wells (although none are located in close proximity to the project area) (DWR 2014).

Groundwater in the project area behaves differently based on whether it resides in bedrock or whether it flows within the alluvium that forms valley bottoms. Balance excavated shallow pits, which revealed groundwater levels in alluvium adjacent to the channel are closely correlated to water levels in the Bear River (Appendix G). This is an expected result given the coarseness of the sediments found in the Bear River, where groundwater is likely to flow in the same direction, although at lower speeds, as the river itself. Groundwater within active stream channel deposits is also referred to as "throughflow." Adjacent bedrock slopes may contribute to groundwater and surface water within the river valley through seepage and springs emanating from fracture zones.

3.7.2 Relevant Plans, Policies, and Ordinances

Federal

Clean Water Act

Section 303 of the Clean Water Act requires states to adopt water quality standards for all surface waters of the United States. Water quality standards are typically numeric, although narrative criteria based on biomonitoring methods may be employed where numerical standards cannot be established or where they are needed to supplement numerical standards (see the description of the Porter-Cologne Water Quality Control Act of 1969 (Porter-Cologne Act)). Standards are based on the designated beneficial use(s) of the water body. Where multiple uses exist, water quality standards must protect the most sensitive use.

Section 402 of the Clean Water Act mandates that certain types of construction activity comply with the requirements of National Pollutant Discharge Elimination System (NPDES) stormwater program. In California, gravel mining permitting occurs under the Industrial General Permit (IGP), issued by the State Water Resources Control Board (SWRCB) and implemented and enforced by the nine RWQCBs. The current IGP (97-03-DWQ) will expire on June 30, 2015, and will be replaced by the new IGP (2014-0057-DWQ). The IGP requires stormwater dischargers to eliminate unauthorized non-stormwater discharges; develop and implement stormwater pollution prevention plans (SWPPPs); implement best management practices (BMPs); conduct monitoring; compare monitoring results to numeric action levels; perform appropriate exceedance response actions when numeric action levels are exceeded; and certify and submit all permit registration documents. In addition, under the new IGP storm water dischargers are required to: implement minimum BMPs; electronically file all permit registration documents via SMARTS[8]; comply with new training expectations and roles for qualified industrial stormwater practitioners; sample to detect exceedance of annual and instantaneous numeric action levels; develop and implement exceedance response actions if annual or instantaneous numeric action levels are exceeded; monitor for parameters listed under Clean Water Act Section 303(d); design treatment control BMPs for flow- and volume-based criteria; and understand new criteria, sampling protocols, and sampling frequency for qualifying storm events.

8 The Storm Water Multiple Application and Report Tracking System (SMARTS) is SWRCB's online tool to assist dischargers in making inquiries, filings, and applications.

Section 404 of the Clean Water Act requires that a permit be obtained from the U.S. Army Corps of Engineers prior to any activity associated with discharge of dredged or fill material into waters of the United States, including wetlands.

Section 401 of the Clean Water Act requires any person applying for a federal permit or license that may result in the discharge of pollutants into waters of the United States (including wetlands) to obtain a state certification administered by the SWRCB through the RWQCBs. In order to acquire certification, it must be demonstrated that the activity complies with all applicable water quality standards, limitations, and restrictions. No license or permit by a federal agency may be granted until Section 401 certification has been granted. Section 401 water quality certifications are typically required prior to obtaining a Section 404 permit from the U.S. Army Corps of Engineers.

National Flood Insurance Program

FEMA oversees floodplains and administers the National Flood Insurance Program adopted under the National Flood Insurance Act of 1968. The program makes federally subsidized flood insurance available to property owners within communities that participate in the program. Areas of special flood hazard (i.e. subject to inundation by a 100-year flood) are identified by FEMA through regulatory flood maps titled Flood Insurance Rate Maps. The National Flood Insurance Program mandates that development cannot occur within the regulatory floodplain (typically the 100-year floodplain) if that development results in more than 1 foot increase in flood elevation. In addition, development is not allowed in delineated floodways within the regulatory floodplain.

Executive Order 11988 (Floodplain Management) addresses floodplain issues related to public safety, conservation, and economics. It generally requires federal agencies constructing, permitting, or funding a project in a floodplain to do the following:

- Avoid incompatible floodplain development
- Be consistent with the standards and criteria of the National Flood Insurance Program
- Restore and preserve natural and beneficial floodplain values

Executive Order 11990 requires federal agencies to follow avoidance, mitigation, and preservation procedures, with public input, before proposing new construction in wetlands. It generally requires:

- Avoidance of wetlands
- Minimization of activities in wetlands
- Coordination with the U.S. Army Corps of Engineers and Clean Water Act Section 404 regarding wetlands mitigation

State

Porter-Cologne Water Quality Control Act

The Porter-Cologne Act authorized the SWRCB to provide comprehensive protection for California's waters through water allocation and water quality protection. The SWRCB implements the requirement of the Clean Water Act Section 303, indicating that water quality standards have to be set for certain waters by adopting water quality control plans under the Porter-Cologne Act. The Porter-Cologne Act established the responsibilities and authorities of the nine RWQCBs, which include preparing water quality plans for areas in the region, identifying water quality objectives, and issuing NPDES permits and Waste Discharge Requirements. Water quality objectives are defined as limits or levels of water quality constituents and characteristics established for reasonable protection of beneficial uses or prevention of nuisance. The Porter-Cologne Act was later amended to provide the authority delegated from the U.S. Environmental Protection Agency to issue NPDES permits.

Section 303(d) of the Clean Water Act requires that the SWRCB identify surface water bodies within California that do not meet established water quality standards. Once identified, the affected water body is included in the SWRCB's "303(d) Listing of Impaired Water Bodies" and a comprehensive program must then be developed to limit the amount of pollutant discharges into that water body. This program includes the establishment of total maximum daily loads for pollutant discharges into the designated water body. The most recent 303(d) listing for California was approved by the U.S. Environmental Protection Agency in 2010.

California Fish and Game Code

Sections 1600–1616 of the California Fish and Game Code require that the California Department of Fish and Wildlife be notified of activity that will substantially divert or obstruct the natural flow of any river, stream, or lake; substantially change or use any material from the bed, channel, or bank of any river, stream, or lake; or deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake. If the California Department of Fish and Wildlife determines that the activity may substantially adversely affect fish and wildlife resources, a Lake or Streambed Alteration Agreement will be prepared that outlines reasonable conditions necessary to protect natural resources threatened by the proposed activity.

Dam Safety Regulations and Inundation Mapping

Responsibility for supervision of dams and reservoirs is assigned to the California Department of Water Resources and delegated to the Division of Safety of Dams (DSOD). The DSOD oversees the construction, enlargement, alteration, repair, maintenance, operation, and removal of dams and reservoirs under the authority of the California Water Code (Division 3, Dams and Reservoirs).

The DSOD has several programs that ensure dam safety. When a new dam is proposed, DSOD engineers and geologists inspect the site and the subsurface to understand the geologic conditions. Once an application for a new dam is submitted, the DSOD reviews the plans and specifications prepared by the owner to ensure that the dam is designed to meet minimum requirements and that the design is appropriate for the known geologic conditions. During construction, the DSOD oversees the construction to ensure the work is being done in accordance with the approved plans and specifications. Following construction, the DSOD inspects each dam on an annual basis to ensure the dam is safe, is performing as intended, and is not developing problems. Roughly a third of these inspections include in-depth instrumentation reviews of the dam surveillance network data. Lastly, the DSOD periodically reviews the stability of dams and their major appurtenances in light of improved design approaches and requirements, as well as new findings regarding earthquake hazards and hydrologic estimates in California.

While there are currently no DSOD-jurisdictional dams on the project site, Rollins Reservoir Dam is located downstream of the proposed project.

Local

General Plan

The Bear River is the boundary between Placer and Nevada Counties. The project description states that gravel skimming operations will take place on both sides of the river, but will be limited to either the north or south side of the channel in a given year. The project reach is otherwise unincorporated.

The Placer County General Plan (County of Placer 2013) includes the following policies relevant to hydrology, geomorphology, and water quality:

- **Policy 6.A.10:** The County shall discourage grading activities during the rainy season, unless adequately mitigated, to avoid sedimentation of creeks and damage to riparian habitat.
- **Policy 6.A.13:** The County shall protect groundwater resources from contamination and further overdraft by pursuing the following efforts:
  - Identifying and controlling sources of potential contamination;
  - Protecting important groundwater recharge areas;
  - Encouraging the use of surface water to supply major municipal and industrial consumptive demands;

  - Encouraging the use of treated wastewater for groundwater recharge; and
  - Supporting major consumptive use of groundwater aquifer(s) in the western part of the County only where it can be demonstrated that this use does not exceed safe yield and is appropriately balanced with surface water supply to the same area.
- **Policy 6.A.15:** The County shall encourage the protection of floodplain lands and, where appropriate, acquire public easements for purposes of flood protection, public safety, wildlife preservation, groundwater recharge, access and recreation.
- **Policy 8.B.1:** The County shall promote flood control measures that maintain natural conditions within the 100-year floodplain of rivers and streams.
- **Policy 8.G.4:** The County shall ensure that the mining and processing of toxic metals in the County is conducted in compliance with applicable environmental protection standards and minimizes impacts on adjacent lands and the surrounding natural environment.
- **Policy 8.G.12:** The County shall identify sites that are inappropriate for hazardous material storage, maintenance, use, and disposal facilities due to potential impacts on adjacent land uses and the surrounding natural environment.

The Nevada County General Plan (County of Nevada 1996) includes the following policies relevant to hydrology, geomorphology, and water quality:

- **Policy 11.4:** Cooperate with State and local agencies in efforts to identify and reduce to acceptable levels all sources of existing and potential point- and non-point source pollution to ground and surface waters, including leaking fuel tanks, discharges from storm drains, auto dismantling and dump sites, sanitary waste systems, parking lots, roadways, logging and mining operations.
- **Policy 11.7:** Through the development and application of Comprehensive Site Development Standards, and project environmental review, establish and enforce minimum building setback lines from perennial streams and significant wetlands that are adequate to protect stream and wetland resource values.
- **Policy 11.9A:** Approve only those grading applications and development proposals that are adequately protected from flood hazards and which do not add flood damage potential. This may include the requirement for foundation design which minimizes displacement of flood waters, as well as other mitigation measures.
- **Policy 11.10:** Cooperate with State and Federal agencies and public and quasi-public organizations and agencies in the acquisition, restoration, and maintenance of habitat lands.

- **Policy 12.4:** Require erosion control measures as an element of all County contracts, discretionary projects, and ministerial projects.
- **Policy 17.22:** Aggregate extraction may be allowed in rivers and floodplains provided environmental impacts associated therewith are addressed through the CEQA process.
- **Policy 17.23:** Prepare a comprehensive plan for river and floodplain development that ensures aggregate operations within rivers and floodplains which have the least impact on the environment are developed before more environmentally-sensitive areas are approved and to also ensure that the environmental impacts of proposed aggregate operations within rivers and floodplains may be more readily assessed.

Grading Ordinance

The grading and erosion prevention ordinance of Placer County requires a grading permit for any grading and/or other construction activity with ground disturbance of 1 acre or more (Ord. 5407-B Section 3, 2006; Ord. 5373- B, 2005; Ord. 5056-B, 2000).

3.7.3 Thresholds of Significance

The significance criteria used to evaluate the project impacts to hydrology and water quality are based on Appendix G of the California Environmental Quality Act (CEQA) Guidelines (14 CCR 15000 et seq.). According to Appendix G, a significant impact related to hydrology and water quality would occur if the project would:

1. Violate any water quality standards or waste discharge requirements.
2. Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted).
3. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river in a manner which would result in substantial erosion or siltation on or off site.
4. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on or off site.
5. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff.
6. Otherwise substantially degrade water quality.

7. Place housing within a 100-year flood hazard areas as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map.
8. Place within a 100-year flood hazard area structures which would impede or redirect flood flows.
9. Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam.
10. Inundation by seiche, tsunami, or mudflow.

3.7.4 Impacts Analysis

Impacts of the project with respect to hydrology and water quality relate almost exclusively to seasonal excavations/earthmoving within the project reach, material screening and stockpile, and the staging and operation of vehicles and equipment. The Bear River, its tributaries, and Rollins Reservoir represent a dynamic and complex hydrologic system that is continually evolving in response to both natural and anthropogenic factors. Due to the nature of the hydrologic analysis performed by Balance, this analysis section is organized differently from the other resources topics in Chapter 3. The CEQA significance criteria addressed by each impact are listed in italics below each impact statement (Impact 3.7-1 and 3.7-2).

The Hydrology Report prepared by Balance (Appendix G) establishes the baseline hydrologic setting, provides an analysis of the potential hydrologic effects of the project, and provides recommendations for the adaptive management gravel skimming operations (included herein as mitigation measures). Because of the project's relative isolation, seasonal operation, and characteristic activities, there are certain impacts which either would not occur or would have negligible consequences. The project is located in an active stream channel with little to no public access, facilities, or infrastructure. The few exceptions include a bridge, an access road, and the Chicago Park Powerhouse (which is upstream and uphill of the project area). All of these facilities are closed to the public and owned and maintained by NID. The project proposes neither structures for human occupancy[9] nor any new fixed/permanent facilities or equipment. Therefore, the CEQA significance criteria related to exposure of people or the public to flood hazards are generally not applicable to the project.

The impacts of the project with respect to the following significance criteria are not significant for the following reasons:

- ***The project would not substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in***

[9] A *structure for human occupancy* is any structure used or intended for supporting or sheltering any use or occupancy, which is expected to have a human occupancy rate of more than 2,000 person-hours per year.

aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted). The project does not propose installation or use of a groundwater well and minor water demands (e.g., dust control) would be served from NID's existing right to surface water in the project area. Removal of material from the project reach could cause the river's low-flow channel to deepen and result in a local lowering of the shallow groundwater table. However, since NID would limit excavation depths to a level no greater than 6 inches below the standing water level, the effect would be minor, highly localized, and generally limited to the dry season until winter and springtime rains raise water levels and replenish the corridor. Furthermore, groundwater within project reach is not relied upon for domestic, municipal, or agricultural uses. Therefore, the impact with respect to this topic would be **less than significant**.

- ***The project would not create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff.*** The project is located along an unimpaired reach of the Bear River and is not served by a municipal storm drain system; instead, it is a part of NID's Yuba–Bear River project, which among other things provides water supply functions. Although it is not a "stormwater drainage system" in the traditional sense of the word, one of the project's main objectives is to restore and maintain storage capacity within Rollins Reservoir. By removing sediment from within the high water level of the Rollins Reservoir, the project increases its capacity to accept storm flows from the watershed. The project would not create or contribute to runoff to the system because operations would occur in the dry season, and because it is already located in the context of an active river channel. Finally, there would be no on-site processing or washing of excavated materials, nor would there be industrial discharges of process water. For these reasons, the proposed project would have **no impact** with respect to this topic.
- ***The project would not place housing within a 100-year flood hazard areas as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map.*** The project does not propose housing. Therefore, the project would have **no impact** with respect to this topic.
- ***The project would not place within a 100-year flood hazard area structures which would impede or redirect flood flows.*** The project would place structures and equipment within a 100-year flood-hazard area, but only during the dry season. All structures and equipment within the 100-year floodplain would be removed prior to the onset of the rainy season. Seasonal gravel skimming activities would remove bed material and ultimately increase the capacity of the Rollins Reservoir, thereby increasing its ability to hold flood flows. Although earthmoving during the gravel removal operations would

leave depressions and/or other topographic anomalies within the floodplain of the Bear River channel, these features would not represent impediments to flow or substantially redirect 100-year flood flows. Instead, a 100-year flood flow would rework and replenish such features. Because the project would not leave structures and/or anchored objects and equipment in the 100-year floodplain, the impact would be **less than significant**.

- ***The project would not expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam:*** Although the Rollins Reservoir Dam, or any dam along the Bear River, may be subject to failure (e.g., in a strong earthquake), the chances of failure are extremely low. The DSOD has oversight of dam safety, which ensures dams are safely operated and seismically resistant (described in Section 3.7.2). Regardless of the likelihood of dam failure and the project's location within the likely inundation zone, the scale of such a disaster would dwarf any effect the project might have on the depth, extent, or timing of inundation. Furthermore, the project would do nothing to increase exposure of the public or off-site properties to such a hazard. The impact of the proposed project on exposure of people or structures to significant risks would be **less than significant**.
- ***The project would not result in inundation by seiche, tsunami, or mudflow.*** There is no risk of a tsunami on the project site. Although the project area could conceivably be affected by a seiche on the Rollins Reservoir or a mudflow from the adjacent bedrock slopes, the project would do nothing to increase exposure of the public or off-site properties to such hazards. Therefore, the project would have **no impact** relating to inundation by seiche, tsunami, or mudflow.

Impact 3.7-1. The proposed gravel-skimming operation has the potential to adversely affect channel form and function, either through direct modification of the channel or inducement of channel incision that could propagate to upstream areas.

Based on field reconnaissance, channel cross sections, and hydraulic modeling, proposed gravel skimming could have a potentially significant impact with respect to channel form and function, either through direct modification of the channel or inducement of channel incision that could propagate to upstream areas.

The analysis below addresses the following criteria from Appendix G of the CEQA Guidelines:

- ***The project could substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river in a manner which would potentially result in erosion or siltation.***
- ***The project could alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase***

the rate or amount of surface runoff in a manner which would result in flooding on or off site.

- ***The project could expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam.***

As discussed in the setting, proposed activities would be within the context of an active riverbed, which means that regardless of project activities, drainage patterns are continually being altered and erosion, sedimentation, and flooding are periodically occurring under existing conditions. The proposed gravel removal operation would be considered a significant impact only insofar as it creates or accelerates undesirable effects on the natural system or NID facilities (e.g., Chicago Park Powerhouse Road Bridge footings). In the context of the watershed as a whole, proposed gravel removal operations would actually be reducing the historic effects of hydraulic mining and river engineering. The enormous volume of gravel within the system is not a totally natural condition, nor is the presence of a delta at the downstream end of the project reach. Although the project would be helping to reverse such effects, vegetation, wildlife, and even man-made facilities (i.e., the Chicago Park Powerhouse Road Bridge) have come to depend on the current condition of the Bear River as a gravel-filled stream valley.

To restore the river bed to the approximate condition of 1965, or pre-reservoir aggradation, the applicant proposes maximum removal of up to 250,000 tons per year, with a typical year (based on previous history) being closer to 50,000 tons per year. The actual volume of material removed would depend on economics, the water level of the reservoir, and the time since a high flow has replenished the gravel supply. From a mass-balance standpoint, the most obvious hydrologic effect would be to locally lower the elevation of the channel bed until a replenishing flow arrives. In the long term, high flows that deliver sediment to the river reach and reservoir would replace excavated material, but would be less likely to accumulate or aggrade within the maximum reservoir pool. This would help accomplish one of the project's primary goals (to restore the capacity of the Rollins Reservoir), but could also have adverse consequences—both direct and indirect—upstream.

Rivers and streams have a natural tendency to respond to decreases in base level by adjusting their longitudinal slope to the new base level. This adjustment occurs episodically as high flows rearrange the channel topography, most frequently in the form of an upstream-migrating headcut (or channel incision). Without adequate measures, proposed activities may accelerate the propagation of headcuts that have been mapped within the project reach (see Figure 3.7-2), or create new headcuts where gravel removal activities are proposed. Furthermore, Balance noted in its field reconnaissance and pebble counts that the river channel is characterized by an armored surface layer of coarse gravels and small cobbles, and a subsurface layer of gravels, sands, and fines. Gravel removal activities—even when limited to material 6 inches below the water level—could disturb and/or remove this armored layer and expose finer sediments that might not otherwise be exposed to flows in a typical rainy season. As indicated in Table 3.7-2, channel-forming flows have sufficient power to mobilize the coarse armored layer irrespective of proposed activities, so this impact would be limited to years with relatively low winter-time peak flow events. Without adequate provisions, a winter storm could inundate the skimmed bars and develop a preferential flow path through the skimmed area (i.e., channel avulsion). The overall effect of channel avulsion and incision would be indirect in nature since it would most likely occur during the rainy season when no activities are proposed.

However, direct effects may also occur if the channelized portion of the river during operation is too narrow to safely pass a full release from the powerhouse. The seasonal channelization of the project reach poses additional risk of incision because the current channel— which has evolved to convey the 1,100 cfs full release from the Chicago Park Powerhouse—is very wide (over 150 feet in some places). The analysis performed by Balance (Appendix G) indicates that if the channel is to be confined with dikes to something narrower than 150 feet, the tractive forces from a full release would be focused over a smaller area, thereby increasing the competence of the channel to mobilize the coarser, armored layer. Because channelization may occur when the Bear River is in a low flow (e.g., <25 cfs) or half release (e.g., 550 cfs), there may be a tendency to establish berms that are too narrow.

In either case, project-induced channel avulsion and/or incision would be problematic for several reasons. The proposed project has included cofferdams to maintain the riffle crest just downstream of the bridge footings. Properly designed, this feature would be effective in protecting NID infrastructure from scour upstream of the riffle crest. However, gravel skimming-induced channel avulsion and/or incision downstream of the cofferdams could result in a local lowering of the shallow alluvial groundwater table during low-flow periods. Although the effects would be localized, and may be reversed during wet years and high flow events, riparian vegetation may be temporarily unable to access groundwater and suffer as a consequence. If project actions are not carefully monitored to prevent incision, there is potential for significant impacts from the proposed project because incision would likely cause an increased hydraulic gradient from shallow alluvial groundwater toward the channel. This has the potential to lower the local groundwater table and adversely affect hydrologic support for riparian biota.

As discussed earlier, the local lowering of the ground surface from gravel extraction activities could result in preferential flow paths through the skimmed area (i.e., channel avulsion) or the upstream propagation of headcuts during wet-season flows. As shown in Figure 3.7-2 and described in Table 3.7-2, there are headcuts currently present in the project reach, and the sediment is periodically mobilized under existing wet season flow regimes. However, gravel extraction activities could increase the frequency and accelerate the timing of such processes, and could disrupt the coarse armored layer on a yearly basis rather than the more infrequent events (e.g., 10% annual chance) that this occurs under current conditions. The proposed activities could increase the rate at which mercury previously deposited in fine sediment in the subsurface is mobilized.

The proposed project, if not conducted carefully, would have a **potentially significant** impact with respect to these issues. However, implementation of Mitigation Measure (MM) **HYD-1** (Hydrologic Management Plan) would avoid or minimize these effects by (1) ensuring gravel removal operations are conducted in a manner that maintains a stable channel geometry, discourages channel avulsion, and prevents upstream migration of headcuts; (2) ensuring the river reach is properly decommissioned at the end of each season; and (3) continually monitoring the condition of the river and adapting the gravel removal operation as necessary. Implementation of **MM-HYD-2** (Channel Design Specifications) would ensure that the channelized portion of the Bear River is designed in a way that prevents erosive velocities.

With implementation of **MM-HYD-1** and **MM-HYD-2**, the impacts of the project on incision and avulsion would be **less than significant**.

Impact 3.7-2. The effects of mining and associated activities (cofferdams, temporary roads and bridges, stockpiling, hauling) have the potential to adversely affect water quality in the Bear River and downstream in Rollins Reservoir.

The analysis addresses the following criteria from Appendix G of the CEQA Guidelines:

- ***The project could violate water quality standards or waste discharge requirements.***
- ***The project could otherwise substantially degrade water quality.***

It is important to note that the project does not add to the mercury content in the watershed as a whole. On the contrary, by exporting fine sediment that is not economically viable, the project would actually decrease the total mercury content within the watershed—mercury that might otherwise have been mobilized and discharged into Rollins Reservoir. The removal of fine sediment that would occur under the proposed project would likewise decrease the total amount of particulate-bound mercury that would be available for methylation. In addition, as discussed in the setting, flows of a high enough magnitude (generally above 4,900 cfs) periodically rework the geometry of the river corridor and transport particulate-bound mercury to the Rollins Reservoir. Thus, mercury and sediment is periodically mobilized by flows and transported to the Rollins Reservoir under the existing hydrologic regime. As the Rollins Reservoir is impaired under CWA Section 303(d) for mercury, the prevailing standard is for projects to reduce the potential for mercury mobilization and methylation to the maximum extent practicable.

Although the project, by exporting fine sediment, would reduce the total mercury load present within the river system, disturbances associated with the proposed gavel skimming operations could increase the bioavailability of mercury through transport in the water column and through methylation within standing water bodies. Although particulate bound mercury is mobilized in channel-forming flows or higher under existing conditions, proposed skimming would remove the coarse “armored” layer, thereby decreasing the magnitude of flow needed to mobilize deeper sediment.

Potential impacts are discussed below in terms of direct and indirect impacts, or those occurring concurrent with skimming operation and those occurring during the winter season.

Direct Effects

Direct impacts could include inadvertent release of construction-related pollutants into the environment, or the creation of conditions that promote the methylation of elemental or particulate-bound mercury already present in the river system.

Although gravel removal operations would occur in the dry season, anomalous rainfall could come into contact with fuels, grease, and/or oils associated with vehicles and equipment or with fine sediment stored in material stockpiles and result in contaminated runoff into the Bear River. Inadvertent spills could likewise adversely affect soil or groundwater quality. In accordance with the project description, the site would be decommissioned such that construction debris, temporary bridges, and vehicle staging areas would be removed from the site. This would be sufficient to avoid adverse effects on water quality following the close of the mining season, but does not address potential adverse effects on water quality during gravel removal operations. This is a potentially significant impact to water quality. Implementation of **MM-HYD-3**, which would implement BMPs in accordance with a SWPPP, and implementation of **MM-HAZ-1** through **MM-HAZ-4**, which collectively ensure proper management of hazardous materials, would ensure that potential impacts on water quality would be reduced to a less than significant level. Water quality impacts associated with pollutant releases from mining equipment and/or temporary structures would therefore be less than significant with mitigation.

In addition, direct effects of the proposed activities could also occur if they were to create conditions that promote the methylation of particulate-bound mercury already present in the river system. Monohan (2014) describes the conceptual model that has been developed based on mercury studies in nearby mining projects as follows:

1. Mercury is primarily transported bound to particulate fine silts and clays (< 0.063 mm) during winter storms.

2. Mercury can be transported long distances from source areas and can accumulate in reservoirs where the water velocity slows and transport capacity decreases.
3. Mercury methylation typically occurs most efficiently during warm summer months in anoxic zones that establish at the bottoms of reservoirs and/or in the shallow groundwater table.
4. Mercury can be methylated when sulfate-reducing and/or iron-reducing bacteria are allowed to develop in low-flow, anoxic conditions.

A report produced by Monohan (2014) for NID indicates that proposed activities that produce standing water and/or anoxic environments can be colonized by bacteria that includes methylated mercury. As the proposed project would allow for gravel removal to 6 inches below the shallow groundwater table, standing water within skimmed pits could develop reducing conditions conducive to methylation of mercury during the mining season.

The project would include the monitoring recommendations proposed by Monahan (2014), which would include multiple groundwater monitoring wells, or piezometers, that are installed in the deposit in several transects across the width of the Bear River deposit spanning the length of the deposit. The water table elevation in the deposit will be monitored from these shallow groundwater wells and samples of shallow groundwater from within the deposit will be collected (at a frequency to be determined but that will likely match changes in surface discharge). Coupled with information about flow into the dewatering channel, the concentrations will be used to calculate the annual load of methylmercury contributed by the deposit. A transect of monitoring wells located upstream of the skimming operation would be used to establish background conditions, in that it would represent the methylmercury in shallow groundwater that is not disturbed by the operations. The water quality in the most upstream transect would be compared to the water quality in the transects that are in the downstream skimming areas to determine the degree and extent to which project operations are affecting mercury levels.

Because the project proposes to remove gravels below the shallow groundwater within the river corridor, the direct impact on mercury methylation would be potentially significant. Implementation of Mitigation Measure HYD-4 would ensure that the operator would notify the RWQCB if the monitoring program detects a statistically significant increase in mercury concentrations or methylmercury downstream of the proposed project relative to the baseline measurements upstream. Mitigation Measure HYD-4 would require the Operator to consult with the RWQCB to ensure further operations remain below regulatory thresholds. The direct impact of the project on mercury levels would therefore be **less than significant with mitigation**.

Indirect Effects

As discussed under Impact 3.7-1, there is also a potential for significant impacts from the proposed project to due to increases in turbidity and mercury delivery to the water column during high flows in the wet season (through channel incision and avulsion).

Geomorphic mapping and observations of bed material at the project reach indicate that very little fine sediment is present on the channel bed and bar surfaces. This is likely due to washing of the fine sediments during rampdown storm flows in the meandering river channel. The larger patches of fines on the surface and subsurface are potentially subject to mobilization. The risk of fine sediment and mercury mobilization are limited during half and full releases, when the armored bed surface is largely immobile. The amount of silt and clay-sized material in subsurface bed material samples Balance collected at the project site was less than 1% by weight, but is nevertheless higher than the concentrations found on the bed surface (Appendix G). During the wet season, high flows that would not otherwise mobilize sediment below the armored layer (i.e., generally those below 4,900 cfs) would have a higher potential to mobilize fines within the footprint of the prior season's gravel skimming operations. This would likewise increase the potential for release of mercury to the water column.

MM-HYD-1 and **MM-HYD-2**, by limiting the potential for channel incision and avulsion, likewise limit the potential for the project to result in the mobilization of elemental and methylmercury. The potential indirect effect of the project on water quality would therefore be **less than significant with mitigation**.

With implementation of **MM-HYD-1**, **MM-HYD-2**, **MM-HYD-3**, **MM-HYD-4**, in addition to **MM-HAZ-1** through **MM-HAZ-4**, the impacts of the project on water quality would be less than significant.

3.7.5 Mitigation Measures

MM-HYD-1 **Hydrologic Management Plan**. A California Professional Engineer (PE) or Geologist (PG) with appropriate expertise in surface water hydrology and geomorphology shall develop and implement a hydrologic management plan (HMP) with the objective of avoiding project-induced channel incision and avulsion and maintaining sustainable levels of sediment within the river corridor above the high water level of the Rollins Reservoir. The HMP shall outline yearly incision/avulsion monitoring activities, flexible limits on annual gravel extraction above the high water level of the Rollins Reservoir, seasonal decommissioning procedures, and a schedule of compliance/reporting activities necessary to achieve HMP objectives.

The HMP shall be consistent with the recommendations contained in the *Hydrology, Geomorphology, and Water Quality of the Bear River at the Chicago Park Powerhouse* memorandum prepared by Balance (Appendix G), including the following elements:

- *Repeat topographic surveys* shall be conducted to inform annual gravel extraction limits, monitor incision rates, and measure the effectiveness of decommissioning procedures. NID shall conduct a baseline topographic survey prior to the first season of gravel removal and perform repeat surveys as needed. The frequency with which repeat topographic surveys are performed shall be determined by the PE/PG responsible for the Hydrologic Management Plan, and shall be sufficient to meet HMP objectives. Monitoring methods shall include detailed thalweg surveys sufficient in point resolution to capture individual pools, riffles, and headcuts, and shall extend from the reservoir pool to the Chicago Park Powerhouse.
- *Seasonal decommissioning procedures* shall include, at a minimum, removal of all operational equipment located within the limits of the 100-year flood, including removal of surge piles, berms, temporary roads and bridges, dikes, and diversion channels. In years where winter flows have substantially changed the condition of the river corridor (to be determined by the PE/PG responsible for the Hydrologic Management Plan), the Operator shall map the general location, size and shape of channels, bars and terraces prior to the mining season to establish a standard for how the site should be decommissioned at the end of the season. To the extent feasible, the Operator shall match grades to the surrounding topography and grade skimmed areas to eliminate abrupt slope breaks that could lead to development of a headcut—primarily on steepened upstream ends of skimming areas. Where the upstream slopes of excavated areas exceed 3%, armoring with boulders shall be required.
- *The annual gravel extraction rate* from the Bear River above the high water level of the Rollins Reservoir shall initially not exceed 72,670 cubic yards per year (based on current estimates of the average annual sediment delivery to the project reach). This limit may be modified thereafter based on repeat topographic surveys of the project reach or a detailed geomorphic analysis that includes a site-specific bedload rating curve.
- *Incision monitoring* shall be conducted by the PG/PE to monitor incision rates based on annual topographic surveys and comparisons to data from prior years. The PE/PG shall standardize data collection methods and quantify thresholds for remedial action, such as installation of grade control

structures. Every year, the PE/PG shall recommend gravel removal strategies that would minimize incision based on prevailing conditions and knowledge gained from repeat surveys (e.g., reservoir level, sediment volume, location of geomorphic features).

- *Additional engineered grade control(s)* shall be installed, based on the recommendation of the PE/PG, if monitoring data indicates gravel extraction has resulted in incision or avulsion that threatens permanent infrastructure.

The HMP shall be developed by a California PE/PG and reviewed and approved by NID.

MM-HYD-2 **Channel Design Specifications**. Operator shall design the channelized portion of the Bear River during gravel removal operations to carry a full release from the Chicago Park Powerhouse without significant risk of channel incision or avulsion. The channelized portion of the Bear River shall be constructed to meet the following specifications:

- Where the channel top width is wide at 1,100 cubic feet per second (cfs), it may be narrowed to 125 feet with minimal risk of eroding the bed.
- Where the channel is less than 125 feet wide at 1,100 cfs, it shall not be narrowed with berms to mitigate the risk of incision.
- If the channel is to be diverted entirely, it shall be sized to convey 1,100 cfs without substantially eroding its boundaries throughout the mining season (i.e., 125 feet wide and 3 feet deep, assuming no freeboard).
- In no case shall the slope of the diversion channel be greater than 1.5%; where possible, it should be lower.

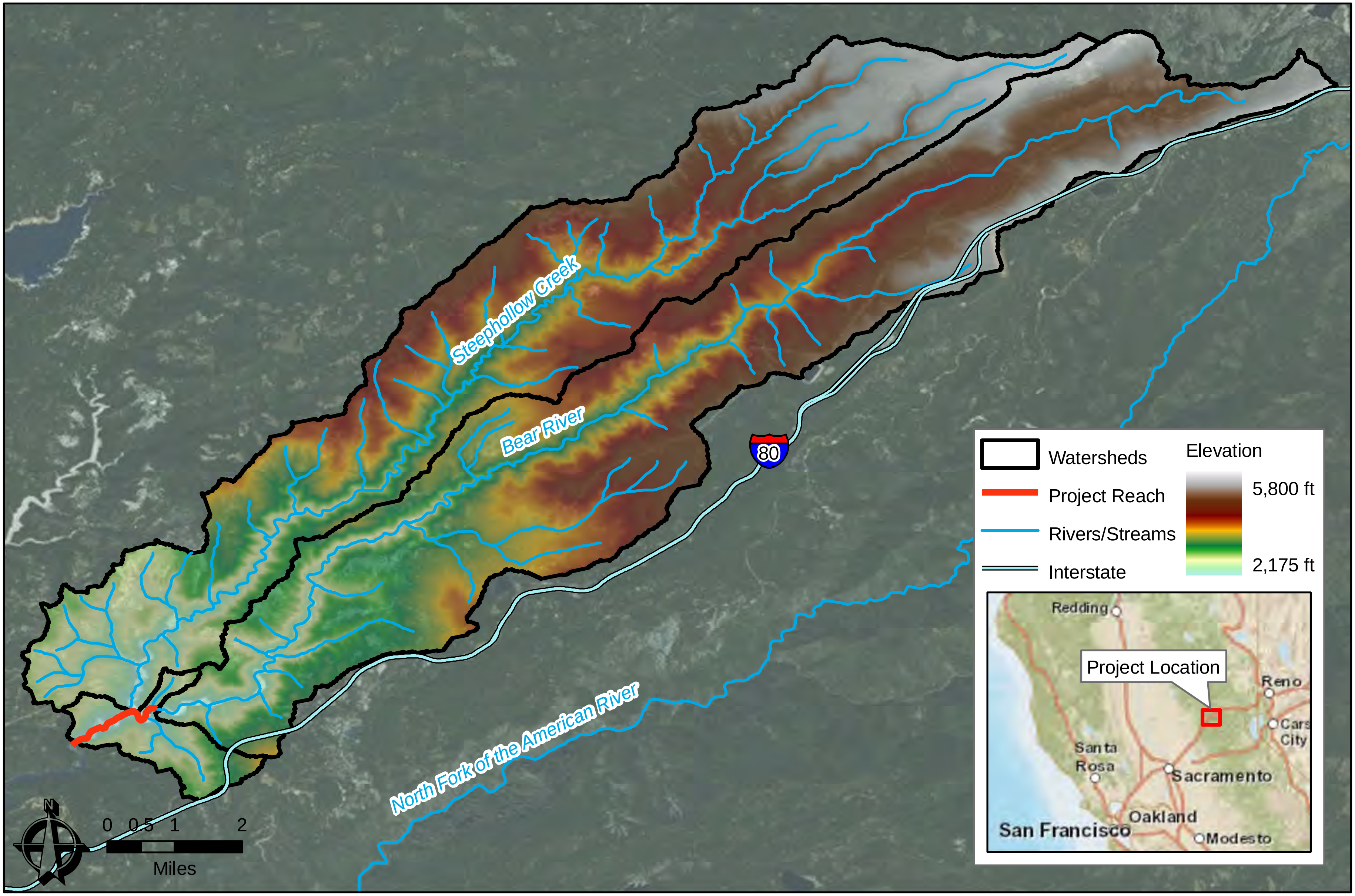
MM-HYD-3 **Stormwater Pollution Prevention Plan**. Operator shall develop and implement a stormwater pollution prevention plan (SWPPP) in accordance with State Water Resources Control Board and Central Valley RWQCB requirements. The SWPPP shall specify the location, type, and maintenance requirements for best management practices (BMPs) necessary to prevent stormwater runoff from carrying construction-related pollutants. BMPs shall be implemented to address potential release of fuels, oil, and/or lubricants from operational vehicles and equipment (e.g., drip pans, secondary containment, washing stations), as well as release of fine sediment from material stockpiles (e.g., sediment barriers, soil binders). The SWPPP shall be developed and implemented by a Construction General Permit Qualified SWPPP Practitioner (QSD) / Qualified SWPPP

Developer (QSP) and submitted to the RWQCB as part of obtaining regulatory approval for the proposed activities (i.e., the Industrial General Permit).

MM-HYD-4 **Exceedance of Water Quality Standard (50 ng/L) for Mercury**. Should monitoring data indicate a statistically significant increase in mercury concentrations or methylmercury downstream of the proposed project relative to the baseline measurements upstream, and if such measurements exceed 50 ng/L, the Operator shall temporarily halt operations, allow standing water to infiltrate, and notify the RWQCB of the exceedance. In consultation with the RWQCB, the operator shall modify operations or implement remedial measures as necessary to ensure project contributions to mercury or methyl mercury in the Bear River and Rollins Reservoir remain below regulatory thresholds.

3.7.6 Level of Significance After Mitigation

Implementation of MM-HYD-1 through MM-HYD-4, as well as MM-HAZ-1 through MM-HAZ-4, would reduce all potential impacts to **less than significant**.



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SOURCE: Balance Hydrologics Inc. 2014

FIGURE 3.7-1

Project Watershed

BEAR RIVER SEDIMENT REMOVAL AT ROLLINS RESERVOIR EIR

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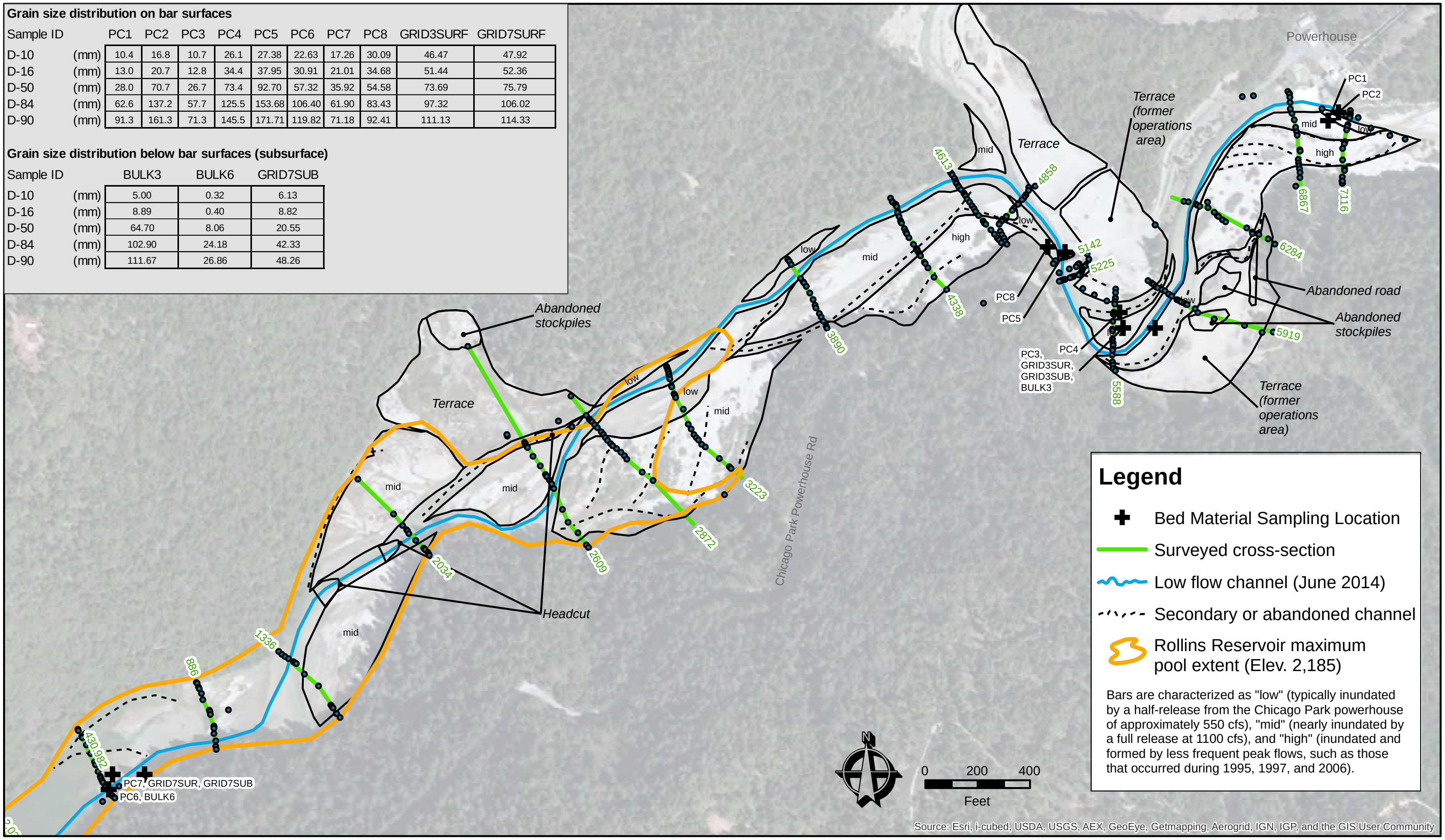

Grain size distribution on bar surfaces

Sample ID		PC1	PC2	PC3	PC4	PC5	PC6	PC7	PC8	GRID3SURF	GRID7SURF
D-10	(mm)	10.4	16.8	10.7	26.1	27.38	22.63	17.26	30.09	46.47	47.92
D-16	(mm)	13.0	20.7	12.8	34.4	37.95	30.91	21.01	34.68	51.44	52.36
D-50	(mm)	28.0	70.7	26.7	73.4	92.70	57.32	35.92	54.58	73.69	75.79
D-84	(mm)	62.6	137.2	57.7	125.5	153.68	106.40	61.90	83.43	97.32	106.02
D-90	(mm)	91.3	161.3	71.3	145.5	171.71	119.82	71.18	92.41	111.13	114.33

Grain size distribution below bar surfaces (subsurface)

Sample ID		BULK3	BULK6	GRID7SUB
D-10	(mm)	5.00	0.32	6.13
D-16	(mm)	8.89	0.40	8.82
D-50	(mm)	64.70	8.06	20.55
D-84	(mm)	102.90	24.18	42.33
D-90	(mm)	111.67	26.86	48.26

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SOURCE: Balance Hydrologics Inc. 2014

FIGURE 3.7-2

Bear River Geomorphic Features

BEAR RIVER SEDIMENT REMOVAL AT ROLLINS RESERVOIR EIR

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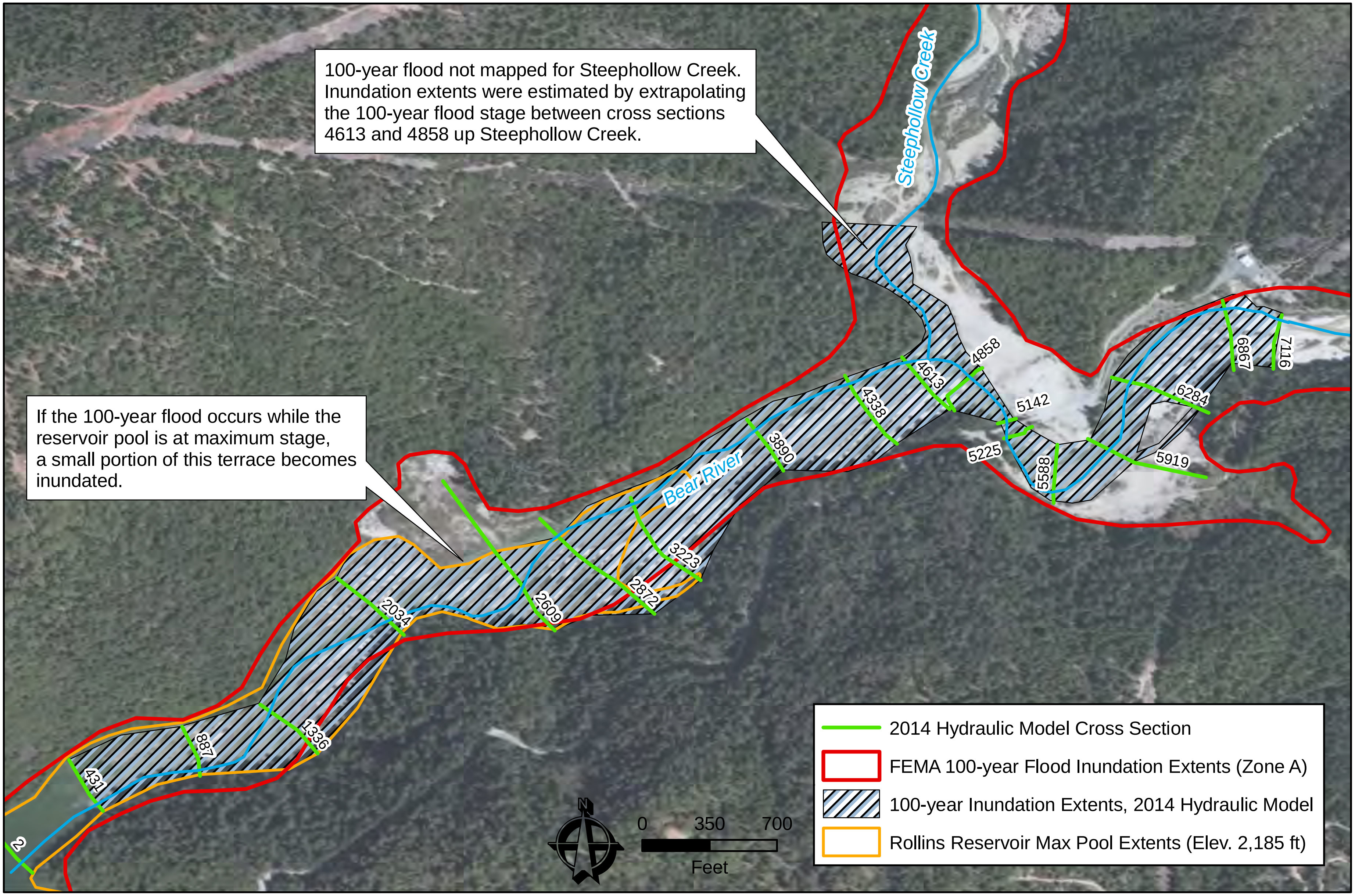

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SOURCE: Balance Hydrologics Inc. 2014

FIGURE 3.7-3

100-Year Flood Inundation

BEAR RIVER SEDIMENT REMOVAL AT ROLLINS RESERVOIR EIR

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3.8 LAND USE AND PLANNING

This section describes the existing land use designations, as well as the zoning and planning setting of the project site, identifies regulatory requirements, evaluates consistency of the proposed Bear River Sediment Removal at Rollins Reservoir Project (proposed project) with applicable plans and policies, and evaluates any land use incompatibility with adjacent uses. Plan consistency and land use incompatibility are generally not in and of themselves environmental effects, but are related to the environmental analysis and are required to be evaluated under Section 15125 of the California Environmental Quality Act (CEQA) Guidelines.

The loss of forestry resources was determined to be less than significant and is discussed in Chapter 4, Other CEQA Considerations. Comments received in response to the Notice of Preparation (NOP; see Appendix A) included concerns regarding trespassing and safety of nearby residences as a consequence. These concerns do not raise environmental issues; therefore, they are not further addressed (although law enforcement service is discussed in Section 3.10, Public Utilities and Services).

3.8.1 Existing Conditions

Regional

The project site straddles both Placer County and Nevada County in the foothills of the Sierra Nevada. The study area is located approximately 6 miles northeast of the City of Colfax. The City of Auburn is located approximately 22 miles to the southwest. Interstate 80 (I-80) is located approximately 1.5 miles due south of the study area. Elevation on the75 acre project site ranges from 2,200 to 2,400 feet. The project site consists of perennial streams surrounded by mixed coniferous forest with some disturbed areas and mine tailings.

Local

The project site is located in a rural area surrounded by forestland in both Nevada County and Placer County (see Figure 3.8-1, Land Use Designations). Rural residences are located to the east of the area along Secret Town Road, Wild Irish Road, and Gold Run Road. Additional residences are located to the northwest along Old Emigrant Trail, Old Pioneer Trail, You Bet Road, and Poorman Creek Road. As stated in Section 3.9, Noise, skimming equipment associated with the proposed project would be located approximately 1,300 feet from the nearest existing residential use to the northwest of the study area (see Figure 3.9-2, Distance from Project Operations to Nearest Noise-Sensitive Receivers). The nearest residence to the proposed aggregate haul route would be approximately 500 feet from that roadway.

The four project parcels within Nevada County are designated Forest/Open Space (FOR/OS-40) in the Nevada County General Plan and zoned OS, Forest Resources (FR)-40-Mineral Extraction (ME), OS-ME, and FR-40. The parcel within Placer County is designated in the Placer County General Plan as Agriculture/Timberland (AG/T)-40-acre minimum and zoned Residential Forest (RF) B-X 40-acre minimum.

The Nevada County General Plan defines Forest as follows (County of Nevada 2010):

> Forest (FOR) is intended to provide for production and management (including timber harvesting and related operations) of timber resources, and compatible recreational and low density residential uses. Within the Forest designation, the minimum parcel size should be 40+ acres, in order to provide for preservation of the timber resource and protection of resource management needs and opportunities.

The Placer County General Plan defines Agriculture and Timberland as follows (County of Placer 2013):

> Agriculture (AG) (10, 20, 40, 80-160 acre minimum). This designation identifies land for the production of food and fiber, including areas of prime agricultural soils, and other productive and potentially productive lands where commercial agricultural uses can exist without creating conflicts with other land uses, or where potential conflicts can be mitigated. Typical land uses allowed include: crop production, orchards and vineyards, grazing, pasture and rangeland, hobby farms; other resource extraction activities; facilities that directly support agricultural operations, such as agricultural products processing; and necessary public utility and safety facilities. Allowable residential development in areas designated Agriculture includes one principal dwelling and one secondary dwelling per lot, caretaker/employee housing, and farm worker housing.

> Timberland (T) (10, 20, 40, 80-640 acre minimum). This designation is applied to mountainous areas of the county where the primary land uses relate to the growing and harvesting of timber and other forest products, together with limited, low-intensity public and commercial recreational uses. Typical land uses allowed include: all commercial timber production operations and facilities; agricultural operations where soil and slope conditions permit; mineral and other resource extraction operations; recreation uses such as incidental camping, private, institutional and commercial campgrounds (but not recreational vehicle parks); and necessary public utility and safety facilities. Allowable residential development in areas designated Timberland includes one principal dwelling and one secondary dwelling per lot and caretaker/employee housing.

Farmland Resources

The study area is designated as “Other Land” on the California Department of Conservation Nevada County Important Farmland Map (DOC 2010a) and the Placer County Important Farmland Map (DOC 2010b) and does not contain any Prime Farmland, Unique Farmland, or Farmland of Statewide or Local Importance. Because there are no farmland resources present within the study area, there would be no impacts to farmland and this issue is not further addressed in this section.

3.8.2 Relevant Plans, Policies, and Ordinances

Federal

There are no relevant federal plans or policies that would be applicable to the project.

State

Surface Mining and Reclamation Act of 1975

SMARA was enacted by the state legislature in 1975 and is the state’s response to the need for a continuing supply of mineral resources while preventing damage from mining activities to public health, property, and the environment (California Public Resources Code, Section 2710 et seq.). SMARA requires the preparation of a reclamation plan and annual mine inspections, as well as the maintenance of a financial assurances cost estimate to guarantee post-mining reclamation of the mine site.

Nevada County is the local SMARA lead agency. Nevada County approved the previous reclamation plan, RP88-03, in 1990. The historical gravel skimming operation on the Bear River is currently in idle status (CA Mine ID# 91-39-0020). The approved 1990 Reclamation Plan, and its current financial assurances, therefore remains in effect.

Surface Mining and Reclamation Act (SMARA) regulations contain performance standards that apply to mining operations on prime and other agricultural lands where the approved end use is agriculture. Since the project site is classified as grazing land, and the end use is open space, SMARA reclamation standards for prime farmland and non-prime agricultural land do not apply.

Local

Nevada County General Plan

Applicable goals and policies from the Nevada County General Plan (County of Nevada 2010) are included herein. The general plan is the long-term policy guide for the physical, economic, and environmental future of the county. It includes goals, objectives, policies, and implementation measures, which are based on assessments of current and future needs of Nevada County and available resources within the county.

For applicable general plan policies related to other environmental issue areas, see the appropriate sections of this Environmental Impact Report (EIR).

Chapter 1: Land Use Element

Policy 1.5.3 The adopted Comprehensive Site Development Standards contained in the Land Use and Development Code (Chapter II, Article 4), were established and are implemented as directed by Action Policy 1.17 of the 1995 General Plan. These standards are used during the "project site review process" to provide a consistent approach for addressing the presence of sensitive environmental features and/or natural constraints, clustering and provisions of open space as a part of development, the potential for land use conflicts between uses, and the potential for public health hazards.

Applicable to all development projects in the County, the Comprehensive Site Development Standards have been designed to be protective of the County's unique character, providing guidance for:

a. Protection of environmentally sensitive resources;
b. Provision of open space as part of site development;
c. Prevention and reduction of fire hazards;
d. Maintenance and enhancement of vegetation and landscaping;
e. Prevention and reduction of flood hazards;
f. Transitions between uses and multiple-use site development;
g. Community design;
h. Buffering and screening to mitigate adverse effects;
i. Incentives to provide for access to public resources and open space; and
j. Protection of important agricultural, mineral, and timber resources.

Chapter 17: Mineral Management

Goal 17.1 Recognize and protect valuable mineral resources for current and future generations in a manner that does not create land use conflicts.

Objective 17.1 Protect valuable mineral deposits from intrusion by incompatible land uses that will impede or preclude mineral extraction or processing. Promote the proper management of all mineral resource activities in the County and minimize the impact of extraction and processing on neighboring activities and the environment in general.

Mine Development and Operation – General

Policy 17.4 All operations shall comply with the Nevada County General Plan Noise Chapter standards.

Policy 17.8 A reclamation plan, consistent with the State Surface Mining and Reclamation Act standards, is required for all mining operations.

Reclamation shall:

1. Prevent, mitigate, or minimize adverse effects on the environment.
2. Encourage the production and conservation of minerals.
3. Provide for the protection and subsequent beneficial use of mined and reclaimed land.
4. Eliminate residual hazards to the public health and safety.
5. Ensure that mined lands are reclaimed on a timely basis to a usable condition that is readily adaptable for alternative land uses.
6. Avoid the environmental and legal problems created by improperly abandoned mines.

Policy 17.10 Consider the socio-economic impacts associated with proposed mining operations.

Policy 17.11 Recognize the importance of water conservation and quality for the present and future needs of the County by:

1. Requiring the conservation of on-site water during mining operations.
2. Requiring that off-site water discharge complies with State water quality standards.
3. Requiring that any increase or decrease of off-site discharge is not detrimental to the downstream environment or downstream water users.

Policy 17.13 The County shall require satisfactory forms of accessible security, including irrevocable letters of credit, cash deposits, escrowed negotiable securities, or performance bonds, from all mining projects to cover all such damages which may stem from the projects.

<u>Surface Mining</u>

Policy 17.15 Surface mining is conditionally permitted only in compatible General Plan designations as defined herein and on parcels zoned "ME". Said mining shall be allowed only after impacts on the environment and nearby land uses have been adequately reviewed and found to be in compliance with CEQA.

Of particular importance shall be the impact of the operation on nearby land uses, water quantity and quality, noise and vibration impacts, and traffic associated with the operation. All other related impacts shall also be addressed.

Policy 17.16 Upon acceptance of the State Classification Reports by the County, all existing and subsequent property owners of MRZ-2 lands shall be notified by the County of the existence of significant mineral deposits and the potential for mining in that area.

Policy 17.22 Aggregate extraction may be allowed in rivers and floodplains provided environmental impacts associated therewith are addressed through the CEQA process.

Policy 17.23 Prepare a comprehensive plan for river and flood plain development that ensures aggregate operations within rivers and floodplains which have the least impact on the environment are developed before more environmentally-sensitive areas are approved and to also ensure that the environmental impacts of proposed aggregate operations within rivers and floodplains may be more readily assessed.

Nevada County Zoning Ordinance

The Nevada County zoning code serves as the primary implementation tool for the General Plan. The General Plan is a policy document and sets forth the county's vision for future development and provides direction for development decisions. The zoning ordinance is a regulatory document that establishes specific standards for the use and development of property in the county. The zoning code regulates development intensity using a variety of methods, such as providing building setbacks and building heights. The code specifically outlines regulations, indicating which land uses are permitted in the various zones. The Zoning Ordinance currently designates the project site OS and FR-40, with a combining district of ME (Mineral Extraction). Surface mining is allowed in the AG, FR, M1, M2, P, PD, and TPZ Districts and where the property is zoned ME, subject to approval of a Use Permit and Reclamation Plan.

<u>Title 3, Land Use and Development Code</u>

County Zoning Regulations, Section L-II 3.22, Surface Mining Permits and Reclamation Plans, includes the following provisions as well as setting forth the process and requirements to obtain a Use Permit and/or Reclamation Plan for surface mining or land reclamation projects:

1. Protection of valuable mineral resources for current and future generations in a manner that does not create land use conflicts.
2. The protection of valuable mineral deposits from intrusion by incompatible land uses that will impede or preclude mineral extraction or processing.
3. That adverse effects on neighboring activities and the environment are prevented or minimized and that mined lands are reclaimed to a usable condition that is readily adaptable for alternative land uses.
4. That the production and conservation of minerals are encouraged, while protecting values relating to recreation, watershed, wildlife, range and forage, and aesthetic enjoyment.
5. That immediate and residual hazards to the public health and safety are eliminated.

The project site is currently subject to a Reclamation Plan, RP88-03. The project site, which has been used for aggregate mining for approximately four decades, is currently "grandfathered" for purposes of a Use Permit (Herman 2014). Should the idle mine status (CA Mine ID# 91-39-0020) expire, the Use Permit issue may require consideration by Nevada County.

Placer County General Plan (May 2013)

Placer County has adopted community plans to provide a more detailed focus on specific geographic areas within the unincorporated county. These plans are periodically reviewed and updated. The community plans, like the Countywide General Plan, include goals, policies, implementation programs, land use and circulation plan diagrams, and supporting background material. The goals and policies contained in the community plans are intended to supplement and elaborate upon the goals and policies of the Countywide General Plan; they do not supersede them.

The study area is located within the Colfax Community Plan Area. The Colfax Community Plan does not include any policies that address mineral resources; therefore, only applicable goals and policies from the Countywide General Plan are included below (County of Placer 2013).

General Plan – Mineral Resources

Goal 1.J: To encourage commercial mining operations within areas designated for such extraction, where environmental, aesthetic, and adjacent land use compatibility impacts can be adequately mitigated.

Policies

1.J.1. The County shall require new mining operations to be designed to provide a buffer between existing or likely adjacent uses, minimize incompatibility with nearby uses, and adequately mitigate their environmental and aesthetic impacts.

1.J.2. The County shall require that new non-mining land uses adjacent to existing mining operations be designed to provide a buffer between the new development and the mining operations. The buffer distance will be based upon an evaluation of noise, aesthetics, drainage, operating conditions, topography, lighting, traffic, operating hours and air quality.

1.J.3. The County shall discourage the development of any uses that would be incompatible with adjacent mining operations or would restrict future extraction of significant mineral resources.

1.J.4. The County shall discourage the development of incompatible land uses in areas that have been identified as having potentially significant mineral resources.

1.J.5. The County shall require that all mining operations prepare and implement reclamation plans that mitigate environmental impacts and incorporate adequate security to guarantee proposed reclamation.

1.J.6. The County shall require that plans for mining operations incorporate adequate measures to minimize impacts to local residents and County roadways.

7.B.2. The County shall weigh the economic benefits of surface mining against the value of preserving agriculture when considering mineral extraction proposals on land designated for agricultural use.

Placer County Code

Chapter 17, Zoning, Article 17.56.270, Surface Mining and Reclamation, sets forth the requirements to create and maintain an effective and comprehensive surface mining and reclamation policy with regulation of surface mining operations.

The Placer County board of supervisors finds and declares that:

1. The extraction of minerals is essential to the continued economic well-being of the county and to the needs of the society, and that the reclamation of mined lands is necessary to prevent or minimize adverse effects on the environment and to protect the public health and safety;
2. The reclamation of mined lands as provided for in this article will permit the continued mining of minerals and will provide for the protection and subsequent beneficial use of the mined and reclaimed land;
3. Surface mining takes place in diverse areas where the geologic, topographic, climatic, biological, and social conditions are significantly different and that the reclamation operations and specifications therefore may vary accordingly.

The project site within Placer County is zoned RF B-X 40-acre minimum.

3.8.3 Thresholds of Significance

Methods of Analysis

Existing land uses in the project vicinity were identified based on information provided by the two counties and a review of aerial maps and other information, and planned land uses for the project site were identified based on information provided by the project applicant. The land use evaluation is based on a qualitative comparison of existing and proposed uses on the site and their compatibility with existing land uses and planned land uses as defined in the General Plans, as well as other applicable local environmental and planning documents.

Implementation of the proposed project would result in a change in land use as compared to existing conditions, but would be consistent with the underlying land use designations and zoning. General plans provide the long-term objectives, principles, and standards for development, and all development proposals must be generally consistent with the overall land use guidance provided in a general plan. More detailed regulation and land use control are applied through county zoning requirements, as well as through other county regulations and ordinances. The project's consistency with applicable ordinances, as well as specific land use implications associated with implementation of the project, are discussed in this section and in other technical sections of this ~~Draft~~ EIR.

As discussed in Section 3.8.1, the project site does not contain any protected farmland; therefore, potential impacts associated with the conversion of farmland to non-agricultural use is not further addressed. In addition, potential impacts related to the dividing of established communities are not addressed further because no community would be divided by the proposed project, as the project site is composed of vacant land that was previously used for surface mining. The study area is not within the boundaries of the Placer County Conservation Plan or the Placer Legacy project, an open space and habitat protection program in Placer County. Therefore, the proposed project would not conflict with a habitat conservation plan or a natural community conservation plan and this issue is not further addressed.

The significance criteria used to evaluate the project impacts to land use and planning are based on Appendix G of the CEQA Guidelines. According to Appendix G of the CEQA Guidelines, a significant impact related to land use and planning would occur if the project would:

- Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect.

3.8.4 Impacts Analysis

Impact 3.8-1. The proposed project could conflict with an applicable land use plan, policy, or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect.

The proposed project straddles two counties, Placer and Nevada, and also includes land owned by the Bureau of Land Management (BLM). The project has been designed to comply with both Placer and Nevada County requirements for reclamation plans and in compliance with both general plans and zoning requirements. The Placer County General Plan includes policies that require all mining operations prepare and implement reclamation plans that mitigate environmental impacts (Policy 1.J.5), and require mining operators to include plans that minimize impacts to local residents and county roadways (Policy 1.J.6). The proposed project would not result in impacts to local roadways or local residents, as discussed in the other technical sections of this EIR. As detailed in Chapter 2, Project Description, the ultimate goal of the project is to restore the Bear River channel to the pre-1965 conditions and to prevent further loss of storage capacity in Rollins Reservoir. The project is designed to provide benefits related to water storage capacity, river restoration, and recreation. The design of the project operation also considers the need to minimize impacts to water quality and to the protected Foothill yellow-legged frog (*Rana boylii*). All work done in the river channel would take place when water levels are low to minimize impacts to fish and other aquatic species.

The parcel within Placer County is designated in the Placer County General Plan as AG/T-40-acre minimum and zoned RF B-X 40-acre minimum. The project is consistent with the intent of the goals and policies for mineral resources contained in the Placer County General Plan and zoning ordinance.

The Nevada County General Plan also includes policies that address mining and reclamation activities. Policy 17.22 requires any aggregate extraction in rivers and floodplains be evaluated under CEQA and Policy 17.23 requires a comprehensive plan for river and floodplain development to minimize impacts. The proposed project has been designed, as noted above, to restore the Bear River channel to the pre-1965 conditions and to prevent further loss of storage capacity in Rollins Reservoir. The project would provide benefits related to water storage capacity, river restoration, and recreation, in compliance with Policies 17.22 and 17.23. The EIR evaluates potential water quantity and quality impacts, noise and vibration impacts, and traffic associated with construction activities, as requested in Policy 17.15. In addition, the project includes the implementation of a reclamation plan to restore the Bear River to its natural conditions, per Policy 17.8.

The project site is zoned OS, FR-40- ME, OS-ME, and FR-40, in the Nevada County zoning ordinance. Surface mining is allowed subject to a Use Permit and Reclamation Plan. The project site is currently covered under Reclamation Plan RP88-03, which has been amended to reflect the reduced project operation (in terms of both geographic area and processing). As an idle mine, the project site is "grandfathered" under the Use Permit requirement.

Based on the analysis, the project is consistent with the existing land use designations and zoning under Placer County and Nevada County. Therefore, impacts would be considered **less than significant**.

3.8.5 Mitigation Measures

No significant impacts would occur; therefore, no mitigation is required.

3.8.6 Level of Significance After Mitigation

Impacts related to land use and planning as a result of the proposed project would be **less than significant** without mitigation.

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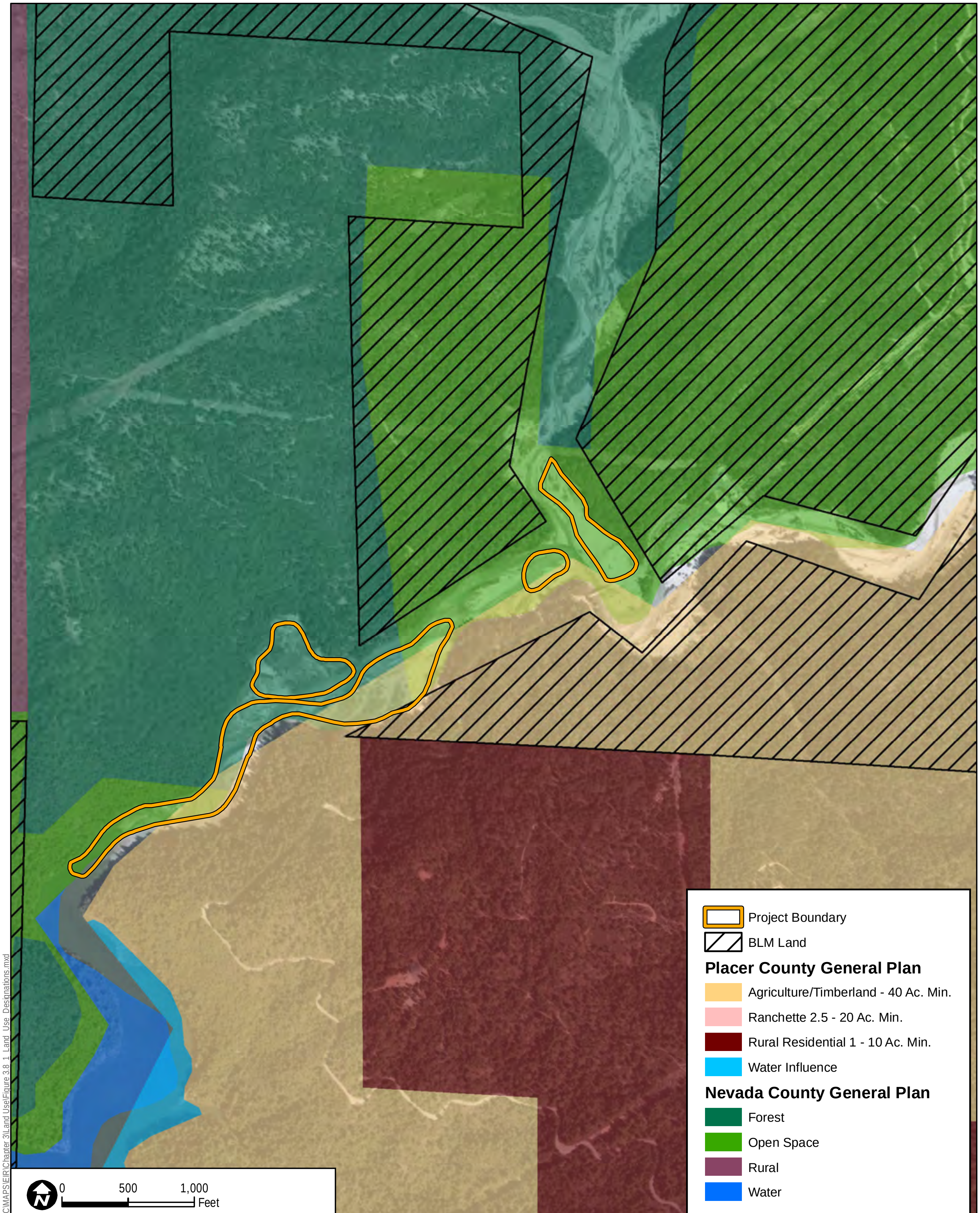

SOURCE: ESRI 2014, Nevada County, Placer County

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FIGURE 3.8-1
Land Use Designations

BEAR RIVER SEDIMENT REMOVAL AT ROLLINS RESERVOIR

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3.9 NOISE

This section evaluates the potential noise impacts of the proposed Bear River Sediment Removal at Rollins Reservoir Project (proposed project), describes the existing noise environment within the project area, and identifies noise levels expected to be generated by construction of the proposed project. Receptors that may potentially be affected by noise are identified, as well as the criteria used to evaluate the effects of project-generated noise on the existing noise environment. The discussion also describes the fundamentals of acoustics, the results of sound level measurements, and acoustical calculations.

Comments received in response to the Notice of Preparation (NOP) for this Environmental Impact Report (EIR) raised concerns regarding noise from people trespassing in the area, noise from backup beepers on construction equipment, trucks and vehicles accessing the site, and trucks using a jake-brake. Noise from people accessing the area is an existing condition and not related to any potential change in existing noise levels associated with the project. Therefore, this issue is not further addressed. However, the other concerns associated with the project are addressed in this section. Copies of the NOP and the comment letters received in response to the NOP are included in Appendix A.

Preparation of this section is based on the *Environmental Noise Assessment, Bear River Restoration Project*, prepared by Bollard Acoustical Consultants Inc. (BAC), January 22, 2014, and the *Bear River Aggregates Noise Simulation Test Results*, September 23, 2014, also prepared by BAC. Copies of these reports are included in Appendix H (collectively referred to as "Noise Report").

3.9.1 Existing Conditions

Existing Noise Environment in the Project Vicinity

The existing noise environment in the immediate study area is fairly quiet, with the main noise source being nature (wind in trees, birds, etc.). To quantify ambient noise levels in the immediate project vicinity, BAC conducted a continuous noise level measurement survey at two locations from November 22 to 25, 2013. The noise measurement locations were selected to be generally representative of the noise exposure received at the residences located nearest to the project operations. The measurement locations are shown on Figure 3.9-1, Nearest Noise Sensitive Receivers and Ambient Noise Monitoring Locations.

Larson Davis Laboratories (LDL) Model 820 precision integrating sound level meters were used for the noise level measurement survey. The meters were calibrated before and after use with an LDL Model CA200 acoustical calibrator to ensure the accuracy of the measurements. The equipment used meets all specifications of the American National Standards Institute requirements for Type 1 sound level meters (ANSI S1.4).

The ambient noise measurement results are shown in Table 3.9-1, Statistical Summary of Ambient Noise Measurement Results. Those data revealed that existing ambient noise levels are fairly low, with day–night average sound level (L_{dn}) values ranging from 45 to 48 A-weighted decibels (dBA) over the monitoring period. Complete listings and graphical depictions of the ambient noise measurement data are contained in the Noise sReport included in Appendix H.

Table 3.9-1
Statistical Summary of Ambient Noise Measurement Results

			Average (L_{eq} dBA)		**Maximum (L_{max} dBA)**	
Site	*Date*	*L_{dn} dBA*	*Day*	*Night*	*Day*	*Night*
A	11-22-13	44	43	35	79	48
	11-23-13	47	43	40	78	57
	11-24-13	46	44	37	83	65
	11-25-13	45	40	38	68	52
B	11-22-13	48	43	42	73	49
	11-23-13	48	42	42	64	56
	11-24-13	58	60	39	100	55
	11-25-13	46	41	40	67	60

Source: BAC 2014.
Notes: Detailed noise level measurements are provided in Appendix H.
The locations of noise measurement sites are shown in Figure 3.9-1.
Average (L_{eq}) noise data represents the energy average of all ambient noise measured during daytime (7 a.m. to 10 p.m.) and nighttime (10 p.m. to 7 a.m.) periods for the dates shown.
Maximum (L_{max}) noise data represents the highest noise level measured during the daytime and nighttime period of the dates shown.

Existing Land Uses in the Project Vicinity

Proposed gravel skimming operations would take place on the Bear River, just northeast of Rollins Reservoir. There are large-lot rural residential uses on both sides of the Bear River in both Nevada and Placer Counties. At its closest position, the aggregate skimming equipment would be located approximately 1,300 feet from the nearest existing residential use, as indicated in Figure 3.9-2, Distance from Project Operations to Nearest Noise-Sensitive Receivers. The nearest residence to the proposed aggregate haul route would be approximately 500 feet from that roadway.

Background on Noise and Acoustical Terminology

Noise is often described as unwanted sound. Sound is defined as any pressure variation in air that the human ear can detect. If the pressure variations occur frequently enough (at least 20 times per second), they can be heard and are called sound. The number of pressure variations per second is called the frequency of sound, and is expressed as cycles per second, called hertz.

Measuring sound directly in terms of pressure would require a very large and awkward range of numbers. The decibel (dB) scale was devised to compress this wide range of pressures into a more manageable range. The decibel scale uses the hearing threshold (20 micropascals of pressure), as a point of reference, defined as 0 dB. Other sound pressures are then compared to the reference pressure, and the logarithm is taken to keep the numbers in a practical range. The decibel scale allows a million-fold increase in pressure to be expressed as 120 dB. Another useful aspect of the decibel scale is that changes in decibel levels correspond closely to human perception of relative loudness. Figure 3.9-3, Typical A-Weighted Sound Levels of Common Noise Sources, illustrates common noise levels associated with various sources. As shown on the figure , an increase of 10 dBA represents a doubling of perceived loudness.

The perceived loudness of sound is dependent upon many factors, including sound pressure level and frequency content. However, within the usual range of environmental noise levels, perception of loudness is relatively predictable, and can be approximated by weighing the frequency response of a sound level meter by means of the standardized A-weighing network. There is a strong correlation between A-weighted sound levels (expressed as dBA) and community response to noise. For this reason, the A-weighted sound level has become the standard tool of environmental noise assessment. All noise levels reported in this section are in terms of A-weighted levels. Please see Appendix H for a copy of the Noise Report prepared for the project and definitions of acoustical terminology.

3.9.2 Relevant Plans, Policies, and Ordinances

Federal and State

There are no federal or state noise criteria that would be directly applicable to this project.

Local

Nevada County General Plan Noise Element

The Nevada County General Plan Noise Element contains the following policies that would be applicable to this project (County of Nevada 1996):

Policy 9.1 The following noise standards (Table 3.9-2), as performance standards and land use compatibility standards, shall apply to all discretionary and ministerial projects excluding permitted residential (including tentative maps) land uses.

Policy 9.9 Limit future noise generating land use to those location of the County where their impacts on noise sensitive land uses will be minimized, consistent with the standards found in Policy 9.1.

Policy 9.10 Require the preparation of a comprehensive noise study for all land use projects determined to have a potential to create noise levels inconsistent with those standards found in Policy 9.1, and in accordance with the methodology identified in the Noise Element Manual contained in General Plan Volume 2, Section 3 – Noise Analysis Appendix A.

Table 3.9-2
Noise Exposure Limits – Nevada County General Plan Noise Element

Land Use Category	Time Period	L_{eq} dBA	L_{max} dBA
Rural	7 a.m. – 7 p.m. 7 p.m. – 10 p.m. 10 p.m. – 7 a.m.	55 50 40	75 65 55
Residential and Public	7 a.m. – 7 p.m. 7 p.m. – 10 p.m. 10 p.m. – 7 a.m.	55 50 45	75 65 60
Commercial and Recreation	7 a.m. – 7 p.m. 7 p.m. – 7 a.m.	70 65	90 75
Business Park	7 a.m. – 7 p.m. 7 p.m. - 7 a.m.	65 60	85 70
Industrial	Anytime	80	80

Source: BAC 2014.
Notes: L_{eq} = equivalent sound level; dBA = A-weighted decibels; L_{max} = maximum sound level
Where two different zoning districts abut, the standard applicable to the lower, or more restrictive, district plus 5 dBA shall apply.
The above standards shall be measured only on property containing a noise sensitive land use as defined in Policy 9.8 and may be measured anywhere on the property containing said land use.
If the measured ambient level exceeds that permitted, then the allowable noise exposure standard shall be set at 5dB above the ambient.
Because of the unique nature of sound, the County reserves the right to provide for a more restrictive standard than shown in this table. The maximum adjustment shall be limited to no less than the current ambient noise levels and shall not exceed the standards of this policy or as they may be further adjusted by Policy 9.lb.
The above standards shall not apply to those activities associated with the actual construction of a project or to those projects associated with the provision of emergency services or functions.

Nevada County Code

Title 3, Chapter II, Article 4, Division 4.1.7 of the Nevada County Code regulates noise. The following specific provisions of the Nevada County Noise Code would be applicable to this project.

> **D. Noise Standards** All land use projects requiring a Development Permit or a Use Permit shall comply with the noise standards provided herein. Permitted residential land uses, including parcel and tentative maps, are not subject to the standards contained in Table L-II 4.1.7 of the County Code.

Because County Code Table L-II 4.1.7 is identical to the Nevada County General Plan Noise Element standards shown in Table 3.9-2, it is not reproduced here.

Placer County General Plan Noise Element

The Placer County General Plan Noise Element contains the following policies that would be applicable to this project (County of Placer 2013):

9.A.2 Noise created by new proposed non-transportation noise sources shall be mitigated so as not to exceed the noise level standards of Table 3.9-3 as measured immediately within the property line of lands designated for noise-sensitive uses: provided, however, the noise created by occasional events occurring within a stadium on land zoned for university purposes may temporarily exceed these standards as provided in an approved Specific Plan.

9.A.9 Noise created by new transportation noise sources, including roadway improvement projects, shall be mitigated so as not to exceed the levels specified in Table 3.9-4 or the performance standards in Table 3.9-3 at outdoor activity areas or interior spaces of existing noise sensitive land uses.

9.A.12 Where noise mitigation measures are required to achieve the standards of Tables 3.9-3 and 3.9-4, the emphasis of such measures shall be placed upon site planning and project design. The use of noise barriers shall be considered as a means of achieving the noise standards only after all other practical design-related noise mitigation measure have been integrated into the project.

Table 3.9-3
Allowable L_{dn} Noise Levels within Specified Zone Districts
Applicable to New Projects Affected by or Including Non-Transportation Noise Sources

Sources Zone District of Receptor	Property Line of Receiving Use	Interior Spaces
Residential adjacent to Industrial	60	45
Other Residential	50	45
Office/Professional	70	45
Transient Lodging	65	45
Neighborhood Commercial	70	45
General Commercial	70	45
Heavy Commercial	75	45
Limited Industrial	75	45
Highway Service	75	45
Shopping Center	70	45
Industrial	—	45

Table 3.9-3
Allowable L_{dn} Noise Levels within Specified Zone Districts Applicable to New Projects Affected by or Including Non-Transportation Noise Sources

Sources Zone District of Receptor	Property Line of Receiving Use	Interior Spaces
Industrial Park	75	45
Industrial Reserve	—	—
Airport	—	45
Unclassified	—	—
Farm	—	—
Agriculture Exclusive	—	—
Forestry	—	—
Timberland Preserve	—	—
Recreation and Forestry	70	—
Open Space	—	—
Mineral Reserve	—	—

Source: BAC 2014.

Notes: L_{dn} = average day–night sound level.

Except where noted otherwise, noise exposures will be those which occur at the property line of the receiving use.

Where existing transportation noise levels exceed the standards of this table, the allowable L_{dn} shall be raised to the same level as that of the ambient level.

If the noise source generated by, or affecting, the uses shown above consists primarily of speech or music, of if the noise source is impulsive in nature, the noise standards shown above shall be decreased by 5 dB.

Where a use permit has established noise level standards for an existing use, those standards shall supersede the levels specified in Table 9-1 (3.9-3) and Table 9-3 (3.9-4). Similarly, where an existing use which is not subject to a use permit causes noise in excess of the allowable levels in Tables 9-1 (3.9-3) and 9-3 (3.9-4), said excess noise shall be considered the allowable level. If a new development is proposed which will be affected by noise from such an existing use, it will ordinarily be assumed that the noise levels already existing or those levels allowed by the existing use permit, whichever are greater, are those levels actually produced by the existing use.

Existing industry located in industrial zones will be given the benefit of the doubt in being allowed to emit increased noise consistent with the state of the art at the time of expansion. In no case will expansion of an existing industrial operation because to decrease allowable noise emission limits. Increased emissions above those normally allowable should be limited to a one-time 5 dB increase at the discretion of the decision making body.

The noise level standards applicable to land uses containing incidental residential uses, such as caretaker dwellings at industrial facilities and homes on agriculturally zoned land, shall be the standards applicable to the zone district, not those applicable to residential uses.

Where no noise level standards have been provided for a specific zone district, it is assumed that the interior and/or exterior spaces of these uses are effectively insensitive to noise.

Table 3.9-4
Maximum Allowable Noise Exposure Transportation Noise Sources

Noise-Sensitive Land Uses	Outdoor Activity Areas L_{dn}/CNEL dBA	Interior Spaces	
		L_{dn}/CNEL dBA	*L_{eq} dBA*
Residential	60	45	—
Transient lodging	60	45	—
Hospitals, nursing homes	60	45	—
Theaters, auditoriums, music halls	—	—	35
Churches, meeting halls	60	—	40
Office buildings	—	—	45

Table 3.9-4
Maximum Allowable Noise Exposure Transportation Noise Sources

Noise-Sensitive Land Uses	Outdoor Activity Areas L_{dn}/CNEL dBA	Interior Spaces	
		L_{dn}/CNEL dBA	*L_{eq} dBA*
Schools, libraries, museums	—	—	45
Playgrounds, neighborhood parks	70	—	—

Source: BAC 2014.
Notes: L_{dn} = average day–night sound level; CNEL = community noise equivalent level; dBA = A-weighted decibels; L_{eq} = equivalent sound level.
Where the location of outdoor activity areas is unknown, the exterior noise level standard shall be applied to the property line of the receiving land use.
L_{eq} as determined for a typical worst-case hour during periods of use.
Where it is not possible to reduce noise in outdoor activity areas to 60 dB L_{dn}/CNEL or less using a practical application of the best-available noise reduction measures, an exterior noise level of up to 65 dB L_{dn}/CNEL may be allowed provided that available exterior noise level reduction measures have been implemented and interior noise levels are in compliance with this table.

Placer County Code

Article 9.36 of the Placer County Code regulates noise. The following specific provisions of the Placer County Noise Code would be applicable to this project.

> **9.36.060A**. It is unlawful for any person at any location to create any sound, or to allow the creation of any sound, on property owned, leased, occupied or otherwise controlled by such person that:
>
> 1. Causes the exterior sound level when measured at the property line of any affected sensitive receptor to exceed the ambient sound level by five dBA; or
> 2. Exceeds the sound level standards as set forth in Table 3.9-5, whichever is the greater.

Table 3.9-5
Sound Level Standards (On Site) – Placer County Code

Sound Level Descriptor	Daytime (7 a.m. – 10 p.m.)	Nighttime (10 p.m. – 7 a.m.)
Hourly L_{eq} (dBA)	55	45
Maximum Level (L_{max}) dBA	70	65

Source: BAC 2014.
Notes: L_{eq} = equivalent sound level; dBA = A-weighted sound level; L_{max} = maximum sound level.
Each of the sound level standards specified in Table 3.9-1 shall be reduced by 5 dB for simple tone noises, consisting of speech and music. However, in no case shall the sound level standard be lower than the ambient sound level plus 5 dB.
If the intruding sound source is continuous and cannot reasonably be discontinued or stopped for a time period whereby the ambient sound level can be measured, the sound level measured while the source is in operation shall be compared directly to the sound level standards of Table 3.9-5.

3.9.3 Thresholds of Significance

Methods of Analysis

There are two distinct noise-producing components of this project. The first component consists of on-site heavy equipment used during gravel extraction (front-end loaders, scrapers, water trucks, haul trucks, etc.). The noise generation of these sources is estimated from BAC file data for similar sources to be approximately 80 dBA L_{max} and 70 dBA L_{eq} at a reference distance of 100 feet from the operating equipment. Based on a noise reduction rate of 6 dB per each doubling of distance from the noise source, the resulting average and maximum noise levels at the nearest residence located 1,300 feet from the proposed operations would be approximately 53 dBA L_{max} and 43 dBA L_{eq}, after accounting for shielding by intervening topography and vegetation. Noise levels at the more distant residences would be even lower due to normal decreases of noise with increasing distance. Table 3.9-6 shows the predicted noise levels for the on-site gravel skimming and stockpiling operations.

Table 3.9-6
Summary of On-Site Project Noise Generation

Receiver[a]	Distance (feet)[b]	Reference Noise Levels[c]		Predicted Noise Levels[d]	
		L_{eq} dBA	*L_{max} dBA*	*L_{eq} dBA*	*L_{max} dBA*
1	1,500	70 @ 100 feet	80 @ 100 feet	41	51
2	1,300			43	53
3	2,100			39	49
4	1,700			40	50
5	3,000			35	45
6	3,500			34	44
7	1,900			39	49

Source: BAC 2014.
Notes:
[a] Receiver locations are identified on Figure 3.9-1.
[b] Distances were scaled from receiver to nearest project gravel extraction area.
[c] Reference noise level data was obtained from BAC file data.
[d] Predicted noise levels include a conservative application of −5 dB for shielding by intervening topography and excess ground and vegetative screening.

To confirm the predicted noise levels, a simulation was conducted at the project site on August 21, 2014, using heavy equipment to simulate project activities. The simulation consisted of a large front-end loader/excavator (John Deere 410E Loader) moving aggregate materials from an existing on-site stockpile into a heavy haul truck (see Appendix H). Noise level measurements were taken at a distance of 125 feet from the operating front-end loader and haul trucks, as well as at positions close to the nearest residences on Old Emigrant Trail. The results of these measurements are described below, in Section 3.9.4.

The second noise source component of the project consists of off-site heavy trucks used for transport of excavated gravel material from the project site to various markets. Based on 250,000 tons of material per year at approximately 25 tons per truck, the project would generate approximately 10,000 truckloads (20,000 trips) over the course of the year; however, most of the activity would occur between April and October. For the purposes of the noise analysis, it was assumed there would be 6 operating days per week during that period (180 operating days per year), the average number of truck trips generated on the haul road would be approximately 110 per day, or about 10 per hour. The noise generation of this aspect of the project was estimated using the Federal Highway Administration Noise Prediction Model to be approximately 35 dBA L_{dn} and 38 dBA L_{eq} at the nearest residence located 500+ feet from the haul road, after accounting for shielding by intervening topography and vegetation.

Because ground-borne vibration dissipates very rapidly with distance, and because the nearest residences to the gravel extraction and project haul routes are 1,300 and 500 feet away, vibration levels associated with the project would be imperceptible and an evaluation of vibration impacts is not included.

The project site is also not located within an airport land use plan, within 2 miles of a public airport, or in the vicinity of a private airstrip; therefore, there would be no impact and these issues are not further evaluated.

The significance criteria used to evaluate the project impacts related to noise are based on Appendix G of the CEQA Guidelines (14 CCR 15000 et seq.). According to Appendix G, a significant impact related to noise would occur if the project would:

1. Result in the exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.
2. Result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.
3. Result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

3.9.4 Impacts Analysis

Impact 3.9-1. The proposed project would not result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

As indicated in Table 3.9-6, on-site project noise sources are predicted to generate *average* noise levels ranging from 34 to 43 dBA L_{eq} at the nearest existing residences to the proposed excavation areas. Both Nevada and Placer Counties apply 55 dBA L_{eq} daytime noise standards to residential land uses affected by non-transportation noise sources. Therefore, on-site noise sources would not exceed the applicable daytime average noise level standards of either Placer or Nevada County.

Table 3.9-6 also indicates that on-site project noise sources are predicted to generate *maximum* noise levels ranging from 44 to 53 dBA L_{max} at the nearest existing residences to the proposed excavation areas. Nevada and Placer Counties both use 75 and 70 dBA L_{max} daytime noise standards, respectively, for residential land uses affected by non-transportation noise sources. Therefore, on-site noise sources would not exceed the applicable daytime maximum noise level standards of either Placer or Nevada County.

To assess noise associated with the project, a simulation was conducted at the project site on August 21, 2014, using heavy equipment to simulate project activities. The simulation consisted of a large front-end loader/excavator (John Deere 410E Loader) moving aggregate materials from an existing on-site stockpile into a heavy haul truck (see Appendix H).

During the simulation, noise level measurements were taken at a distance of 125 feet from the operating front-end loader and haul trucks, as well as at positions close to the nearest residences on Old Emigrant Trail. LDL Model 820 precision integrating sound level meters were used for the noise surveys. Weather conditions during the simulation consisted of clear skies, 65–70 degree Fahrenheit temperatures, calm winds, and low relative humidity.

The results of the noise measurements indicate that the heavy earthmoving equipment generated average and maximum noise levels consistent with the reference levels of 70 dBA L_{eq} and 80 dBA L_{max} at a distance of 100 feet used in the environmental noise analysis prepared for the project (see Appendix H). At two measurement locations, the sound of the operating heavy equipment, including backup beepers, was completely inaudible.

At one point during the simulation, a truck horn was operated for a period of 20 seconds. Even during the prolonged sounding of the truck horn, noise remained completely inaudible at the noise measurement locations near the existing residences. It is expected that the sound of back-up beepers or other warning devices would respond in the same manner.

In the Noise Report prepared for the project (see Appendix H), the highest average and maximum noise levels generated by the project at the nearest residence (Residence 2) were predicted to be approximately 43 dBA L_{eq} and 53 dBA L_{max}. These levels would be well below the counties' daytime noise level standards of 55 dBA L_{eq} and 75 dBA L_{max} applicable to residential land uses in the counties. The results of the simulation support the conclusions of the noise study that the project will satisfy the counties' noise standards and not result in adverse noise impacts at the nearest residences to the project area.

Following review of the Draft EIR, an additional noise simulation was done on August 24, 2015. As with the previous noise simulation, a front end loader and heavy haul truck was operated at the project site. For this test, however, measurements were taken on the nearest residential properties, 14420 Old Emigrant Trail and 14158 Old Emigrant Trail. Additional details on this simulation are located in Chapter 8, Response to Comment Letter C. The second test confirmed that operational noise, although it may be audible at times at the receptor locations, would not exceed the established noise thresholds.

As noted in the Methods of Analysis section, off-site traffic noise levels generated by project truck traffic on the haul route between the excavation area and I-80 are predicted to be 35 dBA L_{dn} at the nearest residence to the haul road. Both Placer and Nevada Counties apply a 60 dBA L_{dn} standard to the exterior areas of residences affected by transportation noise sources. Therefore, project-generated traffic would not exceed acceptable levels of transportation noise for either Placer or Nevada County.

Because both on-site excavation noise and off-site truck traffic noise levels are predicted to be below the applicable noise standards at existing residences in both Placer and Nevada Counties, this impact is considered **less than significant**.

Impact 3.9-2. The proposed project would not result in a substantial permanent (long-term) increase in ambient noise levels in the project vicinity above levels existing without the project.

The ambient noise measurement results provided in Table 3.9-1 indicate that existing ambient noise levels in the general project vicinity ranged from approximately 45 to 50 dBA L_{dn}, 40 to 45 dBA L_{eq}, and 70 to 80 dBA L_{max}.

As indicated in Table 3.9-6, on-site project noise sources are predicted to generate *average* noise levels ranging from 34 to 43 dBA L_{eq} at the nearest existing residences to the proposed excavation areas. Therefore, on-site noise sources are not predicted to exceed measured existing average (L_{eq}) noise levels by more than 5 dB at existing residences in the project vicinity.

Table 3.9-6 also indicates that on-site project noise sources are predicted to generate *maximum* noise levels ranging from 44 to 53 dBA L_{max} at the nearest existing residences to the proposed excavation areas. Therefore, on-site noise sources are not predicted to exceed measured existing maximum (L_{max}) noise levels by more than 5 dB at existing residences in the project vicinity.

As stated in Impact 3.9-1, results of the project simulation support the conclusions of the noise study that the project will satisfy the counties' noise standards and not result in adverse noise impacts at the nearest residences to the project area.

As noted in the Methods of Analysis section, off-site traffic noise levels generated by project truck traffic on the haul route between the excavation area and I-80 are predicted to be 35 dBA L_{dn} and 38 dBA L_{eq} at the nearest residence to the haul road. Therefore, off-site haul truck noise levels are not predicted to exceed measured existing ambient L_{dn} and L_{eq} noise levels by more than 5 dB at existing residences located nearest to the project haul route.

Because both on-site excavation noise and off-site truck traffic noise levels are predicted to be at or below measured existing ambient noise levels, the project is not predicted to result in substantial short-term or permanent long term increases in ambient noise levels and this impact is considered **less than significant**.

Impact 3.9-3. The proposed project would not result in a substantial temporary (short-term) or periodic increase in ambient noise levels in the project vicinity above existing noise levels.

As discussed under Impact 3.9-2, given the very low measured ambient conditions in the general project vicinity (below 60 dBA L_{dn}), project-generated noise levels in excess of 5 dB above ambient conditions without the project would be considered significant. Because the project would not result in a temporary or periodic increase in ambient sound levels of more than 5 dB above current conditions, impacts would be **less than significant**.

3.9.5 Mitigation Measures

No significant impacts would occur; therefore, no mitigation is required. NID proposes to incorporate voluntary noise reduction measures into the project. These voluntary measures include: (1) when purchasing or replacing equipment, NID will use the latest, and least intrusive, backup warning devices available while maintaining compliance with the Mine Safety and Health Administration (MSHA) standards; (2) the stockpile and scale area shall be designed to minimize the need for haul trucks to back up by providing a continuous loop for loading, weighing, and exiting; (3) signs shall be posted to limit horn use unless required for employee and public safety; and (4) noise minimization shall be a standard topic at operations meetings.

3.9.6 Level of Significance After Mitigation

Impacts related to noise as a result of the proposed project would be less than significant without mitigation.

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SOURCE: Bollard Acoustical Consultants 2014

FIGURE 3.9-1

Nearest Noise Sensitive Receivers and Ambient Noise Monitoring Locations

BEAR RIVER SEDIMENT REMOVAL AT ROLLINS RESERVIOR

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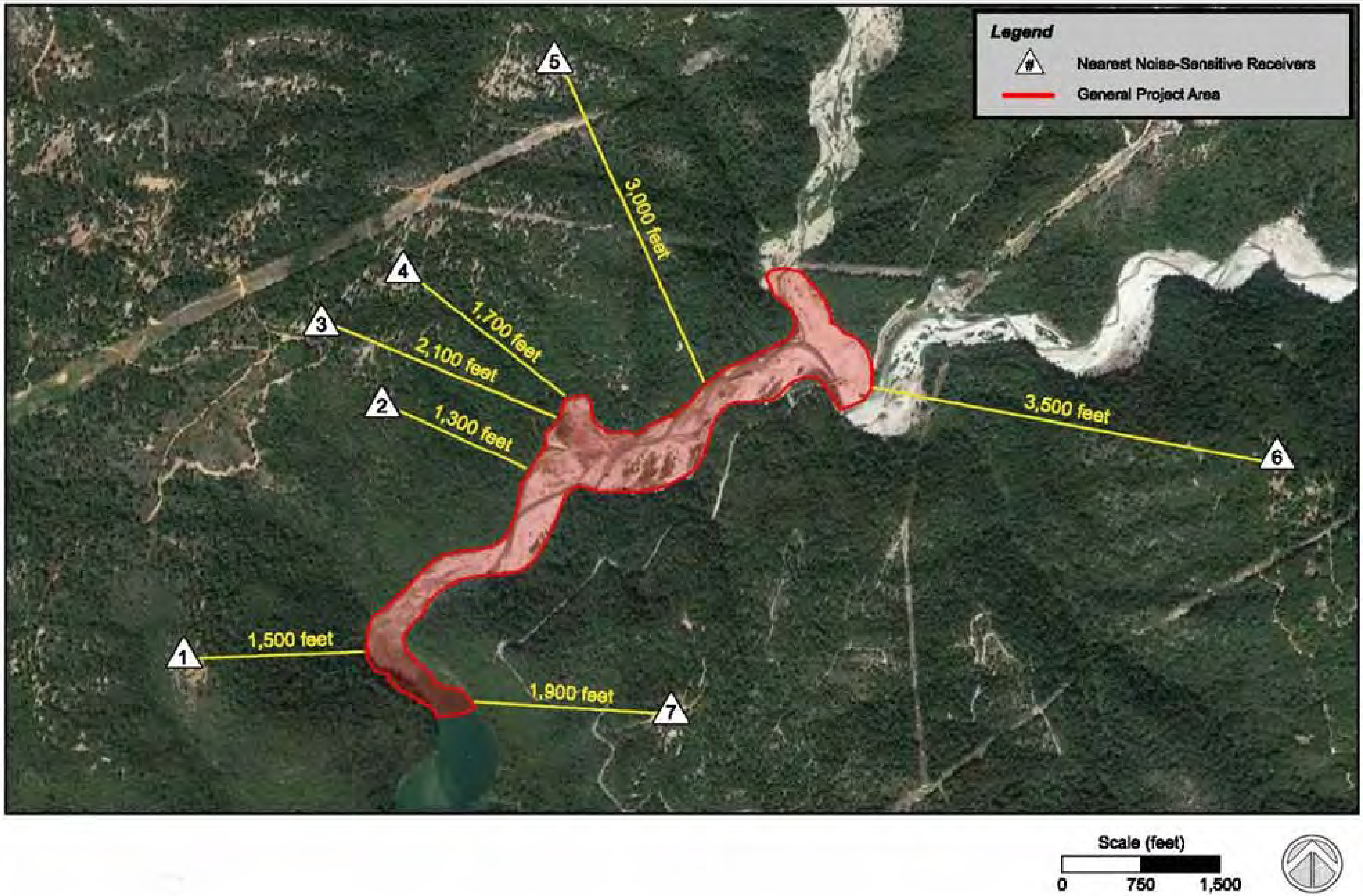

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SOURCE: Bollard Acoustical Consultants 2014

FIGURE 3.9-2

Distance from Project Operations to Nearest Noise-Sensitive Receivers

BEAR RIVER SEDIMENT REMOVAL AT ROLLINS RESERVIOR

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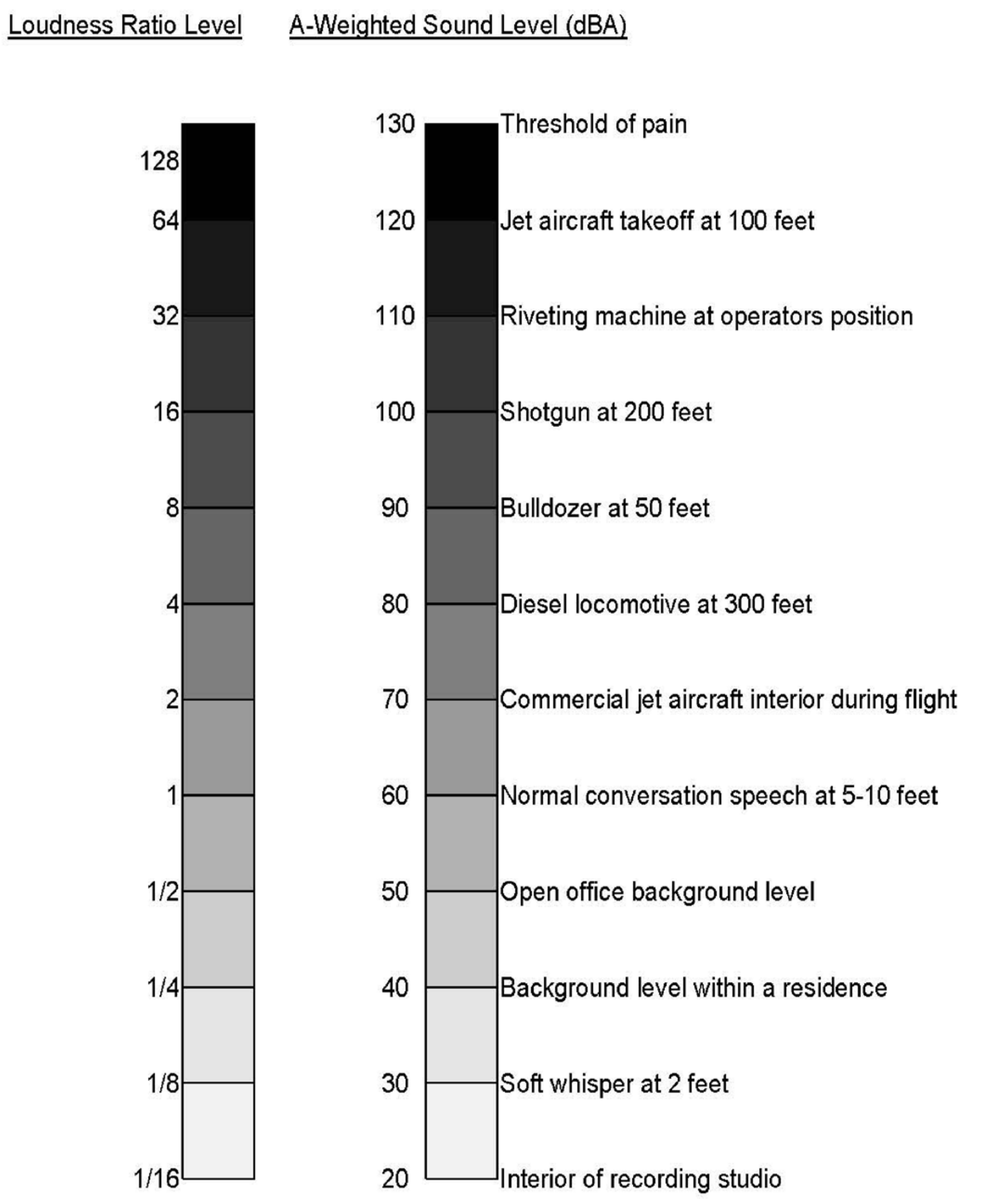

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SOURCE: Bollard Acoustical Consultants 2014

FIGURE 3.9-3

Typical A-Weighted Sound Levels of Common Noise Sources

BEAR RIVER SEDIMENT REMOVAL AT ROLLINS RESERVIOR

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3.10 PUBLIC UTILITIES AND SERVICES

This section describes the existing public utilities and services as well as recreation facilities in the project area and identifies associated regulatory requirements and evaluates potential impacts related to implementation of the proposed Bear River Sediment Removal at Rollins Reservoir Project (proposed project).

3.10.1 Existing Conditions

The project site is located in unincorporated Nevada County and Placer County, approximately 6 miles northeast of the City of Colfax. The City of Auburn is located approximately 22 miles to the southwest. Interstate 80 (I-80) is located approximately 1.5 miles due south of the study area. The approximately 155-acre study area is located just upstream of Rollins Reservoir, and includes an approximately 1-mile reach of the Bear River channel and an 800-foot reach of Steephollow Creek. The Chicago Park Powerhouse is located near the upstream end of the study area, to the north of the Bear River channel.

Because the project site is located within both unincorporated Placer County and Nevada County, public utility and service providers within both jurisdictions are discussed in this section.

3.10.1.1 Public Utilities

3.10.1.1.1 Domestic Water

Nevada County

Western Nevada County, including the project area, is served primarily by the Nevada Irrigation District (NID). Early mining ditches in western Nevada County formed the backbone of NID, which supplies surface water to its domestic, industrial, and agricultural customers. Water supply for NID is currently derived from mountain snowpack from Northern California's Sierra Nevada and is stored in an extensive system of 10 reservoirs that provide surface water supply to NID's seven water treatment plants as well as the raw water supply for NID's raw water system. Outside of the existing service areas, water users depend primarily on groundwater through individual or small systems (NID 2011).

Placer County

The Placer County Water Agency (PCWA) is the primary water resource agency for Placer County. PCWA carries out a broad range of responsibilities, including water resource planning and management, retail and wholesale supply of irrigation water and drinking water, and production of hydroelectric energy in Placer County's 1,500-square-mile area (PCWA 2014). PCWA's service boundaries are coterminous with Placer County.

The PCWA service area is divided into five zones that provide treated and raw water to Colfax, Auburn, Loomis, Rocklin, Lincoln, a small portion of Roseville, unincorporated areas of western Placer County, and a small community in Martis Valley near Truckee. PCWA Zone 3 is adjacent to the project site and includes the communities of Applegate, Weimar, Meadow Vista, Colfax, Gold Run, Monte Vista, Dutch Flat, and Alta and surrounding areas. The Boardman Canal, which begins near Alta, serves as the main delivery method for water to users and treatment plants in Zone 3. Water purchased from Pacific Gas & Electric (PG&E) from the Yuba and Bear Rivers enters PCWA's Boardman Canal from the Drum–Spaulding system. PCWA's Zone 3 water treatment plants include Alta, Monte Vista, Colfax, and Applegate. There are about 27 miles of treated water piping and 2.16 million gallons of treated storage in Zone 3 (PCWA 2011). The predominant demand in Zone 3 is for untreated water, with only about 1,400 accounts served with retail treated water.

PCWA uses surface water as its primary supply. PCWA's primary surface water supplies consist of Middle Fork Project water from the American River, water purchased from PG&E from the Yuba and Bear Rivers, and Central Valley Project water from the American River. In Zone 3, PCWA anticipates its PG&E supply will be available in an amount up to 25,000 acre-feet per year through 2035. PCWA also uses a limited amount of surface water from small creeks under pre-1914 water rights (PCWA 2011). PCWA currently does not rely on substantial use of groundwater to meet its customers' demands. Groundwater would not be used to serve the proposed project.

NID also supplies water for municipal, domestic, and industrial purposes in portions of Placer County. Approximately 66,500 acres of NID's total service area of 287,000 acres is within Placer County—generally, the area between Auburn and Lincoln to the north (NID 2011).

3.10.1.1.2 Wastewater Treatment

Nevada County

Public sanitary sewer systems in the western part of Nevada County are provided by the Cities of Grass Valley and Nevada City and Nevada County Sanitation District No. 1. In areas outside the cities' service areas, the County of Nevada, through the Nevada County Department of Sanitation, operates and maintains the sewage collection and treatment facilities constructed by the Sanitation District No.1. Currently, there are nine systems or zones within Nevada County Sanitation District No. 1. These zones are Lake Wildwood, Lake of the Pines, Kingsbury Greens, Gold Creek, Penn Valley, Mountain Lakes Estates, North San Juan, Cascade Shores, and Glenbrook (which contracts with the City of Grass Valley for treatment and disposal) (County of Nevada 1996). Wastewater treatment services are not available to the project and such services are not needed.

Placer County

The Placer County Department of Facility Services operates and maintains 10 separate sanitary sewer systems within the county; 9 of these are either sewer maintenance districts or county service areas, which derive their operating revenue from sewer user fees within each of the districts (County of Placer 2014a). Sewer services provided by Placer County include the operation and maintenance of 5 wastewater treatment facilities, 44 sewer pump stations, almost 300 miles of sewer pipe, and over 450 septic tank effluent pump systems (County of Placer 2014b). Placer County recently completed the installation of a pump station and pipeline to convey Applegate's wastewater to the existing sewer collection system that conveys wastewater to the Sewer Maintenance District 1 Wastewater Treatment Plant on Joeger Road in North Auburn. The treatment ponds at the Applegate Wastewater Treatment Plant are no longer in use and are expected to be decommissioned in 2014 (County of Placer 2014c).

3.10.1.1.3 Solid Waste and Recycling Services

Nevada County

Waste Management of Nevada County provides refuse and recycling collection services to local residents and business in Nevada County. Trash collected by Waste Management in Nevada County is transported to the McCourtney Road Transfer Station located at 13083 Grass Valley Avenue in Grass Valley. After sorting is complete, residual garbage is hauled to the Recology Ostrom Road Landfill in Wheatland, California. The Ostrom Road landfill currently processes, transfers, and disposes of 60,000 tons of municipal solid waste per year for the County of Nevada (Recology 2014). The estimated closure date for the Ostrom Road Landfill is December 31, 2066 (CalRecycle 2014).

Waste Management offers customized recycling programs to residential, commercial, and industrial customers to reduce the amount of solid waste generated in Nevada County. Current programs include buy/drop-off centers; paper, wood, and pallet recycling; and glass and plastic recycling. Waste Management also provides recycled materials pickup and transfer services, and offers a variety of sizes of mail-back sharps containers, which provides customers a system for the safe disposal of sharps waste (WM 2014).

Placer County

In Placer County, Recology Auburn Placer provides refuse and recycling collection services for residents and business located in areas west of Colfax, including City of Colfax.

3.10.1.2 Public Services

3.10.1.2.1 Fire Protection and Emergency Services

Nevada County

Nevada County is protected by multiple fire protection agencies, including local fire districts, city fire departments, the California Department of Forestry and Fire Protection (CAL FIRE), the Bureau of Land Management (BLM), and the U.S. Forest Service (USFS). The 10 separate fire districts that currently serve Nevada County include the 49er, Higgins Area, North San Juan, Rough and Ready, Truckee, Peardale–Chicago Park, Penn Valley, Nevada County Consolidated, Watt Park, and Ophir Hill. The project area is within the Peardale–Chicago Park Fire District. The Peardale–Chicago Park Fire District provides fire protection for structures and wildland, emergency medical response, and public assistance from Station 57 in Chicago Park and Station 257 in Peardale (PCPFPD 2014). The Nevada–Yuba–Placer Unit of CAL FIRE also provides wildland fire protection services to portions of Nevada County, including the project area. The nearest CAL FIRE station in the project area is located at 24020 Fowler Road in Colfax. USFS and BLM provide wildland fire protection services on federal lands in federal responsibility areas for watershed and resource protection. Various agreements between the fire protection agencies enable cooperative fire protection services. The Grass Valley Emergency Command Center, a cooperative facility between the USFS and CAL FIRE, provides emergency dispatching services through cooperative agreements with all the fire districts and cities within Nevada County (County of Nevada 1996).

Placer County

Placer County Fire provides year-round, all-hazard fire and emergency services to over approximately 475 square miles of unincorporated county area. There are nine fire protection districts and nine fire departments in Placer County (County of Placer 2014). Placer County Fire operates out of five full-time stations with paid staff, seven volunteer stations, and three Amador stations. "Amador stations" are stations that fall within the jurisdiction and responsibility of CAL FIRE during fire season. During the winter season, they fall within the jurisdiction and responsibility of Placer County Fire. The closest station serving the project site, located at 24020 Fowler Road in Colfax, is an Amador station (County of Placer 2014d).

3.10.1.2.2 Law Enforcement Services

Nevada County

Nevada County Sheriff's Department is the largest law enforcement agency in the county. The Sheriff's Office has primary jurisdiction over all of the unincorporated areas of Nevada County and also assists the other law enforcement agencies when the need arises. The geographical area of responsibility for the Sheriff's Office spans in excess of 900 square miles, including numerous lakes and several rivers.

The Sheriff's Department is staffed with 175 personnel, including sworn and civilian personnel. There are three main divisions within the Sheriff's Department: Operations, Administrative Support, and Corrections (Nevada County Sheriff's Office 2014). The Sheriff's Department provides all the duties of Sheriff, Coroner and Public Administrator (Nevada County Sheriff's Office 2014). The Sheriff's Department is headquartered at 950 Maidu Avenue in Nevada City.

Placer County

The Placer County Sheriff's Office provides law enforcement to the unincorporated areas of Placer County and provides contract law enforcement services to the City of Colfax and the Township of Loomis. The Sheriff's Office also provides jail services, coroner's services, court security, and marshal duties to all of Placer County. The Placer County Sheriff's Office is headquartered in North Auburn and has a substation located in Colfax.

3.10.1.2.3 Recreation and Park Districts

Nevada County

In Nevada County, numerous federal, state, and local jurisdictions and private entities provide recreation opportunities.

There are four recreation and park districts in Nevada County: Western Gateway Recreation and Park District in the Penn Valley area, Bear River Recreation and Park District in southern Nevada County, Truckee–Donner Recreation and Park District in eastern Nevada County, and Oak Tree Park and Recreation District in the San Juan Ridge area. River District currently operates the Magnolia Sports Complex in conjunction with the Pleasant Ridge School District. Nevada County owns no lands available for public recreation other than the Western Gateway Park, which the county leases to the Western Gateway Regional Recreation and Park District (County of Nevada 1996).

In addition to the county and city recreation providers, other local agencies maintain area recreational facilities. NID provides outdoor recreational opportunities at district reservoirs in the foothills and mountains of the Northern Sierra. Recreational facilities owned by NID include Rollins Reservoir, Scotts Flat Reservoir, Bowman Reservoir, Combie Reservoir, Faucherie Reservoir, and Jackson Meadows Reservoir. In the project area, Rollins Reservoir, located at the 2,100-foot elevation off Highway 174 between Grass Valley and Colfax, has four independently operated campgrounds. Long Ravine, Greenhorn, Orchard Springs, and Peninsula offer a combined 250 campsites and a range of services that includes stores, restaurants, fuel sales, and rentals (NID 2014).

Placer County

In Placer County, numerous federal, state, and local jurisdictions and private entities provide recreation opportunities. The BLM and USFS manage public and national forest lands that provide recreational opportunities including camping, hiking, and biking. USFS manages lands and operates recreational facilities in Placer County on over 300,000 acres in portions of the Tahoe National Forest and El Dorado National Forest and portions of the Tahoe Basin, encompassing much of central and eastern Placer County (County of Placer 2013).

The Placer County Parks and Grounds Division provides construction, operation, and maintenance of Placer County's parks, beaches, open space, landscaped grounds, and recreational trails. In the project area, the Placer County Parks and Recreation Division operates and maintains the Applegate Park, Bear River Campground, Meadow Vista Trail Staging Area and Equestrian Arenas, and Dutch Flat Swimming Pool and Community Center (County of Placer 2014e).

The Auburn Recreation District, headquartered in the City of Auburn, provides area park and recreation services. In the project area, the Auburn Recreation District operates and maintains the Meadow Vista Park and Sugarpine Ridge Park in Meadow Vista (ARD 2014).

3.10.1.2.4 Other Public Services and Facilities

Other public service providers in the project area include the Nevada County Elementary School and Nevada Union High School Districts. Library services are provided by Nevada County and the City of Grass Valley.

The project site currently has electrical service provided by PG&E. The project is proposing to light the mobile office and equipment staging area for security purposes and to prevent the unauthorized or illegal use of the project site. The PG&E electrical service connection would be removed upon project completion.

3.10.2 Relevant Plans, Policies, and Ordinances

3.10.2.1 Federal

NPDES Permits (Federal and State)

The National Pollutant Discharge Elimination System (NPDES) permit system was established in the Clean Water Act to regulate municipal and industrial discharges to surface waters of the United States. The discharge of wastewater to surface waters is prohibited unless an NPDES permit has been issued to allow that discharge. Each NPDES permit includes the following provisions: effluent and receiving water limits of allowable concentrations and/or mass of pollutants contained in the discharge; prohibitions on discharges not specifically allowed under the permit; provisions that describe required actions by the discharger, including industrial pretreatment, pollution prevention, and self-monitoring activities; and other regulatory requirements.

Resource Conservation and Recovery Act

The Resource Conservation and Recovery Act (40 CFR 258), Subtitle D, contains regulations for municipal solid waste landfills and requires states to implement their own permitting programs incorporating the federal landfill criteria. The federal regulations address the location, operation, design, groundwater monitoring, and closure of landfills.

3.10.2.2 State

Quimby Act

The Quimby Act (California Government Code, Section 66477) permits local jurisdictions to require the dedication of land or the payment of fees in lieu of land for parks and recreational purposes as a condition for approval of a new development's tentative or parcel map. The act sets the requirement at 3 to 5 acres per 1,000 residents, based on the existing park-to-population ratio of the surrounding community.

Statewide General Waste Discharge Requirements

The Statewide General Waste Discharge Requirements for Sanitary Sewer Systems (Order No. 2006-0003-DWQ) established by the State Water Resources Control Board (SWRCB) apply to state agencies that own and operate more than 1 mile of pipe that collects and conveys untreated or partially treated wastewater to a publicly owned treatment facility. These waste discharge requirements, intended to reduce sanitary-sewer overflows, require agencies to develop and certify a sewer system management plan, sections of which must be submitted to the SWRCB.

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act (Porter-Cologne Act) is California's statutory authority for the protection of water quality. Under the Porter-Cologne Act, the state must adopt water quality plans, policies, and objectives that will provide protection to the state's waters for the use and enjoyment of the people of California. In California, the SWRCB has authority and responsibility for establishing policy for water quality control issues for the state. Regional authority for planning, permitting, and enforcement is delegated to the nine Regional Water Quality Control Boards (RWQCBs). The Porter-Cologne Act authorizes the SWRCB and RWQCBs to issue NPDES permits containing waste discharge requirements, and to enforce these permits. SWRCB and RWQCB regulations implementing the Porter-Cologne Act are included in Title 27 of the California Code of Regulations.

California Integrated Waste Management Act

To minimize the amount of solid waste that must be disposed of by transformation and land disposal, the State legislature passed the California Integrated Waste Management Act of 1989 (AB 939), effective January 1990. According to the act, all cities and counties were required to divert 25% of all solid waste from landfill facilities by January 1, 1995, and 50% by January 1, 2000. Each jurisdiction is required to develop solid waste and household hazardous waste plans demonstrating program implementation consistent with the intent of the California Integrated Waste Management Act. The plans must promote (in order of priority) source reduction, recycling and composting, and environmentally safe transformation and land disposal.

Energy Efficiency Standards

Title 24, Part 6, of the California Building Code establishes energy efficiency standards for new construction (new buildings, additions, alterations, nonresidential buildings, and repairs). These standards were established in 1978 in response to a legislative mandate to reduce California's energy consumption and are updated periodically to allow consideration and incorporation of new energy efficiency technologies. New standards were adopted in 2008 to reduce California's electricity demand. For building permit applications submitted on or after January 1, 2010, the 2008 standards must be met. The 2010 building energy efficiency standards were developed in response to a number of efforts, including AB 32, the Global Warming Solutions Act of 2006, which mandates that California must reduce its greenhouse gas emissions to 1990 levels by 2020. The updated standards were adopted by the California Energy Commission in April 2008.

3.10.2.3 Local

Nevada Irrigation District

The following Strategic Plan 2010–2011 objectives (NID 2011) are applicable to the proposed project:

- **Objective 9:** Design, develop and implement a strategy to increase storage.
- **Objective 20:** Partner with organizations in the community to enhance and expand new and existing areas of recreation.

Nevada County Land Use and Development Code

Chapter XVI of the Nevada County Land Use Development Code requires new projects and construction to meet fire safety standards described in California Public Resources Code Section 4290, and establishes requirements for fuel modification and emergency water supply, as well as minimum fire-safe driveway and road standards. New structures built in Nevada County must also comply with fire safety building regulations. These building codes require the use of ignition-resistant building materials and establish design standards to improve the ability of a building to survive a wildfire.

State-mandated California Public Resources Code, Section 4291 requires the management of flammable vegetation around buildings or structures as a firebreak within 30 feet or to the property line from a structure, and as a fuelbreak, within 30 to 100 feet or to the property line from the structure. This regulation applies to all buildings or structures in a mountainous area; forest-covered, brush-covered, or grass-covered lands; or any land that is covered with flammable material in the state responsibility area.

Nevada County General Plan

The Nevada County General Plan (County of Nevada 1996) contains goals, objectives, and policies related to the provision of public services and utilities. The following goals, objectives, and policies are applicable to the proposed project.

Recreation Element

Goal 5.1: Provide a diverse range of recreational opportunities at a regional, district, community, and neighborhood level.

Objective 5.1: Provide a diverse range of recreational opportunities at a regional, district, community, and neighborhood level.

Policy 5.1: Development of parks and recreation facilities in the County park system will focus upon regional facilities providing County-wide services, or serving large areas of the County including Community Regions and Rural Regions. Design of the regional parks should focus on natural resources, environmental education, and provide areas for diverse recreation interest. Regional parks should provide for both active and passive uses which may include open play, picnicking, walking, cycling, nature enjoyment, cultural activities and historic interpretation. Use of environmentally sensitive areas should be limited to open space or low-intensity passive activities.

Objective 5.2: Acquire, develop and maintain park lands to serve the needs of Nevada County.

Policy 5.5: The County shall base park and recreation facility planning on the following level of service standard for County park land to provide regional parks serving both Community Regions and Rural Regions:

- 3.0 acres of park land for each increase of 1,000 persons in county-wide population.

Objective 5.7: Preserve and encourage water based recreational opportunities.

Policy 5.18: Cooperate with other public agencies to provide public access to the lakes and impoundments in the County, consistent with their ability to support water based recreation.

Safety Element

Goal SF-10.6: Ensure adequate public safety services and facilities through development standards, development fees, and land use patterns.

Objective SF-10.6.1: Maintain appropriate levels of safety and protection services and facilities on land and water for both Community and Rural Regions.

Policy SF-10.6.1.1 County public safety facilities shall be included in the County's development impact fee program, as provided in Policy 3.8 to provide for new facilities or upgrading of existing facilities necessary to serve new development.

Objective SF-10.6.3: Encourage appropriate levels of consolidated services to provide for efficiency and cost containment.

Policy SF-10.6.3.1: The County will encourage joint service agreements and consolidation of police, fire, and emergency services between the County, cities, and service districts.

Goal FP-10.7: Enhance fire safety and improve fire protection effectiveness through infrastructure and service improvements.

Objective FP-10.7.2: Ensure that proposed private roads are maintained.

Policy FP-10.7.2.1: As a condition of development, require long-term maintenance of private roads to the standards of the original improvements, including roadside vegetation management.

Objective FP-10.7.4: Encourage fire protection agencies to determine appropriate levels of fire protection facilities and services for both Community and Rural Regions.

Policy FP-10.7.4.1: Encourage the upgrading of facilities within existing fire protection districts, and encourage the expansion of existing districts where warranted by the population density allowed under the General Plan.

Policy FP-10.7.4.2: Cooperate with CAL FIRE, US Forest Service, local fire districts, and the Nevada County Fire Safe Council in fire prevention programs.

Goal FP-10.11: Reduce fire severity and intensity through fuels management.

Objective FP-10.11.1: Recognize Public Resources Codes 4290 and 4291, and other defensible space standards and guidelines in order to protect structures from wildfire, protect wildlands from structure fires, and provide safe access routes for people and firefighters.

Policy FP-10.11.1.1: Recognize the Nevada County Defensible Space Standard as described in this policy. The Defensible Space Standard provides the basic protection measures for life and property from encroaching wildfire, and minimizes structure fires or other fires which may threaten to spread into the wildlands. The standard utilizes Public Resources Code 4291 and includes one component of Public Resources Code 4290, fuels treatment next to driveways, as the minimum fire safety standard in Nevada County.

Public Facilities and Services

Goal 3.1: Provide for public facilities and services commensurate with development type and intensity.

Objective 3.2: Ensure that the capacity, availability, financing, and capability of public services and facilities are sufficient to meet levels of service requirements for development.

Policy 3.12: Encourage all other districts serving the County (including school, utility, cemetery, park, and fire districts) to develop and to regularly update a Master

Service Plan based on realistic growth which specifies a district's policies and requirements for facilities based upon buildout of the County's General Plan. The County shall review all proposed facility sites in the districts' Facilities Master Plans for consistency with the General Plan.

Objective 3.4: Develop and operate public facilities and services in an environmentally sound way.

Policy 3.24: The County, in cooperation with other affected agencies, shall continue to implement the County Integrated Waste Management Plan. Preparation of a comprehensive long-range facilities plan for the County shall consider the need for transfer stations, composting sites, hazardous waste collection facilities, and other solid waste disposal facilities.

Placer County General Plan

The Placer County General Plan (County of Placer 2013) contains goals and policies related to the provision of public facilities and services. The following goals and policies are applicable to the proposed project.

Public Facilities and Services

Goal 4.A: To ensure the timely development of public facilities and the maintenance of specified service levels for these facilities.

Policy 4.A.2. The County shall ensure through the development review process that adequate public facilities and services are available to serve new development. The County shall not approve new development where existing facilities are inadequate unless the following conditions are met:

a. The applicant can demonstrate that all necessary public facilities will be installed or adequately financed (through fees or other means);

b. The facilities improvements are consistent with applicable facility plans approved by the County or with agency plans where the County is a participant; and,

c. The facilities improvements are designed and built to the current standards of the agency providing service.

Goal 4.H: To provide adequate law enforcement services to deter crime and to meet the growing demand for services associated with increasing population and commercial/industrial development in the County.

Policy 4.H.1: Within the County's overall budgetary constraints, the County shall strive to maintain the following staffing ratios (expressed as the ratio of officers to population):

a. 1:1,000 for unincorporated areas

b. 1:7 for jail population

c. 1:16,000 total county population for court and civil officers

Policy 4.H.2: The County Sheriff shall strive to maintain the following average response times for emergency calls for service:

a. 6 minutes in urban areas

b. 8 minutes in suburban areas

c. 15 minutes in rural areas

d. 20 minutes in remote rural areas

Policy 4.H.3: Within the County's overall budgetary constraints, the County shall provide sheriff facilities (including substation space, patrol, and other vehicles, necessary equipment, and support personnel) sufficient to maintain the above service standards.

3.10.3 Thresholds of Significance

3.10.3.1 Public Services

The significance criteria used to evaluate the project impacts to public services are based on Appendix G of the California Environmental Quality Act (CEQA) Guidelines (14 CCR 15000 et seq.). According to Appendix G, a significant impact related to public services would occur if the project would:

1. Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:

   a. Fire protection.

   b. Police protection.

   c. Schools.

   d. Parks.

e. Other public facilities.

3.10.3.2 Public Utilities

The significance criteria used to evaluate the project impacts to public services are based on Appendix G of the CEQA Guidelines. According to Appendix G, a significant impact related to public utilities would occur if the project would:

1. Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board.
2. Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.
3. Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.
4. Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed.
5. Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments.
6. Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs.
7. Comply with federal, state, and local statutes and regulations related to solid waste.

3.10.4 Impacts Analysis

3.10.4.1 Public Services

Impact 3.10-1. The project would not result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, or the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services:

Fire protection

The project may require assistance from the Peardale–Chicago Park Fire Protection District and/or CAL FIRE in the event of an emergency. The proposed project is located within a CAL

FIRE state responsibility area and is designated as a "High Fire Hazard" severity zone (CAL FIRE 2007). The Peardale–Chicago Park Fire Protection District also provides fire protection services in the project area. The Peardale–Chicago Park Fire Protection District has two stations within 5 miles of the project site, one in Peardale and the other in Chicago Park. The nearest CAL FIRE fire station is located in Colfax, approximately 6 miles from the project site. Access to and from the gravel removal and stockpiling site will come from the Chicago Park Powerhouse Road, which connects to Secret Town Road and I-80. NID would continue to maintain Chicago Park Powerhouse Road and would perform widening, resurfacing, or other reconstruction as needed for safety. Because the project would not result in an increased residential population and would include only a minimal increase in the daytime population (employees), it is anticipated that the existing Peardale–Chicago Park Fire Protection District and CAL FIRE staff and equipment would be sufficient to meet the demands of the project while maintaining appropriate response times and standards. The project would not require the construction or expansion of any Peardale–Chicago Park Fire Protection District or CAL FIRE facilities that would have a significant effect on the environment. Therefore, the impact on fire protection services would be considered **less than significant**.

Police protection

The proposed project would involve aggregate removal operations on the Bear River between Rollins Reservoir and the confluence of Steephollow Creek. The project site, which is in both unincorporated Placer County and Nevada County, is within the Placer County Sheriff and Nevada County Sheriff's existing police service area. The closest police station is the Placer County Sheriff's Substation located in Colfax, approximately 6 miles from the project site. Development of the proposed project could slightly increase demand for police services. However, because the project would not result in an increased residential population in either county, it is anticipated that the existing Nevada County Sheriff and Placer County Sheriff staff levels would be sufficient to meet the demands of the proposed project. The number of employees working at the site on a daily basis would not trigger the need to add additional officers. In addition, the project proposes to install yard and security lights within the building and equipment storage area in an effort to reduce unauthorized or illegal use of the project site. The project would not require the construction or expansion of any police facilities that would have a significant effect on the environment; therefore, impacts would be considered **less than significant**.

Parks

The proposed project would not result in an increased residential population and would therefore not result in an increased demand for existing park facilities. The project would involve aggregate removal operations on the Bear River between Rollins Reservoir and the Bear River /

Steephollow Creek confluence. The overall purpose of the project is to provide water supply maintenance to prevent the accumulation of transported sediments in the Rollins Reservoir and the ultimate goal of the project is to restore the channel to the pre-1965 conditions (prior to completion of the Rollins Reservoir Dam) and to prevent further loss of storage capacity in Rollins Reservoir. The project would result in improved recreational opportunities and boat access within Rollins Reservoir. As previously mentioned, because the project would not result in an increased residential population, it would not be expected to result in an increased demand for parks and recreation facilities that would require the need to construct new facilities or expand existing facilities. Therefore, the project would result in **no impact** on parks and recreational facilities.

Schools and other public facilities

Because the project would not introduce a new residential population to the area, it would result in **no impacts** related to an increase in demand for schools, libraries, or other public facilities.

The project site currently has electrical service provided by PG&E. The project is proposing to light the office and equipment staging area for security purposes. The utility connections would be removed upon project completion. Accordingly, **no impact** related to electrical service is anticipated.

3.10.4.2 Public Utilities

Impact 3.10-2. The project would not exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board.

The proposed project would result in no change in wastewater services in the project area. Wastewater in the project area is conveyed by Nevada County. Portable restrooms for the project employees would be placed on site by a licensed vendor and operated in accordance with Nevada County Environmental Health requirements. **No impacts** associated with non-compliance with wastewater treatment requirements of the RWQCB would occur.

Impact 3.10-3. The project would not require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.

The project would not change wastewater or water treatment facilities in the project area. The Nevada County Health Department would be advised by the project operator as to the number and location of employees expected to be on site and the source of domestic water. Wastewater would be handled by portable toilet facilities managed by a vendor. These systems would require health department approvals. Accordingly, the project would have **no impact** related to the construction or expansion of water and wastewater treatment facilities.

Impact 3.10-4. The project would have sufficient water supplies available to serve the project from existing entitlements and resources, and no new or expanded entitlements would be needed.

The project would require a water supply. NID's surface water rights in the project area would be used for on-site dust control. Water would be applied to material being stockpiled and loaded as required to reduce fugitive dust and would be applied to prevent direct runoff into Steephollow Creek or the Bear River. Potable water needs for the project would be delivered by truck, as needed. The project would not require new or expanded entitlements to water and would therefore have **no impact** related to water supply.

Impact 3.10-5. The project would not result in a determination by the wastewater treatment provider which serves or may serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments.

The project site is not currently served by Nevada County (the local wastewater conveyance provider). Portable restrooms for the project employees would be placed on site by a licensed vendor and operated in accordance with Nevada County Environmental Health requirements. The project would have a **less than significant** impact related to an increased demand for wastewater treatment services.

Impact 3.10-6. The project would not require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.

The project is located within a rural portion of the unincorporated territory of Nevada County and Placer County. There are no stormwater drainage facilities in the vicinity of this project site. **No impact** would result on any existing facilities.

Impact 3.10-7. The project would be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs.

Project operations are not anticipated to generate significant amounts of solid waste. All debris would be removed during the course of aggregate removal operations and hauled off site to the McCourtney Road Transfer Station located at 13083 McCourtney Road in Grass Valley. All of the waste would be sorted at the transfer station to capture any recyclable materials. Once sorting is completed, residual garbage would be hauled to the Recology Ostrom Road Landfill in Wheatland, California. Under current projected development conditions, the transfer station has a permitted lifespan extending through 2066 (CalRecycle 2014). Because the project would not be expected to generate a significant amount of solid waste and there is sufficient capacity at the McCourtney Road Transfer Station and the Ostrom Road Landfill, project impacts on landfills would be **less than significant**.

Impact 3.10-8. The project would comply with federal, state, and local statutes and regulations related to solid waste.

The project would comply with all federal, state, and local statutes that relate to the disposal and recycling of solid waste. Therefore, the project would have **no impact** related to non-compliance with solid waste statutes and regulations.

3.10.5 Mitigation Measures

No significant impacts would occur as a result of implementation of the proposed project; therefore, no mitigation is required.

3.10.6 Level of Significance After Mitigation

Impacts related to public utilities and services as a result of the proposed project would be **less than significant** without mitigation.

3.11 TRANSPORTATION

This section describes the existing traffic/circulation setting of the project site, identifies associated regulatory requirements, evaluates potential impacts, and identifies mitigation measures related to implementation of the proposed Bear River Sediment Removal at Rollins Reservoir Project (proposed project).

The information and analysis presented in this section is based on the *Traffic Impact Analysis for Bear River Restoration Project*, prepared by KD Anderson & Associates Inc., December 30, 2013. A copy of this report is included in Appendix I to this Environmental Impact Report (EIR).

3.11.1 Existing Conditions

Access to the project site is currently provided via the Interstate 80 (I-80) Alpine Overcrossing interchange to Secret Town Road and to Chicago Park Powerhouse Road. Chicago Park Powerhouse Road intersects Secret Town Road approximately 2,000 feet to the east of the I-80 interchange.

Study Area Circulation System

Interstate 80 is a four-lane freeway through the region. Although the surrounding area is mountainous, the Alpine Overcrossing interchange is located along a relatively flat segment of the freeway. The overcrossing is a two-lane facility. The eastbound ramps provide a diamond configuration. For westbound traffic, the westbound on-ramp is a loop ramp. The off-ramps are controlled by stop signs, as is the overcrossing connection to Secret Town Road.

To the west on I-80, a pair of westbound hook-ramps serve Magra Road 0.6 mile west of the Alpine Overcrossing interchange, with the Gold Run interchange located 2.8 miles to the east.

Secret Town Road parallels I-80 and follows a relatively flat alignment. The roadway provides 20 to 22 feet of pavement width and is striped with a solid yellow centerline. The paved surface is in relatively good condition. The roadway terminates approximately 3,500 feet east of the Alpine Overcrossing.

Chicago Park Powerhouse Road extends north from Secret Town Road approximately 2,000 feet east of the Alpine Overcrossing. The roadway follows a winding hillside horizontal alignment and extends for approximately 3 miles to the project site. The southerly 2 miles of the roadway follow a relatively gradual grade, with the northerly 1 mile segment on a more pronounced downhill grade into the Bear River canyon. The majority of the roadway provides 19 feet of pavement and has no centerline striping. Toward the northerly end of the road, an approximately 0.5-mile segment has many areas of poor pavement and is narrower in sections. A number of sections are about 4 feet narrower, with a few short segments having a width of only

14 to 15 feet. The balance of the pavement surface along the length of the road is in relatively good condition.

Level of Service Methodology

To assess the quality of existing traffic conditions, level of service (LOS) was calculated for study area intersections. "LOS" is a qualitative measure of traffic operating conditions whereby a letter grade, A through F, corresponding to progressively worsening traffic operating conditions, is assigned to an intersection, roadway segment, or access ramp. In general terms, LOS is calculated for an hour-long traffic condition at a signalized intersection, unsignalized intersection, or roadway segment. Table 3.11-1, Level of Service Definitions, presents typical LOS characteristics.

At unsignalized intersections the number of gaps in through traffic, gap acceptance time and corresponding delays for motorists who must yield the right of way are used for Level of Service analysis. Procedures used for calculating unsignalized intersection Level of Service are as presented in the *Highway Capacity Manual 2010* (HCM2010; TRB 2010). Calculations use identified geometrics and controls, peak hour traffic volumes, and truck volume percentages.

Freeway ramp operations have also been calculated using HCM2010 procedures. Calculations utilize ramp and freeway volumes, truck percentages, and gore area merge/diverge distances and consider the influence of adjacent ramp traffic on individual ramp operations.

Table 3.11-1
Level of Service Definitions

LOS	Freeway Ramp Merge/Diverge	Unsignalized Intersection	Roadway (Daily)
A	<10 pc/m/l	Little or no delay – Delay <10 sec/veh	Completely free flow
B	10–20 pc/m/l	Short traffic delays – Delay >10 sec/veh and <15 sec/veh	Free flow; presence of other vehicles noticeable
C	20–28 pc/m/l	Average traffic delays – Delay >15 sec/veh and <25 sec/veh	Ability to maneuver and select operating speed affected
D	28–35 pc/m/l	Long traffic delays – Delay >25 sec/veh and <35 sec/veh	Unstable flow; speeds and ability to maneuver restricted
E	>35 pc/m/l	Very long traffic delays, failure, extreme congestion – Delay >35 sec/veh and <50 sec/veh	At or near capacity; flow quite unstable
F	Demand exceeds capacity	Intersection often blocked by external causes – Delay >50 sec/veh	Forced flow, breakdown

Sources: TRB 2010, 2000.
Notes: pc/m/l = passenger cars per mile per lane; sec/veh = seconds per vehicle.

Level of Service Standards Local agencies adopt minimum LOS standards as a part of general and community plans for roads under their jurisdiction. Although the project is located on the border of Placer and Nevada Counties, the roadways considered in the analysis are within Placer County. Operating standards within this area of Placer County are defined by the Placer County General Plan (County of Placer 2013) for roadways under Placer County jurisdiction. Policies contained in the Placer County General Plan indicate that the LOS minimum standard for intersections and roadways shall generally be LOS C. Land development requirements shall be set to sustain LOS C at all intersection and roadways for as long as possible. The Placer County General Plan also indicates that the LOS standard shall be D within 0.5 mile of state highways. Similarly, the California Department of Transportation (Caltrans) identifies LOS D as the acceptable intersection LOS standard. As such, the LOS D standard is applicable to the study area intersections and local roadways.

The Transportation Corridor Concept Report (TCCR) for I-80 (Caltrans 2010) is the Caltrans District 3 long-range planning document for the freeway corridor. The purpose of each TCCR is to identify existing route conditions and future needs, including existing and forecast travel data, a concept LOS standard, and the facility needed to maintain the concept LOS and address mobility needs over a 20-year planning horizon. The District 3 TCCR for I-80 is broken into 16 freeway segments, Segment 11 of which includes the study area.

“Concept LOS” represents the minimum acceptable service conditions over the next 20 years. District 3 has established minimum concept LOS standards for the planning horizon at LOS D for rural segments and LOS E for urban segments. However, the concept LOS for some segments departs from these minimums, and Segment 11 is identified as one of these exceptions. The TCCR indicates that it would not be feasible to maintain or re-attain LOS D on Segments 9 through 14 due to lack of funding under current projections and due to factors such as the cost of adding more lanes to I-80’s numerous structural elements. A concept LOS F is identified for these segments. This operating condition also reflects peak day seasonal directional volumes on the highway, generally representative of afternoon weekend conditions during periods of high recreational traffic.

Existing Traffic Volumes

Intersections. The analysis of existing traffic volumes addresses traffic conditions during the morning and afternoon peak weekday traffic hours. Peak hour traffic counts were conducted in October 2013 during the morning (7 a.m. to 9 a.m.) and evening (4 p.m. to 6 p.m.) hours when local schools were in session. Figure 3.11-1 displays existing traffic count information used for this analysis. As shown, existing traffic volumes at the Alpine Overcrossing interchange intersections were observed to be relatively minor during both the AM and PM peak hours.

The interchange ramp intersections currently experience very low traffic volumes and operate at acceptable LOS A in the AM and PM peak hours with the existing stop sign control. Existing intersection operations are summarized in Table 3.11-2, Existing Intersection and Ramp Levels of Service.

Roadways. Daily 24-hour roadway counts were also conducted on Secret Town Road and Chicago Park Powerhouse Road. These counts indicate a daily two-way 24-hour volume of 240 vehicles on Secret Town Road east of the I-80 Alpine Overcrossing and a daily volume of 75 vehicles on Chicago Park Powerhouse Road immediately north of Secret Town Road. These volumes are well within the capacity of the existing two-lane rural roadways.

Freeways. As freeway volumes can vary widely throughout the year and are highest during summer months, hourly directional counts on the freeway for the month of August 2013 were provided by Caltrans and used for purposes of this analysis. An average of the weekday morning (7 a.m. to 9 a.m.) and afternoon (4 p.m. to 6 p.m.) hourly directional freeway volumes for the month of August has been used in calculating the on-ramp and off-ramp merge/diverge freeway operations. Truck traffic count information published by Caltrans has also been used to identify the percentage of truck traffic on I-80 through the study area.

Table 3.11-2 summarizes existing freeway ramp operations. Ramp merge/diverge junctions with I-80 also experience satisfactory LOS A to B operations in the AM and PM weekday peak hours. Calculated speeds in the ramp influence area are presented for informational purposes.

Table 3.11-2
Existing Intersection and Ramp Levels of Service

Ramps	AM Peak Hour		PM Peak Hour	
	LOS	*Speed (mph)*	*LOS*	*Speed (mph)*
Westbound on	B	57.8	B	57.7
Westbound off	A	56.6	B	56.6
Eastbound on	B	57.8	B	57.6
Eastbound off	B	56.6	B	56.5
Intersections	**LOS**	**Delay (sec/veh)**	**LOS**	**Delay (sec/veh)**
EB ramps/overcrossing				
EB approach	A	8.8	A	8.6
SB left	A	7.3	A	7.3
WB ramps/overcrossing				
SB Approach	A	8.8	A	8.6
WB Approach	A	8.6	A	8.4

Notes: LOS = level of service; speed = mean speed in ramp influence area; mph = miles per hour; delay = intersection approach delay; sec/veh = seconds per vehicle; EB = eastbound; WB = westbound.

3.11.2 Relevant Plans, Policies, and Ordinances

Federal

There are no federal transportation plans or policies that would be directly applicable to the proposed project.

State

California Department of Transportation

As described previously, the TCCR for I-80 serves as the Caltrans District 3 long-range planning document for the freeway corridor. The purpose of each TCCR is to identify existing route conditions and future needs, including existing and forecast travel data, a concept LOS standard, and the facilities needed to maintain the concept LOS and address mobility needs over a 20-year planning horizon. The study area is within Segment 11, as defined in the TCCR.

Local

Placer County Transportation Planning Agency

Placer County Transportation Planning Agency (PCTPA) is the Regional Transportation Planning Agency for Placer County, excluding the Lake Tahoe Basin. PCTPA is also the county's Congestion Management Agency. PCTPA is part of a larger metropolitan planning jurisdiction (El Dorado, Placer, Sacramento, Sutter, Yolo, and Yuba Counties), which is coordinated by the Sacramento Area Council of Governments. PCTPA's two most recent regional transportation plans are incorporated into the Sacramento Area Council of Governments' regional planning processes through the Metropolitan Transportation Plan. Regional Transportation Plans document the policy direction, actions, and funding recommendations that are intended to meet the short and long-range transportation needs of Placer County.

Placer County General Plan

The project is located on the border of Nevada and Placer Counties; however, since the roadways within the study area are located in Placer County, the Placer County General Plan is the applicable general plan document for the project. Policies contained in the Placer County General Plan indicate that the LOS minimum standard for intersections and roadways shall generally be LOS C. Land development requirements shall be set to sustain LOS C at all intersection and roadways for as long as possible. The Placer County General Plan also indicates that the LOS standard shall be D within one-half mile of state highways. Similarly, Caltrans identifies LOS D as the acceptable intersection LOS standard. As such, the LOS D standard is applicable to the study area intersections and local roadways.

3.11.3 Thresholds of Significance

The significance criteria used to evaluate the project impacts to transportation are based on Appendix G of the California Environmental Quality Act (CEQA) Guidelines (14 CCR 15000 et seq.). According to Appendix G, a significant impact related to traffic and circulation (transportation) would occur if the project would:

1. Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance or the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit.
2. Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways.
3. Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks.
4. Substantially increase hazards due to a design feature (e.g., sharp curves, or dangerous intersections) or incompatible uses (e.g., farm equipment).
5. Result in inadequate emergency access.
6. Conflict with adopted policies, plans, or programs regarding public transit, bicycles, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.

3.11.4 Impacts Analysis

Impact 3.11-1. The project would not conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit.

The proposed project is intended to remove up to 250,000 tons per year of silt, sand, and aggregate that has accumulated in the northeast end of Rollins Lake along the Bear River. The recovered material will be stockpiled and then transported off site by contractors or operators for use and/or processing. The project would employ up to five people at the site.

Trip Generation

As with all aggregate sources, the transport of material will be dependent upon material availability as well as customer demand. The following operating scenario has been developed to identify the trip generation potential of the site and assumes the maximum annual level of extraction and transport of 250,000 tons of material from the site.

- Up to 250,000 tons of material to be removed per year.
- Generally an 8-month period for transporting the material, 6 days a week, or approximately 200 days per year.
- Above operating scenario equates to 1,250 tons of material per day.
- A standard 10-wheeler dump truck is typically used to haul bulk material by commercial operators. This assumes a truck with transfer-trailer is not likely to be used due to the horizontal alignment limitations of Chicago Park Powerhouse Road.
- A 10-wheeler truck (without trailer) accommodates 15 tons of material.
- This truck capacity equates to 83 truckloads per day, 83 in / 83 out. The 83 arrivals and departures assumes all trucks depart fully loaded, given the relatively remote location of the aggregate site.
- AM peak hour truck trips – up to 40 percent (33 trucks) of loads would be transported in the AM peak hour, but some arrivals would likely be prior to the AM peak hour. AM peak hour truck traffic used for purposes of analysis = 20 trucks in / 33 trucks out. This is based upon experience at similar facilities and reflects the need for construction materials early in the day.
- PM peak hour truck trips – the PM peak hour is assumed to be typical of an average hour throughout the day, or approximately 10 percent of daily activity, 8 trucks in/8 trucks out.
- Employees – up to five personnel, 5 trips inbound in AM peak hour, 5 outbound in PM peak hour used as a worst case.

Resulting trip generation estimates for the site as outlined above are summarized in Table 3.11-3, Project Trip Generation. These trip generation characteristics have been used for purposes of analysis and are estimated to represent a reasonable “worst case” condition considering the maximum annual quantity of material extraction and associated transport.

Table 3.11-3
Project Trip Generation

	Daily	AM Peak Hour			PM Peak Hour		
		In	*Out*	*Total*	*In*	*Out*	*Total*
Material transport	166	20	33	53	8	8	16
Employees	10	5	0	5	0	5	5
Total	**176**	**25**	**33**	**58**	**8**	**13**	**21**

Source: Appendix I.

Trip Distribution

It is expected that the majority of all use and processing demand will be west of the project site on I-80. For purposes of this analysis, 95 percent of truck trips have been assumed to be coming from or going to the west on I-80, with 5 percent coming from or going to the east. This will vary over individual days, but is judged to be representative of overall operations throughout the course of the year. All employee traffic has been assumed to be west of the project site on I-80.

Existing Plus Project Analysis

Traffic volumes projected to be generated by the proposed project were added to existing background traffic to identify "Existing Plus Project" conditions. Figure 3.11-2 identifies "Project Only" traffic volumes, while Figure 3.11-3 adds project trips to existing background traffic volumes to create the "Existing Plus Project" condition. Table 3.11-4, Existing Plus Project Intersection and Ramp Levels of Service, summarizes projected conditions at the overcrossing ramp intersections and the ramp junctions with I-80 under the Existing and Existing Plus Project conditions.

Intersections. Satisfactory LOS A operations are projected to continue at the eastbound ramp/overcrossing intersection with the addition of project truck traffic. Similarly, satisfactory LOS A to B operations are projected at the westbound ramp/overcrossing intersection.

Freeway Ramps. Each of the eastbound and westbound ramp junctions with I-80 are also projected to continue to operate at satisfactory LOS A to B with the addition of project truck traffic in the morning and afternoon study periods.

Based on identified operating criteria, the project would not result in any significant impacts to the Alpine Overcrossing interchange in conjunction with access to the site.

Table 3.11-4
Existing Plus Project Intersection and Ramp Levels of Service

	AM Peak Hour				PM Peak Hour			
	Existing		*Existing Plus Project*		*Existing*		*Existing Plus Project*	
Ramps	*LOS*	*Speed (mph)*	*LOS*	*Speed (mph)*	*LOS*	*Speed (mph)*	*LOS*	*Speed (mph)*
Westbound on	B	57.8	B	57.8	B	57.7	B	57.7
Westbound off	A	56.6	A	56.6	B	56.6	B	56.6
Eastbound on	B	57.8	B	57.8	B	57.6	B	57.6
Eastbound off	B	56.6	B	56.5	B	56.5	B	56.5
Intersections	**LOS**	**Delay (sec/veh)**	**LOS**	**Delay (sec/veh)**	**LOS**	**Delay (sec/veh)**	**LOS**	**Delay (sec/veh)**
EB ramps/overcrossing								
EB approach	A	8.8	A	9.7	A	8.6	A	8.8
SB left	A	7.3	A	7.6	A	7.3	A	7.3
WB ramps/overcrossing								
SB approach	A	8.8	B	10.8	A	8.6	A	9.3
WB approach	A	8.6	B	10.6	A	8.4	A	9.1

Source: Appendix I.
Notes: LOS = level of service; speed = mean speed in ramp influence area; mph = miles per hour; delay = intersection approach delay; sec/veh = seconds per vehicle; EB = eastbound; WB = westbound.

Local Haul Route Operating Conditions. Satisfactory roadway operations are projected to continue on Secret Town Road with the addition of project traffic. The additional traffic will be noticeable to area residents using the road, but the traffic increase will not measurably affect the available capacity of the existing street.

Future Plus Project Analysis

The impacts of implementing the proposed project have also been considered within the context of long-term future (i.e., 20-year) traffic conditions in this area of Placer County. Cumulative analysis accounts for future local and regional traffic growth in the study area. For purposes of analysis, material extraction and transport from the project under long-term conditions has been assumed to be consistent with that identified for near-term conditions, or 250,000 tons of material annually.

The TCCR for I-80 has been used to quantify long-term conditions within the study area. The TCCR indicates that traffic volumes along the segment of I-80 encompassing the study area are forecast to increase by 47 percent over the 20-year planning period, or about 2 percent annually. This growth rate has been applied to existing freeway volumes to project future ramp operations. This growth rate has also been applied to ramp intersection volumes to account for area growth that may occur in the vicinity of the Alpine Overcrossing interchange off of Secret Town Road and Magra Road. Figure 3.11-4 displays forecast traffic volumes under future base conditions without project-generated traffic. Figure 3.11-5 presents resulting volumes with the addition of project-generated traffic to forecast background volumes. No capacity improvements to the study area street and highway system have been assumed for the future analysis.

Table 3.11-5, Future Intersection and Ramp Levels of Service, summarizes projected intersection and freeway ramp operations under future conditions with and without implementation of the proposed project.

Table 3.11-5

Future Intersection and Ramp Levels of Service

	AM Peak Hour				PM Peak Hour			
	Future Base		*Future Plus Project*		*Future Base*		*Future Plus Project*	
Ramps	*LOS*	*Speed (mph)*	*LOS*	*Speed (mph)*	*LOS*	*Speed (mph)*	*LOS*	*Speed (mph)*
Westbound on	B	57.7	B	57.7	B	57.4	B	57.4
Westbound off	B	56.6	B	56.6	B	56.6	B	56.6
Eastbound on	B	57.7	B	57.7	C	57.3	C	57.3
Eastbound off	B	56.5	B	56.4	C	56.5	C	56.4
Intersections	**LOS**	**Delay (sec/veh)**	**LOS**	**Delay (sec/veh)**	**LOS**	**Delay (sec/veh)**	**LOS**	**Delay (sec/veh)**
EB ramps/overcrossing								
EB approach	A	9.0	A	10.0	A	8.8	A	9.0
SB left	A	7.4	A	7.7	A	7.3	A	7.3
WB ramps/overcrossing								
SB approach	A	9.1	B	11.0	A	8.7	A	9.4
WB approach	A	8.9	B	10.8	A	8.5	A	9.2

Source: Appendix I.
Notes: LOS = level of service; speed = mean speed in ramp influence area; mph = miles per hour; delay = intersection approach delay; sec/veh = seconds per vehicle; EB = eastbound; WB = westbound.

Intersections. As shown in Table 3.11-5, satisfactory LOS A operations are projected to continue at the eastbound ramp/overcrossing intersection in the future with or without the addition of project-generated truck traffic. Similarly, satisfactory LOS A to B operations are projected at the westbound ramp/overcrossing intersection in the future with or without the project.

Freeway Ramps. Each of the eastbound and westbound ramp junctions with I-80 is also projected to operate at satisfactory LOS B to C during the weekday in the future, with or without the addition of project truck traffic in the morning and afternoon study periods.

The project would not result in any significant impacts to the Alpine Overcrossing interchange under future traffic conditions.

Truck Loading on Area Roads. The relative impact of truck traffic on area roads associated with the proposed project has been considered based on the procedures contained in Chapter 6 of the Caltrans Highway Design Manual (Caltrans 2012). These procedures equate truck loadings over a 20-year period to equivalent single axle loads (ESALs) and identify relative impact in terms of the resulting traffic index.

For the purpose of pavement analysis, it is assumed that 250,000 tons per year of material would be transported; however, NID estimates that 50,000 tons of material is the more likely scenario over a long-term planning horizon.

Annualizing the 250,000-ton haul scenario over a 365-day year, for purposes of the ESAL calculation, results in 45 trucks per day in one direction. This load is spread over the pavement's 20-year useful life. The number of ESALs associated with this level of truck activity can be identified based on Table 603.3A of the Highway Design Manual. Each daily truck (three-axle, 10-wheeler dump) creates 3,680 ESALs over a 20-year period. Thus, the project's contribution to loadings on Secret Town Road and Chicago Park Powerhouse Road could be up to 165,500 ESALs.

The roadway needed to accommodate this loading over a 20-year period is expressed in terms of the section's traffic index. A traffic index of 7.5 is needed to accommodate 165,500 ESALs. The roadway section required to provide a traffic index of 7.5 is a relatively moderate section typical of many public streets. Although the extent of the street sections serving the project are not known, it is likely that Secret Town Road is constructed to this standard and the project would not appreciably change the overall condition of the road or result in an accelerated maintenance schedule.

As described above, the proposed project would not conflict with an applicable plan or policy establishing measures of effectiveness of the circulation system under either existing plus project or future plus project conditions. Therefore, impacts would be **less than significant**.

Impact 3.11-2. The project would not conflict with an applicable congestion management program, including but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways.

The project study area does not include any roadways that are subject to a congestion management plan; therefore, **no impact** would occur.

Impact 3.11-3. The project would not result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks.

The proposed project does not involve any changes that would change air traffic patterns; therefore, **no impact** would occur.

Impact 3.11-4. The project would potentially increase hazards due to a design feature or incompatible use.

Chicago Park Powerhouse Road follows a winding hillside horizontal alignment and extends for approximately 3 miles to the project site. The southerly 2 miles of the roadway follow a relatively gradual grade, with the northerly 1-mile segment on a more pronounced downhill grade into the Bear River canyon. As described in Section 3.11.1, Existing Conditions, the majority of the roadway provides 19 feet of pavement width and does not have any centerline striping. Toward the northerly end of the road, an approximately 0.5-mile segment has many areas of poor pavement and is narrower in sections. A number of sections are about 4 feet narrower, with a few short segments having a width of only 14 to 15 feet. This area of the roadway is not wide enough to permit two-way truck traffic. The balance of the pavement surface along the length of the road is in relatively good condition, other than several locations where numerous potholes exist due to erosion.

Field observations indicate that a number of the horizontal curves along the Chicago Park Powerhouse Road route have a relatively small radius, estimated to range from 60 to 110 feet (see Figure 3.11-6). The tighter curves do not permit two-way truck traffic within the curve. However, many of these locations provide a graveled or paved shoulder area/turnout on the outside of the curve to permit a vehicle to pull over and yield to an oncoming vehicle. Adherence to the 15 mile per hour (mph) advisory speed will aid in identifying the presence of an oncoming vehicle in the vicinity of the curve, as sight distance is very limited through many of the curves.

The proposed project would substantially increase hazards on the Chicago Park Powerhouse Road through the introduction of two-way truck traffic on a roadway that has limited width and sight distance in certain areas. Therefore, impacts would be **significant** and mitigation is provided in Section 3.11-5, Mitigation Measures (MM-TRA-1); Figure 3.11-6 summarizes the required signing features and roadway locations.

Impact 3.11-5. The project would not result in inadequate emergency access.

The proposed project would result in an increase in truck traffic on area roadways; however, the primary access road, Chicago Park Powerhouse Road, is not used as an emergency access route. As demonstrated in the analysis above, the project-generated traffic would not cause any significant impacts to area roadways and would therefore not impact emergency access on these roadways. As a result, the proposed project would result in a **less than significant** impact on emergency access.

Impact 3.11-6. The project would not conflict with adopted policies, plans, or programs regarding public transit, bicycles, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.

The proposed project is not located in an area that is served by public transit, bicycle, or pedestrian facilities; therefore, **no impact** would occur.

3.11.5 Mitigation Measures

The following mitigation measure (MM) is intended to reduce the potential impact associated with increased hazards on the Chicago Park Powerhouse Road due to increased two-way truck traffic (Impact 3.11-4). Figure 3.11-6 illustrates the section of roadway slated for improvement.

MM-TRA-1 The narrow sections of the Chicago Park Powerhouse Road shall be widened and paved to a width of at least 19 feet or in accordance with the guidelines presented in the American Association of State Highway and Transportation Officials publication "A Policy on Geometric Design of Highways and Streets" and "Guidelines for Geometric Design of Very Low Volume Local Roads (ADT <400)."

The horizontal curves along the Chicago Park Powerhouse Road route that have a relatively small radius (60 to 110 feet) shall be signed appropriately with warning signs to indicate the degree of curvature and advisory speed (example – W4-10(CA) sign with 15 mile per hour advisory speed). These curves shall also be delineated with directional "chevron" warning arrows along the back of the curves to aid in negotiating the curves in darkness. Additionally, the small trees and vegetation immediately off the roadway on the inside of these curves shall be removed to improve sight distance through the curves.

3.11.6 Level of Significance After Mitigation

Implementation of MM-TRA-1 would reduce the proposed project's impacts associated with increased hazards on the Chicago Park Powerhouse Road (Impact 3.11-4) to **less than significant**.

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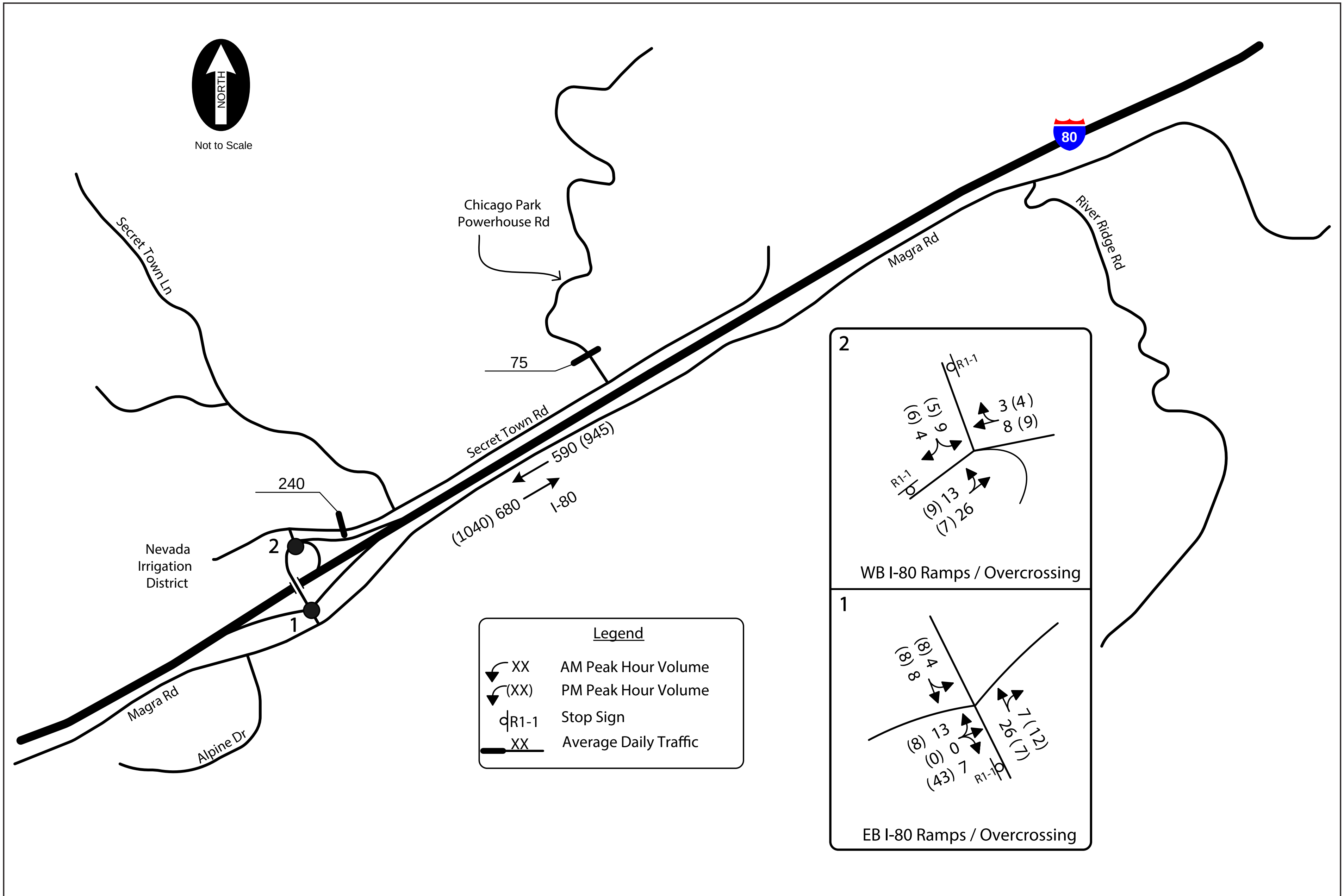

SOURCE: KD Anderson & Associates, Inc. 2013

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FIGURE 3.11-1

Existing Weekday Traffic Volumes

BEAR RIVER SEDIMENT REMOVAL AT ROLLINS RESERVOIR EIR

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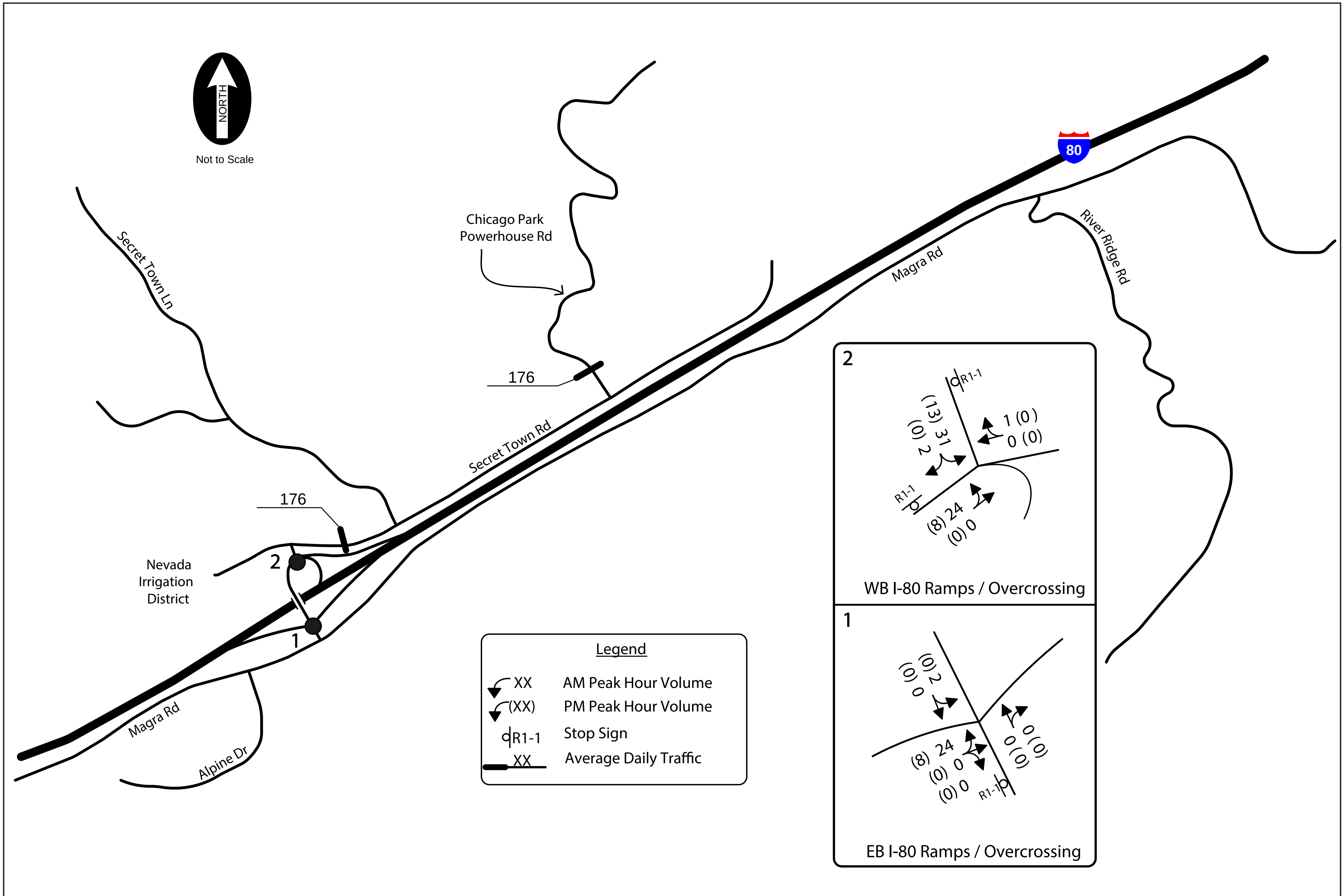

SOURCE: KD Anderson & Associates, Inc. 2013

FIGURE 3.11-2
Project Traffic Volumes

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BEAR RIVER SEDIMENT REMOVAL AT ROLLINS RESERVOIR EIR

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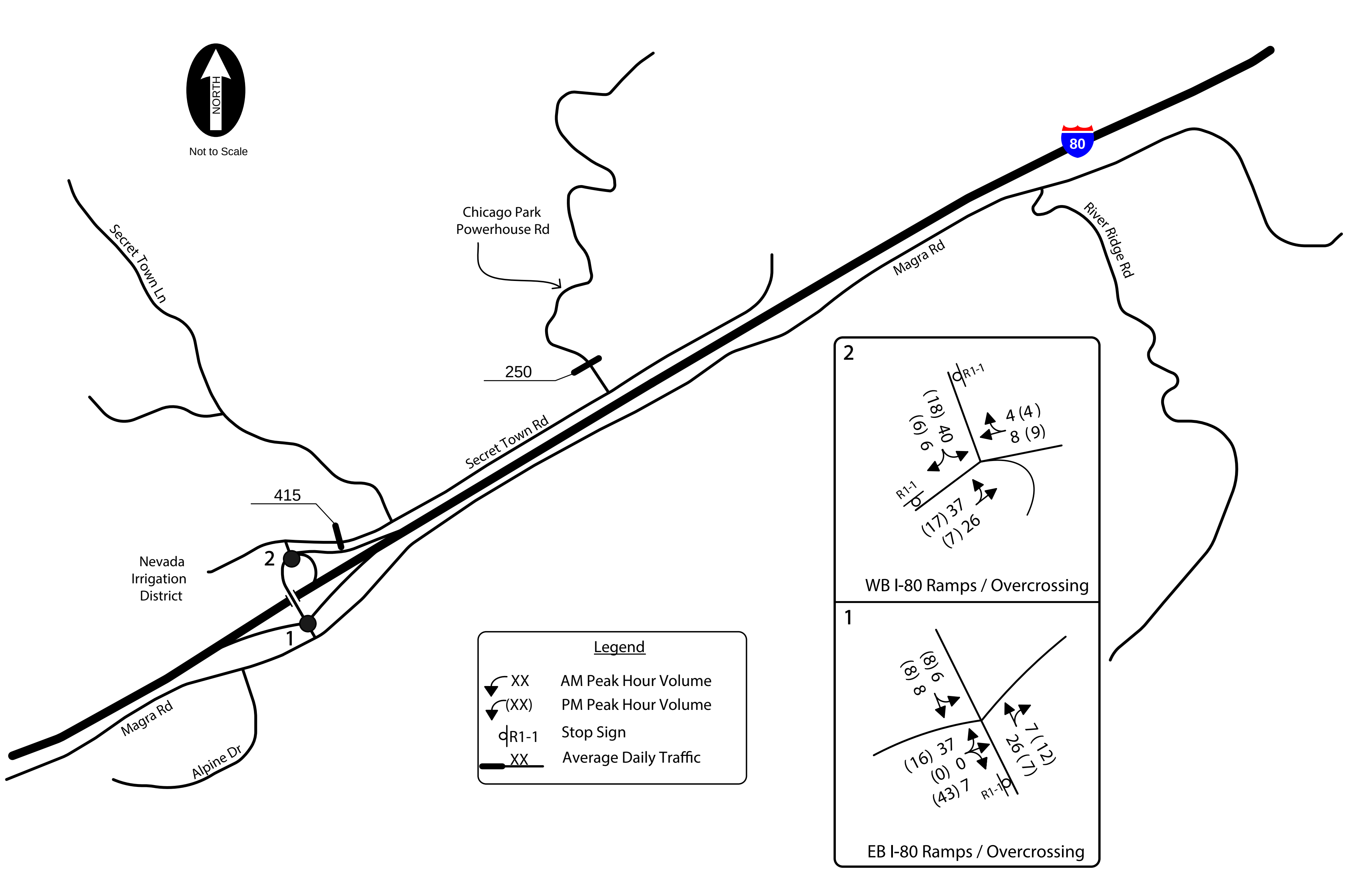

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SOURCE: KD Anderson & Associates, Inc. 2013

FIGURE 3.11-3

Existing Plus Project Traffic Volumes

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BEAR RIVER SEDIMENT REMOVAL AT ROLLINS RESERVOIR EIR

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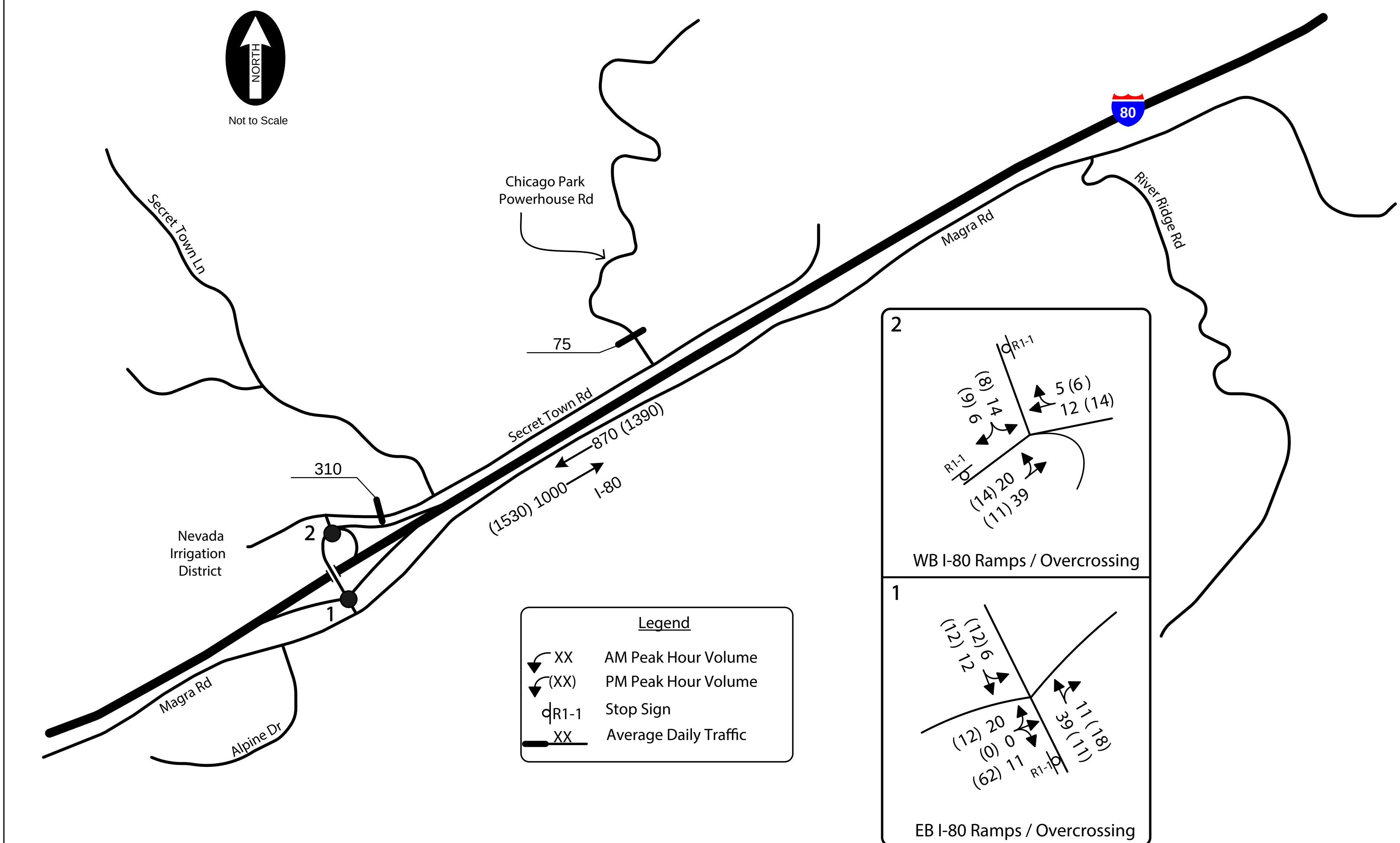

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SOURCE: KD Anderson & Associates, Inc. 2013

FIGURE 3.11-4

Future (Year 2030) Weekday Traffic Volumes

BEAR RIVER SEDIMENT REMOVAL AT ROLLINS RESERVOIR EIR

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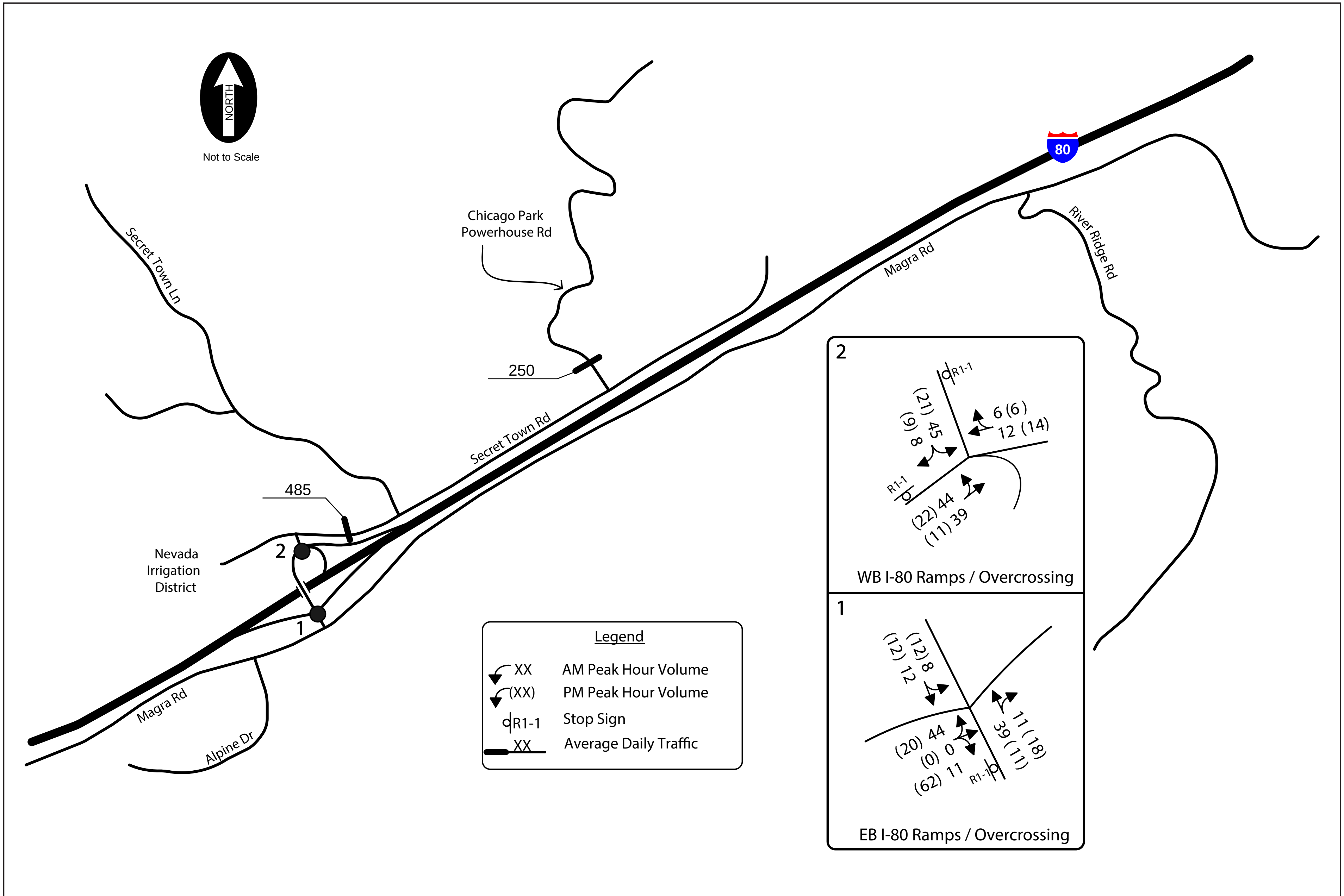

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SOURCE: KD Anderson & Associates, Inc. 2013

FIGURE 3.11-5
Future Plus Project Weekday Traffic Volumes

BEAR RIVER SEDIMENT REMOVAL AT ROLLINS RESERVOIR EIR

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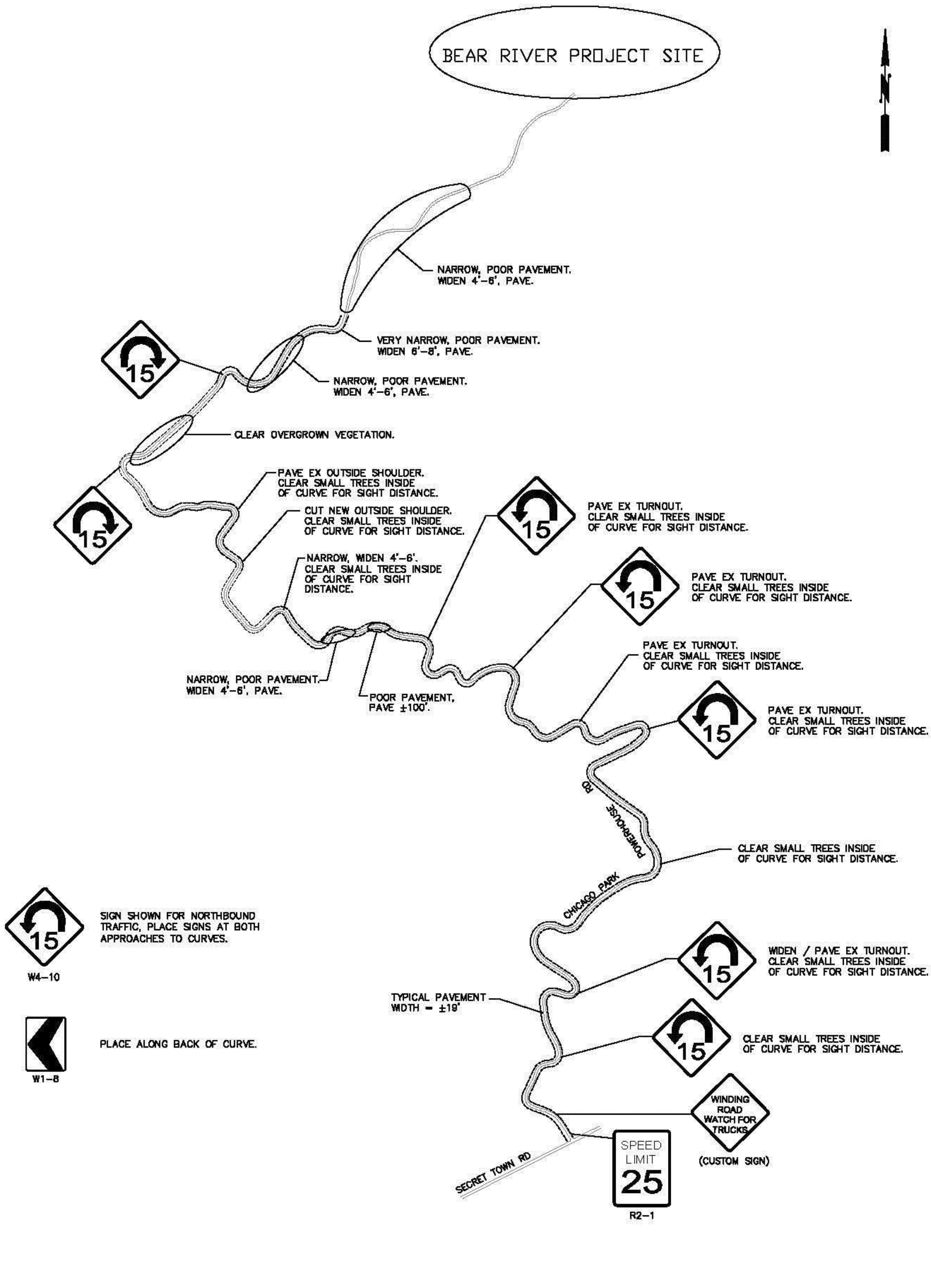

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SOURCE: KD Anderson & Associates, Inc. 2013

FIGURE 3.11-6

MM-TRA-1: Chicago Park Powerhouse Road Improvements

BEAR RIVER SEDIMENT REMOVAL AT ROLLINS RESERVOIR EIR

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CHAPTER 4
OTHER CEQA CONSIDERATIONS

4.1 EFFECTS FOUND NOT TO BE SIGNIFICANT

Section 15128 of the California Environmental Quality Act (CEQA) Guidelines (14 CCR 15128) requires that an environmental impact report (EIR) briefly describe potential environmental effects that were determined not to be significant and therefore were not discussed in detail in the EIR. The environmental issues discussed in the following sections are not considered significant, and the reasons for the conclusion of non-significance are discussed below.

4.1.1 Geology, Soils, and Seismicity

4.1.1.1 Thresholds of Significance

The significance criteria used to evaluate the proposed Bear River Sediment Removal at Rollins Reservoir Project (proposed project) impacts to geology and soils are based on Appendix G of the CEQA Guidelines. According to Appendix G, a significant impact related to geology and soils would occur if the project would:

1. Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:
    a. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area based on other substantial evidence of as known fault. Refer to Division of Mines and Geology Special Publication 42.
    b. Strong seismic ground shaking.
    c. Seismic-related ground failure, including liquefaction.
    d. Landslides.
2. Result in substantial soil erosion or the loss of topsoil.
3. Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse.
4. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property.
5. Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water.

4.1.1.2 Discussion

For an environmental issue area like geology, soils, and seismicity, it is important to note that impacts of the environment on a project or plan (as opposed to impacts of a project or plan on the environment) are beyond the scope of required CEQA review. "[T]he purpose of an EIR is to identify the significant effects of a project on the environment, not the significant effects of the environment on the project" (*Ballona Wetlands Land Trust v. City of Los Angeles* 2011, p. 473). Most topics related to geology, soils, and seismicity are effects of preexisting environmental hazards on users of the project and structures in the project. As explicitly found by the court in the *Ballona* decision, they therefore "do not relate to environmental impacts under CEQA and cannot support an argument that the effects of the environment on the project must be analyzed in an EIR" (*Ballona*, p. 475).

Therefore, impacts with respect to geology, soils, and seismicity would only occur if the project (1) alters existing land uses or increases the density/extent of development in areas with preexisting geologic and/or seismic hazards and/or (2) increases the occurrence, extent, or severity of geologic and/or seismic risks in populated or publicly accessible areas. The project is located in an active stream channel with little to no public access, facilities, or infrastructure. The few exceptions include the Chicago Park Powerhouse Road Bridge, the Chicago Park Powerhouse Road, and the Chicago Park Powerhouse (which is upstream and uphill of the project area). All of these facilities are closed to the public and owned and maintained by NID. The project proposes neither structures for human occupancy[1] nor any new fixed/permanent facilities or equipment. Furthermore, the project has been designed to prevent high flows from scouring or undermining the bridge piers and slope beneath the powerhouse through strategic placement of sheet piles. The interlocking sheet piles would maintain the elevation of the riverbed upstream, including the aforementioned facilities, so that high flows do not continue to undermine or destabilize these areas.

Due to the lack of adjacent development or public access and the provision of sheet piles as part of the project's design, potential effects are limited to localized instabilities within loose riverbed sediments (alluvium). The mining operation would not affect bedrock. Since the mining operation would be limited to 6 inches below the water line, and because these materials have such a shallow angle of repose,[2] slumping or sloughing of material (if any) during excavations would be shallow and localized. Workers in the industry are accustomed to such conditions and are trained to recognize potentially hazardous situations and adapt the work to avoid dangerous conditions or injury. The Mine Safety and Health Administration, a division of the U.S.

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1 A *structure for human occupancy* is any structure used or intended for supporting or sheltering any use or occupancy that is expected to have a human occupancy rate of more than 2,000 person-hours per year.

2 The *angle of repose* of a granular material is the steepest angle of descent or dip relative to the horizontal plane to which a material can be piled without slumping.

Department of Labor, administers the provisions of the Federal Mine Safety and Health Act of 1977. The Mine Safety and Health Administration's ultimate purpose is to eliminate fatal accidents, reduce the frequency and severity of nonfatal accidents, minimize health hazards, and promote improved A and health conditions through inspections, rigorous training, and educational programs for employers and employees in the mining industry.

Because the project would not be publicly accessible and would be designed to avoid substantial scour/undermining of NID facilities, impacts with respect to geology, soils, and seismicity are less than significant.

4.1.2 Mineral Resources

4.1.2.1 Thresholds of Significance

The significance criteria used to evaluate the project impacts to mineral resources are based on Appendix G of the CEQA Guidelines. According to Appendix G, a project impact would be considered significant if it would:

1. Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state.
2. Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan.

4.1.2.2 Discussion

The site has been designated as an "idle mine" by Nevada County, in consultation with the Office of Mine Reclamation. The approved 1989 Reclamation Plan therefore remains in place, along with current financial assurances and an Interim Management Plan (approved May 31, 2013). Because the project proposes the resumption of material extraction from the riverbed, it would increase the availability of a known mineral resource. The impact with respect to this topic would thus be beneficial.

4.1.3 Population and Housing

4.1.3.1 Thresholds of Significance

The significance criteria used to evaluate the project impacts related to population and housing are based on Appendix G of the CEQA Guidelines. According to Appendix G, a project impact would be considered significant if it would:

1. Induce substantial population growth in an area, either directly or indirectly.

2. Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere.
3. Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere.

4.1.3.2 Discussion

The proposed project would not directly construct or remove housing. Aggregate is a necessary resource for development, as it is used in construction materials, roadways, landscaping, roadways, and more. The potential for indirect growth inducement is discussed in Section 4.2, Cumulative Impacts.

The project would not create a significant demand for housing. The work force necessary is fairly small (on the order of 5 to 10 employees). These workers may come from several sources: existing NID workforce, new seasonal hires, or contracted from outside construction material companies. These sources would not require the relocation of large numbers of workers to operate the project, nor would it require the construction of worker housing.

4.2 CUMULATIVE IMPACTS

4.2.1 Introduction

CEQA (California Public Resources Code, Section 21000 et seq.) requires that an EIR contain an assessment of the cumulative impacts that could be associated with the proposed project. This assessment involves examining project-related effects on the environment in the context of similar effects that have been caused by past or existing projects, and the anticipated effects of future projects. As indicated in the CEQA Guidelines, the discussion of cumulative impacts need not provide the same level of detail as project-related impacts. The discussion should be guided by "standards of practicality and reasonableness" (14 CCR 15130(b)). Although project-related impacts can be individually minor, the cumulative effects of these impacts, in combination with the impacts of other projects, could be significant under CEQA and must be addressed (14 CCR 15130(a)). Where a lead agency concludes that the cumulative effects of a project, taken together with the impacts of other closely related past, present, and reasonably foreseeable future projects are significant, the lead agency then must determine whether the project's incremental contribution to such significant cumulative impact is "cumulatively considerable" (and thus significant in and of itself).

4.2.2 Cumulative Context

To ensure an adequate discussion of cumulative impacts is included in an EIR, CEQA allows the lead agency to use either a list of past, present, and probable future projects (including those projects outside the control of the lead agency), or projections included in an adopted local, regional, or statewide plan like a general plan (14 CCR 15130(b)(1)).

It is important to note that the basis of the cumulative analysis varies by technical area. For example, cumulative air quality impacts from project operations are considered at the air basin level. Similarly, water quality impacts are considered within the Bear River watershed. Impacts such as visual change, however, are limited to the viewshed, where impacts are tied to specific local projects.

The lands adjacent to the project area (including the haul route) consist primarily of public land and large rural private properties. No probable future projects have been identified. In addition to normal maintenance activities at Rollins Reservoir and at the Chicago Park Powerhouse, NID has an ongoing sediment removal project on Greenhorn Creek. While Greenhorn is not within the Bear River watershed, it flows into Rollins Reservoir and thus may interact with downstream water quality effects. In addition, the biological resources at Greenhorn are similar to those at the project area.

The cumulative context and the relevant projects or regional projections are noted below by environmental resource. In addition, potentially significant cumulative impacts are identified (with references to the impact discussions in the EIR that address such impacts).

Aesthetics

The proposed project would affect the visual quality of the project area, as discussed in Section 3.1, but not to a level considered significant with mitigation implemented. No other projects have been identified within the project viewshed that would affect the character or quality of the project area. Therefore, no significant cumulative aesthetic impacts would occur.

Air Quality

The cumulative setting for air quality impacts is the Mountain Counties Air Basin. The basin has been designated as a federal and state nonattainment area for O_3 (ozone), a state nonattainment area for PM_{10} (coarse particulate matter), and federal nonattainment area for $PM_{2.5}$ (fine particulate matter). PM_{10} and $PM_{2.5}$ emissions associated with construction generally result in near-field impacts. As discussed in Impact 3.2-3, the proposed project would result in a cumulatively considerable contribution to regional O_3 concentrations. Implementation of MM-AQ-1 and MM-AQ-2 would reduce the cumulative impact, but not necessarily to a level that is less than significant. Therefore, the EIR concludes that cumulative air quality impacts for ozone precursors would be significant and unavoidable.

Biological Resources

The project would not permanently reduce the habitat of a fish or wildlife species, or reduce the number/range of a rare plant. The project would have an impact to foothill yellow-legged frog (*Rana boylii*) from proposed seasonal gravel skimming operations and infrastructure development near the mouth of Steephollow Creek. This impact is potentially significant, but would be reduced to less than significant with implementation of several mitigation measures described in Section 3.3.5. Similar impacts to foothill yellow-legged frog may occur at the Greenhorn Creek. Avoidance measures on Greenhorn Creek, incorporated into the 1600 Streambed Alteration Permit, are similar to the proposed project mitigation measures. Therefore, changes to cumulative projects (proposed project and Greenhorn Creek), would reduce potential cumulative impacts to less than significant.

Cultural Resources

Cultural resource impacts are typically individual in nature, as significance is often a function of uniqueness, unless a resource is affected by more than one project (such as effects to a historic district). No significant historical resources have been identified in the EIR that could be affected by the proposed project. The potential to impact a previously unknown resource has been identified in the EIR, and would be less than significant with mitigation. No cumulative effects have been identified in the EIR.

Greenhouse Gas Emissions

The project's potential contribution to greenhouse gas (GHG) emissions is considered a cumulative impact, as described in Section 3.5. The analysis concludes that the project would not result in a cumulative GHG emissions impact.

Hazards

Cumulative hazardous material impacts may occur if an area of previous contamination would be affected by more than one project, or if multiple projects would introduce hazardous materials to the project area. No previous contamination has been identified in the project area (the issue of water quality impairment from past projects is discussed separately, under Hydrology and Water Quality). The project would involve the routine use of potentially hazardous materials (petroleum products). However, no other projects in the area would use such materials on a routine basis. The project is not within a hazard zone for a public or private airport. The project would not introduce residents into a wildfire hazard area, and any potential contributions to fire hazard would be mitigated to a less than considerable level. Therefore, there is not a potentially cumulative effect for hazards/hazardous materials.

Hydrology and Water Quality

The Bear River has been highly modified by human activities. The Chicago Park Powerhouse was completed in 1963, and Rollins Reservoir was completed in 1966. Today, the flows in the Bear River are completely human-controlled. The waterway has also been affected by earlier activities. Currently, Rollins Reservoir is on the 303(d) impairment list for containing mercury. While mercury may occur naturally, this water quality impairment is likely a result of historic gold mining activity. The project would not introduce additional mercury to the environment. To the extent that the project would potentially affect existing mercury (through the process of conversion from its elemental form to methylmercury), the project could add to a cumulative impact. However, the project design and the implementation of additional mitigation measures would reduce the project's contribution to cumulative water quality problems to less than significant.

Land Use

The project would reintroduce a historic land use (and a "grandfathered" conditional use under county zoning). No changes to other existing or planned land uses in the project area are proposed. Therefore, there will not be a cumulative land use impact.

Noise

Cumulative noise may occur when sensitive receptors are exposed to multiple sources of noise, or through cumulative increases in sources over time (particularly traffic). The project would not have a significant noise impact on sensitive receptors, as discussed in Section 3.9. No other traffic would be introduced to the haul route beyond existing NID maintenance vehicles and the proposed project. The project's contribution to Interstate 80 traffic would be minimal in the context of overall volumes, and no sensitive receptors are located near the highway interchange. The project would therefore not contribute to a cumulative noise effect.

Public Utilities and Services

As discussed in Section 3.10, the project would not impact public services (police and fire). The project would not require additional water supplies. Landfill capacity exists through 2066, taking into account projected growth. Therefore, no cumulative impacts would occur.

Transportation

The transportation analysis takes into account the probable regional growth in traffic (see Section 3.11). The project would not result in a cumulative transportation impact (see Impact 3.11-1).

4.3 GROWTH INDUCEMENT

The availability of sand and gravel aggregate resources does not, in itself, induce or encourage growth. The development of new sources of aggregate is typically considered a response to growth, not something that induces growth. The demand for construction materials is based primarily on market conditions, specifically for infrastructure and development projects, and these activities are controlled by a variety of other factors, such as housing demand and the overall economy. Due to the limited population near the project, it is assumed that average production will be lower than the maximum allowed (closer to 50,000 tons per year, compared to the 250,000 tons per year currently allowed). At this rate, aggregate production would barely keep pace with the inflow of aggregates from the upper watershed. Higher production levels would likely be achieved only if large infrastructure projects, such as reconstruction of a federal or state highway, were to be carried out. These state and regionally important infrastructure projects undergo state (and often federal) environmental review, and any adverse impacts related to growth inducement would be analyzed at such time.

Urban growth in Nevada and Placer Counties is considered in their respective general plans. Nevada County's population in 2013 was 97,165; Placer County's 2013 population was 360,802 (DOF 2014). The projected 2025 population for Nevada County and Placer County, respectively, is 109,325 and 415,027. The Nevada County General Plan 2014 Housing Element provides for regional housing needs in the 2014–2019 timeframe. During that time, Nevada County will need an estimated 764 housing units (County of Nevada 2014).

Development of the project site for mining purposes is not expected to induce substantial new population growth in the area.

4.4 ENERGY

4.4.1 Introduction

CEQA provides that an EIR shall include a detailed statement setting forth all of the following:

> Mitigation measures proposed to minimize significant effects on the environment, including, but not limited to, measures to reduce the wasteful, inefficient, and unnecessary consumption of energy (California Public Resources Code, Section 21100(b)(3)).

In addition, Appendix F of the CEQA Guidelines includes suggested information to "assure that energy implications are considered in project decisions." Appendix F further states that "the California Environmental Quality Act requires that EIRs include a discussion of the potential energy impacts of proposed projects, with particular emphasis on avoiding or reducing inefficient, wasteful and unnecessary consumption of energy (see Public Resources Code section 21100(b)(3)).”

4.4.2 Energy Implications of the Project

The extraction of aggregate resources inherently requires energy. The proposed project requires energy to extract the material, to screen and stockpile the material, and to haul the material off site either for delivery to the end user or for additional processing. In addition, energy must be expended for both the long-term improvements (placement of the scour protection, grading of the operations site) and seasonal structures (the temporary bridges, the temporary channel berm, and the conveyor belt).

This energy usage is balanced by the importance of providing local aggregate sources. As the California Geological Survey has noted:

> Increased aggregate haul distances not only increase the cost of aggregate to the consumer, but also increase environmental and societal impacts such as increased fuel consumption, carbon dioxide emissions, air pollution, traffic congestion and road maintenance (CGS 2012).

Estimated energy consumption is based on the GHG emissions modeling for the project. Project carbon dioxide (CO_2) emissions were converted to gallons of fuel using the U.S. Energy Information Administration’s Voluntary Reporting of Greenhouse Gases Program Fuel Carbon Dioxide Emission Coefficients (EIA 2014). The results are shown in Table 4-1, Estimated Fuel Consumption at Maximum Operation.

Table 4-1
Estimated Fuel Consumption at Maximum Operation

Phase	Source	CalEEMod CO_2 (MT/yr)	Fuel Type	Factor (kg CO_2/gal)*	Gallons
On site	Off-road equipment	534	Diesel	10.15	52,611
	Haul trucks	0.51	Diesel	10.15	50
Off site	Haul trucks	1,358	Diesel	10.15	133,793
	Employee vehicles	12	Gasoline	8.91	1,347
				Total	**187,801**

Notes: CalEEMod = California Emissions Estimator Model; CO2 = carbon dioxide; MT/yr = million tons per year; kg = kilograms; gal = gallon.

Note that these estimates are based on the maximum proposed production rate of 250,000 tons per year. It is anticipated that the average production rate of 50,000 tons per year would result in approximately 80% less fuel usage, or 37,560 gallons per year.

The project would also consume some electricity for the screening operation and lighting. Project lighting would be kept at the minimum necessary for safety and security (per MM-AES-1), which has the benefit of avoiding wasteful usage of electricity.

4.4.3 Conclusion

The removal of sediment requires the consumption of energy, including transportation fuels. Although the fuel usage, particularly at maximum operation, may appear to be a large amount when considered in isolation, it should be considered in relation to two key factors. The first is the energy cost of transporting aggregate from longer distances. As discussed in Section 4.3, aggregate consumption is a byproduct of growth. The state has become increasingly concerned with the lack of local aggregate supplies and the resulting environmental costs of transporting from other areas of the state, country, and from abroad (see the statement from the California Geological Survey in Section 4.4.2). The second factor is the cost, both economically and environmentally, of additional water storage projects. Estimates of proposed water storage projects in California range from $1,700 to $2,700 per acre-foot (Lund 2014). In addition, such projects consume energy and may have significant local environmental effects.

The project has been designed to increase efficiency through the use of surge and stockpiles. Material from the project site may be used as is or may be processed in a centralized site closer to where the final product is needed.

Based on the objective of maintaining reservoir capacity and the additional benefit of locally sourced construction materials, the proposed project is therefore not inefficient, wasteful, or unnecessary with regard to energy usage.

4.5 SIGNIFICANT AND UNAVOIDABLE ENVIRONMENTAL EFFECTS

CEQA Section 21100(b)(2) and CEQA Guidelines Section 15126.2(b) require that any significant and unavoidable effect on the environment must be identified in the EIR. In addition, CEQA Guidelines Section 15093(a) allows the decision-making agency to determine whether the benefits of a proposed project outweigh the unavoidable adverse environmental impacts of implementing the project. The agency can approve a project with unavoidable adverse impacts if it has prepared and adopted a “Statement of Overriding Considerations” setting forth the specific reasons for making such a judgment.

The proposed project would result in significant and unavoidable air quality impacts. Impacts 3.2.2 and 3.2.3 identify direct and cumulative NO_x emissions, respectively, related to project activities. MM-AQ-1 and MM-AQ-2 would reduce the air quality impacts associated with the project, but not to a level that is less than significant. Note that Impact 3.2.2 is only significant under a near-maximum annual production scenario, but not the expected average annual production. Impact 3.2.2 may also be avoided through the implementation of feasible project alternatives (see Chapter 5).

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CHAPTER 5
ALTERNATIVES

5.1 INTRODUCTION

Pursuant to the California Environmental Quality Act (CEQA) Guidelines (14 CCR 15000 et seq.), environmental impact reports (EIRs) are required to “describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives” (14 CCR 15126.6(a)). An EIR “must consider a reasonable range of potentially feasible alternatives that will foster informed decision making and public participation” (14 CCR 15126.6(a)). The alternatives discussion is required even if these alternatives “would impede to some degree the attainment of the project objectives, or would be more costly” (14 CCR 15126.6(b)).

The inclusion of an alternative in an EIR does not constitute definitive evidence that the alternative is in fact “feasible.” The final decision regarding the feasibility of alternatives lies with the decision maker for a given project, who must make the necessary findings addressing the feasibility of alternatives for avoiding or substantially reducing a project’s significant environmental effects (California Public Resources Code, Section 21081; see also 14 CCR 15091).

5.2 PROJECT OBJECTIVES

The overall purpose of the project is to provide water supply maintenance to remove existing sediments and to prevent the accumulation of future transported sediments in Rollins Reservoir. The project constitutes a public necessity and is intended to be ongoing as long as sediments continue to migrate from the Bear River and Steephollow Creek watersheds into Rollins Reservoir.

The project objectives are as follows:

1. Maintain and improve storage capacity in Rollins Reservoir.
2. Remove the aggregate deposits from the Bear River below the confluence of the Bear River and Steephollow Creek.
3. Minimize impacts to the foothill yellow-legged frog (*Rana boylii*) during mining operations.
4. Protect the Chicago Park Powerhouse from undermining due to scouring.
5. Protect the Chicago Park Powerhouse Road Bridge abutments in the Bear River from scouring.
6. Acquire full rights to portions of the Chicago Park Powerhouse Road to establish a safe and efficient haul route and provide a permanent access to and from NID facilities.
7. Improve recreational opportunities and boat access within the upper reach of Rollins Reservoir.
8. Reclaim the site in accordance with revised Reclamation Plan RP88-03.

5.3 SIGNIFICANT IMPACTS

5.3.1 Significant and Unavoidable Impacts

Air Quality

As described in Section 3.2 of the EIR, the project would result in a significant impact due to NO_x emissions that would exceed the established thresholds. In addition, the NO_x emissions would result in a cumulative air quality impact. Mitigation Measure (MM) AQ-1 would help to reduce the potential impact by controlling fugitive dust on the site and MM-AQ-2 would require participation in the Placer County Air Pollution Control District NO_x mitigation program; however, even with mitigation the impacts would remain significant and unavoidable.

5.3.2 Less Than Significant Impacts with Mitigation

Aesthetics

As described in Section 3.1 of the EIR, the project would cause a potentially significant impact by contributing to sky glow as a result of the introduction of new light sources. MM-AES-1 would reduce this impact to a less than significant level by limiting lighting and specifying allowed lighting types.

Biological Resources

As described in Section 3.3 of the EIR, the project would result in significant impacts to three special-status wildlife species (foothill yellow-legged frog, western pond turtle (*Actinemys marmorata*), and bald eagle (*Haliaeetus leucocephalus*)), willow riparian vegetation, and a wildlife movement corridor for aquatic species. The project would also potentially conflict with a local policy or ordinance protecting biological resources. Implementation of MM-BIO-1 through MM-BIO-11 would reduce these impacts to less than significant levels.

Cultural Resources

As described in Section 3.4 of the EIR, the project could impact subsurface historical or prehistoric resources or human remains during skimming operations. Implementation of MM-CUL-1 and MM-CUL-2 would reduce impacts to archaeological resources and human remains to less than significant levels.

Hazards and Hazardous Materials

As described in Section 3.6 of the EIR, the proposed project would result in a significant impact due to the potential for spills of hazardous materials, which could cause soil or groundwater contamination. In addition, impacts related to increased risk of wildfire would be potentially significant. Implementation of MM-HAZ-1 through MM-HAZ-5 would reduce these impacts to a less than significant level.

Hydrology and Water Quality

As described in Section 3.7 of the EIR, the proposed project would result in potential impacts related to water quality and hydrology. These impacts would be reduced to less than significant levels through the implementation of MM-HYD-1 through MM-HYD-4, as well as MM-HAZ-1 through MM-HAZ-4.

Transportation

As described in Section 3.11 of the EIR, the proposed project would result in a significant impact by increasing hazards on the Chicago Park Powerhouse Road due to the introduction of truck traffic. Implementation of MM-TRA-1 would ensure that this impact is reduced to a less than significant level.

5.4 ALTERNATIVES CONSIDERED BUT REJECTED

Section 15126.6(c) of the CEQA Guidelines requires EIRs to identify any alternatives that were considered by the lead agency but were rejected as being infeasible during the scoping process, and briefly explain the reasons for the lead agency's decision to reject such alternatives. The following is a discussion of alternatives that were considered but rejected by Nevada Irrigation District, along with the reasons for not including them in the alternatives analysis.

5.4.1 Alternative Location

The proposed location for sediment removal on the Bear River between Rollins Reservoir and Steephollow Creek was determined based on the goal of restoring the channel to pre-1965 conditions and preventing further loss of storage capacity in Rollins Reservoir. Although an alternative location for the proposed project could be selected on a different segment of the Bear River, the impacts associated with the sediment removal would be the same as the proposed project since the same methods would be used and the environmental resources would be similar.

Section 15126.6(f)(2) of the CEQA Guidelines addresses alternative locations for a project. The key question and first step in the analysis is whether any of the significant effects of the project would be avoided or substantially lessened by putting the project in another location. Only locations that would avoid or substantially lessen any of the significant effects of the project need to be considered for inclusion in the EIR. Since an alternative location for the project would not avoid or reduce impacts associated with the project, this alternative has been eliminated from further analysis.

5.4.2 Dredge Rollins Reservoir Alternative

One of the main goals of the proposed project is to prevent further loss of storage capacity in Rollins Reservoir. An alternative approach to achieving this goal would be to eliminate the proposed sediment removal from the Bear River and instead dredge Rollins Reservoir. The dredging alternative would avoid the impacts to the foothill yellow-legged frog and the scour impacts related to sediment removal in the Bear River. However, as Rollins Reservoir is listed as impaired due to the presence of mercury, in-water operations would increase potential water quality impacts due to creating turbid water with an increased risk of exceeding the Total Maximum Daily Load for mercury in the water column.

5.5 ALTERNATIVES ANALYSIS

This section discusses three alternatives to the proposed project, including the No Project Alternative. The No Project Alternative is a required element of an EIR pursuant to Section 15126.6(e) of the CEQA Guidelines that examines the environmental effects that would occur if the project were not to proceed. The other alternatives are discussed as part of the "range of reasonable alternatives" selected by the Nevada Irrigation District. The alternatives addressed in this section are listed below, followed by a more detailed discussion of each:

1. No Project Alternative
2. Reduced Production Alternative
3. Dewatering Channel Alternative

5.5.1 No Project Alternative

Under the No Project Alternative, no sediment removal would occur and the mine status would remain idle. The lack of sediment removal would result in an increased sediment flow into Rollins Reservoir and reduced storage capacity of the reservoir. In addition, the No Project Alternative would not provide scour protection for the Chicago Park Powerhouse and the Chicago Park Powerhouse Road Bridge.

Aesthetics

The No Project Alternative would not involve any new operations related to sediment removal and would therefore not result in any changes to the aesthetics of the area. No new light sources would be introduced under this alternative. Therefore, the No Project Alternative would avoid the proposed project's impact due to the introduction of new light sources and the potential for sky glow, which would be less than significant with mitigation.

Air Quality

The No Project Alternative would not cause an increase in air emissions since there would be no sediment removal operations and no associated haul trips that could increase emissions. Specifically, this alternative would avoid the proposed project's significant and unavoidable impacts due to NO_x emissions.

Biological Resources

The No Project Alternative would maintain the existing habitats in the project area and would not have impacts on special-status species, riparian vegetation, or wildlife movement corridors. Since no sediment removal operations would be introduced, this alternative would avoid the proposed project's impacts to biological resources, which would be less than significant with mitigation.

Cultural Resources

Under the No Project Alternative, no skimming operations would be introduced that could potentially impact subsurface cultural resources or human remains. The project area would remain in its current state. Therefore, the No Project Alternative would avoid the proposed project's impacts to cultural resources, which would be less than significant with mitigation.

Greenhouse Gas Emissions

As described under Air Quality, the No Project Alternative would not cause an increase in air emissions since no new operations would be introduced to the project area. Although the proposed project would not result in any significant impacts to greenhouse gas (GHG) emissions, the No Project Alternative would avoid impacts altogether and would therefore have reduced impacts.

Hazards and Hazardous Materials

The No Project Alternative would not increase the potential for spills of hazardous materials since no new operations would be introduced. This alternative would therefore avoid the proposed project's impacts due to the potential for hazardous materials spills that could cause soil or groundwater contamination, as well as impacts from the risk of wildfire, which would be less than significant with mitigation.

Hydrology and Water Quality

The No Project Alternative would not provide scour protection for the Chicago Park Powerhouse and the Chicago Park Powerhouse Road Bridge. While scour effects would not be increased, due to the lack of aggregate removal activity, ongoing scour caused by storm events would continue, requiring additional protection measures at the bridge and the Chicago Park Powerhouse.

Water quality impacts related to the proposed project would be avoided, although mercury from historical gold mining activity would likely increase as sediment is washed down the Steephollow and Bear River watersheds and into Rollins Reservoir.

Land Use and Planning

As described in Section 3.8 of the EIR, the proposed project would not result in any significant impacts related to land use and planning. There would be no change in impacts under the No Project Alternative.

Noise

The No Project Alternative would not introduce any new noise sources to the project area since no sediment removal operations would occur. Although the proposed project would not result in any significant impacts to noise, the No Project Alternative would avoid impacts altogether and would therefore have reduced noise impacts.

Public Utilities and Services

The No Project Alternative would have no effect on public utilities and services since no changes to the existing conditions would occur. Although the proposed project would not result in any significant impacts to public utilities and services, the No Project Alternative would avoid impacts altogether and would therefore have reduced impacts.

Transportation

The No Project Alternative would not increase use of the Chicago Park Powerhouse Road and would not introduce any truck traffic to this road. Therefore, this alternative would avoid the proposed project's impact due to increased traffic hazards, which would be less than significant with mitigation.

Comparison to Project Objectives

The No Project Alternative would not meet any of the project objectives. The alternative would not maintain the capacity of Rollins Reservoir and would not remove gravel deposits along the north and south sides of the Bear River. Sediment would continue to accumulate and reduce the water storage capacity of the reservoir. The alternative would not protect the Chicago Park Powerhouse and Chicago Park Powerhouse Road bridge from undermining, would not provide a permanent access to the Chicago Park Powerhouse, and would not improve recreational opportunities within Rollins Reservoir.

5.5.2 Reduced Production Alternative

The Reduced Production Alternative would involve sediment removal operations similar to the proposed project, but limit the amount of material that could be exported from the site (by haul trucks) to 206,000 tons of material during the operating season (April 1 through November 15). By contrast, the proposed project would allow the entire annual production of 250,000 tons to be hauled during the operating season. All other components of the proposed project would be identical under the Reduced Production Alternative.

Aesthetics

The Reduced Production Alternative would introduce the same new light sources as the proposed project and could therefore result in a significant impact without mitigation. However, similar mitigation would also be implemented to reduce the potential impact to below a level of significance. Therefore, the Reduced Production Alternative would have impacts to aesthetics similar to those under the proposed project.

Air Quality

The Reduced Production Alternative would limit the amount of material that could be exported from the site (by haul trucks) to 206,000 tons of material during the operating season (April 1 through November 15), compared to 250,000 tons under the proposed project. As described previously, the proposed project would result in significant and unavoidable project and cumulative impacts due to NO_x emissions generated by the haul trucks transporting material from the project. Air quality modeling indicates that by reducing the amount of material transported during the operating season to 206,000 tons, the average emissions from the associated haul trucks would not cause NO_x emissions to exceed the established daily thresholds. The operating period coincides with the time of year when ozone levels are highest in the region. Note that the remaining 44,000 tons of material that may be removed from the river channel annually under the reclamation plan could be exported in the "off-season" (November 16 to March 28). In addition, the lower NO_x emissions would reduce, but not entirely avoid, the cumulative air quality impact of the proposed project. Therefore, the Reduced Production Alternative would result in reduced air quality impacts compared to the proposed project.

Biological Resources

The Reduced Production Alternative would involve the same sediment removal operations as the proposed project and would impact the same project area. Although maximum production levels would be lower, the typical area and time of operations would be similar. Therefore, this alternative would have the same potential to impact special-status wildlife, willow riparian vegetation, and wildlife movement corridors. Impacts to biological resources would be the same as those under the proposed project and mitigation measures would be implemented to reduce impacts to below a level of significance.

Cultural Resources

As described above, the Reduced Production Alternative would involve the same sediment removal operations as the proposed project, including skimming, which could impact subsurface historical or prehistoric resources or human remains. Impacts to cultural resources would therefore be the same as those under the proposed project and mitigation measures would be implemented to ensure impacts are reduced to less than significant.

Greenhouse Gas Emissions

As described under Air Quality, the Reduced Production Alternative would involve fewer haul truck trips than the proposed project and would therefore reduce associated air emissions. This reduction in haul truck trips would also reduce GHG emissions. Although the proposed project would not result in significant GHG emissions, the Reduced Production Alternative would further reduce this less than significant impact when compared to the proposed project.

Hazards and Hazardous Materials

The Reduced Production Alternative would involve the same operations as the proposed project, including the use of equipment and vehicles requiring fuel, which could lead to impacts due to fuel spills. Similar to the proposed project, this alternative could cause soil or groundwater contamination in the event of a hazardous materials spill and could result in impacts from increased risk of wildfire. Therefore, impacts would be similar to the proposed project and mitigation would be implemented to ensure impacts would be less than significant.

Hydrology and Water Quality

The Reduced Production Alternative would have the same impacts to hydrology and water quality as the proposed project since the same sediment removal operations would occur.

Land Use and Planning

The Reduced Production Alternative would involve operations in the same project area as the proposed project and would not involve any other changes that would impact land use and planning. Therefore, the Reduced Production Alternative would result in the same less than significant impacts to land use and planning as the proposed project.

Noise

The Reduced Production Alternative would involve the same sediment removal operations as the proposed project and would therefore have a similar effect on noise; however, this alternative would result in a reduction in haul truck trips, which could slightly reduce the frequency of increased noise due to truck trips. Although the proposed project would result in less than significant noise impacts, the Reduced Production Alternative would have slightly reduced impacts compared to the proposed project.

Public Utilities and Services

The Reduced Production Alternative would have operational characteristics similar to those of the proposed project and would therefore have similar impacts to public utilities and services. Impacts under both the Reduced Production Alternative and the proposed project would be less than significant.

Transportation

The Reduced Production Alternative would result in fewer average daily haul truck trucks than the proposed project; however, this alternative would still introduce two-way truck traffic on Chicago Park Powerhouse Road, similar to the proposed project. This increase in truck traffic would result in impacts related to increased hazards on Chicago Park Powerhouse Road similar to those under the proposed project. Therefore, traffic impacts would be similar under this alternative and mitigation would be implemented to reduce the significant impact to a less than significant level.

Comparison to Project Objectives

The Reduced Production Alternative would meet all of the project objectives to some extent, as it would maintain the capacity of Rollins Reservoir, would remove gravel deposits along the north and south sides of the Bear River (although potentially not to the same extent as the proposed project), would balance sediment removal with maintaining habitat for the foothill yellow-legged frog, would protect the Chicago Park Powerhouse and Chicago Park Powerhouse Road Bridge from undermining, would provide a permanent access to the Chicago Park Powerhouse, would improve recreational opportunities within Rollins Reservoir, and would reclaim the site in accordance with Reclamation Plan RP88-03, as revised (see Appendix B). By reducing the maximum tonnage hauled during the operating season, this alternative may slightly inhibit the goal of sediment removal in the Bear River.

5.5.3 Dewatering Channel Alternative

The Dewatering Channel Alternative would create a dewatering channel, 125 feet wide and 3 feet deep, within the Bear River channel. The channel would accommodate peak flow releases during the aggregate removal season, would maintain water quality by inhibiting methylation of mercury, and would lower the water level in the riverbed to facilitate the dry removal of aggregate.

This Alternative is similar to the proposed project, but would modify the mining operation in the following manner:

- To extract aggregate under dry conditions, NID will excavate a "dewatering channel" approximately 125 feet wide by 3 feet deep, and up to 1000 feet in length, within the Bear River channel. The purpose of the dewatering channel is to dewater, by gravity, shallow groundwater in the gravel bars within the Bear River channel to allow for dry aggregate extraction. Typically, the Bear River channel is 500 feet wide; therefore, the dewatering channel, which can be relocated or modified daily, will be located in the most appropriate portion of the river channel to optimize dewatering and dry aggregate extraction and minimal impacts to air quality, water quality, riparian habitat, and biological resources.
- The dewatering channel will be located to avoid seasonal variations in riparian habitats to minimize impacts to special status species. Riparian habitat along a section of the left bank of the Bear River has stabilized the gravel deposits and provides habitat to the foothill yellow legged frog. Unless depositional patterns change over the course of the project, this established habitat area could be avoided.
- The dewatering channel will be constructed using a track-mounted excavator operating from the head (upstream) of the dewatering channel. This excavation technique will help keep the excavator out of any surface water for most of the operation. Aggregate from the channel will be used as berm material to direct the meandering Bear River flows into the dewatering channel.
- As the gravel bars are dewatered, the dry aggregate will be excavated using scrapers, or front-end loaders and haul trucks. The aggregate will be moved to stockpiles and hauled off-site (as per the proposed project).
- At the end of each operational day, a portion of the Bear River will be directed into the dewatering channel to oxygenate and flush the channel to ensure that methylating bacteria do not establish. When water is directed into the dewatering channel, the downstream portion of the dewatering channel becomes the new active channel. As the dewatering channel is extended upstream (and connected to the active channel at the end of each day), the Bear River becomes channelized along the southern boundary. Following the excavation season, winter storms would flood the gravel deposits and create a new active channel, as occurs currently.
- The alternative will include a water quality-monitoring component. Multiple groundwater monitoring wells, or piezometers, would be installed across the width of the channel at

multiple transects. Water table height in the gravel deposits will be monitored and samples of the water table will be collected calculate the annual load of methylmercury contributed by the deposit. Transects would likely include one upstream of the operation, one immediately downstream of the operation, and one downstream in standing water in Rollins Reservoir. The upstream transect will provide a background level, undisturbed by project operations, to be used as a comparison to downstream transects to determine the effect of the operations. A concentration of 50 ng/L of total mercury would be used as the maximum water quality standard. Should monitoring show that project activities are causing this level to be exceeded, operations will be halted and standing water allowed to settle any suspended solids.

- The Dewatering Channel Alternative would incorporate the hauling limits of the Reduced Production Alternative. Therefore, only 206,000 tons of material would be exported from the site from April 1 to November 15. However, 250,000 tons of aggregate may be mined from the river channel annually. Material in excess of 206,000 tons may be stockpiled and/or hauled from the site in the off-season (November 16 to March 31).

Aesthetics

The Dewatering Channel Alternative would introduce the same new light sources as the proposed project and could therefore result in a significant impact without mitigation. However, similar mitigation would also be implemented to reduce the potential impact to below a level of significance. Therefore, the Dewatering Channel Alternative would have impacts to aesthetics similar to those under the proposed project. With implementation of Mitigation Measure AES-1, impacts would be less than significant.

Air Quality

The proposed project would remove up to 250,000 tons of material per year. The Dewatering Channel Alternative, similar to the Reduced Production Alternative, would limit material export to 206,000 tons of during the operating season. As described previously, the proposed project would result in significant and unavoidable project and cumulative impacts due to NO_x emissions generated by the haul trucks transporting material from the project. Air quality modeling indicates that by reducing the material hauled from April through November 15 to 206,000 tons, the emissions from the associated haul trucks would not cause NO_x emissions to exceed the established thresholds. In addition, the reduced NO_x emissions would reduce, but not entirely avoid, the cumulative air quality impact of the proposed project. Therefore, the Dewatering Channel Alternative would result in reduced air quality impacts compared to the proposed project. Mitigation Measures AQ-1 and AQ-2 would still be necessary.

Biological Resources

The Dewatering Channel Alternative would modify the aggregate removal operations and would impact the same project area. Maximum production levels would be lower, and the mining technique would be modified to reduce seasonal impacts on riparian and riverine habitats. Impacts to the foothill yellow legged frog may be reduced by the placement of the dewatering channel on the southern side of the Bear River (as described in project mitigation measure BIO-7). Impacts to other biological resources would be similar to those under the proposed project. Overall, biological impacts would be less than the proposed project. However, the biological mitigation measures, with the exception of BIO-7, would still be required to ensure the potential impacts are less than significant.

Cultural Resources

As described above, the Dewatering Channel Alternative would involve a modified aggregate removal operation, which could impact subsurface historical or prehistoric resources or human remains. Impacts to cultural resources would therefore be the same as those under the proposed project and mitigation measures (CUL-1 and CUL-2) would be implemented to ensure impacts are reduced to less than significant.

Greenhouse Gas Emissions

As described under Air Quality, the Dewatering Channel Alternative would involve fewer haul truck trips than the proposed project and would therefore reduce associated air emissions. This reduction in haul truck trips would also reduce GHG emissions. Although the proposed project would not result in significant GHG emissions, the Dewatering Channel Alternative would further reduce this less than significant impact when compared to the proposed project.

Hazards and Hazardous Materials

The Reduced Production Alternative would be similar operations as the proposed project, including the use of equipment and vehicles requiring fuel, which could lead to impacts due to fuel spills. Similar to the proposed project, this alternative could cause soil or groundwater contamination in the event of a hazardous materials spill and could result in impacts from increased risk of wildfire. Therefore, impacts would be similar to the proposed project and mitigation measures (HAZ-1 through HAZ-4) would be implemented to ensure impacts would be less than significant.

Hydrology and Water Quality

The Dewatering Channel Alternative would reduce water quality impacts by managing potential mercury mobilization. Mercury can be methylated when sulfate-reducing and/or iron-reducing bacteria are allowed to develop in low flow conditions. To reduce methylation conditions in the shallow subsurface groundwater table where anoxic zones occur, the dewatering action will preclude stratification and the subsequent establishment of methylating conditions. To further reduce the establishment of methylating bacteria in the dewatering channel, the channel will be flushed by connecting the active channel to the dewatering channel. This should limit the populations of iron-reducing and/or sulfate-reducing bacteria. The width and depth of the dewatering channel is designed to reduce the risk of incision by accommodating full releases from the Powerhouse.

The Dewatering Channel Alternative would substantially reduce, but not avoid, impacts to hydrology and water quality. Relative to the proposed project, the dewatering channel alternative results in a lesser potential for direct impacts with respect to mercury mobilization because it avoids intercepting the shallow groundwater and minimize the presence of slow or standing water. Mitigation Measures HYD-2 and HYD-4 are effectively incorporated into the alternative, and would not be required. Implementation of Measures HYD-1 and HYD-3 would ensure that the Dewatering Channel Alternative would have a less-than-significant impact on hydrology and water quality.

Land Use and Planning

The Dewatering Channel Alternative would involve operations in the same project area as the proposed project and would not involve any other changes that would impact land use and planning. Therefore, the Dewatering Channel Alternative would result in the same less than significant impacts to land use and planning as the proposed project.

Noise

The Dewatering Channel Alternative would involve similar sediment removal operations as the proposed project and would therefore have similar noise impacts; however, this alternative would result in a reduction in haul truck trips, which could slightly reduce the frequency of increased noise due to truck trips. Although the proposed project would result in less than significant noise impacts, the Dewatering Channel Alternative would have slightly reduced impacts compared to the proposed project.

Public Utilities and Services

The Dewatering Channel Alternative would have operational characteristics similar to those of the proposed project and would therefore have similar impacts to public utilities and services. Impacts under both the Dewatering Channel Alternative and the proposed project would be less than significant.

Transportation

By incorporating the hauling limits of the Reduced Production Alternative, the Dewatering Channel Alternative would result in slightly fewer haul trucks than the proposed project; however, this alternative would still introduce two-way truck traffic on Chicago Park Powerhouse Road, similar to the proposed project. This increase in truck traffic would result in impacts related to increased hazards on Chicago Park Powerhouse Road similar to those under the proposed project. Therefore, traffic impacts would be similar under this alternative and mitigation (TRA-1) would be implemented to reduce the significant impact to a less than significant level.

Comparison to Project Objectives

The Dewatering Channel Alternative would meet the project goals to maintain and restore water storage capacity, minimize impacts to the foothill yellow legged frog, protect the Chicago Park Powerhouse and Chicago Park Powerhouse Road Bridge abutments from scouring, provide permanent haul route access to the project site, and reclaim the site in accordance with Reclamation Plan RP88-03, as revised. By reducing the maximum tonnage hauled during the operating season, this alternative may slightly inhibit the goal of restoration (by reducing the amount of material that could be hauled offsite during the construction season, when demand is highest).

5.6 SUMMARY MATRIX

A matrix displaying the major characteristics and significant environmental effects of each alternative is provided in Table 5-1, Alternatives Impact Summary, to summarize the comparison with the proposed project. The matrix also indicates whether the alternative meets the project objectives as defined in Chapter 2, Project Description, and Section 5.2.

Table 5-1
Alternatives Impact Summary

Environmental Issue	Proposed Project Impacts Prior to Mitigation	Proposed Project Impacts After Mitigation	No Project Alternative	Reduced Production Alternative	Dewatering Channel Alternative
Aesthetics	S	LTS	▼	—	—
Air Quality	S	S	▼	▼	▼
Biological Resources	S	LTS	▼	—	▼
Cultural Resources	S	LTS	▼	—	—
Greenhouse Gas Emissions	LTS	LTS	▼	▼	▼
Hazards and Hazardous Materials	S	LTS	▼	—	—
Hydrology and Water Quality	S	LTS	▼	—	▼

Table 5-1
Alternatives Impact Summary

Environmental Issue	Proposed Project Impacts Prior to Mitigation	Proposed Project Impacts After Mitigation	No Project Alternative	Reduced Production Alternative	Dewatering Channel Alternative
Land Use and Planning	LTS	LTS	▼	—	—
Noise	LTS	LTS	▼	▼	▼
Public Utilities and Services	LTS	LTS	▼	—	—
Transportation	S	LTS	▼	▼	▼
Meets Most Project Objectives?	Yes	Yes	No	Yes	Yes

▲ Alternative is likely to result in greater impacts to issue when compared to proposed project.
— Alternative is likely to result in similar impacts to issue when compared to proposed project.
▼ Alternative is likely to result in reduced impacts to issue when compared to proposed project.
LTS = less than significant impact; S = significant impact.

5.7 ENVIRONMENTALLY SUPERIOR ALTERNATIVE

As indicated in Table 5-1, the No Project Alternative would result in the least environmental impacts and would be the environmentally superior alternative. All impacts associated with the proposed project would be reduced under the No Project Alternative. However, the No Project Alternative fails to meet any of the project objectives. Section 15126.6(e)(2) of the CEQA Guidelines states that if the environmentally superior alternative is the No Project Alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives. In this case, the environmentally superior alternative is the Dewatering Channel Alternative. This Alternative would incorporate the same haul limits as the Reduced Production Alternative, avoiding the significant and unavoidable air quality impact due to NO_x emissions, but would also provide water quality benefits. The Dewatering Channel Alternative would also achieve all of the project objectives to a large extent.

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CHAPTER 6
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CHAPTER 7
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CHAPTER 8
RESPONSE TO COMMENTS

8.1 COMMENTS ON THE DRAFT EIR

Table 8-1, below, lists the persons, organizations, and public agencies that commented on the Draft EIR during the review period.

Table 8-1
Comments on the Draft EIR

Letter ID	Name of Commenter	Organization or Agency (if applicable)	Date
A	Martin Earles	Caltrans District 3	July 27, 2015
B	Trevor Cleak	Central Valley Regional Water Quality Control Board	July 27, 2015
C	Maureen Necochea		July 2, 2015
D	Nik Kelly and Phylis Porteus		July 10, 2015
E	Theodore Back		July 17, 2015

8.2 RESPONSES TO COMMENTS

Each comment received is reproduced in the following section. Responses to environmental issues raised in the comments are provided after each comment letter.

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Comment Letter A

Page 1 of 1

From: Earles, Marty B@DOT <marty.earles@dot.ca.gov>
Sent: Monday, July 27, 2015 4:39 PM
To: BRsedimentremoval@nidwater.com
Subject: Comments from Traffic Operations, Caltrans District 3

Lisa Francis Tassone, Board Secretary
Nevada Irrigation District
1036 West Main Street
Grass Valley, California 95945

Ms. Tassone,

This is regarding your draft EIR for the proposed Bear River Sediment Removal project at Rollins Reservoir. Our Planning staff are responsible for soliciting comments from District staff, then compiling and editing those comments and sending an official memo from Caltrans. I missed our internal deadline for comments, so I'm sending this to you directly.

I was impressed with the very-well-written draft EIR, and was fascinated with the subject matter. It's amazing that hydraulic mining from so long ago continues to have so large an impact on the streams and reservoirs. I live east of Grass Valley in the Peardale area, only a few miles from the Rollins Reservoir. My family and I are definitely feeling the effects of the Lowell Fire! It's sad to hear of diminished reservoir capacity; I hope you are successful in your effort to have the EIR approved so gravel skimming operations can be improved. But that's enough personal background. A-1

My perspective is that of a Caltrans engineer in the Traffic Operations area. My concern is safety and operations at the Secret Town interchange in Placer County. It appears the employees and truck drivers who work at the facility will access Interstate 80 here, and here only. We do not have any recent history of safety or operational problems at the interchange. We hope that it will continue to function well as traffic volumes are added to it by the re-opening of the gravel skimming operation.

Our main concern is the westbound on-ramp merge. The ramp is relatively short, so a loaded truck probably won't be able to get up to full speed before merging. It's on a downhill grade, and there are significant truck volumes on the freeway. When you have safety meetings or discuss safety topics, please remind everyone to be alert when transitioning from the haul road to the freeway. If you have any questions or concerns about I-80 or the Secret Town interchange, please contact me. A-2

You don't need to include these comments in the official record, and no response is needed. We'll be happy if you discuss interchange safety occasionally at safety meetings. A-3

Sincerely,

Martin Earles
Associate Transportation Engineer
530-741-5744
Caltrans / District 3 / Highway Operations
703 B Street / Marysville, CA 95901

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Response to Comment Letter A

Caltrans District 3 Operations
Martin Earles
July 27, 2015

A-1 Introduction. No response necessary.

A-2 Commenter notes a concern with loaded trucks merging on the westbound on-ramp, and recommends that drivers be reminded of this topic during safety meetings.

The commenter does not identify this is a significant environmental issue and notes there is no record of existing safety issues at the location. NID will incorporate this safety information into its regular safety meetings.

A-3 Concluding statement. No response necessary.

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Comment Letter B

Central Valley Regional Water Quality Control Board

RECEIVED
JUL 23 2015
NEVADA IRRIGATION DISTRICT

20 July 2015

Tim Crough
Nevada Irrigation District
1006 West Main Street
Grass Valley, CA 95645

CERTIFIED MAIL
7014 2870 0000 7535 4272

COMMENTS TO REQUEST FOR REVIEW FOR THE DRAFT ENVIRONMENTAL IMPACT REPORT, BEAR RIVER SEDIMENT REMOVAL AT ROLLINS RESERVOIR PROJECT, SCH# 2013112006, NEVADA AND PLACER COUNTIES

Pursuant to the State Clearinghouse's 11 June 2015 request, the Central Valley Regional Water Quality Control Board (Central Valley Water Board) has reviewed the *Request for Review for the Draft Environment Impact Report* for the Bear River Sediment Removal at Rollins Reservoir Project, located in Nevada and Placer Counties.

Our agency is delegated with the responsibility of protecting the quality of surface and groundwaters of the state; therefore our comments will address concerns surrounding those issues. B-1

Construction Storm Water General Permit

Dischargers whose project disturb one or more acres of soil or where projects disturb less than one acre but are part of a larger common plan of development that in total disturbs one or more acres, are required to obtain coverage under the General Permit for Storm Water Discharges Associated with Construction Activities (Construction General Permit), Construction General Permit Order No. 2009-009-DWQ. Construction activity subject to this permit includes clearing, grading, grubbing, disturbances to the ground, such as stockpiling, or excavation, but does not include regular maintenance activities performed to restore the original line, grade, or capacity of the facility. The Construction General Permit requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP). B-2

For more information on the Construction General Permit, visit the State Water Resources Control Board website at:
http://www.waterboards.ca.gov/water_issues/programs/stormwater/constpermits.shtml.

Bear River Sediment Removal at Rollins Reservoir Project Nevada and Placer Counties - 2 - 20 July 2015

Phase I and II Municipal Separate Storm Sewer System (MS4) Permits[1]
The Phase I and II MS4 permits require the Permittees reduce pollutants and runoff flows from new development and redevelopment using Best Management Practices (BMPs) to the maximum extent practicable (MEP). MS4 Permittees have their own development standards, also known as Low Impact Development (LID)/post-construction standards that include a hydromodification component. The MS4 permits also require specific design concepts for LID/post-construction BMPs in the early stages of a project during the entitlement and CEQA process and the development plan review process.

For more information on which Phase I MS4 Permit this project applies to, visit the Central Valley Water Board website at: http://www.waterboards.ca.gov/centralvalley/water_issues/storm_water/municipal_permits/.

For more information on the Phase II MS4 permit and who it applies to, visit the State Water Resources Control Board at: http://www.waterboards.ca.gov/water_issues/programs/stormwater/phase_ii_municipal.shtml B-3

Industrial Storm Water General Permit
Storm water discharges associated with industrial sites must comply with the regulations contained in the Industrial Storm Water General Permit Order No. 97-03-DWQ.

For more information on the Industrial Storm Water General Permit, visit the Central Valley Water Board website at: http://www.waterboards.ca.gov/centralvalley/water_issues/storm_water/industrial_general_permits/index.shtml. B-4

Clean Water Act Section 404 Permit
If the project will involve the discharge of dredged or fill material in navigable waters or wetlands, a permit pursuant to Section 404 of the Clean Water Act may be needed from the United States Army Corps of Engineers (USACOE). If a Section 404 permit is required by the USACOE, the Central Valley Water Board will review the permit application to ensure that discharge will not violate water quality standards. If the project requires surface water drainage realignment, the applicant is advised to contact the Department of Fish and Game for information on Streambed Alteration Permit requirements.

If you have any questions regarding the Clean Water Act Section 404 permits, please contact the Regulatory Division of the Sacramento District of USACOE at (916) 557-5250. B-5

[1] Municipal Permits = The Phase I Municipal Separate Storm Water System (MS4) Permit covers medium sized Municipalities (serving between 100,000 and 250,000 people) and large sized municipalities (serving over 250,000 people). The Phase II MS4 provides coverage for small municipalities, including non-traditional Small MS4s, which include military bases, public campuses, prisons and hospitals.

Clean Water Act Section 401 Permit – Water Quality Certification
If an USACOE permit (e.g., Non-Reporting Nationwide Permit, Nationwide Permit, Letter of Permission, Individual Permit, Regional General Permit, Programmatic General Permit), or any other federal permit (e.g., Section 9 from the United States Coast Guard), is required for this project due to the disturbance of waters of the United States (such as streams and wetlands), then a Water Quality Certification must be obtained from the Central Valley Water Board prior to initiation of project activities. There are no waivers for 401 Water Quality *Certifications*. B-6

Waste Discharge Requirements
If USACOE determines that only non-jurisdictional waters of the State (i.e., "non-federal" waters of the State) are present in the proposed project area, the proposed project will require a Waste *Discharge Requirement* (WDR) permit to be issued by Central Valley Water Board. Under the California Porter-Cologne Water Quality Control Act, discharges to all waters of the State, including all wetlands and other waters of the State including, but not limited to, isolated wetlands, are subject to State regulation. B-7

For more information on the Water Quality Certification and WDR processes, visit the Central Valley Water Board website at:
http://www.waterboards.ca.gov/centralvalley/help/business_help/permit2.shtml.

Regulatory Compliance for Commercially Irrigated Agriculture
If the property will be used for commercial irrigated agricultural, the discharger will be required to obtain regulatory coverage under the Irrigated Lands Regulatory Program.
There are two options to comply:

1. **Obtain Coverage Under a Coalition Group.** Join the local Coalition Group that supports land owners with the implementation of the Irrigated Lands Regulatory Program. The Coalition Group conducts water quality monitoring and reporting to the Central Valley Water Board on behalf of its growers. The Coalition Groups charge an annual membership fee, which varies by Coalition Group. To find the Coalition Group in your area, visit the Central Valley Water Board's website at: http://www.waterboards.ca.gov/centralvalley/water_issues/irrigated_lands/app_approval/index.shtml; or contact water board staff at (916) 464-4611 or via email at IrrLands@waterboards.ca.gov. B-8

2. **Obtain Coverage Under the General Waste Discharge Requirements for Individual Growers, General Order R5-2013-0100.** Dischargers not participating in a third-party group (Coalition) are regulated individually. Depending on the specific site conditions, growers may be required to monitor runoff from their property, install monitoring wells, and submit a notice of intent, farm plan, and other action plans regarding their actions to comply with their General Order. Yearly costs would include State administrative fees (for example, annual fees for farm sizes from 10-100 acres are currently $1,084 + $6.70/Acre); the cost to prepare annual monitoring reports; and water quality monitoring costs. To enroll as an Individual Discharger under the Irrigated Lands Regulatory

Bear River Sediment Removal at Rollins Reservoir Project
Nevada and Placer Counties
- 4 -
20 July 2015

Program, call the Central Valley Water Board phone line at (916) 464-4611 or e-mail board staff at IrrLands@waterboards.ca.gov.

Low or Limited Threat General NPDES Permit
If the proposed project includes construction dewatering and it is necessary to discharge the groundwater to waters of the United States, the proposed project will require coverage under a National Pollutant Discharge Elimination System (NPDES) permit. Dewatering discharges are typically considered a low or limited threat to water quality and may be covered under the General Order for *Dewatering and Other Low Threat Discharges to Surface Waters* (Low Threat General Order) or the General Order for *Limited Threat Discharges of Treated/Untreated Groundwater from Cleanup Sites, Wastewater from Superchlorination Projects, and Other Limited Threat Wastewaters to Surface Water* (Limited Threat General Order). A complete application must be submitted to the Central Valley Water Board to obtain coverage under these General NPDES permits.

For more information regarding the Low Threat General Order and the application process, visit the Central Valley Water Board website at:
http://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/general_orders/r5-2013-0074.pdf

For more information regarding the Limited Threat General Order and the application process, visit the Central Valley Water Board website at:
http://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/general_orders/r5-2013-0073.pdf

B-9

If you have questions regarding these comments, please contact me at (916) 464-4684 or tcleak@waterboards.ca.gov.

B-10

Trevor Cleak
Environmental Scientist

cc: State Clearinghouse unit, Governor's Office of Planning and Research, Sacramento

Response to Comment Letter B

Central Valley Regional Water Quality Control Board
Trevor Cleak
July 27, 2015

B-1 Introduction. No response necessary.

B-2 Commenter describes construction storm water general permit. Potential permits necessary to implement the project are discussed in Section 2.7 of the Draft EIR. If necessary, the lead agency will obtain coverage from the nationwide permit, and prepare a Storm Water Pollution Prevention Plan.

B-3 Commenter describes the MS4 permits. As the project is not served by a storm sewer system, MS4 would not apply.

B-4 Commenter describes the Industrial Storm Water General Permit, order No. 97-03-DWQ. As the project will not include washing or processing, it will most likely not be subject to these requirements.

B-5 Commenter describes the Clean Water Act Section 404 Permit. As noted in Section 2.7 of the Draft EIR, a Section 404 Permit will likely be required. See response to comment B-6, below.

B-6 Commenter describes the Clean Water Act Section 401 Water Quality Certification. As noted in Section 2.7 of the Draft EIR, a Section 404 Water Quality Certification will be necessary. The Draft EIR identifies alternatives and mitigation measures that would avoid or reduce potentially significant impacts to water quality (see Section 3.7 of the Draft EIR).

B-7 Commenter describes Waste Discharge Requirements. No non-federal waters of the state have been identified. The project area includes waters of the U.S., subject to the Clean Water Act, Sections 404 and 401.

B-8 Commenter describes regulatory compliance for commercially irrigated agriculture. This does not apply to the proposed project.

B-9 Commenter describes the low or limited threat general NPDES Permit. It is anticipated that “dewatering” (which is substantially different within a streambed than on a typical construction site), would be covered by the 401 Permit process (see response to comment B-6, above).

B-10 Conclusion and contact information. No response necessary.

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Comment Letter C

Page 1 of 2

From: maureen necochea <maureennecochea@gmail.com>
Sent: Thursday, July 02, 2015 3:56 PM
To: crough@nidwater.com
Cc: Brian Grattidge
Subject: Response to Draft EIR Bear River Sedimentation Removal

July 1, 2015

Tim Crough
Nevada Irrigation District
1036 W. Main Street
Grass Valley, California 95945
crough@nidwater.com

Brian Grattidge
Senior Project Manager
DUDEK
980 9th Street, Suite 1750
Sacramento, CA 95814
bgrattidge@dudek.com

All the NOP comments from the community highlighted the concerns residents have regarding the noise from the Bear River Sediment Removal project, in particular, the most irritating intrusive noise: backup beepers, some of which can produce up to 112 decibels. C-1

In the draft EIR for said project,there is a description of one simulation, ostensibly to demonstrate that adverse noise impacts will not be felt. I dispute this conclusory simulation as described in the draft EIR:

To assess noise associated with the project, a simulation was conducted at the project site on August 21, 2014, using heavy equipment to simulate project activities. The simulation consisted of a large front-end loader/excavator (John Deere 410E Loader) moving aggregate materials from an existing on-site stockpile into a heavy haul truck (see Appendix H).

During the simulation, noise level measurements were taken at a distance of 125 feet from the operating front-end loader and haul trucks, as well as at positions close to the nearest residences on Old Emigrant Trail. LDL Model 820 precision integrating sound level meters were used for the noise surveys. Weather conditions during the simulation consisted of clear skies, 65–70 degree Fahrenheit temperatures, calm winds, and low relative humidity.

The results of the noise measurements indicate that the heavy earthmoving equipment generated average and maximum noise levels consistent with the reference levels of 70 dBA L_{eq} and 80 dBA L_{max} at a distance of 100 feet used in the environmental noise analysis prepared for the project (see Appendix H). At two measurement locations, the sound of the operating heavy equipment, including backup beepers, was completely inaudible. C-2

At one point during the simulation, a truck horn was operated for a period of 20 seconds. Even during the prolonged sounding of the truck horn, noise remained completely inaudible at the noise measurement locations near the existing residences. It is expected that the sound of back- up beepers or other warning devices would respond in the same manner.

I beg to differ, as do all my neighbors. Noise from the Canyon is very audible.

Exactly where were these measurements taken on Old Emigrant Trail? This detail is critical and not revealed in the simulation. Our terrain is rough and varied, dropping more than 400 feet in elevation from the ridgetop to the bottom of the canyon. It is possible to have noise muffled in certain hollows, while perceiving conversations from a half mile away at a ridgeline.Were the sound level meters inadvertently or purposefully placed in locations as to thwart detection?

file://dudek-files/projects/300.Environmental/7974%20Steephollow%20Secret%20Town%2... 9/3/2015

Sound has a unique nature. The topography of Steephollow and Bear River Canyons acts as a megaphone. In the Nevada County Noise Exposure Limits Chart (p.242 of the Draft EIR) the County notes: "*Because of the unique nature of sound, the County reserves the right to provide for a more restrictive standard than shown in this table.*" C-3

In Bollard's simulation, the unique nature of sound is disregarded. Two meters placed at unpublished locations for a 20 second horn test purport to represent noise impacts of backup beepers on Old Emigrant Trail residents in perpetuity. This is clearly inadequate testing.

It must further be asked if the acoustic testing methodology in general is designed to produce skewed results that will allow the project slip by the thresholds of significant impact on the environment according to CEQA, specifically " **A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.**" It is significant to note that Bollard's 24 hour noise monitoring to establish the baseline for ambient noise was conducted Friday through Monday, November 22-25,2013, a few days before Thanksgiving. Residents of the area know well that trespassing activity through NID property at the confluence of the Bear River and Steephollow Creek such as promiscuous shooting is more intense around holidays, and on weekends. The spikes on the charts between 11am and 4 pm for Saturday and Sunday reflect such activity, which raises the baseline for the average sound level. To project out these aberrations as a daily average is disingenuous. C-4

Recently,PG&E leased an area at the confluence of the Bear River and Steephollow Creek to use as a staging ground for their tower replacement project along the Drum Oso transmission lines. We could hear the backup beepers loud and clear. It is inconsistent that we can hear the beepers from the same area the project is planned to occupy from our property on Old Emigrant Trail, and Bollard cannot.

The nature of a backup beeper is to produce an alarming, irritating noise. The decibels produced by beepers are well above the County's permitted noise level, but since it is not a continuous sound, the insistent piercing sound is blended in with other operating noises to produce an acceptable "average." C-5

There are a range of warning devices, and nowhere in the Draft EIR is there a discussion of the alternatives. The conclusory and inadequate simulation, as well as the choice of dates to establish a baseline of ambient noise appear to be purposefully designed to avoid discussion of mitigating measures.

The project proposes 12 hour days of backup beepers.Intrusive noise is a documented health hazard, and is not an issue to be glossed over.

I request that it be discussed with particularity, in terms of what requirements are necessary for warning systems in the mining operation by statute, and how those systems can be implemented mitigating adverse effects on the area residents. C-6

Maureen Necochea, Old Emigrant Trail Resident
PO Box 235
Cedar Ridge, Ca 95924

Response to Comment Letter C

Maureen Necochea
July 2, 2015

C-1 Commenter notes that residents identified noise concerns during the scoping process, particularly with regards to backup beepers. These comments were noted in the Draft EIR noise discussion, Section 3.9.

C-2 Commenter cites page 3.9-10 of the Draft EIR, regarding noise simulation tests. Commenter disputes the conclusion that the project would not violate noise standards.

See response to comment C-3, below.

C-3 Commenter notes the particular geography of the canyon, and its effect on sound. Commenter states that the EIR noise analysis disregards geography, questions where noise monitoring on Old Emigrant Trail was done, and asks how a 20-second horn test could adequately simulate the noise of backup beepers.

The noise analysis for the Draft EIR consisted of two parts. The first part was a noise analysis typical for an EIR: background noise measurements were taken, and noise from the project was estimated for both aggregate removal and trucking operations. Using standard calculations for distance, the estimated noise levels at sensitive receptors (in this case residences) were calculated. These results are shown in Table 3.9-6. Potential changes in the noise level were compared to appropriate standards, in this case the noise standards for Nevada County and Placer County (for both counties, the normal allowable sound level for non-transportation sources is 55 dBA Leq for rural residential land uses). Due to the concerns with geography, as noted by the commenter, a simulation test was done to verify the accuracy of the calculated noise levels. This is the second part of the EIR noise analysis.

Figure 1 identifies the location of the simulation testing and measurements (labeled BAC 1 and BAC 2). On August 21, 2014, a front loader/excavator and a heavy duty haul truck were operated at the project site (at the proposed stockpile, where the most activity would occur).

During the simulation, noise level measurements were conducted at a distance of 125 feet from the operating front loader and haul truck. Measurements were also taken on Old Emigrant Trail, in as close proximity to the residences as possible without entering private property.

The results of the noise surveys indicate that the heavy earthmoving equipment generated average and maximum noise levels consistent with the reference levels of 70 dB Leq and 80 dB Lmax at a distance of 100 feet used in the environmental noise analysis prepared for the project.

However, at the two measurement locations (BAC 1 and 2 shown in Figure 1), the sound of the operating heavy equipment was completely inaudible. Noise levels measured at BAC Sites 1 and 2, which were generated entirely by natural sounds, were approximately 30-35 dBA.

At one point during the simulation, BAC staff had the heavy truck driver intentionally sound his horn for a period of 20 seconds. Even during the prolonged sounding of the truck horn, that noise remained completely inaudible at the BAC noise measurement locations near the existing residences. The 20-second horn test, it must be noted, was not intended to solely replicate beeper noise. The equipment used during the test had backup warning devices, which were in use during the test. The horn test provided an extreme scenario for project related noise. Under normal operations, there would not be a need for a prolonged horn blast.

Figure 1. Noise Simulation Testing Locations.

In the first noise study prepared for the project, the highest average and maximum noise levels generated by the project at the nearest residence (Residence 2) were predicted to be approximately 43 dB Leq and 53 dB Lmax. These levels would be well below the County's daytime noise level standards of 55 dB Leq and 75 dB Lmax applicable to residential land uses in the County. The subsequent noise simulation tests were consistent with the predicted noise levels.

In response to this comment, an additional noise simulation was done on August 24, 2015. As with the previous noise simulation, a front end loader and heavy haul truck was operated at the project site. For this test, however, measurements were taken on the nearest residential properties, 14420 Old Emigrant Trail and 14158 Old Emigrant Trail.

Conditions were warm (73 to 76 degree F, 36% humidity) and clear with light winds (5 mph or less). An Amprobe Piccolo SLM-P3 sound level meter was used, calibrated with an Amprobe SM-CAL1.

At 14420 Old Emigrant Trail, the baseline noise level was 38.7 dBA Leq (52.8 dBA Lmax). Birds and distant aircraft were the primary noise sources. This is slightly higher than the levels recorded on Old Emigrant Trail the previous year, but still well below the County daytime standard used in the EIR (55 dB Leq). During the 15-minute operations test, slightly higher ambient levels were recorded – 38.9 dBA Leq (49.6 dBA Lmax). Some individual sounds were audible, such as the dumping of gravel into the empty truck bed. However, the ambient level changed less than 1 dBA and was well below the County standard.

At 14158 Old Emigrant Trail, ambient levels were higher. This was due primarily to helicopters in the vicinity, and more distant sounds of train horns and heavy trucks. The baseline sound level was 45.2 dBA Leq (64.5 dBA Lmax). During the operations test, sound levels were elevated to 48.3 dBA Leq (61.3 dBA Lmax). However, helicopter noise was prevalent during the test. To confirm this, an additional 10-minute measurement was made while helicopters were still in the area, after the operations test had concluded. Sound levels were measured at 48.8 dBA Leq (62.9 dBA Lmax). This indicates that most of the elevated sound level at this location was a result of the helicopter noise rather than the heavy equipment operations. During the equipment test, the truck operator blasted the heavy truck horn. The horn was audible at 14158 Old Emigrant Trail, and was reported to be audible at 14420 Old Emigrant Trail. However, as indicated above, the maximum sound level did not increase. The horn blast, while audible to observers, did not substantially elevate the ambient noise level, and did not exceed County standards.

The results of the second simulation testing supports the residents' contention that individual noises at the confluence of the Bear River and Steephollow Creek may be audible on the north side of the Bear River near Steephollow Creek. However, neither the first nor second test indicated a significant increase in the ambient sound level, and both the daytime average (Leq) and maximum levels (Lmax) are below the County standards of 55 and 75 dBA, respectively. The threshold of significance for noise impacts is not just occasionally audible sounds, but an increase in the ambient sound level that exceeds the specified standard. NID has adopted, for purposes of CEQA, the standard of 55 dBA Leq used by both Nevada and Placer County. 55 dBA Leq is a common standard for residential land uses, particularly rural residential, and is on the quieter end of the normally acceptable range of noise levels for residential land uses (Governor's Office of Planning and Research, *General Plan Guidelines*, 2003, Appendix C). Nevertheless, NID is sensitive to the residents' concerns, and will incorporate the following voluntary measures into the project operation (note that these measures are identified as voluntary, as they are not required to mitigate a significant environmental impact within the meaning of CEQA, but will be incorporated into the mitigation monitoring plan).

1. When purchasing or replacing equipment, NID will use the latest, and least intrusive, backup warning devices available while maintaining compliance with the Mine Safety and Health Administration (MSHA) standards.
2. The stockpile and scale area shall be designed to minimize the need for haul trucks to back up by providing a continuous loop for loading, weighing, and exiting.
3. Signs shall be posted to limit horn use unless required for employee and public safety.
4. Noise minimization shall be a standard topic at operations meetings.

C-4 The commenter notes concerns with the baseline measurements, that illegal activity (such as shooting) elevated the levels (November 2013), and that the elevated noise levels skew the analysis.

Illegal activities such as off-road vehicle use and shooting have been indicated in the EIR scoping comments and a Draft EIR comment letter, and should be considered part of the existing environment. However, due to the fairly narrow range of noise levels over four days, it does not appear that illegal activity had a strong influence on baseline levels to the extent that the measurements are somehow an outlier and not reflective of existing conditions. Elevated baseline levels that are still below the standard of significance (in this case, the County daytime standard of 55 dBA Leq), do not necessarily skew or invalidate the results, and may have the opposite effect. If the existing noise level is close to the standard, and the project noise level causes an exceedance, it could be considered that the cumulative noise effect of the project is significant. However, the predicted noise levels do not exceed the daytime standard.

Subsequent noise tests, in August 2014 and August 2015, did not yield a significant change in noise levels, at times when no illegal shooting or off-road activity was occurring at the project site.

C-5 Commenter notes the irritating nature of back up beepers and cites previous experiences with PG&E operations near the project area. Commenter cites a lack of "alternatives" to the beepers, and questions the baseline measurements and simulations.

Please see responses to comments C-3 and C-4 regarding noise simulations and baseline measurements. Please see response to comment C-6 regarding backup warning device "alternatives."

C-6 Commenter asks specifically what warning systems are required by statute.

The project would be subject to federal MSHA regulations as a surface mining operation. MSHA generally requires an audible back up warning device for mobile equipment. These requirements are found in 30 CFR 57.14132 and are cited below:

> 57.14132 Horns and backup alarms for surface equipment
>
> (a) Manually-operated horns or other audible warning devices provided on self-propelled mobile equipment as a safety feature shall be maintained in functional condition.
>
> (b)(1) When the operator has an obstructed view to the rear, self-propelled mobile equipment shall have
>
> (b)(1)(i) An automatic reverse-activated signal alarm;
>
> (b)(1)(ii) A wheel-mounted bell alarm which sounds at least once for each three feet of reverse movement;
>
> (b)(1)(iii) A discriminating backup alarm that covers the area of obstructed view; or
>
> (b)(1)(iv) An observer to signal when it is safe to back up.
>
> (b)(2) Alarms shall be audible above the surrounding noise level.
>
> (b)(3) An automatic reverse-activated strobe light may be used at night in lieu of an audible reverse alarm.
>
> (c) This standard does not apply to rail equipment.

The following regulation also applies to mobile equipment:

> §57.14200 Warnings prior to starting or moving equipment.

> Before starting crushers or moving self-propelled mobile equipment, equipment operators shall sound a warning that is audible above the surrounding noise level or use other effective means to warn all persons who could be exposed to a hazard from the equipment.

As noted in the regulations, in any situation where the operator does not have a complete and unobstructed view behind the equipment, then either an audible warning device or a "spotter" is required. (Note that at night, a strobe may be used in lieu of an audible alarm; given the normal operating hours of the project, night operations would be uncommon and would not be a major contributor to noise).

Regarding the "unobstructed" view, equipment such as small loaders or backhoes may have complete rear view (assuming no other equipment or stockpiles are nearby). Larger pieces of equipment, such as trucks, generally do not have a complete and unobstructed view behind the equipment. The use of a spotter would require an additional employee on site for that specific purpose. It is envisaged that a typical operating crew at the site would be small (around five people, including equipment operators in the riverbed and staff at the stockpiles and office). Therefore, spotters may be practical during large loading operations (when several trucks would be loaded during successive hours). As noted in response to comment C-3, NID will seek to minimize the need for haul trucks to back up, thus minimizing that source of warning device noise. In addition, NID will seek to employ warning devices that minimize unwanted noise while meeting the MSHA requirements for audibility. As part of its regular operations meetings, project staff will discuss means to minimize warning device noise (including identifying those situations where a complete and unobstructed view exists, or it is feasible to employ the use of a designated spotter).

As discussed above (responses to comments C-3 and C-4), the proposed project would not cause the ambient noise level to exceed the threshold of significance (which is the County noise standard). Therefore, mitigation is not required to satisfy CEQA. However, NID is committed to minimizing noise that may be audible to the neighbors to the extant practical (see response to comment C-3).

Comment Letter D

Nik Kelly
P.O. Box 186
Cedar Ridge, CA 95924

Phyllis Porteous
PO Box 387
Cedar Ridge, CA 95924

7/10/15

TO: NID
RE: - BEAR R/ROLLINS GRAVEL PLANT EIR

ATTN MS. LISA TASSONE

RECEIVED
JUL 14 2015
NEVADA IRRIGATION DISTRICT

DEAR MS TASSONE:

AS OWNERS OF (4) PARCELS ON STEEPHOLLOW CR. OUR CONCERNS RE ABOVE ARE

1. Illegal Trespass ie. Steephollow Creek Floor is all Private land to the lowell Hill Crossing.

The ABOVE CREATES:

A. Illegal Gun Shooting
B. GARBAGE Dumping
C. Camp Fires in Hi Danger Times
D. ATV/DIRT BIKES TRAFFIC & TERRAINE DISTRUCTION.
E. on going Burgularies & Confrontations

BECAUSE OF ALL The PROBS TRESPASS ACROSS YOUR LAND HAS CAUSED (CHECK Sheriffs logs) WE REQUEST YOU SUPPLY 24/7 GUARDING OF YOUR ACCESS TO THE AREA. IF YOU LEAVE EQUIPTMENT, ETC. UNGUARDED YOU WILL EXPERIENCE PROBLEMS & VANDALISM. D-1

Please keep us informed! Nik Kelly / P Porteous D-2

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Response to Comment Letter D

Nik Kelly and Phyllis Porteous
July 10, 2015

D-1 Commenter notes illegal trespass problem at the project site and some of the associated problems, including shooting, garbage, illegal fires, damage from off-road vehicles, and theft. Commenter requests "24/7" security at the project site.

The project will include security measurements, including lighting, gates, and security personnel. While NID cannot guarantee constant and permanent security personnel, the increased level of activity at the project site should substantially discourage trespass in the area.

D-2 Commenter asks to be kept informed. Future project notices will be sent to the commenters' address.

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Comment Letter E

RECEIVED
JUL 17 2015
Nevada Irrigation District

P.O. Box 597
Colfax, Calif. 95713

July 16, 2015

Lisa Francis Tassone, Board Secretary
Nevada Irrigation District
1036 West Main Street
Grass Valley, California 95945

Please consider the following comments on the Draft EIR for the proposed Bear River Sediment Removal at Rollins Reservoir Project

RIVER MORPHOLOGY

This project, as proposed, radically and permanently alters the form and structure of the upper Bear River and Steephollow Creek.

These significant environmental impacts are not addressed in the draft EIR.

Impacts to the Bear River and Steephollow Creek up stream of the proposed project needs to be analyzed, evaluated, and addressed. E-1

The study area must include the entire upper Bear River from the Chicago Park Powerhouse to Dutch Flat and the entire upper Steephollow Creek.

Impacts caused by previous NID mining operation should be included.

GEOLOGY

Page 4-1 of the Draft EIR references Appendix G of the CEQA Guidelines and states:

" a significant impact related to geology and soils would occur if the project would:
2. Result in substantial soil erosion or the loss of topsoil.
3. Be located on a geologic unit or soil that is unstable, or would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse." E-2

The discussion on page 4-2 does not apply to this project. Arguments about "effects of the environment on the project" are totally bogus.

Numbers 2 and 3 above definitely apply.

page 2

This project, as proposed, results in substantial erosion and severely exacerbates the loss of geologic materials from the upper Bear River and Steephollow Creek.

This is clearly evident from previous NID mining activities.

This proposed project has significant geologic environmental impacts outside of the project boundaries which should be analyzed, evaluated, and addressed.

The project should include measures to reduce and minimize geologic material migration from the upper Bear River and Steephollow Creek.

E-2 Cont.

ALTERNATE PROJECT

A project which retards, minimizes,or nearly eliminates down stream migration could be developed.

Things such as (but not limited to) erosion barriers, gradient reduction, energy dissipation, etc, would diminish erosion, geologic material migration, and sedimentation.

Costal breakwater construction materials and techniques could be used to stop the massive erosion of up stream geologic substance caused by previous NID mining activity.

Stopping erosion and controlling migration would nearly eliminate sedimentation of Rollins Reservoir.

Erosion barriers should be installed up stream of the Chicago Park Powerhouse and allow the Bear River to return to the historic condition that existed previous to NID mining activity.

E-3

Thank you for allowing public input to the EIR process.

Sincerely,

Theodore Back

Theodore Back

Response to Comment Letter E

Theodore Black
July 16, 2015

E-1 Commenter states the project would radically and permanently alter the form and structure of the upper Bear River and Steephollow Creek, and that the Draft EIR fails to address these impacts, as well as upstream impacts. Commenter states the study area should include the entire upper Bear River and that impacts from previous NID mining operations should be included.

The project's effects on river morphology are comprehensively addressed in Draft EIR Chapter 3.7. Impact 3.7-1 in particular addresses the potential for project activities to adversely affect channel form and function, including upstream areas near the Chicago Park Powerhouse. Section 3.7.1, Existing Conditions, includes the entire watershed (i.e., upstream areas) in the study area and describes how historic mining activities have affected the watershed, both in terms of sedimentation and water quality. The geomorphic effects of NID's previous mining operation is included in the description of the existing setting.

E-2 Commenter states the Draft EIR would have significant geological impacts related to items VI (b) and (c) of the Appendix G checklist, including impacts upstream.

The effects of the project on sediment transport is comprehensively addressed in Draft EIR Chapter 3.7, Impact 3.7-1 in particular. Project activities would not otherwise have significant impacts on geology and soils for the reasons described on Draft EIR page 4-2. The placement of interlocking sheet piles downstream of the powerhouse as part of the project, and the decommissioning best practices, continual monitoring, and adaptation strategies required under Mitigation Measure MM-HYD-1 would limit the geomorphic effects of the project to the areas shown in Figure 3.7-2.

E-3 Commenter states that an alternate project that minimizes or nearly eliminated downstream migration could be developed. The commenter lists several components of such an alternative, that are directed towards controlling upstream erosion, and allowing the Bear River to return to its "historic condition."

The erosion and sediment control methods sited by the commenter would neither stop sediment from accumulating in the project reach, nor would it achieve the project objective of removing the aggregate deposits below the confluence of the Bear River and Steephollow Creek. In-stream sediment barriers placed upstream of the project site would introduce additional locations of sediment build-up and thus would require frequent maintenance and clean out activities to maintain their effectiveness. Construction and maintenance of upstream sediment barriers would have environmental impacts of their own, because access routes to these features would need to be developed, improved, and/or maintained, and because they would require disturbance of additional in-stream habitat. Finally, sediment barriers of a reasonable size would not prevent sediment transport into the project reach and Rollins Reservoir during peak winter storms, as they would quickly fill to capacity.

Implementation of upstream erosion barriers alone would not meet several project objectives, including removal of aggregate deposits from the Bear River below the confluence of the Bear River and Steephollow Creek, scour protection for the Chicago Park Powerhouse and Chicago Park Powerhouse Road bridge, and improving recreational opportunities. In addition, NID does not control the property, or have a reasonable expectation of acquiring entry and construction rights for properties upstream of the Powerhouse.

APPENDIX A

NOP and Scoping Comments

NEVADA IRRIGATION DISTRICT

1036 W. Main Street
Grass Valley, California 95945

Date: **November 1, 2013**

To: **Responsible Agencies and Interested Persons**

Subject: **Notice of Preparation of an Environmental Impact Report**
Bear River Restoration at Rollins Reservoir

The Nevada Irrigation District (NID) will be the Lead Agency and will prepare an Environmental Impact Report (EIR) for the proposed Bear River Restoration at Rollins Reservoir ("proposed project"). NID is requesting input as to the scope and content of the environmental information that should be contained in the Draft EIR.

The proposed project would restore and maintain reservoir capacity in Rollins Reservoir on an on-going basis through re-establishment of gravel skimming operations on the Bear River below the confluence with Steephollow Creek. The proposed gravel skimming operation would utilize Chicago Park Powerhouse Road to haul excavated materials from the Bear River to Interstate 80. A more detailed project description, including location maps, is attached.

The project is located on the Bear River, at the confluence with Steephollow Creek, roughly between Rollins Reservoir and the Chicago Park Powerhouse. The project site is roughly 6 miles northeast of the City of Colfax and includes land in the counties of Nevada and Placer (approximately 39°10'35" N, 120°53'40" latitude and longitude).

Potentially significant environmental issues include hydrology and water quality, biological resources, cultural resources, air quality, climate change/greenhouse gas emissions, noise, and traffic. The EIR will also examine aesthetics, geology, hazardous materials, public services and utilities and land use.

Because of the time-sensitive nature of the EIR process, please provide your response at the earliest possible date, but not later than **5:00 PM Monday, December 2, 2013** (30 days from the publication of this notice).

If you have any questions regarding this matter, please contact Tim Crough, Assistant General Manager, at (800)222-4102 or crough@nidwater.com.

Comments may be submitted in writing during the review period and addressed to:

Nevada Irrigation District
Re: Bear River Restoration EIR
1006 W. Main Street
Grass Valley, CA 95645
Email: crough@nidwater.com

Project History

Following construction of the Rollins Reservoir Dam in 1965, sediments transported from the upper watershed have accumulated in Rollins Reservoir and the Bear River (at and below the confluence with Steephollow Creek). Gravel skimming was employed between 1965 and 2002 to maintain reservoir capacity and allow for recreational use, such as boating and fishing. Suspension of mining activity in 2001/2002 has allowed for accumulation of gravel and sediments.

Project Overview

The proposed project would reestablish gravel skimming on the Bear River between Rollins Reservoir and Steephollow Creek. It would ultimately restore the project area to the original 1965 contours (when the Rollins Reservoir Dam was completed). The project would provide benefits to water storage capacity, river restoration, and recreation.

Skimming would occur annually when water levels are low, to allow for a dry mining operation (material removal would not occur more than 6 inches below water) using graders, excavators and front-end loaders (no dredging). The project area would be isolated from the perennial stream by the construction of a dike system. Mining would occur on the north or south bank. Through the use of the dikes and dry removal, the project would minimize impacts to water quality. Removal efforts would be concentrated during the period of lowest water levels (typically 60-120 days of the year), and the material would be stockpiled in one of two main areas, plus a surge area for additional material. The annual operations time would be from March 15 to November 15 or shorter, depending on the wet season.

Material would be screened, but not otherwise processed, and placed in the primary stockpile. A secondary stockpile and surge area would allow material to be screened, sold, and transported throughout the active project season. Water would only be used on site for dust control.

Temporary bridges crossing Steephollow Creek and/or the Bear River would be placed at the beginning of the project season to allow access between the skimming area and the primary stockpile and staging area (the bridges would be removed at the end of the season). The material would be sold and loaded onto trucks from the primary stockpile, weighed, and transported on Chicago Park Powerhouse Road to Interstate 80. NID would continue to maintain the access road, but widening, resurfacing, or other reconstruction would be limited to safety needs.

Cofferdams will be used in select locations to reduce scouring. Proposed cofferdam areas include below the Chicago Park Powerhouse, where the riverbank has previously been reinforced with gunite, and at the Chicago Park Powerhouse Bridge, where additional protection of the bridge supports would be installed. The historical effects of scouring may increase as material is removed, creating the need for additional protection as part of the project.

Ancillary features of the project include a staging area with fuel storage, office, maintenance shop, equipment storage, truck scales, and restrooms. The area would be lit for security purposes and the proposed additional activity is expected to reduce unauthorized or illegal use of the project site.

Intended Use of the EIR and Responsible Agencies

NID has existing mining rights in the project area, and has received confirmation of idle mine status for the historical gravel skimming operation (which includes a 1989 Reclamation Plan approved by the County of Nevada). The EIR will address actions by NID to re-establish gravel removal operations, including establishment of a haul route. The 1989 reclamation plan will be relied upon, but will be updated to reflect proposed operations with a more limited gravel skimming area.

It is anticipated that the EIR will be used by responsible agencies that may have jurisdiction over elements of the Project. State and local agencies that may have jurisdiction over the proposed project include the following:

- Regional Water Quality Control Board – Section 401 Clean Water Act Certification and/or Stormwater Pollution Prevention Plan
- California Department of Fish and Wildlife (CDFW) – Section 1600 Streambed Alteration Permit
- Nevada County – Hazardous Waste Business Plan and/or Spill Prevention and Control Plan
- Placer County Air Pollution Control District – review of emissions for activities on the south side of Bear River, including screening, storage, and loading
- Northern Sierra Air Quality Management District – if necessary, review for activities on the north side of Bear River, including gravel skimming and haul route.

Federal agencies that may have jurisdiction over the proposed project include:

- U.S. Army Corps of Engineers (USACE) – Section 404 Clean Water Act Permit
- Bureau of Land Management – if necessary, for modification of existing leases

APPENDIX B

Draft Amended Reclamation Plan

BEAR RIVER RESTORATION
AT ROLLINS RESERVOIR

AMENDED RECLAMATION PLAN

Nevada Irrigation District
February 2015

NEVADA IRRIGATION DISTRICT

BEAR RIVER AT ROLLINS RESERVOIR RESTORATION

AMENDED RECLAMATION PLAN 2015

To Amend RP 88-03

Lead Agency

Nevada County Community Development Agency
950 Maidu Avenue
Nevada City, CA 95959

Operator

Nevada Irrigation District
1036 West Main Street
Grass Valley, CA 95945-5424

Reclamation Plan Prepared by

Wallace Environmental Consulting, Inc.
P.O. Box 266
Courtland, CA 95615

February 2015

NEVADA COUNTY 'AMENDED' RECLAMATION PLAN
Prepared by
NEVADA IRRIGATION DISTRICT
for
BEAR RIVER RESTORATION AT ROLLINS RESERVOIR
Nevada and Placer Counties, California

RECLAMATION PLAN APPLICATION (per Nevada County Land Use and Development Code Section L-II 3.21 and 3.22, and the California Surface Mining and Reclamation Act)

This Reclamation Plan is prepared to amend existing Reclamation Plan Number RP88-03, approved by Nevada County in 1990 (Appendix A).

This Reclamation Plan is submitted by Nevada Irrigation District (NID) to amend the existing mine land reclamation plan (Nevada County permit RP88-03) in accordance with the Surface Mining and Reclamation Act of 1975, Public Resources Code, Division 2, Chapter 9, Article 5. Reclamation of Mined Lands and the Conduct of Surface Mining Operations, Sections 2777 and 2779:

> *§ 2777. Amendments to an approved reclamation plan may be submitted detailing proposed changes from the original plan. Substantial deviations from the original plan shall not be undertaken until such amendment has been filed with, and approved by, the lead agency.*
>
> *§ 2779. Whenever one operator succeeds to the interest of another in any incompleted surface mining operation by sale, assignment, transfer, conveyance, exchange, or other means, the successor shall be bound by the provisions of the approved reclamation plan and the provisions of this chapter.*

NID will exercise its option to amend the existing reclamation plan for aggregate mining within the Bear River channel and for a materials handling operations.

Table 1. Summary Comparison Between Existing/Approved Reclamation Plan and Proposed Amended Reclamation Plan

Existing Reclamation Plan: RP88-03	Proposed Deviations for the Amended Reclamation Plan
Operator: R.J. Miles	Operator: Nevada Irrigation District
Lessee: R.J. Miles	Lessee: None
Commodity: Sand and gravel (sediment)	Commodity: Redefined as "aggregate"
Area: One mile west of Steephollow Creek	Area: Downstream of Steephollow Creek and into seasonally low water areas in the eastern portion of Rollins Reservoir
Operation Life: 25 years	Operation Life: No end-date
Total production: 3,000,000 cy	Total production: On going; no maximum
Maximum depth: 25-50 feet	Maximum depth: 1 to 4 feet
Mine method: Gravel skimming	Mine method: Localize dewater; excavate channel to minimize mercury mobilization, extract aggregate above unconfined water table
Processing: Includes crushing	Processing: No crushing
Water use: 100 to 200,000 gallons/day	Water use: Minor amounts for dust control
Reclamation area: 50 to 60 acres	Reclamation area: Up to 100 acres
Ponds: Recycling ponds	Ponds: None proposed
Ultimate Condition: Restored to conditions prior to historic upstream hydraulic mining	Ultimate Condition: On going aggregate removal and maintenance to prevent loss of capacity in Rollins Reservoir
Circulation: No changes to roads	Circulation: Straighten portions of Chicago Park Powerhouse Road (not part of amended Reclamation Plan)
Use after reclamation: No mining	Use after reclamation: N/A - Seasonal on going mining operations
Rehab Pre-Mining Drainage: Rehab to historic pre-mining conditions	Rehab Pre-Mining Drainage: N/A - Rehab to historic pre-mining conditions is not part of the amended reclamation plan
Disposal of Equipment: Buried, removed or sunk in Rollins Reservoir	Disposal of Equipment: All equipment will be removed from the site
	Installation of coffer dams in the Bear River above Steephollow Creek to mitigate scour

1. Operation Name:

Bear River Restoration at Rollins Reservoir; a mining operation to restore water storage capacity in Rollins Reservoir by mining aggregate (sediment) in the Bear River west of the confluence with Steephollow Creek to prevent sediment and aggregate deposition in the reservoir.

2. Owner and Operator:

Nevada Irrigation District (NID)
1036 West Main Street
Grass Valley, CA 95945-5424
(530) 273-6185
Contact: Tim Crough

3. California Mine Identification Number: Mine Number: 91-39-0020

4. Property Owner(s), or owners of surface rights:

NID owns the surface and mineral rights of land within the amended operational area and leases 4.71 acres from the BLM for the location of the materials handling facilities. The property is identified by the following Assessor's Parcel Numbers: Nevada County 65-240-37-000, 65-240-35-000, 65-260-02-001, 65-260-02-002, and Placer County 063-150-024-000.

5. Owners of Mineral Rights:

Nevada Irrigation District
1036 West Main Street
Grass Valley, CA 95945-5424
(530) 273-6185

6. Lessee: None

7. Agent for Process:

Nevada Irrigation District
1036 West Main Street
Grass Valley, CA 95945-5424
(530) 273-6185
Contact: Tim Crough

8. Summary Mining Operation:

Aggregate mining and processing operation in the Bear River channel upstream of Rollins Reservoir.

9. Location:

The aggregate mining area is located within portions of Sections 6 and 7 Township 15 North, Range 10 East, Mt. Diablo Baseline and Meridian on the "Chicago Park, CA" USGS 7.5 Minute Topographic Quadrangle. Mined lands are confined to the Bear River channel and eastern portions of Rollins Reservoir. The project site is located in Nevada and Placer Counties (Location Map, Figure 1).

10. Access Route to the Operation Site:

The project site is located along the Bear River east of Rollins Reservoir in Nevada and Placer Counties. All access to and from the project site is via the Chicago Park Powerhouse Road and connects to Secret Town Road and Interstate 80. A portion of the road may be improved by straightening some horizontal curves to create better lines of sight.

Access across the Bear River bridge (at the Chicago Park Powerhouse) to and from the project site is restricted to authorized vehicles. Access across the bridge is not open to the public. The bridge gate will be locked during off hours, federal holidays and Sundays.

11. Mineral commodity to be mined:

Definition: Throughout this plan, the commodity to be mined is referred to as "aggregate". Aggregate mining, removal or extraction refers to all sizes of alluvial deposits associated with sediments which have formed gravel bars or aggraded deposits within the Bear River active channel and which are exposed below the seasonal high water elevations in the eastern portion of Rollins Reservoir.

Commodity to be mine is aggregate from exposed deposits in the Bear River channel west of the confluence with Steephollow Creek and from within exposed deposits in the eastern portion of Rollins Reservoir.

12. Total Area to be Mined:

Project area along the Bear River includes approximately 100 acres.

13. Proposed Start Date: Spring 2016

14. Environmental Assessment

The Nevada Irrigation District, the lead agency for the California Environmental Quality Act (CEQA), has prepared a Draft Environmental Impact Report (EIR) to provide the public and responsible agencies information about the potential adverse effects on the local and regional environment associated with the proposed Bear River aggregate mining project at Rollins Reservoir Project. The EIR address all environmental categories which may be effected by the proposed mining project. The Draft EIR is prepared pursuant to the CEQA and is attached to this plan as Appendix **.

1.0 PROJECT DESCRIPTION

1.1 Background

Sediments and aggregate from the Bear River have continuously filled Rollins Reservoir since the construction of the Rollins Reservoir Dam in 1965. Sediments are annually transported by storm events from areas in the upper Bear River and Steephollow Creek watersheds. This ongoing depositional process has the net effect of reducing water storage capacity within Rollins Reservoir and impacting water-related recreational activities. In total, the holding capacity of Rollins reservoir has been reduced by approximately 10,000 acre-feet from its maximum 1965 holding capacity of 65,988 acre-feet.

NID has maintained its mining rights for the project site, and the site has been designated as an "idle mine" by Nevada County, in consultation with the Office of Mine Reclamation (OMR). The approved 1990 Reclamation Plan therefore remains in affect, along with current NID financial assurances and an Interim Management Plan (approved May 31, 2013).

The proposed project would re-initiate aggregate removal on the Bear River between Rollins Reservoir and Steephollow Creek. The goal is to conduct gravel extraction operations within the Bear River channel as a method to prevent additional aggregate deposition, and to restore capacity in Rollins Reservoir.

In 1990, Nevada County issued R.J. Miles (Miles) approval for Reclamation Plan RP88-03 (attached to this plan as Appendix A) which allowed Miles to extract and process sand and gravel from a 112-acre site along the channel of the Bear River upstream of Rollins Reservoir (CA Mine ID# 91-39-0020). Although Miles was the operator, the Bear River above Rollins Reservoir is owned by the NID who leased the sand and gravel operations to Miles between 1990 and 2001. A portion of the Miles processing and loading operations were located on land administered by the US Bureau of Land Management (BLM) and leased to NID. Since 2001, NID has maintained the former Bear River extraction operations under an idle mine status.

NID intends to make deviations to the existing Reclamation Plan (RP88-03) by conducting seasonal aggregate mining operations intended to reduce aggregate accumulation in Rollins Reservoir. The mining methods are designed to mitigate potential impacts associated with mercury. The aggregate removed during proposed operations will be screened for size on site and sold.

Therefore, NID proposes to amend RP88-03 in accordance with the Surface Mining and Reclamation Act of 1975, as amended, (SMARA), specifically §2777 and §2779. This amended Reclamation Plan conforms to current reclamation standards required by SMARA and is described in the following sections.

1.2 Adjacent Improvements

Surrounding land uses are limited to scattered rural residential units and steep forested lands. One traffic-controlled bridge crosses the Bear River between the confluence with Steephollow Creek and the Chicago Park Powerhouse. The bridge was constructed to provide access to the powerhouse and will be used as the only surface access point to aggregate materials handling site.

As part of the Yuba-Bear hydroelectric project and the Chicago Park Development, the Chicago Park Powerhouse is located on the Bear River approximately 2,000 feet upstream of the confluence with Steephollow Creek. The powerhouse is served by a penstock which periodically releases a maximum flow of 1,070 cubic feet per second into the Bear River. The Chicago Park Powerhouse is owned by NID; electricity generated by the powerhouse is sold to PG&E.

1.3 Current Land Uses

The site is not developed, it consists of the Bear River, associated gravel deposits within the river channel and minor riparian habitat.

1.4 Adjacent Land Uses

See number 1.2 above.

1.5 Interim Land Uses

No interim land uses are proposed.

1.6 Bureau of Land Management Lease

NID leases 4.71-acres for commercial use from the U.S. Bureau of Land Management (BLM) east of the Bear River at the Steephollow Creek confluence (Figure 1). The lease, which expires on December 31, 2020 and which can be renewed, stipulates that NID restore the land surface to match surrounding topography when the lease finally terminates.

1.7 Mineral Commodities to be Mined

The aggregate from gravel mining will be screened and sorted for use as various construction materials and landscape products.

1.8 Amount to be Mined

Estimated annual maximum amount to be mined is 250,000 tons of aggregate. Annual anticipated production will average 50,000 tons. There is no overburden or soil.

1.9 Reclamation Schedule

Equipment associated with mining operations will be removed at the end of each season, usually mid-November. The river channel will be left to be restored by winter storms. All surge piles or aggregate stockpiles will be removed by mid-November. Stockpiles on the BLM lease will be maintained and aggregate sold from the site. When the BLM lease expires, NID will, in accordance with its lease conditions, restore the land surface to match surrounding topography.

1.10 Mercury Mobilization in the Bear River and Rollins Reservoir (modified from Technical Memorandum, attached in Appendix C)

Since its construction in 1965, Rollins Reservoir has trapped sediment from the Bear River, Steephollow and Greenhorn Creeks. Sediments are annually transported by storm events from areas in the upper Bear River and Steephollow and Greenhorn Creeks watersheds. This ongoing depositional process has reduced Rollins Reservoir water storage capacity and impacted water-related recreational activities (boating, fishing, swimming, etc.). In total, the storage capacity of Rollins Reservoir has been reduced by approximately 10,000 acre-feet from its maximum 1965 holding capacity of 65,988 acre-feet.

The Bear River watershed is identified as one of the Sierra Nevada most severely mercury-impacted streams, the result of historic gold mining and placer gold amalgamation processes. Currently, some of that mercury remains in the sediments and Rollins Reservoir is listed by the Central Valley Regional Water Quality Control Board as impaired for mercury. The impairment listing, which includes an advisory warning not to consume certain fish, indicates that the reservoir waters continue to be contaminated by mercury.

Mercury mobilization from the proposed aggregate extraction operation is possible if fine grained sediment contaminated with mercury enters the water column and, therefore, becomes available for downstream transport within the Bear River channel or for deposition in Rollins Reservoir. Another concern arose when a dewatering channel, dug as a test in 2013 in the channel deposit on the Greenhorn Creek arm of Rollins Reservoir was examined potential mercury contamination.

The low flow dewatering channel on Greenhorn Creek became colonized with bacteria that included methylated mercury. As a result, there was evidence of increasing methylmercury concentrations at the downstream end of the dewatering channel. A second concern became apparent that a low flow dewatering channel would enable facultative heterotrophic bacteria to establish and allow mercury to more readily enter the aquatic food chain through methylation and incorporation into phytoplankton (algae) or periphyton (Periphyton is a complex mixture of algae, cyanobacteria, heterotrophic microbes, and detritus that is attached to submerged surfaces in most aquatic ecosystems. It serves as an important food source for invertebrates, tadpoles, and some fish).

1.11 Coffer Dams

Cofferdams will be constructed in select locations in the Bear River channel to reduce potential streambed scouring (Figure 1). Coffer dams will be constructed below the Chicago Park Powerhouse, where the riverbank has previously been reinforced, and at the Chicago Park Powerhouse Road Bridge, where coffer dams will help prevent scouring around bridge abutments. The coffer dams will not be removed at the end of each mining season, but will remain permanently in place.

2.0 MINING METHOD

2.1 Proposed Aggregate Mining Method to Mitigate Impacts from Mercury

Aggregate extraction operations on the Bear River have been an effective resource management approach to help restore and maintain capacity in Rollins Reservoir. However, in 2001, after eleven years, gravel skimming (mining) operations were suspended on the Bear River above Rollins Reservoir. NID proposes to re-initiate aggregate removal and restoration activities on the Bear River below its confluence with Steephollow Creek.

The proposed aggregate mining process is designed to restore and maintain capacity in Rollins Reservoir and to mitigate impacts from mercury by achieving three objectives:

1. Limit aggregate mining to dry conditions which means that the shallow groundwater table will not be disturbed and, therefore, fine particles which may be attached to mercury will not become suspended in the groundwater column,
2. Enable groundwater to flow towards a dewatering channel, and
3. Eliminate stagnant, no-flow conditions in the dewatering channel by (re)connecting it to the active river channel.

The mining method, initiated annually between April and November includes:

- Excavate a "dewatering channel" approximately 150 feet wide by at 3 feet deep which will create stream flow velocities of about 2 fps. The purpose of the dewatering channel is to dewater, by gravity, shallow groundwater in the gravel bars within the Bear River channel to allow for dry aggregate extraction. Typically, the Bear River channel is 500 feet wide, therefore, the dewatering channel, which can be relocated or modified daily, will be located in the most appropriate portion of the river channel to optimize dewatering and dry extraction and minimize impacts to air quality, water quality, riparian habitat, and biological resources.
- The dewatering channel will be constructed using a track-mounted excavator operating from the head (upstream) of the dewatering channel. This excavation technique will keep the excavator out of any surface water. Aggregate and sediment from the channel will be used to reinforce the dewatering channel and provide freeboard to the active channel flows.
- As the gravel bars are dewatered, the dry aggregate will be excavated using scrapers, or front-end loaders and haul trucks. The aggregate will be hauled to stockpiles and held for processing, or hauled directly to processing facilities for off-site export.
- At the end of each operational day, a portion of the Bear River will be directed into the dewatering channel to oxygenate and flush the channel to assure that methylating bacteria do not establish. Subsequent construction and extension of the dewatering channel upstream would necessitate directing the active channel into the dewatering channel for the length of the entire dewatering channel. When water is directed into the dewatering channel, the downstream portion of the dewatering channel becomes the new active channel. In this way the Bear River will be channelized along the southern boundary. The River is expected to create a new active channel after winter storms, as a result, a new dewatering channel will need to be established at the start of each excavation season.

2.2 Materials Processing

There are two proposed stockpile areas and one surge pile proposed to store aggregate. The primary stockpile area is located on the east side of Steephollow Creek above the confluence of the Bear River. Most excavated material will be transported by dump trucks or conveyor belts for stockpiling on the east side of Steephollow Creek. Access to the east side of Steephollow Creek or from the south side of the Bear River will require a temporary bridge crossing over the creek/river bed. All stockpiled material will be transported to an off-site location for complete separation and processing. There will be a loading area and scales for materials to be transported from the site.

A secondary stockpile will be established on the north side of the Bear River approximately 1,800 feet downriver of Steephollow Creek. This secondary stockpile area will be used to place aggregates from the upper end of the reservoir that is filled because gravel skimming operations have been suspended since 2001. The stockpile will be used to shorten the transport trip in order to better facilitate removal during drier conditions when the reservoir water levels are lower, most likely during the end of the irrigation season (August through October). These materials will be transported to the primary stockpile areas as space is available on the east side of Steephollow Creek. It's also possible that this stockpile area will be used as a secondary point for truck loading.

A surge pile may also be established on the west side of Steephollow Creek during times where the volume of material exceeds the space available in the primary stockpile area.

On-site aggregate processing will include screening of materials utilizing various sized screens to remove debris and other foreign material (tree trunks, trash and other debris). Water will be applied to material being stockpiled and loaded as required to reduce air quality particulate matter. All watering will be for dust suppression only and limited to prevent direct run-off into the creek or river.

It is estimated that the project could remove up to 50,000 tons per year depending on market factors and demand, although there may be years due to large contracts for the material where production could reach the 250,000 ton level in accordance with the adopted reclamation plan. The project will be on-going as long as sediments continue to be transported into the Bear River above Rollins Reservoir.

A graded parking area for employees and miscellaneous vehicles and equipment storage will be provided on the east side of Steephollow Creek. Portable restrooms will be placed on site in accordance with Nevada County Environmental Health requirements. An impervious bermed fuel storage area will be established on the east side of Steephollow Creek. The design of the fuel storage area will be in conformance with Nevada County Environmental Health standards.

The east side of Steephollow Creek will be graded to accommodate the equipment for the stockpiling and aggregate sales. The graded primary stockpile area will be between 200 to 300 feet in width and 900 feet in length. No disturbance will occur beyond these limits (approximately 2,240 foot elevation contour) as represented on the site plan. Spring start up (March 15), site preparation for the primary stockpile and sales area will be setback from a point equal to or greater than a 1.5 percent slope as measured from a point one foot above the water surface elevation of the live channel of Steephollow Creek. Necessary grading to accommodate the access route on the west side of Steephollow Creek will also maintain the same distances.

The temporary bridge crossing over Steephollow Creek will be sized by a civil engineer so not to impede fish passage. The crossing structure will be placed so as not to increase velocities through the crossing structure. The bridge crossing (more than likely use a flat bed railroad car) will be buried below grade to facilitate access. The bridge will be designed and installed according to a licensed civil engineer's specifications for weight levels and stability to prevent impacts to the creek. The bridge will be installed prior to the start of operations each spring (March 15) and removed after completion of each year's operation (November 15).

Excavated materials will be screened through various sized mesh screens. All screened material will then be transported via a conveyor system to one of many material piles within the primary stockpile area. Dump trucks and other transport vehicles will be loaded by frontend loaders in the primary stockpile area and/or at the secondary stockpile area. All trucks will be weighed in upon arrival and out after loading.

According to the *Biological Resources and Wetland Constraints Analysis for the 155-Acre Secret Town Mine Study Area*, 2013 prepared by Salix Consulting, numerous foothill yellow-legged frogs (*Rana boylei*), a California State Species of Concern, were found along the banks of the Bear River. The frogs prefer quiet backwater and flowing water habitat. Pre- and post- skimming operations will account for potential yellow legged frog habitat by creating both types of habitats.

All operations will be conducted to minimize impacts on the yellow legged frog. As the river channel migrates naturally or is deflected by installation of a dike, areas set aside for gravel skimming will be dried out. Dry conditions are not suitable of the foothill yellow legged frog; the frog will relocate to wetter areas leaving the drier areas for gravel skimming.

Once operations begin (March 15) each year, and in order to minimize erosion and undercutting of the stream bank, the Bear River shall be channelized to avoid impacting the toe of the slope on either side of the river channel. The re-located river channel shall be accompanied with gravel berms compacted to maintain the channel of the river during operations. Gravel skimming will only occur on one side of the river each year to avoid equipment crossing.

A surge pile may be established on the west side of Steephollow Creek on the north or south side of the Bear River on an as needed basis. The surge pile will allow materials to be temporarily placed waiting stockpiling on the east side of the creek and for off-site transport and processing. Dump trucks or conveyor belts may be used to place excavated materials into the stockpiles across Steephollow Creek.

3.0 CONSERVATION PRACTICES

Aggregate mining within the Bear River channel is planned as an on-going process which is atypical of most aggregate or surface mining operations:

- There is no planned end-date. The mining must proceed as long as aggregate and sediment deposition pose a threat to the storage capacity in Rollins Reservoir;
- There are no soils or other growth medium within the mining areas, therefore, no soil stockpiles are necessary;
- The depth of the mining (1-4 feet) does not require benching;
- Mining operations require daily adjustments to channel conditions and therefore, temporary berms and dikes are constructed as needed and removed in response to mining conditions;
- Given the mining setting in the Bear River channel, there is no planned sediment retention, although the mining method is designed to reduce mercury mobilization and sediment transport, and
- NID is not proposing any vegetation test plots since those plots would need to be in the river channel, and likely be within a proposed aggregate extraction areas.

3.1 Revegetation

The goal of the revegetation plan is to meet the fundamental objectives of SMARA and implement a plan that is consistent with surrounding vegetation and that is designed to establish self-sustaining vegetation which provides channel stability and wildlife habitat. The revegetation concept is not directed toward any specific wildlife or plant species habitat goal; rather, it is intended to reinitiate ecological succession into a generally similar vegetation composition to that which occurs presently. Therefore, it will serve to re-create a range of wildlife habitat conditions and resources that is similar to the present range of conditions; consequently, the reclaimed areas can be expected to support the current wildlife uses.

There are two habitat types affected by the proposed mining operations - perennial stream and tailings (Salix Consulting, Inc., February 2013).

> ...perennial stream including the channel of the Bear River and lower-most reach of Steephollow Creek. Riparian vegetation occurs in scattered locations within the channels of these two streams. Where riparian vegetation does occur, it is generally confined to narrow bands and is patchy in distribution. Larger patches of riparian vegetation occur along the floodplain areas of the Bear River. White alder, dogwood, Fremont cottonwood, arroyo willow, Goodding's black willow, and narrow-leaved willow were the most common tree and shrub species observed along the banks of the Bear River and Steephollow Creek. Common understory species present included California mugwort, common monkeyflower, curly dock, hairy willow-herb, summer cottonweed, and grasses.
>
> Tailings [deposits] consist of mostly barren areas that have undergone previous gravel mining activities. Vegetation in these areas tends to be very sparse, and includes a few scattered shrubs and sparse grasses.

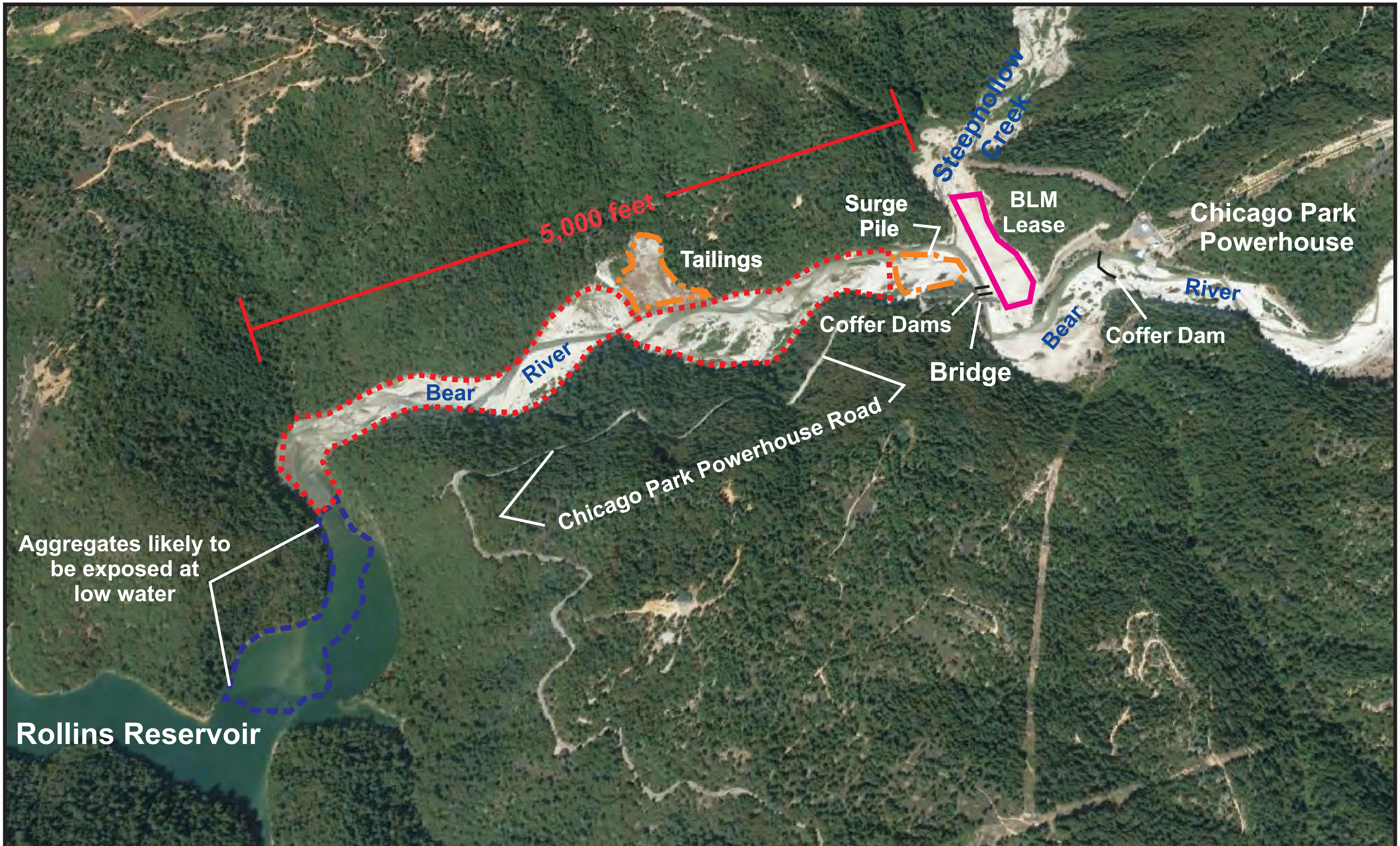
Riparian vegetation occurs in scattered locations within the Bear River channel generally in narrow bands and patchy distribution. Larger areas of riparian vegetation occur above the low flow channels. Some of these riparian areas will likely be disturbed during aggregate mining operations.

Historically, riparian vegetation in the Bear River channel is re-established naturally. Riparian vegetation removed during mining operations will be transplanted to areas along the river channel that are unlikely to be mined for at least five years. This transplanted riparian vegetation will include arroyo willow, Goodding's black willow, and narrow-leaved willow the most common tree and shrub species in the river channel. Additional riparian vegetation may include White alder, dogwood, Fremont cottonwood, California mugwort, common monkeyflower, curly dock, hairy willow-herb, summer cottonweed and locally abundant grasses.

Prior to each mining season, it will be determined which riparian vegetation areas, if any, will likely be lost to mining. those riparian areas will be transplanted to another appropriate location in the Bear River channel. The selected location will have shallow groundwater and be protected from mining operations including transport routes and stockpiles. The transplanted vegetation will be monitored throughout the first season to assess revegetation success. If the transplanted vegetation fails to thrive, additional plantings will occur prior to the end of the mining season.

3.2 Work Season

Proposed work season is no earlier than mid-March to no later than mid-November of each year.



Nevada County 'Amended" Reclamation Plan
Prepared by
Nevada Irrigation District
For
Bear River Restoration at Rollins Reservoir
February 2015

FIGURE 1

NORTH

Wallace Environmental Consulting, Inc.

APPENDIX A
RECLAMATION PLAN 88-03

NEVADA COUNTY 'AMENDED' RECLAMATION PLAN

Prepared by
NEVADA IRRIGATION DISTRICT
for
BEAR RIVER RESTORATION AT ROLLINS RESERVOIR
Nevada and Placer Counties, California

APPENDIX B
DRAFT ENVIRONMENT IMPACT REPORT

NEVADA COUNTY 'AMENDED' RECLAMATION PLAN
Prepared by
NEVADA IRRIGATION DISTRICT
for
BEAR RIVER RESTORATION AT ROLLINS RESERVOIR
Nevada and Placer Counties, California

APPENDIX C
TECHNICAL MEMORANDUM
MERCURY MOBILIZATION

NEVADA COUNTY 'AMENDED' RECLAMATION PLAN

Prepared by
NEVADA IRRIGATION DISTRICT
for
BEAR RIVER RESTORATION AT ROLLINS RESERVOIR
Nevada and Placer Counties, California

APPENDIX C

Air Quality and Greenhouse Gas Data

Secret Town Mine
Emissions Summary - 2015

Source	pounds per day					
	ROG	NOx	CO	SOx	PM10	PM2.5
On-Site	**5.10**	**61.59**	**32.39**	**0.06**	**127.57**	**14.83**
Aggregate Processing	—	—	—	—	2.97	0.38
Off-Road Equipment	5.09	61.53	32.37	0.06	2.42	2.23
Motor Vehicles - On-Site	0.01	0.06	0.02	0.00	0.00	0.00
Unpaved Roads - On-Site	—	—	—	—	122.17	12.22
Off Site	**3.32**	**98.82**	**15.17**	**0.15**	**4.72**	**2.24**
Motor Vehicles - Off-Site	3.32	98.82	15.17	0.15	1.67	1.54
Paved Roads - Off-Site	—	—	—	—	3.05	0.70
Total	**8.41**	**160.41**	**47.56**	**0.20**	**132.29**	**17.06**
Source	**tons per year**					
	ROG	**NOx**	**CO**	**SOx**	**PM10**	**PM2.5**
On-Site	**0.51**	**6.16**	**3.24**	**0.01**	**6.37**	**0.84**
Aggregate Processing	—	—	—	—	0.30	0.04
Off-Road Equipment	0.51	6.15	3.24	0.01	0.24	0.22
Motor Vehicles - On-Site	0.00	0.01	0.00	0.00	0.00	0.00
Unpaved Roads - On-Site	—	—	—	—	5.83	0.58
Off Site	**0.33**	**9.88**	**1.52**	**0.01**	**0.32**	**0.19**
Motor Vehicles - Off-Site	0.33	9.88	1.52	0.01	0.17	0.15
Paved Roads - Off-Site	—	—	—	—	0.15	0.04
Total	**0.84**	**16.04**	**4.76**	**0.02**	**6.69**	**1.03**
CEQA Significance Threshold	*10*	*10*	*100*	*27*	*15*	*15*

Secret Town Mine
Emissions Summary - 2015

Source	metric tons per year			
	CO2	CH4	N2O	CO2E
Off-Road Equipment	533.88	0.16	-	537.23
Motor Vehicles - On-Site				
Haul Trucks	0.51	-	-	0.51
Motor Vehicles - Off-Site				
Haul Trucks	1,357.94	-	-	1,359.43
Employee Vehicles	12.40	-	-	13.05
Total				**1,910.22**
CEQA Significance Threshold				*10,000*

Secret Town Mine
CO_2-to-CO_2 Equivalent Factors

	Source	Units	CO_2	CH_4	N_2O	CO_2E/CO_2
Global Warming Potential			1	21	310	
Diesel Equipment	1	kg/gal	10.15	0.00058	0.00026	1.009
Diesel Trucks	2	g/mi	1,450.00	0.0051	0.0048	1.001
Passenger Vehicles	3					1.053
Electrical Generation	4	lb/MWh	635.7	0.0302	0.0081	1.005

1. California Climate Action Registry. 2009. *General Reporting Protocol: Reporting Entity-Wide Greenhouse Gas Emissions* , Version 3.1, Tables C.6 and C.7.
2. California Climate Action Registry. 2009. *General Reporting Protocol: Reporting Entity-Wide Greenhouse Gas Emissions* , Version 3.1, Tables C.3 and C.4.
3. US EPA, Office of Transportation and Air Quality. 2005. *Greenhouse Gas Emissions from a Typical Passenger Vehicle* (EPA420-F-05-004), p. 4.
4. Pacific Gas & Electric. 2009. Annual Emissions Report. https://www.climateregistry.org/CarrotDocs/19/2007/2007_PUP_Report_PG&E_02-27-09.xls
   and California Climate Action Registry. 2009. *General Reporting Protocol: Reporting Entity-Wide Greenhouse Gas Emissions* , Version 3.1, Table C.2.

Secret Town Mine
Aggregate Movement Emissions - 2015

Production Rate Information

156	ton/hr
8	hr/day
200	day/yr
1,600	hr/yr
1,250	ton/day
250,000	ton/yr

Device Emission Factors

Screens		
PM_{10}	7.40E-04	lb/ton
$PM_{2.5}$	5.00E-05	lb/ton
Conveyors		
PM_{10}	4.60E-05	lb/ton
$PM_{2.5}$	1.30E-05	lb/ton

Drop Operations Formulas

$EF(PM) = k*0.0032*(U/5)^{1.3}/(M/2)^{1.4}$

k (PM_{10}) =	0.35	
k ($PM_{2.5}$) =	0.053	
U =	5	mph
M =	3	%
PM_{10}	6.35E-04	
$PM_{2.5}$	9.61E-05	

(Ref: AP-42 Section 13.2.4.3 - Predictive Emission Factor Equations)

Equipment Type	Throughput		PM_{10}				$PM_{2.5}$			
	Tons/hour	Tons/year	Emission Factor (lb/ton)	Hourly (lb/hour)	Daily (lb/day)	Annual (ton/year)	Emission Factor (lb/ton)	Hourly (lb/hour)	Daily (lb/day)	Annual (ton/year)
Truck Loading using Front End Loader	156	250,000	6.35E-04	0.099	0.794	0.08	9.61E-05	0.015	0.12	0.01
Conveyor	78	250,000	4.60E-05	0.004	0.029	0.00	1.30E-05	0.001	0.01	0.00
Screen	78	250,000	7.40E-04	0.058	0.463	0.05	5.00E-05	0.004	0.03	0.00
Transfer to Pile	26	83,250	6.35E-04	0.017	0.132	0.01	9.61E-05	0.003	0.02	0.00
Conveyor	52	166,750	4.60E-05	0.002	0.019	0.00	1.30E-05	0.001	0.01	0.00
Screen	52	166,750	7.40E-04	0.039	0.308	0.03	5.00E-05	0.003	0.02	0.00
Transfer to Pile	26	83,250	6.35E-04	0.016	0.131	0.01	9.61E-05	0.002	0.02	0.00
Conveyor	26	83,500	4.60E-05	0.001	0.010	0.00	1.30E-05	0.000	0.00	0.00
Screen	26	83,500	7.40E-04	0.019	0.156	0.02	5.00E-05	0.001	0.01	0.00
Transfer to Pile	26	83,500	6.35E-04	0.017	0.134	0.01	9.61E-05	0.003	0.02	0.00
Truck Loading using Front End Loader	156	250,000	6.35E-04	0.099	0.794	0.08	9.61E-05	0.015	0.12	0.01
Total Aggregate Movement				**0.37**	**2.97**	**0.30**		**0.05**	**0.38**	**0.04**

Notes:
1. Emission Factors from AP-42, Section 11.19.2 (Crushed Stone Processing), Table 11.19.2-2.
2. Emission Factor for drop operation (conveyor to product pile) from AP-42, Section 13.2.4 (Aggregate Handling and Storage Piles), Equation (1).
3. Wind speed is mean wind speed from Colfax meteorological data set for 2009-2013 (2.89 m/sec).

Secret Town Mine
Diesel-Powered Equipment

Proposed Operations - 2015

Description	CalEEMod Equipment Name	HP	HP Range: Low HP	HP Range: High HP	No. Units	Daily Hours in Use[1]	Days in Use Per Year	Load Factor
Scraper	Scrapers	362	251	500	1	8.0	200	0.48
Haul Truck	Off-Highway Trucks	511	501	750	1	8.0	200	0.38
Front-End Loader	Rubber Tired Loaders	349	251	500	2	9.0	200	0.36

Description	Emission Factor (g/hp-hr)							
	ROG	NOx	CO	SOx	PM10	PM2.5	CO2	CH4
Scraper	0.47	6.09	3.79	0.005	0.25	0.23	511.95	0.15
Haul Truck	0.45	5.12	2.62	0.005	0.21	0.19	514.64	0.15
Front-End Loader	0.42	5.02	2.33	0.005	0.19	0.17	506.37	0.15

Description	Maximum Hourly Emissions (lb/hr)							
	ROG	NOx	CO	SOx	PM10	PM2.5	CO2	CH4
Scraper	0.18	2.34	1.46	0.00	0.09	0.09	197.08	0.06
Haul Truck	0.19	2.20	1.13	0.00	0.09	0.08	221.40	0.07
Front-End Loader	0.23	2.79	1.30	0.00	0.11	0.10	281.91	0.08

Description	Daily Emis			
	ROG	NOx	CO	SOx
Scraper	1.45	18.74	11.67	0.02
Haul Truck	1.55	17.64	9.02	0.02
Front-End Loader	2.08	25.15	11.68	0.02

1. All equipment would not be used daily, some equipment would be used on a periodic basis. Hours shown are estimated maximum daily and typical annual hours.

Veh & Tech	EMFAC2007 Category	Vehicle Population	VMT (miles/day)	Trips	Total ROG Emissions	Total CO Emissions	Total NOx Emissions	Total CO2 Emissions (Pavley I + LCFS)	Total PM10 EX Emissions	Total PM2_5 EX Emissions	Total SOx Emissions		Miles/Day	Days/Year
Water Truck	LHD2 - DSL	3552.43742	135021.7007	44685.1914	0.033649875	0.17549939	0.58945138	76.25798	0.00727218	0.006690404	0.00074667	(tons/day)	0.5	200
					0.000498437	0.00259957	0.00873121	1.129566	0.00010772	9.91012E-05	1.106E-05	(lbs/mile)		
					0.000249218	0.00129979	0.0043656	0.564783	5.3859E-05	4.95506E-05	5.53E-06	lbs/day		

	Daily Emis			
	ROG	NOx	CO	SOx
Water Truck	0.0002	0.004	0.001	6E-06

Table 3.4 OFFROAD Equipment Emission Factors (g/bhp-hr)

Equipment Type	Year	Low HP	High HP	TOG	ROG	CO	NOX	SO2	PM10	PM2.5	_CO2	_CH4
Aerial Lifts	1990	6	15	5.436	1.804	4.999	9.999	0.833	0.968	0.968	568.299	0.162
Aerial Lifts	1990	16	25	8.446	2.213	5	6.92	0.679	0.735	0.735	568.299	0.199
Aerial Lifts	1990	26	50	22.237	3.256	6.91	7.372	0.692	0.948	0.948	568.299	0.293
Aerial Lifts	1990	51	120	25.547	1.927	5.026	13.323	0.628	1.005	1.005	568.299	0.173
Aerial Lifts	1990	251	500	90.051	1.214	6.888	11.7	0.525	0.605	0.605	568.299	0.109
Aerial Lifts	1990	501	750	162.768	1.214	6.887	11.7	0.538	0.605	0.605	568.299	0.109
Aerial Lifts	2000	6	15	4.911	1.629	4.729	8.804	0.079	0.737	0.737	568.299	0.147
Aerial Lifts	2000	16	25	7.927	2.077	4.749	6.401	0.064	0.569	0.569	568.299	0.187
Aerial Lifts	2000	26	50	21.066	3.084	6.643	6.596	0.065	0.711	0.711	568.3	0.278
Aerial Lifts	2000	51	120	20.809	1.569	4.216	9.602	0.059	0.705	0.705	568.299	0.141
Aerial Lifts	2000	251	500	60.706	0.819	3.931	8.191	0.049	0.31	0.31	568.3	0.073
Aerial Lifts	2000	501	750	109.732	0.819	3.931	8.191	0.051	0.31	0.31	568.299	0.073
Aerial Lifts	2005	6	15	2.733	0.907	3.649	5.927	0.079	0.424	0.424	568.3	0.081
Aerial Lifts	2005	16	25	5.948	1.558	3.804	5.978	0.064	0.474	0.474	568.299	0.14
Aerial Lifts	2005	26	50	18.56	2.717	6.122	6.139	0.065	0.657	0.657	568.299	0.245
Aerial Lifts	2005	51	120	17.765	1.34	3.898	8.079	0.059	0.651	0.651	568.299	0.12
Aerial Lifts	2005	251	500	41.275	0.556	2.307	6.521	0.049	0.217	0.217	568.299	0.05

Low HP	High HP
6	1000
26	750
51	500
121	250
176	175
251	120

Table 3.3 OFFROAD Default Horsepower and Load Factors

OFFROAD Equipment Type	Horsepower	Load Factor
Aerial Lifts	63	0.31
Air Compressors	78	0.48
Bore/Drill Rigs	206	0.50
Cement and Mortar Mixers	9	0.56
Concrete/Industrial Saws	81	0.73
Cranes	226	0.29
Crawler Tractors	208	0.43
Crushing/Proc. Equipment	85	0.78
Dumpers/Tenders	16	0.38
Excavators	163	0.38
Forklifts	89	0.20
Generator Sets	84	0.74
Graders	175	0.41
Off-Highway Tractors	123	0.44
Off-Highway Trucks	400	0.38
Other Construction Equipment	172	0.42
Other General Industrial Equipment	88	0.34
Other Material Handling Equipment	167	0.40
Pavers	126	0.42
Paving Equipment	131	0.36
Plate Compactors	8	0.43
Pressure Washers	13	0.30
Pumps	84	0.74
Rollers	81	0.38
Rough Terrain Forklifts	100	0.40
Rubber Tired Dozers	255	0.40
Rubber Tired Loaders	200	0.36
Scrapers	362	0.48
Signal Boards	6	0.82
Skid Steer Loaders	65	0.37
Surfacing Equipment	254	0.30
Sweepers/Scrubbers	64	0.46
Tractors/Loaders/Backhoes	98	0.37
Trenchers	81	0.50
Welders	46	0.45

Notes:

1. Based on the weighted average horsepower (by equipment

EMFAC2011 Emissions Inventory
Region Type: Air Basin
Region: Mountain Counties
Calendar Year: 2015
Season: Summer
Vehicle Classification: EMFAC2011 Categories

Region	CalYr	Season	Veh_Class	Fuel	MdlYr	Speed (miles/hr)	Population (vehicles)	VMT (miles/day)	Trips (trips/day)	ROG_RUN (tons/day)	ROG_IDLE (tons/day)	ROG_STR (tons/day)	ROG_TOT (tons/day)	ROG_DIUI (tons/day)	ROG_HTS (tons/day)	ROG_RUN (tons/day)	ROG_RES (tons/day)	ROG_TOT (tons/day)	TOG_RUN (tons/day)	TOG_IDLE (tons/day)	TOG_STR (tons/day)	TOG_TOT (tons/day)	TOG_DIUI (tons/day)	TOG_HTS (tons/day)	TOG_RUN (tons/day)	TOG_RES (tons/day)	TOG_TOT (tons/day)	CO_RUNE (tons/day)	CO_IDLEX (tons/day)	CO_STRE (tons/day)	CO_TOTE (tons/day)	NOx_RUN (tons/day)	NOx_IDLE (tons/day)	NOx_STRE (tons/day)	NOx_TOTE (tons/day)	CO2_RUN (tons/day)	CO2_IDLE (tons/day)	CO2_STRE (tons/day)	CO2_TOTE (tons/day)	CO2_RUN (tons/day)	CO2_IDLE (tons/day)	CO2_STRE (tons/day)	CO2_TOTE (tons/day)	PM10_RUN (tons/day)	PM10_IDLE (tons/day)	PM10_STR (tons/day)	PM10_TOTEX (tons/day)	PM10_PM (tons/day)	PM10_PM (tons/day)	PM10_TO (tons/day)	PM2_5_RU (tons/day)	PM2_5_IDI (tons/day)	PM2_5_ST (tons/day)	PM2_5_TOTEX (tons/day)	PM2_5_PM (tons/day)	PM2_5_PM (tons/day)	PM2_5_TC (tons/day)	SOx_RUN (tons/day)	SOx_IDLE (tons/day)	SOx_STRE (tons/day)	SOx_TOTE (tons/day)	Fuel_GAS (1000 gallo	Fuel_DSL (1000 gallons/day)
Mountain C	2015	Summer	LHD2	GAS	Aggregated	Aggregated	811.6432	31104.79	12092.27	0.00978	0.000522	0.008473	0.018775	0.000158	0.002549	0.012455	6.54E-05	0.034002	0.011133	0.000552	0.009071	0.020756	0.000158	0.002549	0.012455	6.54E-05	0.035983	0.151726	0.003109	0.087653	0.242488	0.015834	3.38E-05	0.023155	0.039023	33.23184	0.10411	0.819124	34.15508	32.40105	0.101507	0.798646	33.3012	0.00012	0	3.65E-05	0.000155974	0.000274	0.00126	0.00169	0.000107	0	3.11E-05	0.00013769	6.86E-05	0.00054	0.000746	0.000334	1.1E-06	9.82E-06	0.000345	3.683641	0
Mountain C	2015	Summer	LHD2	DSL	Aggregated	Aggregated	3552.437	135021.7	44685.19	0.03322	0.00043	0	0.03365	0	0	0	0	0.03365	0.037819	0.000489	0	0.038308	0	0	0	0	0.038308	0.171937	0.003562	0	0.175499	0.579285	0.010166	0	0.589451	77.65821	0.555094	0	78.21331	75.71676	0.541217	0	76.25798	0.007164	0.000108	0	0.007272178	0.001786	0.013273	0.02233	0.006591	9.92E-05	0	0.006690404	0.000447	0.005689	0.012825	0.000741	5.3E-06	0	0.000747	0	7.039198

Secret Town Mine

Total Vehicle Emissions - Mountain Counties Air Basin (lb/day)

	ROG	NOx	CO	SOx	PM10	PM2.5	CO2
Onsite	**0.01**	**0.06**	**0.02**	**0.00**	**0.00**	**0.00**	**5.61**
Idling	0.01	0.06	0.02	0.00	0.00	0.00	5.61
Offsite	**2.94**	**87.06**	**13.50**	**0.13**	**1.47**	**1.35**	**13,321.84**
Haul Trips	2.80	86.96	12.39	0.13	1.47	1.35	13,185.20
Worker Trips	0.14	0.10	1.11	0.00	0.00	0.00	136.64
Total	**2.95**	**87.12**	**13.52**	**0.13**	**1.47**	**1.36**	**13,327.45**

Total Vehicle Emissions - Mountain Counties Air Basin (ton/yr)

	ROG	NOx	CO	SOx	PM10	PM2.5	CO2
Onsite	**0.00**	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**	**0.56**
Idling	0.00	0.01	0.00	0.00	0.00	0.00	0.56
Offsite	**0.29**	**8.71**	**1.35**	**0.01**	**0.15**	**0.14**	**1,332.18**
Haul Trips	0.28	8.70	1.24	0.01	0.15	0.14	1,318.52
Worker Trips	0.01	0.01	0.11	0.00	0.00	0.00	13.66
Total	**0.29**	**8.71**	**1.35**	**0.01**	**0.15**	**0.14**	**1,332.74**

Total Vehicle Emissions - Sacramento Valley Air Basin (lb/day)

	ROG	NOx	CO	SOx	PM10	PM2.5	CO2
Onsite	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Idling	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	**0.38**	**11.76**	**1.68**	**0.02**	**0.20**	**0.18**	**1,783.50**
Haul Trips	0.38	11.76	1.68	0.02	0.20	0.18	1,783.50
Worker Trips	-	-	-	-	-	-	-
Total	**0.38**	**11.76**	**1.68**	**0.02**	**0.20**	**0.18**	**1,783.50**

Total Vehicle Emissions - Sacramento Valley Air Basin (ton/yr)

	ROG	NOx	CO	SOx	PM10	PM2.5	CO2
Onsite	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Idling	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Offsite	**0.04**	**1.18**	**0.17**	**0.00**	**0.02**	**0.02**	**178.35**
Haul Trips	0.04	1.18	0.17	0.00	0.02	0.02	178.35
Worker Trips	-	-	-	-	-	-	-
Total	**0.04**	**1.18**	**0.17**	**0.00**	**0.02**	**0.02**	**178.35**

Secret Town Mine

Total Vehicle Emissions (lb/day)

	ROG	NOx	CO	SOx	PM10	PM2.5	CO2
Onsite	**0.01**	**0.06**	**0.02**	**0.00**	**0.00**	**0.00**	**5.61**
Idling	0.01	0.06	0.02	0.00	0.00	0.00	5.61
Offsite	**3.32**	**98.82**	**15.17**	**0.15**	**1.67**	**1.54**	**15,105.34**
Haul Trips	3.18	98.73	14.07	0.15	1.67	1.54	14,968.70
Worker Trips	0.14	0.10	1.11	0.00	0.00	0.00	136.64
Total	**3.32**	**98.88**	**15.20**	**0.15**	**1.67**	**1.54**	**15,110.95**

Total Vehicle Emissions (ton/yr)

	ROG	NOx	CO	SOx	PM10	PM2.5	CO2
Onsite	**0.00**	**0.01**	**0.00**	**0.00**	**0.00**	**0.00**	**0.56**
Idling	0.00	0.01	0.00	0.00	0.00	0.00	0.56
Offsite	**0.33**	**9.88**	**1.52**	**0.01**	**0.17**	**0.15**	**1,510.53**
Haul Trips	0.32	9.87	1.41	0.01	0.17	0.15	1,496.87
Worker Trips	0.01	0.01	0.11	0.00	0.00	0.00	13.66
Total	**0.33**	**9.89**	**1.52**	**0.01**	**0.17**	**0.15**	**1,511.10**

Secret Town Mine

Haul Trip Distance

	Sacramento Valley Air Basin	Mountain Counties Air Basin	Total	
Chevreaux Auburn Plant	5.6	20	25.6	(miles)
Chevreaux Meadow Vista Plant	0	21.4	21.4	(miles)

Worker Trip Distance

Rural Trip Length - Placer County	
16.8	(miles)

Note: CalEEMod home to work rural trip in Placer County (Mountain Counties Air Basin)

Haul Truck Trips	166	trips/day
Worker Trips	10	trips/day
	200	days/yr

Chevreaux Auburn Plant - Haul Trucks (g/day)

	ROG	NOx	CO	SOx	PM10	PM2.5	CO2
Sacramento Valley Air Basin	172.06	5,335.72	760.35	7.92	90.27	83.05	808,997.79
Mountain Counties Air Basin	614.49	19,056.15	2,715.55	28.27	322.39	296.60	2,889,277.82

Worker Trip Emissions - Mountain Counties Air Basin

	ROG	NOx	CO	SOx	PM10	PM2.5	CO2
g/day	61.37	43.43	501.82	0.73	0.55	0.50	61,981.33
lb/day	0.14	0.10	1.11	0.00	0.00	0.00	136.64
ton/yr	0.01	0.01	0.11	0.00	0.00	0.00	13.66
MT/yr							12.40

Chevreaux Meadow Vista Plant - Haul Trucks (g/day)

	ROG	NOx	CO	SOx	PM10	PM2.5	CO2
Sacramento Valley Air Basin	-	-	-	-	-	-	-
Mountain Counties Air Basin	657.50	20,390.08	2,905.63	30.25	344.95	317.36	3,091,527.27

Total Offsite Emissions - Haul Trucks (lb/day)

	ROG	NOx	CO	SOx	PM10	PM2.5	CO2
Sacramento Valley Air Basin	0.38	11.76	1.68	0.02	0.20	0.18	1,783.50
Mountain Counties Air Basin	2.80	86.96	12.39	0.13	1.47	1.35	13,185.20

Total Offsite Emissions - Haul Trucks (ton/yr)

	ROG	NOx	CO	SOx	PM10	PM2.5	CO2	CO2 (MT)
Sacramento Valley Air Basin	0.04	1.18	0.17	0.00	0.02	0.02	178.35	161.80
Mountain Counties Air Basin	0.28	8.70	1.24	0.01	0.15	0.14	1,318.52	1,196.14

Secret Town Mine

Emission Factors: Summary

	ROG	NOx	CO	SOx	PM10	PM2.5	CO2
HHDT							
g/hr-veh	0.132	1.259	0.467	0.001	0.012	0.011	122.565

Emission Factors: Calculations

Year	EMFAC2011 Vehicle Category	Fuel Type	AirBbasin	Season	Vehicle Population	CO (ton/day)	NOx (ton/day)	PM10 (ton/day)	PM2.5 (ton/day)	CO2 (with Pavley + LCFS) (ton/day)	ROG (ton/day)	SOx (ton/day)	
2015	T7 Single	Diesel	Mountain Co	Summer	809.018359	0.010	0.027	0.000	0.000	2.623	0.003	0.000	
						9065.51856	24453.3685	241.1017	221.813565	2379783.53	2565.14373	22.7042474	g/day
						377.73	1,018.89	10.05	9.24	99,157.65	106.88	0.95	g/hr
						0.47	1.26	0.01	0.01	122.57	0.13	0.00	g/hr-veh

Notes:

g/hr-veh: grams per hour per vehicle

Onsite Heavy Heavy Duty Trucks

T7 Tractor

Truck Engine Idle Time Per Day	Trucks	Amount of Idle (hr/day)	Days With Idling (day/yr)
	83	0.25	200

		ROG	NOx	CO	SOx	PM10	PM2.5	CO2
Emission Factor	*g/hr*	10.97	104.53	38.75	0.10	1.03	0.95	10,172.93
Daily Emissions	*lb/day*	0.01	0.06	0.02	0.00	0.00	0.00	5.61
Annual Emissions	*lb/yr*	1.21	11.52	4.27	0.01	0.11	0.10	1,121.35
Annual Emissions	*ton/yr*	0.00	0.01	0.00	0.00	0.00	0.00	0.56

Secret Town Mine

Emission Factors: Summary

		ROG	NOx	CO	SOx	PM10	PM2.5	CO2
LDV Composite								
	g/mile	0.365	0.259	2.987	0.004	0.003	0.003	368.936
T7 Tractor								
	g/mile	0.370	11.480	1.636	0.017	0.194	0.179	1740.529

Emission Factors: Calculations

Area	Scenario	Sub-Area	Calendar Year	Season	Veh & Tech	EMFAC2007 Category	Vehicle Population	VMT	Trips	Total ROG Emissions	Total CO Emissions	Total NOx Emissions	Total CO2 Emissions (Pavley I + LCFS)	Total PM10 EX Emissions	Total PM2_5 EX Emissions	Total SOx Emissions	(tons/day)
Placer County			2015	Summer	LDA - GAS	LDA - GAS	157607	5833598	988131	1.66	13.96	1.07	2,065.12	0.02	0.02	0.02	
Placer County			2015	Summer	LDA - DSL	LDA - DSL	1183	39975	7072	0.00	0.01	0.03	12.57	0.00	0.00	0.00	
Placer County			2015	Summer	LDT1 - GAS	LDT1 - GAS	39115	1314099	233382	1.22	9.07	0.69	549.71	0.01	0.01	0.01	
Placer County			2015	Summer	LDT1 - DSL	LDT1 - DSL	37	1144	198	0.00	0.00	0.00	0.36	0.00	0.00	0.00	
Placer County			2015	Summer	LDT2 - GAS	LDT2 - GAS	81593	3070833	508714	1.25	10.75	1.14	1,544.73	0.01	0.01	0.02	
Placer County			2015	Summer	LDT2 - DSL	LDT2 - DSL	25	833	142	0.00	0.00	0.00	0.27	0.00	0.00	0.00	
										3,748,068	30,648,124	2,652,591	3,785,466,164	33,744	30,663	44,511	(g/day)
										10,260,482	10,260,482	10,260,482	10,260,482	10,260,482	10,260,482	10,260,482	(miles/day)
									Composite LDV (LDA, LDT1, LDT2)	**0.37**	**2.99**	**0.26**	**368.94**	**0.00**	**0.00**	**0.00**	(g/mile)

Placer County			2015	Summer	T7 single - DSL	HHDT - DSL	809	54519	0	0.02	0.10	0.69	104.60	0.01	0.01	0.00	(tons/day)
										20,182	89,186	625,858	94,892,033	10,588	9,741	929	(g/day)
										0.37	**1.64**	**11.48**	**1,740.53**	**0.19**	**0.18**	**0.02**	(g/mile)

EMFAC2011 Emissions Inventory
Region Type: Air Basin
Region: Mountain Counties
Calendar Year: 2015
Season: Summer
Vehicle Classification: EMFAC2011 Categories

0.578027 1.659002556

Region	CalYr	Season	Veh_Class	Fuel	MdlYr	Speed (miles/hr)	Population (vehicles)	VMT (miles/day)	Trips (trips/day)
Mountain Counties	2015	Summer	LDA	GAS	Aggregated	Aggregated	157606.6164	5833598.443	988130.7611
Mountain Counties	2015	Summer	LDA	DSL	Aggregated	Aggregated	1183.338287	39975.31225	7072.336151
Mountain Counties	2015	Summer	LDT1	GAS	Aggregated	Aggregated	39115.03017	1314098.606	233382.0075
Mountain Counties	2015	Summer	LDT1	DSL	Aggregated	Aggregated	37.15362248	1144.087103	197.9841661
Mountain Counties	2015	Summer	LDT2	GAS	Aggregated	Aggregated	81592.6705	3070833.08	508714.2823
Mountain Counties	2015	Summer	LDT2	DSL	Aggregated	Aggregated	24.77989485	832.8111528	141.8045165
Mountain Counties	2015	Summer	T7 Single	DSL	Aggregated	Aggregated	809.0183595	54519.08211	0

Veh_Class	Fuel	ROG_RUN (tons/day)	ROG_IDLEX (tons/day)	ROG_STRE (tons/day)	ROG_TOTE (tons/day)	ROG_DIUR (tons/day)	ROG_HTSK (tons/day)	ROG_RUN (tons/day)	ROG_RES (tons/day)	ROG_TOTAL (tons/day)
LDA	GAS	0.33631	0	0.241713	0.578027	0.223251	0.244622	0.479227	0.1339	1.659002555
LDA	DSL	0.00164	0	0	0.001636	0	0	0	0	0.001635746
LDT1	GAS	0.28051	0	0.147571	0.428081	0.156294	0.146243	0.399798	0.0927	1.223114856
LDT1	DSL	7.92E-05	0	0	7.92E-05	0	0	0	0	7.92E-05
LDT2	GAS	0.25159	0	0.185685	0.437271	0.14879	0.152027	0.42173	0.0878	1.247664179
LDT2	DSL	4.14E-05	0	0	4.14E-05	0	0	0	0	4.14E-05
T7 Single	DSL	0.01942	0.002827587	0	0.022246	0	0	0	0	0.022246306

Veh_Class	Fuel	TOG_RUNE (tons/day)	TOG_IDLEX (tons/day)	TOG_STREX (tons/day)	TOG_TOTE (tons/day)	TOG_DIURI (tons/day)	TOG_HTSK (tons/day)	TOG_RUNL (tons/day)	TOG_RESTI (tons/day)	TOG_TOTAL (tons/day)
LDA	GAS	0.449978	0	0.258488	0.708466	0.223251	0.244622	0.479227	0.133875	1.789441921
LDA	DSL	0.001862	0	0	0.001862	0	0	0	0	0.001862187
LDT1	GAS	0.335577	0	0.157853	0.493431	0.156294	0.146243	0.399798	0.092699	1.288464719
LDT1	DSL	9.01E-05	0	0	9.01E-05	0	0	0	0	9.01E-05
LDT2	GAS	0.335494	0	0.198428	0.533922	0.14879	0.152027	0.42173	0.087846	1.344315953
LDT2	DSL	4.71E-05	0	0	4.71E-05	0	0	0	0	4.71E-05
T7 Single	DSL	0.022107	0.003219	0	0.025326	0	0	0	0	0.025325726

Veh_Class	Fuel	CO_RUNEX (tons/day)	CO_IDLEX (tons/day)	CO_STREX (tons/day)	CO_TOTEX (tons/day)	NOx_RUNE (tons/day)	NOx_IDLEX (tons/day)	NOx_STREX (tons/day)	NOx_TOTEX (tons/day)
LDA	GAS	11.21841	0	2.743636	13.96204544	0.841362	0	0.22823	1.069592592
LDA	DSL	0.009994	0	0	0.009994382	0.025346	0	0	0.025346474
LDT1	GAS	7.343024	0	1.722157	9.065180946	0.584988	0	0.103389	0.688377618
LDT1	DSL	0.000356	0	0	0.000355771	0.000709	0	0	0.000709312
LDT2	GAS	8.574217	0	2.171761	10.7459785	0.894893	0	0.244538	1.139431047
LDT2	DSL	0.000219	0	0	0.000218671	0.000524	0	0	0.000524481
T7 Single	DSL	0.088318	0.009993024	0	0.098310927	0.662935	0.026955225	0	0.689890152

Veh_Class	Fuel	CO2_RUNE (tons/day)	CO2_IDLEX (tons/day)	CO2_STREX (tons/day)	CO2_TOTE (tons/day)	CO2_RUNE (tons/day)	CO2_IDLEX (tons/day)	CO2_STREX (tons/day)	CO2_TOTEX(Pavley I+LCFS) (tons/day)
LDA	GAS	2372.851	0	80.60515	2453.456	1994.65	0	70.46576	2065.115913
LDA	DSL	14.81021	0	0	14.81021	12.57393	0	0	12.57393473
LDT1	GAS	619.0241	0	22.28543	641.3096	529.852	0	19.86175	549.7137351
LDT1	DSL	0.431781	0	0	0.431781	0.357642	0	0	0.357642424
LDT2	GAS	1691.239	0	56.41502	1747.654	1493.612	0	51.12196	1544.733715
LDT2	DSL	0.310169	0	0	0.310169	0.267229	0	0	0.267229492
T7 Single	DSL	104.6594	2.623262307	0	107.2826	102.0429	2.557681	0	104.6005612

Veh_Class	Fuel	PM10_RUN (tons/day)	PM10_IDLEX (tons/day)	PM10_STR (tons/day)	PM10_TOTEX (tons/day)	PM10_PM (tons/day)	PM10_PMI (tons/day)	PM10_TOTAL (tons/day)
LDA	GAS	0.012836	0	0.003837	0.016673609	0.05144	0.236319	0.304435893
LDA	DSL	0.001152	0	0	0.001152053	0.00035	0.001619	0.003123973
LDT1	GAS	0.007334	0	0.001936	0.009269627	0.01159	0.053234	0.074092056
LDT1	DSL	6.53E-05	0	0	6.53E-05	1.01E-05	4.63E-05	0.000121771
LDT2	GAS	0.007875	0	0.002127	0.010001205	0.02708	0.124399	0.161480597
LDT2	DSL	3.41E-05	0	0	3.41E-05	7.34E-06	3.37E-05	7.52E-05
T7 Single	DSL	0.011406	0.000265769	0	0.011671398	0.00216	0.00371	0.017545279

Veh_Class	Fuel	PM2_5_RU (tons/day)	PM2_5_IDLEX (tons/day)	PM2_5_STI (tons/day)	PM2_5_TOTEX (tons/day)	PM2_5_PM (tons/day)	PM2_5_PM (tons/day)	PM2_5_TOTAL (tons/day)
LDA	GAS	0.011679	0	0.003484	0.015163057	0.012861	0.101279	0.129303394
LDA	DSL	0.00106	0	0	0.001059889	8.81E-05	0.000694	0.001842047
LDT1	GAS	0.006612	0	0.001741	0.008353087	0.002897	0.022815	0.034064775
LDT1	DSL	6.01E-05	0	0	6.01E-05	2.52E-06	1.99E-05	8.25E-05
LDT2	GAS	0.007192	0	0.00194	0.009132092	0.00677	0.053314	0.069216092
LDT2	DSL	3.14E-05	0	0	3.14E-05	1.84E-06	1.45E-05	4.77E-05
T7 Single	DSL	0.010493	0.000244508	0	0.010737686	0.000541	0.00159	0.012868726

Veh_Class	Fuel	SOx_RUNE (tons/day)	SOx_IDLEX (tons/day)	SOx_STREX (tons/day)	SOx_TOTEX (tons/day)	Fuel_GAS (1000 gallo	Fuel_DSL (1000 gallons/day)
LDA	GAS	0.023874	0	0.000855	0.024729702	263.7782	0
LDA	DSL	0.000141	0	0	0.000141387	0	1.332919
LDT1	GAS	0.006304	0	0.000254	0.006558209	69.95282	0
LDT1	DSL	4.12E-06	0	0	4.12E-06	0	0.03886
LDT2	GAS	0.017026	0	0.000603	0.017628967	188.0385	0
LDT2	DSL	2.96E-06	0	0	2.96E-06	0	0.027915
T7 Single	DSL	0.000998	2.503E-05	0	0.001023526	0	9.655436

Secret Town Mine
Summary of Paved and Unpaved Road Emissions
Operating Year 2015

	PM_{10}		$PM_{2.5}$	
	lb/day	ton/yr	lb/day	ton/yr

Secret Town Mine
Unpaved Road Emissions
Operating Year 2015

	Equipment Description	No. of Units	Pollutant	k lb/VMT	s %	W (Empty) tons	W (Loaded) tons	W (Avg) tons	E lb/VMT	Control Efficiency Water	Operating Days Days/yr	On-Site Distance feet	Trips/day	Trips/yr	VMT/day	VMT/yr	Unmitigated Emissions lb/day	Unmitigated Emissions ton/yr	Unmitigated Emissions Rain Adjusted ton/yr	Mitigated Emissions lb/day	Mitigated Emissions Rain Adjusted ton/yr
Scraper	CAT 621H Scrapper/Tractor (407 hp)	1	PM_{10}	1.5	8.3	39.62	68.42	54.02	3.953	55%	200	1,000	2	400	0.4	75.8	1.50	0.15	0.14	0.67	0.06
		1	$PM_{2.5}$	0.15	8.3	39.62	68.42	54.02	0.395	55%	200				0.4	75.8	0.15	0.01	0.01	0.07	0.01
Water Truck		1	PM_{10}	1.5	8.3	16.50	33.18	24.84	2.787	55%	200	1,320	2	400	0.5	100.0	1.39	0.14	0.13	0.63	0.06
		1	$PM_{2.5}$	0.15	8.3	16.50	33.18	24.84	0.279	55%	200				0.5	100.0	0.14	0.01	0.01	0.06	0.01
Front End Loader	980H Cat Front-End Loader	2	PM_{10}	1.5	8.3	23.65	33.65	28.65	2.972	55%	200	1,000	2	2,000	0.5	100.0	2.97	0.30	0.28	1.34	0.12
		2	$PM_{2.5}$	0.15	8.3	23.65	33.65	28.65	0.297	55%	200				0.5	100.0	0.30	0.03	0.03	0.13	0.01
Dump Truck	CAT 770G (515 hp, 42.1 tons capacity)	1	PM_{10}	1.5	8.3	78.50	120.60	99.55	5.205	55%	200	4,488	60	12,000	51.0	10,200.0	265.45	13.27	12.40	119.45	5.58
		1	$PM_{2.5}$	0.15	8.3	78.50	120.60	99.55	0.520	55%	200				51.0	10,200.0	26.54	1.33	1.24	11.95	0.56
Employees Vehicles		5	PM_{10}	1.5	8.3			2.40	0.974	55%	200	100	10	2,000	0.2	18.9	0.18	0.01	0.01	0.08	0.00
		5	$PM_{2.5}$	0.15	8.3			2.40	0.097	55%	200				0.2	18.9	0.02	0.00	0.00	0.01	0.00
Total Emissions PM_{10}																	271.50	13.87	12.95	122.17	5.83
Total Emissions $PM_{2.5}$																	27.15	1.39	1.30	12.22	0.58

Secret Town Mine
Unpaved Road Emissions
Operating Year 2015

Notes:

Off-Road Equipment (Example - Water Truck)
Emission Factor (1)
$E = k * (s/12)^{0.9} * (W/3)^{0.45}$ [maximum day]
$E = k * (s/12)^{0.9} * (W/3)^{0.45} * (365 - P)/365$ [annual]

E	emission factor (PM_{10})	2.787	lb/VMT
E	emission factor ($PM_{2.5}$)	0.279	lb/VMT
k	particle size multiplier (PM_{10})	1.5	lb/VMT
k	particle size multiplier ($PM_{2.5}$)	0.15	lb/VMT
s (2)	silt content	8.3	%
W	weight (empty)	16.50	tons
	weight (loaded)	33.18	tons
	weight (mean)	24.84	tons
P	days of rainfall > 0.01 in	22	days
N	days in period	334	days

Source: NOAA, http://lwf.ncdc.noaa.gov/oa/climate/online/ccd/prcpdays.html

On-Road Vehicles (Autos and Trucks) (Use average vehicle weight)
Emission Factor (1)
$E = k * (s/12)^{0.9} * (W/3)^{0.45}$ [maximum day]
$E = k * (s/12)^{0.9} * (W/3)^{0.45} * (365 - P)/365$ [annual]

E	emission factor (PM_{10})	8.401	lb/VMT
E	emission factor ($PM_{2.5}$)	0.840	lb/VMT
k	particle size multiplier (PM_{10})	1.5	lb/VMT
k	particle size multiplier ($PM_{2.5}$)	0.15	lb/VMT
s (2)	silt content	10	%
	weight (mean)	198.74	tons
P	days of rainfall > 0.01 in	32	days
N	days in period	244	days

Source: NOAA, http://www.ncdc.noaa.gov/cdo-web/datatools/normals (Colfax - April to November)

1. Emission factors from AP-42, Section 13.2.2 (Unpaved Roads).
2. Silt content from Section 13.2.2, Table 13.2.2-1: 8.3% for pit and haul road and 10% for plant roads.
3. Control efficiency is assumed to be 55% for watering 2 times per day for mitigation of fugitive dust at construction sites (CalEEMod 2013).

Secret Town Mine
Off-Site Paved Road Emissions
Operating Year 2015

							Unmitigated Emissions lb/day			Unmitigated Emissions ton/yr			
Vehicle Description	Pollutant	Distance miles	Trips/day	Trips/yr	VMT/day	VMT/yr	Fugitive Dust	Brake & Tire	Total	Fugitive Dust	Rainfall Adjusted	Brake & Tire	Total
Haul Trucks	PM_{10}	23.5	166	16,667	3,901	391,667	2.10	0.841	2.95	0.11	0.10	0.04	0.14
	$PM_{2.5}$				3,901	391,667	0.52	0.153	0.67	0.03	0.03	0.01	0.03
Employee Vehicles	PM_{10}	16.8	10	2,000	168	33,600	0.09	0.017	0.11	0.01	0.01	0.00	0.01
	$PM_{2.5}$				168	33,600	0.02	0.01	0.03	0.00	0.00	0.00	0.00
					Total Emissions PM_{10}		2.20	0.86	3.05	0.11	0.11	0.04	0.15
					Total Emissions $PM_{2.5}$		0.54	0.16	0.70	0.03	0.03	0.01	0.04

Notes:

Emission Factor (1)

$E = k * (sL)^{0.91} * (W)^{1.02}$ [maximum day]

$E = k * (sL)^{0.91} * (W)^{1.02} * (1 - P/4N)$ [annual]

k	particle size multiplier (PM_{10})	0.0022	lb/VMT
k	particle size multiplier ($PM_{2.5}$)	0.00054	lb/VMT
sL	silt loading (2)	0.080	g/m^2
W	weight (mean) (3)	2.4	tons
E	emission factor (PM_{10})	0.000540	lb/VMT
E	emission factor ($PM_{2.5}$)	0.000132	lb/VMT
P	days of rainfall > 0.01 in	32	days
N	days in period	244	days

Source: http://www.ncdc.noaa.gov/cdo-web/datatools/normals (Colfax - April to November)

Brake and Tire Wear

Vehicle Description	PM10 Tire Wear (g/mi)	PM10 Brake Wear (g/mi)	PM2.5 Tire Wear (g/mi)	PM2.5 Brake Wear (g/mi)
Haul Trucks (T7)	0.0360	0.0617	0.0020	0.0157
Employees (LDA, LDT1, LDT2)	0.0080	0.0367	0.0020	0.0157

Source: EMFAC2011 (web-based database) for Mountain Counties Air Basin 2015

1. Emission factors from AP-42, Section 13.2.1 (Paved Roads).
2. Silt loading from California Air Resources Board, Areawide Source Methodologies, Section 7.9, Entrained Paved Road Dust, Paved Road Travel (July 1997).
3. Weight (mean) from California Air Resources Board, Areawide Source Methodologies, Section 7.9, Entrained Paved Road Dust, Paved Road Travel (July 1997).

EMFAC2011 Emission Rates
Region Type: Air Basin
Region: Mountain Counties
Calendar Year: 2015
Season: Summer
Vehicle Classification: EMFAC2011 Categories

Region	CalYr	Season	Veh_Class	Fuel	MdlYr	Speed (miles/hr)	Population (vehicles)	VMT (miles/day)	Trips (trips/day)	ROG_RUN (gms/mile)	ROG_IDLE (gms/vehic	ROG_STR (gms/vehic	ROG_DIUR (gms/vehic	ROG_HTS (gms/vehic	ROG_RUN (gms/mile)	ROG_RES (gms/vehic
Mountain Counties	2015	Summer	LDA	GAS	Aggregatec	Aggregatec	157606.6164	5833598.443	988130.8	0.0523	0	1.391296	1.285027	1.40804	0.074524	0.770582
Mountain Counties	2015	Summer	LDA	DSL	Aggregatec	Aggregatec	1183.338287	39975.31225	7072.336	0.037121	0	0	0	0	0	0
Mountain Counties	2015	Summer	LDT1	GAS	Aggregatec	Aggregatec	39115.03017	1314098.606	233382	0.193648	0	3.422568	3.624856	3.391752	0.275998	2.149944
Mountain Counties	2015	Summer	LDT1	DSL	Aggregatec	Aggregatec	37.15362248	1144.087103	197.9842	0.06278	0	0	0	0	0	0
Mountain Counties	2015	Summer	LDT2	GAS	Aggregatec	Aggregatec	81592.6705	3070833.08	508714.3	0.074323	0	2.064523	1.654306	1.690301	0.124587	0.97671
Mountain Counties	2015	Summer	LDT2	DSL	Aggregatec	Aggregatec	24.77989485	832.8111528	141.8045	0.045048	0	0	0	0	0	0
Mountain Counties	2015	Summer	T7 tractor	DSL	Aggregatec	Aggregatec	369.2927427	49026.37158	0	0.337793	2.742184	0	0	0	0	0

Region	Veh_Class	Fuel	TOG_RUN (gms/mile)	TOG_IDLE (gms/vehic	TOG_STR (gms/vehic	TOG_DIUR (gms/vehic	TOG_HTS (gms/vehic	TOG_RUN (gms/mile)	TOG_RES (gms/vehic	CO_RUNE (gms/mile)	CO_IDLEX (gms/vehic	CO_STREX (gms/vehic	NOX_RUN (gms/mile)	NOX_IDLE (gms/vehic	NOX_STR (gms/vehic
Mountain Counties	LDA	GAS	0.069976	0	1.487854	1.285027	1.40804	0.074524	0.770582	1.744569	0	15.79231	0.13084	0	1.313689
Mountain Counties	LDA	DSL	0.04226	0	0	0	0	0	0	0.226808	0	0	0.5752	0	0
Mountain Counties	LDT1	GAS	0.231664	0	3.661033	3.624856	3.391752	0.275998	2.149944	5.069212	0	39.94134	0.403843	0	2.397872
Mountain Counties	LDT1	DSL	0.071471	0	0	0	0	0	0	0.282101	0	0	0.562434	0	0
Mountain Counties	LDT2	GAS	0.099111	0	2.206205	1.654306	1.690301	0.124587	0.97671	2.53298	0	24.14651	0.264368	0	2.718869
Mountain Counties	LDT2	DSL	0.051284	0	0	0	0	0	0	0.238198	0	0	0.571316	0	0
Mountain Counties	T7 tractor	DSL	0.384551	3.121767	0	0	0	0	0	1.534531	9.874532	0	11.56662	30.16558	0

Region	Veh_Class	Fuel	CO2_RUN (gms/mile)	CO2_IDLE (gms/vehic	CO2_STRE (gms/vehic	CO2_RUN (gms/mile)	CO2_IDLE (gms/vehic	CO2_STRE (gms/vehic	PM10_RUN (gms/mile)	PM10_IDLE (gms/vehic	PM10_STR (gms/vehic	PM10_PMTW (gms/mile)	PM10_PMBW (gms/mile)
Mountain Counties	LDA	GAS	369.0009	0	463.9613	310.1871	0	405.5992	0.001996	0	0.022088	0.007999958	0.036749812
Mountain Counties	LDA	DSL	336.0956	0	0	285.3467	0	0	0.026144	0	0	0.007999958	0.036749812
Mountain Counties	LDT1	GAS	427.3396	0	516.8576	365.7801	0	460.6461	0.005063	0	0.04489	0.007999959	0.036749812
Mountain Counties	LDT1	DSL	342.3718	0	0	283.5851	0	0	0.051806	0	0	0.007999959	0.036749811
Mountain Counties	LDT2	GAS	499.6229	0	627.2448	441.2401	0	568.3944	0.002326	0	0.023644	0.007999959	0.036749812
Mountain Counties	LDT2	DSL	337.8668	0	0	291.0927	0	0	0.037191	0	0	0.007999958	0.036749812
Mountain Counties	T7 tractor	DSL	1749.047	2951.167	0	1705.32	2877.388	0	0.170245	0.234162	0	0.035999812	0.061739677

Region	Veh_Class	Fuel	PM2_5_RU (gms/mile)	PM2_5_IDI (gms/vehic	PM2_5_ST (gms/vehic	PM2_5_PMTW (gms/mile)	PM2_5_PMBW (gms/mile)	SOX_RUN (gms/mile)	SOX_IDLE (gms/vehic	SOX_STRE (gms/vehicl
Mountain Counties	LDA	GAS	0.001816	0	0.020051	0.00199999	0.015749918	0.003713	0	0.004923
Mountain Counties	LDA	DSL	0.024053	0	0	0.00199999	0.015749918	0.003209	0	0
Mountain Counties	LDT1	GAS	0.004564	0	0.040382	0.00199999	0.015749918	0.004352	0	0.005895
Mountain Counties	LDT1	DSL	0.047661	0	0	0.00199999	0.015749918	0.003268	0	0
Mountain Counties	LDT2	GAS	0.002125	0	0.021573	0.00199999	0.015749918	0.00503	0	0.006705
Mountain Counties	LDT2	DSL	0.034215	0	0	0.00199999	0.015749918	0.003225	0	0
Mountain Counties	T7 tractor	DSL	0.156625	0.215429	0	0.008999953	0.026459862	0.016687	0.028156	0

Month	Mean Number of Days Rainfall > 0.01 in	Days per Month
Jan	10.9	31
Feb	10.5	28
Mar	11.0	31
Apr	7.8	30
May	5.3	31
Jun	2.3	30
Jul	0.2	31
Aug	0.9	31
Sep	2.3	30
Oct	4.8	31
Nov	8.8	30
Dec	10.9	31
Total	75.7	365
Total - Apr - Nov	32	244

Source: NOAA, http://www.ncdc.noaa.gov/cdo-web/quickdata (Gold Run, CA)

APPENDIX D

Biological Resources Report

DUDEK

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MEMORANDUM

To:	Brian Grattidge
From:	Mike Henry and Craig Seltenrich
Subject:	Site Assessment at Project Site of Proposed Bear River Restoration at Rollins Reservoir
Date:	October 16, 2014
cc:	
Attachment(s):	Figure 1 – Foothill Yellow-Legged Frog within Study Area

SUMMARY

Dudek aquatic biologists Craig Seltenrich and Michael Henry visited the project site on October 6, 2014 between 10:30AM and 2:00PM and walked the full extent of the river bed below the Bear River/Steephollow Creek confluence down to the approximate location of the 1993 lower lake level. Occurrences of foothill yellow-legged frogs (FYLF, *Rana boylii*) were recorded and the suitability of habitat was assessed throughout this reach of the river. In summary, FYLF were observed in isolated locations throughout the study area, but were only abundant in Steephollow Creek and an isolated channel within the Bear River bed that carried Steephollow Creek flows into the Bear River channel. After the confluence, only scattered occurrences were noted. Breeding habitat for FYLF within the main Bear River channel(s) downstream of the confluence with Steephollow Creek appears to be highly limited as a result of generally high main-channel water velocities and the lack of suitable edgewater habitat (water velocities less than 5 cm/sec) for breeding and larval development. With the exception of one low-gradient side-channel with low water velocities located adjacent to the northern river bank, the higher gradient main Bear River channels with relatively consistent bed substrates (mostly cobble and gravel) create unimpeded flow conditions across most of the channel, producing relatively high water velocities. However, based on historical aerial photography, the low-gradient side channel may only periodically provide potentially suitable breeding habitat since this channel also occasionally functions as one of the main Bear River channels (depending on outflow), which would not be conducive for breeding. Additionally, seasonal inundation of the lower portion of the study area by Rollins Lake precludes that area as FYLF breeding habitat, although subadults and adults may temporarily use this habitat after lake levels recede.

OBSERVATIONS OF FOOTHILL YELLOW LEGGED FROG AND SUITABLE HABITAT

Three distinct zones of FYLF abundance were observed in the study area (Figure 1) under the current flow regime:

- Zone 1, from the mouth of Steephollow Creek along two active channels (that connect creek flow with the Bear River) extending approximately 125 feet along the left bank (i.e., base of the elevated bench to be used for processing) and about 600 feet down the right channel bank within the Bear River floodplain;
- Zone 2, the approximately 4,200 feet between Zone 1 and the point where the Bear River turns to the south/southeast; and
- Zone 3, the area between Zone 2 and Rollins Lake.

These zones are described in detail below.

Zone 1

The two channels that currently convey Steephollow Creek flow to the Bear River occur on a slightly elevated terrace relative to the main Bear River channel and both are very low gradient (0 to 1%) with shallow water (≤ 1 ft) and generally low water velocities (≤ 5 cm/sec). The left channel (about 125 feet in length) that runs below the elevated bench averaged about 7 feet wide and the longer right channel (approximately 600 feet in length) averaged about 6 feet wide. Foothill yellow-legged frog young-of-the-year were common along both channels up to the point where the channels entered the Bear River (Figure 1). Young-of-the-year FYLF were the most frequently observed life stage along the two channels, although 2 subadults, 1 adult, and a metamorphosing FYLF tadpole were also noted. The Bear River channels downstream of these two creek discharge locations were steeper gradient with high water velocities. As a result, FYLF breeding habitat within Zone 1 only appears to occur within the two Steephollow Creek channels. Downstream of these two channels in Zone 1, only scattered FYLF (primarily subadults) were observed in localized areas where appropriate habitat was present.

Zone 2

Downriver of Zone 1, increased gradient within the Bear River channel(s) in Zone 2 and the small, fairly homogeneous bed substrates (mostly mid-sized cobble and gravel) creates unobstructed flow conditions and relatively high water velocities across the entire channel. Bear River flow during the site assessment was estimated at about 100 cubic feet per second (cfs), with water velocities up to about 1.5 meters per second (m/s) in the middle of the channel with water velocities of 20 to 40 cm/sec in edgewater habitat along the bank margins. Adults preferentially utilize shallow edgewater areas with water velocities less than 10 cm/sec for breeding and egg laying (Seltenrich and Pool 2002), although the majority of egg masses tend to be deposited in areas where water velocities are less than 5 cm/sec. Several studies have documented partial scouring of egg masses at velocities ≥20 cm/sec (Kupferberg 1996).

The Chicago Powerhouse begins releasing flows of up to 1,100 cfs into the Bear River when reservoirs spill, which can be in the middle of winter many years. Daily summer releases from the Chicago Powerhouse of 500 to 1,100 cfs into the Bear River flow channel typically occur from April through August, likely resulting in even higher water velocities than were observed during the site assessment. Since these releases typically occur at or near the beginning of the breeding period for this species (generally late March through early June) (Storer 1925; Grinnell et al. 1930), the high water velocities and lack of calm edgewater habitat for breeding further reduces the likelihood of FYLF breeding in Zone 2. Additionally, river water temperature tends to be relatively cold exiting the powerhouse and it is unlikely that water temperatures reach the required breeding temperature of ≥ 13º C for Sierra Nevada foothill streams (Seltenrich and Pool 2002) within the short distance (approximately 1.25 miles) between the powerhouse and the top of the reservoir.

In general, low-velocity (< 10 cm/sec) edgewater habitat required by this species for breeding and larval development is essentially absent in Zone 2. However, subadults and adults will use faster water habitats if there is abundant food (spiders, insects, etc.) and the fast water adjacent to the stream banks provides easy escape from potential predators.

Subadults were the most common FYLF life stage observed in Zone 2, with a total of 18 individuals documented within the 4,200 foot Zone 2 reach. The presence of primarily subadults within Zone 2 is not surprising since this life stage accounts for the majority of FYLF dispersal (as with many frogs) to establish new sub-populations. Only two adult FYLF and two young-of-the-year FYLF were observed in Zone 2. The only location where potentially suitable spring breeding habitat may have been present in 2014 is within a somewhat isolated low-gradient channel along the right bank of the river (looking downstream). Most of the FYLF observations in Zone 2 occurred along this channel, and it is possible that the two young-of-the-year frogs may have come from this location since young-of-the-year frogs do not generally move long distances from breeding locations. However, historical aerial photography indicates that this right bank channel also functions as one of the main Bear River channels (depending on outflow), and consequently, may only periodically provide potentially suitable breeding habitat.

In general, the overall paucity of breeding habitat and the presence of only two young-of-the-year frogs in Zone 2 indicate that very little breeding likely occurs within this reach.

Based on the general absence of suitable breeding habitat (with the possible exception of the partially isolated channel along the north bank of the floodplain) and the overall absence of young-of-the-year frogs in Zone 2, impacts of gravel skimming operations in Zone 2 on this species should be minimal. Subadults observed within this Zone during the field assessment represent dispersing individuals (likely from Steephollow Creek) which are highly mobile and could avoid most of the gravel operations in the floodplain. Additionally, these frogs account for a very small percentage of the total FYLF population in Steephollow Creek and in the Bear River upstream of the Chicago Powerhouse, and any impacts to this species would be small and would not adversely affect the population in this area.

Zone 3

Zone 3, which consists of the area downstream of Zone 2 after the river curves to the south/southeast toward Rollins Lake, includes the upper portion of the reservoir. Based on historical aerial photography (Google Earth 2014), this area is typically inundated by the lake through the spring and summer in most years. During the field assessment, the upper portion of the reservoir was dry and could be accessed. Slightly lower river gradient within the Bear River channels in Zone 3 resulted in lower water velocities in some locations, although edgewater velocities were still relatively high. Due to inundation by the reservoir, channel substrates consisted primarily of sand, silt, and clay, with some gravel and cobble. As a result, even if Zone 3 was not inundated on an annual basis, suitable breeding and larval development habitat is not present. No FYLF were observed in Zone 3.

Conclusions

Based on the general absence of suitable FYLF breeding and larval development habitat and the low numbers of frogs observed within the Bear River channels in Zone 1 downstream of the confluence with Steephollow Creek, the majority of the potential impacts to this species resulting from gravel skimming operations will likely occur in the area around the mouth of Steephollow Creek and for a limited distance downstream along the creek channel(s) prior to entering the Bear River. The Bear River channels in this zone do not provide suitable breeding habitat. Impacts to this species in Zone 2 are anticipated to be minimal since very little breeding habitat appears to be present in this area and the majority of the FYLF observed in this zone were subadults who are highly mobile and can avoid much of the gravel skimming operations. In

Zone 3, the annual inundation of this area by the lake precludes this zone as potential habitat for this species.

OTHER SPECIAL STATUS SPECIES OBSERVED

Juvenile western toads (*Anaxyrus boreas*) were observed in large numbers in Zone 1 on the bank of Steephollow Creek below the proposed Processing Area. This species has no formal status, but is becoming uncommon in many areas of the Pacific Northwest and may warrant some level of conservation status in the near future (International Union for Conservation of Nature 2014). One red-tailed hawk (*Buteo jamaicensis*) was observed in the trees on left side of the river in Zone 2, and one deceased red-tailed hawk was found in the river in Zone 2. The hawk appeared to be decapitated, but it is not clear if that damage was postmortem. One brown trout (*Salmo trutta*) was observed within Zone 2 in a pool with no surface connection to the rest of the river channel; this individual may have been stranded in this pool as Rollins Lake retreated. No other special status species were observed during the reconnaissance survey.

ROAD CORRIDOR

Dudek observed the general conditions of the roadway and the areas proposed for improvement by KD Anderson & Associates (2013). The proposed improvements are limited to small tree clearing on the inside of corners as would typically be done by road maintenance crews, paving of existing turnouts, widening of paved sections within the limits of existing gravel roadbed, and paving of currently unpaved segments of road. None of these road construction types would be expected to have significant long-term or short-term effects on the forest habitat that abuts the roadway. No obvious watercourses or culverts were observed along the road alignment, and typical construction BMPs would be expected to limit effects on water quality in any receiving bodies.

RECOMMENDATIONS FOR AVOIDANCE AND MINIMIZATION MEASURES

Based on this reconnaissance survey, very little suitable FYLF breeding habitat occurs within the study area south of Steephollow Creek. In general, the Bear River channels in this area have sufficient gradient (exceeding 2% in some areas) and relatively small, homogeneous substrates (mid-sized cobble and gravel) that create unimpeded flow conditions and relatively high water velocities across the channel. As a result, suitable breeding habitat (edgewater habitat with water velocities less than 10 cm/sec) is sparse or absent within these channels. Further, the frequent releases of 500 to 1,100 cfs from the Chicago Powerhouse during the spring and summer months and likely associated increased water velocities further reduce habitat value. For these reasons, Dudek recommends that mitigation for impacts to FYLF focus on what is referred to as Zone 1 in this memorandum.

Within Zone 1, Dudek notes three different areas with varying priorities for conservation/mitigation (Figure 1):

> *Priority 1:* The area within Steephollow Creek hosts the greatest densities of FYLF, including breeding adults. This area is the highest priority for conservation and the project design to strive to completely avoid any alteration to this area. Stockpile areas on the elevated bench above Steephollow Creek should be designed such that material will not spill off the bench into the creek channel.
>
> *Priority 2:* Steephollow Creek in its configuration on October 6, 2014 split into two watercourses prior to joining Bear River. One traveled south/southeast at the base of the elevated bench and joined the river roughly in the center of the river channel. The other hugged the right side of the river channel and did not join the Bear River until approximately 500 feet downriver. After Steephollow Creek itself, these two watercourses had the highest abundance of FYLF in the study area. Review of historic aerials show that the configuration of this area varies widely from year to year, sometimes with no separated channels after Steephollow Creek, sometimes with one separated channel, and sometimes with two separated channels as was seen on this visit. Depending on how Steephollow Creek and Bear River are configured each year, a high priority area for conservation/mitigation during gravel skimming operations will be any watercourses that split off from Steephollow Creek and remain separate from the main Bear River flow. Stockpile areas and vehicle travel routes should be designed to minimize disturbance to these Steephollow Creek channels to the maximum extent feasible.
>
> *Priority 3:* The main Bear River channel was completely devoid of FYLF in Zone 1. However, depending on how the riverbed configures in the future, areas of slower flow or isolated channels could form here. Given the proximity of the main breeding population in Steephollow Creek, this area should be carefully examined for presence of FYLF and mitigation/conservation implemented accordingly.

RECOMMENDATIONS FOR FURTHER REVIEW

Additional protocol-level surveys for FYLF within the study area would provide additional support for limiting the area of mitigation to Zone 1 as suggested above. Dudek also recommends that, prior to commencing site disturbance each year, NID contract with qualified biologists to briefly inspect Zone 1 for habitat suitability for FYLF and recommend a configuration of infrastructure placement that minimized disturbance to the species. This effort should consist of a brief field visit (~2 hours) and subsequent memorandum.

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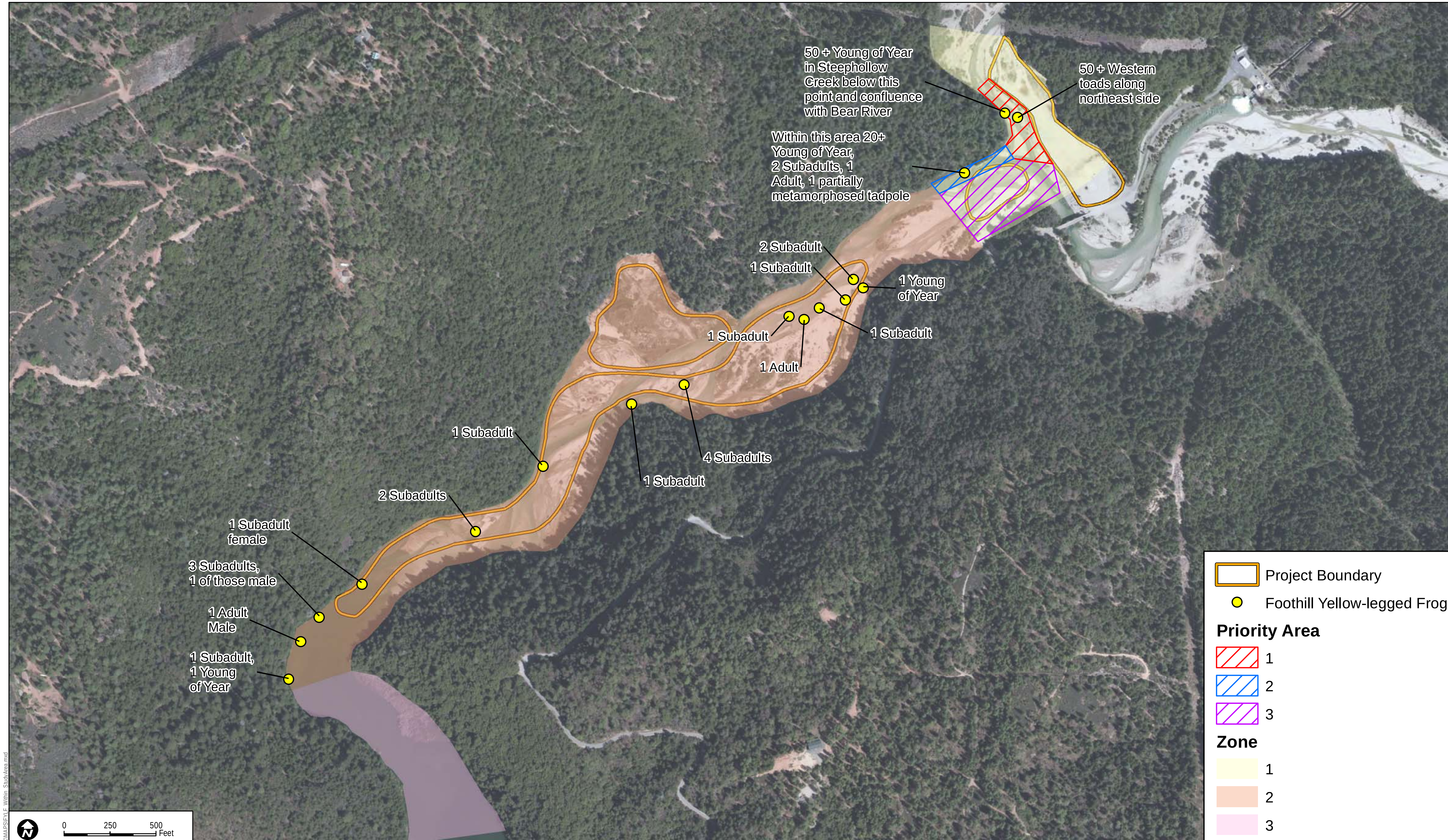

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SOURCE: ESRI 2014

FIGURE 1

Foothill Yellow Legged Frog within Study Area

BEAR RIVER RESTORATION AT ROLLINS RESERVE

APPENDIX E

Cultural Resources Report

CULTURAL RESOURCES INVENTORY REPORT
for the
BEAR RIVER RESTORATION at
ROLLINS RESERVOIR PROJECT, NEVADA and
PLACER COUNTIES, CALIFORNIA

Prepared for:

Nevada Irrigation District
1036 West Main Street
Grass Valley, California 95945-5424
Contact: Remleh Scherzinger

Prepared by:

DUDEK
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Encinitas, California 92024
Nicholas Hanten, Brad Comeau, MSc, RPA,
Samantha Murray, MA, and Micah J. Hale, PhD, RPA

AUGUST 2014

Printed on 30% post-consumer recycled material.

NATIONAL ARCHAEOLOGICAL DATABASE (NADB) INFORMATION

Authors:	Nicholas Hanten, Brad Comeau, MSc, RPA, Samantha Murray, MA, and Micah J. Hale, PhD, RPA
Firm:	Dudek
Project Proponent:	Nevada Irrigation District
Report Date:	July 2014
Report Title:	Cultural Resources Inventory Report for the Bear River Restoration at Rollins Reservoir Project, Nevada and Placer Counties, California
Type of Study:	Archaeological Inventory
Resources:	P-29-002740; P-29-3954; P-29-3955; P-29-3956, Chicago Park Powerhouse Bridge
USGS Quads:	Chicago Park, California 1:24,000; T 15N, R 10E; Sections 6 and 7
Acreage:	75
Permit Numbers:	
Keywords:	Chicago Park USGS 7.5-Minute Quadrangle; Intensive Pedestrian Survey; P-29-2740; P-29-3954; P-29-3955; P-29-3956; P-29-4315; mining; adit; earthen ditch; refuse scatter; historic, Chicago Park Powerhouse Bridge; Little York; Secret Town Mine

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MANAGEMENT SUMMARY

The Bear River Restoration at Rollins Reservoir Project (project) is located in unincorporated portions of Nevada County and Placer County, approximately 6 miles northeast of the City of Colfax (see Figure 1). The project site is located at the confluence of the Bear River and Steephollow Creek, upstream of Rollins Reservoir (see Figure 2). The project site is approximately 75 acres in size, and includes parcels in both Nevada County and Placer County. The project site occurs within Sections 6 and 7 of Township 15 North, Range 10 East on the Chicago Park 7.5-minute USGS topographic quadrangle. The area of potential effect (APE) for the project consists of the entire 75 acre area.

The Nevada Irrigation District is proposing to re-start annual gravel skimming operations within the river, in order to remove materials which have accumulated in the river since gravel skimming ceased in 2001/2002. Removal of this material will increase the water storage capacity of Rollins Reservoir and would provide benefits to river restoration and recreation as well.

The Nevada Irrigation District (NID) is the Lead Agency for compliance with the California Environmental Quality Act (CEQA). As the project also requires a Section 404 Clean Water Act permit, it is also under the jurisdiction of the U.S. Army Corps of Engineers for compliance with Section 106 of the National Historic Preservation Act (NHPA). The Nevada Irrigation District contracted Dudek to perform a Phase I cultural resource inventory for the project, in compliance with Section 106 and CEQA.

This study consisted of a records search of the project area and a 0.5 mile radius around the project area, and an intensive pedestrian survey of the APE. The records search identified 2 resources in the APE and a further seven beyond the APE. The resources within the APE include P-29-002740, a mining complex (tailings, adits, earthen reservoir, etc.), and P-004315, a historic road/ditch. The pedestrian survey relocated both of these resources and identified one new historic period resource, the Chicago Park Powerhouse Bridge.

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1 INTRODUCTION

1.1 Project Location and Description

The Bear River Restoration at Rollins Reservoir Project (project) is located in unincorporated portions of Nevada County and Placer County, approximately 6 miles northeast of the City of Colfax (see Figure 1). The project site is located at the confluence of the Bear River and Steephollow Creek, upstream of Rollins Reservoir (see Figure 2). The project area of potential effect (APE) is approximately 75 acres in size, and includes parcels in both Nevada County and Placer County. The property is identified by the following Assessor's Parcel Numbers: Nevada County 65-240-37-000, 65-240-35-000, 65-260-02-001, 65-260-02-002, and Placer County 063-150-024-000. The project site occurs within Sections 6 and 7 of Township 15 North, Range 10 East on the Chicago Park 7.5-minute USGS topographic quadrangle.

The proposed project would restore and maintain reservoir capacity in Rollins Reservoir on an on-going basis through re-establishment of vested gravel skimming operations on the Bear River at the confluence with Steephollow Creek. The proposed gravel skimming operation would utilize Chicago Park Powerhouse Road to haul excavated materials from the Bear River to Interstate 80. Access to the site is via the Chicago Park Powerhouse Road, off of Interstate 80. The Nevada Irrigation District (NID) is the Lead Agency for compliance with the California Environmental Quality Act (CEQA). As the project also requires a Section 404 Clean Water Act permit, it is also under the jurisdiction of the U.S. Army Corps of Engineers for compliance with Section 106 of the National Historic Preservation Act (NHPA). The Nevada Irrigation District contracted Dudek to perform a Phase I cultural resource inventory for the project, in compliance with Section 106 and CEQA.

1.2 Project Background

Following construction of the Rollins Reservoir Dam in 1965, sediments transported from the upper watershed have accumulated in Rollins Reservoir and the Bear River (at and below the confluence with Steephollow Creek). Gravel skimming was employed between 1965 and 2002 to maintain reservoir capacity and allow for recreational use, such as boating and fishing. Suspension of mining activity in 2001/2002 has allowed for accumulation of gravel and sediments.

The proposed project would reestablish gravel skimming on the Bear River between Rollins Reservoir and Steephollow Creek. It would ultimately restore the project area to the original 1965 contours (when the Rollins Reservoir Dam was completed). The project would provide benefits to water storage capacity, river restoration, and recreation.

Skimming would occur annually when water levels are low, to allow for a dry mining operation (material removal would not occur more than 6 inches below water) using graders, excavators and front-end loaders (no dredging). The project area would be isolated from the perennial stream by the construction of a dike system. Mining would occur on the north or south bank. Through the use of the dikes and dry removal, the project would minimize impacts to water quality. Removal efforts would be concentrated during the period of lowest water levels (typically 60-120 days of the year), and the material would be stockpiled in one of two main areas, plus a surge area for additional material. The annual operations time would be from March 15 to November 15 or shorter, depending on the wet season.

Material would be screened, but not otherwise processed, and placed in the primary stockpile. A secondary stockpile and surge area would allow material to be screened, sold, and transported throughout the active project season. Water would only be used on site for dust control.

Temporary bridges crossing Steephollow Creek and/or the Bear River would be placed at the beginning of the project season to allow access between the skimming area and the primary stockpile and staging area (the bridges would be removed at the end of the season). The material would be sold and loaded onto trucks from the primary stockpile, weighed, and transported on Chicago Park Powerhouse Road to Interstate 80. NID would continue to maintain the access road, but widening, resurfacing, or other reconstruction would be limited to safety needs.

Cofferdams will be used in select locations to reduce scouring. Proposed cofferdam areas include below the Chicago Park Powerhouse, where the riverbank has previously been reinforced with gunite, and at the Chicago Park Powerhouse Bridge, where additional protection of the bridge supports would be installed. The historical effects of scouring may increase as material is removed, creating the need for additional protection as part of the project.

Ancillary features of the project include a staging area with fuel storage, office, maintenance shop, equipment storage, truck scales, and restrooms. The area would be lit for security purposes and the proposed additional activity is expected to reduce unauthorized or illegal use of the project site.

1.3 Regulatory Context

The current cultural resources investigation was completed to satisfy both CEQA and Section 106 of NHPA.

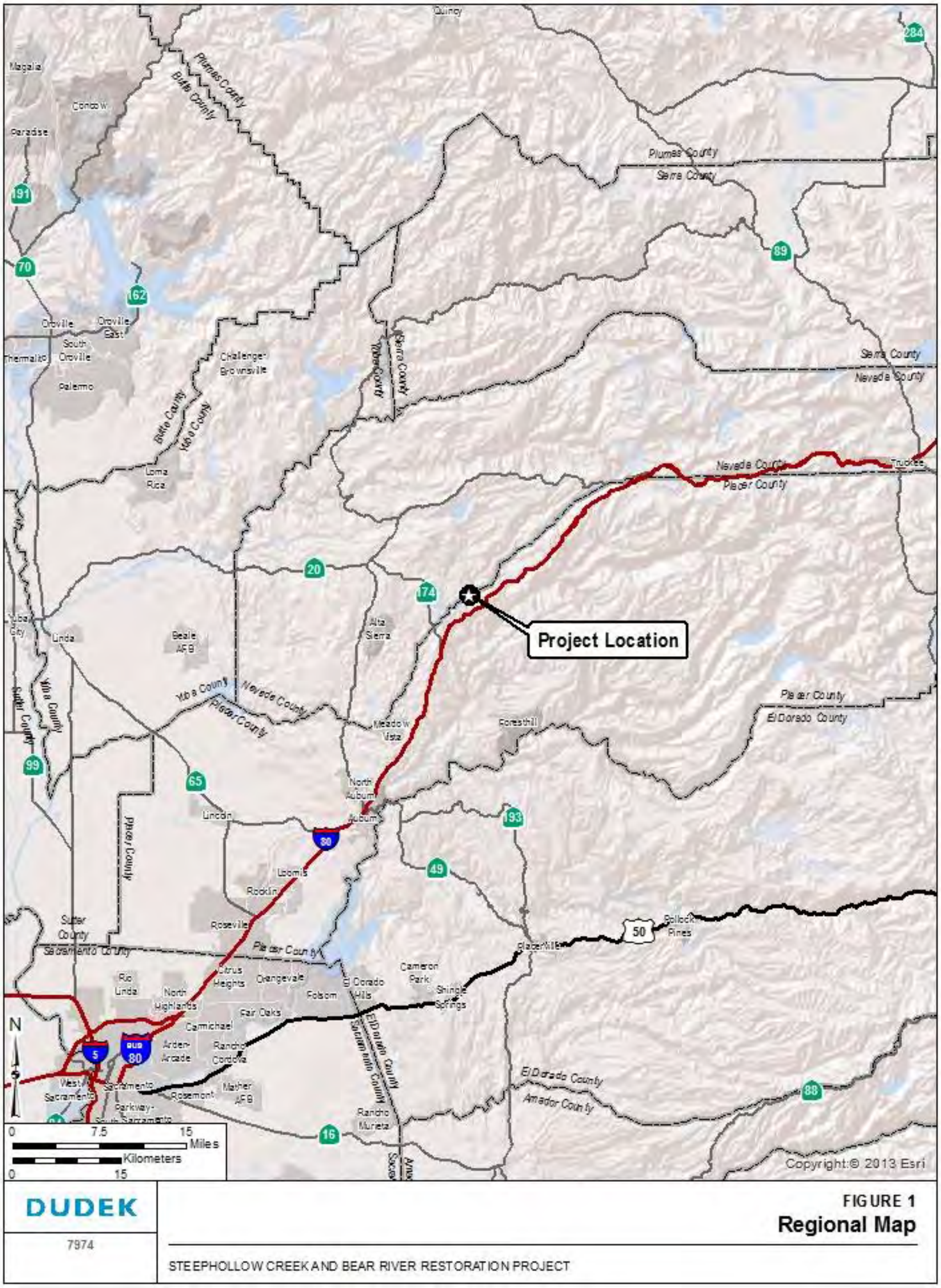
Project Location
Quincy
Plumas County
Butte County
Sierra County
Nevada County
Placer County
Yuba County
El Dorado County
Amador County
Sacramento County
Sutter County
Oroville
Paradise
Concow
Magalia
Truckee
Linda
Beale AFB
Alta Sierra
Meadow Vista
Foresthill
North Auburn
Auburn
Lincoln
Loomis
Rocklin
Roseville
Citrus Heights
Orangevale
Folsom
El Dorado Hills
Cameron Park
Shingle Springs
Placerville
Pollock Pines
Carmichael
Fair Oaks
Rancho Cordova
Mather AFB
Rosemont
Rancho Murieta
Rio Linda
North Highlands
Arden-Arcade
West Sacramento
Sacramento
Palermo
Loma Rica
Challenger-Brownsville
0 7.5 15 Miles
0 15 Kilometers
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FIGURE 1
Regional Map
STEEPHOLLOW CREEK AND BEAR RIVER RESTORATION PROJECT

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SOURCE: USGS 7.5-Minute Series Chicago Park Quadrangle

FIGURE 2
Location Map

STEEPHOLLOW CREEK AND BEAR RIVER RESTORATION PROJECT

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1.3.1 California Register of Historic Resources (CRHR) and CEQA

CEQA requires that all private and public activities not specifically exempted be evaluated against the potential for environmental damage, including effects to historical resources. Historical resources are recognized as part of the environment under CEQA. The act defines historical resources as "any object, building, structure, site, area, or place that is historically significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California" (Division I, Public Resources Code (PRC), Section 5021.1[b]).

Lead agencies have a responsibility to evaluate historical resources against the CRHR criteria prior to making a finding as to a proposed project's impacts to historical resources. Mitigation of adverse impacts is required if the proposed project will cause substantial adverse change. Substantial adverse change includes demolition, destruction, relocation, or alteration such that the significance of a historical resource would be impaired. While demolition and destruction are fairly obvious significant impacts, it is more difficult to assess when change, alteration, or relocation crosses the threshold of substantial adverse change. The CEQA Guidelines provide that a project that demolishes or alters those physical characteristics of a historical resource that convey its historical significance (i.e., its character-defining features) is considered to materially impair the resource's significance. The CRHR is used in the consideration of historical resources relative to significance for purposes of CEQA. The CRHR includes resources listed in, or formally determined eligible for listing in, the National Register of Historic Places (NRHP) and some California State Landmarks and Points of Historical Interest. Properties of local significance that have been designated under a local preservation ordinance (local landmarks or landmark districts), or that have been identified in a local historical resources inventory, may be eligible for listing in the CRHR and are presumed to be significant resources for purposes of CEQA unless a preponderance of evidence indicates otherwise.

Generally, a resource shall be considered by the lead agency to be "historically significant" if the resource meets the criteria for listing on the CRHR (PRC 5024.1; Title 14 California Code of Regulations (CCR) Section 4852), which include the following:

1. It is associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States; or
2. It is associated with the lives of persons important to local, California, or national history; or
3. It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master, or possesses high artistic values; or

4. It has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California, or the nation.

1.3.2 NHPA

The NHPA established the National Register of Historic Places (NRHP) and the President's Advisory Council on Historic Preservation (ACHP), and provided that states may establish State Historic Preservation Officers (SHPOs) to carry out some of the functions of the NHPA. Most significantly for federal agencies responsible for managing cultural resources, Section 106 of the NHPA directs that "[t]he head of any Federal agency having direct or indirect jurisdiction over a proposed Federal or federally assisted undertaking in any State and the head of any Federal department or independent agency having authority to license any undertaking shall, prior to the approval of the expenditure of any Federal funds on the undertaking or prior to the issuance of any license, as the case may be, take into account the effect of the undertaking on any district, site, building, structure, or object that is included in or eligible for inclusion in the NRHP." Section 106 also affords the ACHP a reasonable opportunity to comment on the undertaking (16 U.S.C. 470f).

36 Code of Federal Regulations, Part 800 (36 CFR 800) implements Section 106 of the NHPA. It defines the steps necessary to identify historic properties (those cultural resources listed in or eligible for listing in the NRHP), including consultation with federally recognized Native American tribes to identify resources with important cultural values; to determine whether or not they may be adversely affected by a proposed undertaking; and to outline the process for eliminating, reducing, or mitigating the adverse effects.

The content of 36 CFR 60.4 defines criteria for determining eligibility for listing in the NRHP. The significance of cultural resources identified during an inventory must be formally evaluated for historical significance in consultation with the California SHPO to determine if the resources are eligible for inclusion in the NRHP. Cultural resources may be considered eligible for listing if they possess integrity of location, design, setting, materials, workmanship, feeling, and association. The criteria for determining eligibility are essentially the same in content and order as those outlined under CEQA, but the criteria under NHPA are labeled A through D (rather than 1–4 under CEQA).

Regarding criteria A through D of Section 106, the quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, cultural resources, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and that:

A. Are associated with events that have made a significant contribution to the broad patterns of our history; or

B. Are associated with the lives of persons significant in our past; or

C. Embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

D. Have yielded or may be likely to yield, information important in prehistory or history [36 CFR 60.4].

The current cultural resources inventory is not designed to generate enough data to make eligibility determinations on previously recorded or newly discovered cultural resources; such determinations are typically made during a subsequent evaluation phase (e.g., excavations at prehistoric sites). However, the inventory generated enough data to offer management assessments of the eligibility of cultural resources recorded during the inventory. These assessments are used to propose additional work required to assess historical significance and to mitigate potential adverse effects to the archaeological sites within the project area.

1.4 Tribal Consultation

The Native American Heritage Commission (NAHC) was contacted by Dudek on December 11, 2013 to request a search of the Sacred Lands File. The NAHC responded on December 19, 2013 indicating that the search failed to identify any Native American resources in the vicinity of the project and provided a list of individuals and organizations to contact that may have additional information. Letters were sent to each of the contacts to request information on resources in the area on February 12, 2014. No responses have been received to date. Tribal correspondence documents are included in Appendix C. If any responses are received in the future, they will be forwarded to NID.

1.5 Report Structure and Key Personnel

This report is divided into five chapters. Following this introduction, Chapter 2 reviews the natural environment and the cultural context and Chapter 3 provides the methods used to complete the current inventory. The records search and inventory results are discussed in Chapter 4. Chapter 5 summarizes the cultural resources work completed for this project to-date and provides recommendations for further treatment of the cultural resources, consistent with Section 106 of the NHPA. Several appendices are attached to this report. Appendix A includes confidential records search results; Appendix B provides confidential maps and updated site forms; Appendix C contains tribal correspondence documents; and Appendix D provides resumes of key personnel.

Dr. Micah Hale was the project manager and co-principal investigator for this study. Brad Comeau, MSc, was the co-principal investigator. Nicholas Hanten was the field director. Samantha Murray, MA, and Adam Giacinto, MA, respectively prepared the Historic and Archaeological/Ethnographic contexts for this report. All listed here contributed to the production of this report. Dr. Hale has extensive research in both the local area and overall region completing cultural resources investigations under local, state, and federal guidelines.

2 PROJECT CONTEXT

2.1 Environmental Context

The proposed project is located directly within a length of the Bear River bed. Sediments primarily consist of well sorted sandy and gravelly alluvium within high-flow areas, and raised banks of accumulated cobbles and gravel along the river edges. Steep, tree studded slopes bound the project area on all sides. Average annual temperatures in the area range between 30 and 95 degrees Fahrenheit (Storer and Usinger 1963). Winter rains are substantial, with annual precipitation varying from 15 inches, in relatively dry years, to 40 inches in wet years.

Vegetation within this area is consistent with transitional Foothill and Yellow Pine communities. Tree varieties within this environment commonly include grey pine (*Pinus sabiniana*), interior live oak (*Quercus wislizenii*), blue oak (*Quercus douglasii*), California buckeye (*Aesculus californica*), yellow pine (*Pinus ponderosa*), sugar pine (*Pinus lambertiana*), Douglas fir (Pseudotsuga menziesii), white fir (Abies concolor), incense cedar (Libocedrus decurrens), black cottonwood (*Populus trichocarpa*), black oak (*Quercus kelloggii*), broadleaf maple (*Acer macrophyllum*), and California dogwood (*Cornus nuttallii*). Common shrubs include redbud (*Cercis occidentalis*), chamise (*Adenostoma fasciculatum*), ceanothus (*Ceonothus leucodermis*), mountain misery (*Chamaebatia foliolosa*), prostrate ceanothus (*Ceanothus prostratus*), and western azalea (*Rhododendron occidentale*; Selverston 2008; Storer and Usinger 1963). Common mammals include squirrel (*Sciurus sp*.), striped skunk (*Mephitis mephitis*), mule and whitetail deer (*Odocoileus sp*.), cottontail rabbit (*Sylvilagus sp*.), black-tailed jackrabbit (*Lepus californicus*), opossum, black bear (*Ursus americanus*), gray fox (*Urocyon cinereoargenteus*), mountain lion (*Puma concolor*), raccoon (*Procyon lotor*), among others. Birds include California quail (*Callipepla californica*), bushtit (*Psaltriparus minimus*), wild turkey (*Meleagris gallopavo*), woodpecker (*Melanerpes*), stellar jay (*Cyanocitta stelleri*), owl (*Megascops*), turkey vulture (*Cathartes aura*), warbler, and others. Additional animals include a variety of reptiles and amphibians, as well as insects.

2.2 Cultural Context

Various attempts to parse out information provided through recorded archaeological assemblages from throughout California for the past 12,000 years have led to the development of several cultural chronologies. Some of these are based on geologic time, most are interpreted through temporal trends derived from archaeological assemblages, and others are interpretive reconstructions. Each of these chronologies describe essentially similar trends in assemblage composition in more or less detail. California's archaeological assemblage composition is generally accepted as falling within the following overarching patterns: Paleoindian (pre-5500

BC), Archaic (8000 BC – AD 500), Late Prehistoric (AD 500–1750), and Ethnohistoric (post-AD 1769).

Occupation of the Sierra is likely to have occurred at least 9,000 years ago, however, only a handful of Paleoindian Period lithic bifacial points have been recorded. The nearest of these fluted points were found in Sierra Valley (west of Reno, Nevada; Foster and Betts 1995), Ebbett's Pass (south of Lake Tahoe; Dillon 2002), and at the Sailor Flat site (in the Tahoe National Forest; Wohlgemuth 1984). Fluted points from this area have generally been recorded as isolated finds, or recovered from contexts of mixed provenience. The primary examples of the PaleoIndian pattern, to which such fluted and stemmed points are generally assigned, have been recorded east of the Sierra Nevada. The typical assemblage includes large stemmed projectile points, high proportions of formal lithic tools, bifacial lithic reduction strategies, and relatively small proportions of groundstone tools. Some of the most pertinent of such sites were studied by Emma Lou Davis (1978) on China Lake Naval Air Weapons Station, near Ridgecrest, California. These sites contained fluted and unfluted stemmed points and large numbers of formal flake tools (e.g., shaped scrapers, blades). Other typical Paleoindian sites include the Komodo site (MNO-679)—a multicomponent fluted point site, and MNO-680—a single component Great Basined Stemmed point site (Basgall et al. 2002). At MNO-679 and MNO-680, groundstone tools were rare while finely made projectile points were common.

While the limited available data relating to the earliest occupation in the region has provided for a relatively broad and consistent interpretation of the Paleoindian Period, subsequent prehistoric temporal sequences are much more geographically defined and variable due to the greater amount of available data. The Tahoe Reach is currently the most commonly applied cultural temporal sequence within the region. This draws from regional syntheses primarily developed by both Heizer and Elsasser (1953) and Elston, Davis, and Townsend (1977). The sequence includes the Washoe Lake Phase, Tahoe Reach Phase, Spooner Phase, Martis Complex, and Kings Beach Complex (Hull 2007; Moratto 1984, 1999). Of these, the Martis Complex and the Kings Beach Complex are most applicable to the current project area.

2.2.1 Martis Complex (3000 B.C.–A.D. 500)

The Martis complex has been identified to extend from Lassen County to Alpine County (Elsasser 1960). The date range, 3000 B.C. to approximately 500 A.D. has been substantiated by obsidian hydration and radiocarbon dates provided by Elsasser and Gortner (1991). Subsistence during the Martis Complex was based on hunting and seed collecting economy, with highly mobile populations that exploited both upper and lower regions based on the relative seasonal abundance of resources. Projectile points are variable during this period, and were most commonly heavy with low formality, providing some resemblance to those identified in the

Great Basin regions. Temporally representative tools include finger-held drills or punches, retouched volcanic flake scrapers, spokeshave-notched tools, and large biface blades and cores (Hull 2007). During this period there is a more intensive exploitation of local materials, rather than non-local cherts and obsidian, for the manufacture of formed flaked tools.

2.2.2 Kings Beach Complex (A.D. 500–Historic Contact)

Similar to the Martis Complex, the Kings Beach Complex was characterized by populations that migrated between upper areas in the warmer months and lower elevations during the fall and winter. Subsistence during this period shifted toward a focus on fishing and gathering. A reduction in size and weight of projectile points corresponded with adoption of bow and arrow technology. Typical point forms within this region included Desert Side-notched, Cottonwood, and Rosegate series (CRM 2011). Obsidian and chert replaced volcanic materials such as basalt as the preferred materials for the manufacture of lithic tools. As both high quality cherts and obsidian are not local, the greater presence of such exotic materials suggests that there was an increase in trade with neighboring tribes during this period.

The Kings Beach Complex additional included a greater reliance on exploitation of acorns. This trend is exemplified by the increased presence of bedrock mortars and pestles formed from local cobbles. It should be noted that while bedrock mortars were predominantly used for crushing and grinding acorns, they were also employed for the processing of a variety of other foods, including deer meat, camas roots and seeds (CRM 2011). While the creation of mortars indicated a relatively high investment of time and energy, such bedrock milling features are just as frequently found at sites with limited-to-no subsurface cultural deposits as at intensive use occupation areas with well-developed midden soils.

2.2.3 Ethnohistoric (post-AD 1750)

The region surrounding the project area would have been in Hill Nisenan (also known as the southern Maidu) tribal territory during the ethnohistoric period (Wilson and Towne 1978). This group inhabited the Yuba, Bear, and American river watersheds, extending from the Sierra Nevada summit to the Sacramento River. Ethnographic work, most prominently conducted by Stephen Powers in the 1870s, writes of a relatively high population of indigenous inhabitance in this region (1877). Notably, Powers identified 18 named villages alone along the Bear River, further suggesting that there may have been a larger portion of villages that he had no knowledge of. This was substantiated by interviews conducted by Hugh Littlejohn in 1928, who recorded a number of additional named habitation areas (Carlson 1986).

Nisenan habitation areas were most commonly situated near primary drainages, along ridgelines with mild slopes and south-facing exposures (Wilson and Towne 1978). Traditional village features included bedrock milling stations, granaries, conical house structures, as well as sweat and ceremonial houses. The dead were typically cremated and buried within the boundaries of the habitation area. Tribal groups included extended and unmarried relatives. Groups of Hill Nisenan did have defined chiefs, however, these individuals were chosen based on wealth and popularity rather than hereditary decent (Kroeber 1925). Intra-tribal boundaries overlapped, with natural resources being shared relatively freely between triblets (Carlson 1986). Inter-tribal conflict did occur over resources, and the Hill Nisenan would attack small hunting parties of Washoe that encroached too far into their territory.

The Nisenan subsistence strategy was centered on fishing, hunting, and collecting vegetative resources. This group was highly mobile, with larger central habitation areas and surrounding satellite sites used during hunting excursions and for pre-processing of collected plant resources such as acorns. Common food items included deer, rabbits, birds, bear, rodents, other mammals of small and moderate size, as well as various insects. Deer were sometimes partially processed using mortar and pestle (Kroeber 1925). A ceremony among the Hill Nisenan involved the hunting of a bear during hibernation season. Common tools included the bows and arrow, traps, harpoons, hooks, nets, portable and stationary grinding implements, and pestles and handstones. A number of goods were made using fibrous plants, including canoes constructed tule balsa or logs. Imported items included shell ornaments and beads (particularly disk beads as a monetary unit), green pigment, tobacco, steatite items, and obsidian (Wilson and Towne 1978). Exported items included bows and arrows, animal skins, pine nuts, and other local resources (Kroeber 1925).

Central California indigenous populations derived their linguistic roots from a common Penution stock. The degree of internal variation among these three decedent language groups (Yokution, Maiduan, and Wintuan) is similar to Indo-European, suggesting a time depth of approximately 6,500 years (Golla 2007). The Nisenan spoke one of four closely related Maiduan languages, including Konkow, Chico Maidu, Mountain Maidu, and Nisenan. Shared Hokan phonological and morphological substratal components identified within all Miduan languages indicate past interactions between these two language populations (Hokan time depth is approximately 8,000 years). Miduan language structure suggests that all four Miduan languages were descended from the same proto-Maiduan speaking population to the north. The most likely scenario is that these populations spread southward in the last last1,200 years, with the Nisenan encroaching into area previously occupied by Miwok tribal groups sometime in the past few centuries (Golla 2007). This later population movement is further substantiated by the high frequency of Miwok loan words found within Nisenan vocabulary, a trait that is not shared with the other three Maiduan languages.

2.2.4 The Historic Period

Spanish Period (1769–1822)

Gaspar de Portolá entered the San Francisco bay in 1769. Additional explorations of the san Francisco bay and the plains to the east were conducted by father Pedro Fages in 1772 and Juan Bautista De Anza in 1776 (Grunsky 1989). In 1808, Lieutenant Gabriel Moragain led the first Spanish expedition into the Sacramento Valley. This group traveled explored areas along the American, Calaveras, Cosumnes, Feather, Merced, Mokelumne, Sacramento, and Stanislaus river watersheds. The most recent Spanish expedition into this region was conducted by Luis Arguello in 1817. This group traveled up the Sacramento River to the mouth of the Feather River (Grunsky 1989).

Spanish missionization of Alta California was initiated in San Diego (1769). A total of 21 missions were constructed by the Dominican and Franciscan orders between 1769 and 1823. Missions in the region included San Francisco de Asís (1776), Santa Clara de Asís (1776), San José de Guadalupe (1797 in Alameda County), San Rafael Arcángel (1817 in Marin County), and San Francisco Solano (1823 in Sonoma County; Grunsky 1989)). While missionization had a detrimental effect on tribes throughout the region, there is no record of forcible transport of Nisenan communities by the Spanish to the missions (Wilson and Towne 1978).

Mexican Period (1822–1848)

Mexico's separation from the Spanish empire in 1821 and the secularization of the California missions in the 1830s caused further disruptions to native populations. Following the establishment of the Mexican republic, the government seized many of the lands belonging to Native Americans, providing them as parts of larger Land Grants to affluent Mexican citizens and rancheros. Captain John Sutter was granted the two largest areas of land in the Sacramento Valley area. Sutter founded New Helvetia, a trading and agricultural empire, in 1839. The headquarters was located within Valley Nisenan territory at the confluence of the Sacramento and American rivers. No Mexican land grants were awarded in the County of Nevada. The 1833 Secularization Act passed by the Mexican Congress ordered half of all mission lands to be transferred to the Indians, and the other half to remain in trust and managed by an appointed administrator. These orders were never implemented due to several factors that conspired to prevent the Indians from regaining their patrimony.

American fur trappers and traders conducted a number of exploratory intrusions into west Sierra Nevada Mexican territory. Notably, in 1826, Jedediah Smith led a small party of trappers in an expedition along the Sierra Nevada range, eventually entering the Sacramento Valley in 1827. This group covered the area along the American and Cosumnes rivers. From these travels, maps of this inhospitable terrain were created and disseminated, providing for the waves of European prospectors, ranchers and settlers that would come in the following decades (Grunsky 1989).

American Period (Post –1848)

Nevada County

Little York Township

The project area is located just southwest of an area once known as the township of Little York, which is situated on a narrow ridge between Steep Hollow Creek and the Bear River. Until 1852, miners did not reside permanently in the Little York Township. While gold was present throughout the water courses in decent quantities, it was not enough to satisfy the visions of grandeur for those who came to the region in search of a quick fortune, although some emigrants were able to maintain a successful mining operation in the area (Squire 1967). In the winter of 1850, a small group of miners traveled up the ravine and built a cabin (which would become the first house to be built on the ridge); by the time they packed up and left in the spring, the men made just under ten thousand dollars (Squire 1867). Seeing the success of the traveling miners inspired other miners to pursue work in the gravel beds, which were exposed in an extensive cut of blue cement or blue lead. While gold was clearly visible across the entire face of the cut, the crude mining methods of this period made extraction of such small pieces of gold nearly impossible.

The term "blue lead" was used to describe the appearance of the lower drift deposits which are found just above bedrock. This blue lead is made-up of serpentine rock, talcose slate, and quartz. Yet another term, "blue cement," was used to describe the hardest types of deposits which had to be subject to a crushing process in quartz mills (Raymond 1873:395-396).

In the spring of 1852 William Starr and John Robinson came to the area to prospect in the gravel banks near the head of the ravine, avoiding the channel of blue cement (Squire 1967). Starr and others began to dig to the first tunnel into the gravel hills. The men quickly discovered that there was not enough water to wash their drift dirt, and little could be accomplished in their claims that season. Meanwhile, Robinson had begun prospecting lower down from Starr and company along the face of what was known as Cousin Hill (Squire 1867). After only tunneling for a short distance, Robinson realized that he had found place where money could be made. Word spread quickly to neighboring mining camps and eventually to other parts of the country and Little York soon found itself filled with excited and eager miners from as far as New York and other eastern states (Squire 1867). It did not take long for the miners to locate the entire gravel range, which was extensive and traveled through many nearby hills. Soon the township was divided up and lots were distributed among the miners.

On April 25, 1852 a man with the initials A.M.W. wrote a letter to the editor of the Sacramento Daily Union, announcing new diggings in the small township of Little York and the formation of the York Mining Company. The company was formed to cut a ditch to transport water from the Bear River and Steep Hollow Creek to the mine. “The hills are covered with round smooth pebble quartz, while the diggings are nothing but large smooth boulders and stream pebbles from top to bottom. Those embedded in the earth seem to be generally perfect, but when exposed to the action of the atmosphere, they crumble to pieces, making the tailing very nearly as rich as the pay dirt originally” (SDU 1852a). Another article boasts that the diggings at Green Horn, Steep Hollow, and Little York is confirmed rich, with miners making as much as $8 to $20 a day (SDU 1852b). Several months later it was reported that the men were making as much as $100 per day (SDU 1952c).

A ditch was quickly constructed to convey water from the Bear River to the mines. Saw mills, stores, saloons, mechanic’s shops, a meeting house, and even a theater were also in the works. A town meeting was called in August of 1852 to elect a Recorder and to formally name the township. Contention between easterners and westerners quickly became apparent during the meeting, and in the end the easterners won the vote for the Recorder and selected the name “Little York” for the town. By September of 1852, Little York had nearly all the amenities of a large town and a population of approximately 600.

But with these riches came at a price…in 1853 a young man named Herman C. Bellou of New York was killed at Little York when a bank caved in above the spot he was working (Daily Alta California 1853). One year later, engineer Rudolph Conrad was making repairs in a saw mill when he was burned to death by hot water and steam from the boiler when a screw came loose (SDU 1854a). Several months later, Mr. Scott of Little York was struck in the eye by a sharp piece of quartz which was successfully removed by the local doctor (SDU 1854b). In 1857 miner William Hutchings was killed instantly when a bank caved in above him (SDU 1875).

Secret Town Mine

On January 8, 1863 ground was officially broken at Sacramento to begin construction of the Central Pacific Railroad, with the first rail officially laid on October 27, 1863, and the 18-mile segment between Sacramento and Roseville was completed by the end of the year. By 1866 an additional 66 miles of railroad was completed to reach Secret Town (SFC 1913), and rail cars began running to Secret Town just one month later. One of the richest ledges of quartz ever found in the area had been recently discovered approximately four miles from the town of Willow Creek by a Mexican laborer under the employ of B.K. Thorne and William Irvine. By 1870, plans were already in the works to cut a tunnel through the Colfax divide near Secret Town, low enough to tap into the Bear River and build a sluice off of the substantial tailings that ran alongside the river for several miles. The tailings were described as being "scores of feet in depth – the most extensive in the State – and a large proportion of them have come from diggings of exceeding richness" (SDU 1870). Local authorities estimated that the tunnel would need to be anywhere from 1.75 miles to five miles in length.

In February 1872, the *Sacramento Daily Union* reported that a man named John F. Anderson, a native of Scotland with a family in Merced County, was killed by a fall from the Secret Town railroad bridge just three miles west of Gold Run (SDU 1872). Just over one year later, it was reported that the railroad bridge at Secret Town has been destroyed by a fire and temporarily interrupted the wires of the local telegraph companies (SDU 1873).

In 1890, the *Colfax Sentinel* reported that F.C. Gayety & Son established a quartz claim near Secret Town approximately seven miles north of Colfax that had promise of becoming a good quartz mine. The article describes the claim as having three ledges six feet in width, yielding approximately 500 tons of ore, with rock assays worth about $30 per ton (SDU 1890). Just three years later, articles of incorporation were published for the Gold Ring Mining Company, naming E. Alberto Moody and Charles S. Moody of Gold Run and J.M. Gayety of Secret Town, and Thomas F. Graber and Almon Aimes of Berkeley as directors (SDU 1893). By 1896 the Secret Town Mine appeared in the California State Mining Bureau's State Mineralogist Report described as a quartz mine located three miles south of Gold Run at an elevation of 2,875 feet above mean sea level, with a two-foot quartz vein striking northwest and dipping 60 degrees northeast in a slate formation. The report also describes two mine shafts, 35-feet and 40-feet deep, respectively, and a 20-foot tunnel that cuts the vein at a depth of 150-feet. The mine was reported as being owned by Moody & Gayety of Gold Run (Crawford 1896:285). The 1919 State Mineralogist Report reflects another change in ownership of the mine to E.A. Moody and J.E. Everhart (1919:350).

Chicago Park Colony

In 1887 plans were announced to start dividing up a large number of tracts and lots throughout the Nevada County Bartlett-pear belt, an area which was becoming increasingly more lucrative. This area included a new area known as the Chicago Park Colony, located along the narrow gauge railroad line between Sacramento and Grass Valley near the town of Colfax. It was purported to be "the first real colony in the northern part of this State" and to be populated by "actual new settlers, most of whom will come from the city of Chicago or its immediate vicinity". Once enough land in the colony had been sold, Chicago Park was touted to be a success, with the sale of its lands "doubly assured". According to a report in the Sacramento Daily Union, the colony was established by Morris Lobner and W.B. Hayford of Colfax, who convinced nine men from Chicago to join them in a syndicate which purchased 6,700 acres of land approximately three miles from Colfax on the Nevada County side of the Bear River. "It is a rolling land with rich soil, well adapted to the production of apples, pears, grapes, and the more marketable varieties of fruit". A total of 80 acres were reserved for the town site, with a small portion in the center reserved for a public square. Lot size averaged around 40 x 125-feet in size, and the streets were named after well-known streets in Chicago, IL such as Calumet and La Salle Avenues. Larger lots were reserved for the construction of two churches and a school-house. An additional five acres was reserved just outside of town for the development of a hotel. Large lots were sold upon the condition that at least five-acres be improved and planted on in the coming year. By 1887 approximately 2,000-acres had already been sold to support at least 100 families. The Chicago Park Colony was viewed as a place that would draw attention to the Sierra Foothills (SDU 1887). An article in the Sacramento Daily Union provides an interesting description of the Chicago Park Colony in its early days in contrast to other parts of the foothills where mining had taken its toll on the landscape:

> We no longer see the beautiful foothills scarred, gashed and covered with refuse from the mines, and the level spots covered here and there with broken rocks and other mining debris, and the ravines washed bare of earth. In these days one does not see a few families huddled together and living on scant pastures, but in place of this are orchards of peach, plum, prunes, olives, apples, pears, figs, oranges, a great variety of nut trees, waving fields of rich green clover, wheat, alfalfa, and the beautiful and broad-leafed vine, loaded with clusters of rich purple grapes in numberless varieties…Beautiful homes, surrounded by plants, shrubs and trees of the loveliest bloom and richest foliage, will delight the traveler through this favored land…Here are being reproduced the figs of Smyrna, the lemons of Sicily, the olives of Spain and the wines of France…the future of the foothills must arouse in the heart of every Californian feelings of pleasure and pride, of delight and satisfaction (SDU 1888a).

By 1888 Chicago Park continue to grow and develop, receiving its own published newspaper The Chicago Park Times in January, as well as its very own post office in April with J.H. Hubachek as Postmaster, who resigned later that year.

Hydroelectric Power in Placer and Nevada Counties

In the early 1850s PG&E began construction of an elaborate system of canals, ditches, and pipelines to supply water for hydraulic mining. Miners desperately needed a reliable water supply to wash gravel and pick out the precious gold flecks hidden within. In 1853 there were three primary water companies in the region who were constantly battling in court over claims, counterclaims, and rights of way: Rock Creek, Deer Creek, and South Yuba Canal Companies.

The later managed to remain intact over the years and eventually became the South Yuba Water Company, and by 1905, was taken over as an essential component of PG&E. Hydroelectric power generation first gained attention in 1902 when the Central California Electric Company (a subsidiary of the South Yuba Water Company) completed construction of the Alta Power House. Now that PG&E was in the picture, plans were soon underway for an extensive water system to generate electric power. In the beginning there were delays, especially after the 1906 San Francisco earthquake which caused the region to fall into a financial depression. Development would not get underway until 1912. By 1913 Spaulding Dam had been completed and Drum Power Plant in the Bear River Gorge was in operation. Soon more plants were erected including the Hasley Plant in Christian Valley and the Wise Plant in Auburn Ravine (Lardner and Brock 1924).

The NID was formed on August 15, 1921 by Nevada County voters in response to a campaign led by the Nevada County farm advisor and local agriculturalists, who believed that the Sierra Nevada foothill community desperately needed a reliable water supply. When it was first established approximately 202,000 acres were designated as NID land. In 1926, residents of adjacent Placer County opted to join the NID and an additional 66,500 acres were added.

When hydraulic mining was suspended in 1884, private water companies were forced to look for opportunities elsewhere, specifically in water and power production. Dr. Jarret Laban Rollins had moved from Auburn to Colfax in 1900 and established the Bear River Water and Power Company with a small group of businessmen. The group mapped out a solution to the local irrigation problem which included construction of a new dam and reservoir in the lower elevations of the Sierra Nevada Mountains. The company allied with the NID and helped them to acquire numerous private water systems in the 1920s through the 1950s. While a public water system was already developed to supply water from the Yuba and Bear River watersheds to farmers and their crops on the western slope, a complete network of pipes and canals was still lacking.

In the 1950s Pacific Gas and Electric Company (PG&E) prompted an initiative to harness the powers of the Yuba and Bear Rivers. As a result, NID partnered with PG&E to develop the Yuba-Bear Hydroelectric Project. The new partnership led to bigger and better opportunities including the ability for NID to offer power generation services. As California began to embrace the idea of hydroelectric power plants to help meet the state’s high demand for energy, NID district leaders rallied enough support to pass a $65 million bond to construct the Yuba-Bear River Power Project in 1962. The project includes four areas of development: Bowman, Dutch Flat, Chicago Park, and Rollins (NID 2005). Groundbreaking for the project took place on August 23, 1963 at what would become the site of Rollins Reservoir. The groundbreaking ceremony included destruction the 810 foot long trestle railroad bridge, which once carried the trains of the Nevada County Narrow Gauge Railroad (Barrett 2008). Most of the project was completed between the years 1963 and 1966 (NID 2005). Sadly, Dr. Rollins would never see his dreams come true as he passed away from a heart attack in 1933 at the age of 75. Still, the reservoir was named in his memory during the reservoir's dedication ceremony on May 7, 1966 (Barrett 2008).

Chicago Park development consisted of five major components: 1) the Chicago Park Conduit which diverts water from Dutch Flat #2 Afterbay Dam to Chicago Park Forebay; 2) Chicago Park Forebay which is located off-stream; Chicago Park Powerhouse Penstock which diverts water from Chicago Park Forebay to Chicago Park Powerhouse; 4) Chicago Park Powerhouse (located on the Bear River just northeast of the project area); and 5) Chicago Park Powerhouse Switchyard which is located adjacent to the Rollins Powerhouse (NID 2005).

The Chicago Park Powerhouse Bridge was constructed as an access road for vehicles transporting materials to the powerhouse. As-built plans indicate that the bridge was under construction in 1963 and was built as part of the Yuma-Bear River Development Project.

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3 RESEARCH METHODS

The Secretary of the Interior has issued Standards and Guidelines for Archeology and Historic Preservation (48 FR 44720–44726)), which are used for the identification and evaluation of historic properties and to ensure that the procedures are adequate and appropriate. The identification and evaluation of historic properties are dependent upon the relationship of individual properties to other similar properties (NPS and ACHP 1998, pp. 18–20). Information about properties regarding their prehistory, history, architecture, and other aspects of culture must be collected and organized to define these relationships (NPS 2009), which is the intent of the current inventory.

This investigation consisted of a records search of the project area and a 0.5-mile radius around the project area at the North Central Information Center (NCIC), Sonoma State. Following Bureau of Land Management (BLM) precedents, which are appropriate for federal projects in general, survey techniques are loosely grouped into two categories: reconnaissance and intensive (BLM 2004; NPS 2009). The choice of survey category depends on the level of effort required for a particular project, which can vary depending on the nature of the properties or property types, the possible adverse effects on such properties, and agency requirements (NPS and ACHP 1998). The selection of field survey techniques and level of effort must be responsive to the management needs and preservation goals that direct the survey effort. For any survey, it is important to consider the full range of historic properties that may be affected, either directly or indirectly, and consider strategies that will minimize any adverse effects and maximize beneficial effects on those properties (BLM 2004; NPS 2009; NPS and ACHP 1998).

The current survey methods can be classified as intensive since short-interval transect spacing and full documentation of cultural resources was completed. Survey staff exceeded the applicable Secretary of Interior Professional Qualifications Standards for archaeological survey. Dudek archaeologist Nicholas Hanten surveyed the entire project area of potential effect (APE) with transects spaced no more than 15 meters apart and oriented along the project alignment, except for the active river channel where water was flowing which was not surveyed. A Global Positioning System (GPS) receiver with sub-meter accuracy, loaded with shapefiles of previously recorded resources and project boundaries was used to verify the accuracy of the survey coverage and the location of previously mapped resources. Evidence for buried cultural deposits was opportunistically sought through inspection of natural or artificial erosion/excavation exposures and the spoils from rodent burrows. No artifacts were collected during the survey. Field recording and photo documentation of resources, as appropriate, was completed.

For the purposes of site definition, a minimum density of three or more artifacts in a 25-square-meter area would constitute an archaeological site, as would a feature (i.e., hearth), and any separation of 50 meters or more between artifacts or features was justification for delineation of a site boundary. Isolated finds would consist of fewer than three artifacts within a 25-square-meter area, and are recorded separately from sites, including the use of a different numbering scheme.

Archival/historic research was also performed on the mining history in Placer and Nevada Counties to better understand the context of the resources encountered. This research consisted of reviewing historic topographic map and aerials (www.historicaerials.com) and reviewing published documents (both online and in print).

Documentation of cultural resources complied with the Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation (48 FR 44716-44740), and the California Office of Historic Preservation Planning Bulletin Number 4(a), December 1989, Archaeological Resource Management Reports (ARMR): Recommended Contents and Format (ARMR Guidelines) for the Preparation and Review of Archaeological Reports. All cultural resources identified during this inventory were recorded on California Department of Parks and Recreation Form DPR 523 (Series 1/95), using the Instructions for Recording Historical Resources (Office of Historic Preservation 1995), including updates to previously recorded resources.

4 RESULTS

This section presents the results of the records search and the field survey of the current study.

4.1 Records Search Results

A records search was completed for the current project for a 0.5-mile radius around the project area by staff at the North Central Information Center (NCIC) at California State University Sacramento in December 2013. The records search identified 16 previous studies which have been performed with the records search area; of these, five have covered a least a portion of the project area (Table 1). In total, approximately 25% of the project area has been previously surveyed. The records search also identified 12 cultural resources within the records search area; of these, five are located within the project area (Table 2; Figure 3, Confidential Appendix B). Of the five previously recorded resources, four were combined into a single resource during a previous study and have been subsumed under a single Primary number, P-29-002740, leaving only two distinct resources in the APE. All previously recorded resources are historic period sites and isolates; no prehistoric resources were identified.

Table 1
Previous Cultural Resource Studies

Report Number	Year	Title	Author
Studies Covering Portions of the Record Search Area			
01602	1997	Confidential Archaeological Addendum for Timber Operations on Non-Federal Lands in California for Secret Town Amendment Timber Harvest Plan	Gillett, L.
03109	1996	Sacre THP	Allen, R.W.
03110	1996	Secret Town THP	Gillett, L. and Calvert, J.
05131	1989	Archaeological Reconnaissance of the Drum-Rio Transmission Line	Dames and Moore1
05763	1998	Confidential Archaeological Addendum for Timber Operations on Non-Federal Lands in California: Gearhart Ranch THP	Leonhard
05768	1996	Archaeological and Historical Resources Survey and Impact Assessment: Venture 11	Ferrier, D.C.
07853	2006	An Archaeological Survey Report for the Wier Timber Harvesting Plan, Nevada County, California	Rogers, T.
08137	2006	An Archaeological Survey Report for the Neocochea THP	Rogers, T.
08625	2007	An Archaeological Survey Report for the Add-on to Wier Timber Harvesting Plan, Nevada County, California	Rogers, T.L.
09958	1949	Overland Emigrant Trail	Henning, A.E.
11080	2012	Cultural Resources Constraints Study of the Drum-Higgins 115kV Wood Pole Replacement Project, Nevada and Placer Counties, California	Parus Consulting
Studies Covering a Portion of the Project Area			
00038	1964	Nevada Irrigation District Archaeological and Historical Survey (Rollins Reservoir Portion only)	Lutes, E.

Table 1
Previous Cultural Resource Studies

Report Number	Year	Title	Author
05766	1994	Archaeological and Historical Resources Survey and Impact Assessment: Venture 11	Whitlock, K.
10412	2010	Report#10439: NRHP Evaluation, NID's Yuba-Bear Hydroelectric System, FERC No. 2266, Nevada, Sierra, and Placer Counties, California	Lloyd, J.B. et al.
10412	2009	Cultural Resources survey for the Nevada Irrigation District Yuba-Bear Hydroelectric Relicensing Project (FERC Project No. 2266), Nevada, Placer, and Sierra Counties, California, and Subsequent Addendums	Lloyd, J.B. et al.
10866	2011	Addendum To: Cultural Resources Inventory, National Register of Historic Places Evaluations, and Finding of Effect for Nevada Irrigation District's Yuba-Bear Hydroelectric Project Relicensing (FERC No. 2266)	Flint, S.S. et al.

Table 2
Previously Recorded Cultural Resources

Trinomial P-	Period	Type	NRHP/CRHP Status	Description
Resources within the APE				
29-002740	Historic	Mining Complex	No Formal Recommendation	Pits, dam/reservoir, tailings, refuse scatter, portion of Southern Pacific Railroad boxcar. Incorporates P-29-003954, -003955, and -003956
29-003954	Historic	Mining Camp	No Formal Recommendation	Incorporated into P-29-002740
29-003955	Historic	Railroad boxcar	No Formal Recommendation	Incorporated into P-29-002740
29-003956	Historic	Mining scar/pit	No Formal Recommendation	Incorporated into P-29-002740
29-004315	Historic	Mining Road	No Formal Recommendation	Dirt road, retaining walls, adit, check dam
Resources within the 0.5 Mile Records Search Area				
29-000732	Historic	Trail	Determined Eligible for NRHP in 2005	Overland Emigrant Trail / Donner Trail
29-002165	Historic	Water Ditch	No Formal Recommendation	Earthen ditch, 5 rock retaining walls,
29-004363	Historic	Survey Marker	No Formal Recommendation	Metal pipe
31-005475	Historic	Water Ditch	No Formal Recommendation	Earthen ditch, 3 rock walls
31-005592	Historic	Mining Road	No Formal Recommendation	Earthen cut road; prospecting pit; skid trail
31-005594	Historic	Survey Marker	No Formal Recommendation	Metal pipe
31-005595	Historic	Isolate	No Formal Recommendation	1 piece of sheet metal

Figure 3 Records Search Results Map (Confidential Appendix B)

4.2 Field Survey Results

The pedestrian survey relocated the two previously recorded historic period resources and identified one new resource (Figure 4; Confidential Appendix B). Ground surface visibility varied considerably throughout the APE, with good visibility (50-75%) predominately in previously disturbed areas along the river bank and dry portions of the river bottom, and poor visibility (<25%) in the remainder to the APE. A light-to-moderate cover of snow was present in portions of the APE, particularly along the south side of the river, which contributed to low visibility. Previous gravel skimming activities along the river and historic period mining have effectively disturbed the entire APE. Field conditions at the time of the survey can be seen in Figure 5 and Figure 6.

Figure 4 Survey Results Map (Confidential Appendix B)

4.2.1 Previously Recorded Resources

P-29-002740/-003954/-003955/-003956

This resource consists of a historic period mining complex covering an area 223 by 290 meters. Terry Rogers originally recorded P-29-002740 in 2006 as an earthen reservoir. P-29-003954, -003955, and -003956 were recorded as three distinct resources in 2011 by Applied Earthworks. These resources, a prospecting pit and historic refuse scatter, a railroad boxcar, and a mining scar, were later merged into a single site with P-29-002740 in 2012 by HDR. The site is situated on a small terrace along the north bank of the Bear River, where it converges with Steephollow Creek. Based on statements in the existing site records, the mining activities in this location likely occurred in the late-19th and early-20th Centuries. Archival research, (see Chapter 2), indicates this is the location of an unnamed gold mine in the Little York Township which operated from 1850 through at least the early-1870s (Lester 1873, cited in Western Mining History 2012) and was later the location of Secret Town Mine.

During the current survey, all of the previously recorded site features were relocated and found to be in the same general condition as last reported. The reported refuse scatter was not observed at this time, nor was it seen at the time of the 2012 survey. No new features or artifacts were observed.

P-29-004315

This resource is a historic mining road/earthen ditch located along the northern bank of the Bear River. The resource was originally recorded in by HDR, Inc. in 2012. The road/ditch consists of 15 non-contiguous segments (recorded as Segments A-O) which appear on topographic maps as early as 1949, and may be on the 1883 plat map (HDR 2012). In addition to the road and ditch segments, other historic features include 22 rock retaining walls, a check dam, an adit, and two terraces cut into the hill slope to control the flow of water. Segment O, and the northernmost portion of Segment J, intersect the southern extent of the current project area. Within the project area, these segments only consist of earthen ditches; none of the rock walls or other features associated with the site area located here. Two artifacts, a metal pipe and sheet metal, are located near the southern end of Segment O.

During the current survey, the earthen ditch and artifacts was observed to be in the same condition as previously reported, and no new features or artifacts were observed. The 1949 Chicago Park USGS Quadrangle depicts the road/ditch extending north from the existing recorded boundary, along the northern edge of the Bear River, and then into the riverbed just south of the confluence with Steephollow Canyon. At the confluence, the road turns into a double-line trail/road and proceeds north up Steephollow Canyon. No portion of the trail was observed north of the recorded boundary, as it appears to have been destroyed, either through natural forces, or through mining/gravel skimming operations in the past. Gravel skimming operations will be restricted to the riverbed itself and will not encroach upon the riverbank; therefore, the road/ditch will not be impacted or affected by project implementation.

4.2.2 Newly Recorded Resources

Chicago Park Powerhouse Bridge

The Chicago Park Powerhouse Bridge was constructed in 1963 by Ebasco Services Incorporated, New York (As-Built Drawings) and is owned and operated by the NID. The bridge is a four span pre-stressed concrete girder bridge measuring 169 feet in length and 20 feet in width. The substructure is comprised of three tapered concrete piers supported by spread tiered concrete footings, with abutments placed on either side of the Bear River embankment. Each span is 42.3 feet in width. The superstructure consists of five concrete box beams between each span with a paved asphalt deck and metal guard rails on both sides. The bridge appears to be in original condition and no alterations were noted; the current condition of the bridge can be seen in Figure 7 and Figure 8.

The bridge is located at the eastern edge of the northernmost section of the current project area. As the bridge is still in use, gravel skimming operations will not occur directly adjacent to the bridge, in order to not disturb its structural integrity. Therefore, project development will not directly impact or affect the bridge. The bridge will also not be indirectly impacted or affected. Gravel skimming operations as proposed would re-start industrial operations which were associated with the original construction of the bridge and occurred in the area for almost four decades. These operations would not alter the setting or other characteristics of the resource.

Figure 5 Survey Area Overview Photo, Facing East

Figure 6 Survey Area Overview Photo, Facing East

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Figure 7 Chicago Park Powerhouse Bridge, Facing Northwest

Figure 8 Chicago Park Powerhouse Bridge, Detail Photo, Facing Northeast

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5 SUMMARY AND MANAGEMENT CONSIDERATIONS

The current cultural resources inventory was completed to satisfy the requirements of CEQA and Section 106 of the NHPA. Important in such an endeavor is the development of an understanding of each identified resource in such a way that its historical significance can be assessed. Section 106 of the NHPA mandates the consideration of the historical significance of a resource in an effort to gauge whether it has the potential to be listed in the NRHP; CEQA requires the same consideration of historic resources, but gauges the potential of those resources to be listed in the CRHR. As discussed in Chapter 1, criteria A–D of Section 106 are standards for determining the eligibility of a resource for NRHP listing; determinations under CEQA are essentially the same, however the criteria are numbered 1-4. Survey level data are not sufficient to evaluate resources under Section 106 or CEQA so these resources were formal eligibility recommendations are not presented at this time.

Three historic period cultural resources were identified during this inventory study, none of which have been formally evaluated. The two previously recorded resources consist of a mining complex and a road/earthen ditch. The mining complex (CA-INY-2740) appears to be the remains of an unnamed mine associated with the Little York mining camp and Township and the Secret Town Mine which operated between 1852 and the early 1900s. Proposed gravel skimming operations would remove rock and sediments from within the site boundary, as occurred from 1965-2002 before gravel skimming operations were ceased. Since gravel skimming occurred at the site for almost four decades, the site is clearly not in the same condition as it would have been when the mine was in use or when it was abandoned. While the earthen embankments which comprise the reservoir are still in their original locations, tailing piles and most of the ground surface of the site have been heavily disturbed by the previous gravel skimming activities and the mine shafts are no longer present or identifiable. Proposed gravel skimming at this time would occur in locations previously disturbed by gravel skimming prior to 2002. Therefore, re-starting the same skimming operations would not affect or impact the site.

The road/earthen ditch (P-29-004315) is located along the western bank of the river, above the elevation where gravel skimming operations would occur. The resource may have been an access road into the Secret Town Mine, or may have been a water conveyance ditch associated with hydraulic mining at CA-INY-2740. In either case, it does not show up on topographic maps until 1949, indicating it may be much more recent than the mine. At this time it is not possible to make a direct connection between the road/ditch and the mine, although it would be reasonable to conclude they are related. As this resource is located at a higher elevation than the proposed skimming operations, it will not be impacted or affected by the project.

The Chicago Park Powerhouse Bridge, a newly recorded resource, was built in 1963 to service operations in association with the Rollins reservoir, particularly hauling rock and sediments removed from the river during gravel skimming prior to 2002. The bridge, which is located at the edge of the proposed gravel skimming operations, is currently in use.

Based on the historic research into the bridge performed during this study, the bridge does not meet any of the eligibility criteria for inclusion in the NRHP or the CRHR. The bridge is not associated with events that have made a significant contribution to the broad patterns of our history (Criterion A/1); is not associated with the lives of persons significant in our past (Criterion B/2); does not embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack the individual distinction (Criterion C/3); nor has it yielded or is likely to yield, information important to prehistory or history (Criterion D/4).

Gravel skimming will not occur directly adjacent to the bridge and will not directly impact or affect the bridge. Gravel skimming operations were part of the original activities associated with the bridge construction; therefore, restarting such activities would not constitute an indirect effect or impact to the resource, as the setting of the resource would not be altered in any way.

6 REFERENCES

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36 CFR 800.1–800.16 and Appendix A. Protection of Historic Properties.

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APPENDIX A (CONFIDENTIAL)

Records Search Maps and Information

APPENDIX B (CONFIDENTIAL)

Maps and Site Forms

APPENDIX C

NAHC and Tribal Correspondence

DUDEK

MAIN OFFICE
605 THIRD STREET
ENCINITAS, CALIFORNIA 92024
T 760.942.5147 T 800.450.1818 F 760.632.0164

December 11, 2013

Dave Singleton
Program Analyst
Native American Heritage Commission
915 Capitol Mall, Suite 364
Sacramento, CA 95814-4801
ds_nahc@pacbell.net
(916) 6753-6251

Subject: ***Request for Information for the Bear River Restoration Project, Nevada and Placer County, California***

Dear Mr. Singleton:

I am writing to you to request a search of your files on hand related to the proposed re-establishment of gravel skimming operations to restore and maintain reservoir capacity in Rollins Reservoir. The Project is located on the Bear River below the confluence of Steephollow Creek, approximately six miles northeast of the City of Colfax (see detailed map information below, and on Figure 1). The Project is proposed by the Nevada Irrigation District and is under the jurisdiction of the U.S. Army Corps of Engineers for purposes of compliance with Section 106 of the National Historic Preservation Act (NHPA). Currently, I am unaware of any cultural resources recorded within the project area or the records search buffer. As shown on the attached map, I am requesting a records search for a half-mile radius around the project area. Please call me at Dudek if you have questions.

Respectfully Submitted,

Nicholas Hanten
Archaeologist

Figure 1: Project location map with a half-mile records search radius

USGS Topo 7.5 Minute Series – Chicago Park Quadrangle:
Township 15 N / Range 10 E / Sections 06 and 07
Township 15 N / Range 9 E / Sections 01 and 12

SOURCE: USGS Topo 7.5 Minute Series - Chicago Park Quadrangle
Township 15N / Range 10E / Section 06, 07
Township 15N / 9E / Section 01, 12

FIGURE 1

Records Request

Bear River Restoration Project NOP

NATIVE AMERICAN HERITAGE COMMISSION
1550 Harbor Blvd., ROOM 100
West SACRAMENTO, CA 95691
(916) 373-3710
Fax (916) 373-5471

December 19, 2013

Nicolas Hanten
DUDEK
605 Third St.
Encinitas, CA 92024

Sent by Fax: 760-632-0164

Number of Pages: 3

Re: Bear River Restoration Project, Nevada and Placer Counties

Dear Mr. Hanten,

A record search of the sacred land file has failed to indicate the presence of Native American cultural resources in the immediate project area. The absence of specific site information in the sacred lands file does not indicate the absence of cultural resources in any project area. Other sources of cultural resources should also be contacted for information regarding known and recorded sites.

Enclosed is a list of Native Americans individuals/organizations who may have knowledge of cultural resources in the project area. The Commission makes no recommendation or preference of a single individual, or group over another. This list should provide a starting place in locating areas of potential adverse impact within the proposed project area. I suggest you contact all of those indicated, if they cannot supply information, they might recommend others with specific knowledge. By contacting all those listed, your organization will be better able to respond to claims of failure to consult with the appropriate tribe or group. If a response has not been received within two weeks of notification, the Commission requests that you follow-up with a telephone call to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from any of these individuals or groups, please notify me. With your assistance we are able to assure that our lists contain current information. If you have any questions or need additional information, please contact me at (916) 373-3711.

Sincerely,

Rob Wood
Associate Government Program Analyst

Native American Contact List
Nevada and Placer Counties
December 17, 2013

Shingle Springs Band of Miwok Indians
Hermo Olanio, Vice Chairperson
P.O. Box 1340 — Miwok
Shingle Springs , CA 95682 — Maidu
holanio@ssband.org
(530) 676-8010
(530) 676-8033 Fax

Shingle Springs Band of Miwok Indians
Nicholas Fonseca, Chairperson
P.O. Box 1340 — Miwok
Shingle Springs , CA 95682 — Maidu
nfonseca@ssband.org
(530) 676-8010
(530) 676-8033 Fax

Jill Harvey
11799 McCourtney Road — Maidu
Grass Valley , CA 95949 — Miwok
(530) 273-1749

T' si-Akim Maidu
Grayson Coney, Cultural Director
P.O. Box 1316 — Maidu
Colfax , CA 95713
akimmaidu@att.net
(530) 383-7234

Rose Enos
15310 Bancroft Road — Maidu
Auburn , CA 95603 — Washoe
(530) 878-2378

United Auburn Indian Community of the Auburn Rancheria
Marcos Guerrero, Tribal Preservation Committee
10720 Indian Hill Road — Maidu
Auburn , CA 95603 — Miwok
mguerrero@auburnrancheria.com
530-883-2364
530-883-2320 - Fax

United Auburn Indian Community of the Auburn Rancheria
Gene Whitehouse, Chairperson
10720 Indian Hill Road — Maidu
Auburn , CA 95603 — Miwok
530-883-2390
530-883-2380 - Fax

April Wallace Moore
19630 Placer Hills Road — Nisenan - So Maidu
Colfax , CA 95713 — Konkow
530-637-4279 — Washoe

T' si-Akim Maidu
Eileen Moon, Vice Chairperson
PO Box 1246 — Maidu
Grass Valley , CA 95945
530-274-7497

Shingle Springs Band of Miwok Indians
Daniel Fonseca, Cultural Resource Director
P.O. Box 1340 — Miwok
Shingle Springs , CA 95682 — Maidu
(530) 676-8010
(530) 676-8033 Fax

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list s only applicable for contacting local Native Americans with regard to cultural resources for the proposed Bear River Restoration Project, Chicago Park USGS Quadrangle, Nevada and Placer Counties

Native American Contact List
Nevada and Placer Counties
December 17, 2013

Colfax-Todds Valley Consolidated Tribe
Judith Marks
1068 Silverton Circle — Miwok
Lincoln , Ca 95648 — Maidu
916-580-4078

United Auburn Indian Community of the Auburn Rancheria
Jason Camp, THPO
10720 Indian Hill Road — Maidu
Auburn , CA 95603 — Miwok
jcamp@auburnrancheria.com
916-316-3772 - cell
530-883-2390
530-888-5476 - Fax

T' si-Akim Maidu
Don Ryberg, Chairperson
1239 East Main St. — Maidu
Grass Valley , CA 95945
530-274-7497

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list s only applicable for contacting local Native Americans with regard to cultural resources for the proposed Bear River Restoration Project, Chicago Park USGS Quadrangle, Nevada and Placer Counties

DUDEK

MAIN OFFICE
605 THIRD STREET
ENCINITAS, CALIFORNIA 92024
T 760.942.5147 T 800.450.1818 F 760.632.0164

January 27, 2014

Mr. Hermo Olanio
Shingle Springs Band of Miwok Indians
P.O. Box 1340
Shingle Springs, CA 95682

Subject: Information Request for the Bear River Restoration Project, Nevada and Placer Counties, California

Dear Mr. Olanio,

The Nevada Irrigation District (District) is proposing to re-establish gravel skimming operations to restore and maintain reservoir capacity in Rollins Reservoir (Figure 1). The proposed project is located on the Bear River below the confluence of Steephollow Creek, approximately six miles northeast of the City of Colfax, California. The project is under the jurisdiction of the U.S. Army Corps of Engineers for purposes of compliance with Section 106 of the National Historic Preservation Act (NHPA), and the District is the lead agency for compliance with CEQA. This project falls in Sections 6 and 7 of Township 15 North, Range 10 East of the Chicago Park, CA 1:24,000 USGS quadrangle (Figure 2).

The Native American Heritage Commission conducted a Sacred Lands file search for the project. No Native American cultural resources were identified within a one-half mile radius of the proposed project area. I am writing on behalf of the District as part of the consultation process in order to find out if you, or your tribal community, have any knowledge of cultural resources or places that may be impacted by the proposed project. If you have any information or concerns pertaining to such information, please contact me by phone or email.

Respectfully,

Brad Comeau, MSc., RPA
Archaeologist
Phone: (760) 479-4211
Email: bcomeau@dudek.com
Attachments:

Figure 1. Regional project map.
Figure 2. Project location map.

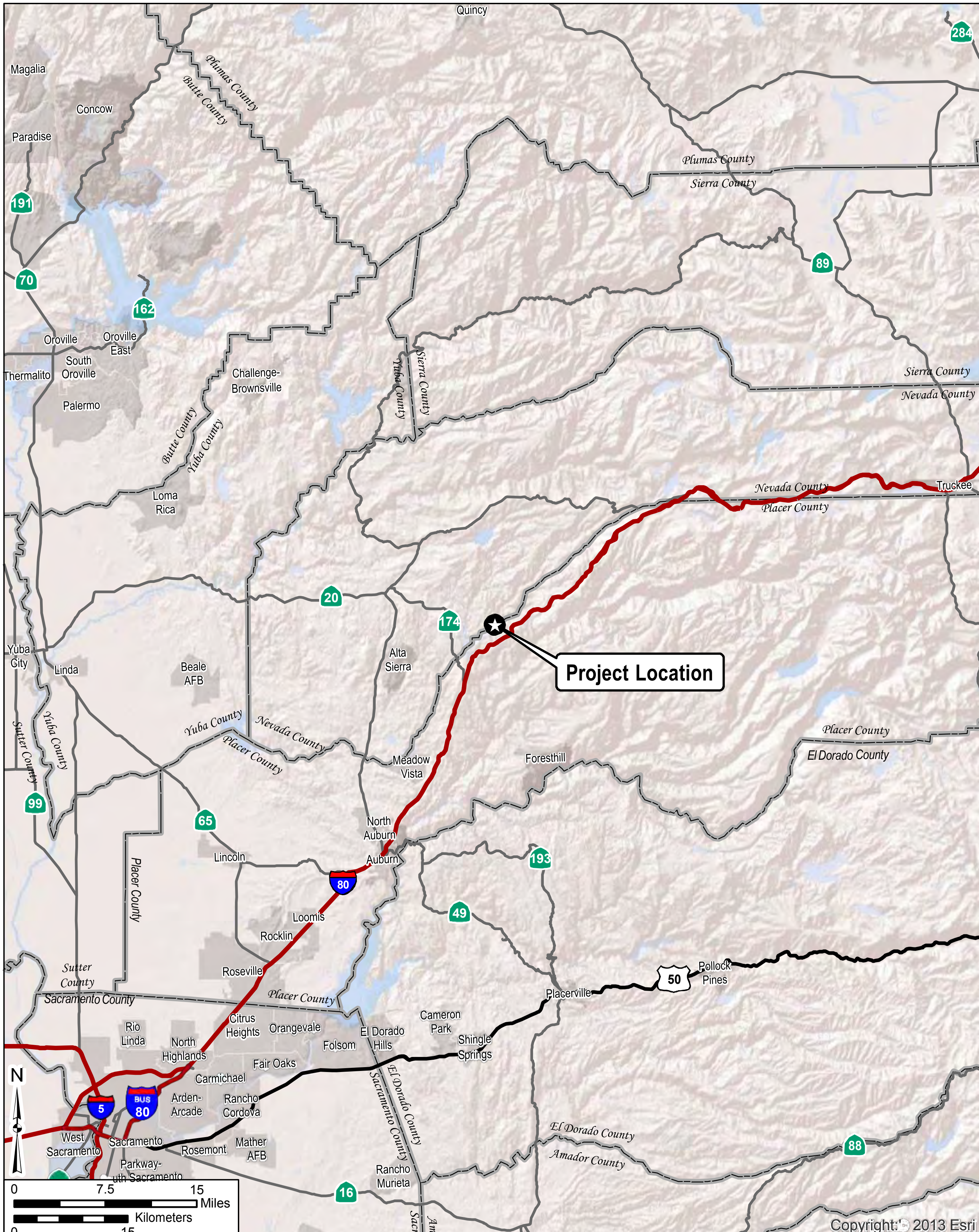

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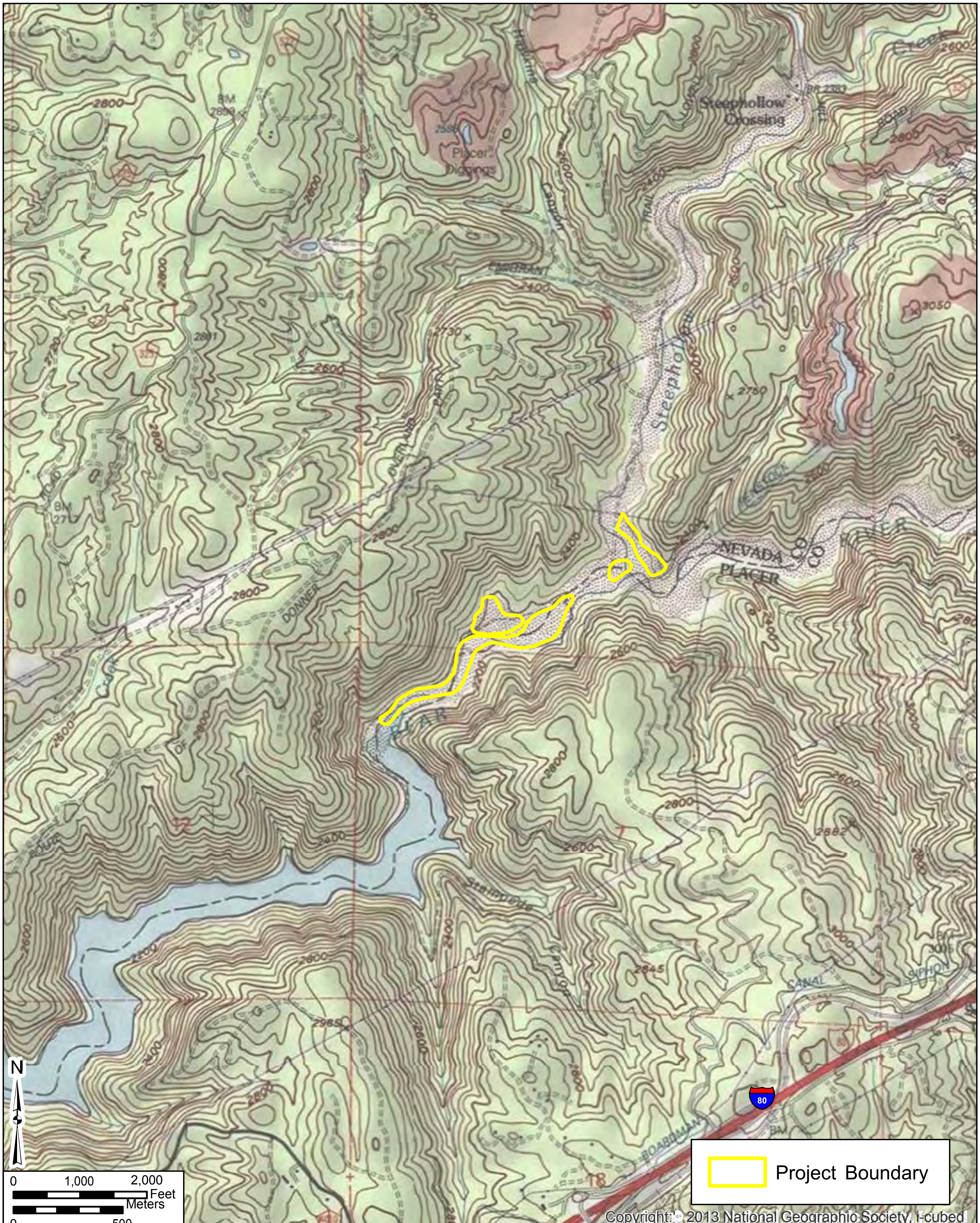
FIGURE 1
Regional Map

STEEPHOLLOW CREEK AND BEAR RIVER RESTORATION PROJECT



DUDEK

7974

SOURCE: USGS 7.5-Minute Series Chicago Park Quadrangle.

FIGURE 2
Location Map

STEEPHOLLOW CREEK AND BEAR RIVER RESTORATION PROJECT

DUDEK

MAIN OFFICE
605 THIRD STREET
ENCINITAS, CALIFORNIA 92024
T 760.942.5147 T 800.450.1818 F 760.632.0164

January 27, 2014

Ms. Jill Harvey
11799 McCourtney Road
Grass Valley, CA 95949

Subject: Information Request for the Bear River Restoration Project, Nevada and Placer Counties, California

Dear Ms. Harvey,

The Nevada Irrigation District (District) is proposing to re-establish gravel skimming operations to restore and maintain reservoir capacity in Rollins Reservoir (Figure 1). The proposed project is located on the Bear River below the confluence of Steephollow Creek, approximately six miles northeast of the City of Colfax, California. The project is under the jurisdiction of the U.S. Army Corps of Engineers for purposes of compliance with Section 106 of the National Historic Preservation Act (NHPA), and the District is the lead agency for compliance with CEQA. This project falls in Sections 6 and 7 of Township 15 North, Range 10 East of the Chicago Park, CA 1:24,000 USGS quadrangle (Figure 2).

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Respectfully,

Brad Comeau, MSc., RPA
Archaeologist
Phone: (760) 479-4211
Email: bcomeau@dudek.com

Attachments:

Figure 1. Regional project map.
Figure 2. Project location map.

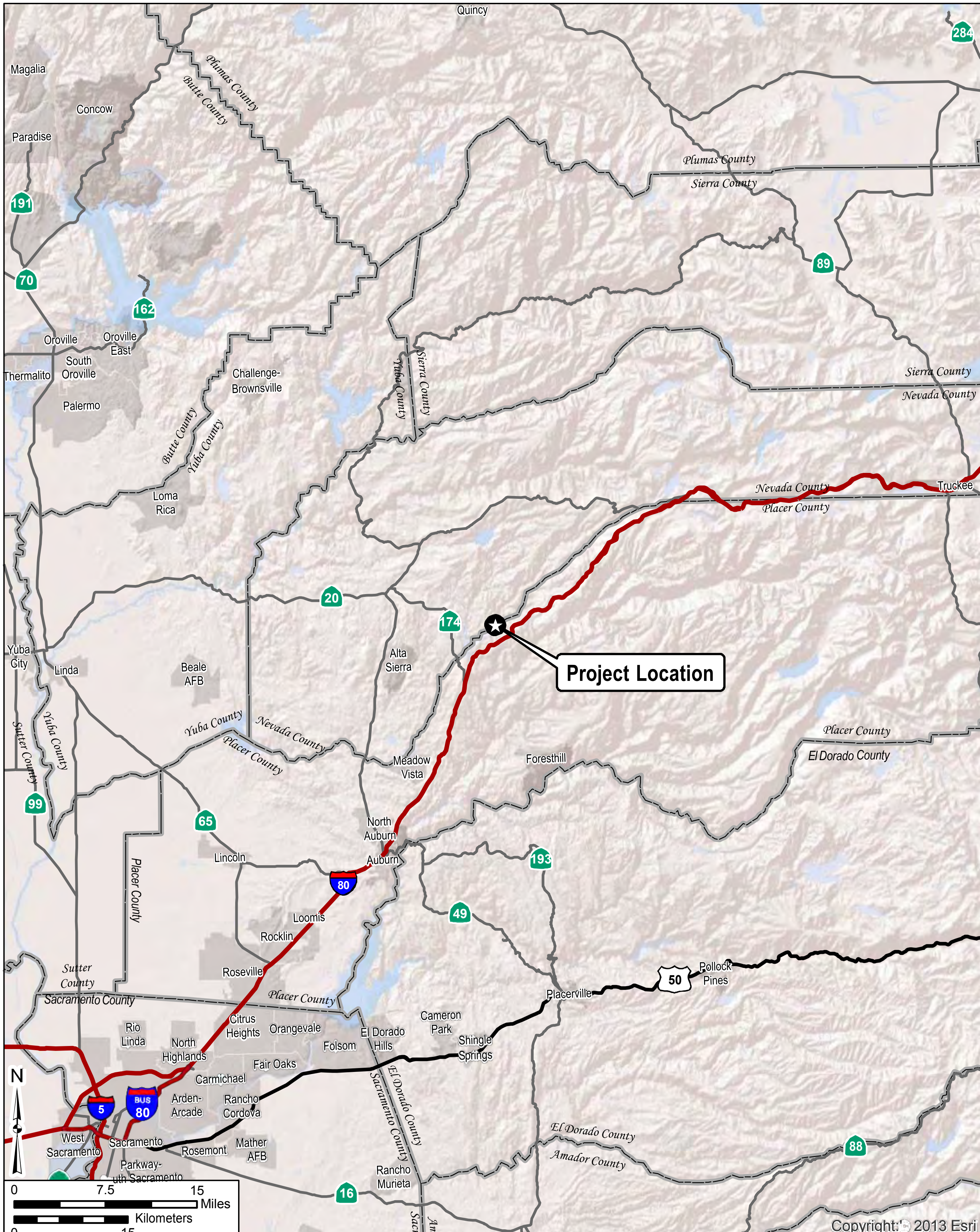

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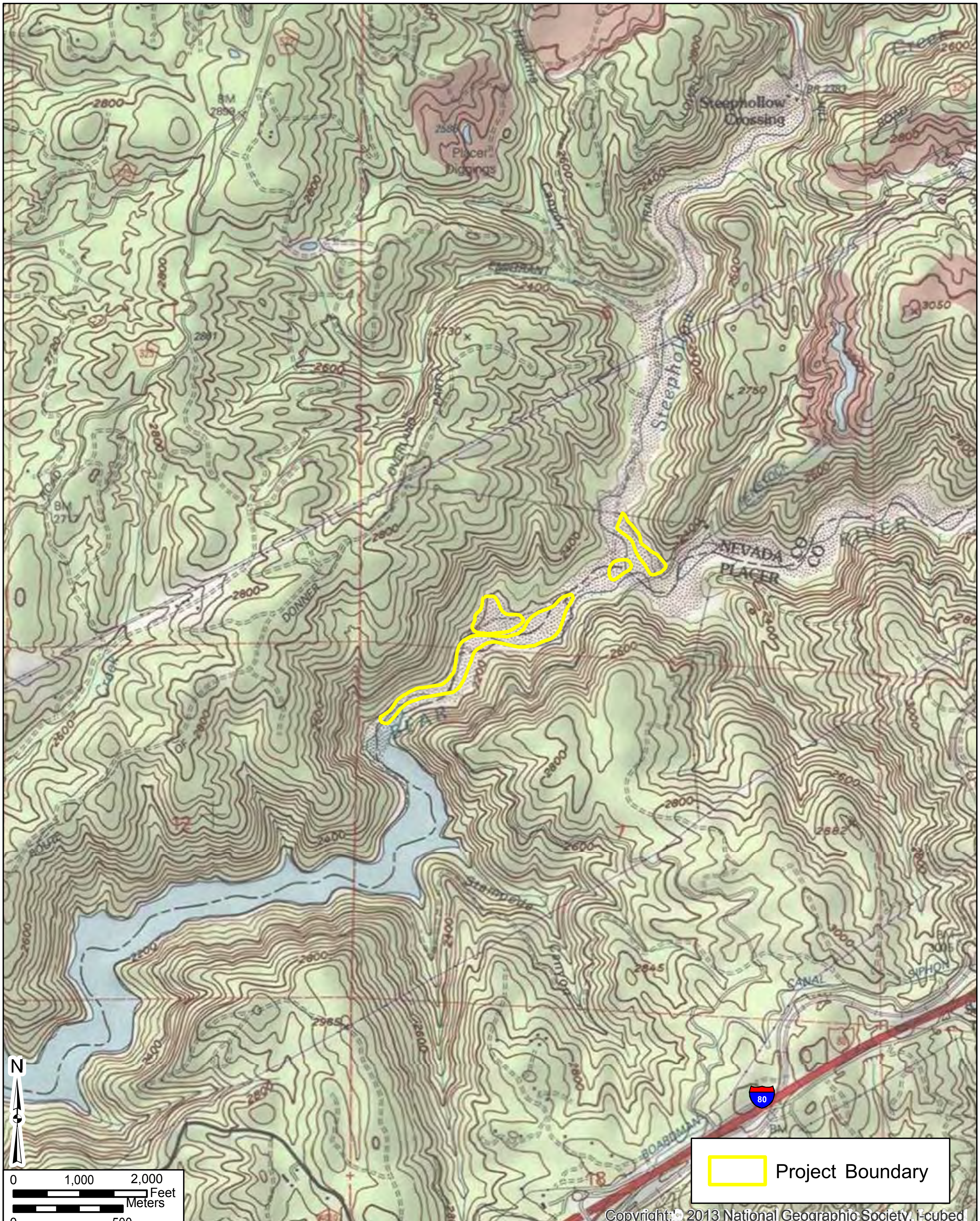
FIGURE 1
Regional Map

STEEPHOLLOW CREEK AND BEAR RIVER RESTORATION PROJECT



DUDEK

7974

SOURCE: USGS 7.5-Minute Series Chicago Park Quadrangle.

FIGURE 2

Location Map

STEEPHOLLOW CREEK AND BEAR RIVER RESTORATION PROJECT

DUDEK

MAIN OFFICE
605 THIRD STREET
ENCINITAS, CALIFORNIA 92024
T 760.942.5147 T 800.450.1818 F 760.632.0164

January 27, 2014

Ms. Rose Enos
15310 Bancroft Road
Auburn, CA 95603

Subject: Information Request for the Bear River Restoration Project, Nevada and Placer Counties, California

Dear Ms. Enos,

The Nevada Irrigation District (District) is proposing to re-establish gravel skimming operations to restore and maintain reservoir capacity in Rollins Reservoir (Figure 1). The proposed project is located on the Bear River below the confluence of Steephollow Creek, approximately six miles northeast of the City of Colfax, California. The project is under the jurisdiction of the U.S. Army Corps of Engineers for purposes of compliance with Section 106 of the National Historic Preservation Act (NHPA), and the District is the lead agency for compliance with CEQA. This project falls in Sections 6 and 7 of Township 15 North, Range 10 East of the Chicago Park, CA 1:24,000 USGS quadrangle (Figure 2).

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Respectfully,

Brad Comeau, MSc., RPA
Archaeologist
Phone: (760) 479-4211
Email: bcomeau@dudek.com
Attachments:

Figure 1. Regional project map.
Figure 2. Project location map.

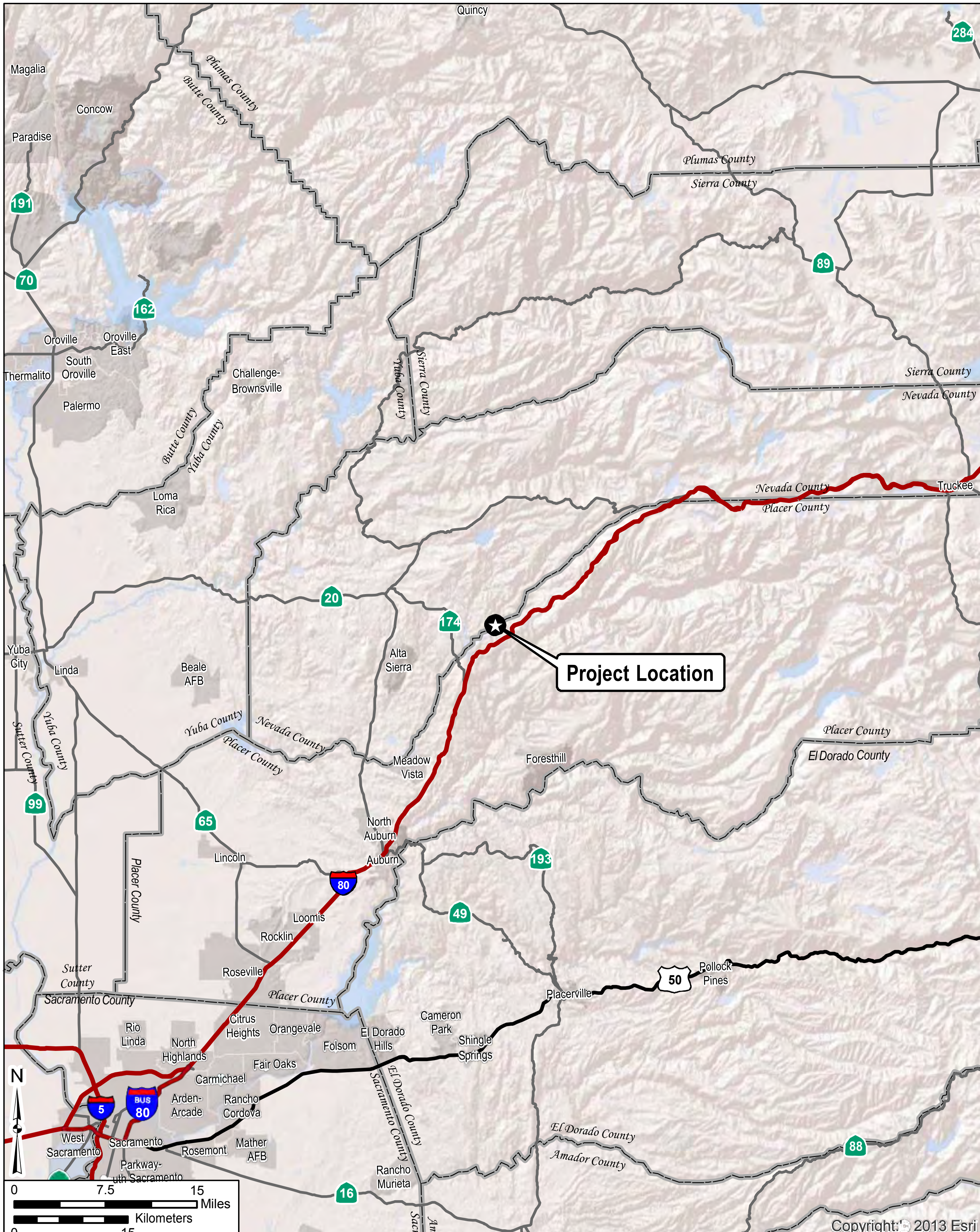

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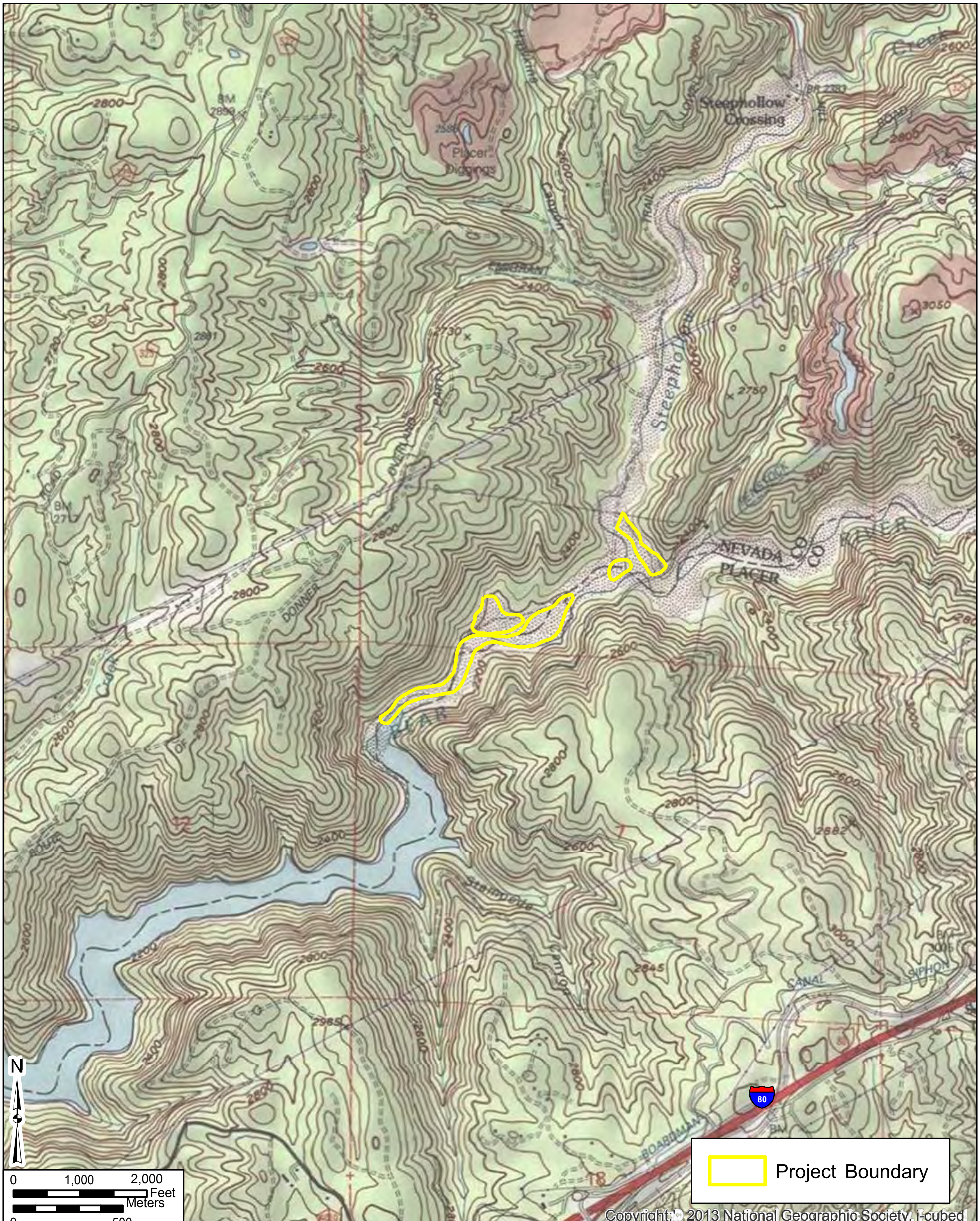
FIGURE 1

Regional Map

STEEPHOLLOW CREEK AND BEAR RIVER RESTORATION PROJECT



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SOURCE: USGS 7.5-Minute Series Chicago Park Quadrangle.

FIGURE 2

Location Map

STEEPHOLLOW CREEK AND BEAR RIVER RESTORATION PROJECT

DUDEK

MAIN OFFICE
605 THIRD STREET
ENCINITAS, CALIFORNIA 92024
T 760.942.5147 T 800.450.1818 F 760.632.0164

January 27, 2014

Mr. Gene Whitehouse
United Auburn Indian Community of the Auburn Rancheria
10720 Indian Hill Road
Auburn, CA 95603

Subject: Information Request for the Bear River Restoration Project, Nevada and Placer Counties, California

Dear Mr. Whitehouse,

The Nevada Irrigation District (District) is proposing to re-establish gravel skimming operations to restore and maintain reservoir capacity in Rollins Reservoir (Figure 1). The proposed project is located on the Bear River below the confluence of Steephollow Creek, approximately six miles northeast of the City of Colfax, California. The project is under the jurisdiction of the U.S. Army Corps of Engineers for purposes of compliance with Section 106 of the National Historic Preservation Act (NHPA), and the District is the lead agency for compliance with CEQA. This project falls in Sections 6 and 7 of Township 15 North, Range 10 East of the Chicago Park, CA 1:24,000 USGS quadrangle (Figure 2).

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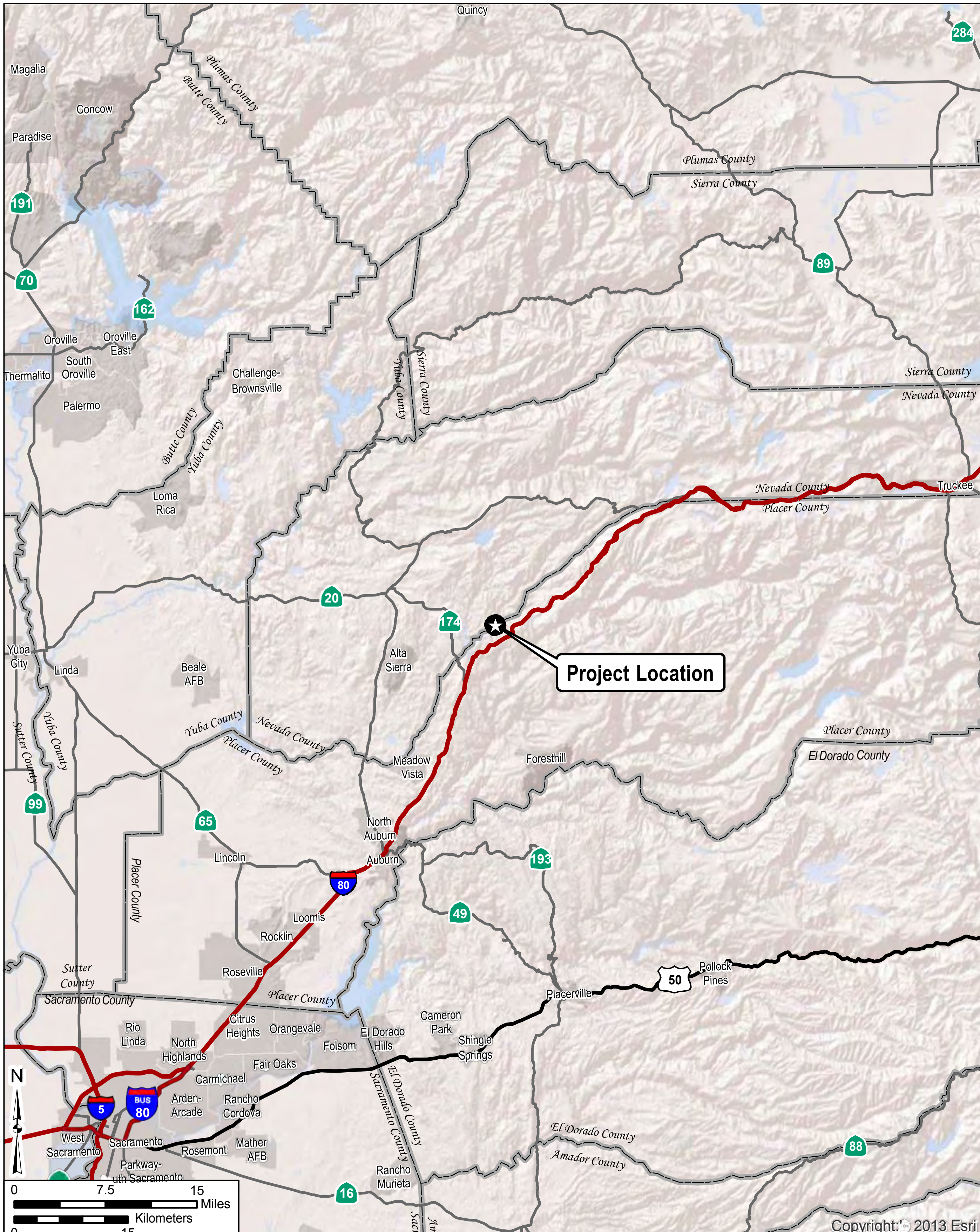

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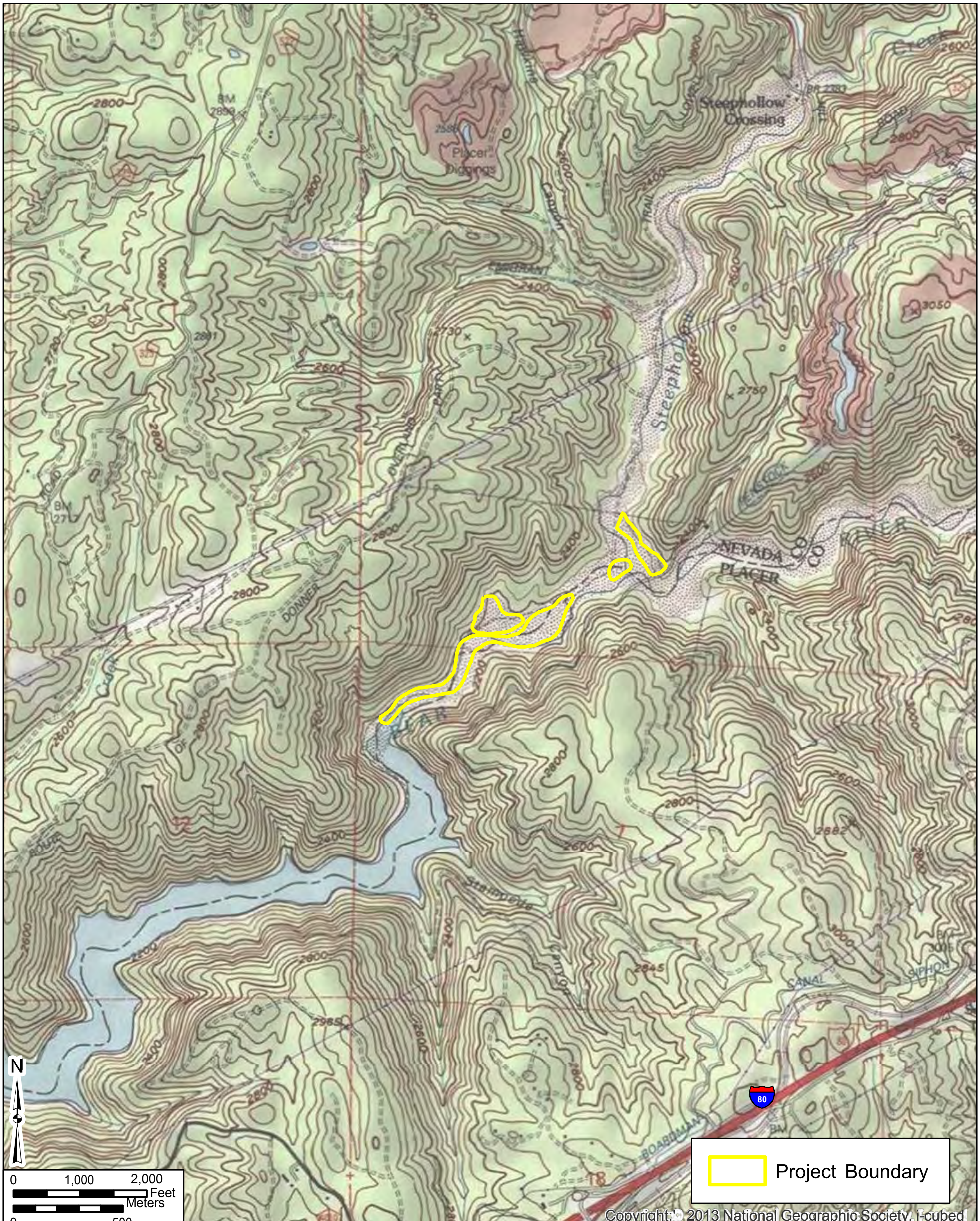

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FIGURE 2

Location Map

STEEPHOLLOW CREEK AND BEAR RIVER RESTORATION PROJECT

DUDEK

MAIN OFFICE
605 THIRD STREET
ENCINITAS, CALIFORNIA 92024
T 760.942.5147 T 800.450.1818 F 760.632.0164

January 27, 2014

Ms. Eileen Moon
T'si-Akim Maidu
P.O. Box 1246
Grass Valley, CA 95945

Subject: Information Request for the Bear River Restoration Project, Nevada and Placer Counties, California

Dear Ms. Moon,

The Nevada Irrigation District (District) is proposing to re-establish gravel skimming operations to restore and maintain reservoir capacity in Rollins Reservoir (Figure 1). The proposed project is located on the Bear River below the confluence of Steephollow Creek, approximately six miles northeast of the City of Colfax, California. The project is under the jurisdiction of the U.S. Army Corps of Engineers for purposes of compliance with Section 106 of the National Historic Preservation Act (NHPA), and the District is the lead agency for compliance with CEQA. This project falls in Sections 6 and 7 of Township 15 North, Range 10 East of the Chicago Park, CA 1:24,000 USGS quadrangle (Figure 2).

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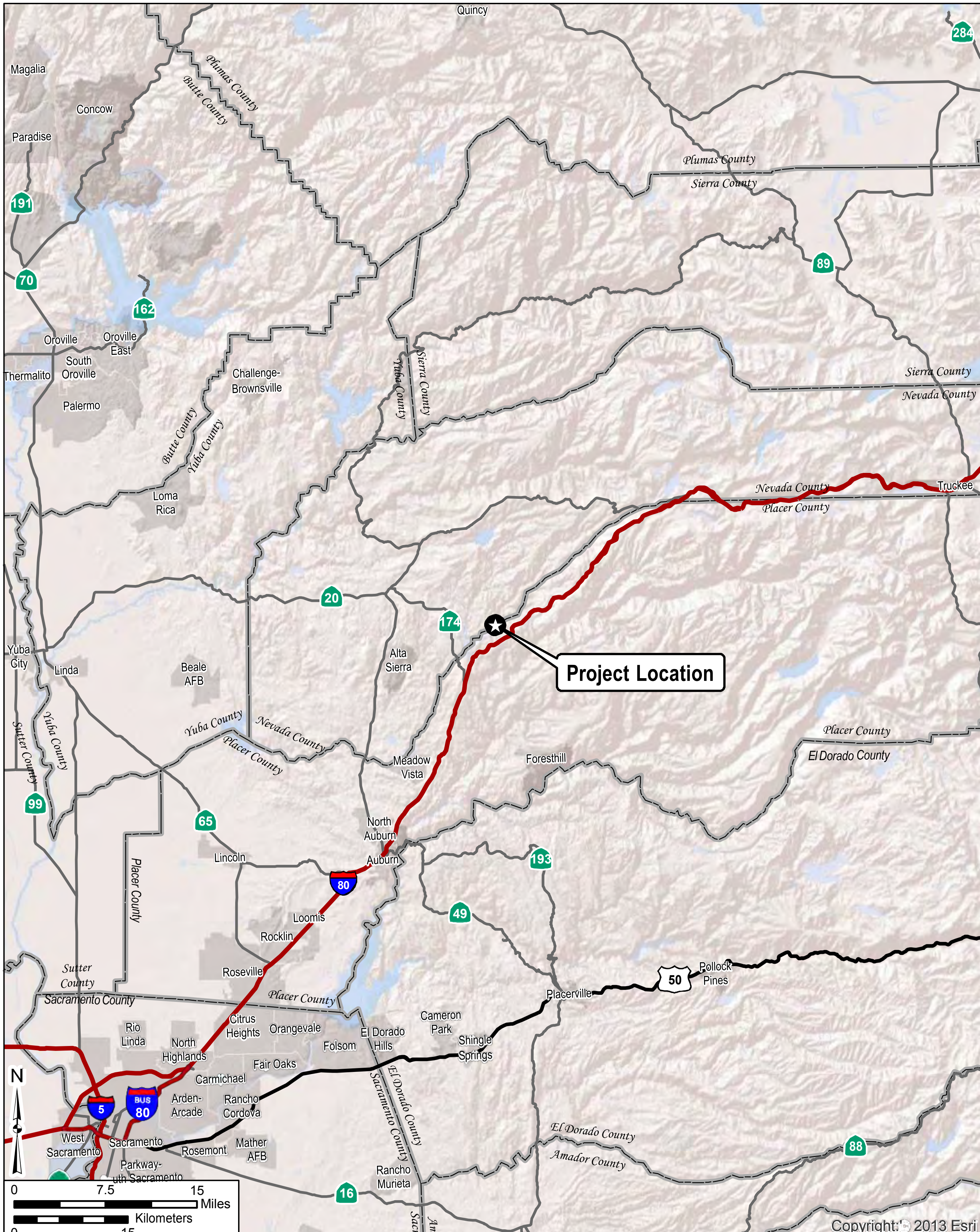

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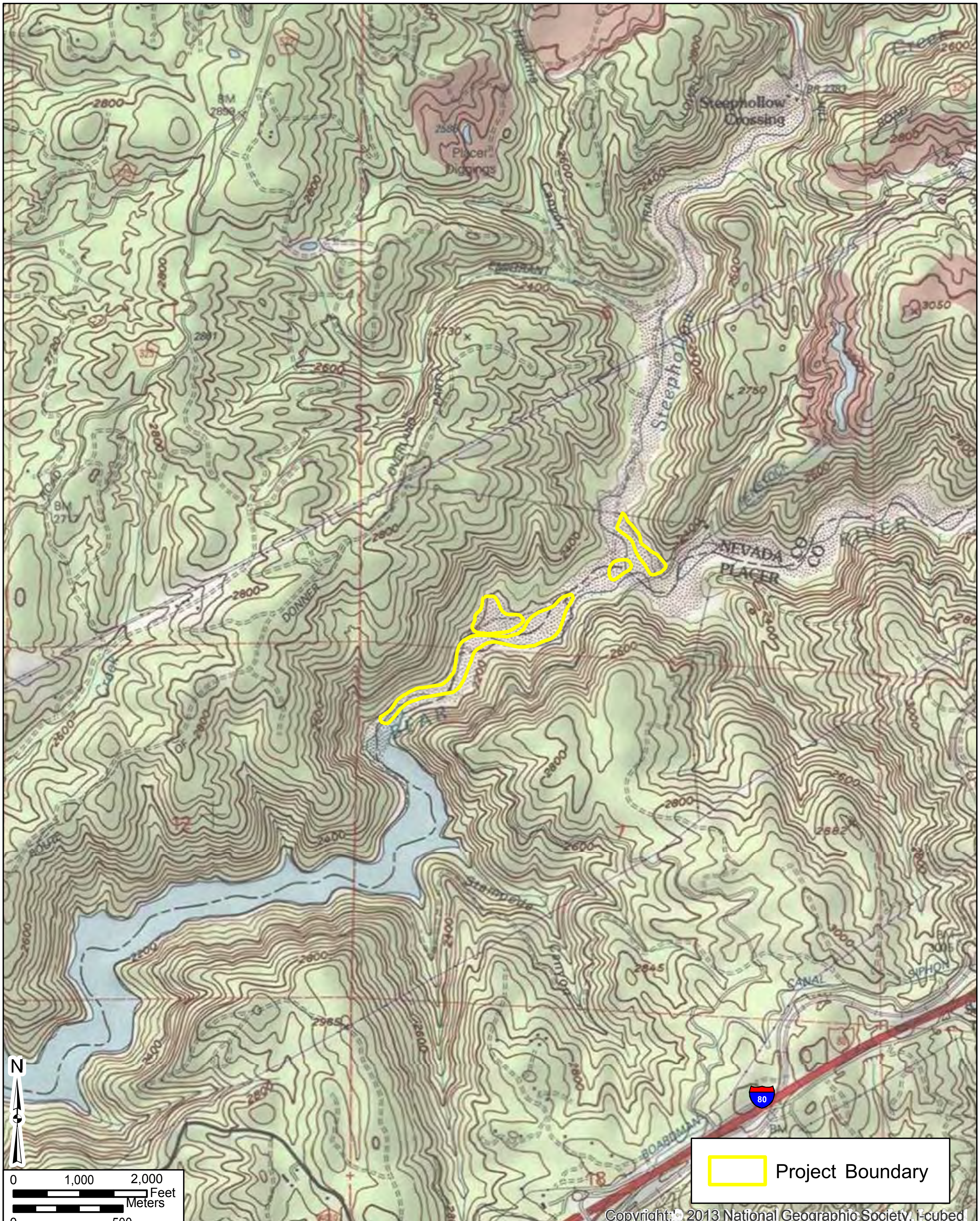

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FIGURE 2
Location Map

STEEPHOLLOW CREEK AND BEAR RIVER RESTORATION PROJECT

DUDEK

MAIN OFFICE
605 THIRD STREET
ENCINITAS, CALIFORNIA 92024
T 760.942.5147 T 800.450.1818 F 760.632.0164

January 27, 2014

Mr. Nicholas Fonseca
Shingle Springs Band of Miwok Indians
P.O. Box 1340
Shingle Springs, CA 95682

Subject: Information Request for the Bear River Restoration Project, Nevada and Placer Counties, California

Dear Mr. Fonseca,

The Nevada Irrigation District (District) is proposing to re-establish gravel skimming operations to restore and maintain reservoir capacity in Rollins Reservoir (Figure 1). The proposed project is located on the Bear River below the confluence of Steephollow Creek, approximately six miles northeast of the City of Colfax, California. The project is under the jurisdiction of the U.S. Army Corps of Engineers for purposes of compliance with Section 106 of the National Historic Preservation Act (NHPA), and the District is the lead agency for compliance with CEQA. This project falls in Sections 6 and 7 of Township 15 North, Range 10 East of the Chicago Park, CA 1:24,000 USGS quadrangle (Figure 2).

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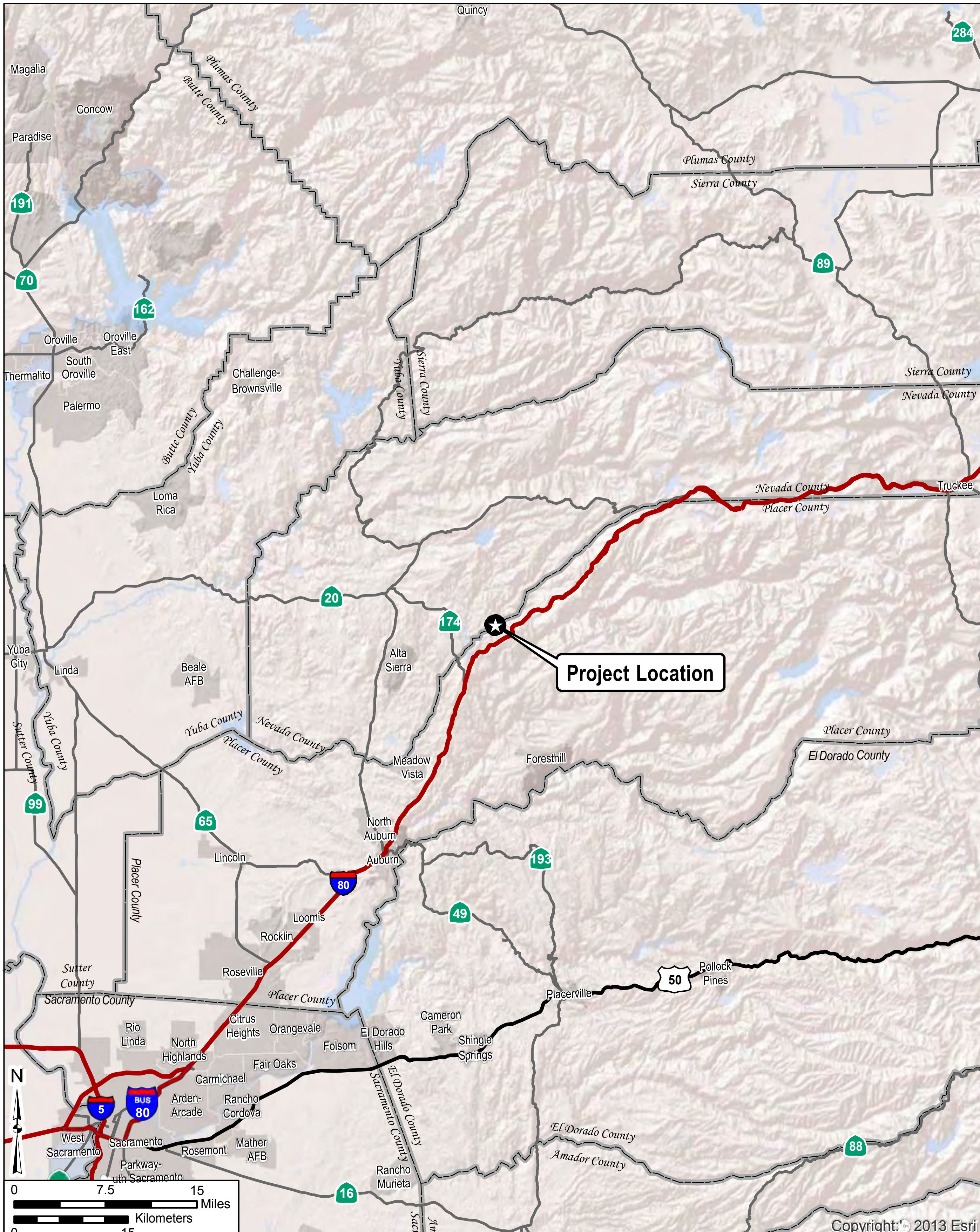

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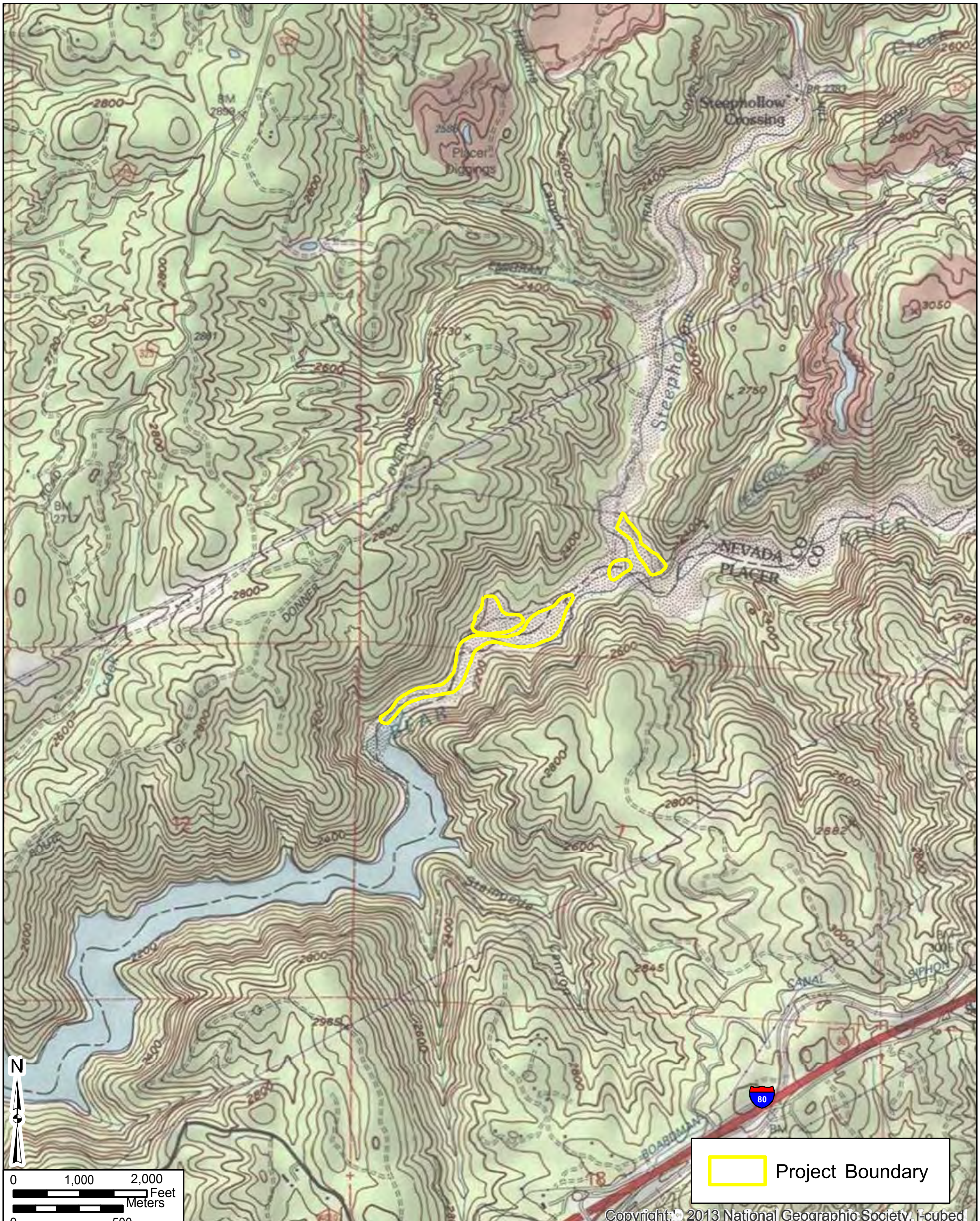

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FIGURE 2

Location Map

STEEPHOLLOW CREEK AND BEAR RIVER RESTORATION PROJECT

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MAIN OFFICE
605 THIRD STREET
ENCINITAS, CALIFORNIA 92024
T 760.942.5147 T 800.450.1818 F 760.632.0164

January 27, 2014

Mr. Jason Camp
United Auburn Indian Community of the Auburn Rancheria
10720 Indian Hill Road
Auburn, CA 95603

Subject: Information Request for the Bear River Restoration Project, Nevada and Placer Counties, California

Dear Mr. Camp,

The Nevada Irrigation District (District) is proposing to re-establish gravel skimming operations to restore and maintain reservoir capacity in Rollins Reservoir (Figure 1). The proposed project is located on the Bear River below the confluence of Steephollow Creek, approximately six miles northeast of the City of Colfax, California. The project is under the jurisdiction of the U.S. Army Corps of Engineers for purposes of compliance with Section 106 of the National Historic Preservation Act (NHPA), and the District is the lead agency for compliance with CEQA. This project falls in Sections 6 and 7 of Township 15 North, Range 10 East of the Chicago Park, CA 1:24,000 USGS quadrangle (Figure 2).

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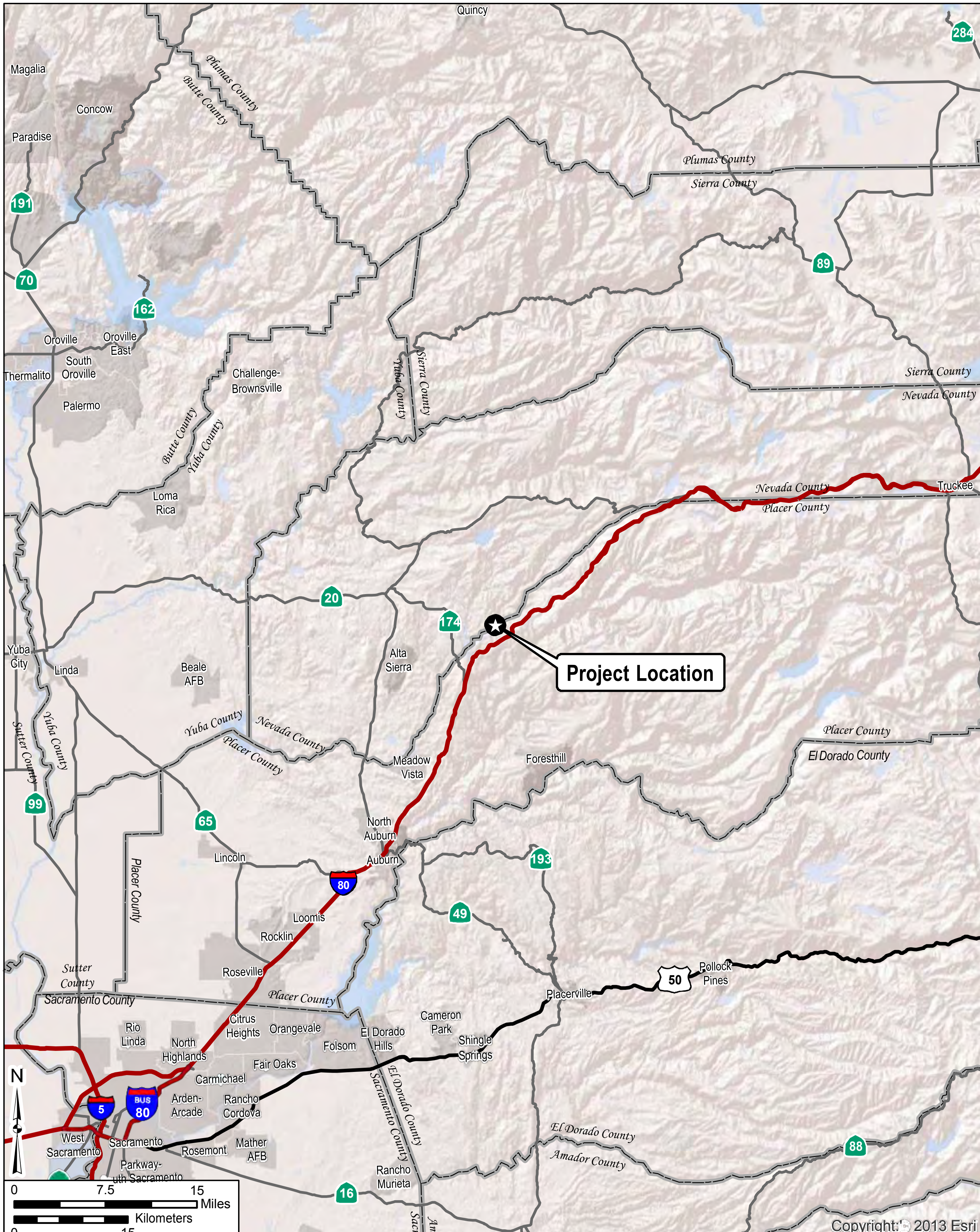

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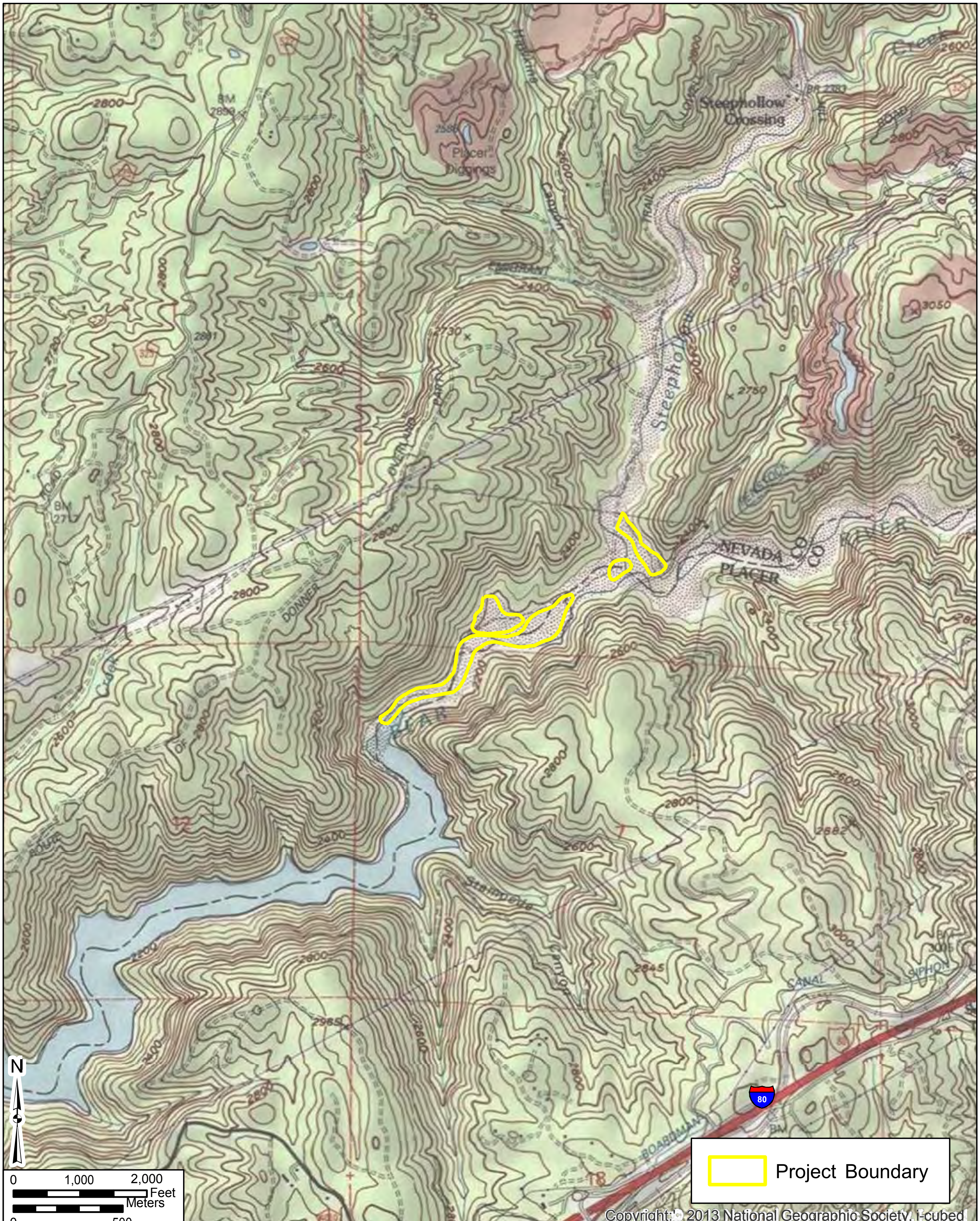

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STEEPHOLLOW CREEK AND BEAR RIVER RESTORATION PROJECT

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MAIN OFFICE
605 THIRD STREET
ENCINITAS, CALIFORNIA 92024
T 760.942.5147 T 800.450.1818 F 760.632.0164

January 27, 2014

Mr. Don Ryberg
T'si-Akim Maidu
1239 East Main St.
Grass Valley, CA 95945

Subject: Information Request for the Bear River Restoration Project, Nevada and Placer Counties, California

Dear Mr. Ryberg,

The Nevada Irrigation District (District) is proposing to re-establish gravel skimming operations to restore and maintain reservoir capacity in Rollins Reservoir (Figure 1). The proposed project is located on the Bear River below the confluence of Steephollow Creek, approximately six miles northeast of the City of Colfax, California. The project is under the jurisdiction of the U.S. Army Corps of Engineers for purposes of compliance with Section 106 of the National Historic Preservation Act (NHPA), and the District is the lead agency for compliance with CEQA. This project falls in Sections 6 and 7 of Township 15 North, Range 10 East of the Chicago Park, CA 1:24,000 USGS quadrangle (Figure 2).

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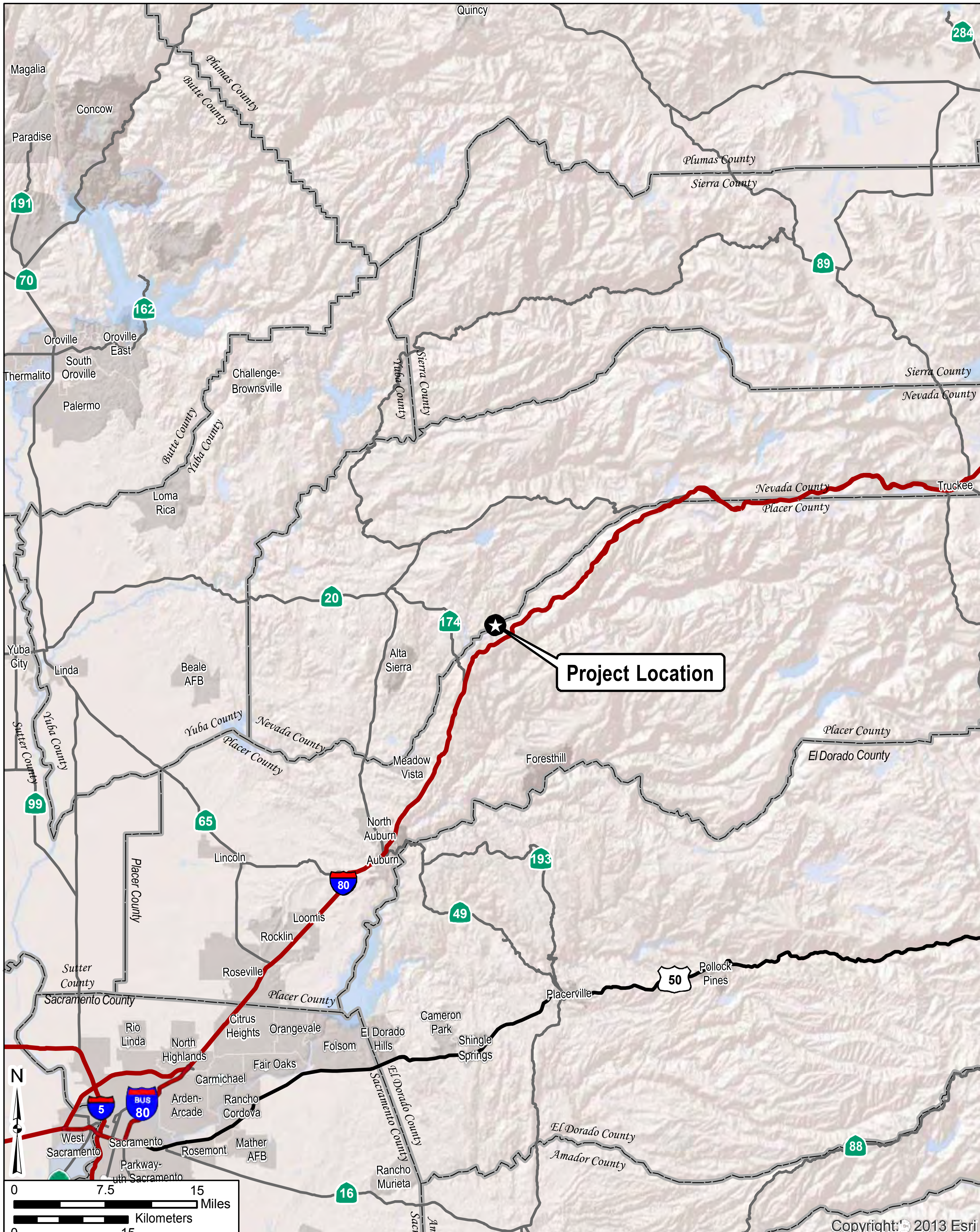

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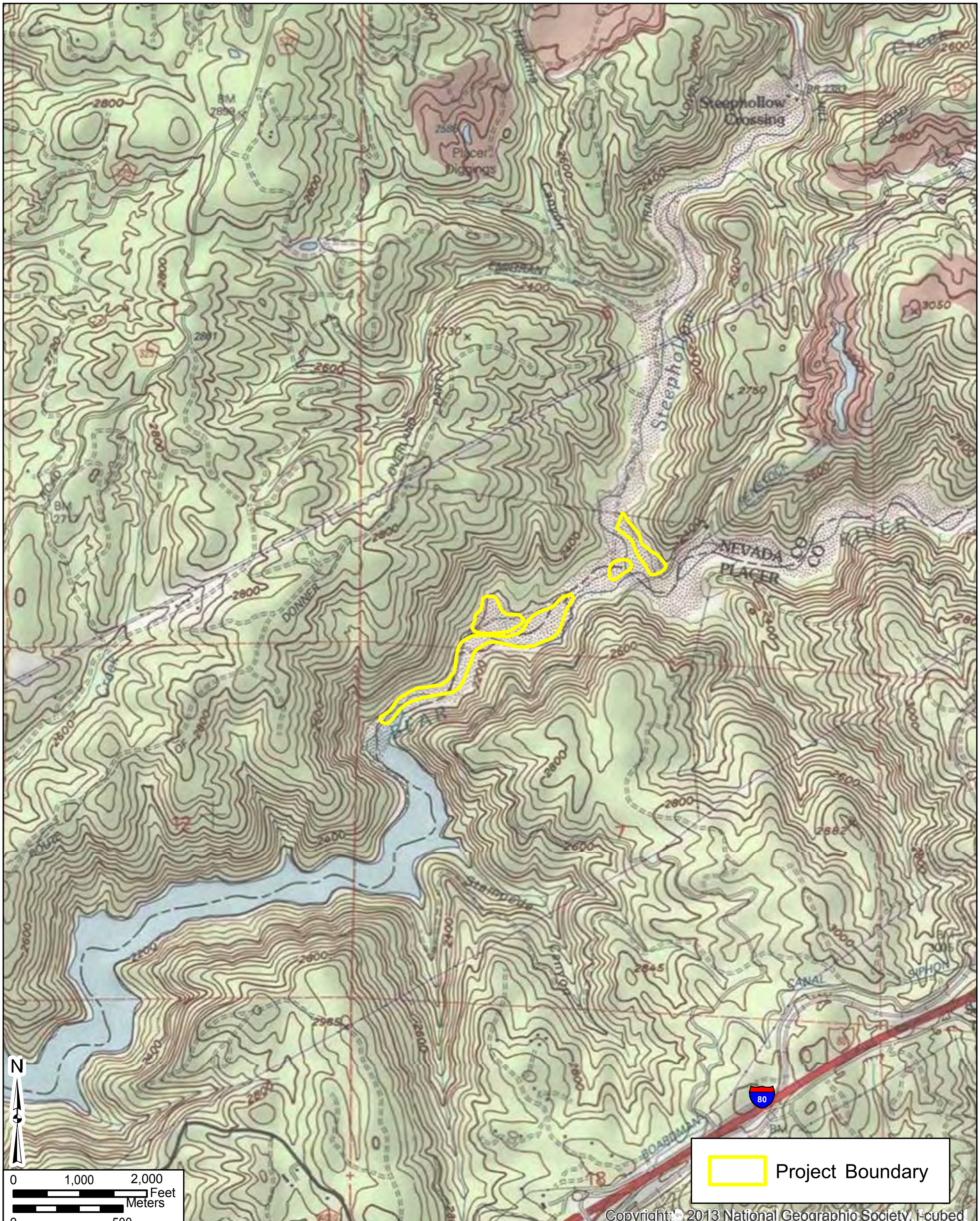

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FIGURE 2

Location Map

STEEPHOLLOW CREEK AND BEAR RIVER RESTORATION PROJECT

DUDEK

MAIN OFFICE
605 THIRD STREET
ENCINITAS, CALIFORNIA 92024
T 760.942.5147 T 800.450.1818 F 760.632.0164

January 27, 2014

Mr. Grayson Coney
T'si-Akim Maidu
P.O. Box 1316
Colfax, CA 95713

Subject: Information Request for the Bear River Restoration Project, Nevada and Placer Counties, California

Dear Mr. Coney,

The Nevada Irrigation District (District) is proposing to re-establish gravel skimming operations to restore and maintain reservoir capacity in Rollins Reservoir (Figure 1). The proposed project is located on the Bear River below the confluence of Steephollow Creek, approximately six miles northeast of the City of Colfax, California. The project is under the jurisdiction of the U.S. Army Corps of Engineers for purposes of compliance with Section 106 of the National Historic Preservation Act (NHPA), and the District is the lead agency for compliance with CEQA. This project falls in Sections 6 and 7 of Township 15 North, Range 10 East of the Chicago Park, CA 1:24,000 USGS quadrangle (Figure 2).

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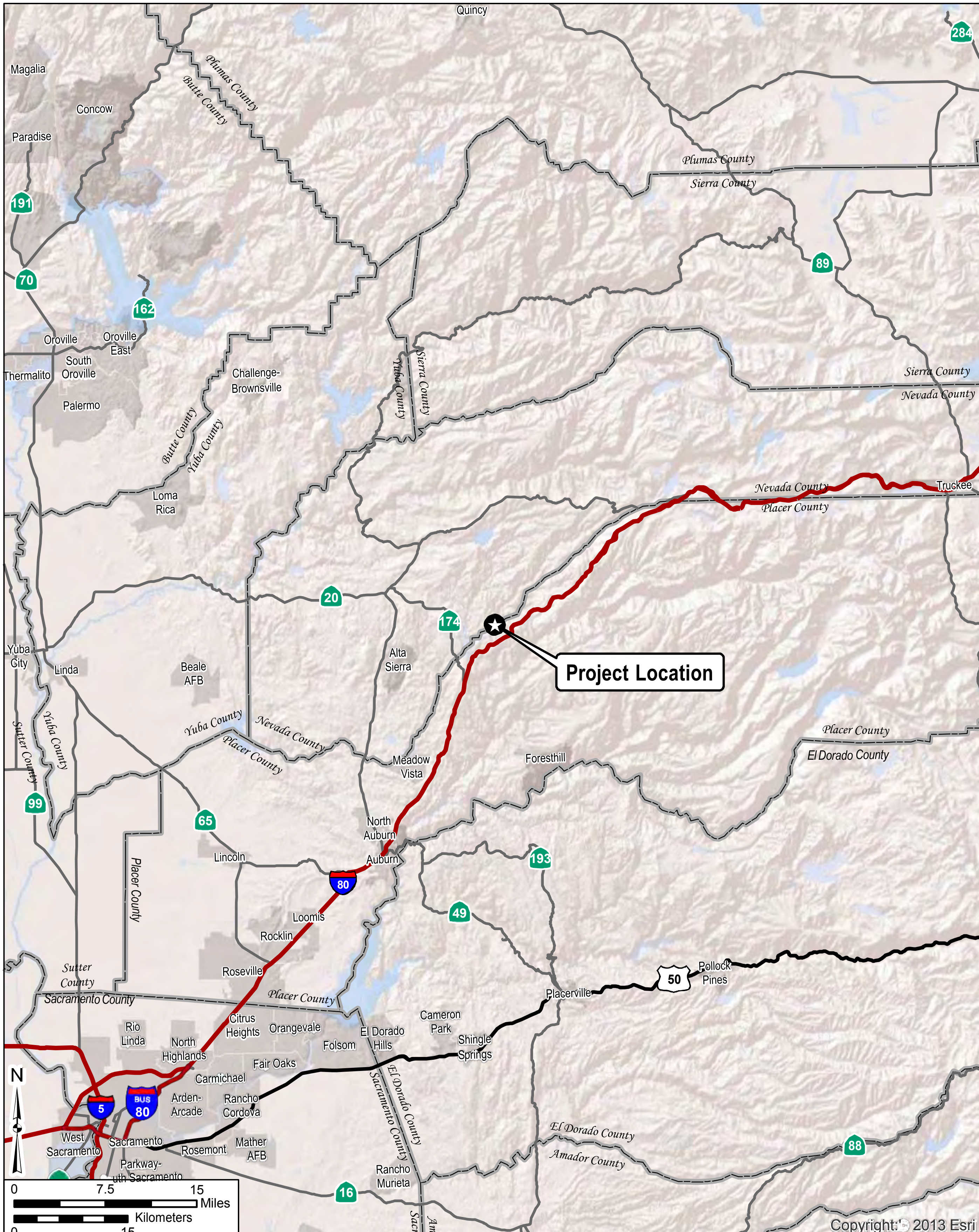

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STEEPHOLLOW CREEK AND BEAR RIVER RESTORATION PROJECT

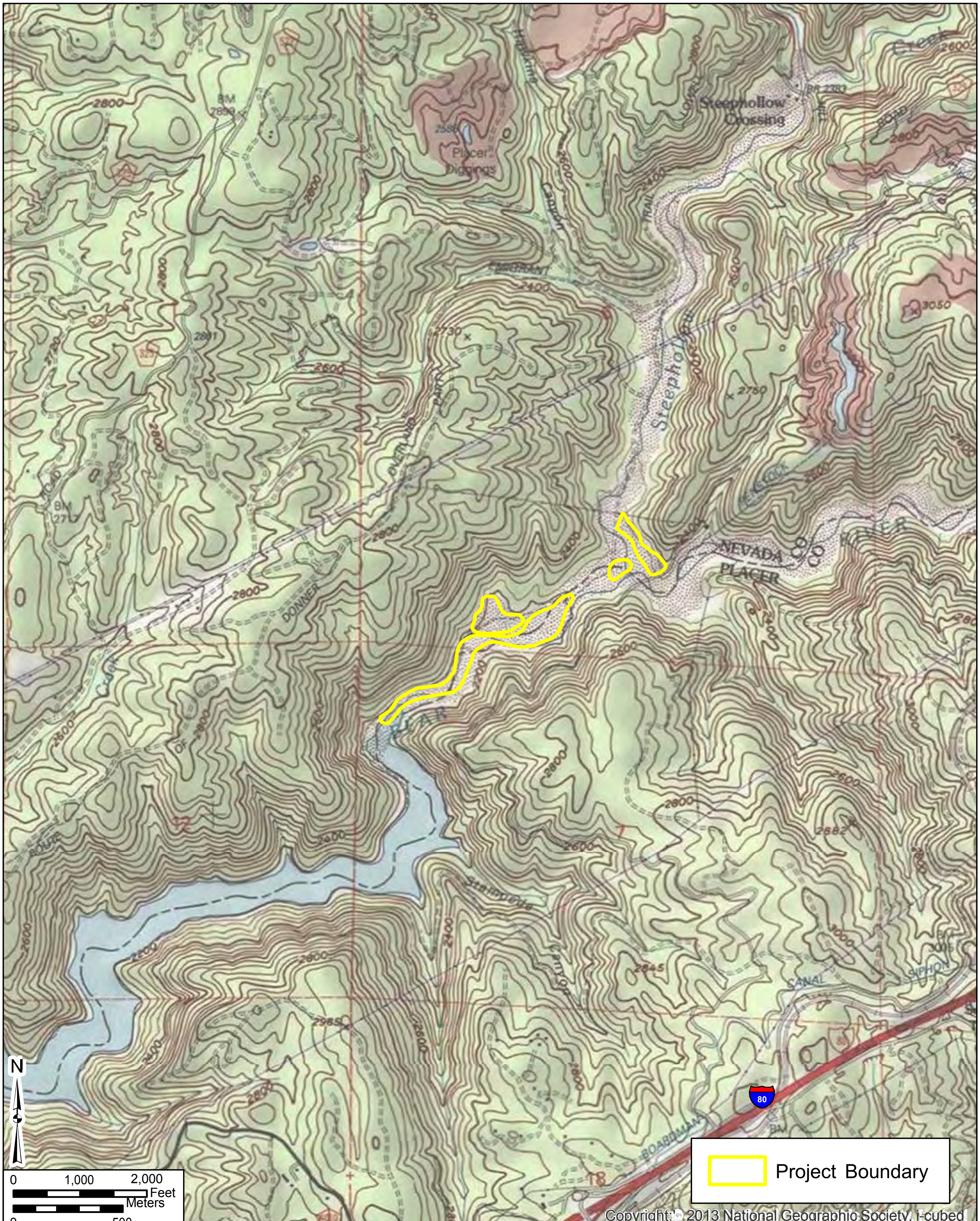

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FIGURE 2

Location Map

STEEPHOLLOW CREEK AND BEAR RIVER RESTORATION PROJECT

DUDEK

MAIN OFFICE
605 THIRD STREET
ENCINITAS, CALIFORNIA 92024
T 760.942.5147 T 800.450.1818 F 760.632.0164

January 27, 2014

Mr. Marcos Guerrero
United Auburn Indian Community of the Auburn Rancheria
10720 Indian Hill Road
Auburn, CA 95603

Subject: Information Request for the Bear River Restoration Project, Nevada and Placer Counties, California

Dear Mr. Guerrero,

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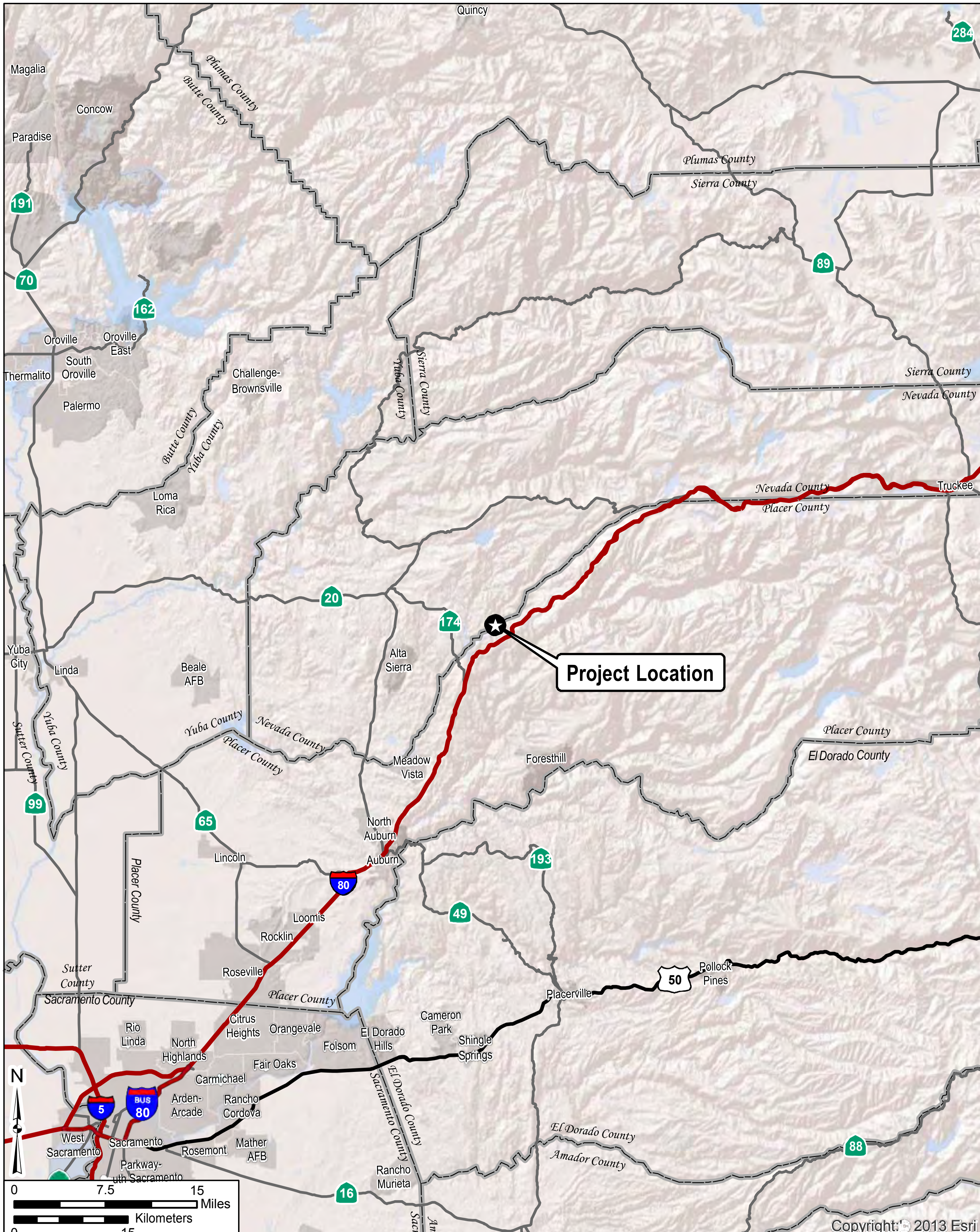

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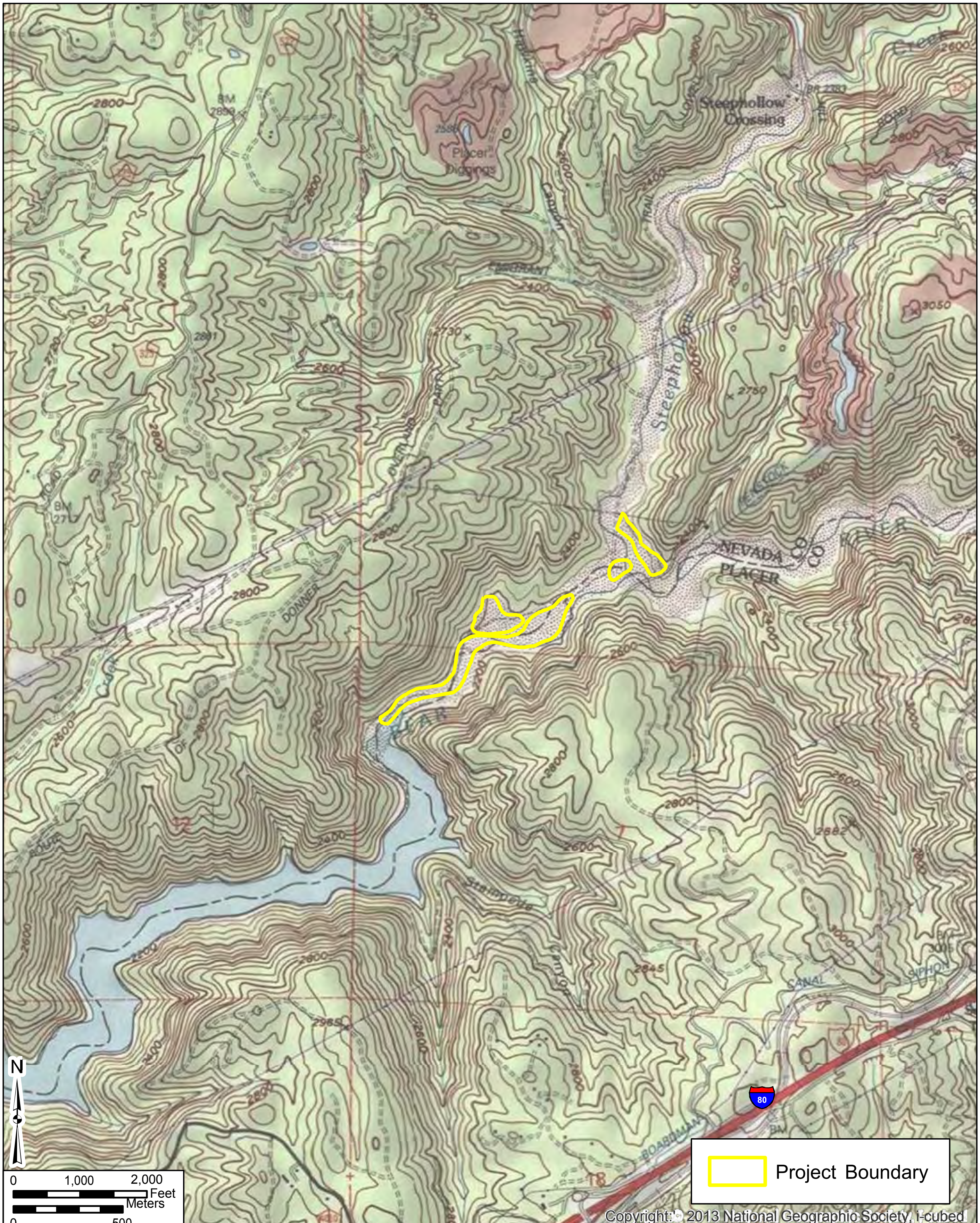

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FIGURE 2
Location Map

STEEPHOLLOW CREEK AND BEAR RIVER RESTORATION PROJECT

DUDEK

MAIN OFFICE
605 THIRD STREET
ENCINITAS, CALIFORNIA 92024
T 760.942.5147 T 800.450.1818 F 760.632.0164

January 27, 2014

Ms. April Wallace Moore
19630 Placer Hills Road
Colfax, CA 95713

Subject: ***Information Request for the Bear River Restoration Project, Nevada and Placer Counties, California***

Dear Ms. Moore,

The Nevada Irrigation District (District) is proposing to re-establish gravel skimming operations to restore and maintain reservoir capacity in Rollins Reservoir (Figure 1). The proposed project is located on the Bear River below the confluence of Steephollow Creek, approximately six miles northeast of the City of Colfax, California. The project is under the jurisdiction of the U.S. Army Corps of Engineers for purposes of compliance with Section 106 of the National Historic Preservation Act (NHPA), and the District is the lead agency for compliance with CEQA. This project falls in Sections 6 and 7 of Township 15 North, Range 10 East of the Chicago Park, CA 1:24,000 USGS quadrangle (Figure 2).

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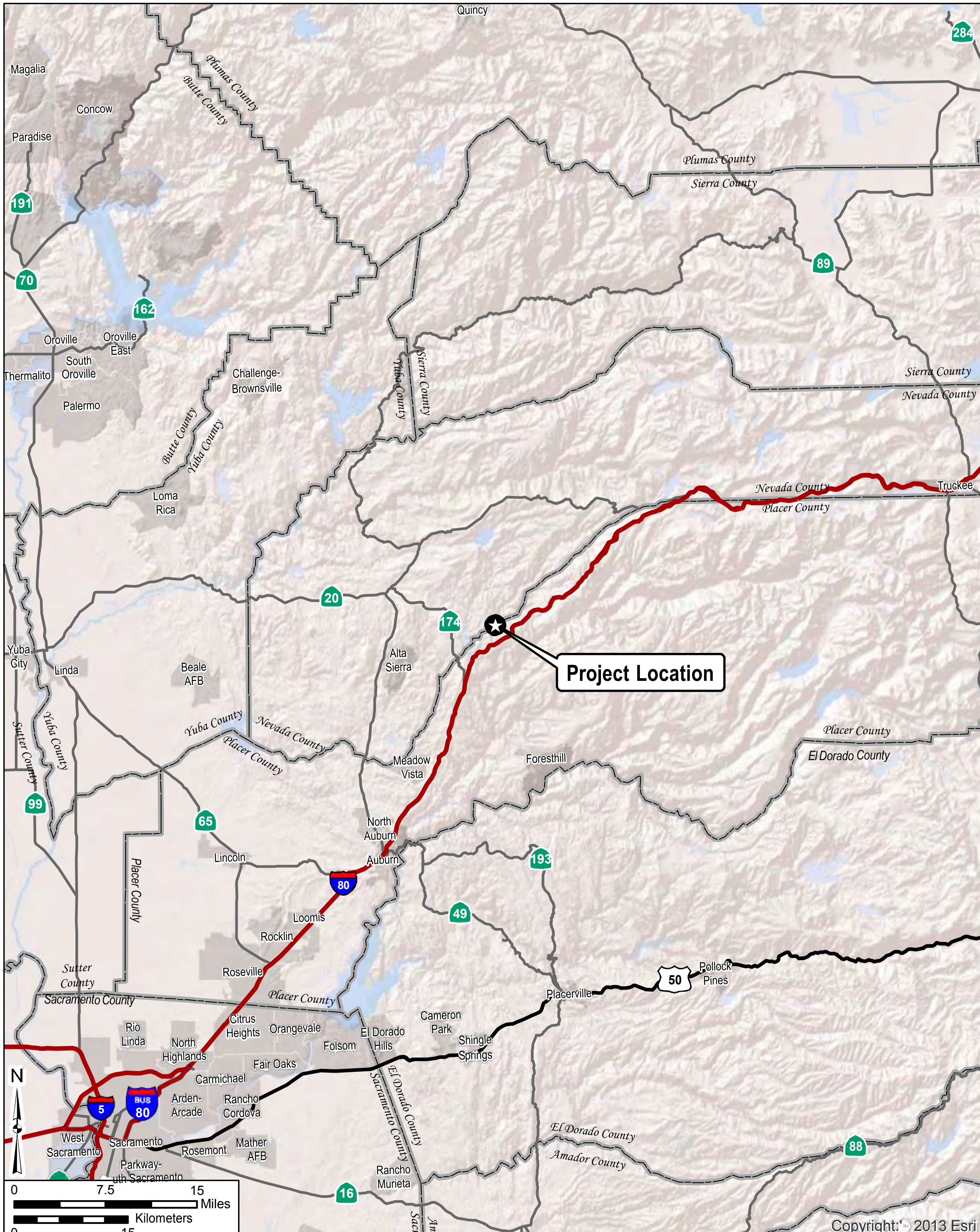

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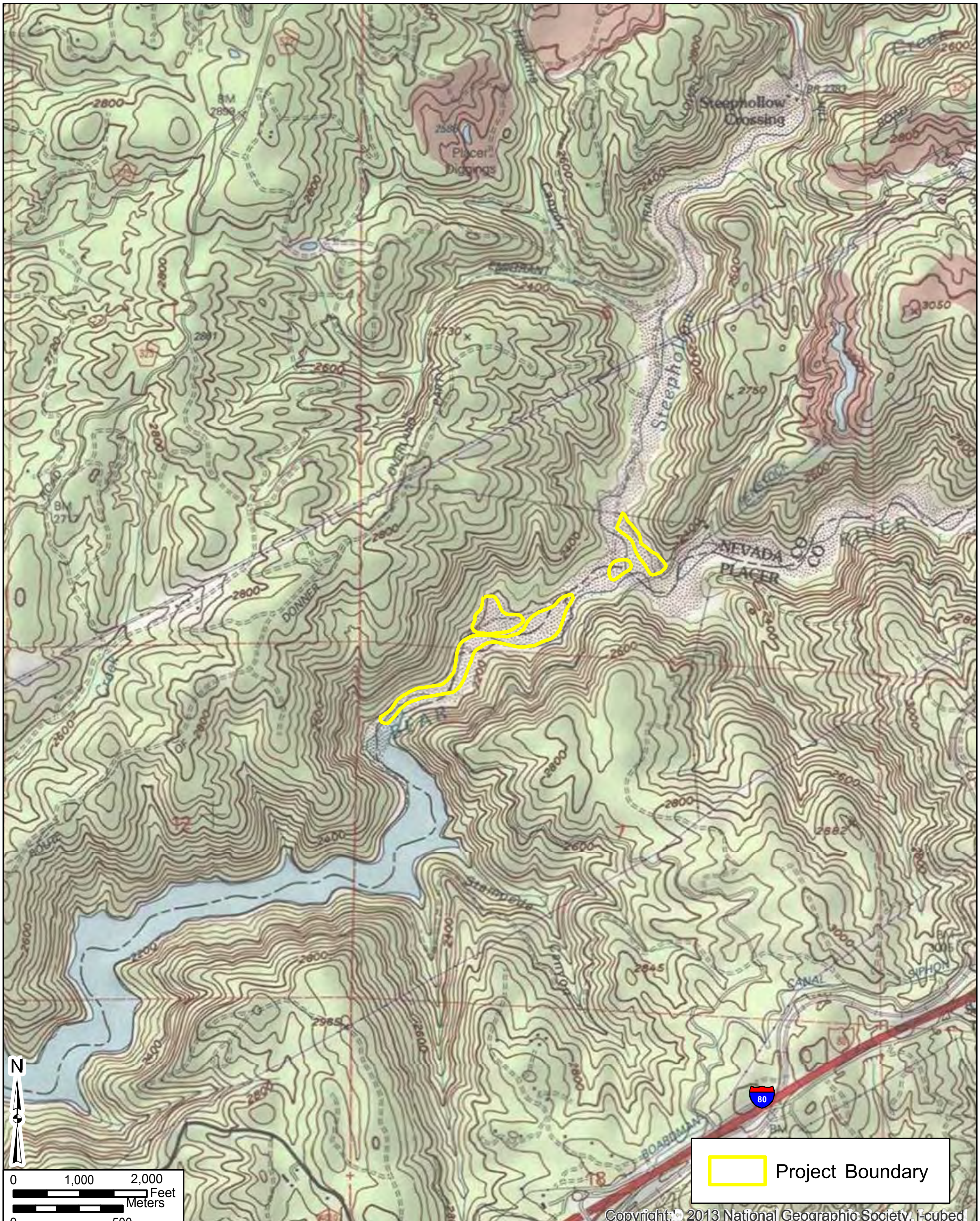

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STEEPHOLLOW CREEK AND BEAR RIVER RESTORATION PROJECT

DUDEK

MAIN OFFICE
605 THIRD STREET
ENCINITAS, CALIFORNIA 92024
T 760.942.5147 T 800.450.1818 F 760.632.0164

January 27, 2014

Mr. Daniel Fonseca
Shingle Springs Band of Miwok Indians
P.O. Box 1340
Shingle Springs, CA 95682

Subject: Information Request for the Bear River Restoration Project, Nevada and Placer Counties, California

Dear Mr. Fonseca,

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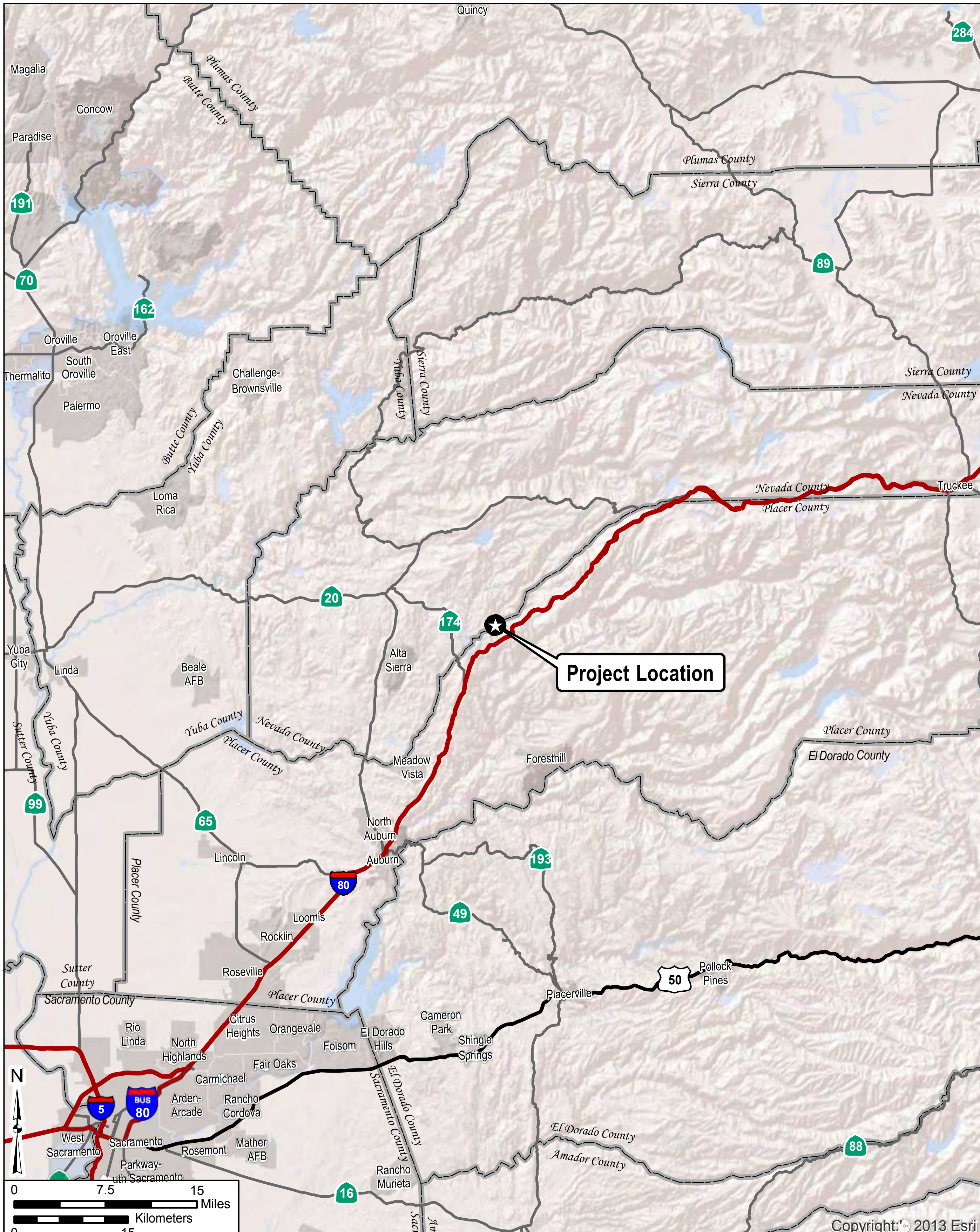

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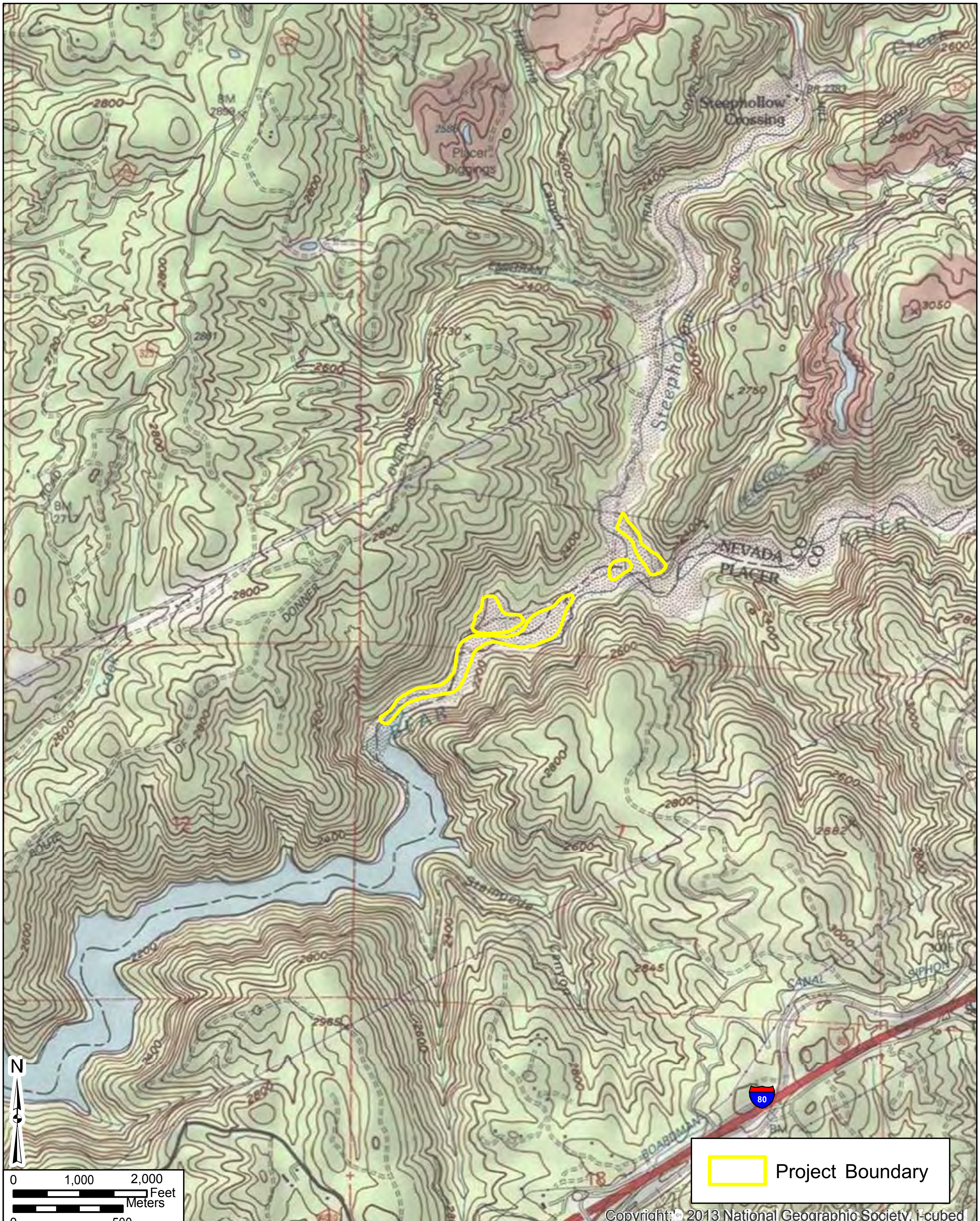

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FIGURE 2
Location Map

STEEPHOLLOW CREEK AND BEAR RIVER RESTORATION PROJECT

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MAIN OFFICE
605 THIRD STREET
ENCINITAS, CALIFORNIA 92024
T 760.942.5147 T 800.450.1818 F 760.632.0164

January 27, 2014

Ms. Judith Marks
Colfax-Todds Valley Consolidated Tribe
1068 SilvertonCircle
Lincoln, CA 95648

Subject: Information Request for the Bear River Restoration Project, Nevada and Placer Counties, California

Dear Ms. Marks,

The Nevada Irrigation District (District) is proposing to re-establish gravel skimming operations to restore and maintain reservoir capacity in Rollins Reservoir (Figure 1). The proposed project is located on the Bear River below the confluence of Steephollow Creek, approximately six miles northeast of the City of Colfax, California. The project is under the jurisdiction of the U.S. Army Corps of Engineers for purposes of compliance with Section 106 of the National Historic Preservation Act (NHPA), and the District is the lead agency for compliance with CEQA. This project falls in Sections 6 and 7 of Township 15 North, Range 10 East of the Chicago Park, CA 1:24,000 USGS quadrangle (Figure 2).

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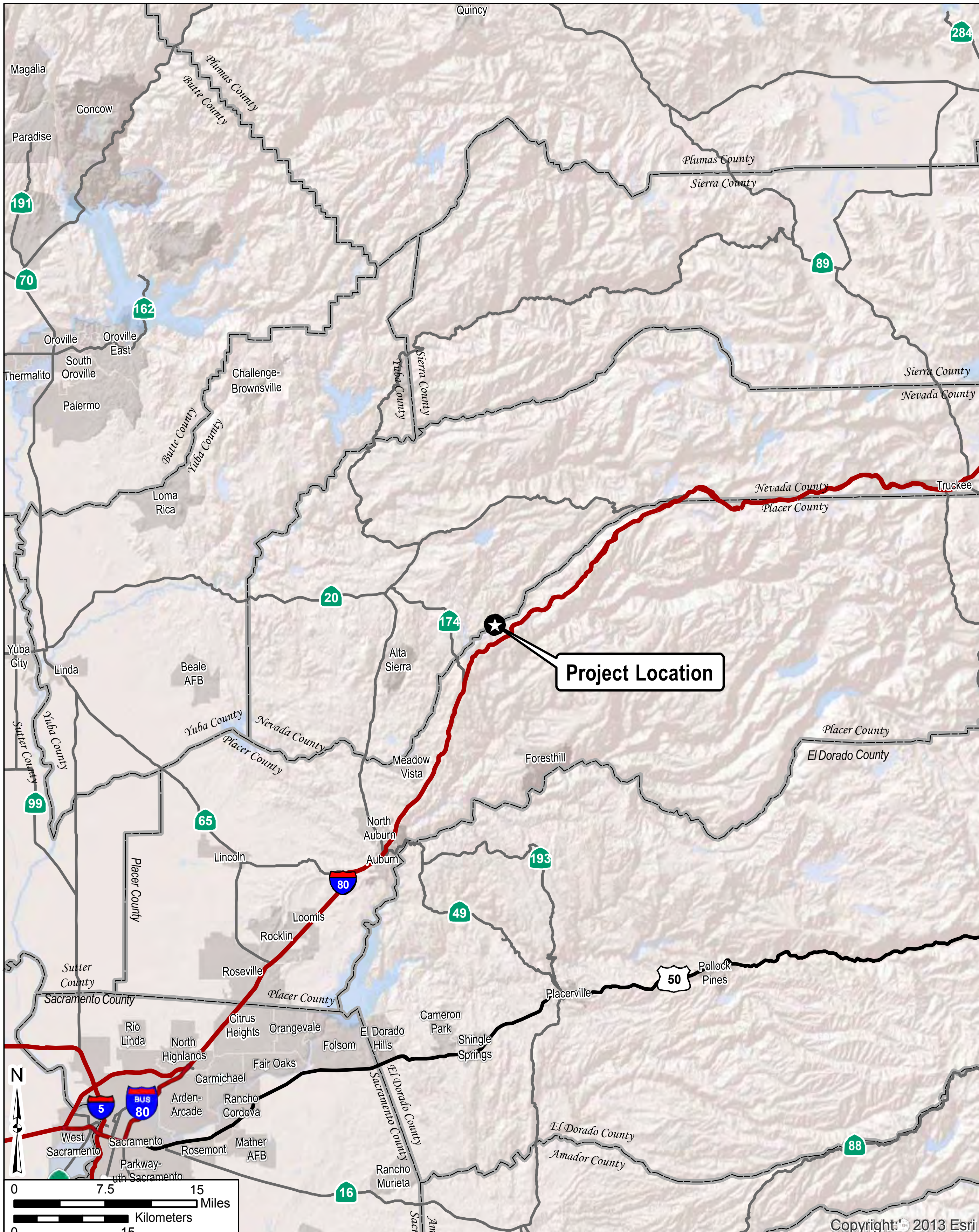

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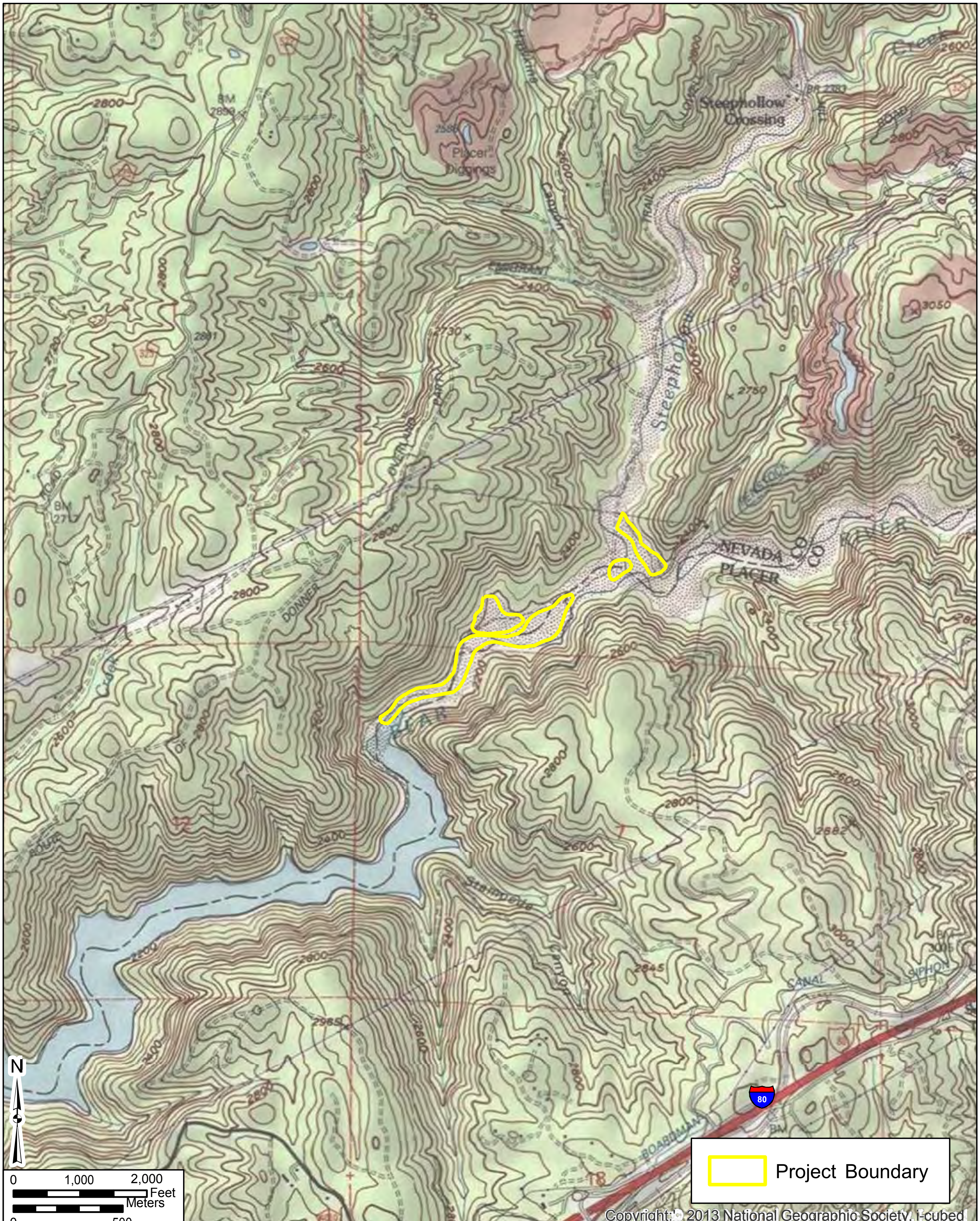

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FIGURE 2
Location Map

STEEPHOLLOW CREEK AND BEAR RIVER RESTORATION PROJECT

MIWOK United Auburn Indian Community
MAIDU of the Auburn Rancheria

Gene Whitehouse, Chairman | John L. Williams, Vice Chairman | Danny Rey, Secretary | Brenda Adams, Treasurer | Calvin Moman, Council Member

March 10, 2014

Brad Comeau
Dudek
605 Third Street
Encinitas, CA 92024

Subject: Information Request for the Bear River Restoration Project, Nevada and Placer Counties, CA

Dear Brad Comeau,

Thank you for requesting information regarding the above referenced project. The United Auburn Indian Community (UAIC) of the Auburn Rancheria is comprised of Miwok and Southern Maidu (Nisenan) people whose tribal lands are within Placer County and whose service area includes El Dorado, Nevada, Placer, Sacramento, Sutter, and Yuba counties. The UAIC is concerned about development within its aboriginal territory that has potential to impact the lifeways, cultural sites, and landscapes that may be of sacred or ceremonial significance. We appreciate the opportunity to comment on this and other projects in your jurisdiction.

In order to ascertain whether or not the project could affect cultural resources that may be of importance to the UAIC, we would like to receive copies of any archaeological reports that have been, or will be, completed for the project. We also request copies of future environmental documents for the proposed project so that we have the opportunity to comment on potential impacts and proposed mitigation measures related to cultural resources. The information gathered will provide us with a better understanding of the project and cultural resources on site and is invaluable for consultation purposes. Please contact us if any Native American cultural resources are in, or found to be within, your project area.

Thank you again for taking these matters into consideration, and for involving the UAIC early in the planning process. We look forward to reviewing the aforementioned documents as requested. Please contact Marcos Guerrero, Cultural Resources Manager, at (530) 883-2364 or email at mguerrero@auburnrancheria.com if you have any questions.

Sincerely,

Gene Whitehouse,
Chairman

CC: Marcos Guerrero, CRM

SHINGLE SPRINGS RANCHERIA
P.O. BOX 1340; SHINGLE SPRINGS, CA 95682
(530) 676-8010; FAX (530) 676-3582

February 20, 2014

Dudek
605 Third Street
Encinitas, CA 92024

RE: Information request for the Bear River Restoration project, Nevada and Placer Counties, California

Dear Brad Comeau

Thank you for your letter dated for January 27, 2014 seeking information regarding the Information request for the Bear River Restoration project, Nevada and Placer Counties, California. Based on the information provided, the Shingle Springs Band of Miwok Indians is not aware of any known cultural resources on this site. However, SSR would like to have continued consultation through updates, as the project progresses this will foster a greater communication between the Tribe and your agency.

SSR would also like to request any and all completed record searches and or surveys that were done in or around the project area up to and including environmental, archaeological and cultural reports.

If during the progress of the project new information or human remains are found we would like to be able to go over our process with you that we currently have in place to protect such important and sacred artifacts (especially near rivers and streams).

Please contact the following individuals if such finds are made:

Andrew Godsey, Assistant Cultural Resource Director / NAI
Office: (530) 698-1403 agodsey@ssband.org

And copy all communications to:
Cynthia Franco, Administrative Assistant (530)698-1557 cfranco@ssband.org

Thank you for providing us with this notice and opportunity to comment.

Sincerely,

Daniel Fonseca
Cultural Resource Director
Tribal Historic Preservation Officer (THPO)
Most Likely Descendent (MLD)

APPENDIX D

Key Personnel Resumes

Nicholas Hanten – Archaeologist

Nicholas Hanten is an archaeologist with 4 years' experience leading and performing test excavation, pedestrian surveys, and construction monitoring for the identification and recovery of artifacts. Mr. Hanten is skilled at collecting data with Trimble GPS units and writing survey reports.

Education

University of California, Davis
BS, Anthropology, 2011

Certifications and Training

University of California, Davis, Archaeological Field School, 2008

Project Experience

Development

Alessandro Business Park, Western Realco, Riverside, California. As archaeological monitor and crew chief, monitored the excavation of potholes and trenches in collaboration with Native American monitors; recorded and excavated five prehistoric archaeological sites

St. John Garabed Church Environmental Services, St. John Garabed Apostolic Church Trust, San Diego, California. As crew chief and lab director, assisted in conducting test excavations for one prehistoric site; managed the cataloging and analysis of recovered artifacts; assisted in preparing a report of findings.

Evaluation of SDI-13,077H and Data Recovery at SDI-13,078 for the Rhodes Crossing Project, San Diego County, California. As part of crew, assisted in test excavation and pedestrian survey.

Education

Cultural Resource Study for the Kearny High School Athletic Field Redevelopment, BRG Consulting, San Diego, California. As crew chief, conducted pedestrian survey and wrote report.

Significance Evaluation of SDI-20363 for the San Marcos High School Expansion Project, San Marcos Unified School District, San Diego County, California. As crew chief, assisted in test excavations and GPS data collection for a buried prehistoric site.

Energy

Block 12 Development, Aera Energy, LLC., Bakersfield, California. As field director, conducted a pedestrian survey of 32 acres for a proposed oil field expansion; prepared a letter report of findings

Solar Site Development Environmental Services, Soitec Solar, San Diego, California. As field director, conducted pedestrian survey of 12 acres for a proposed solar generation facility.

Ocotillo Wind Energy Project, Bureau of Land Management (BLM), Imperial County, California. As third-party monitor, monitored construction activities and archaeological monitors to ensure that all activities were in compliance with BLM regulations.

Archaeological Evaluation for the Rugged Solar Project, County of San Diego, California. As crew member, assisted in test excavation, pedestrian survey, and GPS data collection with Trimble GPS unit.

Silurian Valley Wind Project, Iberdrola Renewables, San Bernardino County, California. As monitor, conducted pedestrian survey of access routes and monitored construction activities.

Gold Basin Project Meteorological Mast Construction, LH Renewables, San Diego County, California. As monitor, conducted pedestrian survey of the project area and monitored construction activities.

Significance Evaluation of Four Prehistoric Archaeological Sites for the GCL/Rosendin Sol Focus Project, RBF Consulting, Borrego Springs, California. As crew chief, assisted in test excavations at prehistoric temporary camps.

Phase I Cultural Resources Pedestrian Survey of Various Parcels for the Sol Orchard Solar Project, RBF Consulting, San Diego County, California. Serving as crew chief, conducted intensive pedestrian survey of multiple parcels for solar development.

Class II and Class III Cultural Resources Inventory for the Tule Wind Alternative Energy Project, HDR Engineering for Iberdrola Renewables, San Diego County, California. Serving as field technician, assisted in pedestrian survey and site recordation.

San Diego Gas & Electric (SDG&E) Sunrise-Powerlink Project, SDG&E, San Diego County, California. As crew chief, conducted small pedestrian surveys and monitoring for utility pole replacement.

Military

Cultural Resource Monitoring for the Red Beach Mobile Mount Project, Marine Corps Base (MCB) Camp Pendleton, San Diego County, California. Serving as monitor, conducted small pedestrian survey and monitored construction activities.

Phase I Cultural Resources Inventory of 7650 acres on Edwards Air Force Base, CH2M HILL/JT3, Kern County, California. As crew chief, assisted in pedestrian survey and GPS data collection with a Trimble GPS unit, and wrote portions of report.

Archaeological Investigations at SDI-9824, MCB Camp Pendleton, San Diego County, California. Serving as crew chief, assisted in archaeological excavation, ground-penetrating radar, and X-ray fluorescence study of a late prehistoric archaeological site.

Phase II Evaluation of 85 Archaeological Sites on Edwards Air Force Base, CH2M HILL/JT3, Kern and Los Angeles Counties, California. As crew chief, assisted in test excavations, pedestrian survey, and GPS data collection with a Trimble GPS unit. Also assisted with laboratory analysis and curation preparation.

Section 106 Evaluations of Two Prehistoric Sites for Firebreak Maintenance, Vandenberg Air Force Base, Santa Barbara County, California. As student assistant, assisted in test excavations at complex prehistoric habitation sites for the University of California, Davis, Field School.

Municipal

Carlsbad Desal Cultural & Biological Monitoring, Poseidon Resources, Carlsbad, California. As archaeological monitor, monitored trenching, grading, and the installation of water lines.

Yokohl Ranch Cultural Resources, The Yokohl Ranch Company, LLC, Tulare County, California. As field director, managed and conducted surface mapping, surface collection, and excavation of 95 prehistoric and historical period sites throughout the Yokohl Valley.

Cultural Resources Testing for the Silver Strand State Beach Project, California State Parks, San Diego County, California. As crew chief, conducted pedestrian survey and test excavations, and assisted in report production.

Archaeological Survey and Evaluations for the Star Ranch Project, County of San Diego Department of Planning and Land Use, San Diego County, California. As lab technician, cataloged and analyzed the assemblage recovered from a previous testing of the project area.

Publications

Hanten, N., and N. Stevens. 2010. "The Reliability of Microscopic Use-Wear Analysis on Monterey Chert Tools." *Proceedings of the Society of California Archaeology* 24.

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Brad Comeau – Archaeologist

Brad Comeau is an archaeologist with over 10 years' experience as a Principal Investigator, field director, archaeological monitor, and field/laboratory technician. He has conducted numerous surveys, evaluation excavations, and data recoveries, primarily in Southern California. He has extensive experience in San Diego County, with additional experience in Riverside, Imperial, Orange, and Los Angeles Counties, the Mojave Desert, San Joaquin Valley, as well as in Massachusetts, New Hampshire, Arizona, and England. His research interests include the role of experimentation in archaeology, copper production techniques, and lithic production.

EDUCATION

University of Sheffield

MSc, Experimental Archaeology, 2012

University of Massachusetts, Amherst
BA, Anthropology, 2004

BA, Italian Studies, 2004

CERTIFICATIONS

County of San Diego, Approved Archaeologist, 2014

City of San Diego, Approved Archaeologist, 2013

Register of Professional Archaeologists, 2013

OSHA HAZWOPER 40-hr course, 2011

City of San Diego, Certified Archaeological Monitor, 2007

PROFESSIONAL AFFILIATIONS

Society for American Archaeology, 2012

Bath and Camerton Archaeological Society, 2012

Society for California Archaeology, 2008

PROJECT EXPERIENCE

Development

Lone Oak Road Project, Hunsaker & Associates, San Diego, Inc., San Diego County, California. As Principal Investigator, directed a Phase I cultural resource inventory for a 14 acre residential subdivision development; coordinated with Native American subcontractor; prepared negative letter report.

Alessandro Business Park Project, Western Realco, City of Riverside, Riverside County, California. As primary author, prepared archaeological monitoring report, including discovery evaluation results for seven new archaeological sites. Prepared DPR forms.

Newland Sierra Project, Newland Sierra, LLC, San Diego County, California. As Principal Investigator, directing Phase III data recovery of three archaeological sites, including re-analysis of existing collections (in progress).

The Vineyard, Van Daele Development Corporation, Temecula, Riverside County, CA. As Principal Investigator, directed archaeological monitoring for construction of a 25 acre residential development; prepared a monitoring and unanticipated discoveries work plan; project is in progress.

Artesian Road Project, The Harwood Group, Rancho Santa Fe, San Diego County, California. As Principal Investigator, directed a Phase I cultural resource study for a 25 acre residential project; coordinated field crew schedule and tribal monitor; primary author of ARMR-format report according to County guidelines; performed background research into historic context of the project area, incorporating results into the report**.**

Martin Residence Project, HAA Architects, Carlsbad, San Diego County, California. As Principal Investigator, performed all aspects of a Phase I cultural resource study for a 1 acre residential development project within a known archaeological site; instructed staff and provided quality control oversight in the preparation of the ARMR-format technical report; performed

Shearwater Creek Project, City of Temecula, Temecula, Riverside County, California. As Principal Investigator, performed all aspects of a Phase I cultural resource study for a 7 acre residential development project; performed pedestrian survey; coordinated with Native American monitors and Tribal representative in regards to a sacred resource in the project area; primary author of the ARMR-format technical report.

Arbor Vista Cluster Residential Project, City of Temecula, Temecula, Riverside County, California. As principal investigator, conducted all aspects of a Phase I pedestrian survey for archaeological and paleontological resources for a 72-acre parcel; directed a crew of two people; primary author ARMR-format technical report of findings, including summation of paleontological resources.

Navy Federal Credit Union Project, City of Temecula, Temecula, Riverside County, California. As principal investigator, conducted Phase I pedestrian survey for archaeological and paleontological resources; lead author of ARMR-format report; prepared all archaeological portions of technical report and contributed to the paleontological portions; performed background research into historic context of the project area, incorporating results into the report.

St. John Garabed Church Project, St. John Garabed Armenian Apostolic Church Trust, San Diego County, California. As field director, conducted site examinations and limited shovel test pit excavation for an Extended Phase 1 survey; directed a crew of two people; prepared a letter report of findings; participated in Phase II evaluation excavation of one prehistoric site; contributed to Phase II evaluation report.

Rhodes Crossing Update, Rhodes Properties, San Diego, California. As field director, led a crew of two people for a Class III pedestrian survey of 88 acres; coordinated Native American monitor participation; assisted with preparation of Archaeological Resource Management Report (ARMR).

Palomar Station Project Survey, Integral Communities Inc., San Marcos, San Diego County, California. As field director, conducted Class III pedestrian survey of 14.5-acre parcel and prepared ARMR technical report of findings.

Gregory Canyon Landfill Environmental Impact Statement PHI Assessments, PCR Services Corporation, Pala, San Diego, California. As field director, conducted pedestrian survey of proposed landfill; relocated and verified previously recorded sites; led a crew of four people; coordinated with Native American monitors; prepared site forms and site descriptions for ARMR report.

Robertson Ranch East Excavation, The Corky McMillin Companies, Carlsbad, San Diego County, California. As field director, conducted controlled grading of two prehistoric sites that required directing excavation activities of multiple types of heavy machinery; identified and led excavation of numerous roasting pit and hearth features by a crew of up to 20 people; instructed crew in carbon-14, thermoluminescence, and soil floatation sampling techniques.

Sky Ranch Monitoring, Lennar, Santee, San Diego County, California. As archaeological monitor, monitored mass grading activities for construction of a subdivision.

Sky Ranch Data Recovery, Lennar, Santee, San Diego County, California. As crew chief, conducted data recovery excavation of two prehistoric sites; led a crew of up to eight staff; drew site maps and unit profiles; collected carbon-14 and soil floatation samples.

4S Ranch Data Recovery, 4S Ranch Company, Rancho Bernardo, San Diego County, California. As field technician and crew chief, conducted Phase III data recovery of a large Late Prehistoric site; excavated numerous hearth features; drew site maps and unit profiles; created a site grid for unit placement; collected carbon-14 and soil floatation samples; led crew ranging from 2-10 people.

Atlas Monitoring and Excavation, D. R. Horton, San Diego County, California. As archaeological monitor, monitored building/subterranean parking structure excavation; excavated historic deposits discovered during monitoring.

The Rock Academy Monitoring, The Rock Church, San Diego, California. As archaeological monitor, monitored building foundation excavation, trenching, and building demolition.

Otay Business Park Project, Paragon Management Company, LLC, San Diego County, California. As field technician, excavated 10 prehistoric and multi-component sites as part of a Phase II evaluation project.

Vantage Point, Point of View Monitoring LLC, San Diego County, California. As archaeological and paleontological monitor, monitored excavation, drilling, and other construction activities during the excavation of a subterranean parking garage and building footings. Recorded and collected artifacts and marine fossils.

Audie Murphy Ranch Monitoring, Woodside Homes, Sun City, Riverside County, California. As archaeological monitor, monitored controlled grading of five sites in collaboration with Native American monitors; excavated hearth features; monitored construction grading.

Roberston Ranch Data Recovery, The Corky McMillin Companies, Carlsbad, San Diego County, California. As field technician, excavated four prehistoric sites as part of a data recovery program, including test unit excavation, wet screening, drawing and photographing profiles, excavating hearth and pit features, and artifact sorting.

LaPozz No. 5 Lode Evaluation, Enviroscientists, Indian Wells Valley, Kern County, California. As field director, led a crew of four people for an evaluation testing program of three prehistoric sites; prepared site form updates and site testing results for the ARMR technical report.

Faraday Data Recovery, Carlsbad, San Diego County, California. As field technician, excavated five prehistoric sites as part of a data-recovery program, including test unit excavation, drawing profiles, wet screening, and sorting artifacts.

Education

San Elijo Hills K-9th Grade Campus Project, San Marcos Unified School District, San Marcos, San Diego County, California. As principal investigator, conducted all aspects of a Phase I pedestrian survey for a 36-acre school; prepared letter report summarizing findings.

Palomar College 7 Building Historic Evaluation, Palomar Community College District, San Marcos, San Diego County, California. As Global Positioning System (GPS) technician and photographer, assisted architectural historians in recording potentially historic buildings; photographed and recorded buildings with Ricoh digital camera, range finder, and Trimble GeoXH GPS.

University House Excavation, University of California, San Diego, San Diego County, California. As crew chief, conducted Phase II test excavation using wet screening; led a crew of five people.

San Marcos Unified School District Monitoring, San Marcos Unified School District, San Diego County, California. As archaeological monitor, monitored transplanting of endangered species by biologists prior to construction grading of site.

Maranatha Excavation, Maranatha Christian School, Rancho Bernardo, San Diego County, California. As field technician, excavated test units for a Phase III data recovery of an archaic period site; drew unit profiles; sorted artifacts.

Energy

Block 4N (North Encanto) Underground Utility District, City of San Diego Public Works Department, San Diego, California. As Principal Investigator, directed archaeological monitoring for the installation of underground utility lines; scheduled archaeological and Native American monitors; prepared monthly summaries; (in progress).

Desert Green Solar Project, Invenergy LLC, Borrego Springs, San Diego County, California. As principal Investigator, directing archaeological monitoring for a 50 acre, 5MW solar energy generation facility; scheduled archaeological and Native American monitors (in progress).

Block 8B Sherman Heights Underground Utility District Archaeological Monitoring, City of San Diego Public Works Department, San Diego, California. As Principal Investigator, provided internal review of the construction monitoring report prepared by the archaeological subcontractor.

Kent South Solar Substation, Dashiell Corporation, County of Kings, California. As primary author, prepared archaeological and paleontological construction monitoring and inadvertent discovery work plan for construction of the substation.

Tierra del Sol LLC Project, Soitec, LLC, Tierra del Sol, San Diego County, California. As field director, conducted pedestrian survey and evaluation of the 337-acre Gen-Tie portion of the solar project; directed crew between 2 and 4 people; prepared the Gen-Tie portion of the technical report; provided internal review and editing on entire report based on agency comments; prepared cost and scoping proposal for evaluation phase.

Rugged Solar Project, Soitec, LLC, Boulevard, San Diego County, California. Provided internal review and editing of the evaluation report based on agency comments for the evaluation of 39 archaeological sites.

LanWest Solar Farm Project, Soitec, LLC, Boulevard, San Diego County, California. Provided internal review and editing based on agency comments of a 231-acre survey report.

LanEast Solar Farm Project, Soitec, LLC, Boulevard, San Diego County, California. Provided internal review and editing based on agency comments of a 35-acre survey report.

Jacumba Solar Extended Phase 1, NextEra, Jacumba, San Diego County, California. As principal investigator, conducted site examinations and limited shovel test pit excavation; directed a crew of two people; prepared a letter report of findings.

Rio Mesa Solar Project, Bureau of Land Management, Riverside County, California. Contributed to 3rd party review for the Bureau of Land Management of the Phase I pedestrian survey report.

San Jacinto Solar Project, NextEra, Riverside County, California. As principal investigator, performed site visit and record search review of project area; prepared constraints analysis assessing the potential for sensitive cultural materials.

Tule Wind Cultural Resources Testing, HDR Inc., McCain Valley, San Diego County, California. As field director, conducted eligibility testing for one prehistoric site, led a crew of four people, and assisted in producing an ARMR report of findings.

Occidental of Elk Hills Block Survey II, Occidental Petroleum, Taft, Kern County, California. As field director, conducted pedestrian survey of 2,560 acres in the Elk Hills Oil Field; led a crew of six people; prepared site forms and site descriptions for technical report.

Class III Cultural Resources Inventory, Occidental Petroleum, Taft, Kern County, California. As field director, conducted pedestrian survey of 2,560 acres in the Elk Hills Oil Field; led a crew of six people; performed records search at the Southern San Joaquin Valley Information Center and Bureau of Land Management (BLM) Bakersfield office; prepared site forms and site descriptions for technical report.

Five Well Pads Cultural Resources Survey, Occidental Petroleum, Kern County, California. As field director, led a crew of two people for a Class III pedestrian survey of 60 acres near McKittrick, California; performed the record searches at the Southern San Joaquin Valley Information Center and BLM Bakersfield office.

Vintage Kern Front Inventory, Vintage Production California LLC, Oildale, Kern County, California. As field director, led a crew of five people for a Class III pedestrian survey of 184 acres in the Kern Front Oil Field; prepared primary record.

Gildred Solar Cultural Resources Survey, Gildred Building Company, Ocotillo Wells, San Diego County, California. As field director, led a crew of four for a Class III pedestrian survey of 440 acres; coordinated Native American monitor participation: assisted with preparation of ARMR technical report.

Silurian Valley West Cultural Resources Study, Iberdrola Renewables, Baker, San Bernardino County, California. As crew chief, led a crew of four people for a Class II pedestrian survey of 4,500 acres within the project right-of-way; assisted the field director in organizing and scheduling two field crews; trained crew members in operation of Bluetooth-enabled laser range finder.

TL 637 Survey Santa Ysabel to Creelman, San Diego Gas & Electric, San Diego County, California. As archaeological monitor, performed pre-construction fielding study with engineers, biologists, and construction managers for an electrical transmission line pole replacement; located previously recorded sites; helped direct new pole locations to avoid site impacts.

East County Substation Survey, Insignia Environmental, Jacumba, San Diego County, California. As crew chief, conducted survey of linear electric transmission line; directed a crew of three people; recorded multiple prehistoric and multicomponent sites; prepared site forms and site descriptions for technical report of findings.

Sunrise Powerlink Evaluations, San Diego Gas & Electric, San Diego and Imperial Counties, California. As field director, conducted subsurface testing of 17 sites; directed a crew ranging from three to six people; helped organize laboratory artifact processing.

Devers–Palo Verde 2 Survey, Southern California Edison, Riverside County, California. As field director, conducted Class III intensive survey of selected portions of a transmission line area of potential effect (APE); relocated and updated previously recorded sites; identified and recorded new sites.

Colorado River Staging Yard Survey, Southern California Edison, Riverside County, California. As crew chief, conducted Class III pedestrian survey of the Colorado River Staging Yard for the Devers–Palo Verde 2 electric transmission line near Blythe; identified and recorded numerous World War II–era sites relating to the Desert Training Center; led a crew of two people.

Tule Wind Project Surveys, HDR Inc., McCain Valley, San Diego County, California. As field director, conducted Class II and Class III intensive pedestrian surveys over 4,900 acres; coordinated multiple survey crews; scheduled and coordinated with Native American monitors; prepared site forms; assisted in producing an ARMR report of findings.

Sunrise Powerlink Survey and Monitoring, San Diego Gas & Electric, San Diego and Imperial Counties, California. As crew chief, led survey crew of four people and two Native American monitors for Class III survey of project APE; coordinated with Native American monitors; created survey schedules in conjunction with the field director and right-of-way agents.

Federal

Bunker Hill Survey, GSR Corporation, Imperial Beach, San Diego County, California. As field director, conducted Class III pedestrian survey of a road improvement and fence construction covering 7.6 acres for the border fence; directed a crew of two people; recorded a previously identified site for a future nomination to the National Register of Historic Places; prepared site form update; prepared ARMR technical report of findings.

Imperial County Drill Sites Survey, United States Geological Survey, Imperial County, California. As field director, conducted survey of two water well drilling sites; coordinated U.S. Border Patrol escort; prepared ARMR technical report of findings.

BLM Western Expansion Survey, TEC Environmental, Johnson Valley, San Bernardino County, California. As crew chief, surveyed various locations throughout the BLM Johnson Valley off-highway vehicle area; identified and recorded new sites; coordinated survey schedule with the field director.

Border Fence Project Survey and Monitoring, U.S. Army Corps of Engineers, San Diego County, California, and Pima, Santa Cruz and Cochise Counties, Arizona. As archaeological monitor, monitored construction of the U.S./Mexico border fence; surveyed locations of proposed construction activity; mapped new archaeological sites; directed construction activities away from archaeological resources.

Military

Fort Irwin Solar Project, Soitec LLC, Fort Irwin, San Bernardino County, California. As principal investigator, directed pedestrian survey of 12 acres for a proposed solar generation facility; also prepared the technical report.

Level 3 Powerline Road Fiber-Optic Project, HP Communications Inc., Fort Irwin, San Bernardino County, California. As principal investigator, conducted intensive pedestrian survey of approximately 10 acres; also prepared the ARMR technical report of findings.

Naval Air Weapons Station (NAWS) Road Survey, Naval Facilities Engineering Command (NAVFAC) Southwest, Ridgecrest, Inyo, San Bernardino, and Kern Counties, California. As field director, conducted Class III pedestrian survey of approximately 129 miles of existing roads; led a crew of four people; scheduled and coordinated with Explosive Ordnance Disposal escorts; prepared ARMR technical report of findings.

NAWS Fiber-Optic Survey, Epsilon Systems Solutions, Ridgecrest, San Bernardino County California. As crew chief, conducted Class III pedestrian survey for a proposed fiber-optic line; led a crew of two people; assisted the field director with scheduling.

Delivery Order (DO) 30 Survey, NAVFAC Southwest, Marine Corps Air Ground Combat Center (MCAGCC) Twentynine Palms, San Bernardino County, California. As crew chief, surveyed numerous proposed landing zones throughout MCAGCC; coordinated scheduling/training area access with the field director; prepared site forms and site descriptions for ARMR report.

53 Aerial Maneuver Zone (AMZ) Survey, NAVFAC Southwest, MCAGCC Twentynine Palms, San Bernardino County, California. As crew chief, surveyed numerous proposed landing zones throughout MCAGCC Twentynine Palms; coordinated scheduling/training area access with the field director; prepared site forms and site descriptions for ARMR report.

Southwest Division (SWDIV)-04/DO 27 Survey, NAWS China Lake, NAVFAC Southwest, Ridgecrest, Inyo County, California. As field technician, participated in a Class III intensive survey under Section 106 of National Historic Preservation Act; operated a Trimble GeoXH for navigation and site recording.

Resource Management

St Algar's Farm Geochemical Testing, English Heritage, Frome, Somerset, United Kingdom. As student volunteer, helped perform a hand-held pXRF field survey of a Roman-era glass and metalworking site; excavated a 5-by-5-meter trench; identified pre-Roman Iron Age component of site; co-author of technical report.

Transportation

San Onofre to Pulgas Double Track Project, PGH Wong Engineering, Inc., San Diego County, California. As Principal Investigator, directing cultural, paleontological, and Native American monitoring of installation of second railroad track through Camp Pendleton; prepared monitoring and inadvertent discovery work plan; attended weekly construction meetings; preparing weekly monitoring schedules for all monitors, including multiple Native American Tribes (in progress); conducted evaluation excavations for two new discoveries identified during monitoring; prepared letter report summarizing discovery evaluations.

Water/Wastewater

Tijuana River Valley Channel Maintenance, City of San Diego, San Diego County, California. Assumed responsibility of Principal Investigator during project implementation from anther contractor; coordinated archaeological and Native American monitoring; prepared negative monitoring report (in prep); prepared budget for services.

Cultural Resource Inventory for the Morena Reservoir, City of San Diego Public Utilities Department, San Diego County, California. As Principal Investigator, directed a Phase I archaeological survey of lands recently exposed within the high-water line of the lake due to water level draw down; documented approximately 40 new archaeological sites; preparing ARMR-format survey report, including recommendations to treat and prevent on-going impacts to the sites, including looting; collected selected surface artifacts potentially at risk of looting; coordinated archaeological subcontractor and Native American monitor (in progress).

Bear River Restoration Project, Nevada Irrigation District, Nevada and Placer Counties, California. As contributing author, prepared ARMR-format report for 75 acre Phase I pedestrian survey for compliance with CEQA and Section 106 of the NHPA (in progress).

Huntington Beach Beach Blvd. Sewer Improvements Project, Civil Source, Huntington Beach, Orange County, California. As Principal Investigator, directed archeological and Native American monitoring for the installation of a 1 mile sewer line (in progress).

Plano Force Main Project, Santa Margarita Wastewater District, City of Rancho Santa Margarita, Orange County, California. Prepared a constraints analysis for the relocation of an existing force main; reviewed records search results and contacted Native American tribes to assess the potential for cultural resources in the project are; prepared a letter report of findings and recommendations.

Recycled Water MNDs, El Toro Water District, Orange County, California. As Principal Investigator, directed cultural and paleontological monitoring of a water pipeline installation project; coordinated field monitor; prepared technical report (in progress).

Water Recycling Monitoring, San Clemente Water District, San Clemente, Orange County, California. As Principal Investigator, directed cultural and paleontological monitoring of a water pipeline installation project; coordinated field monitor; prepared technical report (in progress).

Carlsbad Desal Plant Project, Poseidon Resources, Carlsbad, California. As Principal Investigator, directed cultural and paleontological monitoring for the water pipeline portion of the project; coordinating and scheduling archaeological and Native American monitors; providing oversight and coordination for paleontological monitor subcontractor; prepared end of fieldwork summary for Plant portion of the project (in progress).

Newhall County Water District Sewer Relocation Project, Alliance Engineering, Santa Clarita, Los Angeles County, California. As Principal Investigator, directed a Phase I pedestrian survey of 13.4 acre sewer line project; prepared ARMR-format report in compliance with CEQA and Section 106 of the NHPA; prepared DPR site record updates.

30" ETM Replacement at San Juan Creek, Moulton Niguel Water District, San Juan Capistrano, Orange County, California. As Principal Investigator, prepared a constraints analysis for water main installation project; prepared a records search review and tribal outreach to assess the potential for cultural resources; prepared a letter report of findings.

Poseidon Wetland Mitigation Project, Poseidon Resources, Inc., Imperial Beach, San Diego County, California. As Principal Investigator, conducted all aspects of a Phase II evaluation of three prehistoric archaeological sites; performed ceramic analysis for report; prepared technical report of findings as lead author.

Buena Vista Creek Enhancement Project, City of Vista, Vista, San Diego County, California. As Principal Investigator, conducted all aspects of a Phase I pedestrian survey for archaeological resources; prepared technical report of findings.

Construction Monitoring for the Pipeline 3 Desalination Relining and Pipeline 4 Vent Modifications Project, San Diego County Water Authority, San Diego County, California. As Principal Investigator, conducted all aspects of a Phase I pedestrian survey for archaeological resources; prepared letter reports summarizing findings of each project component.

MWD Upper Newport Backbay EIR, Metropolitan Water District, Newport Beach, Orange County, California. Requested and reviewed records search for the project area for inclusion in the project EIR.

Wastewater Pipeline Improvement Project, City of South Pasadena, Los Angeles County, California. As Principal Investigator, conducted all aspects of a constraints analysis for a City-wide pipeline rehabilitation and replacement project; performed a limited pedestrian reconnaissance of selected pipeline segments; prepared letter report of findings.

Temescal Canyon and Dawson Canyon Pipelines and Non-Potable Water Tank Project, Lee Lake Water District, Riverside County, California. As principal investigator, performed Phase I intensive pedestrian survey of the project APE; prepared letter report of findings.

Padre Dam Data Recovery, Padre Dam Municipal Water District, Lakeside, San Diego County, California. As field director, conducted a data recovery project of a late prehistoric site using wet screening; led a crew of six; coordinated with Native American monitors; performed shell and ceramic lab analysis studies; contributing author of technical report.

Tijuana River Valley Wetland Mitigation Project, San Diego County Water Authority, Imperial Beach, San Diego County, California. As field technician, performed evaluation excavation of a prehistoric site; hand excavated 1 x 1 meter units; directed excavation of mechanically excavated trenches to explore potentially deeply buried deposits; drew and photographed trench and unit profiles.

PUBLICATIONS

Professional Presentations

Dry Run on a Dry Well: An Experimental Investigation of Sintashta Metallurgy. Paper presented at the 78th Annual Meeting of the Society of American Archaeology. 2013. Lead author.

Time, Space and Place: The Potential of Time/Geography, Geophysical, and Geochemical Approaches for Capturing Experimental Engagement. Paper presented at the 78th Annual Meeting of the Society of American Archaeology. 2013. Co-author.

Finding the Smith in Hammerscale Palais: Investigations at an Experimental Iron Production Site. Poster presented at the 39th International Symposium on Archaeometry 2012. Co-author.

Archaeological Investigations at Site CA-SDI-10,611: A Functional and Temporal Analysis of Subterranean Pit Features In Northern San Diego County. Presented at Society for California Archaeology Annual Meeting 2008. Co-author.

The Burghardts of Great Barrington: The View from the W.E.B. Du Bois Boyhood Homesite. Presented at the Society for Historical Archaeology Conference 2005. Co-author.

Professional Publications

2014 Out of the Furnace and into the Field: Reconceptualising Metallurgical Process as Practice. *Proceedings of the 39th International Symposium for Archaeometry, Leuven (2012)*. Brad E. Comeau, L.M. Cheesman, J.L. Slater, and R.C.P. Doonan.

Technical Reports

2014 (Draft) Negative Cultural Resource Survey Report for the Lone Oak Road Project, Hunsaker & Associates, San Diego County, California. Brad Comeau, MSc, RPA. Submitted to Dan Rehm, Hunsaker & Associates.

2014 Cultural Resources Monitoring Report for the Alessandro Business Park Project, City of Riverside, California. Brad Comeau, MSc, RPA, Nicholas Hanten, Joshua D. Dunn, Ma, RPA, and Micah J. Hale, PhD, RPA.

2014 Archaeological Monitoring and Unanticipated Discovery Treatment Plan for The Vineyard Project, City of Temecula, Riverside County, California. Brad Comeau, MSc, RPA, and Micah J. Hale, PhD, RPA. Submitted to Matt Peters, City of Temecula (in progress).

2014 Cultural and Paleontological Resources Survey Report for the Shearwater Creek Project, City of Temecula, Riverside County, California. Brad Comeau, MSc, PRA and Micah J. Hale, PhD RPA. Submitted to Matt Peters, City of Temecula

2014 (Draft) Cultural Resource Monitoring and Discovery Plan for the Kent South Solar Substation, Kings County, California. Brad Comeau, MSc, RPA and Micah J. Hale, PhD, RPA. Submitted to Dashiell Corporation.

2014 Cultural and Paleontological Resources Survey Report for the Martin Residence, City of Carlsbad, San Diego County, California. Joshua D. Dunn, MA, RPA, Brad Comeau, MSC, RPA, and Micah J. Hale, PhD, RPA. Prepared for Jaime Bernal, HAA Architects.

2014 *Cultural Resources Report for the Artesian Road Project, San Diego County, California*. Brad Comeau, MSc, RPA and Micah J. Hale, PhD, RPA. Submitted to Doug Harwood, The Harwood Group.

2013 (Draft) *Cultural Resources Evaluation for the U.S. Fish and Wildlife Service Otay River Estuary Restoration Project, Otay Mesa, San Diego County, California*. Brad Comeau, MSc, RPA, Nicholas Hanten, Micah J. Hale, PhD, RPA, Matt Maxfeldt, and Adam Giacinto, MA, RPA. Submitted to Nick Valentine, U.S. Fish and Wildlife Service.

2013 Cultural Resources Survey Report for the Newhall County Water District Sewer Relocation Project, Santa Clarita, Los Angeles County, California. Brad Comeau, MSc, RPA and Micah J. Hale, PhD, RPA. Submitted to Craig Whitteker, Alliance Engineering.

2013 *Archaeological and Paleontological Monitoring and Unanticipated Discovery Treatment Plan for the San Onofre-Las Pulgas Double Track Project, Camp Pendleton, San Diego County, California*. Brad Comeau, MSc, RPA and Micah J. Hale, PhD, RPA. Prepared for PGH Simon Wong Engineering, Inc.

2013 *Cultural Resources Survey Letter Report for the Construction Monitoring for the Pipeline 3 Desalination Relining and Pipeline 4 Vent Modifications Project*. Brad Comeau, MSc, RPA, and Micah J. Hale, PhD, RPA.

2013 *Archaeological Survey and Evaluation for the Tierra del Sol LLC Project, San Diego County, California*. James T. Daniels, MA, RPA, Micah J. Hale, PhD, RPA, Brad E. Comeau, MSc, and Adam Giacinto, MA, RPA.

2013 *Negative Cultural Resources Letter Report for the Buena Vista Creek Enhancement Project*. Brad Comeau, MSc, RPA and Micah J. Hale, PhD, RPA. Submitted to Tim Shell, City of Vista.

2013 *Cultural and Paleontological Resources Survey Report for the Arbor Vista Cluster Residential Project, City of Temecula, Riverside County, California*. Brad Comeau, MSc, RPA and Micah J. Hale, PhD, RPA. Submitted to Matt Peters, City of Temecula.

2013 *Cultural and Paleontological Survey Report for the Navy Federal Credit Union Project, City of Temecula, Riverside County, California*. Brad Comeau, MSc, Micah J. Hale, PhD, RPA, Dylan Duvergé, MS, and David Stone, MA, RPA. Submitted to Kenneth Taylor, City of Temecula.

2013 *St Algar's Farm, Selwood, Somerset Geochemical Survey Technology Report.* English Heritage Research Report Series 28-2013. David Dungworth, Brad Comeau and Andrew Lowerre.

2013 *Negative Cultural Resources Letter Report for the San Elijo Hills K-8th Grade Campus Project, San Marcos, California*. Brad Comeau, MSc, RPA and Micah J. Hale, PhD, RPA.

2013 *Archaeological Survey Report for the Level 3 Powerline Road Fiber Optic Project, San Bernardino County, California*. Brad Comeau, MSc, RPA and Micah J. Hale, PhD, RPA

2013 *Archaeological Survey Report for the Construction and Operation of a Concentrated Photovoltaic Facility, Fort Irwin, San Bernardino County, California*. Brad Comeau, MSc, and Micah J. Hale, PhD, RPA. Submitted to Brantley Jackson, Fort Irwin.

2013 *Phase II Archaeological Evaluation of CA-SDI-20031 for the St. John Garabed Church Project, San Diego County, California*. Joshua D. Dunn, MA, RPA, Adam Giacinto, MA, RPA, Micah J. Hale, PhD, RPA, Nicholas Hanten, and Brad Comeau, MSc, RPA.

2012 *Results of Extended Phase I Shovel Probing at Potentially Sensitive Archaeological Sites for the Jacumba Solar Project, San Diego County, California*. Brad Comeau, MSc, and Micah Hale, PhD, RPA.

2012 *Cultural Resources Report for the Extended Phase I Survey for the St. John Garabed Church Project, San Diego County, California*. Brad Comeau, MSc, and Micah Hale, PhD, RPA.

2012 *Cultural Resources Survey Report for the Lee Lake Water District Dawson Canyon Non-potable Water Storage Tank and Pipeline Design Project, Riverside County, California*. Brad Comeau, BA, and Micah Hale, PhD, RPA.

2011 *Class III Archaeological Inventory of 2,560 Acres Comprised of the Entire Sections of 10Z, 14D, 20B, 28B, 32G, Elk Hills, Kern County, California*. David Whitley, PhD, RPA; and Brad Comeau, BA; and Michelle Dalope, BA.

2011 *An Archaeological Evaluation of KER-7290, KER-7293 and KER-7294 for the LaPozz No. 5 Lode Claim (CAMC286149), Indian Wells Valley, Kern County, California*. Mark S. Becker, PhD, RPA; Brad Comeau, BA; and Tony Quach, BA.

2011 *Cultural Resources Inventory for the Gildred Solar Project, San Diego County, California.* Chad Willis, MA, RPA; Micah Hale, PhD, RPA; and Brad Comeau, BA.

2011 *Cultural Resources Inventory Report for the Rhodes Crossing Project, San Diego County, California*. Chad Willis, MA, RPA; Micah Hale, PhD, RPA; and Brad Comeau, BA.

2011 *Class II Cultural Resources Inventory for the Silurian Wind Project, Silurian Valley, San Bernardino County, California*. Diane Winslow, MA, RPA; Micah Hale, PhD, RPA; Sherri Andrews, MA, RPA; and Brad Comeau, BA.

2011 *An Archaeological Inventory of Historic and Contemporary Roads at Naval Air Weapons Station China Lake, Inyo, Kern, and San Bernardino Counties, California*. Brad Comeau, BA; Mark A. Giambastiani, PhD, RPA; and Oliver Patsch, BA.

2011 *Cultural Resources Survey Report for the Palomar Station Project, San Marcos, San Diego County, California*. Brad Comeau, BA, and Micah Hale, PhD, RPA.

2011 *An Archaeological Survey of Bunker Hill in Border Field State Park, San Diego County, California*. Brad Comeau, BA, Scott Wolf, BA, and Micah Hale, PhD, RPA.

2010 *Archaeological Survey Report for the Imperial County Drill Sites Project, Imperial County, California*. Brad Comeau, BA, and Jerry Schafer, PhD, RPA.

2010 *Class II and Class III Cultural Resources Inventory Report for the Tule Wind Project, McCain Valley, San Diego County, California*. Micah Hale, PhD, RPA; Brad Comeau, BA; and Chad Willis, MA.

2010 *Draft Study Plan for Cultural Resources: Gregory Canyon Landfill, San Diego County, California*. Don Laylander and Brad Comeau.

2009 *Data Recovery Excavations at CA-SDI-18472 for the Proposed Padre Dam Municipal Water District Secondary Connection Project (Ridge Hill Facilities), Johnstown, San Diego County, California*. Micah Hale, PhD, RPA, with contributions by Brad Comeau and Aaron Sasson.

Master's Dissertation

2012 *Investigating Metallurgical Practice: An Experimental Study of the Sintashta Well-Tunnel-Furnace (WTF) from the Middle Bronze Age, Siberia, Russia*. University of Sheffield.

Volunteer History

2012	Student Placement, English Heritage, Portsmouth, United Kingdom

Awards/Commendations

1999–2003	Francis Ouimet Scholar

Relevant Previous Experience

2012–present	Archaeologist, Dudek, Encinitas, California
2009–2011	Associate Archaeologist, ASM Affiliates Inc., Carlsbad, California
2008–2009	Archaeological Monitor, E^{2}m, Denver, Colorado
2008	Archaeological Monitor/Field Technician, URS Corporation, San Diego, California
2005–2008	Field Supervisor, Brian F. Smith and Associates, Poway, California

2003–2004 Field/Lab Technician, University of Massachusetts Archaeological Services, Amherst, Massachusetts

2003 Field School in Archaeology, University of Massachusetts Amherst/Great Barrington, Massachusetts. As student, participated in site surveying and mapping using theodolite; instructed in and participated in excavation and laboratory methodology; participated in geophysical surveying.

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Samantha Murray, RPA – Archaeologist

Samantha Murray is an archaeologist with 8 years' experience in environmental consulting in all elements of cultural resources management, including project management; Phase I, II, and III field investigations; architectural history studies; building evaluations; archival and records research using the California Historical Resources Information System (CHRIS); Native American consultation with the Native American Heritage Commission (NAHC) and local tribes; local historic group consultation; archaeological and osteological laboratory analysis; and artifact cataloging and curation. Ms. Murray possesses the Secretary of the Interior's Professional Qualification Standards (PQS) for both Archaeology and Architectural History. She is experienced managing multidisciplinary projects in the lines of transportation, transmission and generation, federal land management, land development, state and local government, and the private sector. She prepares environmental compliance documentation in support of projects that fall under the National Historic Preservation Act (NHPA), the Native American Graves Protection Act (NAGPRA), the National Environmental Policy Act (NEPA), and the California Environmental Quality Act (CEQA), including: cultural resources assessments, archaeological/historic resources survey and evaluation reports, inventories of human remains and associated funerary objects, Environmental Assessments (EAs), Environmental Impact Statements (EISs), Environmental Impact Reports (EIRs), Mitigated Negative Declarations (MNDs), and Initial Studies (ISs).

Education

California State University, Los Angeles
MA, Forensic Anthropology, 2013

California State University, Northridge
BA, Anthropology, 2003

Certifications

Register of Professional Archaeologists (ID No. 990015)

Professional Affiliations

Society for American Archaeology (SAA)

Society for California Archaeology (SCA)

Relevant Project Experience

Development

Blackstone Phase II Project, Shea Homes LP, Orange County, California. served as primary report author for the CEQA report. The project involved archaeological and paleontological monitoring and testing of a large housing development property in Brea.

Ponte Vista Project in San Pedro, Jeffer Mangels Butler & Mitchell LLP, City of Los Angeles, Los Angeles County, California. Served as field director for the archaeological survey and was primary author of the technical report. Conducted an archaeological survey of a 61.5-acre former U.S. Navy housing complex and prepared a cultural resources technical report.

Education

Los Angeles City Cemetery Project, AECOM, City of Los Angeles, Los Angeles County, California (2010). Served as a consulting osteologist for the Central High School No. 9 Project. Assisted with the metric, morphological, and comparative analysis of osteological data obtained from the nineteenth century City Cemetery in downtown Los Angeles. This included reanalyzing osteological data recorded several years ago, and assisting with preparation of the osteological analysis chapter (see Publications).

Energy

WKN Wagner Wind Project, The Altum Group, Palm Springs, Riverside County, California. Served as field director for the cultural resources survey and primary author of the cultural resources survey report. The project involved the construction of two 3-megawatt (MW) Vestas V90 wind turbine generators, with an accompanying permanent meteorological

(MET) tower, on an approximately 26-acre site. Conducted an intensive-level survey of the project area, a CHRIS records search and literature review, a NAHC Sacred Lands File search, and initial Native American coordination, and prepared a cultural resources technical report.

LOSSAN Control Point San Onofre to Control Point Pulgas Double Track Project, HNTB Corporation, San Diego County, California. Served as field director for the archaeological and architectural history survey and co-authored the technical report. Conducted a survey and evaluation of cultural resources in support of the Los Angeles to San Diego, California (LOSSAN) Control Point (CP) San Onofre to CP Pulgas Double Track Upgrade Project. The project is located within the boundaries of the Marine Corps Base Camp Pendleton in northern San Diego County, on federal land that is part of a long-term lease to the rail operator.

Poso Creek Delivery Meter Station Project, El Paso Corporation, Kern County, California. Served as field director for the archaeological survey and was primary author of the technical report. Conducted an intensive-level cultural resources survey (for both archaeological and architectural history resources) and prepared a cultural resources technical report in support of the proposed Poso Creek Delivery Meter Station Project on the Mojave Pipeline, near the unincorporated community of Oildale outside the City of Bakersfield.

Federal

Class III Cultural Resources Inventory for the Lake Mathews Project, Bureau of Land Management (BLM) Riverside County, California. Served as archaeological field crew and co-author of the technical report. Conducted a Class III cultural resources inventory within the Lake Mathews Project's Area of Potential Effects (APE), which included 221.1 acres of BLM-managed land, and 24.3 acres of Riverside County Habitat Conservation Agency-managed land, in the Lake Mathews area in Riverside County, California.

Johnsondale Archaeological Survey and Evaluation of Site CA-TUL-819, U.S. Forest Service, Tulare County, California. Served as archaeological field crew, debitage analyst, and co-author of the final report. The project consisted of surveying previously recorded prehistoric site CA-TUL-819, and conducting a testing program to evaluate the site for inclusion in the National Register of Historic Places (NRHP).

Military

Integrated Cultural Resources Management Plan (ICRMP) Update for Marine Corps Logistic Base Barstow, NAVFAC Southwest, San Bernardino County, California. Authored the 2011 ICRMP and served as project manager for the 2014 ICRMP update. The update includes survey and evaluation of two historic road segments, recordation and preparation of a conditions assessment of the Rattlesnake Rock Art site, and revision of the NRHP nomination for the site.

Edwards Air Force Base Historic Context and Survey, JT3/CH2M Hill, Multiple Counties, California. Serving as project manager for survey and evaluation of 17 buildings and structures located throughout the base, and preparation of a Cold War context for all built environment resources on base.

Integrated Cultural Resources Management Plan, Naval Air Station – Lemoore, NAVFAC Southwest (U.S. Navy), Kings County, California. Served as project manager and primary author of the Final ICRMP document. The project consists of preparing a management plan for the protection and management of cultural resources located within Naval Air Station – Lemoore. The management plan inventories known cultural resources, summarizes relevant laws and regulations, and establishes management priorities for the installation.

Integrated Cultural Resources Management Plan for Marine Corps Logistics Base (MCLB) Barstow, NAVFAC Southwest (U.S. Navy), San Bernardino County, Barstow, California. Served as the primary author of the Draft and Final document. The project consisted of preparing a management plan for the protection and management of cultural resources located within MCLB Barstow. The management plan inventories known cultural resources, summarizes relevant laws and regulations, and establishes management priorities for the installation.

Naval Air Station Fallon Training Range B-17 Archaeological Survey, NAVFAC Southwest (U.S. Navy), Churchill County, Nevada. Served as staff archaeologist, assisting with preparation of IMACS (Intermountain Antiquities Computer Center) forms and the technical report. The project consisted of an intensive pedestrian survey of approximately 5,000 acres of land located in training range B-17, Naval Air Station Fallon.

Marine Corps Air Ground Combat Center (MCAGCC) Twentynine Palms Archaeological Survey and Evaluation Project, NAVFAC Southwest (U.S. Navy), San Bernardino County, California. Served as archaeological field crew, debitage analyst, and co-author of the report. The project consisted of surveying approximately 1,575 acres within MCAGCC and testing/evaluating 10 archaeological sites for inclusion in the NRHP.

San Clemente Island Site Documentation, Department of the Navy (Southwest Division), Los Angeles County, California. Served as staff archaeologist in the preparation of a comprehensive report to document archaeological eligibility findings conducted by various researchers at 31 prehistoric archaeological sites on the central plateau of San Clemente Island as part of an effort to determine which sites will require data recovery as mitigation for a change in use of the project area.

Integrated Cultural Resources Management Plan, Naval Weapons Station, Seal Beach, Detachment Corona, NAVFAC Southwest (U.S. Navy), Riverside County, California. Served as project manager and primary author of the Advance Draft document. The project consists of preparing a management plan for the protection and management of cultural resources located within Naval Weapons Station, Seal Beach, Detachment Corona. The management plan inventories known cultural resources, summarizes relevant laws and regulations, and establishes management priorities for the installation.

Integrated Cultural Resources Management Plan, Naval Weapons Station, Seal Beach, NAVFAC Southwest (U.S. Navy), Orange County, California. Served as project manager and primary author of the Advance Draft document. The project consists of preparing a management plan for the protection and management of cultural resources located within Naval Weapons Station, Seal Beach. The management plan inventories known cultural resources, summarizes relevant laws and regulations, and establishes management priorities for the installation.

Integrated Cultural Resources Management Plan, Naval Air Weapons Station China Lake, NAVFAC Southwest (U.S. Navy), Inyo, Kern, and San Bernardino Counties, California. Served as co-author of the final document. The project consists of preparing a management plan for the protection and management of cultural resources located within Naval Air Weapons Station China Lake. The management plan inventories known cultural resources, summarizes relevant laws and regulations, and establishes management priorities for the installation.

Municipal

La Plaza Cemetery Project, County of Los Angeles, California. Served as osteologist and co-author of the technical report, archaeological monitoring report, and Historic Property Management Plan (HPMP), as well as the archaeological field director for the cemetery boundary testing phase. Wrote the osteology chapter of the Section 106 technical report which discusses methods, analysis, and findings regarding 130 individuals excavated by another consultant from the Plaza Church Cemetery. Analyzed all individuals excavated from the site for age, sex, ancestry, and any pathological or traumatic conditions.

City of Los Angeles Department of Public Works (LADPW) Bureau of Engineering (BOE) Gaffey Pool and Bathhouse Project, LADPW, Los Angeles County, California. Served as project manager, field director for the intensive-level cultural resources survey, and primary author of the cultural resources technical report. The LADPW BOE proposes to conduct various improvements to the Gaffey Street Pool and surrounding area, located in Upper Reservation of Fort McArthur in San Pedro, California.

Topanga Library Project Osteological Analysis, AECOM, Los Angeles County, California. Served as project manager, osteologist, and primary author or the osteological technical report. Analyzed fragmented human skeletal remains recovered from CA-LAN-8, one of the first recorded archaeological sites in Los Angeles, including recording metric and morphological traits of the bone fragments, human/non-human determination, determination of the biological profile (age, sex, ancestry, stature, pathology) to whatever extent feasible, documentation of overall bone condition, and determination of the minimum number of individuals present.

Terminal Island Historic Building Evaluations, CDM, Port of Los Angeles, Los Angeles County, California. Served as project manager, field director for the architectural history survey, and primary author of the technical report. Formally evaluated 16 Port of Los Angeles-owned properties on Terminal Island for NRHP and California Register of Historical Resources eligibility, as well as local level eligibility, and recently submitted the final technical report presenting the results of the significance evaluations.

San Nicolas Island Site Testing Project, Ventura County, California. Participated in the testing and laboratory analysis of a prehistoric habitation site on San Nicholas Island that was first recorded in 1993.

Recreation

LADPW BOE Sheldon Skate Park Project, LADPW BOE, Los Angeles County, California. Served as project manager for archaeological monitoring during ground-disturbing activities that occurred as part of construction of the Sheldon Skate Park in Sun Valley and prepared an archaeological monitoring report.

NAVFAC Southwest San Nicolas Island NAGPRA Inventory Update Project, NAVFAC Southwest, various museums in California. Served as project manager and conducted NAGPRA inventory spot-checks of human remains and funerary objects from San Nicolas Island located at seven museum curation facilities throughout California for compliance with CFR 79. Provided NAVFAC Southwest with an updated Section 5 NAGPRA inventory for each facility.

LADPW BOE San Pedro Plaza Park Project, LADPW BOE, Los Angeles County, California. Served as project manager, field director for the intensive-level cultural resources survey, and primary author of the cultural resources technical report. The LADPW BOE proposes to conduct various outdoor improvements to the San Pedro Plaza Park, including grading; hillside slope repair; construction of small retaining walls; and installation of view decks, fencing, gates, security lighting, seating areas, signage, landscaping, and irrigation.

Transportation

LADPW BOE Downtown Cesar Chavez Median Project, LADPW BOE, Los Angeles County, California. Served as field director for the intensive-level cultural resources survey and co-author of the Caltrans Archaeological Survey Report (ASR) and Historic Resources Evaluation Report (HRER). LAPDW BOE proposes to provide for transportation enhancements along West Cesar Chavez Boulevard in the downtown area of Los Angeles.

Metro Green Line to LAX Project, Terry A. Hayes Associates LLC, Los Angeles, California. Served as project manager for a multidisciplinary project that includes cultural resources, biology, and paleontology. The Los Angeles County Metropolitan Transportation Authority (Metro), Federal Transit Administration, Federal Aviation Administration, and Los Angeles World Airports have initiated an Alternatives Analysis (AA)/Draft EIS/Draft EIR for the Metro Green Line to Los Angeles International Airport (LAX) project. The AA/DEIS/DEIR is being prepared to comply with NEPA and CEQA. This study will examine potential connections between the planned Metro Crenshaw/LAX Transit Corridor Project's Aviation/Century Station and the LAX Central Terminal Area located approximately 1 mile to the west.

San Gabriel Trench Grade Separation Project (Phases I, II, and III), Cities of San Gabriel, Alhambra, and Rosemead, Terry A. Hayes Associates LLC, Los Angeles County, California. Served as archaeologist and architectural historian, assisting with the archaeological and architectural history field surveys, archaeological testing of the site and completion of DPR forms for the evaluation of architectural history resources. Served the on-site human osteologist. The project consisted of conducting a cultural resources assessment for a proposed grade separation located within the cities of San Gabriel, Alhambra, and Rosemead. The proposed project would lower a 2.2-mile section of Union Pacific Railroad tracks in the immediate vicinity of the historic Mission San Gabriel Arcángel.

Azusa Intermodal Parking Facility Project, Terry A. Hayes Associates LLC, Azusa, Los Angeles County, California. Served as field director, assistant project manager, and primary report author for the intensive-level cultural resources survey and cultural resources technical report. The City of Azusa proposes to construct an approximately 39-foot high, four-story parking structure; bus bays for passenger loading/unloading for layovers; and electric charging stations for patrons of the future Gold Line Foothill Extension Azusa Station.

Goleta Beach Park Bridge Replacement Project, Quincy Engineering, Santa Barbara County, California. Served as staff archaeologist, field director, and primary author of the Caltrans ASR. Conducted a records search, NAHC coordination, and an intensive pedestrian survey of a 4.67-acre project APE, and prepared the ASR. The County of Santa Barbara proposes to demolish the existing, structurally deficient, Goleta Beach Park Bridge (bridge no. 51C-0158) over the Goleta Slough and replace it with a new bridge.

SANDAG Mid-Coast Corridor Transit Project Peer Review, Parsons Brinckerhoff, San Diego County, California. Served as project manager for a multi-disciplinary peer review of cultural and paleontological resources documents prepared by another consulting firm.

LOSSAN San Luis Rey River and Second Track Project, HNTB Corporation, Oceanside, San Diego County, California. Served as primary author for the technical report and conducted the intensive-level cultural resources field survey. Prepared the cultural resources technical report and a DPR form for evaluation of the bridge's historical significance. The project proposes to construct a new 0.6-mile section of double-track to connect two existing passing tracks, and replace the existing San Luis Rey River Bridge.

Crenshaw/LAX Transit Corridor Project, Terry A. Hayes Associates LLC, Los Angeles County, California. Supervised architectural history survey and participated in the evaluation of over 100 historic properties that may be affected by the Los Angeles County Metropolitan Transportation Authority's (Metro's) proposed Crenshaw/LAX Transit Corridor Project. The project is approximately 8.5 miles in length and is located within the cities of Los Angeles and Inglewood, Los Angeles County, California.

Half Moon Bay Airport Taxiway and Access Road Improvement Project, Coffman Associates, San Mateo County, California. Served as field director for the archaeological and architectural history survey and co-authored the technical report. I conducted a cultural resources survey of 21.65 acres situated on three areas within the 313-acre airport property. Half Moon Bay Airport is located approximately 5 miles north of the City of Half Moon Bay in unincorporated San Mateo County, California.

Sunset Avenue Grade Separation Project, Kimley-Horn and Associates Inc., Riverside County, California. Served as field director for the archaeological and architectural history survey and co-authored the ASR, HRER, and Historic Property Survey Report. Conducted a 43.6-acre survey for cultural resources, and prepared environmental compliance documentation in accordance with Caltrans. The project involved a proposed grade separation of Sunset Avenue, which crosses the Union Pacific Railroad (UPRR) in the City of Banning, Riverside County.

State Route 23/Tierra Rejada Interchange Soundwall Project, Parsons Transportation Group, City of Moorpark, Ventura County, California. Served as field director for the archaeological survey and co-authored the technical report. SWCA Environmental Consultants (SWCA) prepared cultural resources documentation in the form of an ASR. The intent of this report was to achieve CEQA compliance as it relates to cultural resources, for the construction of two soundwalls within the southbound State Route 23 right-of-way (ROW), including portions of the Tierra Rejada off-ramp.

Hollister Avenue Bridge Seismic Retrofit Project, Santa Barbara County Public Works Department, Santa Barbara County, California. Supervised architectural history survey of surrounding properties. The project proposed the seismic retrofit of (UPRR) Bridge 51C-0018 on Hollister Avenue in an unincorporated area of Santa Barbara County, located between UPRR mile posts 362.08 and 362.41.

Nogales Grade Separation/Gale Avenue Widening/Evaluation of 938 Nogales Street, Terry A. Hayes Associates LLC, City of Industry, Los Angeles County, California (2009). Architectural Historian. Conducted the architectural history field survey and co-authored the report. The project consisted of conducting a cultural resources assessment for a proposed grade separation project that would lower Nogales Street beneath the Union Pacific Railroad tracks and widen a 0.83 mile section of Walnut Drive/Gale Avenue located in the City of Industry.

Tribal

Gray Butte Gen-Tie Line, Berry Creek Rancheria of Tyme Maidu Indians, Los Angeles and San Bernardino Counties, California. Served as co-author of the cultural resources technical report. This project was proposed by the Bureau of Indian Affairs, Public Region for the purpose of constructing specific roadways, drainage structures, sidewalks, curbs and gutters within the Berry Creek Rancheria. The project area comprises two nonadjacent study areas (the Subdivision study area and the Roads A & B study area).

PUBLICATIONS

Gross, C., Melmed, A., Murray, S., Dietler, S., and Gibson, H. 2012. Osteological Analysis. In *Not Dead but Gone Before: The Archaeology of Los Angeles City Cemetery*, edited by H. Gibson and S. Dietler, AECOM Cultural Heritage Publication Number 4, San Diego.

Murray, S. 2013. *The People of Plaza Church Cemetery (1822-1844): An Osteological Analysis of Los Angeles' First Cemetery*. UMI Dissertation Publishing, ProQuest, LLC., Michigan.

TRAINING

- Historic Designation and Documentation Workshop, CPF, 2012
- Historic Context Writing Workshop, CPF, 2011
- Flintknapping Workshop, California Desert Studies Center, 2010
- Section 106 Compliance Training, SWCA, 2010
- CEQA Basics Workshop, SWCA, 2009
- NEPA Basics Workshop, SWCA, 2008
- CEQA, NEPA, and Other Legislative Mandates Workshop, UCLA, 2008

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Micah Hale, PhD, RPA – Senior Archaeologist

Micah Hale is Dudek's cultural resources practice manager and lead principal investigator, with technical expertise as a lithic and groundstone analyst, invertebrate analyst, and in ground penetrating radar. Over the course of his 18 year career, Dr. Hale has served as a principal investigator in the public and private sector for all levels of archaeological investigation, as a public outreach coordinator and as an assistant professor at the University of California, Davis (U.C. Davis). As Dudek's cultural resources practice manager, he currently functions as a principal investigator in project oversight including proposals, research designs, fieldwork, artifact analysis, and report authorship.

Dr. Hale's experience is both academic and professional spanning California, Arizona, Nevada, and Oregon, including work for Naval Facilities Engineering Command (NAVFAC) Southwest, California Department of Transportation (Caltrans), Western Area Power Administration, Bureau of Land Management (BLM), U.S. Army Corps of Engineers (ACOE), U.S. Fish and Wildlife Service (USFWS), California State Parks, various city and county agencies, and directly for Native American groups. Dr. Hale has supervised numerous large-scale surveys, test excavations, data recovery programs, and geoarchaeological investigations, served as a third party review consultant, and an expert witness in legal proceedings. He has authored research designs, management and treatment plans, proposals, preliminary and final reports, and technical analyses. Dr. Hale has integrated his personal research interests into projects and participated in professional symposia at local and national venues, including the Society for American Archaeology and the Society for California Archaeology. Additionally, he has conducted academic research in the Polar Arctic, Greenland. Dr. Hale's current focus is on hunter-gatherer archaeology of California and the Great Basin, applying theoretical premises of cultural evolution and human behavioral ecology.

Education

University of California, Davis
PhD, Anthropology, 2009

California State University, Sacramento
MA, Anthropology, 2001

University of California, Davis
BS, Anthropology, 1996

Certifications

Register of Professional Archaeologists, 2001

Professional Affiliations

Society for American Archaeology

Society for California Archaeology

Antelope Valley Archaeological Society

San Diego Archaeological Society

Project Experience

Development

Phase II Archaeological Data Recovery for the Newland Homes Sierra Project, San Diego County, California, 2013-present. As project manager and principal investigator, supervising data recovery investigations at two significant prehistoric archaeological sites and historic archival research of a homestead in support of the Newland Sierra Environmental Impact Report (EIR).

Phase I Archaeological Inventory and Phase II Archaeological Evaluation for the Yokohl Ranch Project, Tulare County, California, 2012-2013. As project manager and principal investigator, supervised completion of 12,000 acre survey and archaeological evaluation of 85 prehistoric and historical archaeological sites in support of the Yokohl Ranch EIR.

Phase I Inventory and Phase II Cultural Resources Evaluation for the Star Ranch Project, RBF Consulting, San Diego County, California, 2011. As project manager and principal investigator, supervised CEQA inventory and evaluation for private development.

Phase II Archaeological Evaluation of Two Prehistoric Sites, Torrey Pines Glider Port, San Diego County, California, 2012. As project manager and principal investigator, supervised CEQA evaluation of two prehistoric archaeological sites for the Torrey Pines City Park General Development Plan.

Data Recovery of One Prehistoric Site for the Rhodes Property, Sea Breeze Properties, San Diego County, California. As project manager and principal investigator, supervised CEQA compliant data recovery of a large prehistoric site for a residential development.

Archaeological Survey of the Paramount Mine Exploratory Drilling Project, Essex Environmental, Mono County, Nevada, 2006. As principal investigator and field director, conducted archaeological survey for mining exploration and prepared the technical report.

Phase I Inventory of 1,544 Acres and Phase II Evaluation of Archaeological Sites along the Western and Northwestern Boundaries, Edwards Air Force Base, Kern County, California, 2005. As field director, supervised a Phase I inventory of 1,544 acres. Recorded 30 new archaeological sites, more than a dozen "sub-modern" refuse dumps, and a variety of isolate finds. Notable sites include several early Holocene lithic scatters (Lake Mojave-, Silver Lake-, and Pinto-age deposits), a rhyolite lithic quarry, and a complex of historic dumps associated with homesteading activities around Lone Butte.

Pankey Ranch Testing, Pardee Homes, Northern San Diego County, California, 2004. As field director, supervised excavation of shovel test pits to delineate the boundaries of site CA-SDI-682, the prehistoric village of Tom-Kav. Managed field personnel, conducted excavation, and wrote portions of technical report.

Oceanside Hilton EIR, Dudek Associates, Oceanside, San Diego County, California, 2004. As principal investigator and field director, conducted a survey of the proposed Hilton Hotel at the eastern end of Buena Vista Lagoon in Carlsbad and prepared portions of technical report for an EIR.

Archaeological Survey of the La Mesa Meadows Residential Development Project, Helix Environmental, San Diego County, California, 2005. As principal investigator, conducted a survey of a proposed residential development in San Diego County.

Data Recovery of Locus O, Star Canyon Development, Agua Caliente Band of Cahuilla Indians, Palm Springs, Riverside County, California, 2004. As field director, supervised field crews for data recovery mitigation of an archaeological deposit and human remains near Tahquitz Canyon. Coordinated with Native American representatives and prepared portions of the technical report.

Linda Vista Survey, City of San Marcos Planning Department, San Diego County, California, 2003. As field director, conducted a Phase I cultural resource inventory of the proposed road realignment in San Marcos. Prepared technical reports and made recommendations for additional work to be done within the project area.

Archaeological Monitoring for Williams Communications Fiber-Optic Line, Jones and Stokes Associates, San Luis Obispo and Bakersfield, Kern and San Luis Obispo Counties, California, 2001. As resource monitor/Native American coordinator, conducted archaeological monitoring for a fiber-optic cable installation project that spanned 180 miles from San Luis Obispo to Bakersfield. Identified and protected archaeological resources in the project area in compliance with state and federal regulations. Managed Native American monitors and coordinated daily work with construction and environmental staff to facilitate project completion.

AT&T Cable Removal Project, Jones and Stokes Associates, Taft to Los Angeles, Kern and Los Angeles Counties, California, 1998. As field archaeologist, conducted a survey to determine archaeological impact by the removal of a lead-lined subsurface cable.

Subsurface Survey of a Proposed Bicycle Path Along the Columbia River Slough in Northwest Portland, City of Portland, Multnomah County, Oregon, 2000. As field archaeologist, conducted auger testing in a variable north-to-south transect at 30-meter intervals, and unit mapping.

Phase II Test Excavations, AT&T, Portland, Multnomah County, Oregon, and Vancouver, Clark County, Washington, 1999. This project determined the presence and condition of any cultural resources in the project areas that were situated on the northern and southern sides of the Columbia River in Washington and Oregon.

Education

Data Recovery for the Palomar North and Meadowood Projects, Palomar College, San Diego County, California, 2012. As principal investigator, supervised Section 106 and CEQA-compliant data recovery of the ethnohistoric village of Tom-Kav. Expert witness for litigation of archaeological work for the client.

Data Recovery Excavations in Advance of Geotechnical Coring at W-12, University of California San Diego (UCSD), San Diego County, California, 2009. As project manager and principal investigator, supervised data recovery excavations in a midden dated as early as 9,600 years before present.

Archaeological Test Excavations at Selected Sites on Vandenberg Air Force Base, University of California, Davis, Lompoc, Santa Barbara County, California, 2008. As principal investigator and field director, supervised and instructed 21 students for the 2008 U.C. Davis Field School.

Archaeological Survey and Excavations in the Polar Arctic, University of California Davis, Northwest Greenland, 2006. As researcher, conducted a project for the National Science Foundation, National Geographic, and the Inglefieldland Polar Archaeology Expedition; U.C. Davis.

Energy

Phase II Evaluation of 19 Archaeological Sites for Soitec's Tierra Del Sol Solar Project, San Diego County, California, 2012-2013. As principal investigator, oversaw and implemented significance evaluations, including fieldwork and documentation, under CEQA and San Diego County guidelines within the development footprint.

Phase II Evaluation of 42 Archaeological Sites for Soitec's Rugged Solar Project, San Diego County, California, 2012-2013. As principal investigator, oversaw and implemented significance evaluations, including fieldwork and documentation, under CEQA and San Diego County guidelines within the development footprint.

Class III Cultural Resources Inventory for the Level 3 Fiber Optic Installation Project, Fort Irwin Army Reserve and BLM, San Bernardino County, California, 2012-2013. As Project manager and co-principal investigator, oversaw and implemented cultural resource inventory of fiber optic corridor and recordation and evaluation of contributing elements to the NRHP-eligible LADWP transmission line corridor.

Class III Cultural Resources Inventory for Soitec's Fort Irwin Solar Project, San Bernardino County, California, 2013. As project manager and co-principal investigator, oversaw and implemented cultural resources inventory.

Third Party Compliance Monitoring for the Ocotillo Wind Energy Farm, Ocotillo, Imperial County, California, 2012-2013. As principal investigator, oversaw and implemented compliance assistance to the BLM to ensure adherence to mitigation measures and proper treatment of cultural resources.

Third Party Compliance Monitoring for the Tule Wind Project, San Diego County, California, 2012-2013. As principal investigator, oversaw and implemented compliance assistance to the Bureau of Land Management to ensure adherence to mitigation measures and proper treatment of cultural resources.

Third Party Compliance Monitoring for the East County Substation Project, San Diego County, California, 2012-2013. As principal investigator, oversaw and implemented compliance assistance to the BLM and California Public Utilities Commission (CPUC) to ensure adherence to mitigation measures and proper treatment of cultural resources.

Third Party Compliance Monitoring for the Rio Mesa Solar Project, Riverside County, California, 2012-2013. As principal investigator, oversaw and implemented compliance assistance to the BLM to ensure adherence to mitigation measures and proper treatment of cultural resources.

Phase II Archaeological Testing of One Historic Site for the Cool Valley Solar Project, RBF Consulting, San Diego County, California. As project manager, supervised implementation of archaeological testing of a historic airfield near Campo.

Phase II Archaeological Testing of Four Prehistoric Sites for the Gildred Solar Project, RBF Consulting, San Diego County, California. As project manager, supervised implementation of archaeological testing of four small prehistoric sites along the ancient Lake Cahuilla shoreline.

Phase II Archaeological Testing of One Prehistoric Site for the Borrego A and B Solar Projects, RBF Consulting, San Diego County, California. As project manager, supervised implementation of archaeological testing of a large prehistoric habitation site in the Imperial Valley.

Phase I Cultural Resources Inventories for the Sol Orchard and Sol Focus Solar Projects, RBF Consulting, San Diego County, California. As project manager, supervised implementation of Phase I CEQA inventories for more than 22 solar projects.

Class II Survey of 4,700 Acres for the Silurian Wind Project, Iberdrola Renewables, San Bernardino County, California, 2011. As project manager and principal investigator, supervised Section 106 inventory of proposed renewable energy project.

Class III and Class II Cultural Resources Inventory for the Tule Wind Alternative Energy Project, HDR Engineering for Iberdrola Renewables, San Diego County, California, 2010. As project manager and principal investigator, supervised inventory of 6,000 acres and recordation of nearly 200 archaeological sites, and assisted the BLM in preparation of a programmatic agreement between Iberdrola and the California State Historic Preservation Office (SHPO).

Monitoring of the Installation of Meteorological (MET) Towers for the Tule Wind Project, HDR Engineering, San Diego County, California, 2010. As project manager and principal investigator, supervised archaeological and Native American monitors during MET tower installation in the Tule Wind project area.

Jamul Substation 6, San Diego Gas & Electric Company (SDG&E), Jamul, San Diego County, California, 2004. As field director, conducted an intensive pedestrian survey of 18 acres in Jamul for a proposed substation construction project. Identified and recorded two archaeological sites within the project area. Prepared the technical report. Coordinated with paleontology subcontractor and incorporated paleontology report into ASM's archaeology technical report.

Path 15 Transmission Line Corridor, Steigers Corporation, San Joaquin Valley, Fresno and Merced Counties, California, 2004. As field director, supervised survey of over 87 miles of 400-foot transmission line corridor and over 46 miles of access roads in Merced and Fresno Counties. Supervised field crew, documented sites, coordinated with Native American representatives, coordinated access to survey areas, and prepared portions of technical report.

Carmel Valley Substation Survey, SDG&E, Carmel Valley, San Diego County, California, 2003. As field director, conducted a Phase I cultural resource inventory of a proposed power substation.

Federal

Ground-Penetrating Radar Survey and Class III Inventory for the Friendship Circle Project, Department of Homeland Security, Gulf South Research Corporation, San Diego County, California. As project manager and principal investigator, supervised and implemented a ground-penetrating radar survey and surface survey for the Friendship Circle project at Border Fields State Park, San Diego.

Military

Phase II Evaluation of 31 High Complexity Sites on Edwards Air Force Base, CH2MHill/JT3, Kern and Los Angeles Counties, California, 2010. As project manager, oversaw Section 106 test excavations at 31 prehistoric archaeological sites.

Phase II Evaluation of 85 Archaeological Sites on Edwards Air Force Base, CH2MHill/JT3, Kern and Los Angeles Counties, California, 2010. As project manager and principal investigator, supervised Section 106 test excavations at 42 prehistoric and 43 historic archaeological sites.

Western Acquisition Survey, Marine Corps Air Ground Combat Center (MCAGCC) Twentynine Palms, San Bernardino County, California, 2010. As principal investigator, managed the survey of 10,000 acres on land administered by the BLM in Johnson Valley, west of the base. Duties included project management, coordination with BLM Barstow field office and MCAGCC 29 Palms personnel, coordinating and supervising field crews, as well as document preparation.

Management Plan for the Coso Rock Art National Historic Landmark (NHL), Naval Air Weapons Station (NAWS) China Lake, Inyo County, California, 2010. As project manager, supervised and co-authored a management plan for the Coso Rock Art NHL, including arranging and implementing stakeholder meetings and field testing the implementation plan.

Section 110 Intensive Archaeological Survey of the Cole Flat Training Area, NAWS China Lake, Inyo County, California, 2009. As project manager and principal investigator, supervised the survey of 5,400 acres near the Coso Rock Art NHL.

Phase I Survey of Selected Parcels in Five Training Areas, MCAGCC Twentynine Palms, San Bernardino County, California, 2009. As project manager and principal investigator, supervised survey of 4,500 acres in the Blacktop, Lava, Lavic Lake, Sunshine Peak, and Quackenbush training areas.

Phase I Survey of Aerial Maneuver Zones for the 53 AMZ Project, MCAGCC Twentynine Palms, California, 2009. As project manager and principal investigator, supervised survey of 72 Aerial Maneuver Zones. Client Reference: Leslie Glover, MCAGCC 29 Palms, 760.830.5369.

Cultural Resources Inventory and Evaluation for the Skaggs Island BRAC Disposal Archaeological Survey, Naval Communications Station, Sonoma County, California, 2011-2012. As principal investigator, supervised survey of installation and recordation and evaluation of historic civilian and military resources.

Phase I Survey of 8,100 Acres on Edwards Air Force Base, ACOE, Kern County, California, 2008–2009. As principal investigator, supervised survey of 8,100 acres on Edward Air Force Base.

Phase I and II Survey of 2,500 Acres and Evaluation of 50 Sites on Edwards Air Force Base, ACOE, Kern County, California, 2008. As principal investigator, supervised survey of 2,500 acres and evaluation of 50 sites on Edward Air Force Base.

Cultural Resources Inventory and Evaluation for the Concord Inland BRAC Disposal Archaeological Survey, Naval Weapons Station, Seal Beach, Detachment Concord, Contra Costa County, California. As principal investigator, supervised survey of 5,200 acres and recordation and evaluation of historic civilian and military resources, and prehistoric archaeological sites.

Archaeological Evaluation of Eight Prehistoric Sites in the Emerson and Quackenbush Training Areas, ACOE, MCAGCC Twentynine Palms, San Bernardino County, California, 2005. As field director, supervised excavation of eight prehistoric sites on the Marine Corps base in Twentynine Palms, California.

Archaeological Evaluation of 22 Sites on Edwards Air Force Base, ACOE, San Bernardino County, California, 2005. As field director, supervised the National Register evaluation of 22 sites at Edwards Air Force Base.

Naval Base Point Loma Site Recordation, NAVFAC Southwest (SW), Point Loma, San Diego County, California, 2004. As principal investigator and field director, supervised relocation of 33 sites located on Naval Base Point Loma. Reviewed site documentation and re-recorded sites that were improperly documented by past surveys.

Archaeological Testing of 23 Sites in the Las Pulgas Corridor, MCB Camp Pendleton Environmental Security, MCB Camp Pendleton, San Diego County, California, 2004. As field director, supervised field crews for Phase II testing and mechanical coring of 23 sites on Camp Pendleton. Coordinated with coring contractor and base personnel. Documented sites in the field. Supervised field crews and prepared portions of technical report.

Rose-Arizone, Clay, and Photo Drainage, and Road Improvement Surveys, NAVFAC SW, NALF San Clemente Island, Los Angeles County, California, 2004. As field director, supervised archaeological surveys and the placement of protective signing on 750 sites. Coordinated access to the island and supervised one crew member.

Remote Sensing, NAVFAC SW, NALF San Clemente Island, Los Angeles County, California, 2004. As Global Positioning System (GPS) specialist, conducted data collection and image rectification for a remote sensing project in the detection of archaeological sites on the base. Supervised one crew member.

MCB Camp Pendleton Burn Survey, MCB Camp Pendleton Environmental Security, MCB Camp Pendleton, San Diego County, California, 2002. As field director, supervised an archaeological survey of 1,500 acres in the De Luz and Case Springs areas of Camp Pendleton. Managed field crews, documented archaeological sites, prepared site forms and portions of technical report.

Survey of Yuma Stormwater Basin, NAVFAC SW, MCAS Yuma, Yuma County, Arizona, 2002. As field director, supervised survey of stormwater basin along the Marine Corps airfield at MCAS Yuma. Managed field crew and prepared technical report. Client

Archaeological Coring of SDI-811, MCB Camp Pendleton Environmental Security, MCB Camp Pendleton, San Diego County, California, 2002. As field director, supervised first phase of a geologic coring project for a shell midden site along the coast of MCB Camp Pendleton, San Diego County. Coordinated with coring contractor and base personnel. Managed field monitors and field crew.

Archaeological Testing and Survey of the Lemon Tank Area, NAVFAC SW, NALF San Clemente Island, Los Angeles County, California, 2002. Conducted excavations, survey, and site recording.

Evaluation of Four Prehistoric Sites, Jones and Stokes Associates, Camp Roberts National Guard, San Luis Obispo County, California, 1998. As field technician, conducted excavation in order to determine the boundaries of the site for further mitigation.

Evaluation of Nine Prehistoric Sites, Edwards Air Force Base, San Bernardino County, California, 1999. As field archaeologist, evaluated nine sites through excavation to determine overall sensitivity and value of the archaeological remains that characterize the region.

Archaeological Survey and Excavation, ACOE, MCAGCC Twentynine Palms, San Bernardino County, California, 1998. As field archaeologist, participated in nine field rotations averaging 10 days each. Conducted survey of portions of the Marine Corps base to determine the distribution of cultural materials, and subsequently excavate sites based on priority. This area is characterized as high desert with the typically associated flora and fauna and archaeological sites that range in age from Early to Late Holocene.

Resource Management

Archaeological Data Recovery Excavations at Border Fields State Park, California State Parks, Imperial Beach, San Diego County, California, 2005. As field director, supervised excavation of prehistoric sites located within the APE of a fence along the U.S.–Mexico Border in San Diego County. Prepared technical report.

Archaeological Salvage Excavations of Two Ollas in Hellhole Canyon, BLM, San Diego County, California, 2005. As principal investigator, relocated a cache of prehistoric ceramic artifacts uncovered during wildfires in San Diego County. Documented cache and collected artifacts for subsequent reconstruction in the ASM laboratory. Prepared technical report detailing project.

Archaeological Data Recovery Excavations at CA-SDI-16691, Jackson Pendo Development Company, Escondido, San Diego County, California, 2005. As principal investigator, supervised data recovery excavation at a Late Prehistoric site in Escondido, California.

El Cuervo Wetlands Mitigation, City of San Diego Land Development Review Department and Mitigation Monitoring Coordination, Carmel Valley, San Diego County, California, 2004. As co-principal investigator, supervised an archaeological monitoring project in central San Diego County, conducted test excavation of one site identified during monitoring. The site was evaluated as not significant. Prepared portions of technical report and supervised on-site monitor.

Milk Vetch Emergency, Imperial Irrigation District, Imperial County, California, 2002. As archaeological monitor, conducted emergency monitoring along transmission line corridor in Imperial County. Coordinated with IID and construction personnel. Prepared technical report.

Burial Salvage Excavations at the Carp Site, CA-MER-295, California Department of Parks and Recreation, Los Banos, Merced County, California, 1999. As field supervisor, directed excavations at CA-MER-295 in the central San Joaquin Valley in order to salvage cultural remains (including burials) from further destruction by the San Joaquin River.

Archaeological Survey of the Silver Lake Recreation Area, El Dorado Irrigation District, El Dorado County, California, 2006. As principal investigator and field director, supervised an archaeological survey of the Silver Lake Recreation area.

Transportation

Ortega Highway Monitoring, City of San Juan Capistrano, Orange County, California, 2013. As project manager, supervised Dudek's principal investigator to coordinate archaeological, tribal, and paleontological mitigation monitoring associated with the construction of water conveyance facilities and road repairs.

Archaeological Testing and Ground Penetrating Radar Study of the Forester Creek Biological Mitigation Area, Caltrans District 11, Santee, San Diego County, California, 2005. As principal investigator and field director, supervised archaeological testing of a private parcel.

Bridge 230.6 Replacement, North County Transit District, Agua Hedionda, Carlsbad, San Diego County, California, 2004. As principal investigator and field director, managed an archaeological survey of an APE associated with the replacement of and historic railroad bridge. Recorded archaeological sites within APE and prepared portions of technical report.

Little Lake Phase II Testing, Caltrans District 5, Little Lake, Inyo County, California, 2004. As field director, supervised Phase II testing of four sites including the ethnohistoric village of *Pagunda* near the town of Little Lake. Supervised field crews, coordinated fieldwork with Caltrans and subcontractors, and prepared portions of technical report.

Extended Phase I Testing, Caltrans District 05, Little Lake, Inyo County, California, 2003. As field director, supervised fieldwork for extended Phase I testing of one prehistoric site along U.S. Highway 395 in Inyo County. Prepared portions of technical report.

Cartago and Olancha Four-Lane Project Test Excavations, Caltrans District 05, Inyo County, California, 2002. As field director, supervised test excavations of 15 sites for the proposed widening of U.S. Highway 395 near Cartago and Olancha. Supervised all fieldwork and managed a team of 12 field archaeologists. Coordinated selected specialized studies, conducted ground stone analysis, and prepared large portions of the resulting 800+-page report.

Survey of Amtrak Second Mainline Right-of-Way, North County Transit District, Oceanside, San Diego County, California, 2002. As co-field director, managed an archaeological survey of 6.2 miles of North County Transportation District railroad right-of-way near San Onofre, California.

State Route 905 Survey, Caltrans District 11, San Diego County, California, 2002. As co-field director, conducted survey and recording of sites along the State Route 905 right-of-way in southern San Diego County. Documented three prehistoric sites within the proposed right-of-way. Created site maps and prepared site forms.

Evaluation of 11 Sites along U.S. 395, Caltrans District 05, Blackrock, Inyo County, California, 2000. As crew chief, managed 6-18 personnel, prepared paperwork and report. Made decisions surrounding site excavations in Owens Valley. Project included Phase II test excavation of numerous sites ranging in age from early to late Holocene.

Phase I Survey, Caltrans District 10, Stockton, San Joaquin County, California, 1997. As field archaeologist, conducted various survey and excavation projects for Caltrans throughout central California. Conducted survey and excavation, operated as a graduate student assistant to the District 10 archaeologist dealing with compliance issues, prepared site mapping and technical reports including Archaeological Survey Reports (ASR), Historic Properties Survey Reports (HPSR), and Negative Declarations.

Phase I Survey/TEA, Caltrans, Inyo and Mono Counties, California, 1996–1997. As field archaeologist, conducted survey of most major highways in Mono and Inyo Counties, California. Documented the distribution of all cultural material within the Caltrans right-of-way in order to determine impacts by road widening.

Tribal

Section 106 Mitigation Development and Tribal Consultation Assistance, BLM, San Diego County, California, 2011–2012. As project manager, assisted the BLM in development of Historic Properties Treatment Plan, Tribal Participation Plan, and other mitigation measures for the Tule Wind project, McCain Valley California.

Mitigative Screening, Agua Caliente Band of Cahuilla Indians, Palm Springs, Riverside County, California, 2003. As field director, supervised archaeological mitigation of an impacted burial site on the Agua Caliente Reservation. Prepared mapping of the project, coordinated field efforts with Tribal representatives, oversaw monitoring of the project, and prepared portions of the technical report.

Water/Wastewater

San Clemente Water Recycling Monitoring, City of San Clemente, Orange County, California, 2013. As project manager, supervised Dudek's principal investigator to coordinate archaeological, tribal, and paleontological mitigation monitoring associated with the construction of a new water conveyance pipeline. Duties include preparation of a discovery and treatment plan.

Poseidon Resources Desalination Plant and Pipeline Monitoring, City of Carlsbad, San Diego County, California, 2013. As project manager, supervised Dudek's principal investigator to coordinate archaeological, tribal, and paleontological mitigation monitoring associated with the construction of the desalination plant and a new water conveyance pipeline. Duties include preparation of a discovery and treatment plan and evaluation of archaeological discoveries.

Poseidon Resources Desalination Plant and Pipeline Wetland Mitigation Archaeological Evaluation, City of San Diego, San Diego County, California, 2013. As project manager and principal investigator, developed methods and strategies to evaluate archaeological deposits most likely related to the 1782 ethnohistoric Kumeyaay village of La Punta located within the wetland mitigation area. Project included geotechnical coring and backhoe exploration to locate and evaluate buried archaeological deposits Duties included assistance provided to the USFWS for NAGPRA consultation and implementation.

Lee Lake Cultural Resources Inventory, Lee Lake Water District, Riverside County, California, 2013. As project manager, supervised Dudek's principal investigator to coordinate and implement cultural resources inventory for the construction of a new pipeline and water storage facility.

Cultural Resources Monitoring for the City of Napa Levee Improvement Project, ACOE, Sacramento District, Sacramento, California, 2010-2011. As principal investigator, supervised archaeological monitoring requiring HAZWOPER certified archaeologists to treat historical archaeological discoveries for a levee and stormwater improvement project.

Data Recovery Excavations at the Ridge Hill Facilities Site (SDI-18472), Padre Dam Municipal Water District (PDMWD), San Diego County, California, 2009. As principal investigator, supervised data recovery of a complex late prehistoric habitation site.

San Clemente Canyon Survey, City of San Diego Metropolitan Wastewater Department, City of San Diego, San Diego County, California, 2004. As principal investigator and field director, supervised and conducted an intensive pedestrian survey of proposed access road maintenance for the San Clemente Canyon sewer line. Two cultural resources were identified. Conducted site documentation, prepared sites forms and technical report. Managed survey crew member.

Lake Murray Survey, City of San Diego Metropolitan Wastewater Department, La Mesa, San Diego County, California, 2003. As field director, conducted survey of proposed trunk sewer replacement in La Mesa. Prepared portions of the technical report.

Imperial Irrigation District's Phase II Testing, Imperial Irrigation District, Imperial County, California, 2003. As field director, supervised Phase II testing of eight sites in the

Colorado Desert. Managed field crews, conducted test excavations, and prepared site documentation and portions of the technical report.

Carmel Valley Archaeological Monitoring, City of San Diego Metropolitan Wastewater Department, Carmel Valley, San Diego County, California, 2002. As field monitor for pre-trenching for placement of sewer line, conducted monitoring and wrote portions of technical report.

EIR/EIS Preparation

Dr. Hale currently assists in the preparation of technical descriptions and analyses for environmental impact statements and reports at the state and federal levels for Dudek projects. Examples of completed environmental sections include those prepared for the Yokohl Ranch, Rio Mesa Solar, Soitec Rugged and Tierra Del Sol Solar, SDG&E's Wood to Steel project, and various others. More details are available upon request.

OTHER RELEVANT EXPERIENCE

Training

- 2012 - Accounting and Finance for Non-Financial Managers, UCSD Rady School of Business Management
- 2010 - ESOP Planning and Management, UCSD Rady School of Business Management
- 2004 - Ground Penetrating Radar Field Methods and Interpretation Certificate
- 2002, 2010 - GPS Field Methods Training, ASC Scientific

Teaching

- 2008 - Assistant Professor, Archaeology, U.C. Davis
- 2008 - Instructor/ Principal Investigator, 2008 UC Davis Archaeology Field School, Vandenberg Air Force Base, California.
- 2005–2008 – Level III Teaching Assistant, U.C. Davis; taught discussion sections/ lectures for Human Evolution, Archaeology, and Human Ecology
- 1998–1999 – Acted as Public Education Coordinator for the Museum of Anthropology at UC Davis; included instructing a course teaching archaeology students how to inform the public about the value of anthropology through in-class presentations, exhibits, and the building of 'teaching trunks' for people in grades 1–12 of primary and secondary education
- 1997–1998 - Substitute teacher with an Emergency Credential in the Woodland and Davis Joint Unified School Districts for grades K–12, all subjects excluding foreign languages
- 1997–present – Regularly perform presentations about the value of archaeology in classrooms at the level of the grades 1–12
- 1996 – Teaching assistant at the U.C. Davis archaeological field school; job duties included student management and instruction in the methods of excavation and survey.

PUBLICATIONS

Selected Technical Reports

Hale, Micah J. 2010. "Limited Archaeological Excavations at SDI-4669 (SDM-W-12A)." *In Advance of Geotechnical Coring, University House Rehabilitation Project, University of California at San Diego, La Jolla, California*. Submitted to Ione Stiegler Architecture, La Jolla, California. Report on file at South Coastal Information Center, SDSU.

Hale, Micah J. 2010. *Results of Archaeological Monitoring for Meteorological Masts in McCain Valley, San Diego County, California*. Prepared for HDR Engineering Inc.

Hale, Micah J. 2007. *Archaeological Survey of the Silver Lake Recreation Area, El Dorado Irrigation District, El Dorado County, California*. Prepared for Trish Fernandez, El Dorado Irrigation District, El Dorado County, California.

Hale, Micah J. 2005. "Ground Stone Analysis." In *From the Coast to the Inland: Prehistoric Settlement Systems Along the Las Pulgas Corridor, Camp Pendleton, California*, by Micah J. Hale and Mark S. Becker. Report submitted to Southwest Division of Naval Facilities.

Hale, Micah J. 2005. *Cultural Resources Inventory for the Proposed San Diego Model Schools Development Project*. ASM Affiliates Inc., Carlsbad, California. Prepared for the City of San Diego, California.

Hale, Micah J. 2004. *Cultural Resources Inventory for the Replacement of Bridge 230.6 over Agua Hedionda Lagoon, San Diego County, California*. Submitted to North County Transit District, San Diego County, California.

Hale, Micah J. 2004. *Cultural Resources Inventory for the Gawle Property, San Diego County, California*. Submitted to Helix Environmental for the City of San Diego.

Hale, Micah J. 2004. *Cultural Resources Inventory for the Hines Nursery, San Diego County, California*. Submitted to Hines Nurseries, Rainbow Valley, California.

Hale, Micah J. 2004. *Cultural Resources Inventory for the San Clemente Canyon Trunk Sewer Maintenance and Access Routes, San Diego County, California*. Submitted to Metropolitan Wastewater Department, City of San Diego, California.

Hale, Micah J. 2004. *Cultural Resources Inventory for the Montezuma Trunk Sewer Replacement, San Diego County, California*. Submitted to Metropolitan Wastewater Department, City of San Diego, California.

Hale, Micah J. 2004. *Cultural Resources Inventory for the Oceanside Hotel EIR, San Diego County, California*. Submitted to Dudek for the City of Oceanside, California.

Hale, Micah J. 2004. *Historic Resources Mitigation Monitoring of the El Cuervo Norte Project, San Diego County, California*. Submitted to the City of San Diego.

Hale, Micah J. 2004. *Emergency Test Excavations of an Exposed Olla, Riverside County, California*. Submitted to BLM, Riverside County, California.

Hale, Micah J. 2004. *Cultural Resources Monitoring for Geotechnical Coring Related to the All-American Canal Lining Project, Imperial County, California*. Submitted to Imperial Irrigation District, Imperial County, California.

Hale, Micah J. 2004. *Cultural Resources Monitoring of Geotechnical Coring Related to the Coachella Canal Lining Project, Riverside County, California*. Submitted to Imperial Irrigation District, Riverside County, California.

Hale, Micah J. 2004. "Ground and Battered Stone Analysis." In *Data Recovery Investigations at the Eucalyptus Site, CA-SDI-6954, San Diego County, California*. Prepared by Don Laylander, ASM Affiliates Inc., Carlsbad, California. Submitted to EDAW, Inc.

Hale, Micah J. 2003. *Cultural Resources Inventory for the Linda Vista Drive Re-Alignment Alternatives, City of San Marcos, California*. Submitted to Nolte for the City of San Marcos.

Hale, Micah J. 2003. *Cultural Resources Inventory for the Lake Murray Trunk Sewer Replacement, San Diego County, California*. Submitted to the Metropolitan Wastewater Department, City of San Diego, California.

Hale, Micah J. 2000. *Cultural Resource Monitoring Report*. Jones and Stokes Associates Inc. Prepared for AT&T Corp., Atlanta, Georgia, for the AT&T cable removal project from Lucin, Utah, to Red Bluff, California.

Hale, Micah J. 2000. "Ground and Battered Stone Analysis." In *Report on Excavations at Four Locations in the Lead Mountain Vicinity of the 29-Palms Marine Base*, edited by Mark Basgall. Sacramento Archaeological Research Center.

Hale, Micah J. 2000. "Ground and Battered Stone Analysis." In *Report on Excavations at CA-MER-295*, edited by Mark Basgall and R. Bethard. Sacramento Archaeological Research Center.

Hale, Micah J. 2000. "Invertebrate Analysis." In *Report on Excavations at CA-MER-295*, edited by Mark Basgall and Mark Giambastiani. Sacramento Archaeological Research Center.

Hale, Micah J. 2000. "Site Reports for Sites SBR-9415 and SBR-9420." In *Report on Excavations at Lead Mountain in Twentynine Palms Marine Corps Air Ground Combat Training Center*, edited by Mark Basgall. Sacramento Archaeological Research Center.

Hale, Micah J. 1999. "Ground and Battered Stone Analysis." In *Muddle in the Middle: Phase II Excavations of Five Sites in Kern County, California*, edited by Mark Basgall. Prepared for V. Levulett, Environmental Management, Caltrans District 5, San Luis Obispo. Sacramento Archaeological Research Center.

Hale, Micah J., and Brad Comeau. 2009. *Data Recovery Excavations at CA-SDI-18472 for the Proposed Padre Dam Municipal Water District Secondary Connection Project (Ridge Hill Facilities) Johnstown, San Diego County, California*. Prepared for Mr. Albert Lau, Engineering Manager, Padre Dam Municipal Water District.

Hale, Micah, Brad Comeau, and Chad Willis. 2010. *Class II and Class III Cultural Resources Inventory Report for the Tule Wind Project, McCain Valley, San Diego County, California*. Prepared for HDR Engineering Inc. Report on file at the South Coastal Information Center, SDSU.

Hale, Micah J., and John R. Cook. 2005. *Results of Ground Penetrating Radar Investigations at CA-SDI-10148 in the Forester Creek Biological Mitigation Site, San Diego County, California*. With contributions by Jeffrey S. Patterson. Prepared for Chris White, Caltrans District 11.

Hale, Micah J., and Mark S. Becker. 2006. *From the Coast to the Inland: Prehistoric Settlement Systems Along the Las Pulgas Corridor, Camp Pendleton, California*. ASM Affiliates, Carlsbad, California. Submitted to Southwest Division of Naval Facilities.

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Presentations

Hale, Micah J. 2012. *The Data Matter: Contributions of the Sacramento State Archaeological Research Center*. Presented at the 2012 Society for California Archaeology Meetings, San Diego, California.

Hale, Micah J. 2012. *Andy Yatsko, the Human Transit: Celebrating His Lifetime Contributions*. Presented at the 2012 Society for California Archaeology Meetings, San Diego, California.

Hale, Micah J. 2012. *Malcolm Rogers' Work Along the San Diego Coast*. Presented at the 2012 Society for California Archaeology Meetings, San Diego, California.

Hale, Micah J. 2011. *Tracing the Origins of Processing Economies in the Far West: A View from Coastal Southern California*. Presented at the Yucca Valley Archaeopalooza Conference, 29 Palms, California.

Hale, Micah J. 2011. *Adaptive Divergence Among Southern California Hunter Gatherers*. Presented at the 2011 Society for California Archaeology Meetings, Rohnert Park, California.

Hale, Micah J. 2011. *A 10,000 Year Old Habitation at the University House, La Jolla: Implications for Trans-Holocene Socioeconomic Stability in San Diego*. Presented at the 2011 Society for American Archaeology Meetings, Sacramento, California.

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Hale, Micah J. 2002. *Prehistory Along the Southwestern Shore of Owens Lake: Preliminary Results from the Cartago-Olancha Project.* Presented at the 2002 Northern California Data Sharing Meetings, Society for California Archaeology, Santa Cruz, California.

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Hale, Micah J. 1999. *The Analysis Method of Formatting Presentations and Lesson Plans in Archaeology*. Presented at the Society for American Archaeology 64th Annual Meeting, Chicago, Illinois.

Hale, Micah J. 1998. *A Practical and Effective Method for Teaching Archaeology to the Public*. Presented at the Society for California Archaeology Annual Meeting, San Diego, California.

AWARDS/COMMENDATIONS

- 2010 – NAVFAC SW, Camp Pendleton, Research Grant, $59,000
- 2008 – U.S. Air Force, Vandenberg AFB, Radiocarbon Grant, $25,000
- 2008 – Fieldwork Fellowship, Graduate Studies, UC Davis, $2,010
- 2007 – Fieldwork Fellowship, Graduate Studies, UC Davis, $1,800
- 2006 – Fieldwork Fellowship, Graduate Studies, UC Davis, $5,650
- 2005–2009 – Graduate Fee Fellowship/Stipend, UC Davis, $74,500

CLEARANCES

- Department of Defense (DoD) High-Security Clearance for SPAWAR, Naval Base Point Loma, NALF San Clemente Island, Vandenberg Air Force Base, MCAGCC 29 Palms, Edwards Air Force Base, NAWS China Lake, Yuma Proving Grounds, and MCB Camp Pendleton

APPENDIX F

Environmental Records Search

Bear River Restoration
CHICAGO PARK POWERHOUSE RD
Colfax, CA 95945

Inquiry Number: 4025470.2s
August 04, 2014

The EDR Radius Map™ Report with GeoCheck®

EDR® Environmental Data Resources Inc

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

TABLE OF CONTENTS

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-13) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

CHICAGO PARK POWERHOUSE RD
COLFAX, CA 95945

COORDINATES

Latitude (North):	39.1746000 - 39˚ 10' 28.56''
Longitude (West):	120.9027000 - 120˚ 54' 9.72''
Universal Tranverse Mercator:	Zone 10
UTM X (Meters):	681174.6
UTM Y (Meters):	4338039.0
Elevation:	2190 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	39120-B8 CHICAGO PARK, CA
Most Recent Revision:	1979

AERIAL PHOTOGRAPHY IN THIS REPORT

Portions of Photo from:	20120706
Source:	USDA

TARGET PROPERTY SEARCH RESULTS

The target property was not listed in any of the databases searched by EDR.

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL........................... National Priority List

EXECUTIVE SUMMARY

Proposed NPL - - - - - - - - Proposed National Priority List Sites
NPL LIENS - - - - - - - - Federal Superfund Liens

Federal Delisted NPL site list

Delisted NPL - - - - - - - - National Priority List Deletions

Federal CERCLIS list

CERCLIS - - - - - - - - Comprehensive Environmental Response, Compensation, and Liability Information System
FEDERAL FACILITY - - - - - - - - Federal Facility Site Information listing

Federal CERCLIS NFRAP site List

CERC-NFRAP - - - - - - - - CERCLIS No Further Remedial Action Planned

Federal RCRA CORRACTS facilities list

CORRACTS - - - - - - - - Corrective Action Report

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF - - - - - - - - RCRA - Treatment, Storage and Disposal

Federal RCRA generators list

RCRA-LQG - - - - - - - - RCRA - Large Quantity Generators
RCRA-SQG - - - - - - - - RCRA - Small Quantity Generators
RCRA-CESQG - - - - - - - - RCRA - Conditionally Exempt Small Quantity Generator

Federal institutional controls / engineering controls registries

US ENG CONTROLS - - - - - - - - Engineering Controls Sites List
US INST CONTROL - - - - - - - - Sites with Institutional Controls
LUCIS - - - - - - - - Land Use Control Information System

Federal ERNS list

ERNS - - - - - - - - Emergency Response Notification System

State- and tribal - equivalent NPL

RESPONSE - - - - - - - - State Response Sites

State- and tribal - equivalent CERCLIS

ENVIROSTOR - - - - - - - - EnviroStor Database

State and tribal landfill and/or solid waste disposal site lists

SWF/LF - - - - - - - - Solid Waste Information System

State and tribal leaking storage tank lists

LUST - - - - - - - - Geotracker's Leaking Underground Fuel Tank Report

EXECUTIVE SUMMARY

SLIC .... Statewide SLIC Cases
INDIAN LUST .... Leaking Underground Storage Tanks on Indian Land

State and tribal registered storage tank lists

UST .... Active UST Facilities
AST .... Aboveground Petroleum Storage Tank Facilities
INDIAN UST .... Underground Storage Tanks on Indian Land
FEMA UST .... Underground Storage Tank Listing

State and tribal voluntary cleanup sites

VCP .... Voluntary Cleanup Program Properties
INDIAN VCP .... Voluntary Cleanup Priority Listing

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS .... A Listing of Brownfields Sites

Local Lists of Landfill / Solid Waste Disposal Sites

ODI .... Open Dump Inventory
DEBRIS REGION 9 .... Torres Martinez Reservation Illegal Dump Site Locations
SWRCY .... Recycler Database
HAULERS .... Registered Waste Tire Haulers Listing
INDIAN ODI .... Report on the Status of Open Dumps on Indian Lands
WMUDS/SWAT .... Waste Management Unit Database

Local Lists of Hazardous waste / Contaminated Sites

US CDL .... Clandestine Drug Labs
HIST Cal-Sites .... Historical Calsites Database
SCH .... School Property Evaluation Program
Toxic Pits .... Toxic Pits Cleanup Act Sites
CDL .... Clandestine Drug Labs
US HIST CDL .... National Clandestine Laboratory Register

Local Lists of Registered Storage Tanks

CA FID UST .... Facility Inventory Database
HIST UST .... Hazardous Substance Storage Container Database
SWEEPS UST .... SWEEPS UST Listing

Local Land Records

LIENS 2 .... CERCLA Lien Information
LIENS .... Environmental Liens Listing
DEED .... Deed Restriction Listing

Records of Emergency Release Reports

HMIRS .... Hazardous Materials Information Reporting System

EXECUTIVE SUMMARY

CHMIRS	California Hazardous Material Incident Report System
LDS	Land Disposal Sites Listing
MCS	Military Cleanup Sites Listing
SPILLS 90	SPILLS 90 data from FirstSearch

Other Ascertainable Records

RCRA NonGen / NLR	RCRA - Non Generators / No Longer Regulated
DOT OPS	Incident and Accident Data
DOD	Department of Defense Sites
FUDS	Formerly Used Defense Sites
CONSENT	Superfund (CERCLA) Consent Decrees
ROD	Records Of Decision
UMTRA	Uranium Mill Tailings Sites
US MINES	Mines Master Index File
TRIS	Toxic Chemical Release Inventory System
TSCA	Toxic Substances Control Act
FTTS	FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
HIST FTTS	FIFRA/TSCA Tracking System Administrative Case Listing
SSTS	Section 7 Tracking Systems
ICIS	Integrated Compliance Information System
PADS	PCB Activity Database System
MLTS	Material Licensing Tracking System
RADINFO	Radiation Information Database
FINDS	Facility Index System/Facility Registry System
RAATS	RCRA Administrative Action Tracking System
RMP	Risk Management Plans
CA BOND EXP. PLAN	Bond Expenditure Plan
UIC	UIC Listing
NPDES	NPDES Permits Listing
Cortese	"Cortese" Hazardous Waste & Substances Sites List
HIST CORTESE	Hazardous Waste & Substance Site List
CUPA Listings	CUPA Resources List
Notify 65	Proposition 65 Records
DRYCLEANERS	Cleaner Facilities
WIP	Well Investigation Program Case List
ENF	Enforcement Action Listing
HAZNET	Facility and Manifest Data
EMI	Emissions Inventory Data
INDIAN RESERV	Indian Reservations
SCRD DRYCLEANERS	State Coalition for Remediation of Drycleaners Listing
2020 COR ACTION	2020 Corrective Action Program List
LEAD SMELTERS	Lead Smelter Sites
US AIRS	Aerometric Information Retrieval System Facility Subsystem
WDS	Waste Discharge System
PRP	Potentially Responsible Parties
HWP	EnviroStor Permitted Facilities Listing
US FIN ASSUR	Financial Assurance Information
Financial Assurance	Financial Assurance Information Listing
PCB TRANSFORMER	PCB Transformer Registration Database
COAL ASH EPA	Coal Combustion Residues Surface Impoundments List
MWMP	Medical Waste Management Program Listing
COAL ASH DOE	Steam-Electric Plant Operation Data
HWT	Registered Hazardous Waste Transporter Database

EXECUTIVE SUMMARY

PROC - - - - - - - - - - Certified Processors Database
EPA WATCH LIST - - - - - EPA WATCH LIST

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP - - - - - - - - - EDR Proprietary Manufactured Gas Plants
EDR US Hist Auto Stat - - - EDR Exclusive Historic Gas Stations
EDR US Hist Cleaners - - - EDR Exclusive Historic Dry Cleaners

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA LF - - - - - - - - - - Recovered Government Archive Solid Waste Facilities List
RGA LUST - - - - - - - - - Recovered Government Archive Leaking Underground Storage Tank

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were not identified.

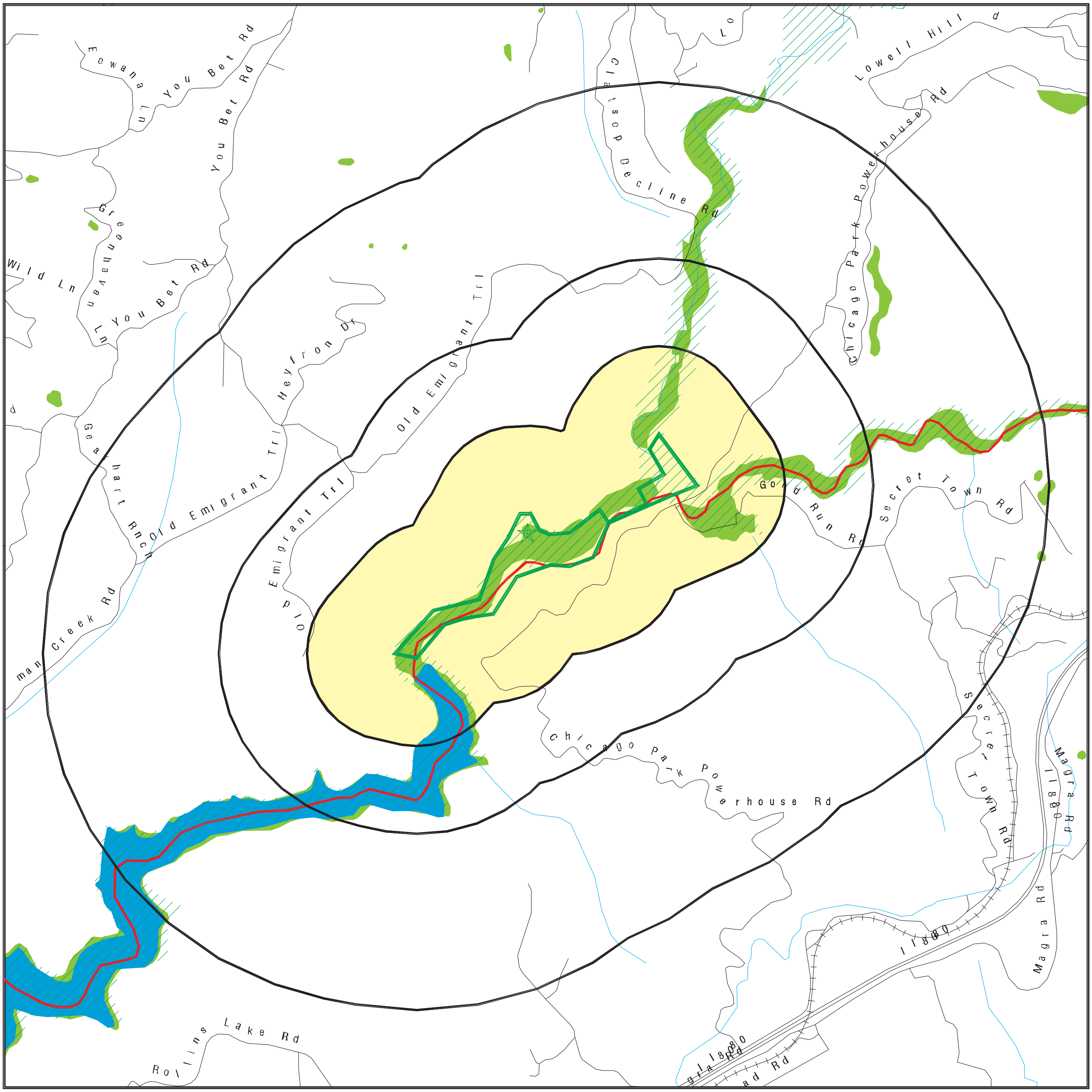
Unmappable (orphan) sites are not considered in the foregoing analysis.

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped. Count: 19 records.

Site Name	Database(s)
COLFAX MAINTENANCE FACILITY	HIST CORTESE, LUST
BEAR RIVER CANAL PROJECT	NPDES
SAVE MART #608	CUPA Listings
FLYERS #41	CUPA Listings
ARCO #2077	CUPA Listings
MINE DEV CORP	CERC-NFRAP
PG&E GAS PLANT GRASS VALLEY 215 1	CERC-NFRAP
PG&E GAS PLANT GRASS VALLEY 215 1A	CERC-NFRAP
BUTLER BROS	CERC-NFRAP
PG&E GAS PLANT NEVADA CITY	CERC-NFRAP
PACIFIC BELL	UST
WHITE CLOUD GUARD STATION	HIST UST
SFPP LP CISCO GROVE STATION	RCRA-SQG, HAZNET
PACIFIC BELL C/O ALLEN TBROL	RCRA-SQG
OWENS CONSTRUCTION	CA PLACER CO. MS
CAL TRANS - COLFAX MAINT STATION	CA PLACER CO. MS
SIERRA WELDING	CA PLACER CO. MS
EMIGRANT GAP TURNTABLE	ENVIROSTOR
SHELL OIL CORPORATION	ENVIROSTOR

overview MAP - 4025470.2s



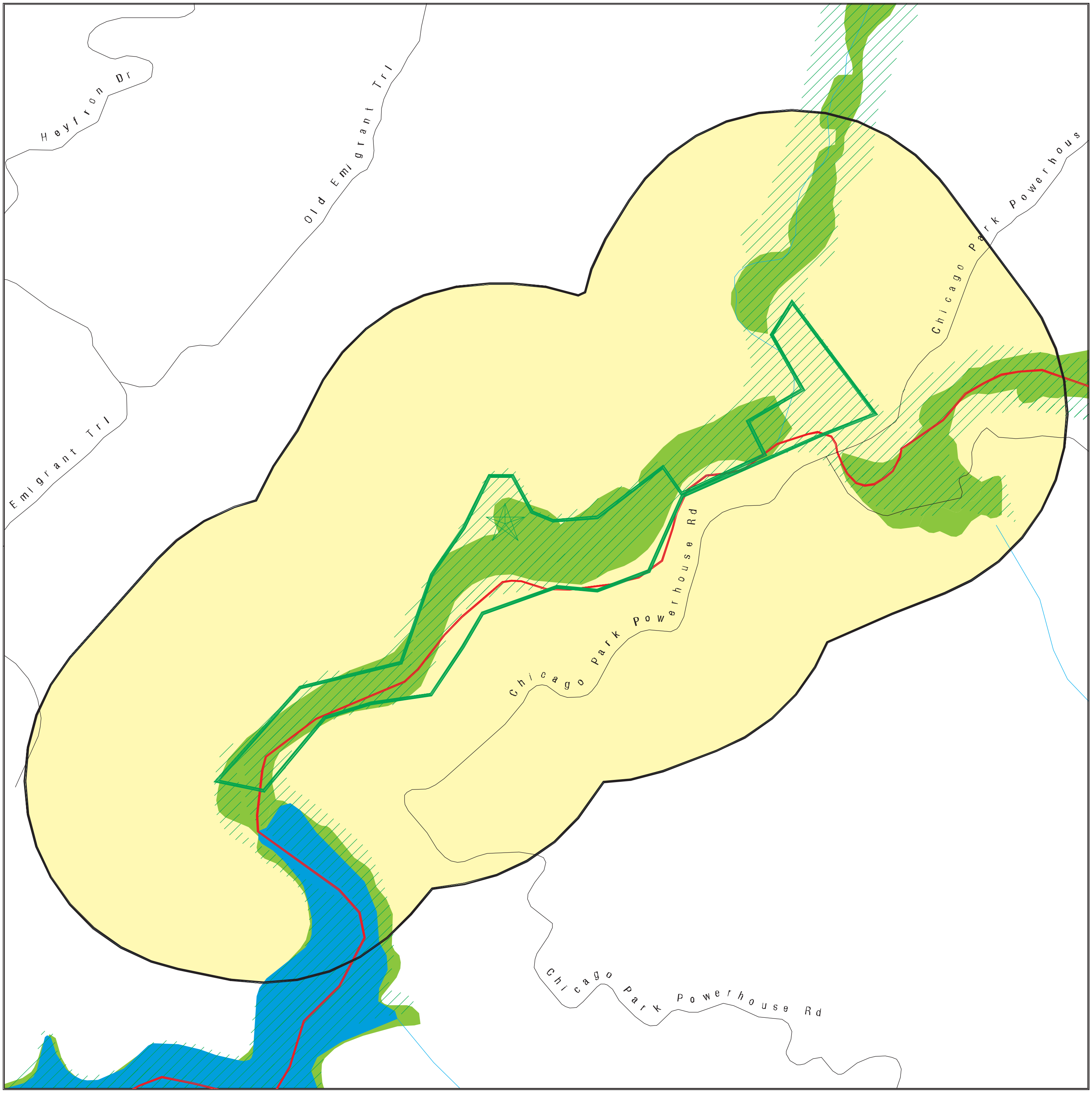
0 1/4 1/2 1 Miles

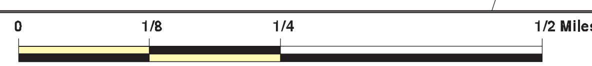
- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- County Boundary
- Oil & Gas pipelines from USGS
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- Areas of Concern

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: Bear River Restoration	CLIENT: Dudek & Associates
ADDRESS: CHICAGO PARK POWERHOUSE RD	CONTACT: Khristina Leyba
Colfax CA 95945	INQUIRY #: 4025470.2s
LAT/LONG: 39.1746 / 120.9027	DATE: August 04, 2014 1:28 pm

detail MAP - 4025470.2s





- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- County Boundary
- Oil & Gas pipelines from USGS
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- Areas of Concern

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME:	Bear River Restoration	CLIENT:	Dudek & Associates
ADDRESS:	CHICAGO PARK POWERHOUSE RD Colfax CA 95945	CONTACT:	Khristina Leyba
		INQUIRY #:	4025470.2s
LAT/LONG:	39.1746 / 120.9027	DATE:	August 04, 2014 1:31 pm

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
STANDARD ENVIRONMENTAL RECORDS								
Federal NPL site list								
NPL	1.000		0	0	0	0	NR	0
Proposed NPL	1.000		0	0	0	0	NR	0
NPL LIENS	TP		NR	NR	NR	NR	NR	0
Federal Delisted NPL site list								
Delisted NPL	1.000		0	0	0	0	NR	0
Federal CERCLIS list								
CERCLIS	0.500		0	0	0	NR	NR	0
FEDERAL FACILITY	0.500		0	0	0	NR	NR	0
Federal CERCLIS NFRAP site List								
CERC-NFRAP	0.500		0	0	0	NR	NR	0
Federal RCRA CORRACTS facilities list								
CORRACTS	1.000		0	0	0	0	NR	0
Federal RCRA non-CORRACTS TSD facilities list								
RCRA-TSDF	0.500		0	0	0	NR	NR	0
Federal RCRA generators list								
RCRA-LQG	0.250		0	0	NR	NR	NR	0
RCRA-SQG	0.250		0	0	NR	NR	NR	0
RCRA-CESQG	0.250		0	0	NR	NR	NR	0
Federal institutional controls / engineering controls registries								
US ENG CONTROLS	0.500		0	0	0	NR	NR	0
US INST CONTROL	0.500		0	0	0	NR	NR	0
LUCIS	0.500		0	0	0	NR	NR	0
Federal ERNS list								
ERNS	TP		NR	NR	NR	NR	NR	0
State- and tribal - equivalent NPL								
RESPONSE	1.000		0	0	0	0	NR	0
State- and tribal - equivalent CERCLIS								
ENVIROSTOR	1.000		0	0	0	0	NR	0
State and tribal landfill and/or solid waste disposal site lists								
SWF/LF	0.500		0	0	0	NR	NR	0
State and tribal leaking storage tank lists								
LUST	0.500		0	0	0	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
SLIC	0.500		0	0	0	NR	NR	0
INDIAN LUST	0.500		0	0	0	NR	NR	0
State and tribal registered storage tank lists								
UST	0.250		0	0	NR	NR	NR	0
AST	0.250		0	0	NR	NR	NR	0
INDIAN UST	0.250		0	0	NR	NR	NR	0
FEMA UST	0.250		0	0	NR	NR	NR	0
State and tribal voluntary cleanup sites								
VCP	0.500		0	0	0	NR	NR	0
INDIAN VCP	0.500		0	0	0	NR	NR	0
ADDITIONAL ENVIRONMENTAL RECORDS								
Local Brownfield lists								
US BROWNFIELDS	0.500		0	0	0	NR	NR	0
Local Lists of Landfill / Solid Waste Disposal Sites								
ODI	0.500		0	0	0	NR	NR	0
DEBRIS REGION 9	0.500		0	0	0	NR	NR	0
SWRCY	0.500		0	0	0	NR	NR	0
HAULERS	TP		NR	NR	NR	NR	NR	0
INDIAN ODI	0.500		0	0	0	NR	NR	0
WMUDS/SWAT	0.500		0	0	0	NR	NR	0
Local Lists of Hazardous waste / Contaminated Sites								
US CDL	TP		NR	NR	NR	NR	NR	0
HIST Cal-Sites	1.000		0	0	0	0	NR	0
SCH	0.250		0	0	NR	NR	NR	0
Toxic Pits	1.000		0	0	0	0	NR	0
CDL	TP		NR	NR	NR	NR	NR	0
US HIST CDL	TP		NR	NR	NR	NR	NR	0
Local Lists of Registered Storage Tanks								
CA FID UST	0.250		0	0	NR	NR	NR	0
HIST UST	0.250		0	0	NR	NR	NR	0
SWEEPS UST	0.250		0	0	NR	NR	NR	0
Local Land Records								
LIENS 2	TP		NR	NR	NR	NR	NR	0
LIENS	TP		NR	NR	NR	NR	NR	0
DEED	0.500		0	0	0	NR	NR	0
Records of Emergency Release Reports								
HMIRS	TP		NR	NR	NR	NR	NR	0
CHMIRS	TP		NR	NR	NR	NR	NR	0
LDS	TP		NR	NR	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
MCS	TP		NR	NR	NR	NR	NR	0
SPILLS 90	TP		NR	NR	NR	NR	NR	0
Other Ascertainable Records								
RCRA NonGen / NLR	0.250		0	0	NR	NR	NR	0
DOT OPS	TP		NR	NR	NR	NR	NR	0
DOD	1.000		0	0	0	0	NR	0
FUDS	1.000		0	0	0	0	NR	0
CONSENT	1.000		0	0	0	0	NR	0
ROD	1.000		0	0	0	0	NR	0
UMTRA	0.500		0	0	0	NR	NR	0
US MINES	0.250		0	0	NR	NR	NR	0
TRIS	TP		NR	NR	NR	NR	NR	0
TSCA	TP		NR	NR	NR	NR	NR	0
FTTS	TP		NR	NR	NR	NR	NR	0
HIST FTTS	TP		NR	NR	NR	NR	NR	0
SSTS	TP		NR	NR	NR	NR	NR	0
ICIS	TP		NR	NR	NR	NR	NR	0
PADS	TP		NR	NR	NR	NR	NR	0
MLTS	TP		NR	NR	NR	NR	NR	0
RADINFO	TP		NR	NR	NR	NR	NR	0
FINDS	TP		NR	NR	NR	NR	NR	0
RAATS	TP		NR	NR	NR	NR	NR	0
RMP	TP		NR	NR	NR	NR	NR	0
CA BOND EXP. PLAN	1.000		0	0	0	0	NR	0
UIC	TP		NR	NR	NR	NR	NR	0
NPDES	TP		NR	NR	NR	NR	NR	0
Cortese	0.500		0	0	0	NR	NR	0
HIST CORTESE	0.500		0	0	0	NR	NR	0
CUPA Listings	0.250		0	0	NR	NR	NR	0
Notify 65	1.000		0	0	0	0	NR	0
DRYCLEANERS	0.250		0	0	NR	NR	NR	0
WIP	0.250		0	0	NR	NR	NR	0
ENF	TP		NR	NR	NR	NR	NR	0
HAZNET	TP		NR	NR	NR	NR	NR	0
EMI	TP		NR	NR	NR	NR	NR	0
INDIAN RESERV	1.000		0	0	0	0	NR	0
SCRD DRYCLEANERS	0.500		0	0	0	NR	NR	0
2020 COR ACTION	0.250		0	0	NR	NR	NR	0
LEAD SMELTERS	TP		NR	NR	NR	NR	NR	0
US AIRS	TP		NR	NR	NR	NR	NR	0
WDS	TP		NR	NR	NR	NR	NR	0
PRP	TP		NR	NR	NR	NR	NR	0
HWP	1.000		0	0	0	0	NR	0
US FIN ASSUR	TP		NR	NR	NR	NR	NR	0
Financial Assurance	TP		NR	NR	NR	NR	NR	0
PCB TRANSFORMER	TP		NR	NR	NR	NR	NR	0
COAL ASH EPA	0.500		0	0	0	NR	NR	0
MWMP	0.250		0	0	NR	NR	NR	0
COAL ASH DOE	TP		NR	NR	NR	NR	NR	0
HWT	0.250		0	0	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
PROC	0.500		0	0	0	NR	NR	0
EPA WATCH LIST	TP		NR	NR	NR	NR	NR	0
EDR HIGH RISK HISTORICAL RECORDS								
EDR Exclusive Records								
EDR MGP	1.000		0	0	0	0	NR	0
EDR US Hist Auto Stat	0.250		0	0	NR	NR	NR	0
EDR US Hist Cleaners	0.250		0	0	NR	NR	NR	0
EDR RECOVERED GOVERNMENT ARCHIVES								
Exclusive Recovered Govt. Archives								
RGA LF	TP		NR	NR	NR	NR	NR	0
RGA LUST	TP		NR	NR	NR	NR	NR	0

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

MAP FINDINGS

Map ID Direction Distance Elevation	Site	Database(s)	EDR ID Number EPA ID Number

NO SITES FOUND

Count: 19 records. ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
COLFAX	S110710096	OWENS CONSTRUCTION	HWY 174 AT R/R BRIDGE	95713	CA PLACER CO. MS
COLFAX	S110709962	CAL TRANS - COLFAX MAINT STATION	HWY 174	95713	CA PLACER CO. MS
COLFAX	S104180920	SIERRA WELDING	1305 HWY 174 SHOP	95713	CA PLACER CO. MS
COLFAX	S101307914	COLFAX MAINTENANCE FACILITY	HWY 174	95713	HIST CORTESE, LUST
COLFAX	1001486923	SFPP LP CISCO GROVE STATION	HWY 80 CISCO GROVE OFF RAMP	95713	RCRA-SQG, HAZNET
COLFAX	S111291086	BEAR RIVER CANAL PROJECT	COLFAX QUAD SE QUARDRANT	95713	NPDES
EMIGRANT GAP	S101481507	EMIGRANT GAP TURNTABLE	OLD STATE HIGHWAY 80	95713	ENVIROSTOR
FRENCH CORRAL	1003878414	MINE DEV CORP	PLEASANT VALLY RD	95945	CERC-NFRAP
GRASS VALLEY	U004049562	PACIFIC BELL	23337 HWY 49	95945	UST
GRASS VALLEY	S101481395	SHELL OIL CORPORATION	HUGHES ROAD NW CORNER NEVADA H	95945	ENVIROSTOR
GRASS VALLEY	1003878902	PG&E GAS PLANT GRASS VALLEY 215 1	IDAHO MARYLAND RD	95945	CERC-NFRAP
GRASS VALLEY	1003878899	PG&E GAS PLANT GRASS VALLEY 215 1A	MAIN, AUBURN, STEWART & BANK S	95945	CERC-NFRAP
GRASS VALLEY	S114002421	SAVE MART #608	2054 NEVADA CITY HWY	95945	CUPA Listings
GRASS VALLEY	S114002393	FLYERS #41	2001 NEVADA CITY HWY	95945	CUPA Listings
GRASS VALLEY	S114002291	ARCO #2077	1913 NEVADA CITY HWY	95945	CUPA Listings
GRASS VALLEY	1000250698	PACIFIC BELL C/O ALLEN TBROL	E/S OF HWY 49 1520 SOUTH	95945	RCRA-SQG
GRASS VALLEY	1003879333	BUTLER BROS	SCOTIA MINES	95945	CERC-NFRAP
NEVADA	1003878905	PG&E GAS PLANT NEVADA CITY	50-52 COYOTE ST NR MAIN	95945	CERC-NFRAP
NEVADA CITY	U001617088	WHITE CLOUD GUARD STATION	HIGHWAY 20 (11 MI. E. OF NEV.	95945	HIST UST

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Number of Days to Update: Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL: National Priority List

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 10/25/2013
Date Data Arrived at EDR: 11/11/2013
Date Made Active in Reports: 01/28/2014
Number of Days to Update: 78

Source: EPA
Telephone: N/A
Last EDR Contact: 07/08/2014
Next Scheduled EDR Contact: 10/20/2014
Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 3
Telephone 215-814-5418

EPA Region 4
Telephone 404-562-8033

EPA Region 5
Telephone 312-886-6686

EPA Region 10
Telephone 206-553-8665

EPA Region 6
Telephone: 214-655-6659

EPA Region 7
Telephone: 913-551-7247

EPA Region 8
Telephone: 303-312-6774

EPA Region 9
Telephone: 415-947-4246

Proposed NPL: Proposed National Priority List Sites

A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 10/25/2013
Date Data Arrived at EDR: 11/11/2013
Date Made Active in Reports: 01/28/2014
Number of Days to Update: 78

Source: EPA
Telephone: N/A
Last EDR Contact: 07/08/2014
Next Scheduled EDR Contact: 10/20/2014
Data Release Frequency: Quarterly

NPL LIENS: Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991
Date Data Arrived at EDR: 02/02/1994
Date Made Active in Reports: 03/30/1994
Number of Days to Update: 56

Source: EPA
Telephone: 202-564-4267
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

Federal Delisted NPL site list

DELISTED NPL: National Priority List Deletions
The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 10/25/2013
Date Data Arrived at EDR: 11/11/2013
Date Made Active in Reports: 01/28/2014
Number of Days to Update: 78

Source: EPA
Telephone: N/A
Last EDR Contact: 07/08/2014
Next Scheduled EDR Contact: 10/20/2014
Data Release Frequency: Quarterly

Federal CERCLIS list

CERCLIS: Comprehensive Environmental Response, Compensation, and Liability Information System
CERCLIS contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). CERCLIS contains sites which are either proposed to or on the National Priorities List (NPL) and sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 10/25/2013
Date Data Arrived at EDR: 11/11/2013
Date Made Active in Reports: 02/13/2014
Number of Days to Update: 94

Source: EPA
Telephone: 703-412-9810
Last EDR Contact: 05/29/2014
Next Scheduled EDR Contact: 09/08/2014
Data Release Frequency: Quarterly

FEDERAL FACILITY: Federal Facility Site Information listing
A listing of National Priority List (NPL) and Base Realignment and Closure (BRAC) sites found in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database where EPA Federal Facilities Restoration and Reuse Office is involved in cleanup activities.

Date of Government Version: 05/31/2013
Date Data Arrived at EDR: 07/08/2013
Date Made Active in Reports: 12/06/2013
Number of Days to Update: 151

Source: Environmental Protection Agency
Telephone: 703-603-8704
Last EDR Contact: 07/08/2014
Next Scheduled EDR Contact: 10/20/2014
Data Release Frequency: Varies

Federal CERCLIS NFRAP site List

CERCLIS-NFRAP: CERCLIS No Further Remedial Action Planned
Archived sites are sites that have been removed and archived from the inventory of CERCLIS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list this site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. This decision does not necessarily mean that there is no hazard associated with a given site; it only means that, based upon available information, the location is not judged to be a potential NPL site.

Date of Government Version: 10/25/2013
Date Data Arrived at EDR: 11/11/2013
Date Made Active in Reports: 02/13/2014
Number of Days to Update: 94

Source: EPA
Telephone: 703-412-9810
Last EDR Contact: 05/29/2014
Next Scheduled EDR Contact: 09/08/2014
Data Release Frequency: Quarterly

Federal RCRA CORRACTS facilities list

CORRACTS: Corrective Action Report
CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 03/11/2014
Date Data Arrived at EDR: 03/13/2014
Date Made Active in Reports: 04/09/2014
Number of Days to Update: 27

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 07/02/2014
Next Scheduled EDR Contact: 10/13/2014
Data Release Frequency: Quarterly

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF: RCRA - Treatment, Storage and Disposal

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 03/11/2014
Date Data Arrived at EDR: 03/13/2014
Date Made Active in Reports: 04/09/2014
Number of Days to Update: 27

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 07/02/2014
Next Scheduled EDR Contact: 10/13/2014
Data Release Frequency: Quarterly

Federal RCRA generators list

RCRA-LQG: RCRA - Large Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

Date of Government Version: 03/11/2014
Date Data Arrived at EDR: 03/13/2014
Date Made Active in Reports: 04/09/2014
Number of Days to Update: 27

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 07/02/2014
Next Scheduled EDR Contact: 10/13/2014
Data Release Frequency: Quarterly

RCRA-SQG: RCRA - Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

Date of Government Version: 03/11/2014
Date Data Arrived at EDR: 03/13/2014
Date Made Active in Reports: 04/09/2014
Number of Days to Update: 27

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 07/02/2014
Next Scheduled EDR Contact: 10/13/2014
Data Release Frequency: Quarterly

RCRA-CESQG: RCRA - Conditionally Exempt Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 03/11/2014
Date Data Arrived at EDR: 03/13/2014
Date Made Active in Reports: 04/09/2014
Number of Days to Update: 27

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 07/02/2014
Next Scheduled EDR Contact: 10/13/2014
Data Release Frequency: Varies

Federal institutional controls / engineering controls registries

US ENG CONTROLS: Engineering Controls Sites List
A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 03/19/2014
Date Data Arrived at EDR: 03/21/2014
Date Made Active in Reports: 07/15/2014
Number of Days to Update: 116

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 06/05/2014
Next Scheduled EDR Contact: 09/22/2014
Data Release Frequency: Varies

US INST CONTROL: Sites with Institutional Controls
A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 03/19/2014
Date Data Arrived at EDR: 03/21/2014
Date Made Active in Reports: 07/15/2014
Number of Days to Update: 116

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 06/05/2014
Next Scheduled EDR Contact: 09/22/2014
Data Release Frequency: Varies

LUCIS: Land Use Control Information System
LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 05/28/2014
Date Data Arrived at EDR: 05/30/2014
Date Made Active in Reports: 06/17/2014
Number of Days to Update: 18

Source: Department of the Navy
Telephone: 843-820-7326
Last EDR Contact: 05/19/2014
Next Scheduled EDR Contact: 09/01/2014
Data Release Frequency: Varies

Federal ERNS list

ERNS: Emergency Response Notification System
Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 09/30/2013
Date Data Arrived at EDR: 10/01/2013
Date Made Active in Reports: 12/06/2013
Number of Days to Update: 66

Source: National Response Center, United States Coast Guard
Telephone: 202-267-2180
Last EDR Contact: 07/03/2014
Next Scheduled EDR Contact: 07/14/2014
Data Release Frequency: Annually

State- and tribal - equivalent NPL

RESPONSE: State Response Sites
Identifies confirmed release sites where DTSC is involved in remediation, either in a lead or oversight capacity. These confirmed release sites are generally high-priority and high potential risk.

Date of Government Version: 06/05/2014
Date Data Arrived at EDR: 06/06/2014
Date Made Active in Reports: 07/09/2014
Number of Days to Update: 33

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 06/06/2014
Next Scheduled EDR Contact: 08/18/2014
Data Release Frequency: Quarterly

State- and tribal - equivalent CERCLIS

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

ENVIROSTOR: EnviroStor Database

The Department of Toxic Substances Control's (DTSC's) Site Mitigation and Brownfields Reuse Program's (SMBRP's) EnviroStor database identifes sites that have known contamination or sites for which there may be reasons to investigate further. The database includes the following site types: Federal Superfund sites (National Priorities List (NPL)); State Response, including Military Facilities and State Superfund; Voluntary Cleanup; and School sites. EnviroStor provides similar information to the information that was available in CalSites, and provides additional site information, including, but not limited to, identification of formerly-contaminated properties that have been released for reuse, properties where environmental deed restrictions have been recorded to prevent inappropriate land uses, and risk characterization information that is used to assess potential impacts to public health and the environment at contaminated sites.

Date of Government Version: 06/05/2014
Date Data Arrived at EDR: 06/06/2014
Date Made Active in Reports: 07/09/2014
Number of Days to Update: 33

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 06/06/2014
Next Scheduled EDR Contact: 08/18/2014
Data Release Frequency: Quarterly

State and tribal landfill and/or solid waste disposal site lists

SWF/LF (SWIS): Solid Waste Information System

Active, Closed and Inactive Landfills. SWF/LF records typically contain an inve ntory of solid waste disposal facilities or landfills. These may be active or i nactive facilities or open dumps that failed to meet RCRA Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 05/19/2014
Date Data Arrived at EDR: 05/20/2014
Date Made Active in Reports: 05/22/2014
Number of Days to Update: 2

Source: Department of Resources Recycling and Recovery
Telephone: 916-341-6320
Last EDR Contact: 05/20/2014
Next Scheduled EDR Contact: 09/01/2014
Data Release Frequency: Quarterly

State and tribal leaking storage tank lists

LUST REG 9: Leaking Underground Storage Tank Report

Orange, Riverside, San Diego counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 03/01/2001
Date Data Arrived at EDR: 04/23/2001
Date Made Active in Reports: 05/21/2001
Number of Days to Update: 28

Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-637-5595
Last EDR Contact: 09/26/2011
Next Scheduled EDR Contact: 01/09/2012
Data Release Frequency: No Update Planned

LUST REG 8: Leaking Underground Storage Tanks

California Regional Water Quality Control Board Santa Ana Region (8). For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/14/2005
Date Data Arrived at EDR: 02/15/2005
Date Made Active in Reports: 03/28/2005
Number of Days to Update: 41

Source: California Regional Water Quality Control Board Santa Ana Region (8)
Telephone: 909-782-4496
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: Varies

LUST REG 7: Leaking Underground Storage Tank Case Listing

Leaking Underground Storage Tank locations. Imperial, Riverside, San Diego, Santa Barbara counties.

Date of Government Version: 02/26/2004
Date Data Arrived at EDR: 02/26/2004
Date Made Active in Reports: 03/24/2004
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Colorado River Basin Region (7)
Telephone: 760-776-8943
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

LUST REG 6V: Leaking Underground Storage Tank Case Listing

Leaking Underground Storage Tank locations. Inyo, Kern, Los Angeles, Mono, San Bernardino counties.

Date of Government Version: 06/07/2005
Date Data Arrived at EDR: 06/07/2005
Date Made Active in Reports: 06/29/2005
Number of Days to Update: 22

Source: California Regional Water Quality Control Board Victorville Branch Office (6)
Telephone: 760-241-7365
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

LUST REG 6L: Leaking Underground Storage Tank Case Listing

For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/09/2003
Date Data Arrived at EDR: 09/10/2003
Date Made Active in Reports: 10/07/2003
Number of Days to Update: 27

Source: California Regional Water Quality Control Board Lahontan Region (6)
Telephone: 530-542-5572
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: No Update Planned

LUST REG 5: Leaking Underground Storage Tank Database

Leaking Underground Storage Tank locations. Alameda, Alpine, Amador, Butte, Colusa, Contra Costa, Calveras, El Dorado, Fresno, Glenn, Kern, Kings, Lake, Lassen, Madera, Mariposa, Merced, Modoc, Napa, Nevada, Placer, Plumas, Sacramento, San Joaquin, Shasta, Solano, Stanislaus, Sutter, Tehama, Tulare, Tuolumne, Yolo, Yuba counties.

Date of Government Version: 07/01/2008
Date Data Arrived at EDR: 07/22/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 9

Source: California Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-4834
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: No Update Planned

LUST REG 4: Underground Storage Tank Leak List

Los Angeles, Ventura counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35

Source: California Regional Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6710
Last EDR Contact: 09/06/2011
Next Scheduled EDR Contact: 12/19/2011
Data Release Frequency: No Update Planned

LUST REG 3: Leaking Underground Storage Tank Database

Leaking Underground Storage Tank locations. Monterey, San Benito, San Luis Obispo, Santa Barbara, Santa Cruz counties.

Date of Government Version: 05/19/2003
Date Data Arrived at EDR: 05/19/2003
Date Made Active in Reports: 06/02/2003
Number of Days to Update: 14

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-542-4786
Last EDR Contact: 07/18/2011
Next Scheduled EDR Contact: 10/31/2011
Data Release Frequency: No Update Planned

LUST REG 2: Fuel Leak List

Leaking Underground Storage Tank locations. Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, Sonoma counties.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: California Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-622-2433
Last EDR Contact: 09/19/2011
Next Scheduled EDR Contact: 01/02/2012
Data Release Frequency: Quarterly

LUST REG 1: Active Toxic Site Investigation

Del Norte, Humboldt, Lake, Mendocino, Modoc, Siskiyou, Sonoma, Trinity counties. For more current information, please refer to the State Water Resources Control Board's LUST database.

Date of Government Version: 02/01/2001
Date Data Arrived at EDR: 02/28/2001
Date Made Active in Reports: 03/29/2001
Number of Days to Update: 29

Source: California Regional Water Quality Control Board North Coast (1)
Telephone: 707-570-3769
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

LUST: Geotracker's Leaking Underground Fuel Tank Report

Leaking Underground Storage Tank Incident Reports. LUST records contain an inventory of reported leaking underground storage tank incidents. Not all states maintain these records, and the information stored varies by state. For more information on a particular leaking underground storage tank sites, please contact the appropriate regulatory agency.

Date of Government Version: 06/16/2014
Date Data Arrived at EDR: 06/17/2014
Date Made Active in Reports: 07/10/2014
Number of Days to Update: 23

Source: State Water Resources Control Board
Telephone: see region list
Last EDR Contact: 07/31/2014
Next Scheduled EDR Contact: 09/29/2014
Data Release Frequency: Quarterly

SLIC: Statewide SLIC Cases

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 06/16/2014
Date Data Arrived at EDR: 06/17/2014
Date Made Active in Reports: 07/11/2014
Number of Days to Update: 24

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 07/31/2014
Next Scheduled EDR Contact: 09/29/2014
Data Release Frequency: Varies

SLIC REG 1: Active Toxic Site Investigations

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2003
Date Data Arrived at EDR: 04/07/2003
Date Made Active in Reports: 04/25/2003
Number of Days to Update: 18

Source: California Regional Water Quality Control Board, North Coast Region (1)
Telephone: 707-576-2220
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

SLIC REG 2: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/30/2004
Date Data Arrived at EDR: 10/20/2004
Date Made Active in Reports: 11/19/2004
Number of Days to Update: 30

Source: Regional Water Quality Control Board San Francisco Bay Region (2)
Telephone: 510-286-0457
Last EDR Contact: 09/19/2011
Next Scheduled EDR Contact: 01/02/2012
Data Release Frequency: Quarterly

SLIC REG 3: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/18/2006
Date Data Arrived at EDR: 05/18/2006
Date Made Active in Reports: 06/15/2006
Number of Days to Update: 28

Source: California Regional Water Quality Control Board Central Coast Region (3)
Telephone: 805-549-3147
Last EDR Contact: 07/18/2011
Next Scheduled EDR Contact: 10/31/2011
Data Release Frequency: Semi-Annually

SLIC REG 4: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing

The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/17/2004
Date Data Arrived at EDR: 11/18/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 47

Source: Region Water Quality Control Board Los Angeles Region (4)
Telephone: 213-576-6600
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: Varies

SLIC REG 5: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/01/2005
Date Data Arrived at EDR: 04/05/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 16

Source: Regional Water Quality Control Board Central Valley Region (5)
Telephone: 916-464-3291
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: Semi-Annually

SLIC REG 6V: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 05/24/2005
Date Data Arrived at EDR: 05/25/2005
Date Made Active in Reports: 06/16/2005
Number of Days to Update: 22

Source: Regional Water Quality Control Board, Victorville Branch
Telephone: 619-241-6583
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: Semi-Annually

SLIC REG 6L: SLIC Sites
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/07/2004
Date Data Arrived at EDR: 09/07/2004
Date Made Active in Reports: 10/12/2004
Number of Days to Update: 35

Source: California Regional Water Quality Control Board, Lahontan Region
Telephone: 530-542-5574
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

SLIC REG 7: SLIC List
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 11/24/2004
Date Data Arrived at EDR: 11/29/2004
Date Made Active in Reports: 01/04/2005
Number of Days to Update: 36

Source: California Regional Quality Control Board, Colorado River Basin Region
Telephone: 760-346-7491
Last EDR Contact: 08/01/2011
Next Scheduled EDR Contact: 11/14/2011
Data Release Frequency: No Update Planned

SLIC REG 8: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 04/03/2008
Date Data Arrived at EDR: 04/03/2008
Date Made Active in Reports: 04/14/2008
Number of Days to Update: 11

Source: California Region Water Quality Control Board Santa Ana Region (8)
Telephone: 951-782-3298
Last EDR Contact: 09/12/2011
Next Scheduled EDR Contact: 12/26/2011
Data Release Frequency: Semi-Annually

SLIC REG 9: Spills, Leaks, Investigation & Cleanup Cost Recovery Listing
The SLIC (Spills, Leaks, Investigations and Cleanup) program is designed to protect and restore water quality from spills, leaks, and similar discharges.

Date of Government Version: 09/10/2007
Date Data Arrived at EDR: 09/11/2007
Date Made Active in Reports: 09/28/2007
Number of Days to Update: 17

Source: California Regional Water Quality Control Board San Diego Region (9)
Telephone: 858-467-2980
Last EDR Contact: 08/08/2011
Next Scheduled EDR Contact: 11/21/2011
Data Release Frequency: Annually

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 08/27/2012
Date Data Arrived at EDR: 08/28/2012
Date Made Active in Reports: 10/16/2012
Number of Days to Update: 49

Source: EPA Region 8
Telephone: 303-312-6271
Last EDR Contact: 07/22/2014
Next Scheduled EDR Contact: 11/10/2014
Data Release Frequency: Quarterly

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 04/28/2014
Date Data Arrived at EDR: 05/01/2014
Date Made Active in Reports: 06/17/2014
Number of Days to Update: 47

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 04/28/2014
Next Scheduled EDR Contact: 11/10/2014
Data Release Frequency: Varies

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 05/14/2014
Date Data Arrived at EDR: 05/15/2014
Date Made Active in Reports: 07/15/2014
Number of Days to Update: 61

Source: EPA Region 6
Telephone: 214-665-6597
Last EDR Contact: 07/22/2014
Next Scheduled EDR Contact: 11/20/2014
Data Release Frequency: Varies

INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Florida, Mississippi and North Carolina.

Date of Government Version: 04/24/2014
Date Data Arrived at EDR: 04/25/2014
Date Made Active in Reports: 06/17/2014
Number of Days to Update: 53

Source: EPA Region 4
Telephone: 404-562-8677
Last EDR Contact: 04/22/2014
Next Scheduled EDR Contact: 08/11/2014
Data Release Frequency: Semi-Annually

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 02/01/2013
Date Data Arrived at EDR: 05/01/2013
Date Made Active in Reports: 11/01/2013
Number of Days to Update: 184

Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 08/01/2014
Next Scheduled EDR Contact: 11/10/2014
Data Release Frequency: Varies

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 03/01/2013
Date Data Arrived at EDR: 03/01/2013
Date Made Active in Reports: 04/12/2013
Number of Days to Update: 42

Source: Environmental Protection Agency
Telephone: 415-972-3372
Last EDR Contact: 07/22/2014
Next Scheduled EDR Contact: 11/10/2014
Data Release Frequency: Quarterly

INDIAN LUST R5: Leaking Underground Storage Tanks on Indian Land
Leaking underground storage tanks located on Indian Land in Michigan, Minnesota and Wisconsin.

Date of Government Version: 05/12/2014
Date Data Arrived at EDR: 05/12/2014
Date Made Active in Reports: 06/17/2014
Number of Days to Update: 36

Source: EPA, Region 5
Telephone: 312-886-7439
Last EDR Contact: 04/28/2014
Next Scheduled EDR Contact: 11/10/2014
Data Release Frequency: Varies

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 11/06/2013
Date Data Arrived at EDR: 11/07/2013
Date Made Active in Reports: 12/06/2013
Number of Days to Update: 29

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 04/28/2014
Next Scheduled EDR Contact: 11/10/2014
Data Release Frequency: Quarterly

State and tribal registered storage tank lists

UST: Active UST Facilities
Active UST facilities gathered from the local regulatory agencies

Date of Government Version: 06/16/2014
Date Data Arrived at EDR: 06/17/2014
Date Made Active in Reports: 07/10/2014
Number of Days to Update: 23

Source: SWRCB
Telephone: 916-341-5851
Last EDR Contact: 07/31/2014
Next Scheduled EDR Contact: 09/29/2014
Data Release Frequency: Semi-Annually

AST: Aboveground Petroleum Storage Tank Facilities
A listing of aboveground storage tank petroleum storage tank locations.

Date of Government Version: 08/01/2009
Date Data Arrived at EDR: 09/10/2009
Date Made Active in Reports: 10/01/2009
Number of Days to Update: 21

Source: California Environmental Protection Agency
Telephone: 916-327-5092
Last EDR Contact: 07/18/2014
Next Scheduled EDR Contact: 10/20/2014
Data Release Frequency: Quarterly

INDIAN UST R1: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 1 (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and ten Tribal Nations).

Date of Government Version: 02/01/2013
Date Data Arrived at EDR: 05/01/2013
Date Made Active in Reports: 01/27/2014
Number of Days to Update: 271

Source: EPA, Region 1
Telephone: 617-918-1313
Last EDR Contact: 08/01/2014
Next Scheduled EDR Contact: 11/10/2014
Data Release Frequency: Varies

INDIAN UST R4: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Tribal Nations)

Date of Government Version: 04/24/2014
Date Data Arrived at EDR: 04/25/2014
Date Made Active in Reports: 06/17/2014
Number of Days to Update: 53

Source: EPA Region 4
Telephone: 404-562-9424
Last EDR Contact: 04/22/2014
Next Scheduled EDR Contact: 08/11/2014
Data Release Frequency: Semi-Annually

INDIAN UST R5: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 5 (Michigan, Minnesota and Wisconsin and Tribal Nations).

Date of Government Version: 05/12/2014
Date Data Arrived at EDR: 05/12/2014
Date Made Active in Reports: 06/17/2014
Number of Days to Update: 36

Source: EPA Region 5
Telephone: 312-886-6136
Last EDR Contact: 04/28/2014
Next Scheduled EDR Contact: 11/10/2014
Data Release Frequency: Varies

INDIAN UST R6: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 6 (Louisiana, Arkansas, Oklahoma, New Mexico, Texas and 65 Tribes).

Date of Government Version: 05/14/2014
Date Data Arrived at EDR: 05/15/2014
Date Made Active in Reports: 06/17/2014
Number of Days to Update: 33

Source: EPA Region 6
Telephone: 214-665-7591
Last EDR Contact: 07/22/2014
Next Scheduled EDR Contact: 11/10/2014
Data Release Frequency: Semi-Annually

INDIAN UST R7: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 7 (Iowa, Kansas, Missouri, Nebraska, and 9 Tribal Nations).

Date of Government Version: 05/28/2014
Date Data Arrived at EDR: 05/01/2014
Date Made Active in Reports: 06/17/2014
Number of Days to Update: 47

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 04/28/2014
Next Scheduled EDR Contact: 11/10/2014
Data Release Frequency: Varies

INDIAN UST R8: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming and 27 Tribal Nations).

Date of Government Version: 05/07/2014
Date Data Arrived at EDR: 05/09/2014
Date Made Active in Reports: 06/17/2014
Number of Days to Update: 39

Source: EPA Region 8
Telephone: 303-312-6137
Last EDR Contact: 07/22/2014
Next Scheduled EDR Contact: 11/10/2014
Data Release Frequency: Quarterly

INDIAN UST R9: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 9 (Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations).

Date of Government Version: 05/12/2014
Date Data Arrived at EDR: 05/14/2014
Date Made Active in Reports: 06/17/2014
Number of Days to Update: 34

Source: EPA Region 9
Telephone: 415-972-3368
Last EDR Contact: 07/22/2014
Next Scheduled EDR Contact: 11/10/2014
Data Release Frequency: Quarterly

INDIAN UST R10: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 10 (Alaska, Idaho, Oregon, Washington, and Tribal Nations).

Date of Government Version: 04/04/2014
Date Data Arrived at EDR: 04/08/2014
Date Made Active in Reports: 06/17/2014
Number of Days to Update: 70

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 07/22/2014
Next Scheduled EDR Contact: 11/10/2014
Data Release Frequency: Quarterly

FEMA UST: Underground Storage Tank Listing
A listing of all FEMA owned underground storage tanks.

Date of Government Version: 01/01/2010
Date Data Arrived at EDR: 02/16/2010
Date Made Active in Reports: 04/12/2010
Number of Days to Update: 55

Source: FEMA
Telephone: 202-646-5797
Last EDR Contact: 07/08/2014
Next Scheduled EDR Contact: 10/27/2014
Data Release Frequency: Varies

State and tribal voluntary cleanup sites

INDIAN VCP R1: Voluntary Cleanup Priority Listing
A listing of voluntary cleanup priority sites located on Indian Land located in Region 1.

Date of Government Version: 03/20/2014
Date Data Arrived at EDR: 04/01/2014
Date Made Active in Reports: 06/17/2014
Number of Days to Update: 77

Source: EPA, Region 1
Telephone: 617-918-1102
Last EDR Contact: 07/01/2014
Next Scheduled EDR Contact: 10/13/2014
Data Release Frequency: Varies

INDIAN VCP R7: Voluntary Cleanup Priority Lisitng
A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008
Date Data Arrived at EDR: 04/22/2008
Date Made Active in Reports: 05/19/2008
Number of Days to Update: 27

Source: EPA, Region 7
Telephone: 913-551-7365
Last EDR Contact: 04/20/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

VCP: Voluntary Cleanup Program Properties
Contains low threat level properties with either confirmed or unconfirmed releases and the project proponents have request that DTSC oversee investigation and/or cleanup activities and have agreed to provide coverage for DTSC’s costs.

Date of Government Version: 06/05/2014
Date Data Arrived at EDR: 06/06/2014
Date Made Active in Reports: 07/09/2014
Number of Days to Update: 33

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 06/06/2014
Next Scheduled EDR Contact: 08/18/2014
Data Release Frequency: Quarterly

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS: A Listing of Brownfields Sites
Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. Assessment, Cleanup and Redevelopment Exchange System (ACRES) stores information reported by EPA Brownfields grant recipients on brownfields properties assessed or cleaned up with grant funding as well as information on Targeted Brownfields Assessments performed by EPA Regions. A listing of ACRES Brownfield sites is obtained from Cleanups in My Community. Cleanups in My Community provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

Date of Government Version: 07/01/2014
Date Data Arrived at EDR: 07/03/2014
Date Made Active in Reports: 07/28/2014
Number of Days to Update: 25

Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 07/03/2014
Next Scheduled EDR Contact: 10/06/2014
Data Release Frequency: Semi-Annually

Local Lists of Landfill / Solid Waste Disposal Sites

ODI: Open Dump Inventory

An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations

A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 01/12/2009
Date Data Arrived at EDR: 05/07/2009
Date Made Active in Reports: 09/21/2009
Number of Days to Update: 137

Source: EPA, Region 9
Telephone: 415-947-4219
Last EDR Contact: 07/25/2014
Next Scheduled EDR Contact: 11/10/2014
Data Release Frequency: No Update Planned

SWRCY: Recycler Database

A listing of recycling facilities in California.

Date of Government Version: 06/16/2014
Date Data Arrived at EDR: 06/17/2014
Date Made Active in Reports: 07/11/2014
Number of Days to Update: 24

Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 06/17/2014
Next Scheduled EDR Contact: 09/29/2014
Data Release Frequency: Quarterly

HAULERS: Registered Waste Tire Haulers Listing

A listing of registered waste tire haulers.

Date of Government Version: 02/18/2014
Date Data Arrived at EDR: 02/20/2014
Date Made Active in Reports: 03/27/2014
Number of Days to Update: 35

Source: Integrated Waste Management Board
Telephone: 916-341-6422
Last EDR Contact: 05/19/2014
Next Scheduled EDR Contact: 09/01/2014
Data Release Frequency: Varies

INDIAN ODI: Report on the Status of Open Dumps on Indian Lands

Location of open dumps on Indian land.

Date of Government Version: 12/31/1998
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 01/24/2008
Number of Days to Update: 52

Source: Environmental Protection Agency
Telephone: 703-308-8245
Last EDR Contact: 08/01/2014
Next Scheduled EDR Contact: 11/17/2014
Data Release Frequency: Varies

WMUDS/SWAT: Waste Management Unit Database

Waste Management Unit Database System. WMUDS is used by the State Water Resources Control Board staff and the Regional Water Quality Control Boards for program tracking and inventory of waste management units. WMUDS is composed of the following databases: Facility Information, Scheduled Inspections Information, Waste Management Unit Information, SWAT Program Information, SWAT Report Summary Information, SWAT Report Summary Data, Chapter 15 (formerly Subchapter 15) Information, Chapter 15 Monitoring Parameters, TPCA Program Information, RCRA Program Information, Closure Information, and Interested Parties Information.

Date of Government Version: 04/01/2000
Date Data Arrived at EDR: 04/10/2000
Date Made Active in Reports: 05/10/2000
Number of Days to Update: 30

Source: State Water Resources Control Board
Telephone: 916-227-4448
Last EDR Contact: 05/07/2014
Next Scheduled EDR Contact: 08/25/2014
Data Release Frequency: No Update Planned

Local Lists of Hazardous waste / Contaminated Sites

US CDL: Clandestine Drug Labs

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 05/28/2014
Date Data Arrived at EDR: 06/20/2014
Date Made Active in Reports: 07/15/2014
Number of Days to Update: 25

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 06/04/2014
Next Scheduled EDR Contact: 09/15/2014
Data Release Frequency: Quarterly

HIST CAL-SITES: Calsites Database

The Calsites database contains potential or confirmed hazardous substance release properties. In 1996, California EPA reevaluated and significantly reduced the number of sites in the Calsites database. No longer updated by the state agency. It has been replaced by ENVIROSTOR.

Date of Government Version: 08/08/2005
Date Data Arrived at EDR: 08/03/2006
Date Made Active in Reports: 08/24/2006
Number of Days to Update: 21

Source: Department of Toxic Substance Control
Telephone: 916-323-3400
Last EDR Contact: 02/23/2009
Next Scheduled EDR Contact: 05/25/2009
Data Release Frequency: No Update Planned

SCH: School Property Evaluation Program

This category contains proposed and existing school sites that are being evaluated by DTSC for possible hazardous materials contamination. In some cases, these properties may be listed in the CalSites category depending on the level of threat to public health and safety or the environment they pose.

Date of Government Version: 06/05/2014
Date Data Arrived at EDR: 06/06/2014
Date Made Active in Reports: 07/09/2014
Number of Days to Update: 33

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 06/06/2014
Next Scheduled EDR Contact: 08/18/2014
Data Release Frequency: Quarterly

TOXIC PITS: Toxic Pits Cleanup Act Sites

Toxic PITS Cleanup Act Sites. TOXIC PITS identifies sites suspected of containing hazardous substances where cleanup has not yet been completed.

Date of Government Version: 07/01/1995
Date Data Arrived at EDR: 08/30/1995
Date Made Active in Reports: 09/26/1995
Number of Days to Update: 27

Source: State Water Resources Control Board
Telephone: 916-227-4364
Last EDR Contact: 01/26/2009
Next Scheduled EDR Contact: 04/27/2009
Data Release Frequency: No Update Planned

CDL: Clandestine Drug Labs

A listing of drug lab locations. Listing of a location in this database does not indicate that any illegal drug lab materials were or were not present there, and does not constitute a determination that the location either requires or does not require additional cleanup work.

Date of Government Version: 12/31/2013
Date Data Arrived at EDR: 02/28/2014
Date Made Active in Reports: 03/20/2014
Number of Days to Update: 20

Source: Department of Toxic Substances Control
Telephone: 916-255-6504
Last EDR Contact: 07/14/2014
Next Scheduled EDR Contact: 10/27/2014
Data Release Frequency: Varies

US HIST CDL: National Clandestine Laboratory Register

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 05/28/2014
Date Data Arrived at EDR: 06/20/2014
Date Made Active in Reports: 07/15/2014
Number of Days to Update: 25

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 06/04/2014
Next Scheduled EDR Contact: 09/15/2014
Data Release Frequency: No Update Planned

Local Lists of Registered Storage Tanks

CA FID UST: Facility Inventory Database

The Facility Inventory Database (FID) contains a historical listing of active and inactive underground storage tank locations from the State Water Resource Control Board. Refer to local/county source for current data.

Date of Government Version: 10/31/1994
Date Data Arrived at EDR: 09/05/1995
Date Made Active in Reports: 09/29/1995
Number of Days to Update: 24

Source: California Environmental Protection Agency
Telephone: 916-341-5851
Last EDR Contact: 12/28/1998
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

UST MENDOCINO: Mendocino County UST Database

A listing of underground storage tank locations in Mendocino County.

Date of Government Version: 09/23/2009
Date Data Arrived at EDR: 09/23/2009
Date Made Active in Reports: 10/01/2009
Number of Days to Update: 8

Source: Department of Public Health
Telephone: 707-463-4466
Last EDR Contact: 06/02/2014
Next Scheduled EDR Contact: 09/15/2014
Data Release Frequency: Annually

HIST UST: Hazardous Substance Storage Container Database

The Hazardous Substance Storage Container Database is a historical listing of UST sites. Refer to local/county source for current data.

Date of Government Version: 10/15/1990
Date Data Arrived at EDR: 01/25/1991
Date Made Active in Reports: 02/12/1991
Number of Days to Update: 18

Source: State Water Resources Control Board
Telephone: 916-341-5851
Last EDR Contact: 07/26/2001
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

SWEEPS UST: SWEEPS UST Listing

Statewide Environmental Evaluation and Planning System. This underground storage tank listing was updated and maintained by a company contacted by the SWRCB in the early 1990's. The listing is no longer updated or maintained. The local agency is the contact for more information on a site on the SWEEPS list.

Date of Government Version: 06/01/1994
Date Data Arrived at EDR: 07/07/2005
Date Made Active in Reports: 08/11/2005
Number of Days to Update: 35

Source: State Water Resources Control Board
Telephone: N/A
Last EDR Contact: 06/03/2005
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

Local Land Records

LIENS 2: CERCLA Lien Information

A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 02/18/2014
Date Data Arrived at EDR: 03/18/2014
Date Made Active in Reports: 04/24/2014
Number of Days to Update: 37

Source: Environmental Protection Agency
Telephone: 202-564-6023
Last EDR Contact: 07/22/2014
Next Scheduled EDR Contact: 11/10/2014
Data Release Frequency: Varies

LIENS: Environmental Liens Listing

A listing of property locations with environmental liens for California where DTSC is a lien holder.

Date of Government Version: 05/05/2014
Date Data Arrived at EDR: 05/06/2014
Date Made Active in Reports: 05/19/2014
Number of Days to Update: 13

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 06/09/2014
Next Scheduled EDR Contact: 09/22/2014
Data Release Frequency: Varies

DEED: Deed Restriction Listing

Site Mitigation and Brownfields Reuse Program Facility Sites with Deed Restrictions & Hazardous Waste Management Program Facility Sites with Deed / Land Use Restriction. The DTSC Site Mitigation and Brownfields Reuse Program (SMBRP) list includes sites cleaned up under the program's oversight and generally does not include current or former hazardous waste facilities that required a hazardous waste facility permit. The list represents deed restrictions that are active. Some sites have multiple deed restrictions. The DTSC Hazardous Waste Management Program (HWMP) has developed a list of current or former hazardous waste facilities that have a recorded land use restriction at the local county recorder's office. The land use restrictions on this list were required by the DTSC HWMP as a result of the presence of hazardous substances that remain on site after the facility (or part of the facility) has been closed or cleaned up. The types of land use restriction include deed notice, deed restriction, or a land use restriction that binds current and future owners.

Date of Government Version: 06/09/2014
Date Data Arrived at EDR: 06/11/2014
Date Made Active in Reports: 07/09/2014
Number of Days to Update: 28

Source: DTSC and SWRCB
Telephone: 916-323-3400
Last EDR Contact: 06/11/2014
Next Scheduled EDR Contact: 09/22/2014
Data Release Frequency: Semi-Annually

Records of Emergency Release Reports

HMIRS: Hazardous Materials Information Reporting System

Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 03/31/2014
Date Data Arrived at EDR: 04/01/2014
Date Made Active in Reports: 07/15/2014
Number of Days to Update: 105

Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 07/01/2014
Next Scheduled EDR Contact: 10/13/2014
Data Release Frequency: Annually

CHMIRS: California Hazardous Material Incident Report System

California Hazardous Material Incident Reporting System. CHMIRS contains information on reported hazardous material incidents (accidental releases or spills).

Date of Government Version: 02/04/2014
Date Data Arrived at EDR: 04/29/2014
Date Made Active in Reports: 05/09/2014
Number of Days to Update: 10

Source: Office of Emergency Services
Telephone: 916-845-8400
Last EDR Contact: 07/28/2014
Next Scheduled EDR Contact: 11/10/2014
Data Release Frequency: Varies

LDS: Land Disposal Sites Listing

The Land Disposal program regulates of waste discharge to land for treatment, storage and disposal in waste management units.

Date of Government Version: 06/16/2014
Date Data Arrived at EDR: 06/17/2014
Date Made Active in Reports: 07/10/2014
Number of Days to Update: 23

Source: State Water Qualilty Control Board
Telephone: 866-480-1028
Last EDR Contact: 07/31/2014
Next Scheduled EDR Contact: 09/29/2014
Data Release Frequency: Quarterly

MCS: Military Cleanup Sites Listing

The State Water Resources Control Board and nine Regional Water Quality Control Boards partner with the Department of Defense (DoD) through the Defense and State Memorandum of Agreement (DSMOA) to oversee the investigation and remediation of water quality issues at military facilities.

Date of Government Version: 06/16/2014
Date Data Arrived at EDR: 06/17/2014
Date Made Active in Reports: 07/10/2014
Number of Days to Update: 23

Source: State Water Resources Control Board
Telephone: 866-480-1028
Last EDR Contact: 07/31/2014
Next Scheduled EDR Contact: 09/29/2014
Data Release Frequency: Quarterly

SPILLS 90: SPILLS90 data from FirstSearch

Spills 90 includes those spill and release records available exclusively from FirstSearch databases. Typically, they may include chemical, oil and/or hazardous substance spills recorded after 1990. Duplicate records that are already included in EDR incident and release records are not included in Spills 90.

Date of Government Version: 06/06/2012
Date Data Arrived at EDR: 01/03/2013
Date Made Active in Reports: 02/22/2013
Number of Days to Update: 50

Source: FirstSearch
Telephone: N/A
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

Other Ascertainable Records

RCRA NonGen / NLR: RCRA - Non Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 03/11/2014
Date Data Arrived at EDR: 03/13/2014
Date Made Active in Reports: 04/09/2014
Number of Days to Update: 27

Source: Environmental Protection Agency
Telephone: (415) 495-8895
Last EDR Contact: 07/02/2014
Next Scheduled EDR Contact: 10/13/2014
Data Release Frequency: Varies

DOT OPS: Incident and Accident Data

Department of Transporation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 07/31/2012
Date Data Arrived at EDR: 08/07/2012
Date Made Active in Reports: 09/18/2012
Number of Days to Update: 42

Source: Department of Transporation, Office of Pipeline Safety
Telephone: 202-366-4595
Last EDR Contact: 05/06/2014
Next Scheduled EDR Contact: 08/18/2014
Data Release Frequency: Varies

DOD: Department of Defense Sites

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 11/10/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 62

Source: USGS
Telephone: 888-275-8747
Last EDR Contact: 07/18/2014
Next Scheduled EDR Contact: 10/27/2014
Data Release Frequency: Semi-Annually

FUDS: Formerly Used Defense Sites

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 12/31/2012
Date Data Arrived at EDR: 02/28/2014
Date Made Active in Reports: 04/24/2014
Number of Days to Update: 55

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 06/04/2014
Next Scheduled EDR Contact: 09/22/2014
Data Release Frequency: Varies

CONSENT: Superfund (CERCLA) Consent Decrees

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 12/31/2013
Date Data Arrived at EDR: 01/24/2014
Date Made Active in Reports: 02/24/2014
Number of Days to Update: 31

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 06/30/2014
Next Scheduled EDR Contact: 10/13/2014
Data Release Frequency: Varies

ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 11/25/2013
Date Data Arrived at EDR: 12/12/2013
Date Made Active in Reports: 02/24/2014
Number of Days to Update: 74

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 06/10/2014
Next Scheduled EDR Contact: 09/22/2014
Data Release Frequency: Annually

UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 09/14/2010
Date Data Arrived at EDR: 10/07/2011
Date Made Active in Reports: 03/01/2012
Number of Days to Update: 146

Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 02/25/2014
Next Scheduled EDR Contact: 06/09/2014
Data Release Frequency: Varies

US MINES: Mines Master Index File

Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 01/30/2014
Date Data Arrived at EDR: 03/05/2014
Date Made Active in Reports: 07/15/2014
Number of Days to Update: 132

Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 06/06/2014
Next Scheduled EDR Contact: 09/15/2014
Data Release Frequency: Semi-Annually

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2011
Date Data Arrived at EDR: 07/31/2013
Date Made Active in Reports: 09/13/2013
Number of Days to Update: 44

Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 05/30/2014
Next Scheduled EDR Contact: 09/08/2014
Data Release Frequency: Annually

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2006
Date Data Arrived at EDR: 09/29/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 64

Source: EPA
Telephone: 202-260-5521
Last EDR Contact: 06/25/2014
Next Scheduled EDR Contact: 10/06/2014
Data Release Frequency: Every 4 Years

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 05/22/2014
Next Scheduled EDR Contact: 09/08/2014
Data Release Frequency: Quarterly

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA
Telephone: 202-566-1667
Last EDR Contact: 05/22/2014
Next Scheduled EDR Contact: 09/08/2014
Data Release Frequency: Quarterly

HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing
A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2007
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

HIST FTTS INSP: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing
A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2008
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

SSTS: Section 7 Tracking Systems
Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 12/10/2010
Date Made Active in Reports: 02/25/2011
Number of Days to Update: 77

Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 07/22/2014
Next Scheduled EDR Contact: 11/10/2014
Data Release Frequency: Annually

ICIS: Integrated Compliance Information System

The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 05/06/2014
Date Data Arrived at EDR: 05/16/2014
Date Made Active in Reports: 06/17/2014
Number of Days to Update: 32

Source: Environmental Protection Agency
Telephone: 202-564-5088
Last EDR Contact: 10/09/2014
Next Scheduled EDR Contact: 10/27/2014
Data Release Frequency: Quarterly

PADS: PCB Activity Database System

PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 06/01/2013
Date Data Arrived at EDR: 07/17/2013
Date Made Active in Reports: 11/01/2013
Number of Days to Update: 107

Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 07/18/2014
Next Scheduled EDR Contact: 10/27/2014
Data Release Frequency: Annually

MLTS: Material Licensing Tracking System

MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 07/22/2013
Date Data Arrived at EDR: 08/02/2013
Date Made Active in Reports: 11/01/2013
Number of Days to Update: 91

Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
Last EDR Contact: 06/05/2014
Next Scheduled EDR Contact: 09/22/2014
Data Release Frequency: Quarterly

RADINFO: Radiation Information Database

The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 07/07/2014
Date Data Arrived at EDR: 07/10/2014
Date Made Active in Reports: 07/28/2014
Number of Days to Update: 18

Source: Environmental Protection Agency
Telephone: 202-343-9775
Last EDR Contact: 07/10/2014
Next Scheduled EDR Contact: 10/20/2014
Data Release Frequency: Quarterly

FINDS: Facility Index System/Facility Registry System

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 11/18/2013
Date Data Arrived at EDR: 02/27/2014
Date Made Active in Reports: 03/12/2014
Number of Days to Update: 13

Source: EPA
Telephone: (415) 947-8000
Last EDR Contact: 06/13/2014
Next Scheduled EDR Contact: 09/22/2014
Data Release Frequency: Quarterly

RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995
Date Data Arrived at EDR: 07/03/1995
Date Made Active in Reports: 08/07/1995
Number of Days to Update: 35

Source: EPA
Telephone: 202-564-4104
Last EDR Contact: 06/02/2008
Next Scheduled EDR Contact: 09/01/2008
Data Release Frequency: No Update Planned

RMP: Risk Management Plans

When Congress passed the Clean Air Act Amendments of 1990, it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The Risk Management Program Rule (RMP Rule) was written to implement Section 112(r) of these amendments. The rule, which built upon existing industry codes and standards, requires companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Program, which includes a(n): Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases; Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g the fire department) should an accident occur.

Date of Government Version: 04/01/2014
Date Data Arrived at EDR: 05/23/2014
Date Made Active in Reports: 07/28/2014
Number of Days to Update: 66

Source: Environmental Protection Agency
Telephone: 202-564-8600
Last EDR Contact: 07/22/2014
Next Scheduled EDR Contact: 11/10/2014
Data Release Frequency: Varies

BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2011
Date Data Arrived at EDR: 02/26/2013
Date Made Active in Reports: 04/19/2013
Number of Days to Update: 52

Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 05/30/2014
Next Scheduled EDR Contact: 09/08/2014
Data Release Frequency: Biennially

CA BOND EXP. PLAN: Bond Expenditure Plan

Department of Health Services developed a site-specific expenditure plan as the basis for an appropriation of Hazardous Substance Cleanup Bond Act funds. It is not updated.

Date of Government Version: 01/01/1989
Date Data Arrived at EDR: 07/27/1994
Date Made Active in Reports: 08/02/1994
Number of Days to Update: 6

Source: Department of Health Services
Telephone: 916-255-2118
Last EDR Contact: 05/31/1994
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

UIC: UIC Listing

A listing of wells identified as underground injection wells, in the California Oil and Gas Wells database.

Date of Government Version: 01/15/2014
Date Data Arrived at EDR: 03/18/2014
Date Made Active in Reports: 04/24/2014
Number of Days to Update: 37

Source: Deaprtment of Conservation
Telephone: 916-445-2408
Last EDR Contact: 06/20/2014
Next Scheduled EDR Contact: 09/29/2014
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

NPDES: NPDES Permits Listing
A listing of NPDES permits, including stormwater.

Date of Government Version: 05/19/2014
Date Data Arrived at EDR: 05/20/2014
Date Made Active in Reports: 05/28/2014
Number of Days to Update: 8

Source: State Water Resources Control Board
Telephone: 916-445-9379
Last EDR Contact: 05/20/2014
Next Scheduled EDR Contact: 09/01/2014
Data Release Frequency: Quarterly

CORTESE: "Cortese" Hazardous Waste & Substances Sites List
The sites for the list are designated by the State Water Resource Control Board (LUST), the Integrated Waste Board (SWF/LS), and the Department of Toxic Substances Control (Cal-Sites).

Date of Government Version: 06/30/2014
Date Data Arrived at EDR: 07/01/2014
Date Made Active in Reports: 07/28/2014
Number of Days to Update: 27

Source: CAL EPA/Office of Emergency Information
Telephone: 916-323-3400
Last EDR Contact: 07/01/2014
Next Scheduled EDR Contact: 10/13/2014
Data Release Frequency: Quarterly

HIST CORTESE: Hazardous Waste & Substance Site List
The sites for the list are designated by the State Water Resource Control Board [LUST], the Integrated Waste Board [SWF/LS], and the Department of Toxic Substances Control [CALSITES]. This listing is no longer updated by the state agency.

Date of Government Version: 04/01/2001
Date Data Arrived at EDR: 01/22/2009
Date Made Active in Reports: 04/08/2009
Number of Days to Update: 76

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 01/22/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

NOTIFY 65: Proposition 65 Records
Listings of all Proposition 65 incidents reported to counties by the State Water Resources Control Board and the Regional Water Quality Control Board. This database is no longer updated by the reporting agency.

Date of Government Version: 10/21/1993
Date Data Arrived at EDR: 11/01/1993
Date Made Active in Reports: 11/19/1993
Number of Days to Update: 18

Source: State Water Resources Control Board
Telephone: 916-445-3846
Last EDR Contact: 06/17/2014
Next Scheduled EDR Contact: 10/06/2014
Data Release Frequency: No Update Planned

DRYCLEANERS: Cleaner Facilities
A list of drycleaner related facilities that have EPA ID numbers. These are facilities with certain SIC codes: power laundries, family and commercial; garment pressing and cleaner's agents; linen supply; coin-operated laundries and cleaning; drycleaning plants, except rugs; carpet and upholster cleaning; industrial launderers; laundry and garment services.

Date of Government Version: 09/10/2013
Date Data Arrived at EDR: 09/11/2013
Date Made Active in Reports: 10/16/2013
Number of Days to Update: 35

Source: Department of Toxic Substance Control
Telephone: 916-327-4498
Last EDR Contact: 06/09/2014
Next Scheduled EDR Contact: 09/22/2014
Data Release Frequency: Annually

WIP: Well Investigation Program Case List
Well Investigation Program case in the San Gabriel and San Fernando Valley area.

Date of Government Version: 07/03/2009
Date Data Arrived at EDR: 07/21/2009
Date Made Active in Reports: 08/03/2009
Number of Days to Update: 13

Source: Los Angeles Water Quality Control Board
Telephone: 213-576-6726
Last EDR Contact: 06/25/2014
Next Scheduled EDR Contact: 10/13/2014
Data Release Frequency: Varies

ENF: Enforcement Action Listing

A listing of Water Board Enforcement Actions. Formal is everything except Oral/Verbal Communication, Notice of Violation, Expedited Payment Letter, and Staff Enforcement Letter.

Date of Government Version: 05/30/2014
Date Data Arrived at EDR: 05/30/2014
Date Made Active in Reports: 07/07/2014
Number of Days to Update: 38

Source: State Water Resoruces Control Board
Telephone: 916-445-9379
Last EDR Contact: 07/25/2014
Next Scheduled EDR Contact: 11/10/2014
Data Release Frequency: Varies

HAZNET: Facility and Manifest Data

Facility and Manifest Data. The data is extracted from the copies of hazardous waste manifests received each year by the DTSC. The annual volume of manifests is typically 700,000 - 1,000,000 annually, representing approximately 350,000 - 500,000 shipments. Data are from the manifests submitted without correction, and therefore many contain some invalid values for data elements such as generator ID, TSD ID, waste category, and disposal method.

Date of Government Version: 12/31/2012
Date Data Arrived at EDR: 07/16/2013
Date Made Active in Reports: 08/26/2013
Number of Days to Update: 41

Source: California Environmental Protection Agency
Telephone: 916-255-1136
Last EDR Contact: 07/18/2014
Next Scheduled EDR Contact: 10/27/2014
Data Release Frequency: Annually

EMI: Emissions Inventory Data

Toxics and criteria pollutant emissions data collected by the ARB and local air pollution agencies.

Date of Government Version: 12/31/2012
Date Data Arrived at EDR: 03/25/2014
Date Made Active in Reports: 04/28/2014
Number of Days to Update: 34

Source: California Air Resources Board
Telephone: 916-322-2990
Last EDR Contact: 06/26/2014
Next Scheduled EDR Contact: 10/06/2014
Data Release Frequency: Varies

INDIAN RESERV: Indian Reservations

This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 12/08/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 34

Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 07/18/2014
Next Scheduled EDR Contact: 10/27/2014
Data Release Frequency: Semi-Annually

SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing

The State Coalition for Remediation of Drycleaners was established in 1998, with support from the U.S. EPA Office of Superfund Remediation and Technology Innovation. It is comprised of representatives of states with established drycleaner remediation programs. Currently the member states are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Date of Government Version: 03/07/2011
Date Data Arrived at EDR: 03/09/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 54

Source: Environmental Protection Agency
Telephone: 615-532-8599
Last EDR Contact: 07/25/2014
Next Scheduled EDR Contact: 11/03/2014
Data Release Frequency: Varies

FEDLAND: Federal and Indian Lands

Federally and Indian administrated lands of the United States. Lands included are administrated by: Army Corps of Engineers, Bureau of Reclamation, National Wild and Scenic River, National Wildlife Refuge, Public Domain Land, Wilderness, Wilderness Study Area, Wildlife Management Area, Bureau of Indian Affairs, Bureau of Land Management, Department of Justice, Forest Service, Fish and Wildlife Service, National Park Service.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 02/06/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 339

Source: U.S. Geological Survey
Telephone: 888-275-8747
Last EDR Contact: 07/18/2014
Next Scheduled EDR Contact: 10/27/2014
Data Release Frequency: N/A

WDS: Waste Discharge System
Sites which have been issued waste discharge requirements.

Date of Government Version: 06/19/2007
Date Data Arrived at EDR: 06/20/2007
Date Made Active in Reports: 06/29/2007
Number of Days to Update: 9

Source: State Water Resources Control Board
Telephone: 916-341-5227
Last EDR Contact: 05/22/2014
Next Scheduled EDR Contact: 09/08/2014
Data Release Frequency: Quarterly

PRP: Potentially Responsible Parties
A listing of verified Potentially Responsible Parties

Date of Government Version: 04/15/2013
Date Data Arrived at EDR: 07/03/2013
Date Made Active in Reports: 09/13/2013
Number of Days to Update: 72

Source: EPA
Telephone: 202-564-6023
Last EDR Contact: 07/01/2014
Next Scheduled EDR Contact: 10/13/2014
Data Release Frequency: Quarterly

LEAD SMELTER 2: Lead Smelter Sites
A list of several hundred sites in the U.S. where secondary lead smelting was done from 1931and 1964. These sites may pose a threat to public health through ingestion or inhalation of contaminated soil or dust

Date of Government Version: 04/05/2001
Date Data Arrived at EDR: 10/27/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 36

Source: American Journal of Public Health
Telephone: 703-305-6451
Last EDR Contact: 12/02/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

EPA WATCH LIST: EPA WATCH LIST
EPA maintains a "Watch List" to facilitate dialogue between EPA, state and local environmental agencies on enforcement matters relating to facilities with alleged violations identified as either significant or high priority. Being on the Watch List does not mean that the facility has actually violated the law only that an investigation by EPA or a state or local environmental agency has led those organizations to allege that an unproven violation has in fact occurred. Being on the Watch List does not represent a higher level of concern regarding the alleged violations that were detected, but instead indicates cases requiring additional dialogue between EPA, state and local agencies - primarily because of the length of time the alleged violation has gone unaddressed or unresolved.

Date of Government Version: 08/30/2013
Date Data Arrived at EDR: 03/21/2014
Date Made Active in Reports: 06/17/2014
Number of Days to Update: 88

Source: Environmental Protection Agency
Telephone: 617-520-3000
Last EDR Contact: 05/16/2014
Next Scheduled EDR Contact: 08/25/2014
Data Release Frequency: Quarterly

2020 COR ACTION: 2020 Corrective Action Program List
The EPA has set ambitious goals for the RCRA Corrective Action program by creating the 2020 Corrective Action Universe. This RCRA cleanup baseline includes facilities expected to need corrective action. The 2020 universe contains a wide variety of sites. Some properties are heavily contaminated while others were contaminated but have since been cleaned up. Still others have not been fully investigated yet, and may require little or no remediation. Inclusion in the 2020 Universe does not necessarily imply failure on the part of a facility to meet its RCRA obligations.

Date of Government Version: 11/11/2011
Date Data Arrived at EDR: 05/18/2012
Date Made Active in Reports: 05/25/2012
Number of Days to Update: 7

Source: Environmental Protection Agency
Telephone: 703-308-4044
Last EDR Contact: 05/16/2014
Next Scheduled EDR Contact: 08/25/2014
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

LEAD SMELTER 1: Lead Smelter Sites

A listing of former lead smelter site locations.

Date of Government Version: 06/04/2014
Date Data Arrived at EDR: 06/12/2014
Date Made Active in Reports: 07/28/2014
Number of Days to Update: 46

Source: Environmental Protection Agency
Telephone: 703-603-8787
Last EDR Contact: 07/01/2014
Next Scheduled EDR Contact: 10/20/2014
Data Release Frequency: Varies

PROC: Certified Processors Database

A listing of certified processors.

Date of Government Version: 06/16/2014
Date Data Arrived at EDR: 06/17/2014
Date Made Active in Reports: 07/10/2014
Number of Days to Update: 23

Source: Department of Conservation
Telephone: 916-323-3836
Last EDR Contact: 06/17/2014
Next Scheduled EDR Contact: 09/29/2014
Data Release Frequency: Quarterly

HWT: Registered Hazardous Waste Transporter Database

A listing of hazardous waste transporters. In California, unless specifically exempted, it is unlawful for any person to transport hazardous wastes unless the person holds a valid registration issued by DTSC. A hazardous waste transporter registration is valid for one year and is assigned a unique registration number.

Date of Government Version: 07/14/2014
Date Data Arrived at EDR: 07/15/2014
Date Made Active in Reports: 07/28/2014
Number of Days to Update: 13

Source: Department of Toxic Substances Control
Telephone: 916-440-7145
Last EDR Contact: 07/15/2014
Next Scheduled EDR Contact: 10/27/2014
Data Release Frequency: Quarterly

COAL ASH DOE: Sleam-Electric Plan Operation Data

A listing of power plants that store ash in surface ponds.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 08/07/2009
Date Made Active in Reports: 10/22/2009
Number of Days to Update: 76

Source: Department of Energy
Telephone: 202-586-8719
Last EDR Contact: 07/18/2014
Next Scheduled EDR Contact: 10/27/2014
Data Release Frequency: Varies

MWMP: Medical Waste Management Program Listing

The Medical Waste Management Program (MWMP) ensures the proper handling and disposal of medical waste by permitting and inspecting medical waste Offsite Treatment Facilities (PDF) and Transfer Stations (PDF) throughout the state. MWMP also oversees all Medical Waste Transporters.

Date of Government Version: 05/23/2014
Date Data Arrived at EDR: 06/13/2014
Date Made Active in Reports: 07/09/2014
Number of Days to Update: 26

Source: Department of Public Health
Telephone: 916-558-1784
Last EDR Contact: 06/09/2014
Next Scheduled EDR Contact: 09/22/2014
Data Release Frequency: Varies

US AIRS (AFS): Aerometric Information Retrieval System Facility Subsystem (AFS)

The database is a sub-system of Aerometric Information Retrieval System (AIRS). AFS contains compliance data on air pollution point sources regulated by the U.S. EPA and/or state and local air regulatory agencies. This information comes from source reports by various stationary sources of air pollution, such as electric power plants, steel mills, factories, and universities, and provides information about the air pollutants they produce. Action, air program, air program pollutant, and general level plant data. It is used to track emissions and compliance data from industrial plants.

Date of Government Version: 10/23/2013
Date Data Arrived at EDR: 11/06/2013
Date Made Active in Reports: 12/06/2013
Number of Days to Update: 30

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 06/25/2014
Next Scheduled EDR Contact: 10/13/2014
Data Release Frequency: Annually

US AIRS MINOR: Air Facility System Data
A listing of minor source facilities.

Date of Government Version: 10/23/2013
Date Data Arrived at EDR: 11/06/2013
Date Made Active in Reports: 12/06/2013
Number of Days to Update: 30

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 06/25/2014
Next Scheduled EDR Contact: 10/13/2014
Data Release Frequency: Annually

HWP: EnviroStor Permitted Facilities Listing
Detailed information on permitted hazardous waste facilities and corrective action ("cleanups") tracked in EnviroStor.

Date of Government Version: 05/27/2014
Date Data Arrived at EDR: 05/28/2014
Date Made Active in Reports: 07/07/2014
Number of Days to Update: 40

Source: Department of Toxic Substances Control
Telephone: 916-323-3400
Last EDR Contact: 05/28/2014
Next Scheduled EDR Contact: 09/08/2014
Data Release Frequency: Quarterly

US FIN ASSUR: Financial Assurance Information
All owners and operators of facilities that treat, store, or dispose of hazardous waste are required to provide proof that they will have sufficient funds to pay for the clean up, closure, and post-closure care of their facilities.

Date of Government Version: 06/19/2014
Date Data Arrived at EDR: 06/20/2014
Date Made Active in Reports: 07/28/2014
Number of Days to Update: 38

Source: Environmental Protection Agency
Telephone: 202-566-1917
Last EDR Contact: 05/16/2014
Next Scheduled EDR Contact: 09/01/2014
Data Release Frequency: Quarterly

Financial Assurance 2: Financial Assurance Information Listing
A listing of financial assurance information for solid waste facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

Date of Government Version: 05/19/2014
Date Data Arrived at EDR: 05/20/2014
Date Made Active in Reports: 05/22/2014
Number of Days to Update: 2

Source: California Integrated Waste Management Board
Telephone: 916-341-6066
Last EDR Contact: 05/19/2014
Next Scheduled EDR Contact: 09/01/2014
Data Release Frequency: Varies

Financial Assurance 1: Financial Assurance Information Listing
Financial Assurance information

Date of Government Version: 05/05/2014
Date Data Arrived at EDR: 05/14/2014
Date Made Active in Reports: 05/22/2014
Number of Days to Update: 8

Source: Department of Toxic Substances Control
Telephone: 916-255-3628
Last EDR Contact: 07/25/2014
Next Scheduled EDR Contact: 11/10/2014
Data Release Frequency: Varies

PCB TRANSFORMER: PCB Transformer Registration Database
The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 02/01/2011
Date Data Arrived at EDR: 10/19/2011
Date Made Active in Reports: 01/10/2012
Number of Days to Update: 83

Source: Environmental Protection Agency
Telephone: 202-566-0517
Last EDR Contact: 08/01/2014
Next Scheduled EDR Contact: 11/10/2014
Data Release Frequency: Varies

COAL ASH EPA: Coal Combustion Residues Surface Impoundments List
A listing of coal combustion residues surface impoundments with high hazard potential ratings.

Date of Government Version: 03/14/2014
Date Data Arrived at EDR: 06/11/2014
Date Made Active in Reports: 07/28/2014
Number of Days to Update: 47

Source: Environmental Protection Agency
Telephone: N/A
Last EDR Contact: 06/11/2014
Next Scheduled EDR Contact: 09/22/2014
Data Release Frequency: Varies

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP: EDR Proprietary Manufactured Gas Plants

The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

EDR US Hist Auto Stat: EDR Exclusive Historic Gas Stations

EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR US Hist Cleaners: EDR Exclusive Historic Dry Cleaners

EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA LUST: Recovered Government Archive Leaking Underground Storage Tank

The EDR Recovered Government Archive Leaking Underground Storage Tank database provides a list of LUST incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the State Water Resources Control Board in California.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 12/30/2013
Number of Days to Update: 182

Source: State Water Resources Control Board
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

RGA LF: Recovered Government Archive Solid Waste Facilities List

The EDR Recovered Government Archive Landfill database provides a list of landfills derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Resources Recycling and Recovery in California.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/13/2014
Number of Days to Update: 196

Source: Department of Resources Recycling and Recovery
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

COUNTY RECORDS

ALAMEDA COUNTY:

Contaminated Sites

A listing of contaminated sites overseen by the Toxic Release Program (oil and groundwater contamination from chemical releases and spills) and the Leaking Underground Storage Tank Program (soil and ground water contamination from leaking petroleum USTs).

Date of Government Version: 04/22/2014
Date Data Arrived at EDR: 04/24/2014
Date Made Active in Reports: 05/09/2014
Number of Days to Update: 15

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 06/30/2014
Next Scheduled EDR Contact: 10/13/2014
Data Release Frequency: Semi-Annually

Underground Tanks

Underground storage tank sites located in Alameda county.

Date of Government Version: 04/22/2014
Date Data Arrived at EDR: 04/24/2014
Date Made Active in Reports: 05/12/2014
Number of Days to Update: 18

Source: Alameda County Environmental Health Services
Telephone: 510-567-6700
Last EDR Contact: 06/30/2014
Next Scheduled EDR Contact: 10/13/2014
Data Release Frequency: Semi-Annually

AMADOR COUNTY:

CUPA Facility List

Cupa Facility List

Date of Government Version: 07/23/2014
Date Data Arrived at EDR: 06/26/2014
Date Made Active in Reports: 07/25/2014
Number of Days to Update: 29

Source: Amador County Environmental Health
Telephone: 209-223-6439
Last EDR Contact: 06/19/2014
Next Scheduled EDR Contact: 09/22/2014
Data Release Frequency: Varies

BUTTE COUNTY:

CUPA Facility Listing
Cupa facility list.

Date of Government Version: 08/01/2013
Date Data Arrived at EDR: 08/02/2013
Date Made Active in Reports: 08/22/2013
Number of Days to Update: 20

Source: Public Health Department
Telephone: 530-538-7149
Last EDR Contact: 07/08/2014
Next Scheduled EDR Contact: 10/27/2014
Data Release Frequency: No Update Planned

CALVERAS COUNTY:

CUPA Facility Listing
Cupa Facility Listing

Date of Government Version: 07/02/2014
Date Data Arrived at EDR: 07/03/2014
Date Made Active in Reports: 07/30/2014
Number of Days to Update: 27

Source: Calveras County Environmental Health
Telephone: 209-754-6399
Last EDR Contact: 06/26/2014
Next Scheduled EDR Contact: 10/13/2014
Data Release Frequency: Quarterly

COLUSA COUNTY:

CUPA Facility List
Cupa facility list.

Date of Government Version: 06/11/2014
Date Data Arrived at EDR: 06/13/2014
Date Made Active in Reports: 07/07/2014
Number of Days to Update: 24

Source: Health & Human Services
Telephone: 530-458-0396
Last EDR Contact: 05/30/2014
Next Scheduled EDR Contact: 08/25/2014
Data Release Frequency: Varies

CONTRA COSTA COUNTY:

Site List
List includes sites from the underground tank, hazardous waste generator and business plan/2185 programs.

Date of Government Version: 02/24/2014
Date Data Arrived at EDR: 02/25/2014
Date Made Active in Reports: 03/18/2014
Number of Days to Update: 21

Source: Contra Costa Health Services Department
Telephone: 925-646-2286
Last EDR Contact: 05/05/2014
Next Scheduled EDR Contact: 08/18/2014
Data Release Frequency: Semi-Annually

DEL NORTE COUNTY:

CUPA Facility List
Cupa Facility list

Date of Government Version: 05/05/2014
Date Data Arrived at EDR: 05/06/2014
Date Made Active in Reports: 05/13/2014
Number of Days to Update: 7

Source: Del Norte County Environmental Health Division
Telephone: 707-465-0426
Last EDR Contact: 07/30/2014
Next Scheduled EDR Contact: 11/17/2014
Data Release Frequency: Varies

EL DORADO COUNTY:

CUPA Facility List
CUPA facility list.

Date of Government Version: 05/29/2014
Date Data Arrived at EDR: 05/30/2014
Date Made Active in Reports: 07/07/2014
Number of Days to Update: 38

Source: El Dorado County Environmental Management Department
Telephone: 530-621-6623
Last EDR Contact: 05/05/2014
Next Scheduled EDR Contact: 08/18/2014
Data Release Frequency: Varies

FRESNO COUNTY:

CUPA Resources List
Certified Unified Program Agency. CUPA's are responsible for implementing a unified hazardous materials and hazardous waste management regulatory program. The agency provides oversight of businesses that deal with hazardous materials, operate underground storage tanks or aboveground storage tanks.

Date of Government Version: 03/31/2014
Date Data Arrived at EDR: 04/15/2014
Date Made Active in Reports: 05/01/2014
Number of Days to Update: 16

Source: Dept. of Community Health
Telephone: 559-445-3271
Last EDR Contact: 07/11/2014
Next Scheduled EDR Contact: 10/27/2014
Data Release Frequency: Semi-Annually

HUMBOLDT COUNTY:

CUPA Facility List
CUPA facility list.

Date of Government Version: 06/09/2014
Date Data Arrived at EDR: 06/11/2014
Date Made Active in Reports: 07/07/2014
Number of Days to Update: 26

Source: Humboldt County Environmental Health
Telephone: N/A
Last EDR Contact: 05/22/2014
Next Scheduled EDR Contact: 09/08/2014
Data Release Frequency: Varies

IMPERIAL COUNTY:

CUPA Facility List
Cupa facility list.

Date of Government Version: 04/28/2014
Date Data Arrived at EDR: 04/30/2014
Date Made Active in Reports: 05/13/2014
Number of Days to Update: 13

Source: San Diego Border Field Office
Telephone: 760-339-2777
Last EDR Contact: 07/25/2014
Next Scheduled EDR Contact: 11/10/2014
Data Release Frequency: Varies

INYO COUNTY:

CUPA Facility List
Cupa facility list.

Date of Government Version: 09/10/2013
Date Data Arrived at EDR: 09/11/2013
Date Made Active in Reports: 10/14/2013
Number of Days to Update: 33

Source: Inyo County Environmental Health Services
Telephone: 760-878-0238
Last EDR Contact: 05/22/2014
Next Scheduled EDR Contact: 09/08/2014
Data Release Frequency: Varies

KERN COUNTY:

Underground Storage Tank Sites & Tank Listing
Kern County Sites and Tanks Listing.

Date of Government Version: 08/31/2010
Date Data Arrived at EDR: 09/01/2010
Date Made Active in Reports: 09/30/2010
Number of Days to Update: 29

Source: Kern County Environment Health Services Department
Telephone: 661-862-8700
Last EDR Contact: 05/12/2014
Next Scheduled EDR Contact: 08/25/2014
Data Release Frequency: Quarterly

KINGS COUNTY:

CUPA Facility List
A listing of sites included in the county's Certified Unified Program Agency database. California's Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

Date of Government Version: 05/28/2014
Date Data Arrived at EDR: 05/30/2014
Date Made Active in Reports: 06/20/2014
Number of Days to Update: 21

Source: Kings County Department of Public Health
Telephone: 559-584-1411
Last EDR Contact: 05/27/2014
Next Scheduled EDR Contact: 09/08/2014
Data Release Frequency: Varies

LAKE COUNTY:

CUPA Facility List
Cupa facility list

Date of Government Version: 04/22/2014
Date Data Arrived at EDR: 04/24/2014
Date Made Active in Reports: 05/13/2014
Number of Days to Update: 19

Source: Lake County Environmental Health
Telephone: 707-263-1164
Last EDR Contact: 07/18/2014
Next Scheduled EDR Contact: 11/03/2014
Data Release Frequency: Varies

LOS ANGELES COUNTY:

San Gabriel Valley Areas of Concern
San Gabriel Valley areas where VOC contamination is at or above the MCL as designated by region 9 EPA office.

Date of Government Version: 03/30/2009
Date Data Arrived at EDR: 03/31/2009
Date Made Active in Reports: 10/23/2009
Number of Days to Update: 206

Source: EPA Region 9
Telephone: 415-972-3178
Last EDR Contact: 06/19/2014
Next Scheduled EDR Contact: 10/06/2014
Data Release Frequency: No Update Planned

HMS: Street Number List
Industrial Waste and Underground Storage Tank Sites.

Date of Government Version: 03/31/2014
Date Data Arrived at EDR: 06/06/2014
Date Made Active in Reports: 07/17/2014
Number of Days to Update: 41

Source: Department of Public Works
Telephone: 626-458-3517
Last EDR Contact: 07/21/2014
Next Scheduled EDR Contact: 10/27/2014
Data Release Frequency: Semi-Annually

List of Solid Waste Facilities
Solid Waste Facilities in Los Angeles County.

Date of Government Version: 04/21/2014
Date Data Arrived at EDR: 04/22/2014
Date Made Active in Reports: 05/19/2014
Number of Days to Update: 27

Source: La County Department of Public Works
Telephone: 818-458-5185
Last EDR Contact: 07/21/2014
Next Scheduled EDR Contact: 11/03/2014
Data Release Frequency: Varies

City of Los Angeles Landfills

Landfills owned and maintained by the City of Los Angeles.

Date of Government Version: 03/05/2009
Date Data Arrived at EDR: 03/10/2009
Date Made Active in Reports: 04/08/2009
Number of Days to Update: 29

Source: Engineering & Construction Division
Telephone: 213-473-7869
Last EDR Contact: 07/30/2014
Next Scheduled EDR Contact: 11/03/2014
Data Release Frequency: Varies

Site Mitigation List

Industrial sites that have had some sort of spill or complaint.

Date of Government Version: 01/07/2014
Date Data Arrived at EDR: 02/25/2014
Date Made Active in Reports: 03/25/2014
Number of Days to Update: 28

Source: Community Health Services
Telephone: 323-890-7806
Last EDR Contact: 07/16/2014
Next Scheduled EDR Contact: 11/03/2014
Data Release Frequency: Annually

City of El Segundo Underground Storage Tank

Underground storage tank sites located in El Segundo city.

Date of Government Version: 04/23/2014
Date Data Arrived at EDR: 04/25/2014
Date Made Active in Reports: 05/22/2014
Number of Days to Update: 27

Source: City of El Segundo Fire Department
Telephone: 310-524-2236
Last EDR Contact: 07/18/2014
Next Scheduled EDR Contact: 11/03/2014
Data Release Frequency: Semi-Annually

City of Long Beach Underground Storage Tank

Underground storage tank sites located in the city of Long Beach.

Date of Government Version: 02/25/2014
Date Data Arrived at EDR: 02/27/2014
Date Made Active in Reports: 04/14/2014
Number of Days to Update: 46

Source: City of Long Beach Fire Department
Telephone: 562-570-2563
Last EDR Contact: 07/25/2014
Next Scheduled EDR Contact: 11/10/2014
Data Release Frequency: Annually

City of Torrance Underground Storage Tank

Underground storage tank sites located in the city of Torrance.

Date of Government Version: 01/13/2014
Date Data Arrived at EDR: 03/27/2014
Date Made Active in Reports: 04/28/2014
Number of Days to Update: 32

Source: City of Torrance Fire Department
Telephone: 310-618-2973
Last EDR Contact: 07/25/2014
Next Scheduled EDR Contact: 10/27/2014
Data Release Frequency: Semi-Annually

MADERA COUNTY:

CUPA Facility List

A listing of sites included in the county’s Certified Unified Program Agency database. California’s Secretary for Environmental Protection established the unified hazardous materials and hazardous waste regulatory program as required by chapter 6.11 of the California Health and Safety Code. The Unified Program consolidates the administration, permits, inspections, and enforcement activities.

Date of Government Version: 06/09/2014
Date Data Arrived at EDR: 06/11/2014
Date Made Active in Reports: 06/27/2014
Number of Days to Update: 16

Source: Madera County Environmental Health
Telephone: 559-675-7823
Last EDR Contact: 05/02/2014
Next Scheduled EDR Contact: 09/08/2014
Data Release Frequency: Varies

MARIN COUNTY:

Underground Storage Tank Sites
Currently permitted USTs in Marin County.

Date of Government Version: 01/03/2014
Date Data Arrived at EDR: 01/09/2014
Date Made Active in Reports: 02/12/2014
Number of Days to Update: 34

Source: Public Works Department Waste Management
Telephone: 415-499-6647
Last EDR Contact: 07/02/2014
Next Scheduled EDR Contact: 10/20/2014
Data Release Frequency: Semi-Annually

MERCED COUNTY:

CUPA Facility List
CUPA facility list.

Date of Government Version: 05/27/2014
Date Data Arrived at EDR: 05/29/2014
Date Made Active in Reports: 06/24/2014
Number of Days to Update: 26

Source: Merced County Environmental Health
Telephone: 209-381-1094
Last EDR Contact: 05/27/2014
Next Scheduled EDR Contact: 09/08/2014
Data Release Frequency: Varies

MONO COUNTY:

CUPA Facility List
CUPA Facility List

Date of Government Version: 06/09/2014
Date Data Arrived at EDR: 06/13/2014
Date Made Active in Reports: 06/27/2014
Number of Days to Update: 14

Source: Mono County Health Department
Telephone: 760-932-5580
Last EDR Contact: 06/02/2014
Next Scheduled EDR Contact: 09/15/2014
Data Release Frequency: Varies

MONTEREY COUNTY:

CUPA Facility Listing
CUPA Program listing from the Environmental Health Division.

Date of Government Version: 06/09/2014
Date Data Arrived at EDR: 06/11/2014
Date Made Active in Reports: 07/09/2014
Number of Days to Update: 28

Source: Monterey County Health Department
Telephone: 831-796-1297
Last EDR Contact: 05/22/2014
Next Scheduled EDR Contact: 09/08/2014
Data Release Frequency: Varies

NAPA COUNTY:

Sites With Reported Contamination
A listing of leaking underground storage tank sites located in Napa county.

Date of Government Version: 12/05/2011
Date Data Arrived at EDR: 12/06/2011
Date Made Active in Reports: 02/07/2012
Number of Days to Update: 63

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 05/30/2014
Next Scheduled EDR Contact: 09/15/2014
Data Release Frequency: No Update Planned

Closed and Operating Underground Storage Tank Sites
Underground storage tank sites located in Napa county.

Date of Government Version: 01/15/2008
Date Data Arrived at EDR: 01/16/2008
Date Made Active in Reports: 02/08/2008
Number of Days to Update: 23

Source: Napa County Department of Environmental Management
Telephone: 707-253-4269
Last EDR Contact: 05/30/2014
Next Scheduled EDR Contact: 09/15/2014
Data Release Frequency: No Update Planned

NEVADA COUNTY:

CUPA Facility List
CUPA facility list.

Date of Government Version: 11/06/2013
Date Data Arrived at EDR: 11/07/2013
Date Made Active in Reports: 12/04/2013
Number of Days to Update: 27

Source: Community Development Agency
Telephone: 530-265-1467
Last EDR Contact: 07/30/2014
Next Scheduled EDR Contact: 11/17/2014
Data Release Frequency: Varies

ORANGE COUNTY:

List of Industrial Site Cleanups
Petroleum and non-petroleum spills.

Date of Government Version: 05/01/2014
Date Data Arrived at EDR: 05/15/2014
Date Made Active in Reports: 05/22/2014
Number of Days to Update: 7

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 05/07/2014
Next Scheduled EDR Contact: 08/28/2014
Data Release Frequency: Annually

List of Underground Storage Tank Cleanups
Orange County Underground Storage Tank Cleanups (LUST).

Date of Government Version: 05/01/2014
Date Data Arrived at EDR: 05/15/2014
Date Made Active in Reports: 05/28/2014
Number of Days to Update: 13

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 05/07/2014
Next Scheduled EDR Contact: 08/25/2014
Data Release Frequency: Quarterly

List of Underground Storage Tank Facilities
Orange County Underground Storage Tank Facilities (UST).

Date of Government Version: 05/01/2014
Date Data Arrived at EDR: 05/14/2014
Date Made Active in Reports: 05/21/2014
Number of Days to Update: 7

Source: Health Care Agency
Telephone: 714-834-3446
Last EDR Contact: 05/07/2014
Next Scheduled EDR Contact: 08/25/2014
Data Release Frequency: Quarterly

PLACER COUNTY:

Master List of Facilities
List includes aboveground tanks, underground tanks and cleanup sites.

Date of Government Version: 06/09/2014
Date Data Arrived at EDR: 06/10/2014
Date Made Active in Reports: 07/09/2014
Number of Days to Update: 29

Source: Placer County Health and Human Services
Telephone: 530-745-2363
Last EDR Contact: 06/09/2014
Next Scheduled EDR Contact: 09/22/2014
Data Release Frequency: Semi-Annually

RIVERSIDE COUNTY:

Listing of Underground Tank Cleanup Sites
Riverside County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 07/08/2014
Date Data Arrived at EDR: 07/11/2014
Date Made Active in Reports: 07/28/2014
Number of Days to Update: 17

Source: Department of Environmental Health
Telephone: 951-358-5055
Last EDR Contact: 06/23/2014
Next Scheduled EDR Contact: 10/06/2014
Data Release Frequency: Quarterly

Underground Storage Tank Tank List
Underground storage tank sites located in Riverside county.

Date of Government Version: 04/15/2014
Date Data Arrived at EDR: 04/17/2014
Date Made Active in Reports: 05/09/2014
Number of Days to Update: 22

Source: Department of Environmental Health
Telephone: 951-358-5055
Last EDR Contact: 06/23/2014
Next Scheduled EDR Contact: 10/06/2014
Data Release Frequency: Quarterly

SACRAMENTO COUNTY:

Toxic Site Clean-Up List
List of sites where unauthorized releases of potentially hazardous materials have occurred.

Date of Government Version: 02/06/2014
Date Data Arrived at EDR: 04/08/2014
Date Made Active in Reports: 04/29/2014
Number of Days to Update: 21

Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 07/11/2014
Next Scheduled EDR Contact: 10/20/2014
Data Release Frequency: Quarterly

Master Hazardous Materials Facility List
Any business that has hazardous materials on site - hazardous material storage sites, underground storage tanks, waste generators.

Date of Government Version: 05/05/2014
Date Data Arrived at EDR: 07/17/2014
Date Made Active in Reports: 07/28/2014
Number of Days to Update: 11

Source: Sacramento County Environmental Management
Telephone: 916-875-8406
Last EDR Contact: 07/08/2014
Next Scheduled EDR Contact: 10/20/2014
Data Release Frequency: Quarterly

SAN BERNARDINO COUNTY:

Hazardous Material Permits
This listing includes underground storage tanks, medical waste handlers/generators, hazardous materials handlers, hazardous waste generators, and waste oil generators/handlers.

Date of Government Version: 05/30/2014
Date Data Arrived at EDR: 05/30/2014
Date Made Active in Reports: 07/07/2014
Number of Days to Update: 38

Source: San Bernardino County Fire Department Hazardous Materials Division
Telephone: 909-387-3041
Last EDR Contact: 05/12/2014
Next Scheduled EDR Contact: 08/25/2014
Data Release Frequency: Quarterly

SAN DIEGO COUNTY:

Hazardous Materials Management Division Database

The database includes: HE58 - This report contains the business name, site address, business phone number, establishment 'H' permit number, type of permit, and the business status. HE17 - In addition to providing the same information provided in the HE58 listing, HE17 provides inspection dates, violations received by the establishment, hazardous waste generated, the quantity, method of storage, treatment/disposal of waste and the hauler, and information on underground storage tanks. Unauthorized Release List - Includes a summary of environmental contamination cases in San Diego County (underground tank cases, non-tank cases, groundwater contamination, and soil contamination are included.)

Date of Government Version: 09/23/2013
Date Data Arrived at EDR: 09/24/2013
Date Made Active in Reports: 10/17/2013
Number of Days to Update: 23

Source: Hazardous Materials Management Division
Telephone: 619-338-2268
Last EDR Contact: 06/09/2014
Next Scheduled EDR Contact: 09/22/2014
Data Release Frequency: Quarterly

Solid Waste Facilities

San Diego County Solid Waste Facilities.

Date of Government Version: 10/31/2013
Date Data Arrived at EDR: 11/19/2013
Date Made Active in Reports: 12/31/2013
Number of Days to Update: 42

Source: Department of Health Services
Telephone: 619-338-2209
Last EDR Contact: 07/22/2014
Next Scheduled EDR Contact: 11/10/2014
Data Release Frequency: Varies

Environmental Case Listing

The listing contains all underground tank release cases and projects pertaining to properties contaminated with hazardous substances that are actively under review by the Site Assessment and Mitigation Program.

Date of Government Version: 03/23/2010
Date Data Arrived at EDR: 06/15/2010
Date Made Active in Reports: 07/09/2010
Number of Days to Update: 24

Source: San Diego County Department of Environmental Health
Telephone: 619-338-2371
Last EDR Contact: 06/04/2014
Next Scheduled EDR Contact: 09/22/2014
Data Release Frequency: No Update Planned

SAN FRANCISCO COUNTY:

Local Oversite Facilities

A listing of leaking underground storage tank sites located in San Francisco county.

Date of Government Version: 09/19/2008
Date Data Arrived at EDR: 09/19/2008
Date Made Active in Reports: 09/29/2008
Number of Days to Update: 10

Source: Department Of Public Health San Francisco County
Telephone: 415-252-3920
Last EDR Contact: 05/09/2014
Next Scheduled EDR Contact: 08/25/2014
Data Release Frequency: Quarterly

Underground Storage Tank Information

Underground storage tank sites located in San Francisco county.

Date of Government Version: 11/29/2010
Date Data Arrived at EDR: 03/10/2011
Date Made Active in Reports: 03/15/2011
Number of Days to Update: 5

Source: Department of Public Health
Telephone: 415-252-3920
Last EDR Contact: 05/09/2014
Next Scheduled EDR Contact: 08/25/2014
Data Release Frequency: Quarterly

SAN JOAQUIN COUNTY:

San Joaquin Co. UST
A listing of underground storage tank locations in San Joaquin county.

Date of Government Version: 06/20/2014
Date Data Arrived at EDR: 06/23/2014
Date Made Active in Reports: 07/11/2014
Number of Days to Update: 18

Source: Environmental Health Department
Telephone: N/A
Last EDR Contact: 06/19/2014
Next Scheduled EDR Contact: 10/06/2014
Data Release Frequency: Semi-Annually

SAN LUIS OBISPO COUNTY:

CUPA Facility List
Cupa Facility List.

Date of Government Version: 06/11/2014
Date Data Arrived at EDR: 06/13/2014
Date Made Active in Reports: 07/09/2014
Number of Days to Update: 26

Source: San Luis Obispo County Public Health Department
Telephone: 805-781-5596
Last EDR Contact: 06/09/2014
Next Scheduled EDR Contact: 09/08/2014
Data Release Frequency: Varies

SAN MATEO COUNTY:

Business Inventory
List includes Hazardous Materials Business Plan, hazardous waste generators, and underground storage tanks.

Date of Government Version: 04/03/2014
Date Data Arrived at EDR: 04/04/2014
Date Made Active in Reports: 05/01/2014
Number of Days to Update: 27

Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 06/16/2014
Next Scheduled EDR Contact: 09/29/2014
Data Release Frequency: Annually

Fuel Leak List
A listing of leaking underground storage tank sites located in San Mateo county.

Date of Government Version: 06/16/2014
Date Data Arrived at EDR: 06/19/2014
Date Made Active in Reports: 07/10/2014
Number of Days to Update: 21

Source: San Mateo County Environmental Health Services Division
Telephone: 650-363-1921
Last EDR Contact: 06/13/2014
Next Scheduled EDR Contact: 09/29/2014
Data Release Frequency: Semi-Annually

SANTA BARBARA COUNTY:

CUPA Facility Listing
CUPA Program Listing from the Environmental Health Services division.

Date of Government Version: 09/08/2011
Date Data Arrived at EDR: 09/09/2011
Date Made Active in Reports: 10/07/2011
Number of Days to Update: 28

Source: Santa Barbara County Public Health Department
Telephone: 805-686-8167
Last EDR Contact: 05/22/2014
Next Scheduled EDR Contact: 09/08/2014
Data Release Frequency: Varies

SANTA CLARA COUNTY:

Cupa Facility List
Cupa facility list

Date of Government Version: 06/02/2014
Date Data Arrived at EDR: 06/03/2014
Date Made Active in Reports: 06/23/2014
Number of Days to Update: 20

Source: Department of Environmental Health
Telephone: 408-918-1973
Last EDR Contact: 06/02/2014
Next Scheduled EDR Contact: 09/15/2014
Data Release Frequency: Varies

HIST LUST - Fuel Leak Site Activity Report

A listing of open and closed leaking underground storage tanks. This listing is no longer updated by the county. Leaking underground storage tanks are now handled by the Department of Environmental Health.

Date of Government Version: 03/29/2005
Date Data Arrived at EDR: 03/30/2005
Date Made Active in Reports: 04/21/2005
Number of Days to Update: 22

Source: Santa Clara Valley Water District
Telephone: 408-265-2600
Last EDR Contact: 03/23/2009
Next Scheduled EDR Contact: 06/22/2009
Data Release Frequency: No Update Planned

LOP Listing

A listing of leaking underground storage tanks located in Santa Clara county.

Date of Government Version: 03/03/2014
Date Data Arrived at EDR: 03/05/2014
Date Made Active in Reports: 03/18/2014
Number of Days to Update: 13

Source: Department of Environmental Health
Telephone: 408-918-3417
Last EDR Contact: 06/02/2014
Next Scheduled EDR Contact: 09/15/2014
Data Release Frequency: Annually

Hazardous Material Facilities

Hazardous material facilities, including underground storage tank sites.

Date of Government Version: 05/12/2014
Date Data Arrived at EDR: 05/19/2014
Date Made Active in Reports: 05/28/2014
Number of Days to Update: 9

Source: City of San Jose Fire Department
Telephone: 408-535-7694
Last EDR Contact: 05/12/2014
Next Scheduled EDR Contact: 08/25/2014
Data Release Frequency: Annually

SANTA CRUZ COUNTY:

CUPA Facility List

CUPA facility listing.

Date of Government Version: 05/27/2014
Date Data Arrived at EDR: 05/28/2014
Date Made Active in Reports: 06/20/2014
Number of Days to Update: 23

Source: Santa Cruz County Environmental Health
Telephone: 831-464-2761
Last EDR Contact: 05/27/2014
Next Scheduled EDR Contact: 09/08/2014
Data Release Frequency: Varies

SHASTA COUNTY:

CUPA Facility List

Cupa Facility List.

Date of Government Version: 06/10/2014
Date Data Arrived at EDR: 06/12/2014
Date Made Active in Reports: 06/20/2014
Number of Days to Update: 8

Source: Shasta County Department of Resource Management
Telephone: 530-225-5789
Last EDR Contact: 05/22/2014
Next Scheduled EDR Contact: 09/08/2014
Data Release Frequency: Varies

SOLANO COUNTY:

Leaking Underground Storage Tanks

A listing of leaking underground storage tank sites located in Solano county.

Date of Government Version: 06/19/2014
Date Data Arrived at EDR: 06/26/2014
Date Made Active in Reports: 07/25/2014
Number of Days to Update: 29

Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 06/13/2014
Next Scheduled EDR Contact: 09/29/2014
Data Release Frequency: Quarterly

Underground Storage Tanks

Underground storage tank sites located in Solano county.

Date of Government Version: 06/19/2014
Date Data Arrived at EDR: 06/26/2014
Date Made Active in Reports: 07/25/2014
Number of Days to Update: 29

Source: Solano County Department of Environmental Management
Telephone: 707-784-6770
Last EDR Contact: 06/13/2014
Next Scheduled EDR Contact: 09/29/2014
Data Release Frequency: Quarterly

SONOMA COUNTY:

Cupa Facility List

Cupa Facility list

Date of Government Version: 12/31/2013
Date Data Arrived at EDR: 01/02/2014
Date Made Active in Reports: 02/11/2014
Number of Days to Update: 40

Source: County of Sonoma Fire & Emergency Services Department
Telephone: 707-565-1174
Last EDR Contact: 06/26/2014
Next Scheduled EDR Contact: 10/13/2014
Data Release Frequency: Varies

Leaking Underground Storage Tank Sites

A listing of leaking underground storage tank sites located in Sonoma county.

Date of Government Version: 07/01/2014
Date Data Arrived at EDR: 07/03/2014
Date Made Active in Reports: 07/28/2014
Number of Days to Update: 25

Source: Department of Health Services
Telephone: 707-565-6565
Last EDR Contact: 06/26/2014
Next Scheduled EDR Contact: 10/13/2014
Data Release Frequency: Quarterly

SUTTER COUNTY:

Underground Storage Tanks

Underground storage tank sites located in Sutter county.

Date of Government Version: 06/09/2014
Date Data Arrived at EDR: 06/11/2014
Date Made Active in Reports: 07/17/2014
Number of Days to Update: 36

Source: Sutter County Department of Agriculture
Telephone: 530-822-7500
Last EDR Contact: 06/09/2014
Next Scheduled EDR Contact: 09/22/2014
Data Release Frequency: Semi-Annually

TUOLUMNE COUNTY:

CUPA Facility List

Cupa facility list

Date of Government Version: 05/16/2014
Date Data Arrived at EDR: 05/16/2014
Date Made Active in Reports: 06/13/2014
Number of Days to Update: 28

Source: Divison of Environmental Health
Telephone: 209-533-5633
Last EDR Contact: 07/25/2014
Next Scheduled EDR Contact: 11/10/2014
Data Release Frequency: Varies

VENTURA COUNTY:

Business Plan, Hazardous Waste Producers, and Operating Underground Tanks

The BWT list indicates by site address whether the Environmental Health Division has Business Plan (B), Waste Producer (W), and/or Underground Tank (T) information.

Date of Government Version: 04/28/2014
Date Data Arrived at EDR: 05/20/2014
Date Made Active in Reports: 05/27/2014
Number of Days to Update: 7

Source: Ventura County Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 05/16/2014
Next Scheduled EDR Contact: 09/01/2014
Data Release Frequency: Quarterly

Inventory of Illegal Abandoned and Inactive Sites

Ventura County Inventory of Closed, Illegal Abandoned, and Inactive Sites.

Date of Government Version: 12/01/2011
Date Data Arrived at EDR: 12/01/2011
Date Made Active in Reports: 01/19/2012
Number of Days to Update: 49

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 07/01/2014
Next Scheduled EDR Contact: 10/13/2014
Data Release Frequency: Annually

Listing of Underground Tank Cleanup Sites

Ventura County Underground Storage Tank Cleanup Sites (LUST).

Date of Government Version: 05/29/2008
Date Data Arrived at EDR: 06/24/2008
Date Made Active in Reports: 07/31/2008
Number of Days to Update: 37

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 05/16/2014
Next Scheduled EDR Contact: 09/01/2014
Data Release Frequency: Quarterly

Medical Waste Program List

To protect public health and safety and the environment from potential exposure to disease causing agents, the Environmental Health Division Medical Waste Program regulates the generation, handling, storage, treatment and disposal of medical waste throughout the County.

Date of Government Version: 04/28/2014
Date Data Arrived at EDR: 04/30/2014
Date Made Active in Reports: 05/19/2014
Number of Days to Update: 19

Source: Ventura County Resource Management Agency
Telephone: 805-654-2813
Last EDR Contact: 07/28/2014
Next Scheduled EDR Contact: 11/10/2014
Data Release Frequency: Quarterly

Underground Tank Closed Sites List

Ventura County Operating Underground Storage Tank Sites (UST)/Underground Tank Closed Sites List.

Date of Government Version: 05/27/2014
Date Data Arrived at EDR: 06/17/2014
Date Made Active in Reports: 07/11/2014
Number of Days to Update: 24

Source: Environmental Health Division
Telephone: 805-654-2813
Last EDR Contact: 06/16/2014
Next Scheduled EDR Contact: 09/29/2014
Data Release Frequency: Quarterly

YOLO COUNTY:

Underground Storage Tank Comprehensive Facility Report

Underground storage tank sites located in Yolo county.

Date of Government Version: 04/01/2014
Date Data Arrived at EDR: 04/08/2014
Date Made Active in Reports: 05/05/2014
Number of Days to Update: 27

Source: Yolo County Department of Health
Telephone: 530-666-8646
Last EDR Contact: 06/19/2014
Next Scheduled EDR Contact: 10/06/2014
Data Release Frequency: Annually

YUBA COUNTY:

CUPA Facility List
CUPA facility listing for Yuba County.

Date of Government Version: 05/19/2014
Date Data Arrived at EDR: 05/22/2014
Date Made Active in Reports: 06/19/2014
Number of Days to Update: 28

Source: Yuba County Environmental Health Department
Telephone: 530-749-7523
Last EDR Contact: 07/31/2014
Next Scheduled EDR Contact: 11/17/2014
Data Release Frequency: Varies

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

CT MANIFEST: Hazardous Waste Manifest Data
Facility and manifest data. Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a tsd facility.

Date of Government Version: 07/30/2013
Date Data Arrived at EDR: 08/19/2013
Date Made Active in Reports: 10/03/2013
Number of Days to Update: 45

Source: Department of Energy & Environmental Protection
Telephone: 860-424-3375
Last EDR Contact: 05/23/2014
Next Scheduled EDR Contact: 09/01/2014
Data Release Frequency: Annually

NJ MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2011
Date Data Arrived at EDR: 07/19/2012
Date Made Active in Reports: 08/28/2012
Number of Days to Update: 40

Source: Department of Environmental Protection
Telephone: N/A
Last EDR Contact: 07/17/2014
Next Scheduled EDR Contact: 10/27/2014
Data Release Frequency: Annually

NY MANIFEST: Facility and Manifest Data
Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 05/01/2014
Date Data Arrived at EDR: 05/07/2014
Date Made Active in Reports: 06/10/2014
Number of Days to Update: 34

Source: Department of Environmental Conservation
Telephone: 518-402-8651
Last EDR Contact: 05/07/2014
Next Scheduled EDR Contact: 08/18/2014
Data Release Frequency: Annually

PA MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2012
Date Data Arrived at EDR: 07/24/2013
Date Made Active in Reports: 08/19/2013
Number of Days to Update: 26

Source: Department of Environmental Protection
Telephone: 717-783-8990
Last EDR Contact: 07/18/2014
Next Scheduled EDR Contact: 11/03/2014
Data Release Frequency: Annually

RI MANIFEST: Manifest information
Hazardous waste manifest information

Date of Government Version: 12/31/2012
Date Data Arrived at EDR: 06/21/2013
Date Made Active in Reports: 08/05/2013
Number of Days to Update: 45

Source: Department of Environmental Management
Telephone: 401-222-2797
Last EDR Contact: 05/27/2014
Next Scheduled EDR Contact: 09/08/2014
Data Release Frequency: Annually

WI MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2012
Date Data Arrived at EDR: 08/09/2013
Date Made Active in Reports: 09/27/2013
Number of Days to Update: 49

Source: Department of Natural Resources
Telephone: N/A
Last EDR Contact: 06/16/2014
Next Scheduled EDR Contact: 09/29/2014
Data Release Frequency: Annually

Oil/Gas Pipelines: This data was obtained by EDR from the USGS in 1994. It is referred to by USGS as GeoData Digital Line Graphs from 1:100,000-Scale Maps. It was extracted from the transportation category including some oil, but primarily gas pipelines.

Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:
Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing
Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.

Daycare Centers: Licensed Facilities
Source: Department of Social Services
Telephone: 916-657-4041

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 2003 & 2011 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

Scanned Digital USGS 7.5' Topographic Map (DRG)
Source: United States Geologic Survey
A digital raster graphic (DRG) is a scanned image of a U.S. Geological Survey topographic map. The map images are made by scanning published paper maps on high-resolution scanners. The raster image is georeferenced and fit to the Universal Transverse Mercator (UTM) projection.

STREET AND ADDRESS INFORMATION

GEOCHECK ®- PHYSICAL SETTING SOURCE ADDENDUM

TARGET PROPERTY ADDRESS

BEAR RIVER RESTORATION
CHICAGO PARK POWERHOUSE RD
COLFAX, CA 95945

TARGET PROPERTY COORDINATES

Latitude (North):	39.1746 - 39˚ 10’ 28.56’’
Longitude (West):	120.9027 - 120˚ 54’ 9.72’’
Universal Tranverse Mercator:	Zone 10
UTM X (Meters):	681174.6
UTM Y (Meters):	4338039.0
Elevation:	2190 ft. above sea level

USGS TOPOGRAPHIC MAP

Target Property Map:	39120-B8 CHICAGO PARK, CA
Most Recent Revision:	1979

EDR’s GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

Assessment of the impact of contaminant migration generally has two principal investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW DIRECTION INFORMATION

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

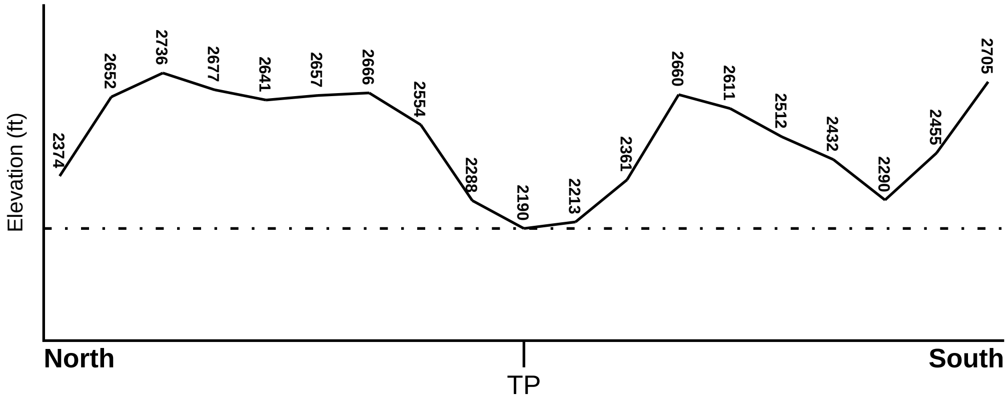
TOPOGRAPHIC INFORMATION

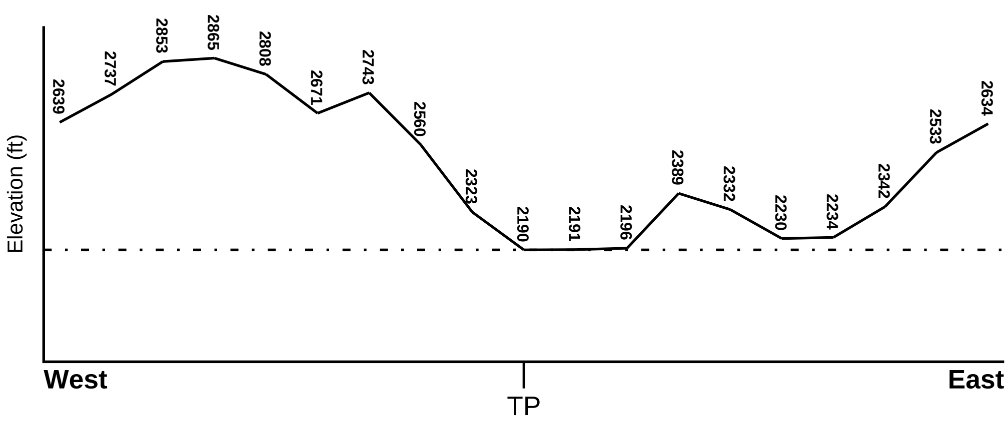
Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

TARGET PROPERTY TOPOGRAPHY

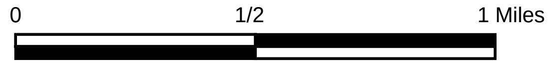
General Topographic Gradient: General ESE

SURROUNDING TOPOGRAPHY: ELEVATION PROFILES





Target Property Elevation: 2190 ft.



Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

FEMA FLOOD ZONE

Target Property County	FEMA Flood Electronic Data
NEVADA, CA	YES - refer to the Overview Map and Detail Map

Flood Plain Panel at Target Property: 06057C - FEMA DFIRM Flood data

Additional Panels in search area: 0602390125C - FEMA Q3 Flood data

NATIONAL WETLAND INVENTORY

NWI Quad at Target Property	NWI Electronic Data Coverage
CHICAGO PARK	YES - refer to the Overview Map and Detail Map

HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Site-Specific Hydrogeological Data*:

Search Radius: 1.25 miles
Status: Not found

AQUIFLOW®

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

MAP ID	LOCATION FROM TP	GENERAL DIRECTION GROUNDWATER FLOW
Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

ROCK STRATIGRAPHIC UNIT

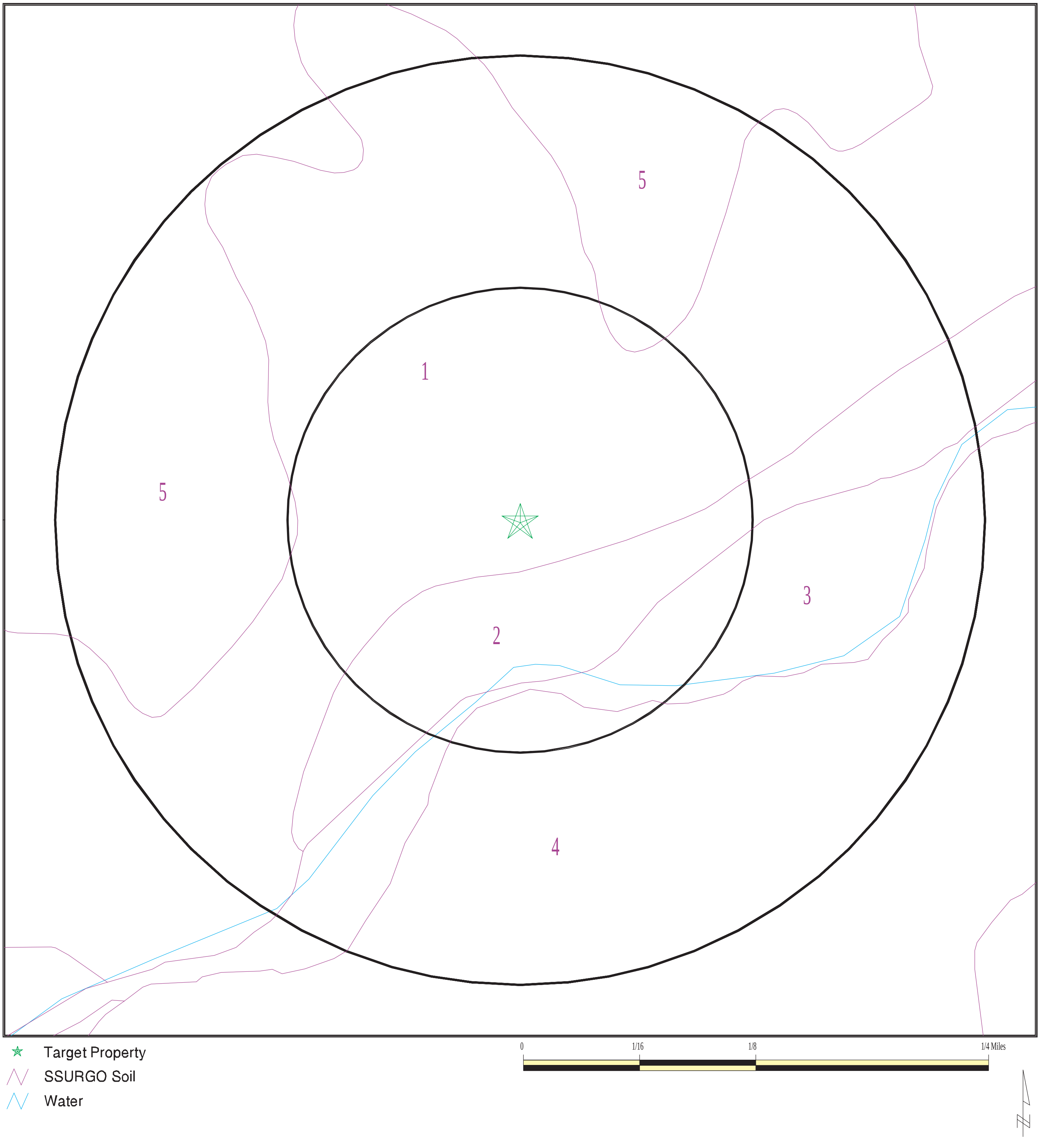
Era:	Mesozoic
System:	Lower Jurassic and Upper Triassic
Series:	Lower Mesozoic
Code:	lMze *(decoded above as Era, System & Series)*

GEOLOGIC AGE IDENTIFICATION

Category: Eugeosynclinal Deposits

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

SSURGO SOIL MAP - 4025470.2s



SITE NAME:	Bear River Restoration
ADDRESS:	CHICAGO PARK POWERHOUSE RD Colfax CA 95945
LAT/LONG:	39.1746 / 120.9027

CLIENT:	Dudek & Associates
CONTACT:	Khristina Leyba
INQUIRY #:	4025470.2s
DATE:	August 04, 2014 1:31 pm

DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. The following information is based on Soil Conservation Service SSURGO data.

Soil Map ID: 1

Soil Component Name: Mariposa

Soil Surface Texture: gravelly loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information

	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	
Layer	**Upper**	**Lower**	**Soil Texture Class**	**AASHTO Group**	**Unified Soil**		**Soil Reaction (pH)**
1	0 inches	9 inches	gravelly loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 14 Min: 4	Max: 6.5 Min: 5.6
2	9 inches	20 inches	gravelly clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand.	Max: 14 Min: 4	Max: 6 Min: 4.5
3	20 inches	24 inches	bedrock	Not reported	Not reported	Max: 4 Min: 1.4	Max: Min:

Soil Map ID: 2

Soil Component Name: Riverwash

Soil Surface Texture: very stony sand

Hydrologic Group: Class A - High infiltration rates. Soils are deep, well drained to excessively drained sands and gravels.

Soil Drainage Class: Excessively drained

Hydric Status: Partially hydric

Corrosion Potential - Uncoated Steel: Not Reported

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information

	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	5 inches	very stony sand	Granular materials (35 pct. or less passing No. 200), Stone Fragments, Gravel and Sand.	COARSE-GRAINED SOILS, Gravels, Clean gravels, Poorly Graded Gravel.	Max: 141 Min: 42	Max: Min:
2	5 inches	59 inches	stratified extremely gravelly coarse sand to gravelly sand	Granular materials (35 pct. or less passing No. 200), Stone Fragments, Gravel and Sand.	COARSE-GRAINED SOILS, Gravels, Clean gravels, Poorly Graded Gravel.	Max: 141 Min: 42	Max: Min:

Soil Map ID: 3

Soil Component Name: Water

Soil Surface Texture: very stony sand

Hydrologic Group: Class A - High infiltration rates. Soils are deep, well drained to excessively drained sands and gravels.

Soil Drainage Class:
Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Not Reported

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

No Layer Information available.

Soil Map ID: 4

Soil Component Name: MARIPOSA

Soil Surface Texture: gravelly loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		Soil Reaction (pH)
1	0 inches	5 inches	gravelly loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Gravels, Gravels with fines, Silty Gravel	Max: 14 Min: 4	Max: 6.5 Min: 5.1
2	5 inches	27 inches	gravelly loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Gravels, Gravels with fines, Clayey Gravel	Max: 14 Min: 4	Max: 6 Min: 4.5
3	27 inches	31 inches	weathered bedrock	Not reported	Not reported	Max: 0.42 Min: 0	Max: Min:

Soil Map ID: 5

Soil Component Name: Josephine

Soil Surface Texture: gravelly loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		Soil Reaction (pH)
1	0 inches	11 inches	gravelly loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Gravels, Gravels with fines, Silty Gravel	Max: 14 Min: 4	Max: 6.5 Min: 5.6
2	11 inches	50 inches	gravelly clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	Not reported	Max: 14 Min: 4	Max: 6 Min: 5.1
3	50 inches	53 inches	bedrock	Not reported	Not reported	Max: 0.42 Min: 0.02	Max: Min:

LOCAL / REGIONAL WATER AGENCY RECORDS

EDR Local/Regional Water Agency records provide water well information to assist the environmental professional in assessing sources that may impact ground water flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

WELL SEARCH DISTANCE INFORMATION

DATABASE	SEARCH DISTANCE (miles)
Federal USGS	1.000
Federal FRDS PWS	Nearest PWS within 1 mile
State Database	1.000

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
No Wells Found		

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

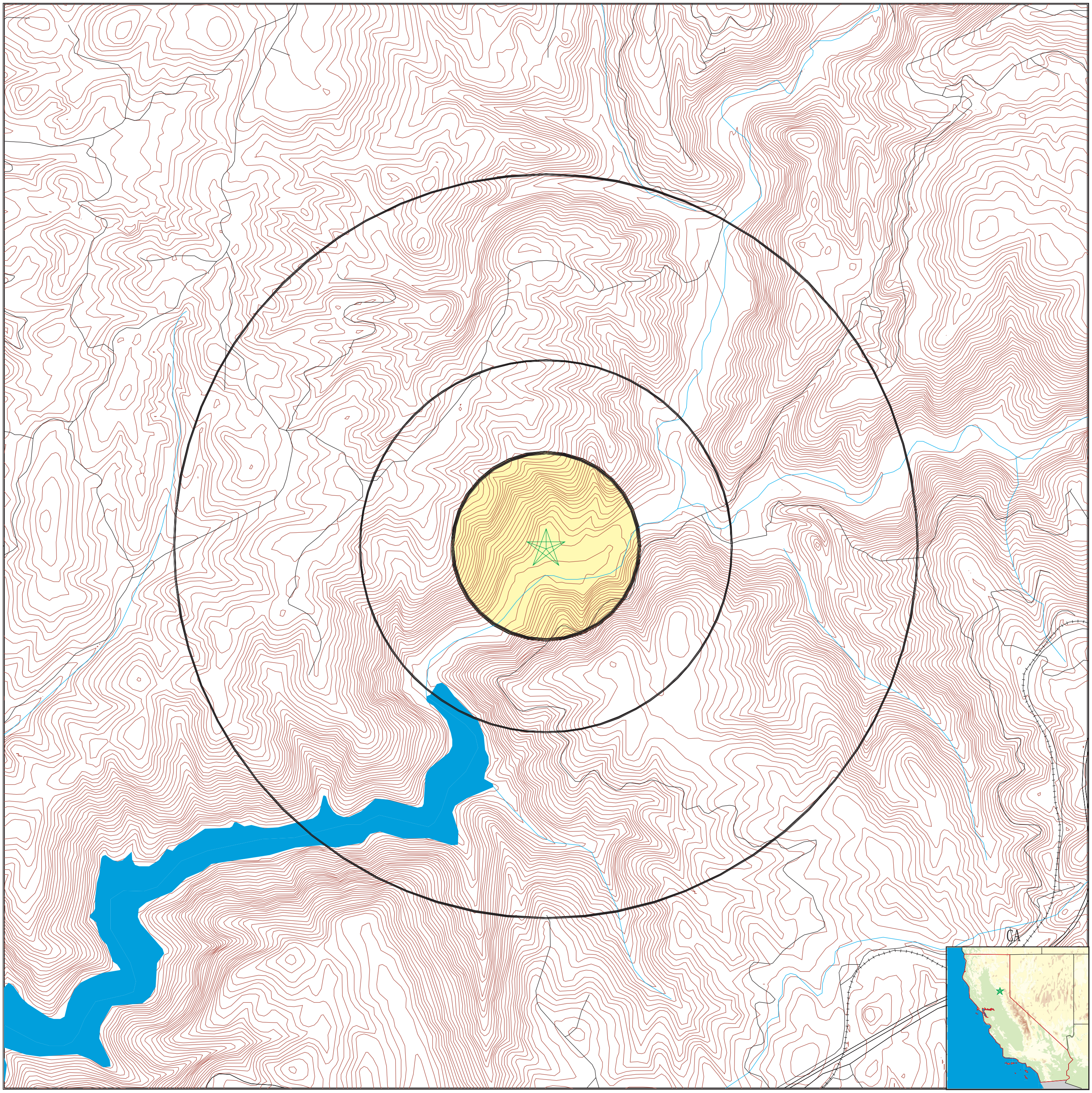
MAP ID	WELL ID	LOCATION FROM TP
No PWS System Found		

Note: PWS System location is not always the same as well location.

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
No Wells Found		

PHYSICAL SETTING SOURCE MAP - 4025470.2s



County Boundary
Major Roads
Contour Lines
Earthquake Fault Lines
Earthquake epicenter, Richter 5 or greater
Water Wells
Public Water Supply Wells
Cluster of Multiple Icons

Groundwater Flow Direction
Indeterminate Groundwater Flow at Location
Groundwater Flow Varies at Location
Closest Hydrogeological Data
Oil, gas or related wells

SITE NAME: Bear River Restoration ADDRESS: CHICAGO PARK POWERHOUSE RD Colfax CA 95945 LAT/LONG: 39.1746 / 120.9027	CLIENT: Dudek & Associates CONTACT: Khristina Leyba INQUIRY #: 4025470.2s DATE: August 04, 2014 1:31 pm

AREA RADON INFORMATION

State Database: CA Radon

Radon Test Results

Zipcode	Num Tests	> 4 pCi/L
95945	62	14

Federal EPA Radon Zone for NEVADA County: 2

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

Federal Area Radon Information for Zip Code: 95945

Number of sites tested: 11

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	3.427 pCi/L	91%	0%	9%
Living Area - 2nd Floor	Not Reported	Not Reported	Not Reported	Not Reported
Basement	5.300 pCi/L	0%	100%	0%

PHYSICAL SETTING SOURCE RECORDS SEARCHED

TOPOGRAPHIC INFORMATION

USGS 7.5' Digital Elevation Model (DEM)
Source: United States Geologic Survey
EDR acquired the USGS 7.5' Digital Elevation Model in 2002 and updated it in 2006. The 7.5 minute DEM corresponds to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps. The DEM provides elevation data with consistent elevation units and projection.

Scanned Digital USGS 7.5' Topographic Map (DRG)
Source: United States Geologic Survey
A digital raster graphic (DRG) is a scanned image of a U.S. Geological Survey topographic map. The map images are made by scanning published paper maps on high-resolution scanners. The raster image is georeferenced and fit to the Universal Transverse Mercator (UTM) projection.

HYDROLOGIC INFORMATION

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 2003 & 2011 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

HYDROGEOLOGIC INFORMATION

AQUIFLOW[R] Information System
Source: EDR proprietary database of groundwater flow information
EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit
Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

STATSGO: State Soil Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Services
The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

SSURGO: Soil Survey Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Services (NRCS)
Telephone: 800-672-5559
SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Services, mapping scales generally range from 1:12,000 to 1:63,360. Field mapping methods using national standards are used to construct the soil maps in the Soil Survey Geographic (SSURGO) database. SSURGO digitizing duplicates the original soil survey maps. This level of mapping is designed for use by landowners, townships and county natural resource planning and management.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

LOCAL / REGIONAL WATER AGENCY RECORDS

FEDERAL WATER WELLS

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)
This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

STATE RECORDS

Water Well Database
Source: Department of Water Resources
Telephone: 916-651-9648

California Drinking Water Quality Database
Source: Department of Public Health
Telephone: 916-324-2319
The database includes all drinking water compliance and special studies monitoring for the state of California since 1984. It consists of over 3,200,000 individual analyses along with well and water system information.

OTHER STATE DATABASE INFORMATION

California Oil and Gas Well Locations
Source: Department of Conservation
Telephone: 916-323-1779
Oil and Gas well locations in the state.

RADON

State Database: CA Radon
Source: Department of Health Services
Telephone: 916-324-2208
Radon Database for California

Area Radon Information
Source: USGS
Telephone: 703-356-4020
The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

EPA Radon Zones
Source: EPA
Telephone: 703-356-4020
Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

OTHER

Airport Landing Facilities: Private and public use landing facilities
Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

California Earthquake Fault Lines: The fault lines displayed on EDR's Topographic map are digitized quaternary fault lines, prepared in 1975 by the United State Geological Survey. Additional information (also from 1975) regarding activity at specific fault lines comes from California's Preliminary Fault Activity Map prepared by the California Division of Mines and Geology.

STREET AND ADDRESS INFORMATION

APPENDIX G

Hydrology and Geomorphology Technical Memorandum

Memo

To: Brian Grattidge, DUDEK

From: Peter Kulchawik and David Shaw

Date: August 28, 2014

Subject: DRAFT Hydrology, Geomorphology, and Water Quality of the Bear River at the Chicago Park Powerhouse, Placer and Nevada Counties, California

1. INTRODUCTION

Balance Hydrologics, Inc. (Balance) has developed the following information for inclusion in Nevada Irrigation District's (NID) Bear River Project Adminstrative Draft Environmental Impact Report (ADEIR) in Nevada County. The roughly 75-acre aggregate mine is an instream, gravel-skimming operation which would be re-established on the reach just downstream from NID's Chicago Park Power House and the mouth of Steephollow Creek immediately east of Rollins Reservoir, on land owned or leased by NID from the Bureau of Land Management (BLM). The mine was operated by R.J. Miles for over 20 years until their lease ended in 2002, when R.J. Miles and NID reclaimed the site, filled the ponds, and removed the mining equipment. NID then filed for and was granted Idle Mine Status by Nevada County and the State Office of Mined Land Reclamation (OMR). Based on review of the project description dated May 16, 2013 and Site Plan dated April 29, 2013, the most significant hydrologic issues to be addressed in the hydrology and water quality section of the EIR are anticipated to be:

- effects of the proposed gravel-skimming operation on channel form and function, particularly along the right bank of the Bear River from the Chicago Park Power House and penstock to just downstream from the Chicago Park Power House bridge;
- effects of mining and associated activities (levee, road and bridge construction in the channel corridor; gravel removal, stockpiling and hauling) on water quality in the Bear River and downstream in Rollins Reservoir; and
- effects of mining and associated activities on hydrologic support (groundwater and surface water flow directions) for fish, amphibian and bird habitat in the riparian corridor and just downstream from the project site.

The hydrologic, drainage, and water quality assessments of the proposed project contained in this memo are based on prior geomorphic evaluations of the reach (Curtis, 1999; ENGEO, 2005; Knudsen, 1995) and regional technical studies completed by the USGS and others (Alpers and others, 2004; Hunerlach and others, 1999; Hunerlach and others, 2004). These efforts were supplemented by additional field mapping and modeling conducted by Balance Hydrologics staff in 2014 and described herein. The following sections describe the existing site conditions, the standards for significant impacts per CEQA guidelines, methods for assessing impacts, and anticipated impacts and recommendations for mitigation measures.

2. SITE DESCRIPTION

2.1 Physical Setting

The project area consists of a 1.25-mile reach of the Bear River from the Chicago Park Powerhouse to the delta in Rollins Reservoir. The powerhouse is a component of NID's Yuba-Bear River project, and generates electricity using flow from the upper Bear River and diverted flow from the South and Middle Yuba River drainages. Scour around the base of the powerhouse has required a number of remedial efforts to protect the foundation. Approximately 1,500 feet downstream from the powerhouse, the Chicago Park Powerhouse Road bridge crosses the Bear River. Similar to the powerhouse, channel scour has undermined the bridge pier foundations. The pier foundations have been fortified with a mix of concrete, sheet piles, and gabions which on certain piers have more than doubled their widths. Downstream 500 feet from the bridge, Steephollow Creek—an unregulated drainage system—enters the Bear River. Roughly 2,000 feet downstream from the Steephollow-Bear River confluence there is a high terrace on the right bank that has been used to store previous mine gravels and is currently proposed as a secondary stockpile area for the proposed Project. Adjacent to the terrace the channel bed elevation nears 2,185 feet (NGVD29), approximately the same elevation as the maximum stage of Rollins Reservoir according to 1966 as-built drawings for the dam. In dry years, Rollins Reservoir recedes to a lower elevation, roughly 2,000 feet downstream of the terrace. The reservoir stage was measured as 2,164.0 feet during our Summer 2014 field work. Annually the reservoir stage fluctuates an average of 36 feet between a mean low elevation of 2,130 feet and a mean high elevation of 2,166 feet (ENGEO, 2005). Reservoir storage has been reported to be as low as 720 acre feet (ac-ft) in November, 1976 and as high as 68,600 ac-ft in December, 2005. Monthly average reservoir storage is presented in Table 1 and illustrates the seasonality of water levels in the reservoir; during wet period years, the reservoir level may remain at or near its maximum throughout the year, but during dry periods reservoir levels may fall and stay below the maximum storage for more than a year.

Table 1. Average monthly reservoir storage in Rollins Reservoir

Month	Maximum storage (ac-ft)	Minimum storage (ac-ft)	Average storage (ac-ft)	Average stage (ft)
October	67,700	7,770	58,309	2,141
November	67,200	8,940	60,440	2,149
December	67,600	13,600	62,922	2,153
January	67,340	12,500	63,367	2,159
February	66,800	10,100	62,874	2,163
March	66,800	11,400	61,300	2,166
April	66,600	12,800	59,809	2,167
May	66,600	7,910	58,286	2,166
June	66,400	5,510	46,795	2,164
July	66,900	5,170	45,183	2,162
August	67,450	720	50,553	2,160
September	68,600	6,500	54,066	2,143

Source: California Data Exchange Center (CDEC) Station RLL for period from December 1964 to July 2014 and USGS Gage 11421800 for period October 1987 to October 1996

The project reach is laterally confined by steep bedrock-controlled hillsides, and the valley bottom width ranges from 200 to 900 feet. The reach has a median elevation of 2,190 feet (NAVD29), with an average slope of 0.70 percent. Surface bed material is primarily gravels and cobbles; larger deposits of sands and finer-sized material are prevalent at the delta to Rollins Reservoir. Riparian vegetation within the valley floor is patchy, and generally does not exceed 15 to 20 years in age. The majority of the mature riparian vegetation appears to have become established following the last major flood event in 1997. In addition to episodic flooding, the distribution and age of riparian vegetation on the valley floor is influenced by alteration of the natural flow and sediment regimes by NID and PG&E dams and diversions[1]. Riparian vegetation along the fringe of the valley floors is limited by steep, conifer-dominated hillsides and bedrock outcrop.

Relics from past mining operations are present throughout the site. Abandoned gravel stockpiles are the most obvious remnant, and are generally located on high terraces away from the main channel. Many of the former haul roads have been washed out, the only remaining evidence of which was observed just upstream and downstream of the Chicago Park Powerhouse Road bridge.

[1] A comprehensive schematic of NID’s Yuba-Bear Hydroelectric Project and PG&E’s Drum-Spaulding Hydroelectric Project is attached as Appendix A.

2.2 Hydrologic Setting

Surface water through the project reach originates from three primary sources: the Bear River upstream of the powerhouse (27.1 mi^2 catchment), Steephollow Creek (23.9 mi^2 catchment), and the powerhouse (Figure 1). A small area of intervening hillsides (1.7 mi^2) contributes runoff over the length of the project reach. Both the Bear River and Steephollow Creek watersheds are slender in shape lending to a low drainage densities (ratio of channel length to watershed area). This characteristic has connotations on the efficiency of the systems to discharge water and sediment. The headwaters of the Bear River and Steephollow Creek are located roughly 15 miles northeast of the project site near Emigrant Gap, where elevations reach 5,800 feet. The majority of both watersheds is forested with a few service roads and small privately-owned parcels. Denuded areas from historical hydraulic mining operations comprise approximately 15 to 25% of both watersheds. The hydrology of the Bear River watershed is highly regulated by a network of pipes, canals, and reservoirs part of NID's Bear-Yuba Project and PG&E's Drum-Spaulding Project (see Appendix A). While the footprint of this infrastructure is relatively small in the context of the total watershed area, the control on the flow regime in the Bear River is sizable.

No groundwater data was readily-available for the project reach, however, shallow pits revealed groundwater levels in alluvium adjacent to the channel are closely correlated to water levels in the Bear River. Shallow pits were dug adjacent to the channel and groundwater was encountered at roughly the same elevation as the water surface elevation in the channel.

Mean annual precipitation in the Bear/Steephollow watersheds is 62.2 inches[2]. Annual peak flows are driven by spring snowmelt runoff and winter rain events, however; the timing and magnitude of peak flow can be affected by NID and PG&E impoundments and diversions. USGS gage 11421790 (Bear River below Dutch Flat Afterbay near Dutch Flat, CA) is located roughly 5 miles upstream from the Chicago Park Powerhouse, and has a flow record beginning in 1965. According to this record, annual peak flow has occurred during every month of the year except August, and most frequently between December and May. A flood frequency analysis was conducted in order to estimate the 100-year flood from the annual maximum series for the Bear River upstream of the Chicago Park Powerhouse. The Pearson Type III probability distribution model provided the best fit to the data; by extrapolation, the 100-year flood is estimated to be 3,200 cfs. No gage data were available for Steephollow Creek, so the 100-year flood was estimated using regional regression equations by Gotvald et al (2012) to be 7,000 cfs. The magnitude for the 100-year flood from regression equations is more than double the estimate for the Bear River watershed which is only slightly larger and has similar geophysical characteristics. Although there is inherent error associated with use of regression equations, 7,000 cfs may not be an unreasonable estimate for an unregulated system such as Steephollow Creek, whereas the 100-year flow estimate of 3,200 cfs for the Bear River is based on a regulated flow regime.

NID characterizes releases from the Chicago Park Powerhouse as either a half (550 cfs) release or a full (1,100 cfs) release. These flows occur on a regular (almost daily) basis during the summer months when

[2] Mean annual precipitation estimated from the Parameter-Elevation Regressions on Independent Slopes Model (PRISM) climatic dataset, 800 meter resolution; includes data from 1971 to 2000.

demand for energy production is at its highest. The frequency and duration of these flows is such that they are considered to be a primary control on channel geometry and form downstream of the powerhouse; this concept will be discussed in detail in the following sections.

For the purposes of this technical memo, we consider three flow magnitudes as central to assessing the impacts from re-opening of Secret Town Mine: (1) a half release from Chicago Park Powerhouse (550 cfs) is a frequent flow that can inundate lower gravel bars, (2) a full release from Chicago Park Powerhouse is a frequent flow that can inundate a second set of higher elevation “middle” gravel bars, and (3) the 100-year flood is an infrequent flow that is anticipated to inundate most of the valley floor. Our estimate for the 100-year flood at the downstream end of the project reach is 11,300 cfs (sum of the Bear River and Steephollow Creek 100-year floods, plus a full release from Chicago Park Powerhouse). The project reach is mapped by the Federal Emergency Management Agency (FEMA) as Zone A meaning a detailed estimate of the magnitude of the 100-year flood was unavailable for comparison.

2.3 Geology and Geomorphology

Bedrock geology of the project site and much of the local contributing watershed is dominated by Paleozoic metamorphic rocks—specifically, the Calaveras complex member of the Feather River Peridotite Belt (Saucedo and Wagner, 1992). The upper watershed is of similar-aged metamorphic rocks but is offset structurally by the Melones Fault Zone. This regional structure helped control pre-historic drainage patterns, which led to the formation of extensive auriferous gravel deposits in the upper Steephollow and Bear River drainages. Prior to establishing its current course, the pre-historic South Yuba River flowed down the Bear River and Steephollow drainages at times, establishing significantly larger bedrock and boulder-lined canyons than the present-day streams have the capacity to form. When the gold-bearing gravels were discovered in the upper watersheds, extensive hydraulic mining operations began upstream of the project site. Water was diverted and used to erode large volumes of sand, silt, and gravel for separation of gold, and mercury was added to the process to recover the gold as amalgam (Hunerlach and others, 1999). Hydraulic mining was most intense from the 1850’s to 1880’s, and by 1890 mining activity ceased altogether (James, 1989), but not before thousands of tons of sediment were washed into the Bear and Steephollow channels.

The mine tailings settled in the lower-gradient project reach and caused the channel to aggrade by tens of feet until the 1880s (James, 1989), when miners were prohibited from freely discharging sediment to streams. Between the late 1800’s and the mid-1960’s the Yuba-Bear and Drum-Spaulding projects were not yet in place, and channel response to the mining episode began, with incision progressing through the mine tailings, developing remnant terraces from the left over channel fill. Recent geophysical surveys indicate the current maximum depth of sediment to be as much as 50 feet (NorCal Geophysical, 2014), and field surveys of remnant terraces suggest maximum aggradation reached elevations 25 to 30 feet higher than the present day channel bed. James (1989) has concluded that the bulk of channel fill material is dominated by re-worked hydraulic mining deposits, based on evidence that pre-mining-era channels were bedrock and boulder dominated, with limited sediment delivery and transport capacity prior to mining sediment production.

The Bear River is thought to have largely equilibrated to the post-mining sediment pulse by the 1930s such that throughout the mid-1900s, sediment transport into the project reach was roughly equal to sediment transport out of the reach, estimated by Knudsen (1995) to average 72,670 cubic yards per year. This is equal to approximately 65 percent of the average annual extraction by the R.J. Miles Company from 1978 to 1994 (Knudsen, 1995). A notable period of localized incision began when the Drum Afterbay and Chicago Park Powerhouse came online in the mid-1960's. The increased magnitude, frequency, and duration of sediment-free discharge, combined with gravel mining operations, periodic channelization for mining activities, and ongoing (but minor) response to mining sediment aggradation, caused the channel to incise up to 18 feet at the bridge location since the bridge was constructed. Today, ongoing channel incision is evidenced by active sediment transport during flow events and several headcuts in the project reach observed during the 2014 field work. Knudson (1995) also presents evidence of periodic channel aggradation associated with high flow events associated with 'atmospheric river' types of storms, such as those that occurred in December 2005, February 1982, January 1997, and February 1986.. Gravel mining operations in the project reach began in the 1970's and continued through the mid-1990's, with these periodic floods largely replenishing excavated areas (ENGEO, 2006).

Channel planform is mildly sinuous through the project reach, with a sinuosity of 1.2. Meandering is limited by bedrock along the valley walls and to some extent the toes of terraces, though terrace scarp erosion does occur and delivers mining sediment to the channel. Several anabranching channels have developed, many of which remain dry until a half or full release from the Powerhouse. Flow releases from the Powerhouse have led to the maintenance of multiple bars. A hydraulic model developed for this study (presented in detail later) confirms bar elevations relate to flow rates at half and full releases. For discussion purposes, we refer to the low bar as the surface just above the river stage during a half release, and the middle bar as the surface just above the river stage during a full release (see Figure 2).

2.4 Regulatory Setting

Federal

Section 303 of the Clean Water Act (CWA) requires states to adopt water quality standards for all surface waters of the United States. Water quality standards are typically numeric, although narrative criteria based upon biomonitoring methods may be employed where numerical standards cannot be established or where they are needed to supplement numerical standards. (See a description of State Porter-Cologne Water Quality Control Act, below.) Standards are based on the designated beneficial use(s) of the water body. Where multiple uses exist, water quality standards must protect the most sensitive use.

Section 402 of the CWA mandates that certain types of construction activity comply with the requirements of National Pollutant Discharge Elimination System (NPDES) stormwater program. In California, gravel mining permitting occurs under the General Industrial Permit, issued by the State Water Resources Control Board (SWRCB) and implemented and enforced by the nine Regional Water Quality Control Boards (RWQCBs). The current Industrial General Permit (IGP; 97-03-DWQ) will expire on June 30, 2015, and will be replaced by the new IGP (2014-0057-DWQ). The IGP requires storm water dischargers to: eliminate unauthorized non-storm water discharges; develop and implement storm water pollution prevention plans (SWPPPs); implement best management practices (BMPs); conduct monitoring; compare monitoring results to numeric action levels (NALs); perform appropriate exceedance response actions (ERAs) when NALs are exceeded; and certify and submit all permit registration documents (PRDs). In addition, under the new IGP storm water dischargers are required to: implement minimum BMPs; electronically file all PRDs via SMARTS; comply with new training expectations and roles for qualified industrial storm water practitioners (QISPs); sample to detect exceedance of annual and instantaneous NALs; develop and implement ERAs is annual or instantaneous NALs are exceeded; monitor for parameters listed under CWA Section 303(d); design treatment control BMPs for flow- and volume-based criteria; and understand new criteria, sampling protocols, and sampling frequency for qualifying storm events (QSEs).

Section 404 of the CWA requires that a permit be obtained from U.S. Army Corps of Engineers (USACE) prior to any activity associated with discharge of dredged or fill material into waters of the United States, including wetlands.

Section 401 of the CWA requires any person applying for a federal permit or license that may result in the discharge of pollutants into waters of the United States (including wetlands) to obtain a state certification administered by the SWRCB through the RWQCBs. In order to acquire certification, it must be demonstrated that the activity complies with all applicable water quality standards, limitations, and restrictions. No license or permit by a federal agency may be granted until 401 certification has been granted. Section 401 water quality certifications are typically required prior to obtaining a Section 404 permit from the USACE.

FEMA oversees floodplains and administers the National Flood Insurance Program (NFIP) adopted under the National Flood Insurance Act of 1968. The program makes federally subsidized flood insurance available to property owners within communities that participate in the program. Areas of special flood hazard (i.e. subject to inundation by a 100-year flood) are identified by FEMA through regulatory flood maps titled Flood Insurance Rate Maps (FIRMS). The NFIP mandates that development cannot occur within the regulatory floodplain (typically the 100-year floodplain) if that development results in more than 1 foot increase in flood elevation. In addition, development[3] is not allowed in delineated floodways within the regulatory floodplain.

Executive Order 11988 (Floodplain Management) addresses floodplain issues related to public safety, conservation, and economics. It generally requires federal agencies constructing, permitting, or funding a project in a floodplain to do the following:

- Avoid incompatible floodplain development,

[3] Per Code of Federal Regulations, Title 44, Part 9, §4: There shall be no encroachments, including fill, new construction, substantial improvements of structures or facilities, or other development within a designated regulatory floodway that would result in any increase in flood levels within the community during the occurrence of the base flood discharge. Until a regulatory floodway is designated, no new construction, substantial improvements, or other development (including fill) shall be permitted within the base floodplain unless it is demonstrated that the cumulative effect of the proposed development, when combined with all other existing and anticipated development, will not increase the water surface elevation of the base flood more than one foot at any point within the community.

- Be consistent with the standards and criteria of the NFIP, and
- Restore and preserve natural and beneficial floodplain values.

Executive Order 11990 requires federal agencies to follow avoidance, mitigation, and preservation procedures, with public input, before proposing new construction in wetlands. It generally requires:

- Avoidance of wetlands,
- Minimization of activities in wetlands, and
- Coordination with the USACE and CWA Section 404 regarding wetlands mitigation.

State

The Porter-Cologne Water Quality Control Act of 1969 authorized the SWRCB to provide comprehensive protection for California's waters through water allocation and water quality protection. The SWRCB implements the requirement of the Clean Water Act Section 303, indicating that water quality standards have to be set for certain waters by adopting water quality control plans under the Porter-Cologne Act. The Porter-Cologne Act established the responsibilities and authorities of the nine RWQCBs, which include preparing water quality plans for areas in the region, identifying water quality objectives, and issuing NPDES permits and Waste Discharge Requirements (WDRs). Water quality objectives are defined as limits or levels of water quality constituents and characteristics established for reasonable protection of beneficial uses or prevention of nuisance. The Porter-Cologne Act was later amended to provide the authority delegated from the U.S. Environmental Protection Agency (EPA) to issue NPDES permits.

Section 303(d) of the CWA requires that the State Water Resource Control Board (SWRCB) identify surface water bodies within California that do not meet established water quality standards. Once identified, the affected water body is included in the SWRCB's "303(d) Listing of Impaired Water Bodies" and a comprehensive program must then be developed to limit the amount of pollutant discharges into that water body. This program includes the establishment of "total maximum daily loads" (TMDL) for pollutant discharges into the designated water body. The most recent 303(d) listing for California was approved by the EPA in 2010.

Section 1600-1616 of the California Fish and Game Code requires that the California Department of Fish and Wildlife (CDFW) be notified of activity that will: substantially divert or obstruct the natural flow of any river, stream or lake; or substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake; or deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake. If CDFW determines that the activity may substantially adversely affect fish and wildlife resources, a Lake or Streambed Alteration Agreement will be prepared that outlines reasonable conditions necessary to protect natural resources threatened by the proposed activity.

Local

The Bear River is the boundary between Placer and Nevada Counties. The project description states that gravel mining will take place on both sides of the River, but will be limited to either the north or south side of the channel in a given year. The project reach is otherwise unincorporated.

The Placer County General Plan includes the following policies relevant to hydrology, geomorphology, and water quality:

- Policy 6.A.10: The County shall discourage grading activities during the rainy season, unless adequately mitigated, to avoid sedimentation of creeks and damage to riparian habitat.
- Policy 6.A.13: The County shall protect groundwater resources from contamination and further overdraft by pursuing the following efforts:
    a. Identifying and controlling sources of potential contamination;
    b. Protecting important groundwater recharge areas;
    c. Encouraging the use of surface water to supply major municipal and industrial consumptive demands;
    d. Encouraging the use of treated wastewater for groundwater recharge; and
    e. Supporting major consumptive use of groundwater aquifer(s) in the western part of the County only where it can be demonstrated that this use does not exceed safe yield and is appropriately balanced with surface water supply to the same area.
- Policy 6.A.15: The County shall encourage the protection of floodplain lands and, where appropriate, acquire public easements for purposes of flood protection, public safety, wildlife preservation, groundwater recharge, access and recreation.
- Policy 8.B.1: The County shall promote flood control measures that maintain natural conditions within the 100-year floodplain of rivers and streams.
- Policy 8.G.4: The County shall ensure that the mining and processing of toxic metals in the County is conducted in compliance with applicable environmental protection standards and minimizes impacts on adjacent lands and the surrounding natural environment.
- Policy 8.G.12: The County shall identify sites that are inappropriate for hazardous material storage, maintenance, use, and disposal facilities due to potential impacts on adjacent land uses and the surrounding natural environment.

The grading and erosion prevention ordinance of Placer County requires a grading permit for any grading and/or other construction activity with ground disturbance of one acre or more. (Ord. 5407-B § 3, 2006: Ord. 5373- B, 2005; Ord. 5056-B, 2000)

The Nevada County General Plan includes the following policies relevant to hydrology, geomorphology, and water quality:

- Policy 11.4: Cooperate with State and local agencies in efforts to identify and reduce to acceptable levels all sources of existing and potential point- and non-point source pollution to ground and surface waters, including leaking fuel tanks, discharges from storm drains, auto dismantling and dump sites, sanitary waste systems, parking lots, roadways, logging and mining operations.

- Policy 11.7: Through the development and application of Comprehensive Site Development Standards, and project environmental review, establish and enforce minimum building setback lines from perennial streams and significant wetlands that are adequate to protect stream and wetland resource values.
- Policy 11.9A: Approve only those grading applications and development proposals that are adequately protected from flood hazards and which do not add flood damage potential. This may include the requirement for foundation design which minimizes displacement of flood waters, as well as other mitigation measures.
- Policy 11.10: Cooperate with State and Federal agencies and public and quasi-public organizations and agencies in the acquisition, restoration, and maintenance of habitat lands.
- Policy 12.4: Require erosion control measures as an element of all County contracts, discretionary projects, and ministerial projects.
- Policy 17.22: Aggregate extraction may be allowed in rivers and floodplains provided environmental impacts associated therewith are addressed through the CEQA process.
- Policy 17.23: Prepare a comprehensive plan for river and floodplain development that ensures aggregate operations within rivers and floodplains which have the least impact on the environment are developed before more environmentally-sensitive areas are approved and to also ensure that the environmental impacts of proposed aggregate operations within rivers and floodplains may be more readily assessed.

2.5 Water Quality

Mercury was used in the hydraulic mining process to enhance gold recovery (Alpers and others, 2005). Since the mid-1990's several studies have identified point sources and concentrations of mercury throughout the Bear and Yuba River watersheds (e.g. Hunerlach and others, 1999; Alpers and others, 2004; Hunerlach and others, 2004; Alpers and others, 2005). Hunerlach and others (1999) documented mercury and methyl mercury concentrations in excess of hazardous waste criteria for protecting human health at Dutch Flat, within the Bear River watershed. More recently Hunerlach and others (2004) sampled 40 sites in the Greenhorn Creek system (next watershed to the north from Steephollow Creek), and found the highest concentrations of mercury to be associated with former mining infrastructure. James (1991) and Curtis (1999) studied the hydraulic mining history in Steephollow Creek, however, neither study was aimed at quantifying water quality parameters. Nevertheless, it is reasonable to conclude that Steephollow Creek also delivers mercury to the Bear River based on regional correlations of hydraulic mining and elevated mercury concentrations. Currently Rollins Reservoir is on the 303(d) list for containing mercury, however, a TMDL has yet to be established.

Mercury concentrations tend to be greatest in mixtures dominated by silt- and clay-sized material (less than 0.0625 mm; Shelton and Capel, 1994) because (1) small globules of mercury are transported in suspension with similar-sized material, and (2) fine sediment has adsorptive qualities that attract mercury.

Once a sediment-mercury mixture is mobilized and deposited on the surface, the mercury is more readily converted from its elemental form to an organic form (e.g. methyl mercury), at which point it may enter the food web. Even small amounts of mercury entering the food web is problematic since mercury concentration increases with higher trophic levels through biomagnification (Krabbenhoft and Rickert, 1995).

Aside from mercury and methyl mercury, water quality is affected by increased turbidity from fine sediment. Water in the Bear River was extremely clear during the Summer 2014 field work, however fine-grained delta deposits were observed indicating large quantities of fine sediment are implicit to the system.

2.6 Flooding

The entire project reach is within a FEMA Special Flood Hazard Area (SFHA). FEMA flood insurance rate map (FIRM) Panels 06057C0675E (effective date February 3, 2010) and 06061C0125F (effective date June 8, 1998) show the SFHA as Zone A. Zone A designation means the area is subject to inundation by the one percent annual chance flood event (i.e. 100-year flood), but a detailed hydraulic analysis has not been performed to determine precise base flood elevations (BFE) or flood depths. Moreover, the magnitude of the 100-year flood used for inundation mapping is not presented in flood insurance studies (FIS) for Placer or Nevada Counties. Typical of flood maps in rural areas, the project site was mapped from low-resolution topographic data, and shows implausible overlap of the inundation extents with and areas of higher elevation and steep terrain. Balance Hydrologics therefore used the 100-year flow estimates outlined above, combined with field surveys, geomorphic mapping, and construction of a 1-dimensional hydraulic model to estimate the extents associated with the 100-year flood at this location. Figure 3 compares results for the 100-year flood inundation extents as mapped with the hydraulic model for this study with inundation extents as mapped by FEMA, and shows discrepancies in floodplain mapping, largely due to accuracy and resolution of the FEMA map, along with changes in channel bed topography between 2010 and 2014.

3. PROJECT IMPACTS AND MITIGATION MEASURES

3.1 Standards of Significance

According to Appendix G, Environmental Checklist, of the CEQA Guidelines, hydrology and water quality impacts resulting from the implementation of the proposed project would be considered significant if the project would:

a) Violate any water quality standards or waste discharge requirements (see HYD-2).
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which

would not support existing land uses or planned uses for which permits have been granted) (see HYD-3).

c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site (see HYD-1).
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner, which would result in flooding on- or off-site. (Not applicable. No features are proposed that would increase the rate or amount of surface runoff.)
e) Create or contribute runoff water, which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff (see HYD-2).
f) Otherwise substantially degrade water quality (see HYD-2).
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map (Not applicable. No housing or other structures are proposed within the 100-year flood hazard area.)
h) Place within a 100-year flood hazard area structures, which would impede or redirect flood flows (see HYD-1).
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam (see HYD-1).
j) Inundation by seiche, tsunami, or mudflow (Less than significant. Aggregate removal could increase the area of the lake, and therefore also increase the area that could be inundated by a seismically-induced seiche. This would only be the case during high lake level stands, when mining activities are not occurring project area assuming that the mining period will coincide with low lake levels. Furthermore, the increased lake area is not anticipated to be greater than the original design extent of the reservoir.)

3.2 Methods for Assessing Impacts

Literature Review

We reviewed available regional and site-specific information on the hydrology, geomorphology, and water quality of the Bear River in the vicinity of the project reach including: USGS reports, prior NID reports, environmental data for Federal Energy Regulatory Commission (FERC) relicensing, and articles from various scientific journals. This included the following primary reports, among other sources of water quality information in the region:

- Bear River aggregate removal study, Rollins Reservoir, California prepared by ENGEO
- Geomorphic evaluation of the Bear River near the Chicago Park Powerhouse facilities, Nevada Irrigation District prepared by WLA Associates
- Sustained storage and transport of hydraulic gold mining sediment in the Bear River by L.A. James

- A sediment budget of hydraulic gold-mining sediment for Steephollow Creek Basin (Jennifer Curtis M.S. Thesis)
- Draft geophysical report by NORCAL Geophysical Consultants, Inc.

Field Reconnaissance, Geomorphic Mapping, and Bed Material Composition

Balance staff visited the site in March and June of 2014 to assess existing conditions related to the project site hydrology, geomorphology, and water quality. Key geomorphic features (e.g. historical terraces, bars, side channels, historic channels, areas of deposition/aggradation, headcuts) were mapped during site visits on March 21, June 10, June 11, and June 18, 2014. Bed surface material composition was measured and characterized using modified Wolman Pebble Counts. The surface layer of a gravel bed is commonly coarser than the underlying layers and similar to the material available for transport, so subsurface sediment was characterized by either a) removing the surface layer and conducting a pebble count in a 1-square meter representative grid, or b) obtaining a bulk sample (bed core) and conducting a sieve analysis.

Hydraulic Modeling and Scour Evaluations

The US Army Corp of Engineers Hydrologic Engineering Center's River Analysis System (HEC-RAS) version 4.1 was used to model the Bear River through the project reach. Eighteen cross sections were surveyed with a total station (elevations in NGVD29), and the coordinates tied to control points provided by NID. Water surface elevations were recorded while surveying, when flow was measured to be 25 cfs. Water surface elevations associated with a half and full release were estimated based on field indicators such as rock staining and high-water marks left by leaves and other debris. Manning's *n* values were initially selected using empirical relationships based on particle size by Hey (1979) and Limerinos (1970). The model was calibrated by adjusting roughness values until the modeled water surface elevations came reasonably within the observed water surface elevations for the observed flow (25 cfs), a half release (550 cfs), and a full release (1,100 cfs). The depth of scour at the Chicago Park Powerhouse bridge was estimated following procedures outlined in HEC-18.

Geophysical Investigation

Concurrent with channel cross-section development and geomorphic mapping, a seismic refraction survey was conducted to estimate the depth of valley fill material at a number of locations. We have reviewed preliminary draft data produced for this study but have not yet received a final report.

3.2 Results

Field Reconnaissance, Geomorphic Mapping, and Bed Material Composition

Results of the geomorphic evaluation are shown in Figure 4. As described above, we have identified a number of distinct terrace and bar surfaces, presumably related to past episodes of channel aggradation (during large storm events) and incision (during intervening periods). Three high terrace features are located in the vicinity of the Chicago Park Powerhouse bridge, and were used in the past for gravel mining operations. With the exception of the "main" highest terrace on the north side of the bridge, the elevations of the three terraces were correlated during cross-section survey work, and are interpreted define the maximum extent of valley fill which occurred in the late 1800s-can be correlated with a fourth terrace found roughly 2,000 feet upstream of the powerhouse and are interpreted to represent the maximum extent of channel fill that occurred after peak mining sediment production. The elevation of these terraces above the channel bed decreases with proximity to the reservoir, presumably a result of sediment deposition within the channel in the vicinity of the reservoir.

Along the channel bed, three distinct bar elevations can be found, though correlations are difficult due to the recent history of disturbance associated with gravel extraction. In general, the highest bar appears to have been established as a result of deposition during the peak flows of 1995 and/or 1997 as evidenced by 15- to 20-year-old willow and alder thickets that have become established. This surface is rarely inundated today, and in some locations sediment is actively removed and reworked by the channel at the toes of these deposits. Channel incision and reworking of these deposits has led to the formation of two more active sets of bars: a low bar adjacent to the channel, which becomes frequently inundated and creates riffles, and a middle bar, which is less frequently inundated.

Finally, a number of very steep riffles, or headcuts, can be found within the maximum reservoir pool (see Figure 4, presumably a result of changing baselevel in the reservoir; when the reservoir level is high, sediment is deposited at the reservoir margin and the channel gradient becomes very shallow. As the reservoir water level falls, channel steepening leads to headward (upstream) erosion of the toe of these delta deposits.

Bed material within the active channel can be described as an armored surface layer of coarse gravels and small cobbles, and a subsurface layer of gravels, sands, and fines. Bed material on bars was measured to be finer than within the active channel, though a similar pattern of armored surface layer over a finer subsurface layer appeared to be persistent throughout the project reach.

Hydraulic Modeling

Scour is a complex process that has been distilled down to a few equations in HEC-18. As such, it is important to acknowledge how simplifying assumptions made for the HEC-18 procedure might influence results. In the event of a 100-year flood, scour depth was predicted to be 5 to 10 feet at the bridge. The major flaw in this estimate is the inability of one-dimensional hydraulic models to simulate the complex flow fields arising from abrupt transitions between cross sections. The channel becomes steep and very deep for a short distance longitudinally beneath the bridge. We feel the near-bed velocities used in the scour equations are overestimated because they are computed on a cross-section-average basis, throughout the water column. During extreme flood events the strongest flow vectors would more likely bypass the deep scour hole, thereby creating a recirculating eddy within the scour hole. Another flaw in the scour estimate is it does not consider the presence of bedrock. Bedrock is exposed adjacent to the south-most bridge pier foundation. The geophysical investigation indicated that bedrock is proximate to the surface in the vicinity of the bridge, however, it is unclear the precise depth to bedrock at the bridge. Clearly though, bedrock limits total scour depth.

Based on field observations, it appears the primary feature currently limiting scour at the bridge is the riffle crest just downstream. Hydraulic model results, along with bed material size data, suggest that the bed surface layer could be mobilized during the 100-year flood along most of the project reach. Channel shear stress from the hydraulic model was used to estimate the maximum size particle that could be entrained by the 100-year flood by assuming a Shields parameter of 0.03. While 0.03 is a widely-accepted value for incipient motion, it is important to recognize other properties influencing particle mobility such as degree of grain exposure and bed armoring which can vary the Shield parameter by nearly an order of magnitude (Knighton, 1998). Even so, assuming a Shields parameter of 0.30, the hydraulic model suggests that at the riffle downstream of the bridge a particle 55 mm in diameter could be mobilized during the 100-year flood. This is significant since the riffle currently appears to be controlling the hydraulics through the bridge opening, and its compromise would likely lead to additional scour at the bridge foundations.

As expected, the extents of the modeled 100-year flood are significantly different than the effective FEMA maps for the project reach (Figure 3). The channel has incised to a point where the model suggests that remnant terraces are not inundated by the 100-year flood. However, if the tailwater in the model is assumed to be equal to the maximum stage in Rollins Reservoir, the remnant terrace on the right side of the channel at cross section 2609 would begin to become inundated.

3.3 Impacts and Mitigation Measures

Impact HYD-1:	*The proposed gravel-skimming operation has the potential to adversely affect channel form and function,either through direct modification of the channel or inducement of channel incision that could propagate to upstream areas.*

Based on field reconnaissance, channel cross sections, and hydraulic modeling, proposed gravel skimming could have a potentially significant impact with respect to channel incision and could further undermine bridge piers and/or other infrastructure near the Chicago Park Powerhouse. Proposed mitigation measures include:

MM HYD-1a:	*Develop and implement a seasonal decommissioning plan that minimizes risk of incision.*
MM HYD-1b:	*Design diversion channel to accommodate 1,100 cfs, and decommission seasonally.*
MM HYD-1c:	*Limit annual gravel extraction outside the reservoir pool to the average annual bedload replenishment rate; all gravel mining beyond this threshold should take place within the reservoir pool.*
MM HYD-1d:	*Develop and implement a channel geomorphology/topography monitoring plan (annual topographic or cross-sectional and longitudinal channel surveys).*
MM HYD-1e:	*Engineered grade control structures located downstream of the confluence with Steephollow creek.*

These measures would reduce the risk of incision by maintaining stable channel geometry, discouraging channel avulsion, and preventing upstream migration of headcuts. Therefore, this impact is considered to be **less than significant with mitigation.**

Even though the schematic layout included with the project description shows no mining activities upstream of the Chicago Park Powerhouse bridge, there is potential for significant impacts from the proposed project because it could: (1) alter the existing drainage pattern of the site or area, including the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site, and (2) expose structures to a significant risk of loss through the continued undermining of the bridge foundations and ultimate potential for bridge failure.

The largest threat to the Chicago Powerhouse, the bridge, and the banks in between is channel incision. Incision has already threatened the powerhouse and bridge to the point of requiring remedial repairs, and has led to oversteepening and subsequent failures along the right bank between the powerhouse and bridge. The riffle downstream of the bridge appears to be stable, and to be the primary mechanism limiting incision at the bridge. Based on the project description, our understanding of the project reach, and observations of channel response to gravel skimming operations elsewhere in California (Kondolf, 1997; Mount, 1995) it is plausible that a sequence of events may lead to continued incision and further threaten the bridge, powerhouse, and banks in between, as follows. 1) Gravel skimming occurs during

April through October, and is limited to bars and water less than six inches deep, 2) A winter storm inundates the skimmed bars, which have become finer and more erodible after having the armored layer removed, 3) The channel avulses, cutting a new course through the relatively finer subsurface layer, 4) At the upstream limit of avulsion, a headcut forms due to the abrupt change from the coarse, armored bed to the less resistive subsurface layer, 5) The headcut then propagates upstream, lowering the riffle on the downstream side of the bridge, and steepening the channel gradient below the bridge, 6) The headcut continues to migrate upstream of the bridge, eventually affecting the right bank and the powerhouse. In general, reaches located downstream of dams and/or diversions are particularly susceptible to incision because the water is “sediment starved”; that is, they are more likely to dissipate energy by eroding the channel boundary since the sediment supply is low (Kondolf, 1997).

Mitigation Measures:

The following suite of mitigation measures are recommended to reduce the impact of HYD-1 to a less than significant level by maintaining the gradient of the reach, discouraging channel avulsion, and preventing upstream migration of headcuts:

MM HYD-1a: *Develop and implement a seasonal decommissioning plan that minimizes risk of incision.*

A seasonal decommissioning plan should include at minimum: removing all mining equipment located within the limits of the 100-year flood; removal of surge piles, berms, temporary roads and bridges, dikes, and diversion channels located within the 100-year flood limits to match grades of the surrounding topography; skimming operations should focus on higher bars well above the existing channel, and final grading of skimmed areas should eliminate abrupt grade breaks that could lead to development of a head cut. Skimming operations should be focused on higher bars so should especially focus on smoothing slopes where a headcut might initiate, primarily on steepened upstream ends of skimming areas and locations where lateral flows could spill into skimming areas. If channel and bank slopes in these areas exceed three percent, armoring with boulders will be required. Agrading plan should be developed seasonally to set a standard for how the site will be left at the end of the season. If monitoring data (as discussed under MM HYD-1d) suggest incision is occurring despite seasonal decommissioning, additional grade control structures (MM HYD-1e) should be designed and constructed.

Areas of the project site within the 100-year flood limits should be decommissioned seasonally in a manner that results in no rise to flood stages in order for the potential for these significant impacts to be mitigated. The schematic layout for the mining operation shows an aggregate surge pile near the confluence of the Bear River and Steephollow Creek. The pile is within the FEMA and modeled 100-year flood inundation extents (Figure 3), and if it is not decommissioned (i.e. leveled) at the end of each mining season, could have a significant impact on channel form. In the event of a large flood, the surge pile could induce avulsion since it would obstruct and redirect flow. The surge pile would also be a substantial sediment source, that could affect downstream segments of the channel.

MM HYD-1b: *Design diversion channel to accommodate 1,100 cfs, and decommission seasonally.*

The Bear River Project Description states, “Each season, the Bear River will be channelized through the installation of a system of berms to permit removal of gravels and sediments deposited from prior winter storms.” The seasonal channelization of the project reach poses additional risk of incision because the current channel that has evolved to convey the 1,100 cfs full release from the Chicago Park Powerhouse is very wide (over 150 feet in some places). If the channel is to be confined with dikes to something narrower than 150 feet, the tractive forces from a full release would be focused over a smaller area, thereby increasing the competence of the channel to mobilize the coarser, armored layer.

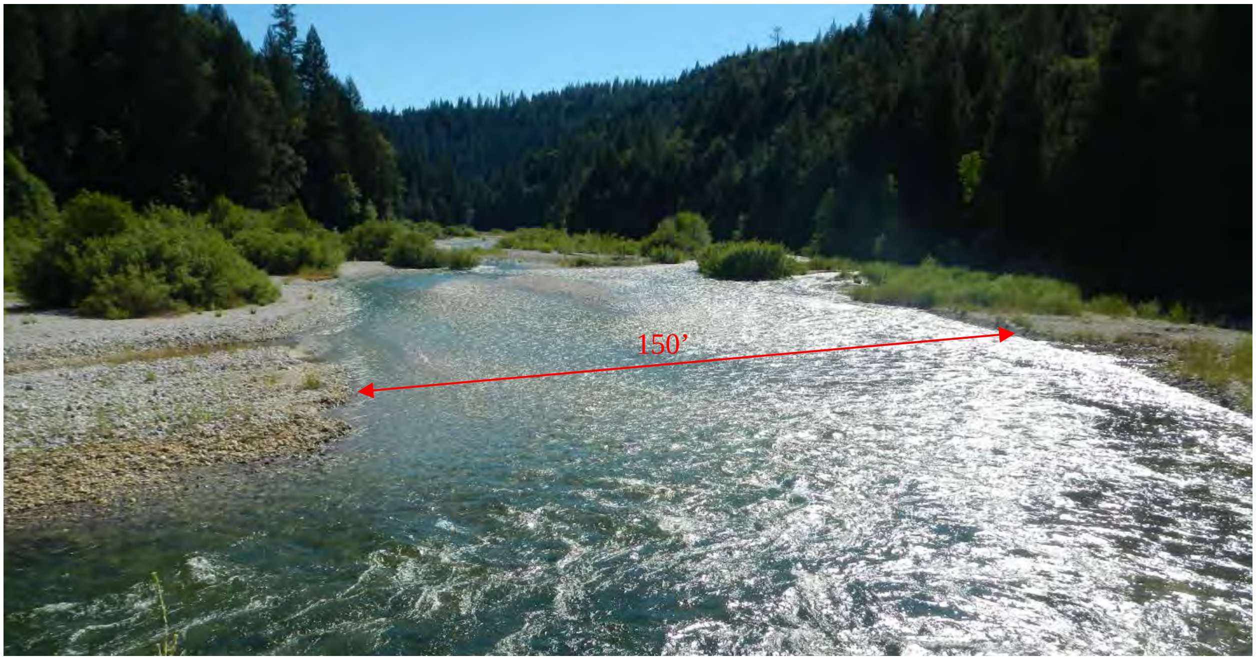


Photo 1: The Bear River at full release (1,100 cfs). Photo is looking downstream from right bank. Steephollow Creek enters the Bear River on the right side of the photo.

Mitigation should include limits on how much the existing channel can be temporarily narrowed. Where the channel top width is wide at 1,100 cfs, it could be narrowed to 125 feet with minimal risk of eroding the bed. Where the channel is less than 125 feet wide at 1,100 cfs, it should not be narrowed with berms to mitigate the risk of incision. If the channel is to be diverted entirely, mitigation should include sizing the channel to convey 1,100 cfs without substantially eroding its boundaries throughout the mining season. To achieve this objective the channel should be approximately 125 feet wide and 3 feet deep. The channel should be built deeper if freeboard is desired. In no case should the slope of the diversion channel be greater than 1.5 percent, and where possible, should be lower.

These channel width parameters are based on normal depth calculations assuming a rectangular cross section, a Manning n of 0.040, and a slope of 1.5 percent.[4] The normal depth was used to estimate bed shear stress, and subsequently the Shields parameter (assuming a particle size of 70 mm, the reach-average d_{50} for surface material). This series of calculations was repeated while changing the channel width until the Shield parameter was approximately 0.06, a widely-accepted threshold for incipient motion in the scientific literature. It should also be noted that increased incision has the potential to mobilize both coarser bedload sediment and finer suspended sediment to downstream areas.

MM HYD-1c: *Limit annual gravel extraction to the average annual bedload replenishment rate; any gravel extraction beyond this threshold should take place within the reservoir pool.*

Knudsen (1997) estimated the average annual sediment delivery to the project reach as 72,670 cubic yards per year: Imprecise scaling methods were used for this estimate, and should be improved upon on an annual basis through repeat topographic surveys of the project reach, or a detailed geomorphic analysis that includes a site-specific bedload rating curve development. By limiting extraction to the replenishment rate, elevations along the channel thalweg should be relatively static, and the risk of incision low. If restricting mining to the average annual sediment delivery is economically infeasible, mitigation should include limiting annual mining beyond the replenishment rate to the area within the reservoir pool. This area has the highest aggradation rate in the reach because it does not dependent on annual peak flows being of sufficient magnitude to deposit overbank gravels. Moreover, gravel removal from within the reservoir pool would help restore storage volume in Rollins Reservoir. Mining in this area should still be subject to the decommissioning strategies discussed under MM HYD-1a, and removal rates should be limited by the maximum decommissioning slopes and pool levels.

MM HYD-1d: *Develop and implement an incision monitoring plan (annual topographic or cross-sectional and longitudinal channel surveys).*

Incision rates should be carefully monitored to evaluate the impact of mining activities on base levels, and whether the recommended mitigation measures are effective. A monitoring plan should be developed by a California Professional Engineer or Geologist that standardizes monitoring methods, and quantifies thresholds for incision to trigger implementation of MM HYD-1e. At minimum, monitoring methods should include detailed thalweg surveys (i.e. sufficient point resolution to capture individual pools and riffles, as well as headcuts) that extend from the reservoir pool to the Chicago Park Powerhouse. Baseline data should to be collected prior to the first mining season. Once mining commences, repeat monitoring

[4] The average slope of riffles in the reach; this slope is steep compared to the reach-average slope, and was adopted to yield a conservative estimate.

should be completed at the end of each gravel mining season, and compared with data from prior years to better establish replenishment rates and incision.

MM HYD-1e: *Engineered grade control structures located downstream of the confluence with Steephollow creek.*

Engineered grade control structures made of interlocking sheet piles are proposed for the project reach to prevent incision from reaching the bridge and powerhouse. If placed effectively, these structures could lessen the steep channel slope under the bridge, and induce channel aggradation (rather than incision) at the bridge. For example, if a channel bed elevation of 2198 feet were maintained at Section 4613, the channel slope under the bridge would be drastically reduced, and aggradation would likely ensue. Installing the structures at this locations also has the advantage of preventing incision from lowering the base level of the channel at the Steephollow confluence, resulting in a headcut propagating up the Steephollow system. The project description also acknowledges that the grade control structure design and installation would need to proceed in a way that will not prevent fish passage. Incision could progress, however, and lower the base level of the channel at the downstream end of the cofferdam to an extent that would disrupt longitudinal continuity. Therefore, a series of sheet piles would likely be more effective, and would lessen the vertical drop over each dam, thereby improving the conditions for passage, and reducing the potential for downstream scour pool formation at each cofferdam. If this approach is adopted, it will be crucial to identify the target species for passage, and consider their physiologic limitations in designing the drops. Gravel extraction approaches which minimize the risk of incision is, perhaps, a better solution to engineered grade control since it would synergistically reduce the risk of significant impacts to hydrology, geomorphology, and water quality in the project reach. For this reason, engineered grade control structures are recommended as a reduntant and secondary measure to be implemented if monitoring data reveal mining activities are inducing incision.

Impact HYD-2:	*The effects of mining and associated activities (cofferdams, temporary roads and bridges, stockpiling, hauling) have the potential to adversely affect water quality in the Bear River and downstream in Rollins Reservoir.*

Gravel skimming could have a potentially significant impact because it will increase the exposure of fine sediment to the water column, which can serve as a transport mechanism for high concentrations of mercury. Mitigation measures would include:

MM HYD-2a:	*Develop and implement a seasonal decommissioning plan that minimizes risk of incision.*
MM HYD-2b:	*Construct sediment detention basins within the reservoir pool.*
MM HYD-2c:	*Develop and implement a SWPPP that includes appropriate Construction BMPs.*

These measures would lower the risk of constituents entering the water column that would degrade water quality, therefore, **this impact is less than significant with mitigation.**

There is potential for significant impacts from the proposed project to degrade water quality primarily because disturbing bed material could increase turbidity and mercury delivery to the water column. The risk of increasing turbidity and mercury delivery is directly related to the risk of increasing the delivery of fine sediment to the channel. Turbidity is the decrease in water clarity from suspended solids. There is a strong correlation between concentrations of trace elements (e.g. mercury) and the size of stream bed material. The concentration of trace elements increases as particle size decreases, with the silt and clay fraction (less than 0.0625 mm) having the highest concentration of trace elements (Shelton and Capel, 1994).

Geomorphic mapping and observations of bed material at the project reach indicate that very little fine sediment is present on the channel bed and bar surfaces. Since it is the larger patches of fines on the surface and subsurface that are more significant to mercury retention and potential mobilization, the risk of fine sediment and mercury mobilization are currently limited during half and full releases, when the armored bed surface is largely immobile. The amount of silt and clay-sized material in subsurface bed material samples collected at the project site was less than one percent by weight, but is nevertheless higher than the concentrations found on the bed surface. Gravel skimming therefore poses an increased risk to mobilizing mercury-laden sediment because the coarse armor layer will be removed, thereby exposing the relatively higher-concentrations fine material in the subsurface layer to the water column.

Mitigation Measures:

The following suite of mitigation measures are recommended to reduce the impact of HYD-2 to a less than significant level by minimizing the risk of delivering mercury, fine sediment, and chemical contaminants to the water column:

MM HYD-2a:	*Develop and implement a seasonal decommissioning plan that minimizes risk of incision.*

This mitigation measure is the same as the suite of mitigation measures discussed for Impact HYD-1. By taking measures to minimize incision, the risk of exposing fine sediment in the subsurface layer is lowered, thereby decreasing the potential to adversely affect water quality.

MM HYD-2b: *Construct sediment detention basins within the reservoir pool.*

Regrading gravel extraction pits as described in MM HYD-1a will lower the risk of pit capture and subsequent aggressive incision, however, regrading will stir bed material leaving fine sediment exposed to the water column. It is highly unlikely the bars will be inundated during the gravel skimming season, so the risk of mobilizing surficial fines is mainly associated with annual peak runoff in the winter or spring. Re-armoring bars to shield fine sediment from becoming mobilized is impractical since it would involve importing large amounts of cobble- and boulder-size material, which may trigger other unwanted channel adjustments. The best mitigation measure may be to construct sediment detention basins in the delta, similar to ideas proposed by ENGEO (2005). Sediment basins should be limited to bars above the seasonal and not positioned across the thalweg. Positioning a sediment basin across the thalweg would carry a severe risk of failure since shear stresses in the thalweg tend to be greater than at other parts of the channel cross section. The basins should be constructed above the typical seasonal high water level in Rollins reservoir and below the maximum stage between elevations 2,167 and 2,185 feet, and should be maintained annually to remove and treat trapped sediment. Additional consideration should be given to the grading plan recommended in MM HYD-1a, especially if mining within the reservoir pool (likely the same location as the sediment basins) is to occur as discussed in MM HYD-1c.

The basins should be monitored to test the rate of sediment retention, quantify the grain size distribution of trapped sediment, and sample for mercury. Estimates of annual sediment yield by Knudsen (1995) should be used as a first estimate to size the detention basins after the first year of mining. If sedimentation during the winter and spring exceeds the volume of the sediment basin, it should be constructed to be larger in subsequent years. It should be noted that the basins will not fill in many years when flows are below average. Methods to standardize the documentation of sediment basin filling rates are discussed in MM HYD-1d.

MM HYD-2c: *Develop and implement a SWPPP that includes appropriate BMPs.*

Other than mercury and turbidity, potential threats to water quality include accidental discharge of chemical contaminants, such as petroleum product from leaking equipment or inappropriately-sited maintenance activities. The project description acknowledges that the mobile tanker will be located on a concrete pad with a 12-inch surrounding berm, and will comply with the Nevada County Health Department requirements for on-site, seasonal fuel storage. In addition, per the requirements of the NDPES Industrial General Permit, a SWPPP must be developed that specifies and maps the BMPs that will prevent construction pollutants. Through proper development and implementation of the SWPPP and BMPs, potential threats to water quality from accidental discharge of chemical contaminants will be mitigated to a less-than-significant level.

Impact HYD-3: *The effects of mining and associated activities will adversely affect the hydrologic support (groundwater and surface water flow directions and levels) for riparian and aquatic biota.*

The proposed gravel skimming could potentially have a significant impact if it triggers incision in the main channel. Incision in the main channel would adversely affect the hydrologic support by drawing groundwater away from the riparian zone. Mitigation measures would include:

MM HYD-3a: *Develop and implement a seasonal decommissioning plan that minimizes risk of incision.*

By maintaining groundwater dynamics, **this impact is less than significant with mitigation.**

If project actions are not carefully monitored to prevent incision, there is potential for significant impacts from the proposed project because incision would likely cause an increased hydraulic gradient from shallow alluvial groundwater toward the channel. This has the potential to lower the local groundwater table and adversely affect hydrologic support for riparian biota. Inducement of groundwater drainage toward the channel also has the potential to alter water quality in the channel.

Salix Consulting (2013) mapped most of the project reach as perennial stream, and described the distribution of vegetation in these areas as patchy, limited to narrow bands and depositional surfaces (i.e. fine sediment). Because most of the existing riparian vegetation is high relative to the main channel, it is likely that it will be sensitive to small changes in groundwater levels. Incision is the greatest threat to lowering the local groundwater table, which in turn, may cause vegetation mortality or shifts in the location of riparian communities. Loss of riparian vegetation will reduce the amount of habitat and food available to native fauna, the specific manifestations of which are beyond the scope of this document. In general, riparian vegetation is not laterally proximate to the channel, and does not appear to exert control on bank stability or water temperature.

The largest threat to aquatic biota from project actions that could potentially lower the local groundwater table is stranding. Areas of backwater habitat sensitive to becoming disconnected from the main channel were not observed, so there is not potential for significant impacts from stranding.

Mitigation Measures:

The following mitigation measure is recommended to reduce the impact of HYD-3 to a less than significant level by maintaining groundwater dynamics:

MM HYD-3a: *Develop and implement a seasonal decommissioning plan that minimizes risk of incision.*

This mitigation measure is the same as the suite of mitigation measures discussed for Impact HYD-1. By taking measures to minimize incision, the risk of adversely affecting hydrologic support for riparian and aquatic biota becomes low.

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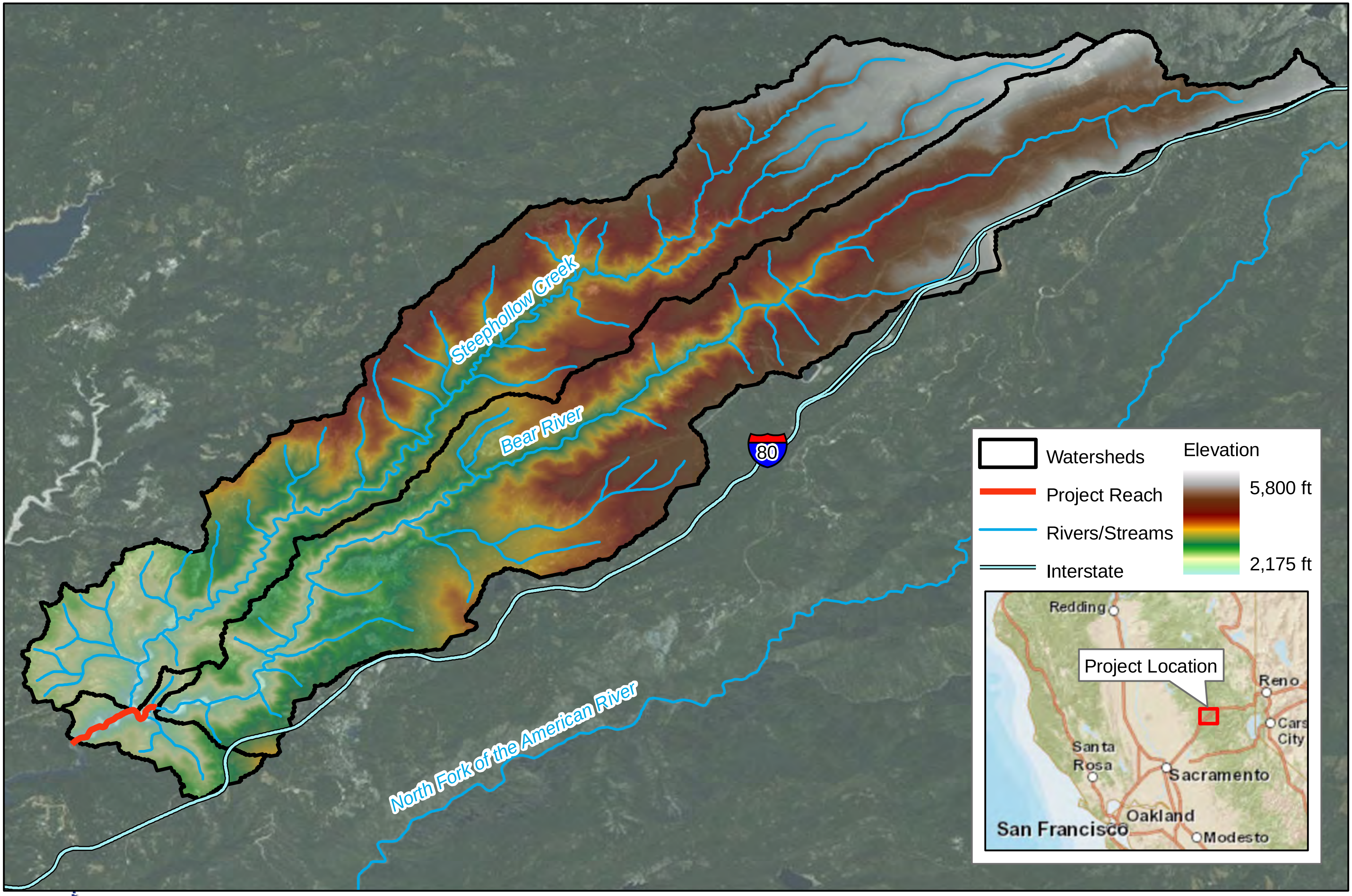

Balance Hydrologics, Inc.

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Figure 1. Project location and contributing watersheds, Secret Town Mine EIR Placer and Nevada Counties, California

Sources: ESRI, USGS, Placer County GIS, NHD

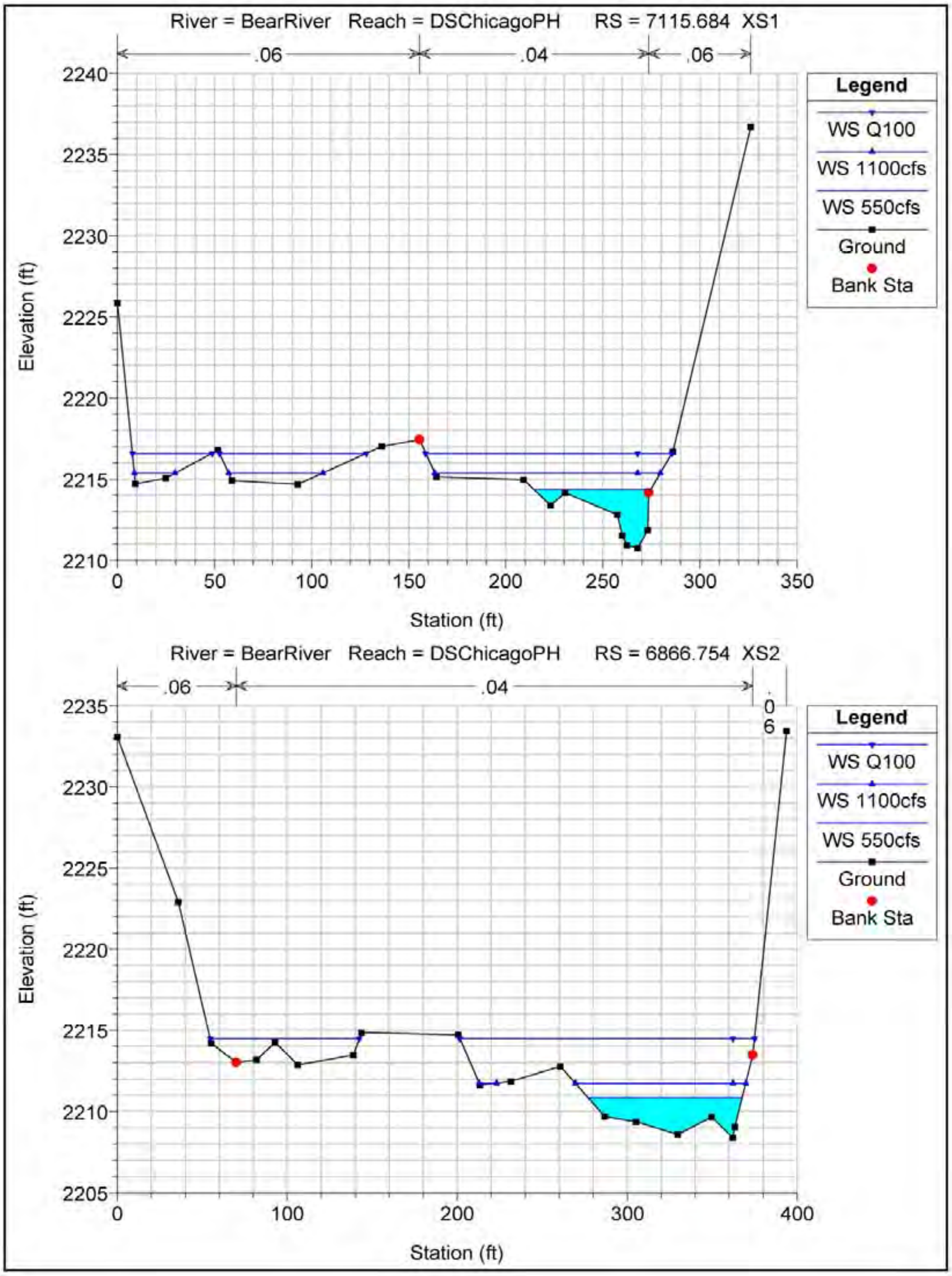

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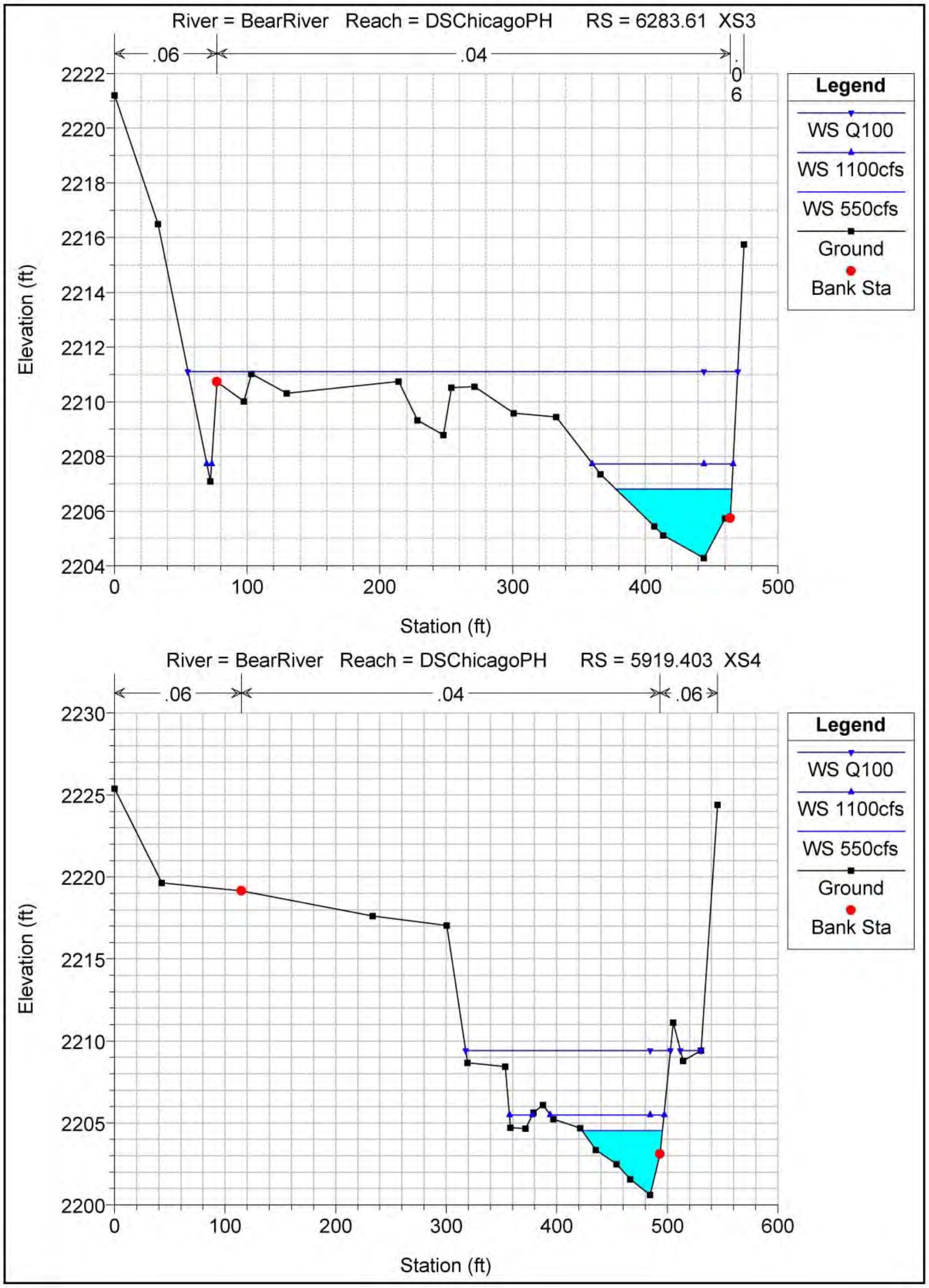
Figure 2. Channel Cross Sections and Hydraulic Model Output
Bear River Project EIR
Placer and Nevada Counties, California



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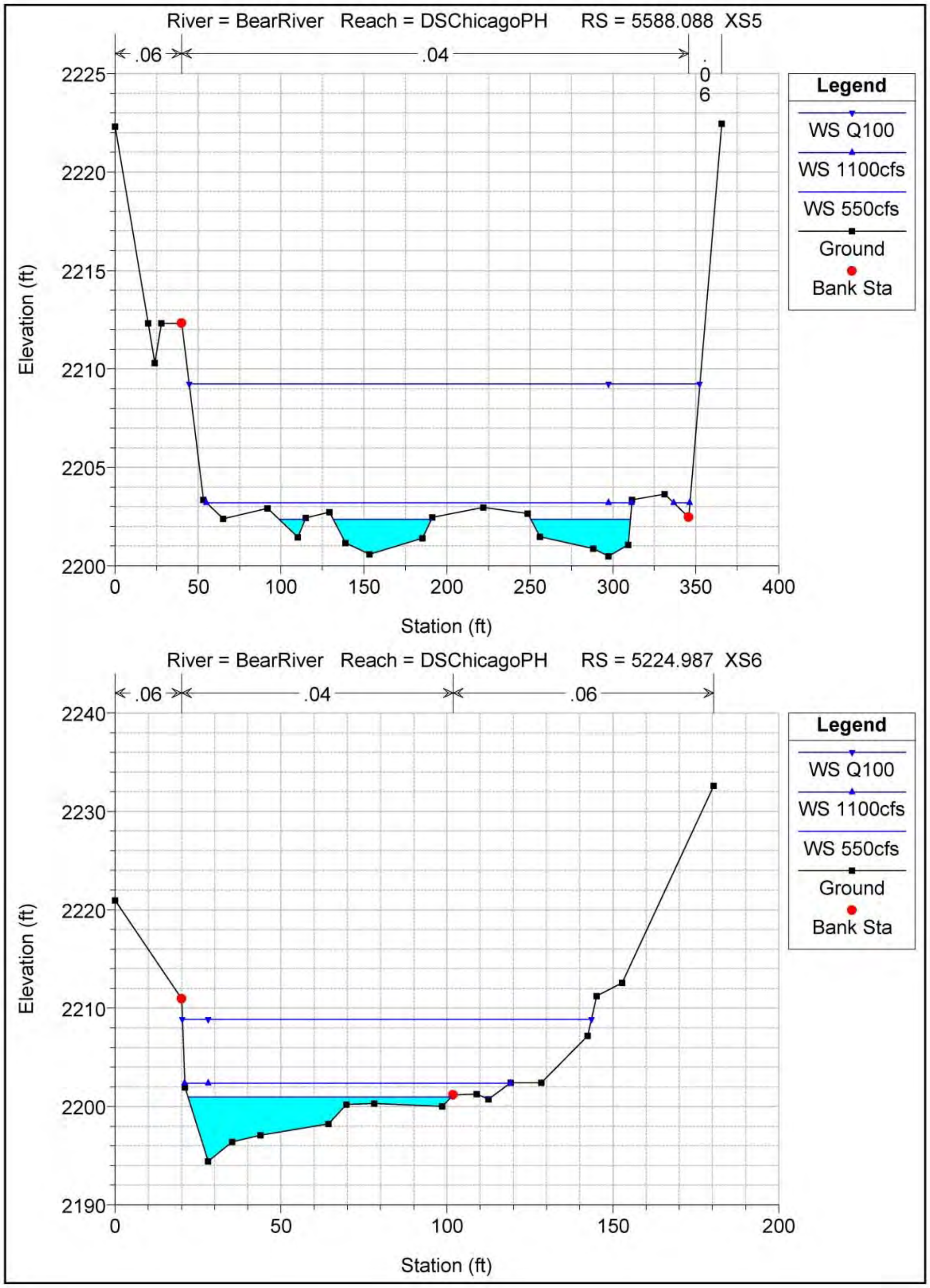

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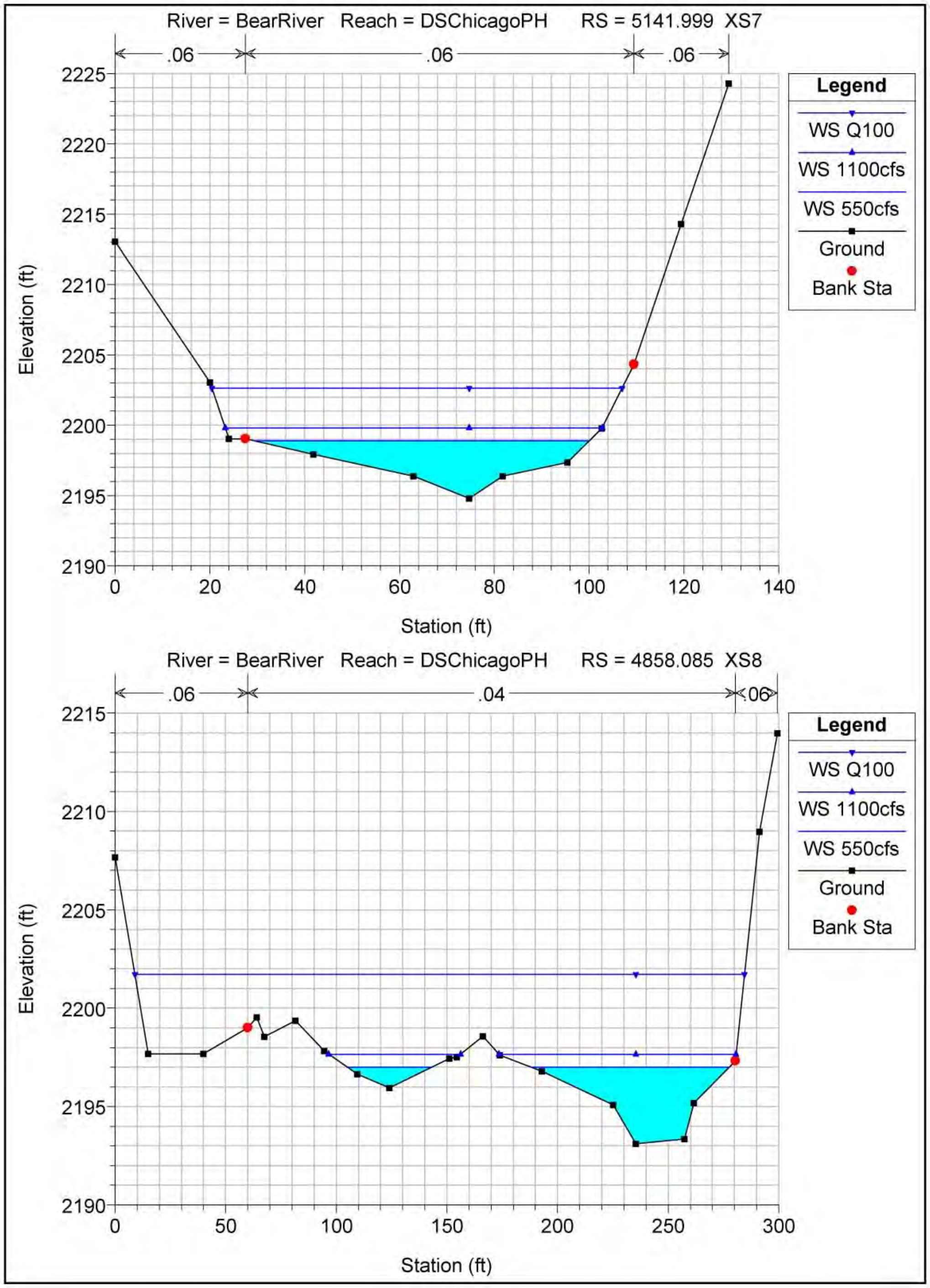

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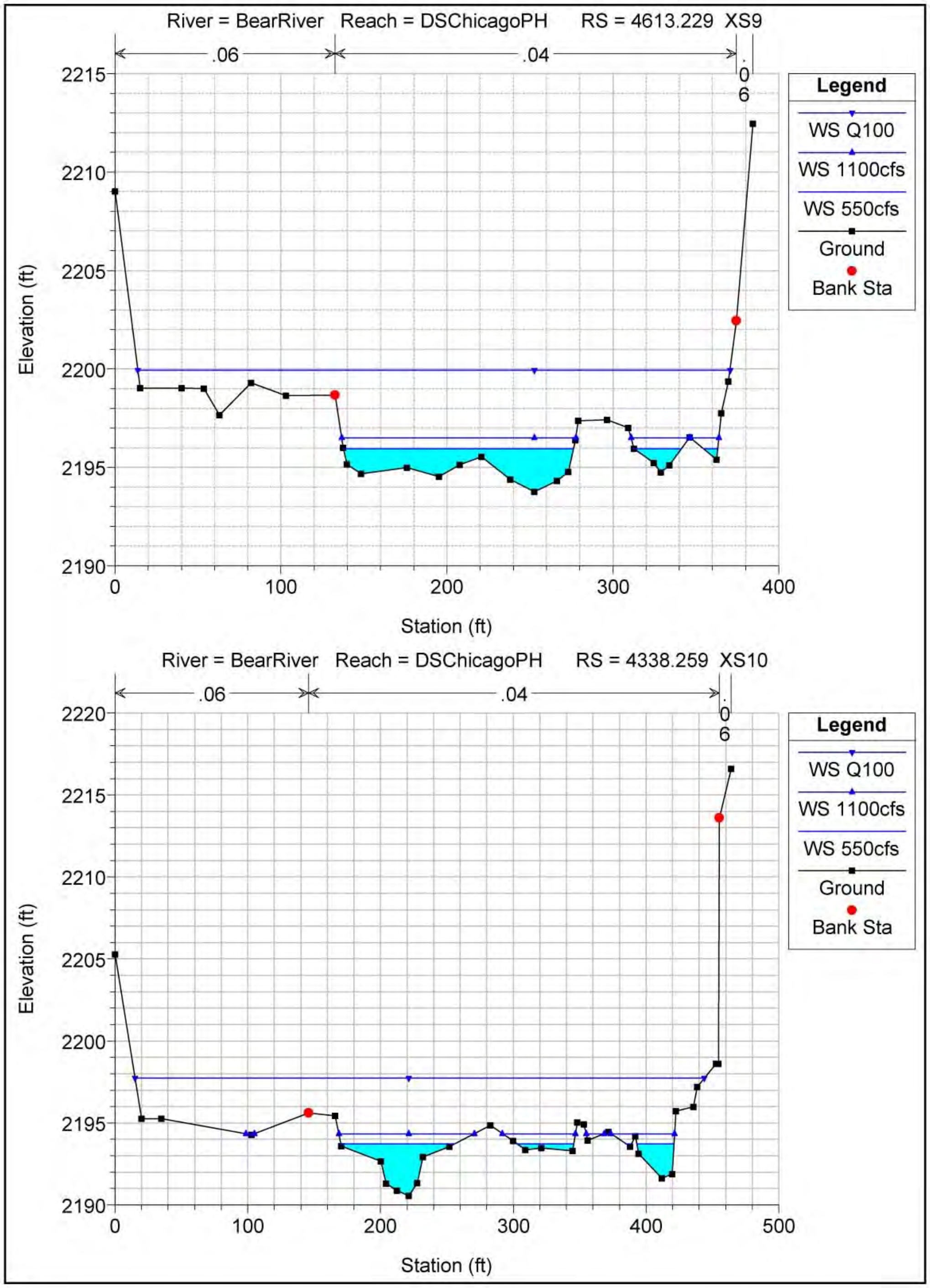

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Bear River Project EIR
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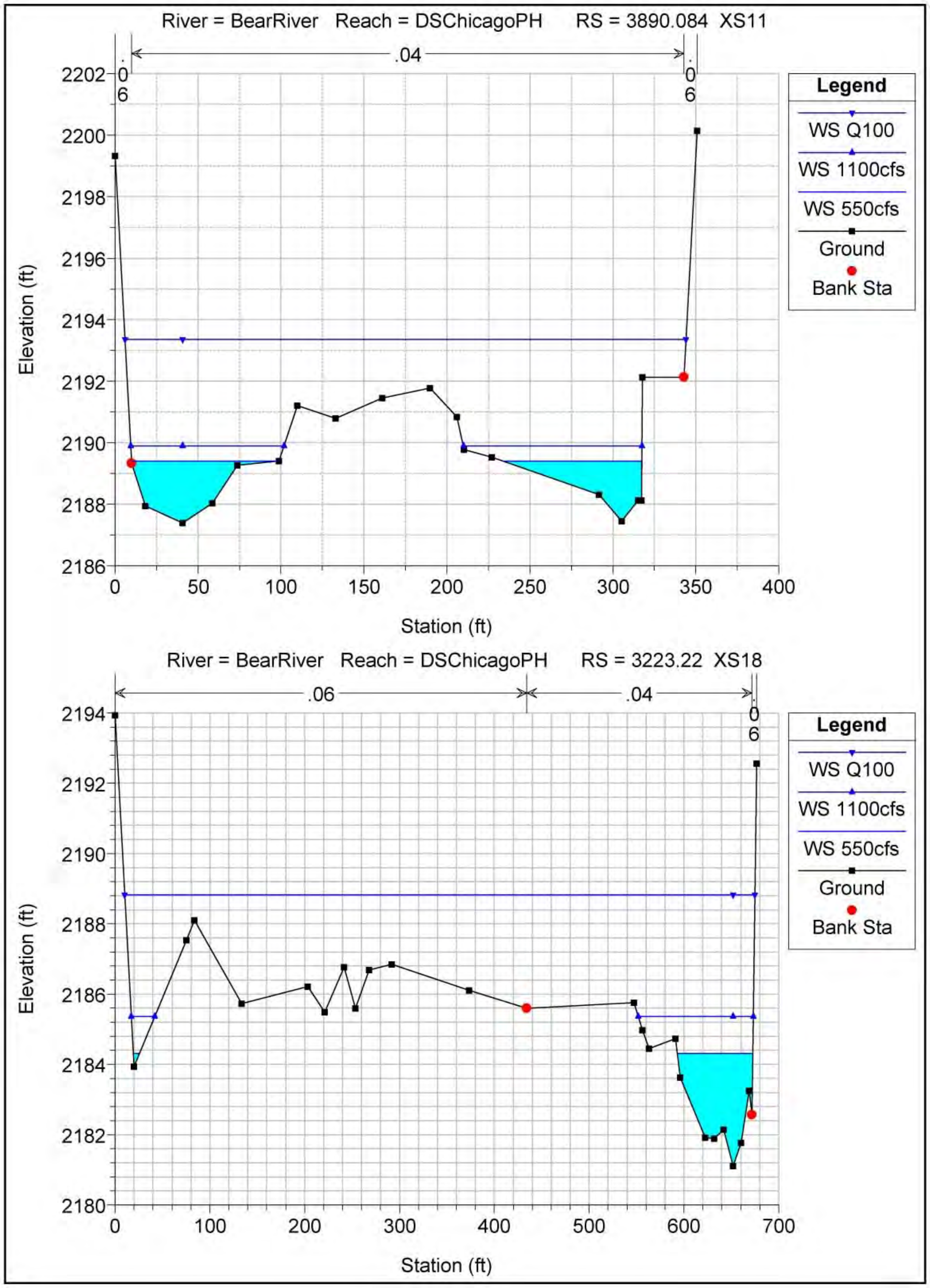

Balance Hydrologics, Inc.

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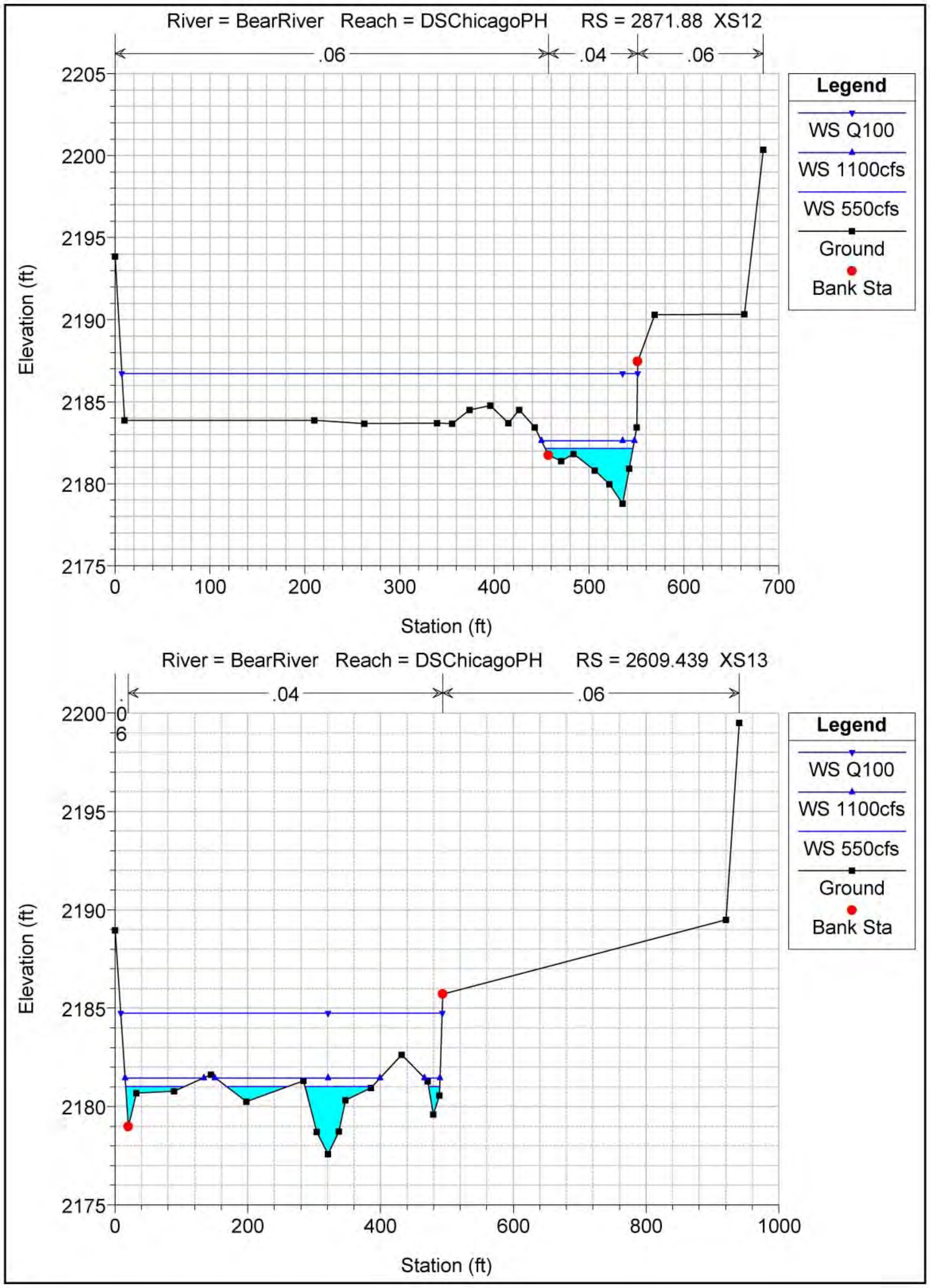

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Bear River Project EIR
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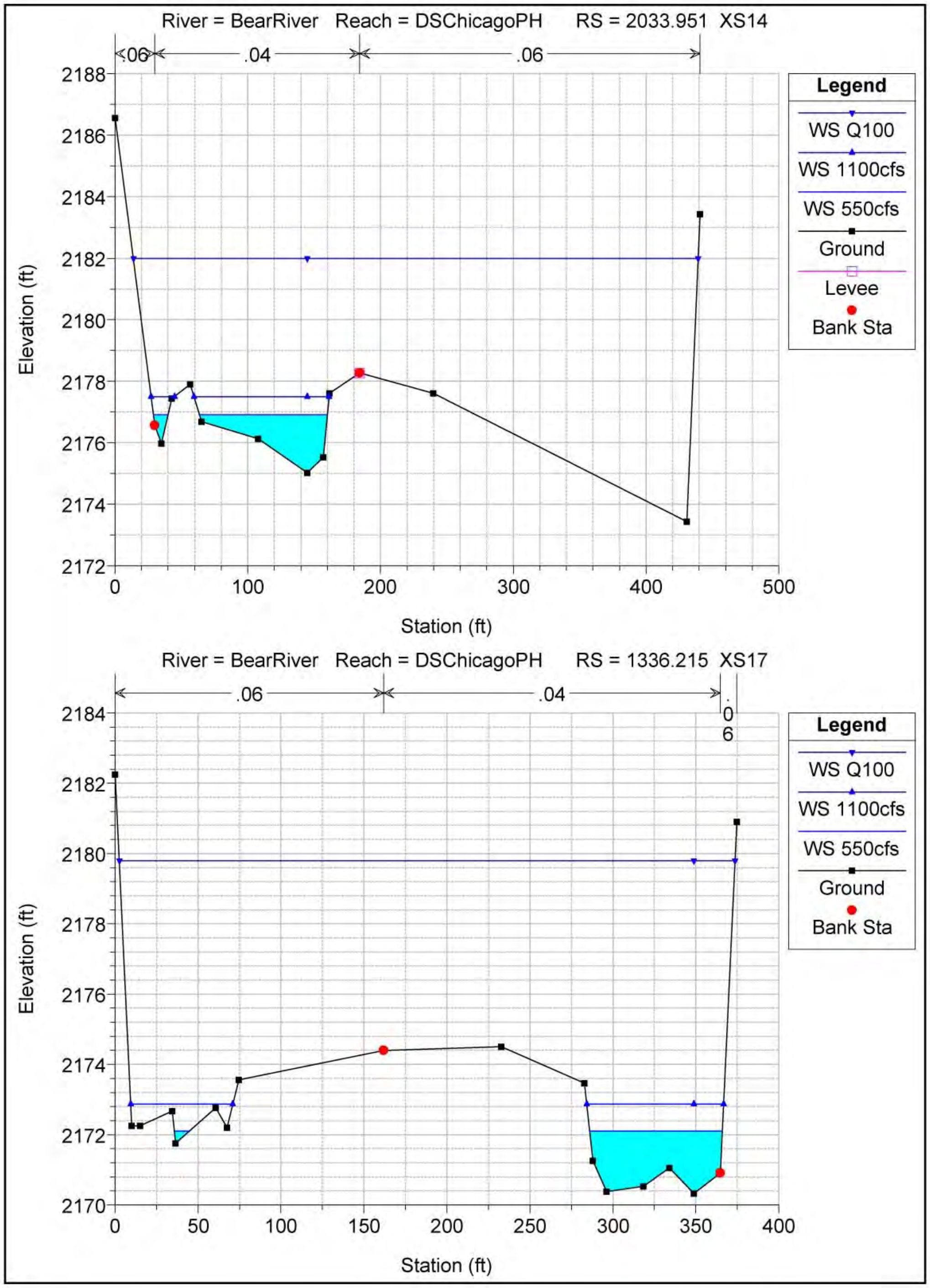

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Figure 2. Channel Cross Sections and Hydraulic Model Output
Bear River Project EIR
Placer and Nevada Counties, California

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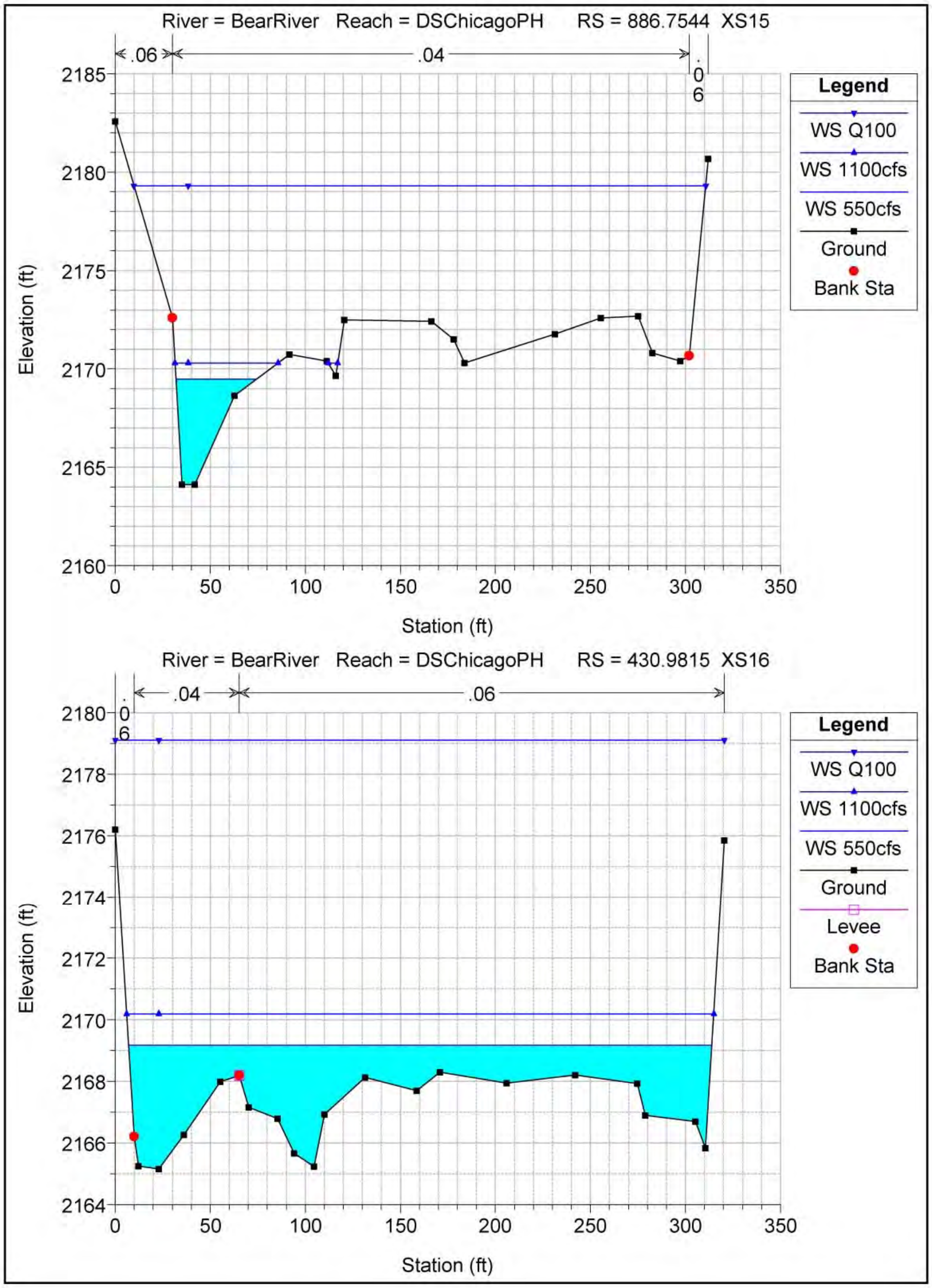

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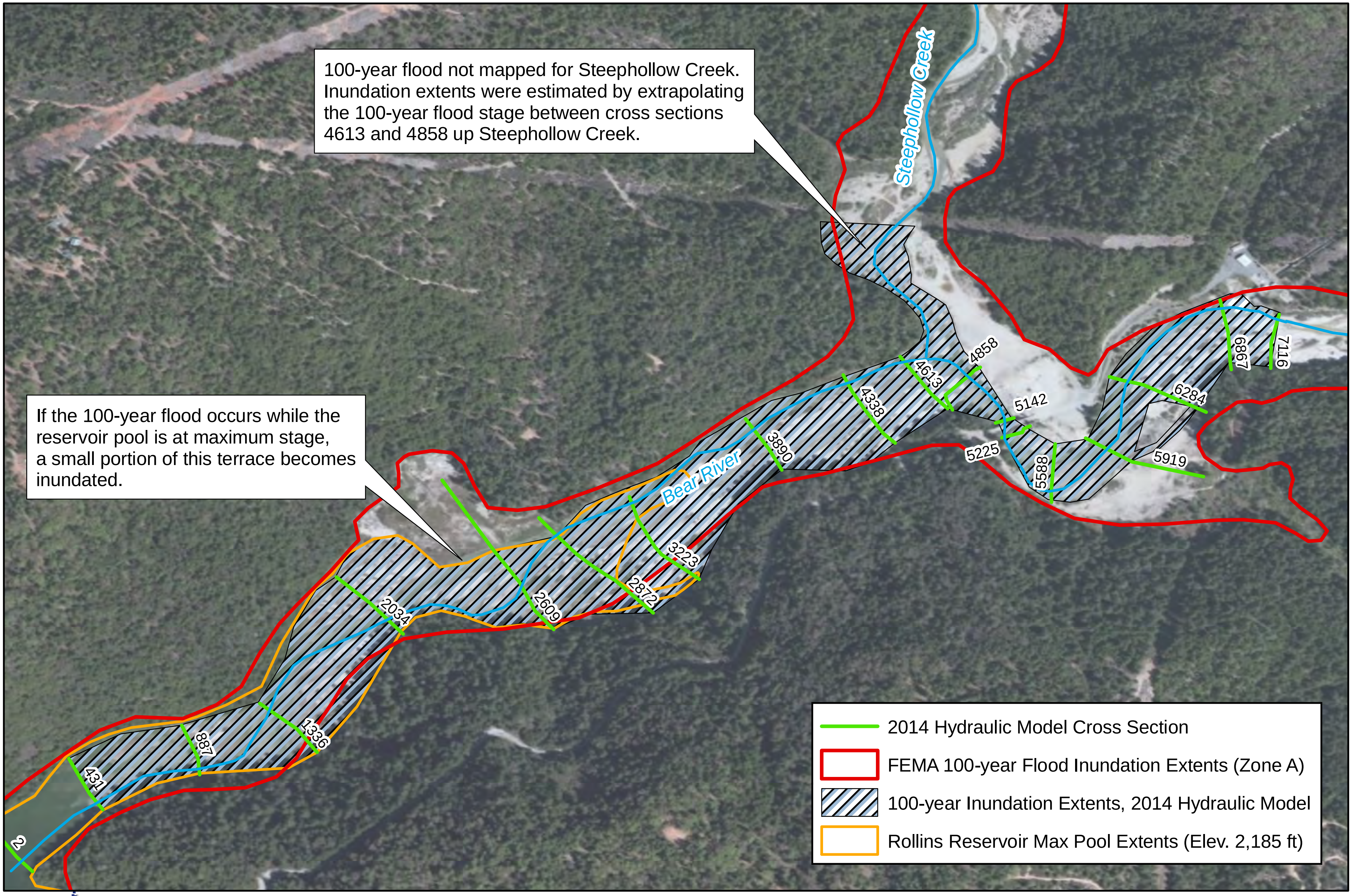

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Figure 3. 100-year flood inundation extents from FEMA and the 2014 hydraulic model, Secret Town Mine EIR Placer and Nevada Counties, California

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Sources: ESRI, USGS, FEMA, NHD

Grain size distribution on bar surfaces

Sample ID		PC1	PC2	PC3	PC4	PC5	PC6	PC7	PC8	GRID3SURF	GRID7SURF
D-10	(mm)	10.4	16.8	10.7	26.1	27.38	22.63	17.26	30.09	46.47	47.92
D-16	(mm)	13.0	20.7	12.8	34.4	37.95	30.91	21.01	34.68	51.44	52.36
D-50	(mm)	28.0	70.7	26.7	73.4	92.70	57.32	35.92	54.58	73.69	75.79
D-84	(mm)	62.6	137.2	57.7	125.5	153.68	106.40	61.90	83.43	97.32	106.02
D-90	(mm)	91.3	161.3	71.3	145.5	171.71	119.82	71.18	92.41	111.13	114.33

Grain size distribution below bar surfaces (subsurface)

Sample ID		BULK3	BULK6	GRID7SUB
D-10	(mm)	5.00	0.32	6.13
D-16	(mm)	8.89	0.40	8.82
D-50	(mm)	64.70	8.06	20.55
D-84	(mm)	102.90	24.18	42.33
D-90	(mm)	111.67	26.86	48.26

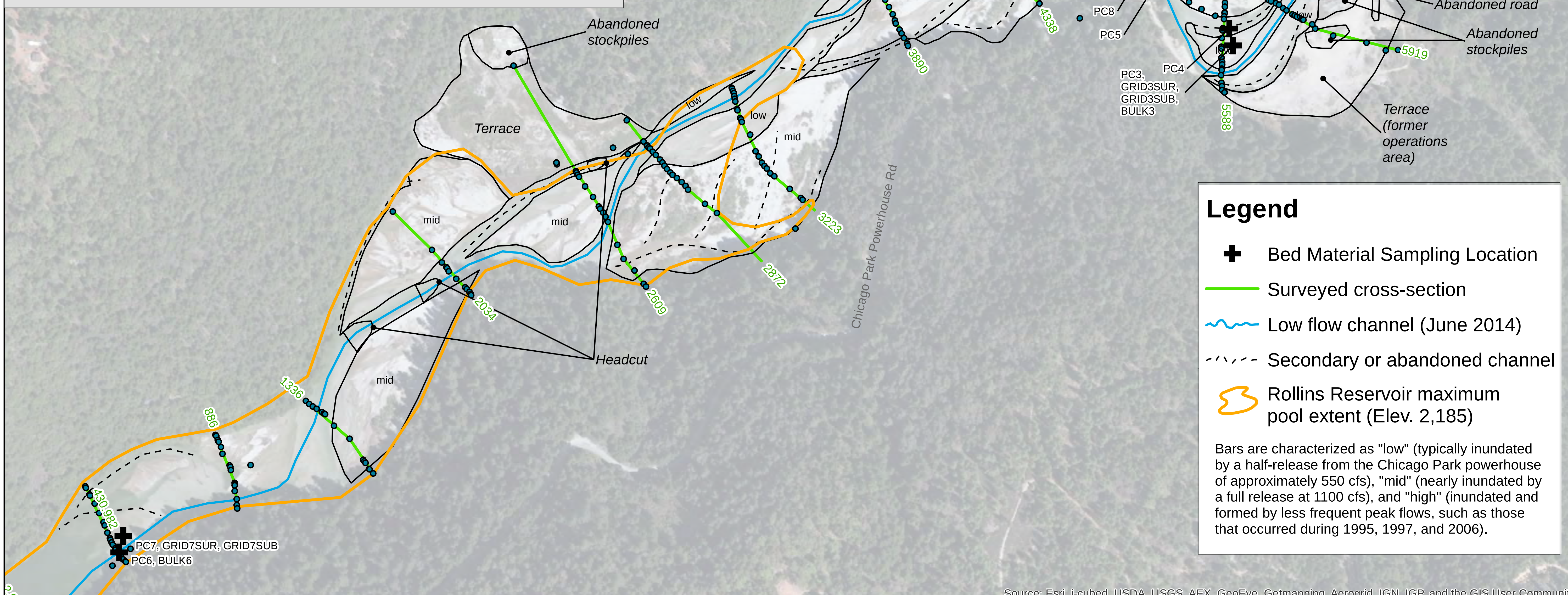

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Figure 4. Bear River Geomorphic Features
Nevada and Placer Counties, California

213071 Figure3-Geomorph map.mxd

Appendix A

Modeling Schematic of Projects

NID's Yuba-Bear Hydroelectric Project (FERC No. 2266) and

PG&E's Drum-Spaulding Project (FERC No. 2310)

Revision Date: April 2011

(Subject to Change)

APPENDIX H

Noise Studies

Environmental Noise Assessment

Bear River Restoration Project

Nevada and Placer Counties, California

BAC Job # 2013-088

Prepared For:

Dudek

Attn: Mr. Brian Grattidge
853 Lincoln Way, Suite 208
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Prepared By:

Bollard Acoustical Consultants, Inc.

Paul Bollard, President

January 22, 2014

BOLLARD
Acoustical Consultants

Introduction

The purpose of the Bear River Restoration (Project) is to restore and maintain reservoir capacity in Rollins Reservoir on an on-going basis through re-establishment of gravel skimming operations from the Bear River below the confluence with Steephollow Creek. The project area and site plan are provided as Figures 1 and 2, respectively.

This noise analysis has been prepared to assess the state of compliance of the project-related noise generation with the applicable Placer and Nevada County Noise Standards, as well as California Environmental Quality Act (CEQA) noise standards.

Environmental Setting

Background on Noise and Acoustical Terminology

Noise is often described as unwanted sound. Sound is defined as any pressure variation in air that the human ear can detect. If the pressure variations occur frequently enough (at least 20 times per second), they can be heard and are called sound. The number of pressure variations per second is called the frequency of sound, and is expressed as cycles per second, called Hertz (Hz).

Measuring sound directly in terms of pressure would require a very large and awkward range of numbers. The decibel scale was devised to compress this wide range of pressures into a more manageable range. The decibel scale uses the hearing threshold (20 micropascals of pressure), as a point of reference, defined as 0 dB. Other sound pressures are then compared to the reference pressure, and the logarithm is taken to keep the numbers in a practical range. The decibel scale allows a million-fold increase in pressure to be expressed as 120 dB. Another useful aspect of the decibel scale is that changes in decibel levels correspond closely to human perception of relative loudness. Figure 3 illustrates common noise levels associated with various sources.

The perceived loudness of sound is dependent upon many factors, including sound pressure level and frequency content. However, within the usual range of environmental noise levels, perception of loudness is relatively predictable, and can be approximated by weighing the frequency response of a sound level meter by means of the standardized A-weighing network. There is a strong correlation between A-weighted sound levels (expressed as dBA) and community response to noise. For this reason, the A-weighted sound level has become the standard tool of environmental noise assessment. All noise levels reported in this section are in terms of A-weighted levels. Please see Appendix A for definitions of acoustical terminology used in this report.

Figure 1

Bear River Restoration Project - Placer/Nevada County, California

Project Area, Nearest Noise-Sensitive Receivers, and Ambient Noise Monitoring Locations

BOLLARD Acoustical Consultants

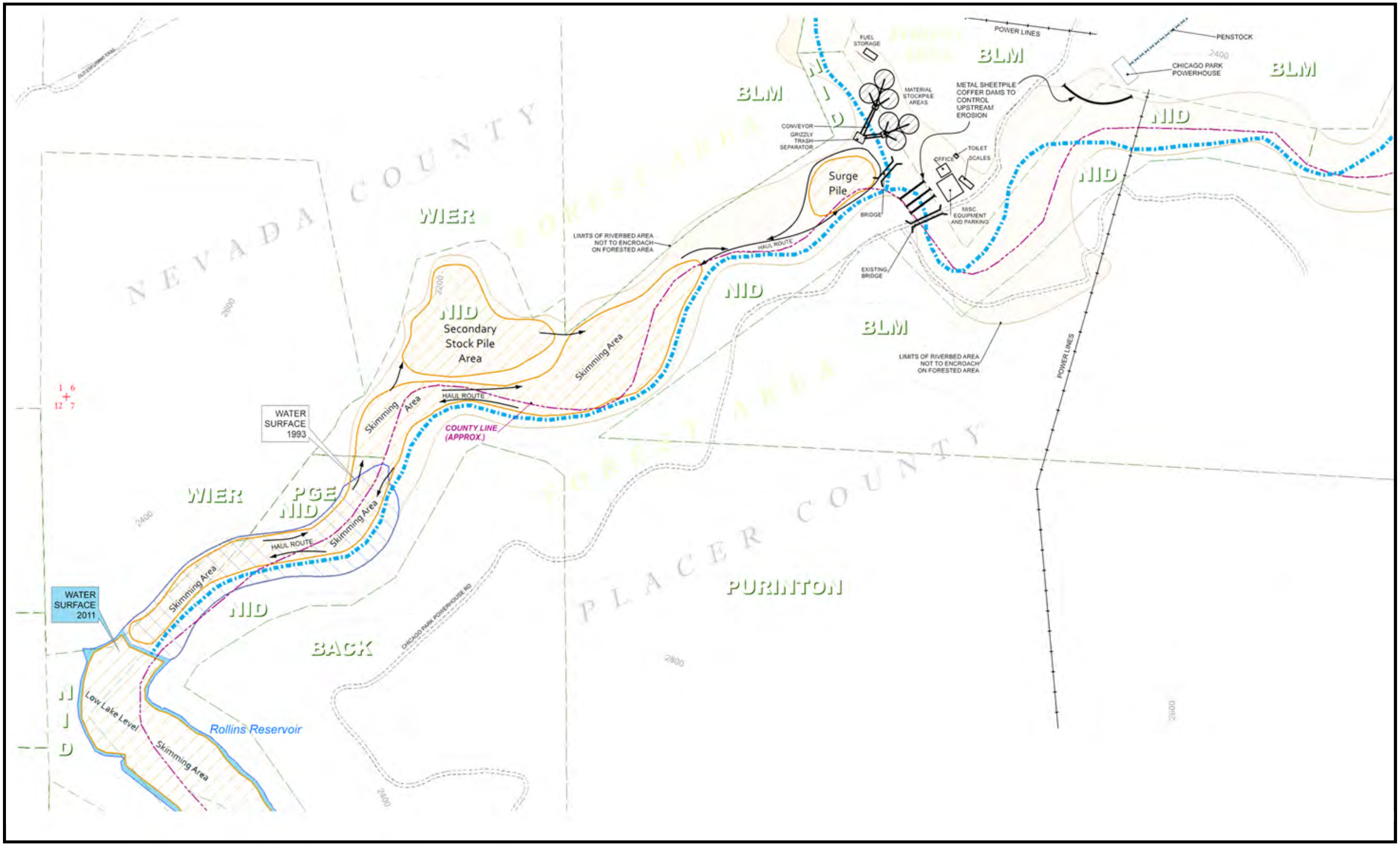
Scale (feet)

0 750 1,500

Figure 2

Bear River Restoration Project - Placer/Nevada County, California

Project Site Plan



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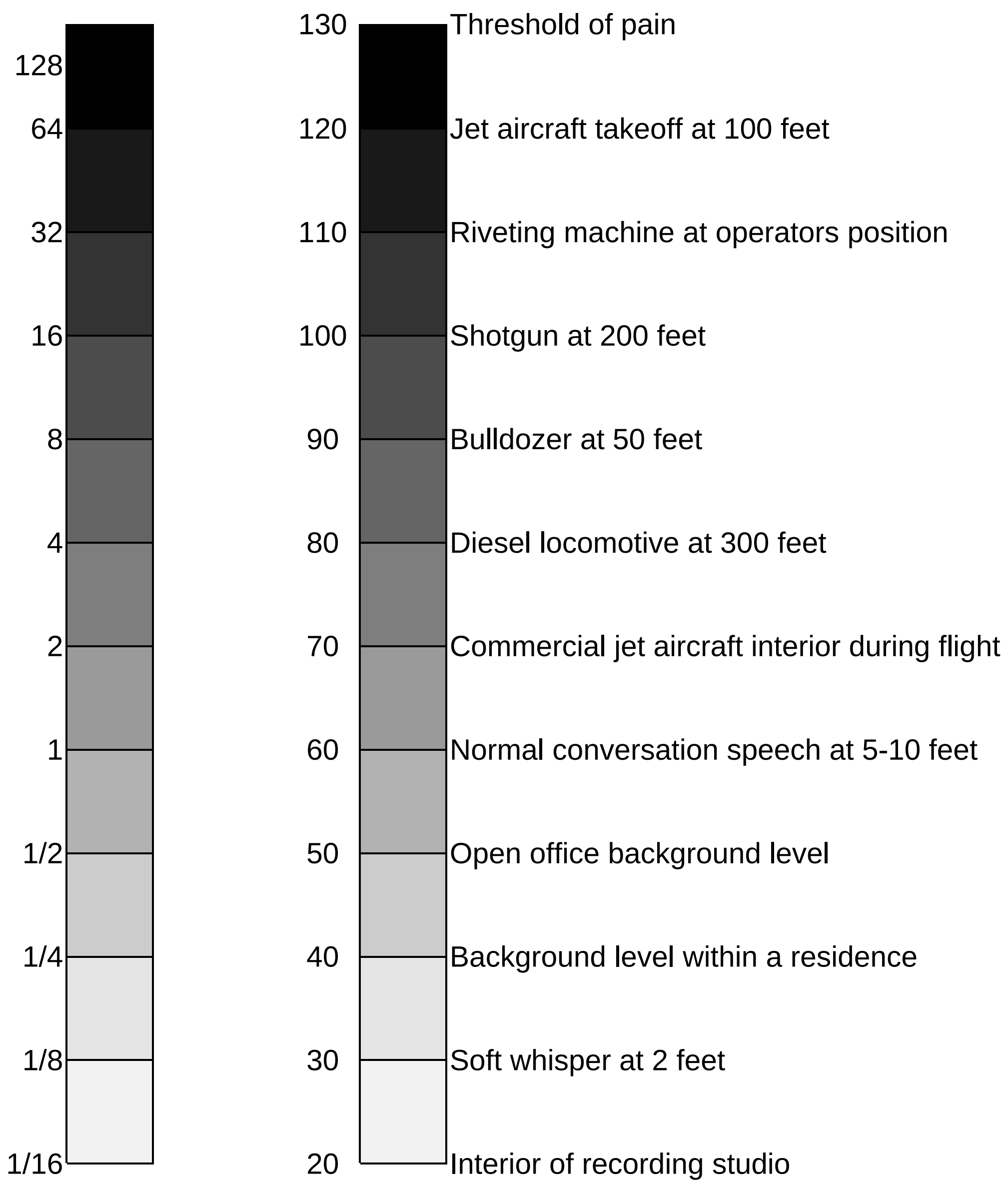
Scale (feet)

0 400 800

Figure 3
Typical A-Weighted Sound Levels of Common Noise Sources

<u>Loudness Ratio Level</u>   <u>A-Weighted Sound Level (dBA)</u>



Existing Land Uses in the Project Vicinity

Proposed gravel skimming operations will take place on the Bear River, just northeast of Rollins Reservoir. There are large-lot rural residential uses on both sides of the Bear River in both Nevada and Placer Counties. At its closest position, the aggregate skimming equipment would be located 1,300 feet from the nearest existing residential use, as indicated in Figure 4. The nearest residence to the proposed aggregate haul route would be approximately 500 feet from that roadway.

Existing Noise Environment in the Project Vicinity

The existing noise environment in the immediate project area is fairly quiet, with the main noise source being nature (wind in trees, birds, etc.). To quantify ambient noise levels in the immediate project vicinity, BAC conducted a continuous noise level measurement survey at two locations from November 22-25, 2013. The noise measurement locations were selected to be generally representative of the noise exposure received at the residences located nearest to the project operations. The measurement locations are shown on Figure 1.

Larson Davis Laboratories (LDL) Model 820 precision integrating sound level meters were used for the noise level measurement survey. The meters were calibrated before and after use with an LDL Model CA200 acoustical calibrator to ensure the accuracy of the measurements. The equipment used meets all specifications of the American National Standards Institute requirements for Type 1 sound level meters (ANSI S1.4).

The ambient noise measurement results are shown in Table 1. Those data revealed that existing ambient noise levels are fairly low, with L_{dn} values ranging from 45 to 48 dB over the monitoring period. Complete listings and graphical depictions of the ambient noise measurement data are contained in Appendices B and C.

Figure 4

Bear River Restoration Project - Placer/Nevada County, California

Distances from Project Operations to Nearest Noise-Sensitive Receivers

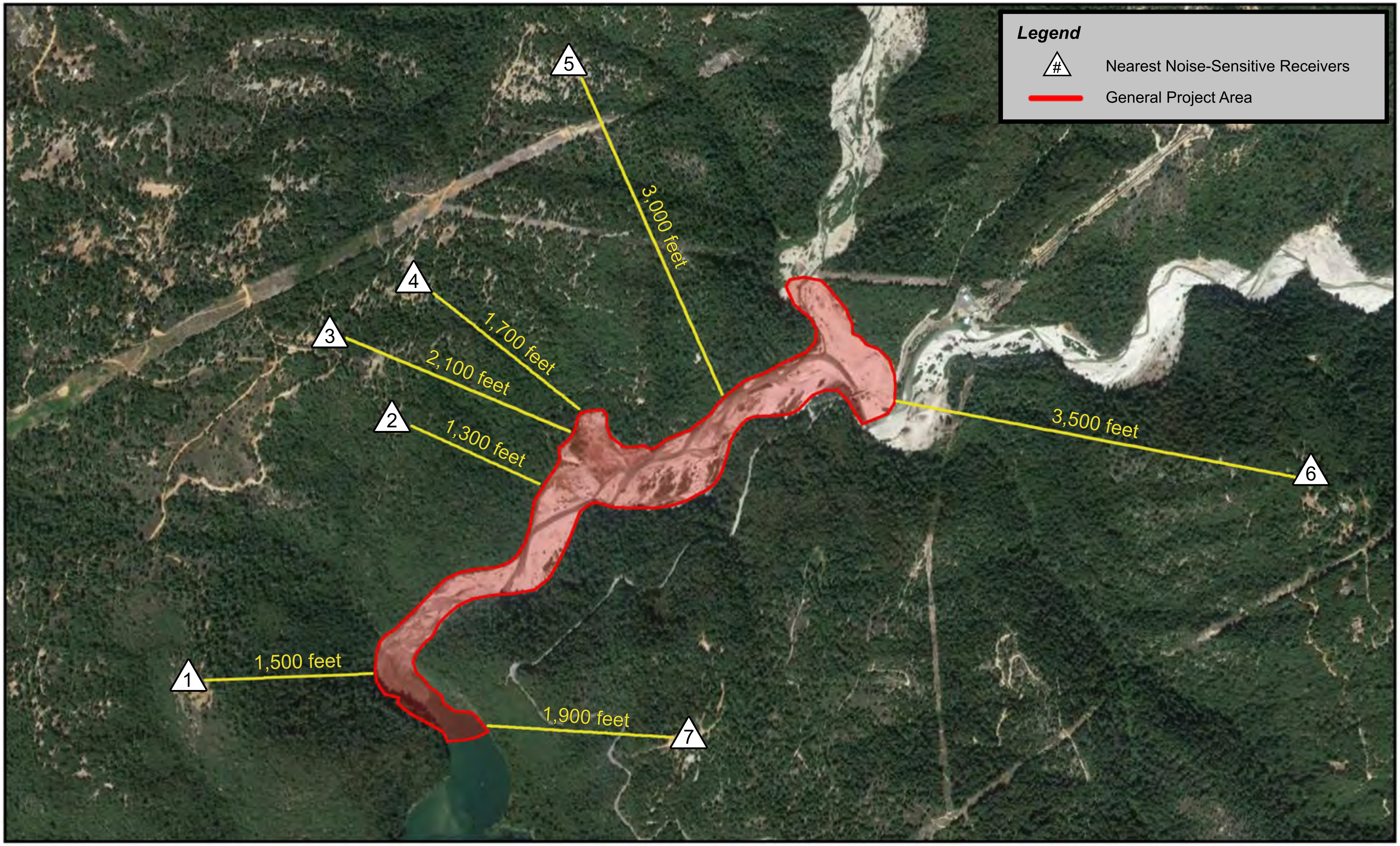


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Table 1
Statistical Summary of Ambient Noise Measurement Results[1] – November 22-25, 2013
Bear River Restoration Project – Placer/Nevada County, California

			Average (L_{eq}, dB)[3]		Maximum (L_{max}, dB)[4]	
Site[2]	Date	L_{dn}, dB	Day	Night	Day	Night
A	November 22	44	43	35	79	48
	November 23	47	43	40	78	57
	November 24	46	44	37	83	65
	November 25	45	40	38	68	52
B	November 22	48	43	42	73	49
	November 23	48	42	42	64	56
	November 24	58	60	39	100	55
	November 25	46	41	40	67	60

Notes:
1 Detailed noise level measurement results are provided in Appendices B and C.
2 The locations of noise measurement sites are shown on Figure 1.
3 Average (L_{eq}) noise data represents energy average of all ambient noise measured during daytime (7 a.m. to 10 p.m.) and nighttime (10 p.m. to 7 a.m.) periods for the dates shown.
4 Maximum (L_{max}) noise data represents the highest noise level measured during the daytime and nighttime period of the dates shown.

Regulatory Setting

State & Federal

There are no State or Federal Noise Criteria which would be directly applicable to this project.

Nevada County

Nevada County General Plan Noise Element

The Nevada County General Plan Noise Element contains the following policies which would be applicable to this project.

Policy 9.1 The following noise standards (Table 2), as performance standards and land use compatibility standards, shall apply to all discretionary and ministerial projects excluding permitted residential (including tentative maps) land uses.

Table 2
Noise Exposure Limits
Nevada County Noise Element of the General Plan

Land Use Category	Time Period	L_{eq}, dB	L_{max}, dB
Rural	7 a.m. - 7 p.m.	55	75
	7 p.m. - 10 p.m.	50	65
	10 p.m. - 7 a.m.	40	55
Residential & Public	7 a.m. - 7 p.m.	55	75
	7 p.m. - 10 p.m.	50	65
	10 p.m. - 7 a.m.	45	60
Commercial & Recreation	7 a.m. - 7 p.m.	70	90
	7 p.m. - 7 a.m.	65	75
Business Park	7 a.m. - 7 p.m.	65	85
	7 p.m. - 7 a.m.	60	70
Industrial	any time	80	80

Notes:

Where two different zoning districts abut, the standard applicable to the lower, or more restrictive, district plus 5 dBA shall apply.

The above standards shall be measured only on property containing a noise sensitive land use as defined in Policy 9.8 and may be measured anywhere on the property containing said land use.

If the measured ambient level exceeds that permitted, then the allowable noise exposure standard shall be set at 5dB above the ambient.

Because of the unique nature of sound, the County reserves the right to provide for a more restrictive standard than shown in this table. The maximum adjustment shall be limited to no less than the current ambient noise levels and shall not exceed the standards of this policy or as they may be further adjusted by Policy 9.lb.

The above standards shall not apply to those activities associated with the actual construction of a project or to those projects associated with the provision of emergency services or functions.

Source: Nevada County General Plan

Policy 9.9 Limit future noise generating land use to those location of the County where their Impacts on noise sensitive land uses will be minimized, consistent with the standards found in Policy 9.1.

Policy 9.10 Require the preparation of a comprehensive noise study for all land use projects determined to have a potential to create noise levels inconsistent with those standards found in Policy 9.1, and in accordance with the methodology identified in the Noise Element Manual contained in General Plan Volume 2, Section 3 - Noise Analysis Appendix A.

Nevada County Code

Title 3, Chapter II, Article 4, Division 4.1.7 of the Nevada County Code regulates noise. The following specific provisions of the County Noise Code would be applicable to this project.

D. Noise Standards All land use projects requiring a Development Permit or a Use Permit hall comply with the noise standards provided herein. Permitted residential land uses, including parcel and tentative maps, are not subject to the standards contained in Table L-II 4.1.7 of the County Code.

Because County Code Table That Table is L-II 4.1.7 is identical to the County General Plan Noise Element standards shown in Table 2 above, it is not reproduced here.

Placer County

Placer County General Plan Noise Element

The Placer County General Plan Noise Element contains the following policies which would be applicable to this project.

9.A.2. Noise created by new proposed non-transportation noise sources shall be mitigated so as not to exceed the noise level standards of Table 3 as measured immediately within the property line of lands designated for noise-sensitive uses: provided, however, the noise created by occasional events occurring within a stadium on land zoned for university purposes may temporarily exceed these standards as provided in an approved Specific Plan.

9.A.9. Noise created by new transportation noise sources, including roadway improvement projects, shall be mitigated so as not to exceed the levels specified in Table 4 or the performance standards in Table 9-3 at outdoor activity areas or interior spaces of existing noise sensitive land uses.

9.A.12. Where noise mitigation measures are required to achieve the standards of Tables 3 and 4, the emphasis of such measures shall be placed upon site planning and project design. The use of noise barriers shall be considered as a means of achieving the noise standards only after all other practical design-related noise mitigation measure have been integrated into the project.

Table 3
Allowable Ldn Noise Levels within Specified Zone Districts
Applicable to New Projects Affected by or Including Non-Transportation Noise Sources

Sources Zone District of Receptor	Property Line of Receiving Use	Interior Spaces2
Residential Adjacent to Industrial3	60	45
Other Residential4	50	45
Office/Professional	70	45
Transient Lodging	65	45
Neighborhood Commercial	70	45
General Commercial	70	45
Heavy Commercial	75	45
Limited Industrial	75	45
Highway Service	75	45
Shopping Center	70	45
Industrial	---	45
Industrial Park	75	45
Industrial Reserve	---	---
Airport	---	45
Unclassified	---	---
Farm	(see footnote 6)	---
Agriculture Exclusive	(see footnote 6)	---
Forestry	---	---
Timberland Preserve	---	---
Recreation & Forestry	70	---
Open Space	---	---
Mineral Reserve	---	---

Notes:

- Except where noted otherwise, noise exposures will be those which occur at the property line of the receiving use.
- Where existing transportation noise levels exceed the standards of this table, the allowable Ldn shall be raised to the same level as that of the ambient level.
- If the noise source generated by, or affecting, the uses shown above consists primarily of speech or music, of if the noise source is impulsive in nature, the noise standards shown above shall be decreased by 5 dB.
- Where a use permit has established noise level standards for an existing use, those standards shall supersede the levels specified in Table 9-1 and Table 9-3. Similarly, where an existing use which is not subject to a use permit causes noise in excess of the allowable levels in Tables 9-1 and 9-3, said excess noise shall be considered the allowable level. If a new development is proposed which will be affected by noise from such an existing use, it will ordinarily be assumed that the noise levels already existing or those levels allowed by the existing use permit, whichever are greater, are those levels actually produced by the existing use.
- Existing industry located in industrial zones will be given the benefit of the doubt in being allowed to emit increased noise consistent with the state of the art[5] at the time of expansion. In no case will expansion of an existing industrial operation because to decrease allowable noise emission limits. Increased emissions above those normally allowable should be limited to a one-time 5 dB increase at the discretion of the decision making body.
- The noise level standards applicable to land uses containing incidental residential uses, such as caretaker dwellings at industrial facilities and homes on agriculturally zoned land, shall be the standards applicable to the zone district, not those applicable to residential uses.
- Where no noise level standards have been provided for a specific zone district, it is assumed that the interior and/or exterior spaces of these uses are effectively insensitive to noise.

Table 4
Maximum Allowable Noise Exposure
Transportation Noise Sources

Noise Sensitive Land Uses	Outdoor Activity Areas Ldn/CNEL, dB	Interior Spaces Ldn/CNEL,dB	Interior Spaces Leq, dB
Residential	60	45	--
Transient Lodging	60	45	--
Hospitals, Nursing Homes	60	45	--
Theaters, Auditoriums, Music Halls	--	--	35
Churches, Meeting Halls	60	--	40
Office Buildings	--	--	45
Schools, Libraries, Museums	--	--	45
Playgrounds, Neighborhood Parks	70	--	--

- Where the location of outdoor activity areas is unknown, the exterior noise level standard shall be applied to the property line of the receiving land use.
- Leq as determined for a typical worst-case hour during periods of use.
- Where it is not possible to reduce noise in outdoor activity areas to 60 dB L_{dn}/CNEL or less using a practical application of the best-available noise reduction measures, an exterior noise level of up to 65 dB L_{dn}/CNEL may be allowed provided that available exterior noise level reduction measures have been implemented and interior noise levels are in compliance with this table.

<u>Placer County Code</u>

Article 9.36 of the Placer County Code regulates noise. The following specific provisions of the County Noise Code would be applicable to this project.

9.36.060A. It is unlawful for any person at any location to create any sound, or to allow the creation of any sound, on property owned, leased, occupied or otherwise controlled by such person that:

1. Causes the exterior sound level when measured at the property line of any affected sensitive receptor to exceed the ambient sound level by five dBA; or

2. Exceeds the sound level standards as set forth in Table 5, whichever is the greater.

Table 5
Sound Level Standards (on-site)
Placer County Code

Sound Level Descriptor	Daytime (7 am – 10 pm)	Nighttime (10 pm – 7 am)
Hourly Leq, dB	55	45
Maximum Level (Lmax) dB	70	65

- Each of the sound level standards specified in Table 1 shall be reduced by five dB for simple tone noises, consisting of speech and music. However, in no case shall the sound level standard be lower than the ambient sound level plus five dB.
- If the intruding sound source is continuous and cannot reasonably be discontinued or stopped for a time period whereby the ambient sound level can be measured, the sound level measured while the source is in operation shall be compared directly to the sound level standards of Table 5.

Impacts and Mitigation Measures

Thresholds of Significance

According to the California Environmental Quality Act (CEQA), a project would have a significant impact upon the environment if it would result in….

a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

- Noise sources affecting sensitive receptors in Placer County are evaluated relative to the applicable Placer County General Plan Noise Element and Noise Ordinance Standards presented previously in this report.

- Noise sources affecting sensitive receptors in Nevada County are evaluated relative to the applicable Nevada County General Plan Noise Element and Noise Ordinance Standards presented previously in this report.

b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?

- Because ground-borne vibration dissipates very rapidly with distance, and because the nearest residences to the gravel extraction and project haul routes are 1,300 and 500 feet away, vibration levels associated with the project would be imperceptible and no evaluation of vibration impacts is warranted.

c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

- Given the very low measured ambient conditions in the general project vicinity (below 60 dB Ldn), project-generated noise levels in excess of 5 dB above ambient conditions without the project is considered significant.

d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

- Given the very low measured ambient conditions in the general project vicinity (below 60 dB Ldn), project-generated noise levels in excess of 5 dB above ambient conditions without the project is considered significant.

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

- Because the project is not located within an airport land use plan or within 2 miles of a public airport, this significance threshold would not apply to this project.

f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?

- Because the project is not located in the vicinity of a private airstrip, this significance threshold would not apply to this project.

Methodology

There are two (2) distinct noise-producing components of this project. The first component consists of on-site heavy equipment utilized during gravel extraction (front end loaders, scrapers, water trucks, haul trucks, etc.). The noise generation of these sources is estimated from BAC file data for similar sources to be approximately 80 dB Lmax and 70 dB Leq at a reference distance of 100 feet from the operating equipment. Based on a noise reduction rate of 6 dB per each doubling of distance from the noise source, the resulting average and maximum noise levels at the nearest residence located 1,300 feet from the proposed operations would be approximately 53 dB Lmax and 43 dB Leq, after accounting for shielding by intervening topography and vegetation. Noise levels at the more distant residences would be even lower due to normal decreases of noise with increasing distance. Table 6 shows the predicted noise levels for the onsite gravel skimming and stockpiling operations.

Table 6
Summary of On-Site Project Noise Generation
Bear River Restoration Project – Placer/Nevada County, California

		Reference Noise Levels[3]		Predicted Noise Levels (dB)[4]	
Receiver[1]	Distance (feet)[2]	L_{eq}	L_{max}	L_{eq}	L_{max}
1	1500			41	51
2	1300			43	53
3	2100			39	49
4	1700	70 dB @ 100'	80 dB @ 100'	40	50
5	3000			35	45
6	3500			34	44
7	1900			39	49

Notes
1 Receiver Locations are identified on Figure 1.
2 Distances were scaled from receiver to nearest project gravel extraction area.
3 Reference noise level data was obtained from BAC file data.
4 Predicted noise levels include a conservative application of -5 dB for shielding by intervening topography and excess ground and vegetative screening.

The second noise source component of the project consists of off-site heavy trucks used for transport of excavated gravel material from the project site to various markets. Based on 250,000 tons of material per year at approximately 25 tons per truck, the project would generate approximately 10,000 truck loads (20,000 trips) over the course of the proposed 7-month operating year (April through October). Based on 6 operating days per week during that period (180 operating days per year), the average number of truck trips generated on the haul road would be approximately 110 per day, or about 10 per hour. The noise generation of this aspect of the project was estimated using the Federal Highway Administration Noise Prediction Model to be approximately 35 dB Ldn and 38 dB Leq at the nearest residence located 500+ feet from the haul road, after accounting for shielding by intervening topography and vegetation.

Specific Impacts and Mitigation Measures

Impact 1: Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance.

As indicated in Table 6, on-site project noise sources are predicted to generate average noise levels ranging from 34-43 dB Leq at the nearest existing residences to the proposed excavation areas. Both Nevada and Placer Counties apply 55 dB Leq daytime noise standards to residential land uses affected by non-transportation noise sources. Therefore, on-site noise sources are predicted to satisfy the applicable daytime average noise level standards of both Placer and Nevada Counties.

Table 6 also indicates that on-site project noise sources are predicted to generate maximum noise levels ranging from 44-53 dB Lmax at the nearest existing residences to the proposed excavation areas. Nevada and Placer Counties apply 75 and 70 dB Lmax daytime noise standards, respectively, to residential land uses affected by non-transportation noise sources. Therefore, on-site noise sources are predicted to satisfy the applicable daytime maximum noise level standards of both Placer and Nevada Counties.

As noted in the methodology section of this report, off-site traffic noise levels generated by project truck traffic on the haul route between the excavation area and I-80 are predicted to be 35 dB Ldn at the nearest residence to the haul road. Both Placer and Nevada Counties apply a 60 dB Ldn standard to the exterior areas of residences affected by transportation noise sources. Therefore, project-generated traffic will satisfy the transportation noise sources for both Placer and Nevada Counties.

Because both on-site excavation noise and off-site truck traffic noise levels are predicted to be below the applicable noise standards at existing residences in both Placer and Nevada Counties, this impact is considered ***less than significant***.

Impact 2: Exposure of persons to a substantial permanent or temporary increase in ambient noise levels in the project vicinity above levels existing without the project?

The ambient noise measurement results provided in Table 1 indicate that existing ambient noise levels in the general project vicinity ranged from approximately 45-50 dB Ldn, 40-45 dB Leq, and 70-80 dB Lmax.

As indicated in Table 6, on-site project noise sources are predicted to generate average noise levels ranging from 34-43 dB Leq at the nearest existing residences to the proposed excavation areas. Therefore, on-site noise sources are not predicted to exceed measured existing average (Leq) noise levels by more than 5 dB Leq at existing residences in the project vicinity.

Table 6 also indicates that on-site project noise sources are predicted to generate maximum noise levels ranging from 44-53 dB Lmax at the nearest existing residences to the proposed excavation areas. Therefore, on-site noise sources are not predicted to exceed measured existing maximum (Lmax) noise levels by more than 5 dB Leq at existing residences in the project vicinity.

As noted in the methodology section of this report, off-site traffic noise levels generated by project truck traffic on the haul route between the excavation area and I-80 are predicted to be 35 dB Ldn and 38 dB Leq at the nearest residence to the haul road. Therefore, off-site haul truck noise levels are not predicted to exceed measured existing ambient Ldn and Leq noise levels by more than 5 dB Leq at existing residences located nearest to the project haul route.

Because both on-site excavation noise and off-site truck traffic noise levels are predicted to be at or below measured existing ambient noise levels, the project is not predicted to result in substantial short-term or permanent increases in ambient noise levels and this impact is considered ***less than significant***.

Appendix A

Acoustical Terminology

Acoustics	The science of sound.
Ambient Noise	The distinctive acoustical characteristics of a given space consisting of all noise sources audible at that location. In many cases, the term ambient is used to describe an existing or pre-project condition such as the setting in an environmental noise study.
Attenuation	The reduction of an acoustic signal.
A-Weighting	A frequency-response adjustment of a sound level meter that conditions the output signal to approximate human response.
Decibel or dB	Fundamental unit of sound, A Bell is defined as the logarithm of the ratio of the sound pressure squared over the reference pressure squared. A Decibel is one-tenth of a Bell.
CNEL	Community Noise Equivalent Level. Defined as the 24-hour average noise level with noise occurring during evening hours (7 - 10 p.m.) weighted by a factor of three and nighttime hours weighted by a factor of 10 prior to averaging.
Frequency	The measure of the rapidity of alterations of a periodic signal, expressed in cycles per second or hertz.
Ldn	Day/Night Average Sound Level. Similar to CNEL but with no evening weighting.
Leq	Equivalent or energy-averaged sound level.
Lmax	The highest root-mean-square (RMS) sound level measured over a given period of time.
Loudness	A subjective term for the sensation of the magnitude of sound.
Masking	The amount (or the process) by which the threshold of audibility is for one sound is raised by the presence of another (masking) sound.
Noise	Unwanted sound.
Peak Noise	The level corresponding to the highest (not RMS) sound pressure measured over a given period of time. This term is often confused with the Maximum level, which is the highest RMS level.
RT_{60}	The time it takes reverberant sound to decay by 60 dB once the source has been removed.
Sabin	The unit of sound absorption. One square foot of material absorbing 100% of incident sound has an absorption of 1 sabin.
SEL	A rating, in decibels, of a discrete event, such as an aircraft flyover or train passby, that compresses the total sound energy of the event into a 1-s time period.
Threshold of Hearing	The lowest sound that can be perceived by the human auditory system, generally considered to be 0 dB for persons with perfect hearing.
Threshold of Pain	Approximately 120 dB above the threshold of hearing.

Appendix B-1

Bear River Restoration Project
24hr Continuous Noise Monitoring at Site A
Friday, November 22, 2013

Hour	Leq	Lmax	L50	L90
0:00	33	40	33	32
1:00	32	42	32	31
2:00	35	47	34	32
3:00	32	39	32	31
4:00	34	43	34	32
5:00	33	40	32	31
6:00	35	48	35	33
7:00	34	45	34	32
8:00	40	62	34	32
9:00	34	47	32	31
10:00	35	57	33	31
11:00	31	47	30	29
12:00	41	54	35	31
13:00	46	61	42	38
14:00	50	79	42	36
15:00	50	78	41	37
16:00	42	64	38	33
17:00	37	48	36	33
18:00	43	66	37	34
19:00	34	46	32	31
20:00	37	48	36	34
21:00	37	49	37	36
22:00	39	48	38	37
23:00	37	41	37	34

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	50.3	31.0	43.3	38.6	32.0	35.0
Lmax (Maximum)	78.5	44.5	56.7	48.1	39.5	43.1
L50 (Median)	42.4	30.3	36.1	38.3	31.7	33.9
L90 (Background)	38.2	28.7	33.3	37.2	31.0	32.6

Computed Ldn, dB	44.0
% Daytime Energy	92%
% Nighttime Energy	8%

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Appendix B-2

Bear River Restoration Project
24hr Continuous Noise Monitoring at Site A
Saturday, November 23, 2013

Hour	Leq	Lmax	L50	L90
0:00	34	47	34	32
1:00	37	56	36	33
2:00	39	57	37	35
3:00	36	42	35	33
4:00	46	55	44	38
5:00	42	53	35	32
6:00	36	49	34	32
7:00	40	60	35	33
8:00	35	57	33	31
9:00	41	64	32	31
10:00	41	66	31	29
11:00	39	61	34	31
12:00	42	65	35	32
13:00	41	50	41	36
14:00	53	78	36	34
15:00	45	70	34	32
16:00	37	53	35	33
17:00	38	45	38	37
18:00	38	49	37	36
19:00	39	47	38	37
20:00	39	48	39	37
21:00	38	43	38	37
22:00	39	55	38	37
23:00	36	45	36	33

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	52.5	35.4	43.4	46.3	34.2	40.1
Lmax (Maximum)	78.3	43.1	57.1	57.2	42.4	51.0
L50 (Median)	40.7	30.9	35.7	43.9	33.5	36.3
L90 (Background)	37.3	29.3	33.7	38.3	31.6	33.9

Computed Ldn, dB	47.2
% Daytime Energy	78%
% Nighttime Energy	22%

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Appendix B-3

Bear River Restoration Project
24hr Continuous Noise Monitoring at Site A
Sunday, November 24, 2013

Hour	Leq	Lmax	L50	L90
0:00	36	45	34	33
1:00	35	45	34	32
2:00	41	65	34	32
3:00	33	48	33	31
4:00	34	44	33	32
5:00	34	54	33	31
6:00	36	43	35	33
7:00	42	61	39	36
8:00	42	64	36	33
9:00	38	62	33	31
10:00	41	61	34	32
11:00	39	60	34	32
12:00	44	68	34	32
13:00	37	60	33	32
14:00	40	65	34	33
15:00	54	83	36	34
16:00	41	62	37	36
17:00	37	42	37	36
18:00	40	62	38	37
19:00	38	42	38	37
20:00	39	46	39	38
21:00	38	46	38	37
22:00	38	45	38	37
23:00	38	44	38	35

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	54.1	36.6	44.4	41.0	33.2	36.9
Lmax (Maximum)	83.3	41.6	58.8	64.9	42.8	48.2
L50 (Median)	39.3	33.3	36.1	38.1	32.6	34.7
L90 (Background)	37.9	31.4	34.4	37.2	31.4	33.0

Computed Ldn, dB	45.5
% Daytime Energy	90%
% Nighttime Energy	10%

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Appendix B-4

Bear River Restoration Project
24hr Continuous Noise Monitoring at Site A
Monday, November 25, 2013

Hour	Leq	Lmax	L50	L90
0:00	36	51	35	33
1:00	34	41	34	33
2:00	35	52	34	33
3:00	37	47	35	33
4:00	39	49	38	35
5:00	37	46	37	34
6:00	38	45	38	35
7:00	40	48	39	37
8:00	40	56	37	35
9:00	38	60	35	33
10:00	41	63	34	31
11:00	41	61	33	32
12:00	37	57	34	32
13:00	36	59	32	31
14:00	42	68	34	32
15:00	45	66	36	33
16:00	39	62	38	37
17:00	37	46	37	36
18:00	38	51	37	37
19:00	38	42	38	37
20:00	39	44	39	38
21:00	39	45	39	38
22:00	39	46	39	37
23:00	42	52	40	37

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	44.6	36.5	40.0	41.6	34.4	38.0
Lmax (Maximum)	68.3	42.4	55.3	51.9	40.5	47.5
L50 (Median)	39.4	32.4	36.3	39.9	33.9	36.6
L90 (Background)	38.1	30.8	34.6	37.4	32.6	34.5

Computed Ldn, dB	44.8
% Daytime Energy	72%
% Nighttime Energy	28%

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Appendix B-5

Bear River Restoration Project

24hr Continuous Noise Monitoring at Site B

Friday, November 22, 2013

Hour	Leq	Lmax	L50	L90
0:00	41	43	41	40
1:00	41	47	41	40
2:00	41	47	41	40
3:00	41	42	41	40
4:00	41	45	41	40
5:00	41	43	40	40
6:00	41	49	41	40
7:00	41	44	41	40
8:00	41	43	41	40
9:00	41	47	41	40
10:00	40	45	40	39
11:00	41	44	40	39
12:00	44	62	43	41
13:00	43	49	43	41
14:00	46	73	43	41
15:00	44	61	43	42
16:00	43	59	43	42
17:00	44	55	44	43
18:00	44	51	43	42
19:00	43	50	43	43
20:00	44	49	44	43
21:00	44	51	44	43
22:00	43	47	43	43
23:00	43	44	43	42

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	46.0	40.2	43.0	43.4	40.5	41.6
Lmax (Maximum)	72.8	42.9	52.2	48.6	41.9	45.3
L50 (Median)	43.6	40.2	42.2	43.5	40.5	41.4
L90 (Background)	43.1	38.9	41.4	43.1	40.1	40.7

Computed Ldn, dB	48.2
% Daytime Energy	70%
% Nighttime Energy	30%

BOLLARD

Acoustical Consultants

Appendix B-6

Bear River Restoration Project

24hr Continuous Noise Monitoring at Site B

Saturday, November 23, 2013

Hour	Leq	Lmax	L50	L90
0:00	42	49	42	42
1:00	43	56	42	41
2:00	43	55	42	41
3:00	41	43	41	41
4:00	42	43	42	41
5:00	42	44	42	41
6:00	41	45	41	40
7:00	41	53	41	40
8:00	41	47	41	40
9:00	41	52	40	40
10:00	42	62	40	39
11:00	41	57	40	39
12:00	41	57	40	39
13:00	42	52	41	40
14:00	43	64	40	39
15:00	40	50	40	39
16:00	41	47	41	40
17:00	42	47	42	41
18:00	42	48	42	41
19:00	41	44	41	41
20:00	43	53	41	41
21:00	41	45	41	40
22:00	41	50	41	40
23:00	39	45	39	38

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	43.4	40.4	41.5	42.7	39.4	41.7
Lmax (Maximum)	63.7	44.5	51.9	56.3	42.8	47.7
L50 (Median)	41.6	39.5	40.8	42.4	39.1	41.4
L90 (Background)	41.1	38.7	39.9	41.6	38.4	40.7

Computed Ldn, dB	48.1
% Daytime Energy	62%
% Nighttime Energy	38%

BOLLARD
Acoustical Consultants

Appendix B-7

Bear River Restoration Project
24hr Continuous Noise Monitoring at Site B
Sunday, November 24, 2013

Hour	Leq	Lmax	L50	L90
0:00	40	50	39	38
1:00	39	45	39	38
2:00	40	55	39	38
3:00	39	41	39	38
4:00	39	48	39	38
5:00	39	42	39	38
6:00	39	42	39	38
7:00	39	53	39	38
8:00	48	72	39	38
9:00	39	47	39	38
10:00	44	61	39	38
11:00	71	100	39	38
12:00	40	59	38	37
13:00	38	46	38	37
14:00	40	61	38	37
15:00	48	77	41	39
16:00	63	83	41	40
17:00	41	42	41	40
18:00	41	46	41	40
19:00	41	44	41	40
20:00	41	49	41	40
21:00	41	52	41	40
22:00	41	49	41	40
23:00	39	54	39	37

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	71.4	38.3	60.3	41.0	38.5	39.4
Lmax (Maximum)	100.2	42.3	59.4	55.2	41.2	47.3
L50 (Median)	41.4	38.3	39.6	40.7	38.5	38.9
L90 (Background)	40.2	37.3	38.9	40.1	37.5	38.3

Computed Ldn, dB	58.4
% Daytime Energy	100%
% Nighttime Energy	0%

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Appendix B-8

Bear River Restoration Project
24hr Continuous Noise Monitoring at Site B
Monday, November 25, 2013

Hour	Leq	Lmax	L50	L90
0:00	38	45	38	37
1:00	38	49	38	37
2:00	38	46	38	37
3:00	40	55	38	37
4:00	40	54	38	37
5:00	38	44	38	37
6:00	39	53	38	38
7:00	39	52	38	37
8:00	40	51	39	38
9:00	40	61	39	38
10:00	44	67	39	37
11:00	41	61	38	37
12:00	38	49	38	37
13:00	38	48	38	37
14:00	39	52	39	38
15:00	43	61	41	39
16:00	41	49	41	40
17:00	41	46	41	40
18:00	41	53	41	40
19:00	41	44	41	40
20:00	41	49	41	40
21:00	41	45	41	40
22:00	42	60	41	40
23:00	42	56	39	37

	Statistical Summary					
	Daytime (7 a.m. - 10 p.m.)			Nighttime (10 p.m. - 7 a.m.)		
	High	Low	Average	High	Low	Average
Leq (Average)	43.9	38.2	40.7	42.0	38.0	39.7
Lmax (Maximum)	67.1	44.3	52.6	60.0	43.8	51.2
L50 (Median)	41.3	37.6	39.4	40.7	37.7	38.5
L90 (Background)	40.2	37.1	38.7	40.1	37.2	37.6

Computed Ldn, dB	46.3
% Daytime Energy	67%
% Nighttime Energy	33%

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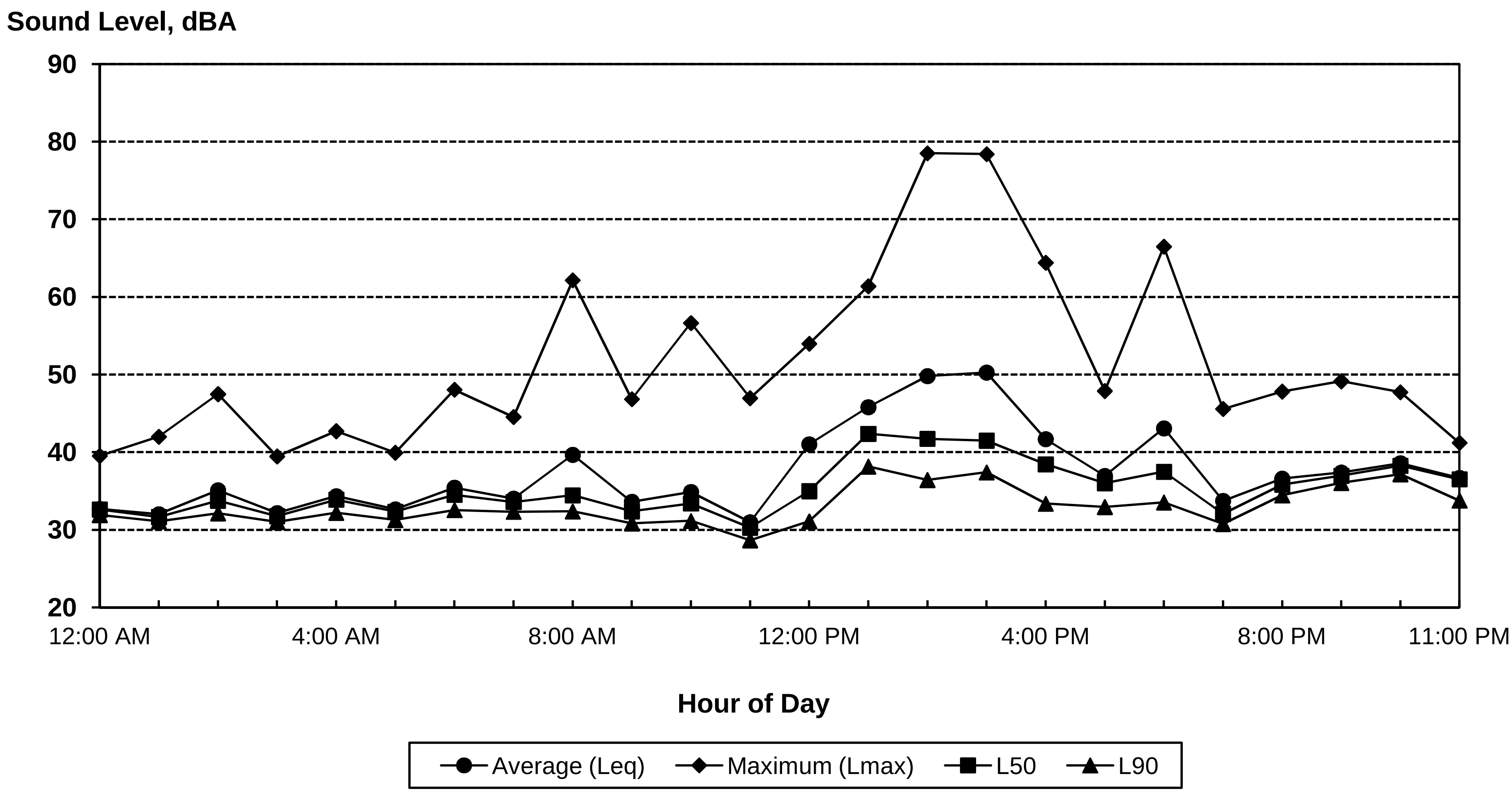
Appendix C-1
Bear River Restoration Project
24hr Continuous Noise Monitoring at Site A
Friday, November 22, 2013



Ldn: 44 dB

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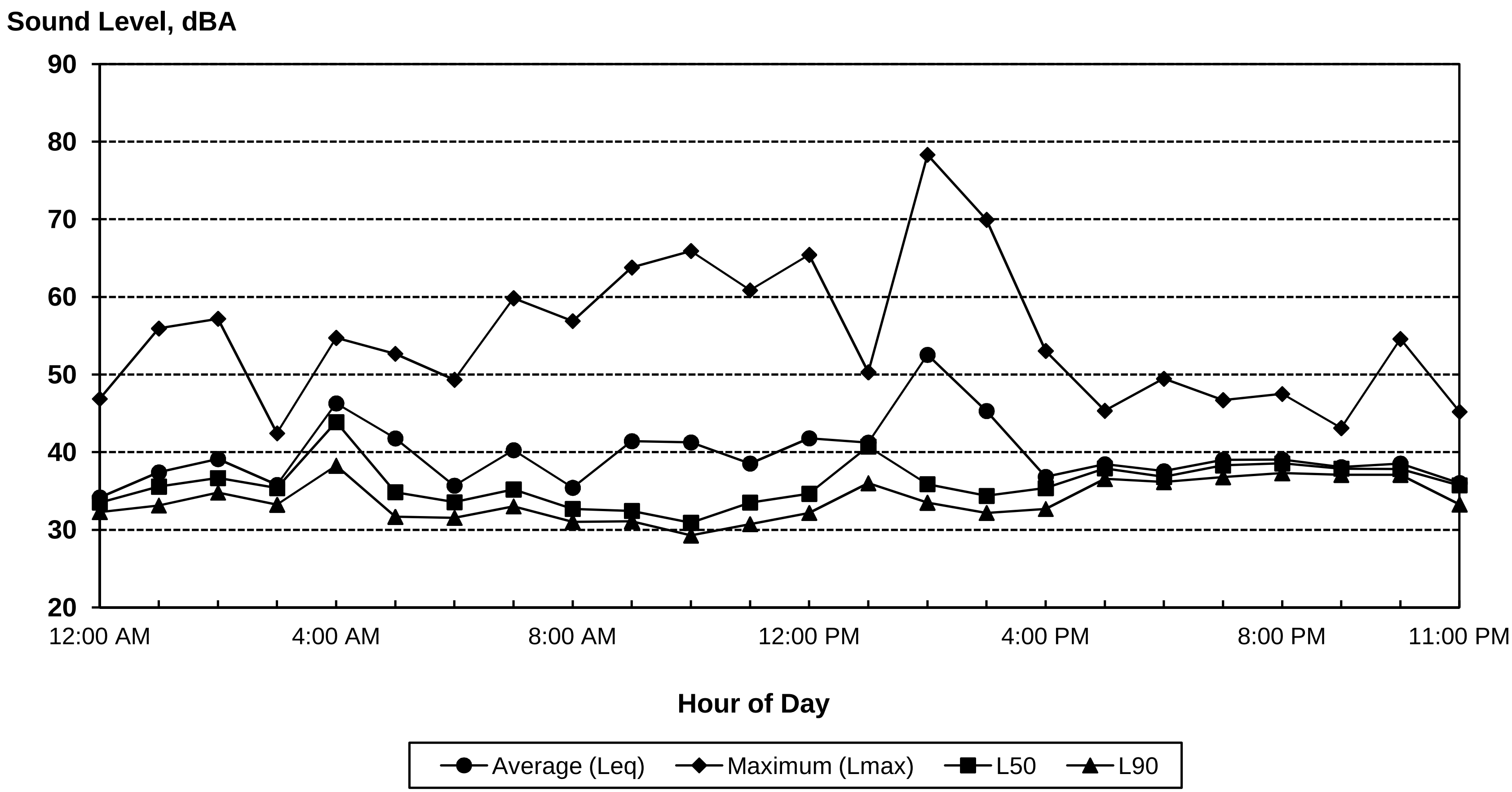
Appendix C-2
Bear River Restoration Project
24hr Continuous Noise Monitoring at Site A
Saturday, November 23, 2013



Ldn: 47 dB

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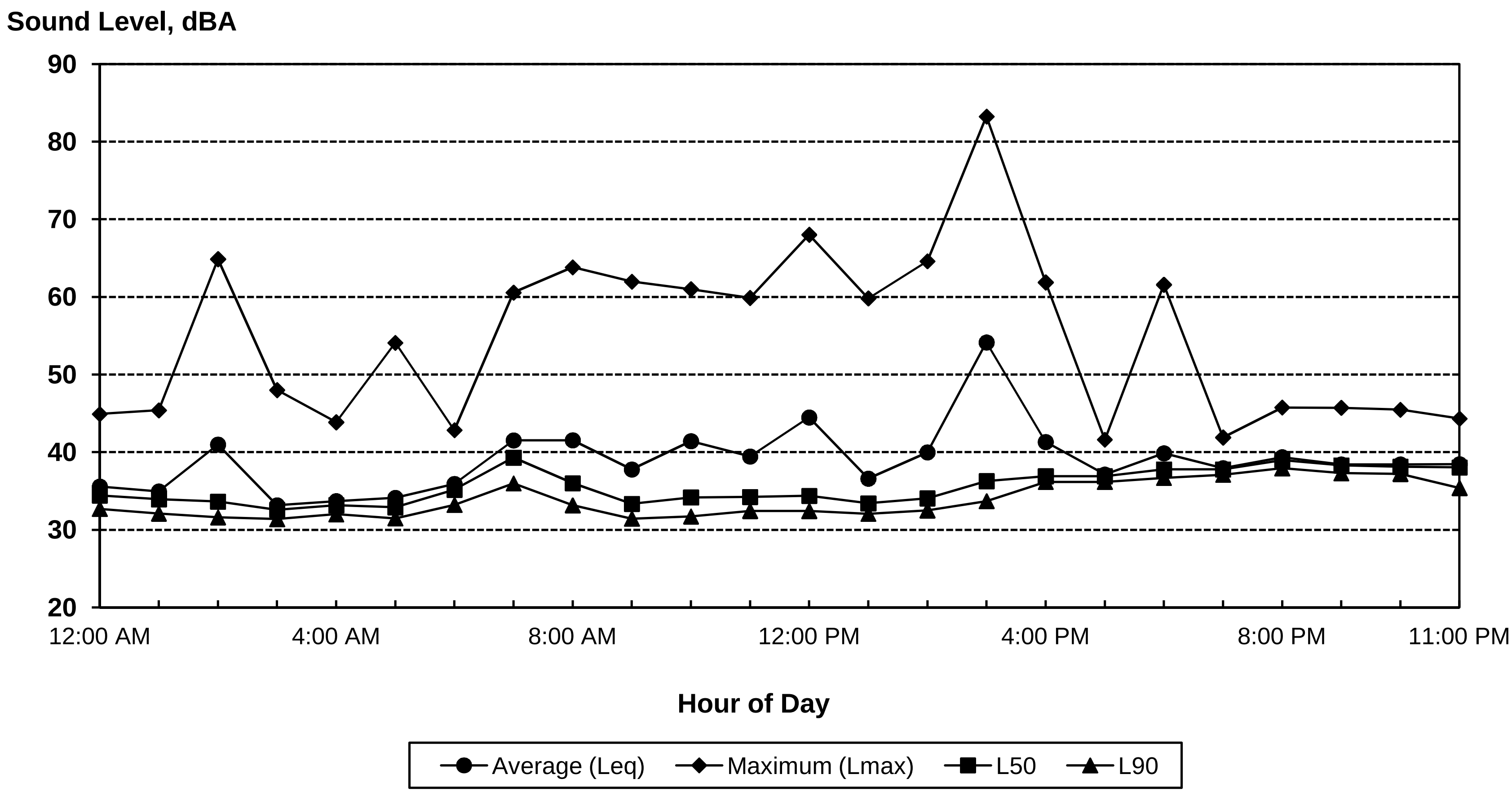
Acoustical Consultants

Appendix C-3
Bear River Restoration Project
24hr Continuous Noise Monitoring at Site A
Sunday, November 24, 2013



Ldn: 45 dB

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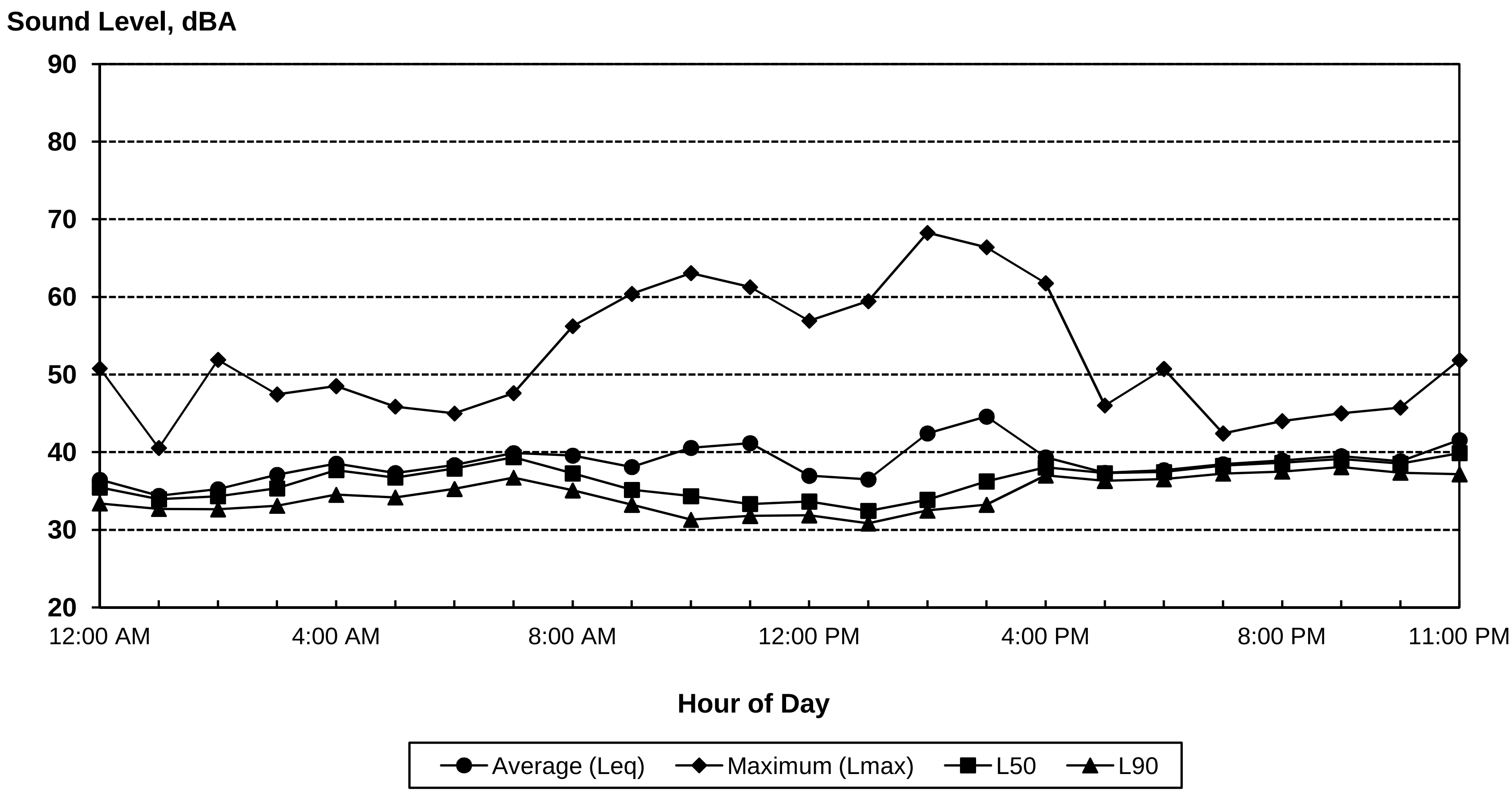
Appendix C-4
Bear River Restoration Project
24hr Continuous Noise Monitoring at Site A
Monday, November 25, 2013



Ldn: 45 dB

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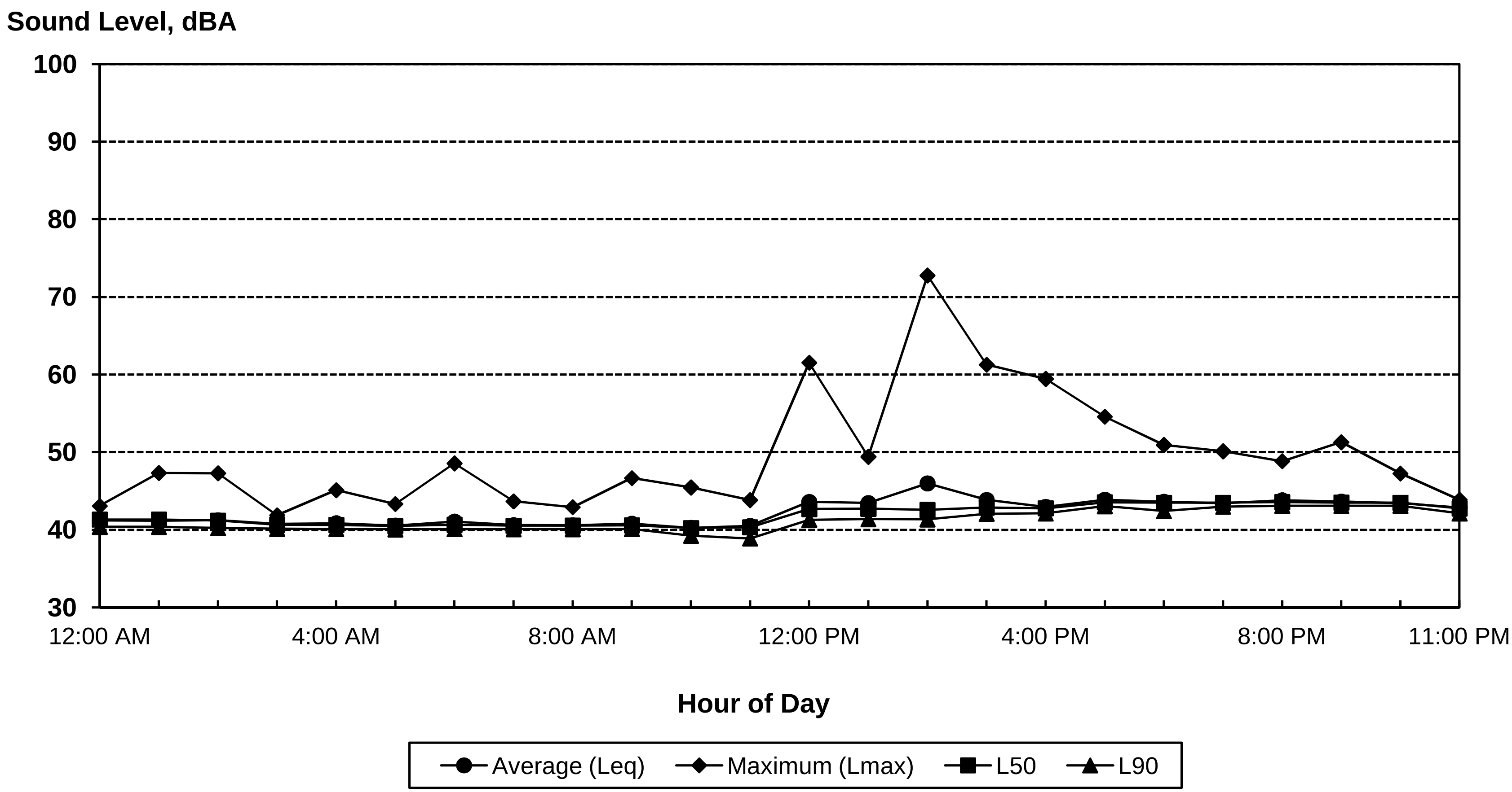
Acoustical Consultants

Appendix C-5
Bear River Restoration Project
24hr Continuous Noise Monitoring at Site B
Friday, November 22, 2013



Ldn: 48 dB

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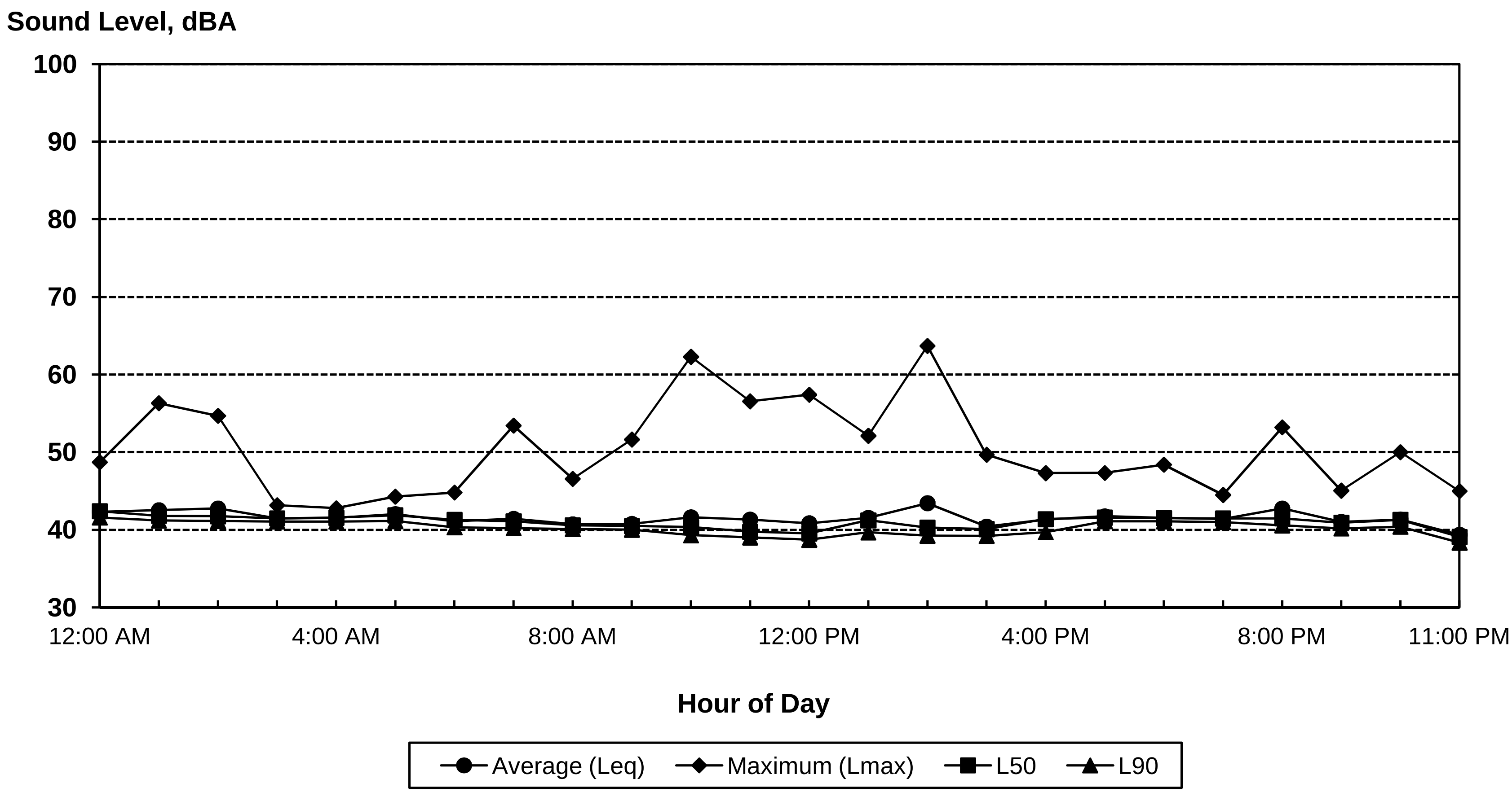
Acoustical Consultants

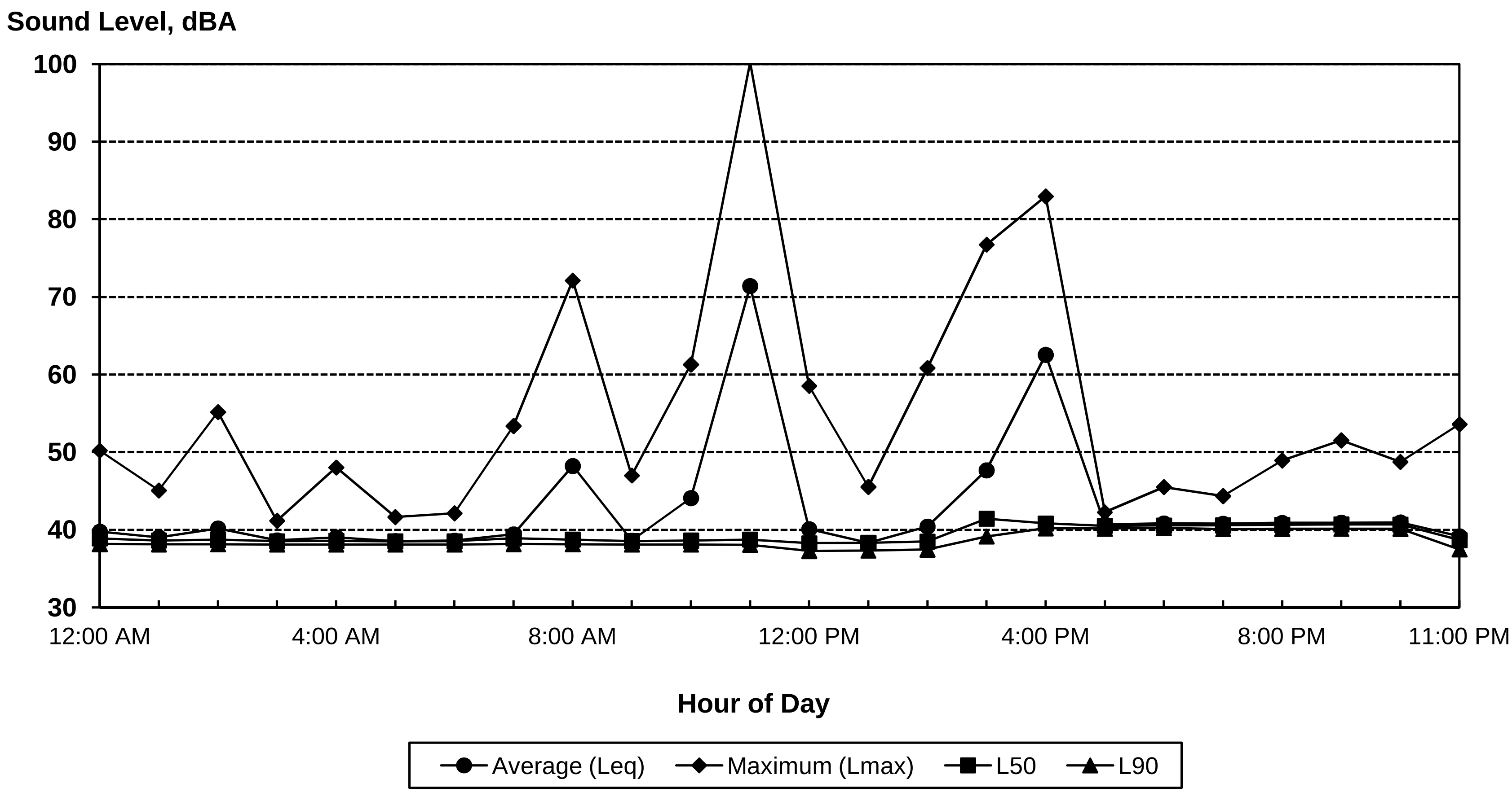
Appendix C-6
Bear River Restoration Project
24hr Continuous Noise Monitoring at Site B
Saturday, November 23, 2013



Ldn: 48 dB

BOLLARD
Acoustical Consultants

Appendix C-7
Bear River Restoration Project
24hr Continuous Noise Monitoring at Site B
Sunday, November 24, 2013



Ldn: 58 dB

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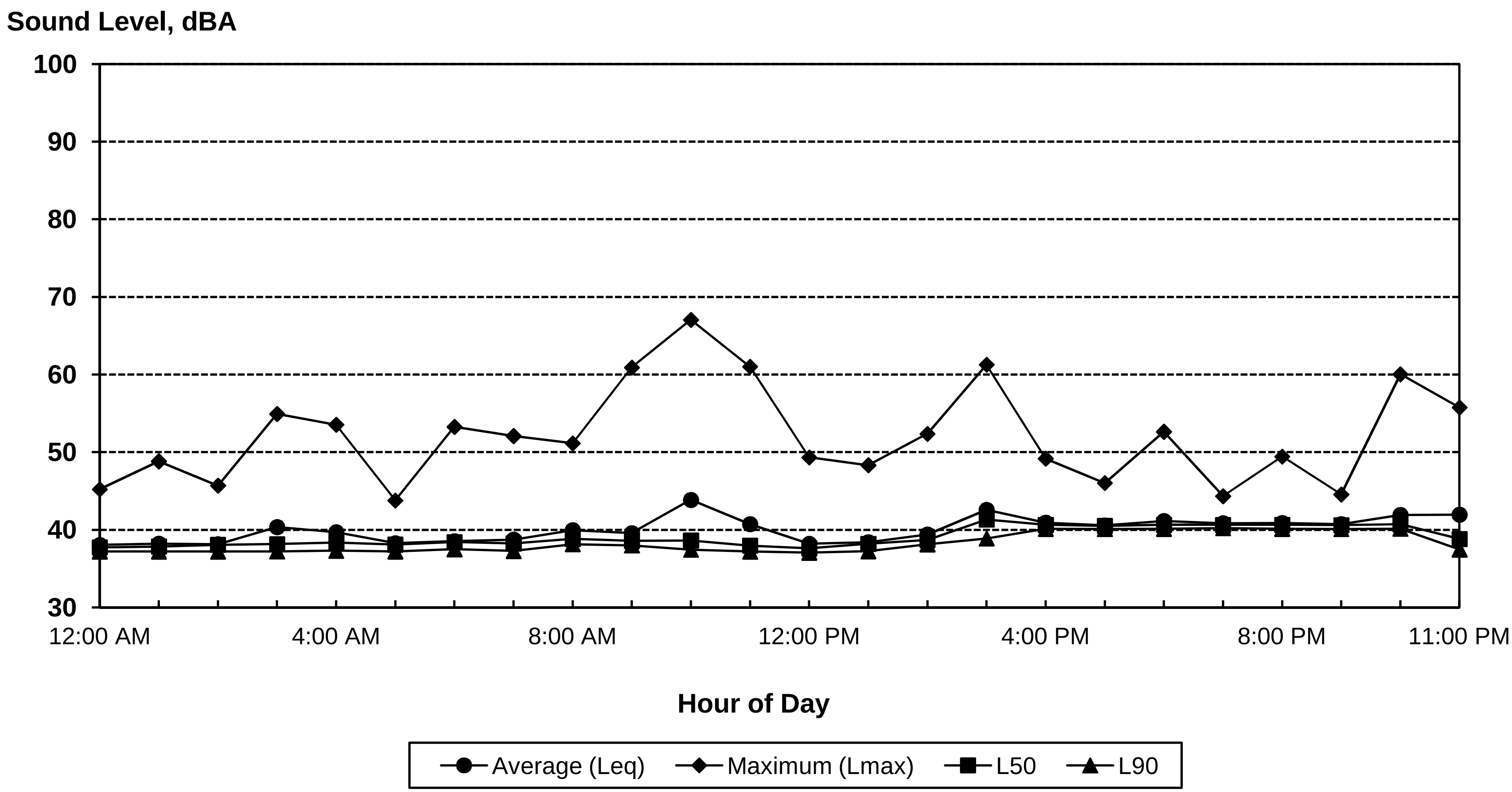
Appendix C-8
Bear River Restoration Project
24hr Continuous Noise Monitoring at Site B
Monday, November 25, 2013



Ldn: 46 dB

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Figure 1

Bear River Restoration Project - Placer/Nevada County, California

Project Area, Nearest Noise-Sensitive Receivers, and Ambient Noise Monitoring Locations

BOLLARD
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Scale (feet)
0 750 1,500

September 23, 2014

Brian Grattidge
Senior Project Manager
DUDEK
980 9th Street, Suite 1750
Sacramento, CA 95814

Transmitted via email: bgrattidge@dudek.com

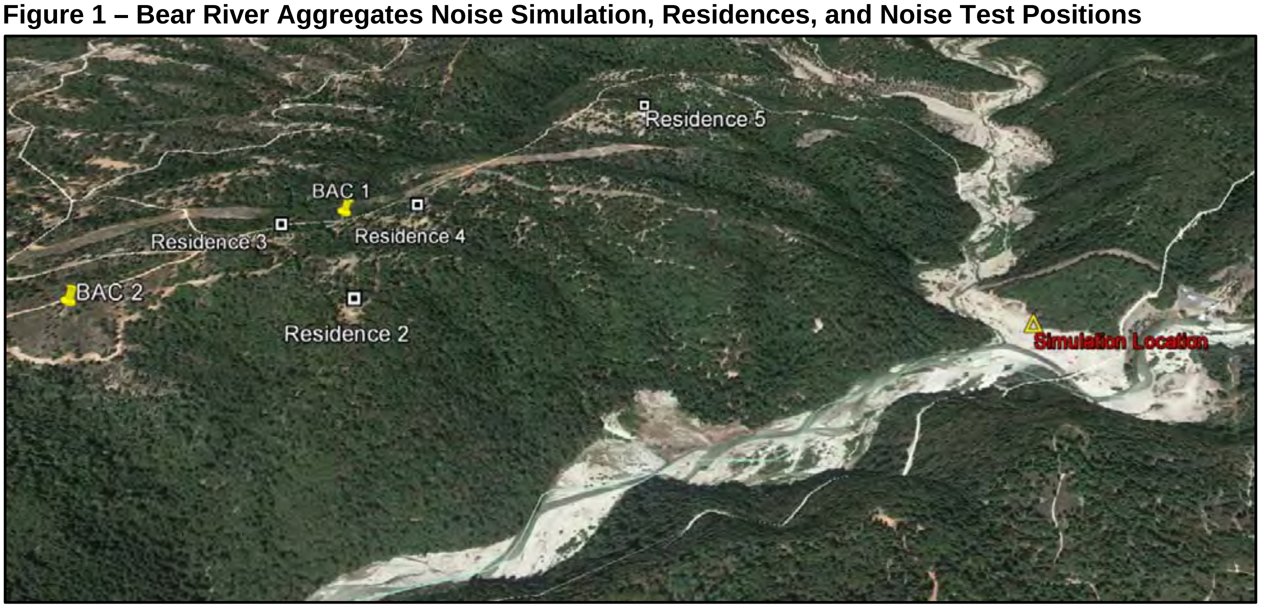
Subject: Bear River Aggregates Noise Simulation Test Results

Dear Mr. Grattidge,

As you are aware, on the morning of August 21, 2014, a simulation of heavy equipment noise generation was conducted at the site of the proposed Bear River Aggregates project in Nevada County. The simulation consisted of a large front loader / excavator (John Deere 410E Loader) moving aggregate materials from an existing on-site stockpile into a heavy haul truck. During the simulation, noise level data was collected at a reference distance of 125 feet from the operating loader and haul truck, as well as at locations on the north side of the Bear River, generally representative of the locations of the nearest residences to the project site. Figure 1 shows the simulation location as well as the location where the noise monitoring was conducted and the location of the nearest residences.

The simulation was conducted at the location where the maximum project noise generation will occur; the processing and load-out area. Although excavation will occur further to the west at locations closer to the nearest residences, excavation noise is predicted to be lower than processing area noise generation. Figure 1 shows the location where the simulation was conducted, as well as the locations of the nearest residences and noise measurement locations.

Figure 1 – Bear River Aggregates Noise Simulation, Residences, and Noise Test Positions



During the simulation, noise level measurements were conducted at a distance of 125 feet from the operating front loader and haul trucks, as well as at positions as close as BAC staff was able to get to the nearest residences on Old Emigrant Trail. Larson Davis Laboratories Model 820 precision integrating sound level meters were used for the noise surveys. The meters were calibrated prior to use to ensure the accuracy of the measurements. Weather conditions during the survey consisted of clear skies, 65-70 degree Fahrenheit temperatures, calm winds and low relative humidity.

The results of the noise surveys indicate that the heavy earthmoving equipment generated average and maximum noise levels consistent with the reference levels of 70 dB Leq and 80 dB Lmax at a distance of 100 feet used in the environmental noise analysis prepared for the project (BAC file 2013-088, Environmental Noise Assessment – Bear River Restoration Project, January 22, 2014). However, at the two measurement locations (BAC 1 and 2 shown in Figure 1), the sound of the operating heavy equipment was completely inaudible. Noise levels measured at BAC Sites 1 and 2, which were generated entirely by natural sounds, were approximately 30-35 dBA.

At one point during the simulation, BAC staff had the heavy truck driver intentionally sound his horn for a period of 20 seconds. Even during the prolonged sounding of the truck horn, that noise remained completely inaudible at the BAC noise measurement locations near the existing residences.

In the aforementioned BAC noise study prepared for the project, the highest average and maximum noise levels generated by the project at the nearest residence (Residence 2) were predicted to be approximately 43 dB L_{eq} and 53 dB L_{max}. These levels would be well below the County's daytime noise level standards of 55 dB Leq and 75 dB Lmax applicable to residential land uses in the County. The results of the simulation support the conclusions of the BAC noise analysis that the project will satisfy the County's noise standards and not result in adverse noise impacts at the nearest residences to the project area.

This concludes BAC's assessment of City of Folsom Water Treatment Facility Active Flow Pump Noise Emissions. Please contact me at (916) 663-0500 or paulb@bacnoise.com if you have any comments or questions regarding this letter.

Sincerely,

Bollard Acoustical Consultants, Inc.

Paul Bollard

Paul Bollard
President, INCE Board Certified

APPENDIX I

Traffic Impact Analysis

TRAFFIC IMPACT ANALYSIS

FOR

BEAR RIVER RESTORATION PROJECT
Nevada / Placer County's, California

Prepared For:

DUDEK
853 Lincoln Way, Suite 208
Auburn, CA 95603

Prepared By:
KD Anderson & Associates, Inc.
3853 Taylor Road, Suite G
Loomis, CA 95650
(916) 660-1555

December 30, 2013

Job No. 2448-01

Bear River Restoration.rpt

TRAFFIC IMPACT ANALYSIS FOR
BEAR RIVER RESTORATION PROJECT
Nevada / Placer County's, CA

TABLE OF CONTENTS

KDA

TRAFFIC IMPACT ANALYSIS FOR
BEAR RIVER RESTORATION PROJECT
Nevada / Placer County's, CA

INTRODUCTION

This report documents **KD Anderson & Associates, Inc.'s** assessment of the potential traffic impacts associated with implementation of the **Nevada Irrigation District's (NID) Bear River Restoration Project**, located where the Bear River feeds into Rollins Reservoir along the Nevada County - Placer County line. The proposed project is intended to annually remove up to 250,000 tons of silt, sand and aggregates that have accumulated in the northeast end of Rollins Lake along the Bear River. The purpose of the project is to restore and maintain reservoir capacity in Rollins Reservoir on an on-going basis through re-establishment of gravel bar skimming operations from the Bear River below the confluence with Steephollow Creek.

The recovered material will be stockpiled and then transported off-site by contractors or operators for use and/or processing. Chicago Park Powerhouse Road provides access to the site and is linked to Interstate 80 (I-80) via Secret Town Road at the Alpine Overcrossing interchange. The roadway was constructed in 1964 by NID and served as the haul route for similar gravel skimming operations prior to 2002. The transport of material will be dependent upon material availability as well as customer demand. Figure 1 displays the regional location of the project.

The analysis is intended to describe the traffic impacts of the project and address both short term and long term circulation conditions in the vicinity of the site. Existing traffic conditions have been identified based on recent traffic counts on local streets and at the I-80 interchange intersections providing access to the project area. Operations at the interchange intersections as well as at the interchange ramps have been quantified. Project trip generation has been estimated based on the potential amount of available material and the typical seasonal pattern of material sales. The distribution of project trips was developed based upon likely destinations of transported material for use and/or processing. Utilizing the expected distribution, project trips were assigned to the study area street system to identify projected intersection and freeway ramp operations with implementation of the restoration project.

Project impacts have also been analyzed under long term cumulative background (i.e., year 2030) conditions. Long term cumulative conditions reflect continuing growth in this area of Placer County as well as Caltrans projections for traffic volume increases on I-80.

VICINITY MAP

KD Anderson & Associates, Inc.
Transportation Engineers

2448-01 LT 12/13/2013

figure 1

EXECUTIVE SUMMARY

The **Nevada Irrigation District's (NID) Bear River Restoration Project** is located where the Bear River feeds into Rollins Reservoir along the Nevada County - Placer County line. The proposed project is intended to annually remove up to 250,000 tons of silt, sand and aggregates that have accumulated in the northeast end of Rollins Lake along the Bear River. The purpose of the project is to restore and maintain reservoir capacity in Rollins Reservoir on an on-going basis through re-establishment of gravel bar skimming operations from the Bear River below the confluence with Steephollow Creek. The recovered material will be stockpiled and then transported off-site by contractors or operators for use and/or processing. Chicago Park Powerhouse Road provides access to the site and is linked to Interstate 80 (I-80) via Secret Town Road at the Alpine Overcrossing interchange.

Existing Conditions. Existing traffic volumes at the Alpine interchange and on surrounding streets are very low and existing traffic operations are good. The current Level of Service at intersections and freeway ramps satisfies the minimum standards established by Placer County and Caltrans.

Project Trip Generation. Trip generation estimates for the project have been developed assuming the maximum annual quantity of material extraction and transport occurring over an 8 month operating period. Estimated daily and peak hour trip generation quantities are summarized below.

		AM Peak Hour			PM Peak Hour		
	Daily	**In**	**Out**	**Total**	**In**	**Out**	**Total**
Material Transport	166	20	33	53	8	8	16
Employees	10	5	0	5	0	5	5
Total	176	25	33	58	8	13	21

Project Impacts. The impacts of project traffic were evaluated by superimposing project traffic onto current baseline conditions. Minimum Placer County and Caltrans operating standards for Level of Service will continue to be satisfied at the Alpine Overcrossing interchange. Satisfactory roadway operations are projected to continue on Secret Town Road with the addition of project traffic.

The majority of Chicago Park Powerhouse Road provides 19' of pavement. Towards the northerly end of the road, an approximately ½ mile segment has many areas of poor pavement and is narrower in sections. A number of sections are about 4' narrower, with a few short segments having a width of only 14'-15'. This area of the roadway will require improvement to permit 2-way truck traffic.

Other recommendations have also been provided to accommodate 2-way truck traffic on the road. Field observations indicate that a number of the horizontal curves along the route have a relatively small radius, estimated to range from 60’ – 110’. The tighter curves do not permit 2-way truck traffic within the curve. However, many of these locations provide a graveled or paved shoulder area / turnout on the outside of the curve to permit a vehicle to pull over and yield to another on-coming vehicle. These curve locations should be signed appropriately with warning signs to indicate the degree of curvature and advisory speed (example – W4-10(CA) sign with 15 mph advisory speed). These curves should also be delineated with directional “chevron” warning arrows along the back of the curves to aide in negotiating the curves in darkness. Adherence to the 15 mph advisory speed will also aide in identifying the presence of an on-coming vehicle in the vicinity of the curve, as sight distance is very limited through many of the curves. The limited line of sight through a number of the curves can also be significantly improved with removal of small trees and vegetation on the inside of the curves immediately off of the roadway. Recommendations have been summarized in Figure 5 of this report.

Cumulative Impacts. The cumulative impact of the project was evaluated based on assumed background traffic growth representative of a year 2030 planning horizon. Minimum Placer County and Caltrans Level of Service standards will be satisfied with and without the project.

EXISTING SETTING

Regionally, materials transport from the NID **Bear River Restoration Project** site will be served by Interstate 80, which links the project area with Colfax, Auburn and the Roseville – Sacramento metropolitan area to the west. The majority of all transported material is projected to be oriented to the west on I-80. Circulation to the site is provided via the I-80 Alpine Overcrossing interchange to Secret Town Road and to Chicago Park Powerhouse Road. Chicago Park Powerhouse Road intersects Secret Town Road approximately 2,000' to the east of the I-80 interchange.

Study Area Circulation System

Interstate 80 is a 4-lane freeway through the region. Although the surrounding area is mountainous, the Alpine Overcrossing interchange is located along a relatively flat segment of the freeway. The overcrossing is a 2-lane facility. The eastbound ramps provide a diamond configuration. For westbound traffic, the westbound on-ramp is a loop ramp. The off-ramps are controlled by stop signs, as is the overcrossing connection to Secret Town Road.

To the west on I-80, a pair of westbound hook-ramps serve Magra Road 0.6 miles west of the Alpine Overcrossing interchange, with the Gold Run interchange located 2.8 miles to the east.

Secret Town Road parallels I-80 and follows a relatively flat alignment, provides 20'-22' of pavement width and is striped with a solid yellow centerline. The paved surface is judged to be in relatively good condition. The roadway terminates approximately 3,500' east of the Alpine Overcrossing.

Chicago Park Powerhouse Road extends north from Secret Town Road approximately 2,000' east of the Alpine Overcrossing. The roadway follows a winding hillside horizontal alignment and extends for approximately 3 miles to the project site. The southerly 2 miles of the roadway follow a relatively gradual grade, with the northerly 1 mile segment on a more pronounced downhill grade into the Bear River canyon. The majority of the roadway provides 19' of pavement and the roadway has no centerline striping. Towards the northerly end of the road, an approximately ½ mile segment has many areas of poor pavement and is narrower in sections. A number of sections are about 4' narrower, with a few short segments having a width of only 14'-15'. The balance of the pavement surface along the length of the road is judged to be in relatively good condition.

Level of Service Methodology

To assess the quality of existing traffic conditions, "Levels of Service" were calculated for study area intersections. "Level of Service" (LOS) is a qualitative measure of traffic operating conditions whereby a letter grade, "A" through "F", corresponding to progressively worsening traffic operating conditions, is assigned to an intersection, roadway segment or access ramp. In general terms, Level of Service is calculated for an hour-long traffic condition at a signalized intersection, unsignalized intersection, or roadway segment. Table 1 presents typical Level of Service characteristics.

At unsignalized intersections the number of gaps in through traffic, gap acceptance time and corresponding delays for motorists who must yield the right of way are used for Level of Service analysis. Procedures used for calculating unsignalized intersection Level of Service are as presented the *Highway Capacity Manual, 2010 edition*. Calculations utilize identified geometrics and controls, peak hour traffic volumes and truck volume percentages.

Freeway ramp operations have also been calculated using *2010 Highway Capacity Manual* procedures. Calculations utilize ramp and freeway volumes, truck percentages, gore area merge / diverge distances and consider the influence of adjacent ramp traffic on individual ramp operations.

Table 1
Level of Service Definitions

Level of Service	Freeway Ramp Merge - Diverge (passenger car / mile / lane)	Unsignalized Intersection	Roadway (Daily)
"A"	< 10 pc/m/l	Little or no delay. Delay ≤ 10 sec/veh	Completely free flow.
"B"	10 - 20 pc/m/l	Short traffic delays. Delay > 10 sec/veh and ≤ 15 sec/veh	Free flow, presence of other vehicles noticeable.
"C"	20 - 28 pc/m/l	Average traffic delays. Delay > 15 sec/veh and ≤ 25 sec/veh	Ability to maneuver and select operating speed affected.
"D"	28 - 35 pc/m/l	Long traffic delays. Delay > 25 sec/veh and ≤ 35 sec/veh	Unstable flow, speeds and ability to maneuver restricted.
"E"	> 35 pc/m/l	Very long traffic delays, failure, extreme congestion. Delay > 35 sec/veh and ≤ 50 sec/veh	At or near capacity, flow quite unstable.
"F"	Demand Exceeds Capacity	Intersection often blocked by external causes. Delay > 50 sec/veh	Forced flow, breakdown.

Sources: 2010 Highway Capacity Manual and Transportation Research Board (TRB) Special Report 209.

Standards of Significance. Local agencies adopt minimum Level of Service standards as a part of General and Community Plans, and theses standards govern the roads under their jurisdiction. Operating standards within this area of Placer County are defined by the Placer County General Plan (PCGP) for roadways under Placer County jurisdiction. Policies contained in the PCGP indicate that the Level of Service minimum standard for intersections and roadway shall generally be LOS "C". Land development requirements shall be set to sustain LOS "C" at all intersection and roadways for as long as possible. The Placer County General Plan also indicates that the LOS standard shall be "D" within ½ mile of state highways. Similarly, Caltrans identifies LOS “D” as the acceptable intersection Level of Service standard. As such, the LOS "D" standard is applicable to the study area intersections and local roadways.

The Transportation Corridor Concept Report (TCCR) for Interstate 80 is Caltrans District 3 long range planning document for the freeway corridor. The purpose of each TCCR is to identify existing route conditions and future needs, including existing and forecast travel data, a concept level of service (LOS) standard, and the facility needed to maintain the concept LOS and address mobility needs over a 20 year planning horizon. The District 3 TCCR for I-80 is broken into 16 freeway segments of which segment 11 includes the study area.

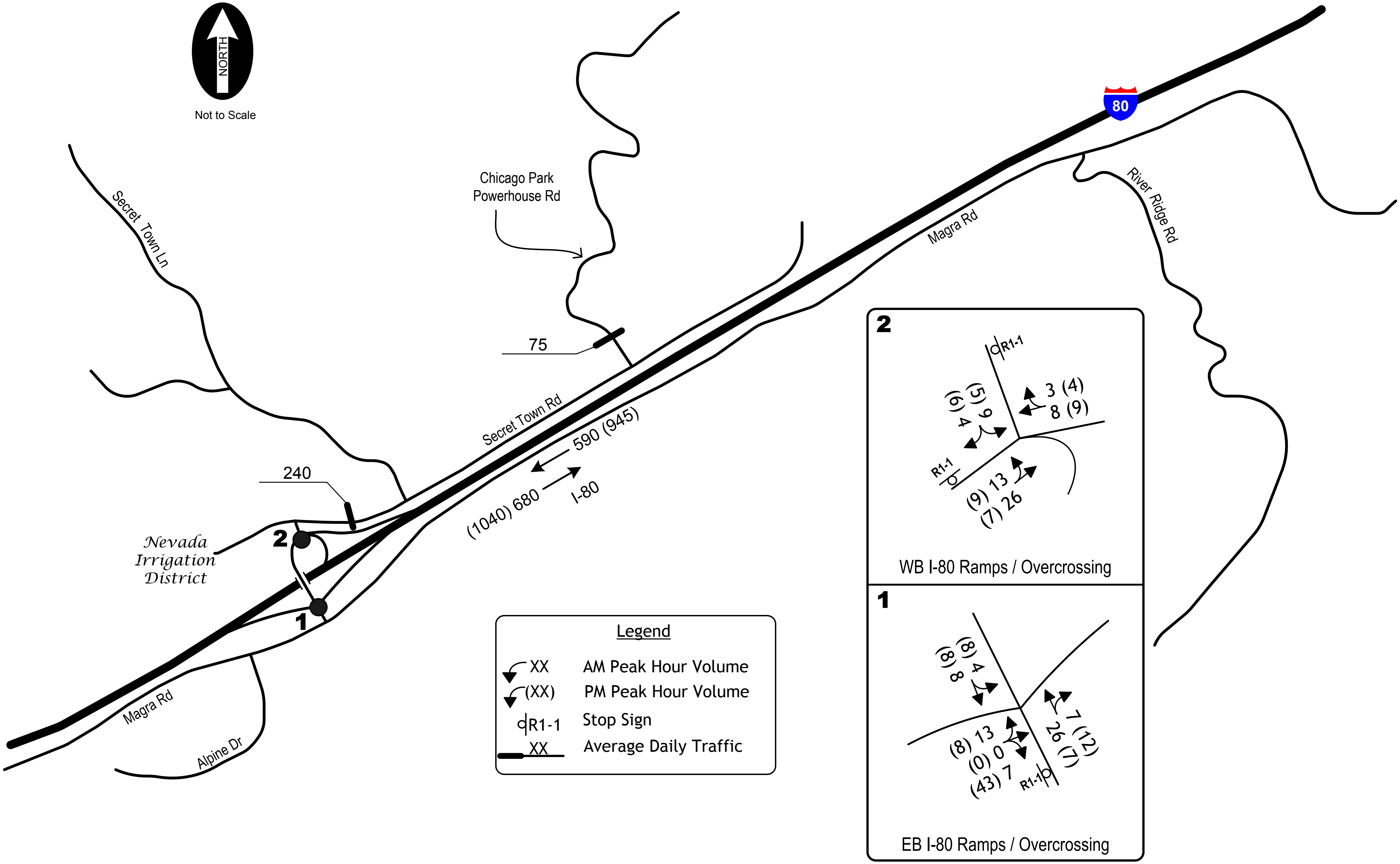
Concept LOS represents the minimum acceptable service conditions over the next 20 years. District 3 has established minimum Concept LOS standards for the planning horizon at LOS "D" for rural segments and LOS "E" for urban segments. However, the Concept LOS for some segments departs from these minimums and segment 11 is identified as one of these exceptions. The TCCR indicates that it would not be feasible to maintain or re-attain LOS "D" on segments 9 through 14 due to lack of funding under current projections and to factors such as the cost of adding more lanes to I-80's numerous structural elements. A Concept LOS "F" is identified for these segments. This operating condition also reflects peak day seasonal directional volumes on the highway, generally representative of afternoon weekend conditions during periods of high recreational traffic.

Existing Traffic Volumes

Intersections. This analysis addresses traffic conditions during the morning and afternoon peak weekday traffic hours. Peak hour traffic counts were conducted in October 2013 during the morning (i.e., 7:00 to 9:00 a.m.) and evening (4:00 to 6:00 p.m.) hours when local schools were in session. Figure 2 displays existing traffic count information used for this analysis. As shown, existing traffic volumes at the Alpine interchange intersections were observed to be relatively minor during both the morning and afternoon hours.

Roadways. Daily 24 hour roadway counts were also conducted on Secret Town Road and Chicago Park Powerhouse Road. These counts indicate a daily 2-way 24 hour volume of 240 vehicles on Secret Town Road east of the I-80 Alpine Overcrossing and a daily volume of 75 vehicles on Chicago Park Powerhouse Road immediately north of Secret Town Road. These volumes are well within the capacity of the existing 2-lane rural roadways.

Freeway. As freeway volumes can vary widely throughout the year and are highest during summer months, hourly directional counts on the freeway for the month of August, 2013 were provided by Caltrans and used for purposes of this analysis. An average of the weekday morning (7:00 – 9:00 a.m.) and afternoon (4:00 – 6:00 p.m.) hourly directional freeway volumes for the month of August has been used in calculating the on-ramp and off-ramp merge/diverge freeway operations. Truck traffic count information published by Caltrans has also been used to identify the percentage of truck traffic on I-80 through the study area.



EXISTING WEEKDAY TRAFFIC VOLUMES

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figure 2

Existing Levels of Service

Intersections. The interchange ramp intersections currently experience very low traffic volumes and operate at acceptable Level of Service (LOS) “A” in the AM and PM peak hours with the existing stop sign control. Existing intersection operations are summarized in Table 2.

Freeway Ramps. Table 2 also summarizes existing freeway ramp operations. Ramp merge / diverge junctions with I-80 also experience satisfactory Level of Service “A” to “B” operations in the AM and PM weekday peak hours. Calculated speeds in the ramp influence area are also presented for informational purposes. Intersection and ramp LOS calculations are presented in the Appendix to this report.

Table 2
Existing Intersection and Ramp Levels of Service

	AM Peak Hour		PM Peak Hour	
Ramps	**LOS**	**Speed**	**LOS**	**Speed**
Westbound On	B	57.8	B	57.7
Westbound Off	A	56.6	B	56.6
Eastbound On	B	57.8	B	57.6
Eastbound Off	B	56.6	B	56.5
Intersections	**LOS**	**Delay**	**LOS**	**Delay**
EB Ramps/Overcrossing				
EB Approach	A	8.8	A	8.6
SB Left	A	7.3	A	7.3
WB Ramps/Overcrossing				
SB Approach	A	8.8	A	8.6
WB Approach	A	8.6	A	8.4

LOS – Level of Service
Speed – Mean speed in ramp influence area
Delay – Intersection approach delay in seconds

PROJECT TRAFFIC IMPACTS

Project Characteristics

The proposed project is intended to remove up to 250,000 tons of silt, sand and aggregates on an annual basis that have accumulated in the northeast end of Rollins Lake along the Bear River. The recovered material will be stockpiled and then transported off-site by contractors or operators for use and/or processing. The project would employ up to 5 persons at the site.

Trip Generation. As with all aggregate sources, the transport of material will be dependent upon material availability as well as customer demand. The following operating scenario has been developed to identify the trip generation potential of the site and assumes the maximum annual level of extraction and transport of 250,000 tons of material from the site.

- Up to 250,000 tons of material to be removed per year.
- Generally an 8 month period for transporting the material, 6 days a week, or approximately 200 days per year.
- Above operating scenario equates to 1,250 tons of material per day.
- A standard 10 wheeler dump truck is typically used to haul bulk material by commercial operators. This assumes a truck with transfer-trailer is not likely to be used due to the horizontal alignment limitations of Chicago Park Powerhouse Road.
- A 10 wheeler truck (without trailer) accommodates 15 tons of material.
- This truck capacity equates to 83 truck loads per day, 83 in / 83 out. The 83 arrivals and departures assumes all trucks depart fully loaded given the relatively remote location of the aggregate site.
- AM peak hour truck trips – up to 40% (33 trucks) of loads would be transported in morning peak hour, but some arrivals likely prior to morning peak hour. AM peak hour truck traffic used for purposes of analysis = 20 trucks in / 33 trucks out. This is based upon experience at similar facilities and reflects the need for construction materials early in the day.
- PM peak hour truck trips – the afternoon peak hour is assumed to be typical of an average hour throughout the day, or approximately 10% of daily activity, 8 trucks in / 8 trucks out.
- Employees – up to 5 personnel, 5 trips inbound in AM peak hour, 5 outbound in PM peak hour used as a worst case.

Resulting trip generation estimates for the site as outlined above are summarized in Table 3. These trip generation characteristics have been used for purposes of analysis and are estimated to represent a reasonable "worst case" condition considering the maximum annual quantity of material extraction and associated transport.

Table 3 Project Trip Generation							
		AM Peak Hour			PM Peak Hour		
	Daily	In	Out	Total	In	Out	Total
Material Transport	166	20	33	53	8	8	16
Employees	10	5	0	5	0	5	5
Total	176	25	33	58	8	13	21

Trip Distribution. Having determined the number of trips that are expected to be generated by the project, it is necessary to identify the directional distribution of project-generated traffic. It is expected that the majority of all use and processing demand will be oriented to the west on I-80. For purposes of this analysis, 95% of truck trips have been assumed to be oriented to the west on I-80, with 5% oriented east. This will vary over individual days, but is judged to be representative of overall operations throughout the course of the year. All employee traffic has been assumed to be oriented west on I-80.

Existing Plus Project Traffic Volumes and Levels of Service

Traffic volumes projected to be generated by the Bear River Restoration Project were added to existing background traffic to identify "Existing plus Project" conditions. Figure 3 identifies "project only" traffic volumes, while Figure 4 superimposes project trips onto existing background traffic volumes to create the "Existing Plus Project" condition. Table 4 summarizes projected conditions at the overcrossing ramp intersections and the ramp junctions with I-80.

Intersections. Satisfactory LOS "A" operations are projected to continue at the eastbound ramp / overcrossing intersection with the addition of project truck traffic. Similarly, satisfactory LOS "A" to "B" operations are projected at the westbound ramp / overcrossing intersection.

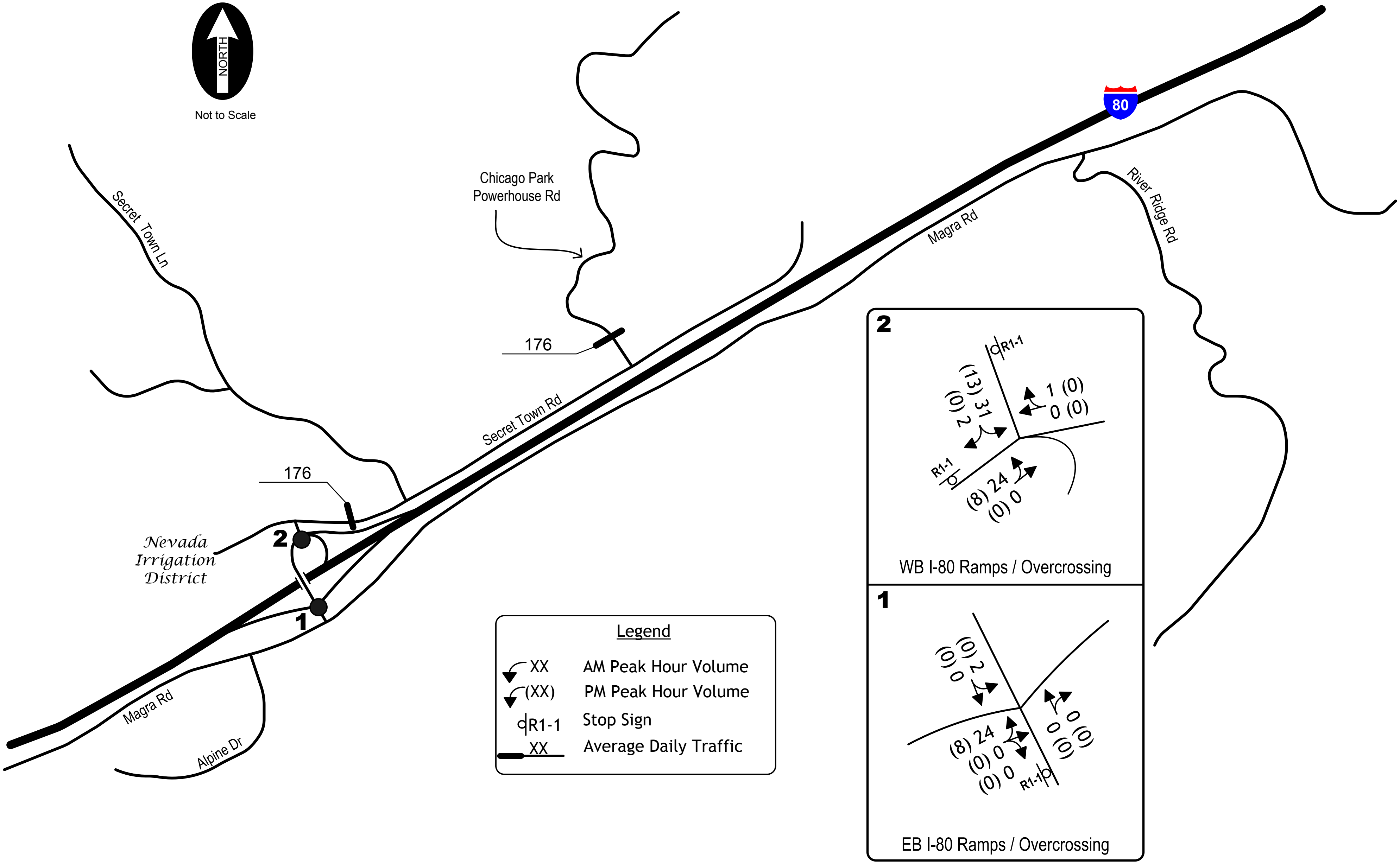
Freeway Ramps. Each of the eastbound and westbound ramp junctions with I-80 are also projected to continue to operate at satisfactory LOS "A" to "B" with the addition of project truck traffic in the morning and afternoon study periods.

Based on identified operating criteria, the project would not result in any significant impacts to the Alpine Overcrossing interchange in conjunction with access to the site.

Table 4
Existing plus Project Intersection and Ramp Levels of Service

Ramps	AM Peak Hour				PM Peak Hour			
	Existing		Existing Plus Project		Existing		Existing Plus Project	
	LOS	Speed	LOS	Speed	LOS	Speed	LOS	Speed
Westbound On	B	57.8	B	57.8	B	57.7	B	57.7
Westbound Off	A	56.6	A	56.6	B	56.6	B	56.6
Eastbound On	B	57.8	B	57.8	B	57.6	B	57.6
Eastbound Off	B	56.6	B	56.5	B	56.5	B	56.5
Intersections	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**
EB Ramps/Overcrossing								
EB Approach	A	8.8	A	9.7	A	8.6	A	8.8
SB Left	A	7.3	A	7.6	A	7.3	A	7.3
WB Ramps/Overcrossing								
SB Approach	A	8.8	B	10.8	A	8.6	A	9.3
WB Approach	A	8.6	B	10.6	A	8.4	A	9.1

LOS – Level of Service
Speed – Mean speed in ramp influence area
Delay – Intersection approach delay in seconds



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PROJECT TRAFFIC VOLUMES

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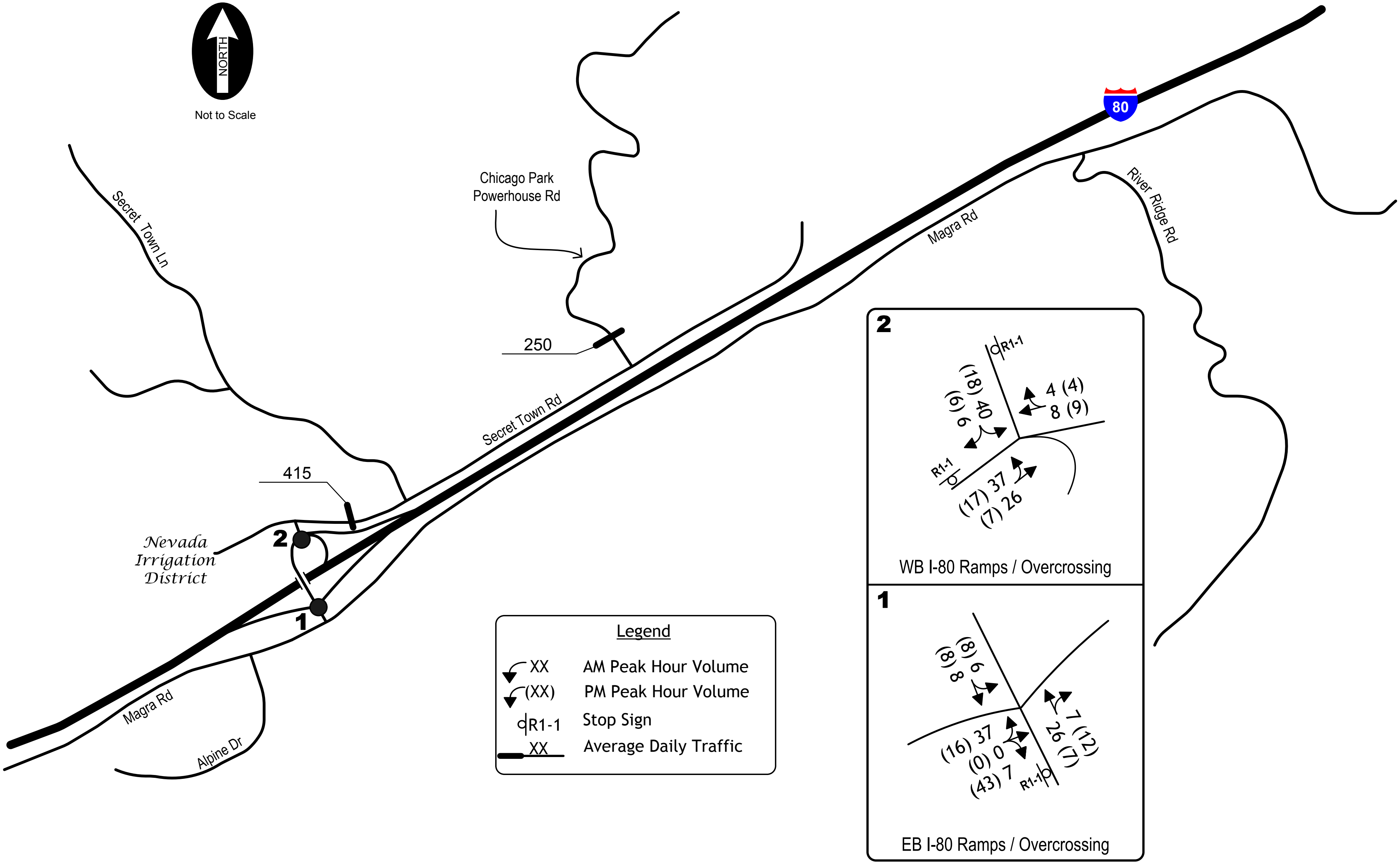
figure 3



EXISTING PLUS PROJECT TRAFFIC VOLUMES

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figure 4

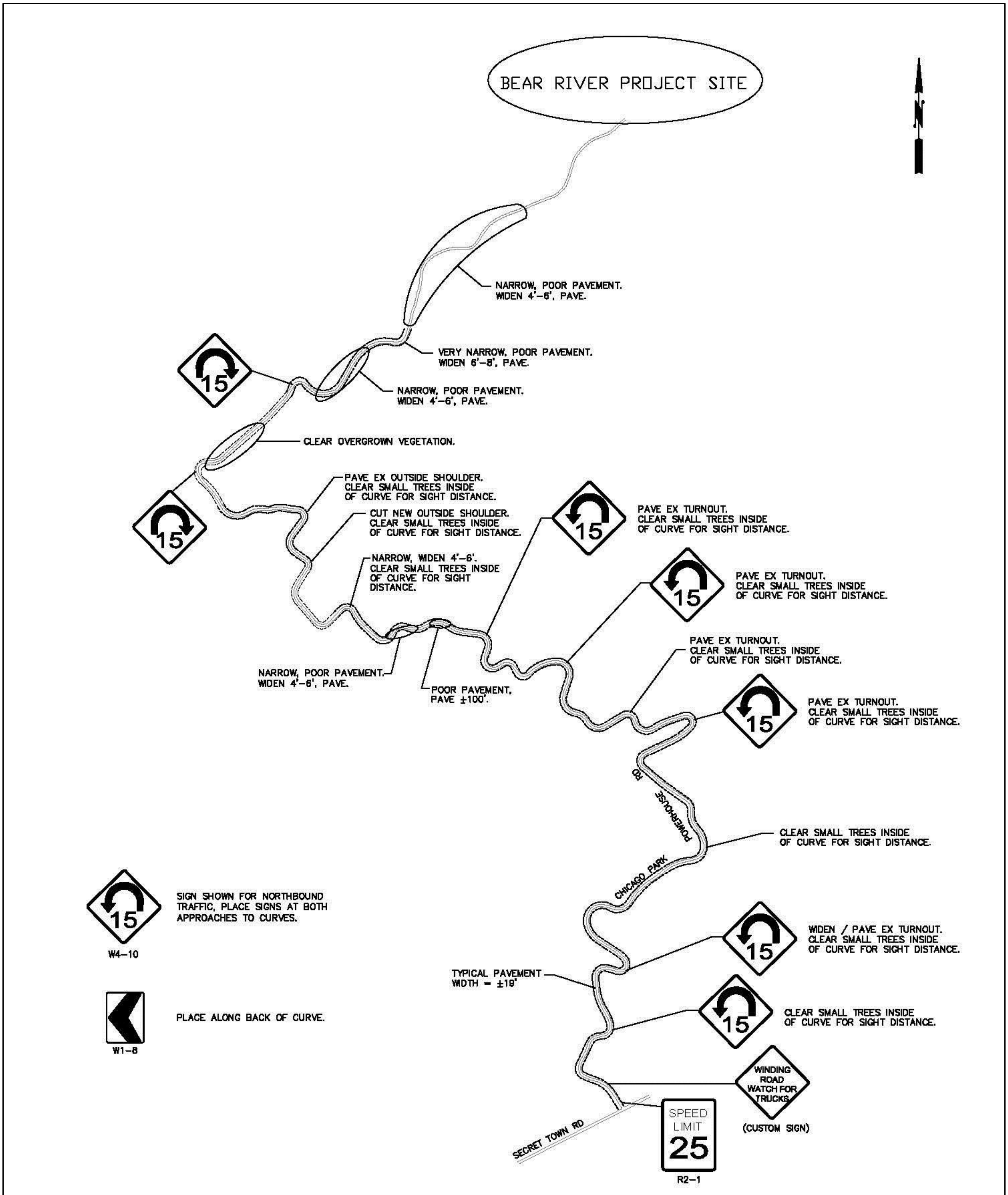
Local Haul Route Operating Conditions. Satisfactory roadway operations are projected to continue on Secret Town Road with the addition of project traffic. The additional traffic will be noticeable to area residents using the road, but the traffic increase will not measurably affect the available capacity of the existing street.

Chicago Park Powerhouse Road follows a winding hillside horizontal alignment and extends for approximately 3 miles to the project site. The southerly 2 miles of the roadway follow a relatively gradual grade, with the northerly 1 mile segment on a more pronounced downhill grade into the Bear River canyon. The majority of the roadway provides 19' of pavement and the roadway does not have any centerline striping. Towards the northerly end of the road, an approximately ½ mile segment has many areas of poor pavement and is narrower in sections. A number of sections are about 4' narrower, with a few short segments having a width of only 14'-15'. This area of the roadway will require improvement to permit 2-way truck traffic. The balance of the pavement surface along the length of the road is in relatively good condition other than several locations were numerous potholes exist due to erosion.

Recommendations regarding the needed roadway width to accommodate 2-way truck traffic as well as treatments at horizontal curves are based upon guidelines presented in the AASHTO publications "*A Policy on Geometric Design of Highways and Streets*" and "*Guidelines for Geometric Design of Very Low Volume Local Roads (ADT < 400)*". Each of these publications discusses "special purpose roads", consisting of facilities such as recreational roads, resource recovery roads and local service roads and are considered applicable to conditions and the intended use of Chicago Park Powerhouse Road.

Field observations indicate that a number of the horizontal curves along the Chicago Park Powerhouse Road route have a relatively small radius, estimated to range from 60' – 110'. The tighter curves do not permit 2-way truck traffic within the curve. However, many of these locations provide a graveled or paved shoulder area / turnout on the outside of the curve to permit a vehicle to pull over and yield to another on-coming vehicle. These curve locations should be signed appropriately with warning signs to indicate the degree of curvature and advisory speed (example – W4-10(CA) sign with 15 mph advisory speed). These curves should also be delineated with directional "chevron" warning arrows along the back of the curves to aide in negotiating the curves in darkness. Adherence to the 15 mph advisory speed will also aide in identifying the presence of an on-coming vehicle in the vicinity of the curve, as sight distance is very limited through many of the curves. The limited line of sight through a number of the curves can also be significantly improved with removal of small trees and vegetation on the inside of the curves immediately off of the roadway. It is likely that much of this lower vegetation growth has occurred over the last ten years subsequent to use of the road as a haul route for similar extraction operations prior to 2002.

Figure 5 summarizes recommended signing features and roadway locations in need of improvement to facilitate 2-way truck traffic along the route for transport of material.



CHICAGO PARK POWERHOUSE ACCESS ROAD
IMPROVEMENT RECOMMENDATIONS TO
ACCOMMODATE 2-WAY TRUCK TRAFFIC

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figure 5

CUMULATIVE TRAFFIC IMPACTS

The impacts of implementing the **Nevada Irrigation District's (NID) Bear River Restoration Project** have also been considered within the context of long-term future (i.e., 20 year) traffic conditions in this area of Placer County. Cumulative analysis accounts for future local and regional traffic growth in the study area. For purposes of analysis, material extraction and transport from the project under long term conditions has been assumed to be consistent with that identified for near term conditions, or 250,000 tons of material annually.

Background Traffic Volume Growth. The Transportation Corridor Concept Report (TCCR) for Interstate 80 has been used to quantify long term conditions within the study area. The TCCR is Caltrans long range (20 year) planning document for each State Highway Route. The I-80 TCCR indicates that traffic volumes along the segment of I-80 encompassing the study area are forecast to increase by 47% over the 20 year planning period, or about 2% annually. This growth rate has been applied to existing freeway volumes to project future ramp operations. This growth rate has also been applied to ramp intersection volumes to account for area growth which may occur in the vicinity of the Alpine interchange off of Secret Town Road and Magra Road. Figure 6 displays forecast traffic volumes under cumulative base conditions without project generated traffic. Figure 7 presents resulting volumes with the addition of project generated traffic to forecast background volumes.

Cumulative Circulation System Improvements. No capacity improvements to the study area street and highway system have been assumed for the long term cumulative analysis.

Cumulative Levels of Service

Table 5 summarizes projected intersection and freeway ramp operations under long term cumulative conditions with and without implementation of the Bear River Restoration Project.

Intersections. As shown in Table 5, satisfactory LOS "A" operations are projected to continue at the eastbound ramp / overcrossing intersection in the future with or without the addition of project generated truck traffic. Similarly, satisfactory LOS "A" to "B" operations are projected at the westbound ramp / overcrossing intersection.

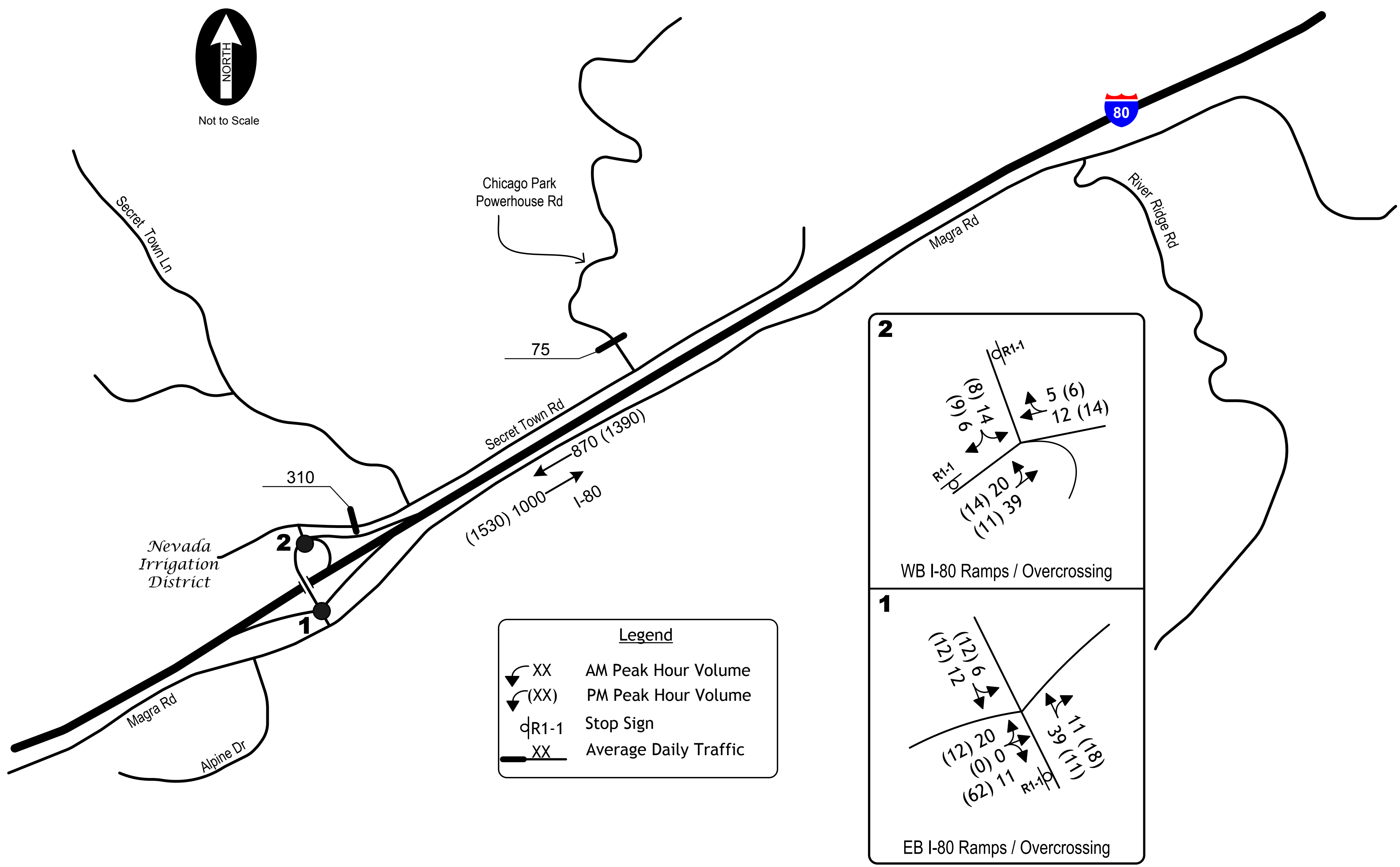
Freeway Ramps. Each of the eastbound and westbound ramp junctions with I-80 are also projected to operate at satisfactory LOS "B" to "C" during the weekday in the future, with or without the addition of project truck traffic in the morning and afternoon study periods.

Based on identified operating criteria, the project would not result in any significant impacts to the Alpine Overcrossing interchange under long term cumulative traffic conditions.

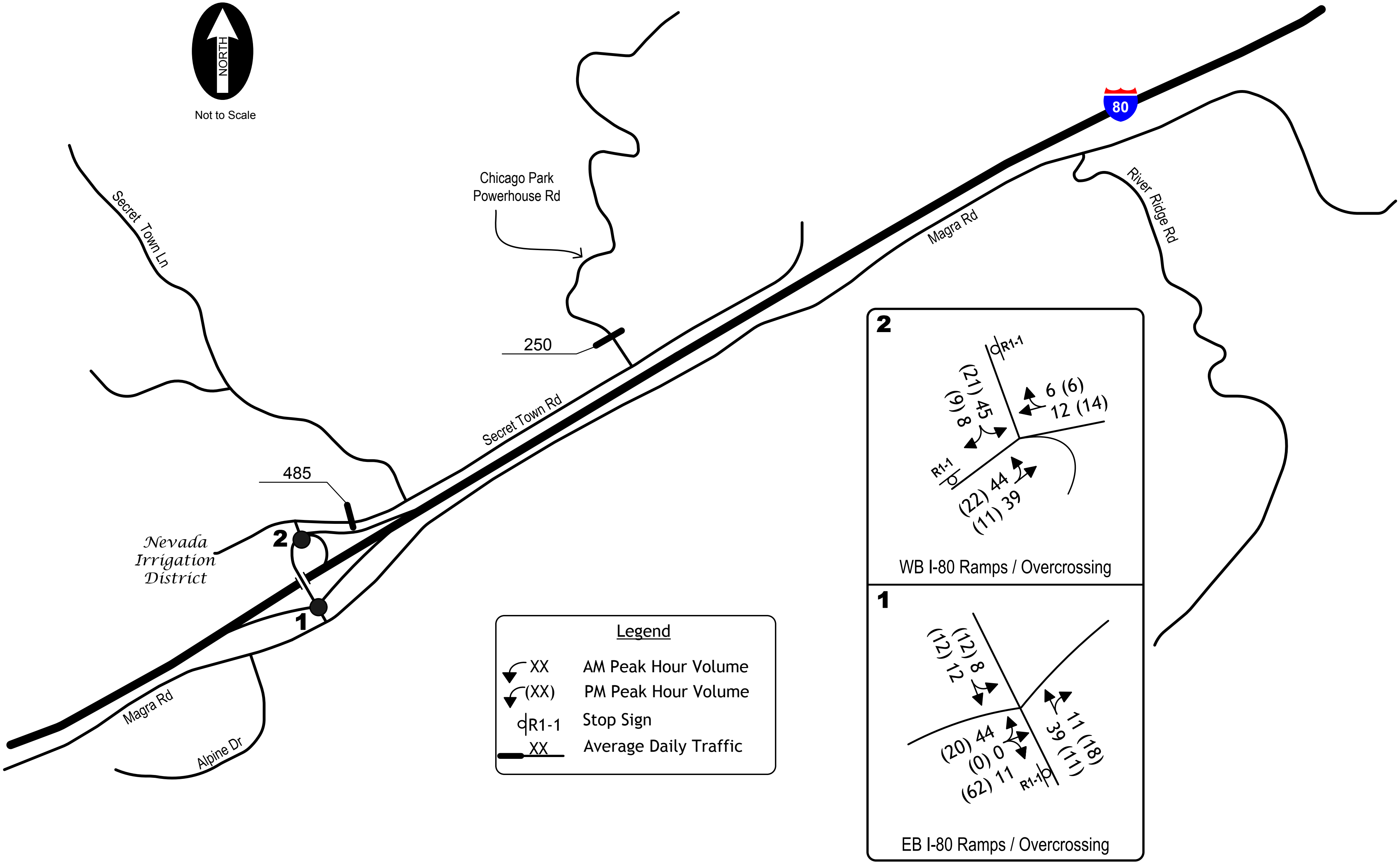
Table 5
Future Intersection and Ramp Levels of Service

Ramps	AM Peak Hour				PM Peak Hour			
	Future Base		Future Plus Project		Future Base		Future Plus Project	
	LOS	Speed	LOS	Speed	LOS	Speed	LOS	Speed
Westbound On	B	57.7	B	57.7	B	57.4	B	57.4
Westbound Off	B	56.6	B	56.6	B	56.6	B	56.6
Eastbound On	B	57.7	B	57.7	C	57.3	C	57.3
Eastbound Off	B	56.5	B	56.4	C	56.5	C	56.4
Intersections	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**
EB Ramps/Overcrossing								
EB Approach	A	9.0	A	10.0	A	8.8	A	9.0
SB Left	A	7.4	A	7.7	A	7.3	A	7.3
WB Ramps/Overcrossing								
SB Approach	A	9.1	B	11.0	A	8.7	A	9.4
WB Approach	A	8.9	B	10.8	A	8.5	A	9.2

LOS – Level of Service
Speed – Mean speed in ramp influence area
Delay – Intersection approach delay in seconds



FUTURE (YEAR 2030)
WEEKDAY TRAFFIC VOLUMES



FUTURE PLUS PROJECT
WEEKDAY TRAFFIC VOLUMES

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Truck Loading on Area Roads. The relative impact of truck traffic on area roads associated with the proposed project has been considered based on the procedures contained in Chapter 6 of the Caltrans Highway Design Manual (HDM). These procedures equate truck loadings over a 20 year period to *Equivalent Single Axle Loads (ESAL's)* and identify relative impact in terms of resulting *Traffic Index (TI).*

For the purpose of pavement analysis the 250,000 tons per year of material transport has been used, however, it is not likely that this level of activity would be sustained over a long period. The 250,000 tons per year has been used as a worst case scenario for purposes of the traffic analysis, however, NID estimates that 50,000 tons of material is the more likely scenario over a long term planning horizon.

Annualizing the 250,000 ton haul scenario over a 365 day year for purposes of the ESAL calculation results in 45 trucks per day in one direction. This load is spread over the pavement's twenty year useful life. The number of ESAL's associated with this level of truck activity can be identified based on Table 603.3A of the HDM. Each daily truck (3-axle, 10 wheeler dump) creates 3,680 ESAL's over a twenty year period. Thus, the project's contribution to loadings on Secret Town Road and Chicago Park Powerhouse Road could be 165,500 ESAL's.

The roadway needed to accommodate this loading over a 20 year period is expressed in terms of the section's **Traffic Index (T.I)**. A T.I. of 7.5 is needed to accommodate 165,500 ESAL's. The roadway section required to provide a T.I. of 7.5 is a relatively moderate section typical of many public streets. Although the extent of the street sections serving the project are not known, it is likely that Secret Town Road is constructed to this standard and the project would not appreciably change the overall condition of the road or result in an accelerated maintenance schedule.

APPENDIX

Ramp LOS Calculations

Existing & Existing plus Project

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	MB	Freeway/Dir of Travel	EB I-80
Agency or Company	KDA	Junction	Alpine pm 38.35
Date Performed	10/28/2013	Jurisdiction	CT
Analysis Time Period	AM peak	Analysis Year	2013

Project Description Existing conditions

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	200
Freeway Volume, V_F	680
Ramp Volume, V_R	20
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp: ☑ Yes ☑ On ☐ No ☐ Off; L_{down} = 1270 ft; V_D = 11 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	680	0.92	Rolling	13	6	0.797	1.00	928
Ramp	20	0.60	Level	0	0	1.000	1.00	33
UpStream								
DownStream	11	0.60	Level	0	0	1.000	1.00	18

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 928 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	928	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	895	Exhibit 13-8	4700	No
V_R	33	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	928	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = 10.4 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.366 (Exhibit 13-12)

S_R= 56.6 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 56.6 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	MB	Freeway/Dir of Travel	EB I-80
Agency or Company	KDA	Junction	Alpine pm 38.35
Date Performed	10/25/2013	Jurisdiction	CT
Analysis Time Period	AM peak	Analysis Year	2013

Project Description Existing Conditions

Inputs

Upstream Adj Ramp: ☑ Yes ☐ On ☐ No ☑ Off

L_{up} = 1270 ft

V_u = 20 veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	220
Deceleration Lane Length L_D	
Freeway Volume, V_F	680
Ramp Volume, V_R	11
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	680	0.92	Rolling	13	6	0.797	1.00	928
Ramp	11	0.60	Level	0	0	1.000	1.00	18
UpStream	20	0.60	Level	0	0	1.000	1.00	33
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 928 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	946	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	946	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$$

D_R = 11.5 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.313 (Exibit 13-11)

S_R= 57.8 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 57.8 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

Analyst	MB
Agency or Company	KDA
Date Performed	10/25/2013
Analysis Time Period	AM peak

Site Information

Freeway/Dir of Travel	WB I-80
Junction	Alpine pm 38.35
Jurisdiction	CT
Analysis Year	2013

Project Description Existing Conditions

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	285
Deceleration Lane Length L_D	
Freeway Volume, V_F	590
Ramp Volume, V_R	35
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	30.0

Downstream Adj Ramp

☑ Yes ☐ On

☐ No ☑ Off

L_{down} = 3100 ft

V_D = 30 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	590	0.92	Rolling	13	6	0.797	1.00	805
Ramp	35	0.71	Level	0	0	1.000	1.00	49
UpStream								
DownStream	30	0.80	Level	0	0	1.000	1.00	37

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 805 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	854	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	854	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$$

D_R = 10.3 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.313 (Exibit 13-11)

S_R= 57.8 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 57.8 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	MB	Freeway/Dir of Travel	WB I-80
Agency or Company	KDA	Junction	Alpine pm 38.35
Date Performed	10/28/2013	Jurisdiction	CT
Analysis Time Period	AM peak	Analysis Year	2013

Project Description Existing conditions

Inputs

Upstream Adj Ramp				Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N	2		☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N	1		☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A			L_{down} = 800 ft
V_u = veh/h	Deceleration Lane Length L_D	180		V_D = 35 veh/h
	Freeway Volume, V_F	590		
	Ramp Volume, V_R	11		
	Freeway Free-Flow Speed, S_{FF}	65.0		
	Ramp Free-Flow Speed, S_{FR}	40.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	590	0.92	Rolling	13	6	0.797	1.00	805
Ramp	11	0.71	Level	0	0	1.000	1.00	15
UpStream								
DownStream	35	0.71	Level	0	0	1.000	1.00	49

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F(P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 805 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	805	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	790	Exhibit 13-8	4700	No
V_R	15	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	805	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$$

D_R = 9.6 (pc/mi/ln)

LOS = A (Exhibit 13-2)

Speed Determination

D_s = 0.364 (Exhibit 13-12)

S_R= 56.6 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 56.6 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	MB	Freeway/Dir of Travel	EB I-80
Agency or Company	KDA	Junction	Alpine pm 38.35
Date Performed	10/28/2013	Jurisdiction	CT
Analysis Time Period	PM peak	Analysis Year	2013

Project Description Existing conditions

Inputs

Upstream Adj Ramp		Freeway / Ramp		Downstream Adj Ramp	
☐ Yes	☐ On	Freeway Number of Lanes, N	2	☑ Yes	☑ On
☑ No	☐ Off	Ramp Number of Lanes, N	1	☐ No	☐ Off
L_{up} =	ft	Acceleration Lane Length, L_A		L_{down} =	1270 ft
V_u =	veh/h	Deceleration Lane Length L_D	200	V_D =	20 veh/h
		Freeway Volume, V_F	1040		
		Ramp Volume, V_R	51		
		Freeway Free-Flow Speed, S_{FF}	65.0		
		Ramp Free-Flow Speed, S_{FR}	40.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1040	0.92	Rolling	13	6	0.797	1.00	1419
Ramp	51	0.82	Level	0	0	1.000	1.00	62
UpStream								
DownStream	20	0.82	Level	0	0	1.000	1.00	24

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 1419 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1419	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	1357	Exhibit 13-8	4700	No
V_R	62	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1419	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = 14.7 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.369 (Exhibit 13-12)

S_R= 56.5 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 56.5 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	MB	Freeway/Dir of Travel	EB I-80
Agency or Company	KDA	Junction	Alpine pm 38.35
Date Performed	10/25/2013	Jurisdiction	CT
Analysis Time Period	PM peak	Analysis Year	2013

Project Description Existing Conditions

Inputs

Upstream Adj Ramp

☑ Yes ☐ On

☐ No ☑ Off

L_{up} = 1270 ft

V_u = 51 veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	220
Deceleration Lane Length L_D	
Freeway Volume, V_F	1040
Ramp Volume, V_R	20
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1040	0.92	Rolling	13	6	0.797	1.00	1419
Ramp	20	0.80	Level	0	0	1.000	1.00	25
UpStream	51	0.80	Level	0	0	1.000	1.00	64
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1419 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1444	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1444	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$$

D_R = 15.3 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.320 (Exibit 13-11)

S_R= 57.6 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 57.6 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

Analyst	MB
Agency or Company	KDA
Date Performed	10/28/2013
Analysis Time Period	PM peak

Site Information

Freeway/Dir of Travel	WB I-80
Junction	Alpine pm 38.35
Jurisdiction	CT
Analysis Year	2013

Project Description Existing conditions

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	180
Freeway Volume, V_F	945
Ramp Volume, V_R	13
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp

☑ Yes ☑ On

☐ No ☐ Off

L_{down} = 800 ft

V_D = 12 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	945	0.92	Rolling	13	6	0.797	1.00	1289
Ramp	13	0.71	Level	0	0	1.000	1.00	18
UpStream								
DownStream	12	0.71	Level	0	0	1.000	1.00	17

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * $V_{12}/2$ ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 1289 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * $V_{12}/2$ ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1289	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	1271	Exhibit 13-8	4700	No
V_R	18	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1289	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$$

D_R = 13.7 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.365 (Exhibit 13-12)

S_R= 56.6 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 56.6 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	MB	Freeway/Dir of Travel	WB I-80
Agency or Company	KDA	Junction	Alpine pm 38.35
Date Performed	10/25/2013	Jurisdiction	CT
Analysis Time Period	PM peak	Analysis Year	2013

Project Description Existing Conditions

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 2	☑ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☑ Off
L_{up} = ft	Acceleration Lane Length, L_A: 285	L_{down} = 3100 ft
V_u = veh/h	Deceleration Lane Length L_D:	V_D = 30 veh/h
	Freeway Volume, V_F: 945	
	Ramp Volume, V_R: 12	
	Freeway Free-Flow Speed, S_{FF}: 65.0	
	Ramp Free-Flow Speed, S_{FR}: 30.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	945	0.92	Rolling	13	6	0.797	1.00	1289
Ramp	12	0.71	Level	0	0	1.000	1.00	17
UpStream								
DownStream	30	0.80	Level	0	0	1.000	1.00	37

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1289 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1306	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1306	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$$

D_R = 13.9 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.318 (Exibit 13-11)

S_R= 57.7 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 57.7 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	MB	Freeway/Dir of Travel	EB I-80
Agency or Company	KDA	Junction	Alpine pm 38.35
Date Performed	10/28/2013	Jurisdiction	CT
Analysis Time Period	AM peak	Analysis Year	2013

Project Description Existing plus project

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	200
Freeway Volume, V_F	680
Ramp Volume, V_R	44
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp

☑ Yes ☑ On

☐ No ☐ Off

L_{down} = 1270 ft

V_D = 13 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	680	0.92	Rolling	13	6	0.797	1.00	928
Ramp	44	0.60	Level	43	0	0.823	1.00	89
UpStream								
DownStream	13	0.60	Level	15	0	0.930	1.00	23

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F\,(P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 928 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	928	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	839	Exhibit 13-8	4700	No
V_R	89	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	928	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$$

D_R = 10.4 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.371 (Exhibit 13-12)

S_R= 56.5 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 56.5 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	MB	Freeway/Dir of Travel	EB I-80
Agency or Company	KDA	Junction	Alpine pm 38.35
Date Performed	10/25/2013	Jurisdiction	CT
Analysis Time Period	AM peak	Analysis Year	2013

Project Description Existing plus project

Inputs

Upstream Adj Ramp

☑ Yes ☐ On

☐ No ☑ Off

L_{up} = 1270 ft

V_u = 44 veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	220
Deceleration Lane Length L_D	
Freeway Volume, V_F	680
Ramp Volume, V_R	13
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	680	0.92	Rolling	13	6	0.797	1.00	928
Ramp	13	0.60	Level	15	0	0.930	1.00	23
UpStream	44	0.60	Level	43	0	0.823	1.00	89
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F\,(P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 928 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	951	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	951	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 11.5 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.313 (Exibit 13-11)

S_R= 57.8 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 57.8 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

 HCS2010™ Version 6.50 Generated: 12/13/2013 10:55 AM

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	MB	Freeway/Dir of Travel	WB I-80
Agency or Company	KDA	Junction	Alpine pm 38.35
Date Performed	10/28/2013	Jurisdiction	CT
Analysis Time Period	AM peak	Analysis Year	2013

Project Description Existing plus project

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	180
Freeway Volume, V_F	590
Ramp Volume, V_R	12
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp: ☑ Yes ☑ On ☐ No ☐ Off; L_{down} = 800 ft; V_D = 66 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	590	0.92	Rolling	13	6	0.797	1.00	805
Ramp	12	0.71	Level	8	0	0.962	1.00	18
UpStream								
DownStream	66	0.71	Level	47	0	0.810	1.00	115

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 805 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	805	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	787	Exhibit 13-8	4700	No
V_R	18	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	805	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 9.6 (pc/mi/ln)

LOS = A (Exhibit 13-2)

Speed Determination

D_s = 0.365 (Exhibit 13-12)

S_R= 56.6 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 56.6 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	MB	Freeway/Dir of Travel	WB I-80
Agency or Company	KDA	Junction	Alpine pm 38.35
Date Performed	10/25/2013	Jurisdiction	CT
Analysis Time Period	AM peak	Analysis Year	2013

Project Description Existing plus Project

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	285
Deceleration Lane Length L_D	
Freeway Volume, V_F	590
Ramp Volume, V_R	66
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	30.0

Downstream Adj Ramp

☑ Yes ☐ On

☐ No ☑ Off

L_{down} = 3100 ft

V_D = 30 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	590	0.92	Rolling	13	6	0.797	1.00	805
Ramp	66	0.71	Level	47	0	0.810	1.00	115
UpStream								
DownStream	30	0.80	Level	0	0	1.000	1.00	37

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 805 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	920	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	920	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 10.8 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.314 (Exibit 13-11)

S_R= 57.8 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 57.8 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	MB	Freeway/Dir of Travel	WB I-80
Agency or Company	KDA	Junction	Alpine pm 38.35
Date Performed	10/25/2013	Jurisdiction	CT
Analysis Time Period	AM peak	Analysis Year	2013

Project Description Existing plus Project, upstream off

Inputs

Upstream Adj Ramp: ☑ Yes ☐ On ☐ No ☑ Off

L_{up} = 800 ft

V_u = 12 veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	285
Deceleration Lane Length L_D	
Freeway Volume, V_F	590
Ramp Volume, V_R	66
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	30.0

Downstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	590	0.92	Rolling	13	6	0.797	1.00	805
Ramp	66	0.71	Level	47	0	0.810	1.00	115
UpStream	12	0.71	Level	8	0	0.962	1.00	18
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 805 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	920	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	920	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 10.8 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.314 (Exibit 13-11)

S_R= 57.8 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 57.8 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	MB	Freeway/Dir of Travel	EB I-80
Agency or Company	KDA	Junction	Alpine pm 38.35
Date Performed	10/28/2013	Jurisdiction	CT
Analysis Time Period	PM peak	Analysis Year	2013

Project Description Existing plus project

Inputs

Upstream Adj Ramp			Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N	2	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N	1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A		L_{down} = 1270 ft
V_u = veh/h	Deceleration Lane Length L_D	200	V_D = 20 veh/h
	Freeway Volume, V_F	1040	
	Ramp Volume, V_R	59	
	Freeway Free-Flow Speed, S_{FF}	65.0	
	Ramp Free-Flow Speed, S_{FR}	40.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1040	0.94	Rolling	13	6	0.797	1.00	1389
Ramp	59	0.82	Level	14	0	0.935	1.00	77
UpStream								
DownStream	20	0.82	Level	0	0	1.000	1.00	24

Merge Areas	Diverge Areas

Estimation of v_{12} (Merge Areas)

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Estimation of v_{12} (Diverge Areas)

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 1389 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks (Merge Areas)

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Capacity Checks (Diverge Areas)

	Actual	Capacity		LOS F?
V_F	1389	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	1312	Exhibit 13-8	4700	No
V_R	77	Exhibit 13-10	2100	No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1389	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F) (Merge Areas)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Level of Service Determination (if not F) (Diverge Areas)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = 14.4 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination (Merge Areas)

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Speed Determination (Diverge Areas)

D_s = 0.370 (Exhibit 13-12)

S_R= 56.5 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 56.5 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	MB	Freeway/Dir of Travel	EB I-80
Agency or Company	KDA	Junction	Alpine pm 38.35
Date Performed	10/25/2013	Jurisdiction	CT
Analysis Time Period	PM peak	Analysis Year	2013

Project Description Existing plus project

Inputs

Upstream Adj Ramp				Downstream Adj Ramp
☑ Yes ☐ On	Freeway Number of Lanes, N	2		☐ Yes ☐ On
☐ No ☑ Off	Ramp Number of Lanes, N	1		☑ No ☐ Off
L_{up} = 1270 ft	Acceleration Lane Length, L_A	220		L_{down} = ft
V_u = 59 veh/h	Deceleration Lane Length L_D			V_D = veh/h
	Freeway Volume, V_F	1040		
	Ramp Volume, V_R	20		
	Freeway Free-Flow Speed, S_{FF}	65.0		
	Ramp Free-Flow Speed, S_{FR}	40.0		

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1040	0.92	Rolling	13	6	0.797	1.00	1419
Ramp	20	0.80	Level	0	0	1.000	1.00	25
UpStream	59	0.80	Level	14	0	0.935	1.00	79
DownStream								

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1419 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1444	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1444	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 15.3 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.320 (Exhibit 13-11)

S_R= 57.6 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 57.6 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	MB	Freeway/Dir of Travel	WB I-80
Agency or Company	KDA	Junction	Alpine pm 38.35
Date Performed	10/28/2013	Jurisdiction	CT
Analysis Time Period	PM peak	Analysis Year	2013

Project Description Existing plus project

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	180
Freeway Volume, V_F	945
Ramp Volume, V_R	13
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp

☑ Yes ☑ On

☐ No ☐ Off

L_{down} = 800 ft

V_D = 25 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	945	0.92	Rolling	13	6	0.797	1.00	1289
Ramp	13	0.71	Level	0	0	1.000	1.00	18
UpStream								
DownStream	25	0.71	Level	32	0	0.862	1.00	41

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 1289 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1289	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	1271	Exhibit 13-8	4700	No
V_R	18	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1289	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = 13.7 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.365 (Exhibit 13-12)

S_R= 56.6 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 56.6 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	MB	Freeway/Dir of Travel	WB I-80
Agency or Company	KDA	Junction	Alpine pm 38.35
Date Performed	10/25/2013	Jurisdiction	CT
Analysis Time Period	PM peak	Analysis Year	2013

Project Description Existing plus Project

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	285
Deceleration Lane Length L_D	
Freeway Volume, V_F	945
Ramp Volume, V_R	25
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	30.0

Downstream Adj Ramp

☑ Yes ☐ On

☐ No ☑ Off

L_{down} = 3100 ft

V_D = 30 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	945	0.92	Rolling	13	6	0.797	1.00	1289
Ramp	25	0.71	Level	32	0	0.862	1.00	41
UpStream								
DownStream	30	0.80	Level	0	0	1.000	1.00	37

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F\,(P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1289 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1330	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1330	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$$

D_R = 14.0 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.319 (Exibit 13-11)

S_R= 57.7 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 57.7 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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Ramp LOS Calculations

Future & Future plus Project

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	MB	Freeway/Dir of Travel	EB I-80
Agency or Company	KDA	Junction	Alpine pm 38.35
Date Performed	10/28/2013	Jurisdiction	CT
Analysis Time Period	AM peak	Analysis Year	2030

Project Description Future base

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	200
Freeway Volume, V_F	1000
Ramp Volume, V_R	31
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp: ☑ Yes ☑ On ☐ No ☐ Off

L_{down} = 1270 ft

V_D = 17 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1000	0.92	Rolling	13	6	0.797	1.00	1364
Ramp	31	0.60	Level	0	0	1.000	1.00	52
UpStream								
DownStream	17	0.60	Level	0	0	1.000	1.00	28

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 1364 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1364	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	1312	Exhibit 13-8	4700	No
V_R	52	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1364	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$$

D_R = 14.2 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.368 (Exhibit 13-12)

S_R= 56.5 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 56.5 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	MB	Freeway/Dir of Travel	EB I-80
Agency or Company	KDA	Junction	Alpine pm 38.35
Date Performed	10/25/2013	Jurisdiction	CT
Analysis Time Period	AM peak	Analysis Year	2030

Project Description Future base

Inputs

Upstream Adj Ramp

☑ Yes ☐ On

☐ No ☑ Off

L_{up} = 1270 ft

V_u = 31 veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	220
Deceleration Lane Length L_D	
Freeway Volume, V_F	1000
Ramp Volume, V_R	17
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1000	0.92	Rolling	13	6	0.797	1.00	1364
Ramp	17	0.60	Level	0	0	1.000	1.00	28
UpStream	31	0.60	Level	0	0	1.000	1.00	52
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1364 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1392	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1392	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$$

D_R = 14.9 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.319 (Exibit 13-11)

S_R= 57.7 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 57.7 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	MB	Freeway/Dir of Travel	WB I-80
Agency or Company	KDA	Junction	Alpine pm 38.35
Date Performed	10/28/2013	Jurisdiction	CT
Analysis Time Period	AM peak	Analysis Year	2030

Project Description Future Base

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 2	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 800 ft
V_u = veh/h	Deceleration Lane Length L_D: 180	V_D = 53 veh/h
	Freeway Volume, V_F: 870	
	Ramp Volume, V_R: 17	
	Freeway Free-Flow Speed, S_{FF}: 65.0	
	Ramp Free-Flow Speed, S_{FR}: 40.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	870	0.92	Rolling	13	6	0.797	1.00	1187
Ramp	17	0.71	Level	0	0	1.000	1.00	24
UpStream								
DownStream	53	0.71	Level	0	0	1.000	1.00	75

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 1187 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1187	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	1163	Exhibit 13-8	4700	No
V_R	24	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1187	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = 12.8 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.365 (Exhibit 13-12)

S_R= 56.6 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 56.6 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	MB	Freeway/Dir of Travel	WB I-80
Agency or Company	KDA	Junction	Alpine pm 38.35
Date Performed	10/25/2013	Jurisdiction	CT
Analysis Time Period	AM peak	Analysis Year	2030

Project Description Future base

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	285
Deceleration Lane Length L_D	
Freeway Volume, V_F	870
Ramp Volume, V_R	53
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	30.0

Downstream Adj Ramp: ☑ Yes ☐ On ☐ No ☑ Off; L_{down} = 3100 ft; V_D = 30 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	870	0.92	Rolling	13	6	0.797	1.00	1187
Ramp	53	0.71	Level	0	0	1.000	1.00	75
UpStream								
DownStream	30	0.80	Level	0	0	1.000	1.00	37

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1187 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1262	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1262	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$$

D_R = 13.5 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.318 (Exibit 13-11)

S_R= 57.7 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 57.7 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	MB	Freeway/Dir of Travel	EB I-80
Agency or Company	KDA	Junction	Alpine pm 38.35
Date Performed	10/28/2013	Jurisdiction	CT
Analysis Time Period	PM peak	Analysis Year	2030

Project Description Future base

Inputs

Upstream Adj Ramp			Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N	2	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N	1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A		L_{down} = 1270 ft
V_u = veh/h	Deceleration Lane Length L_D	200	V_D = 30 veh/h
	Freeway Volume, V_F	1530	
	Ramp Volume, V_R	74	
	Freeway Free-Flow Speed, S_{FF}	65.0	
	Ramp Free-Flow Speed, S_{FR}	40.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1530	0.92	Rolling	13	6	0.797	1.00	2087
Ramp	74	0.82	Level	0	0	1.000	1.00	90
UpStream								
DownStream	30	0.82	Level	0	0	1.000	1.00	37

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 2087 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	2087	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	1997	Exhibit 13-8	4700	No
V_R	90	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2087	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$$

D_R = 20.4 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

D_s = 0.371 (Exhibit 13-12)

S_R= 56.5 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 56.5 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	MB	Freeway/Dir of Travel	EB I-80
Agency or Company	KDA	Junction	Alpine pm 38.35
Date Performed	10/25/2013	Jurisdiction	CT
Analysis Time Period	PM peak	Analysis Year	2030

Project Description Future base

Inputs

Upstream Adj Ramp

☑ Yes ☐ On

☐ No ☑ Off

L_{up} = 1270 ft

V_u = 74 veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	220
Deceleration Lane Length L_D	
Freeway Volume, V_F	1530
Ramp Volume, V_R	30
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	1530	0.92	Rolling	13	6	0.797	1.00	2087
Ramp	30	0.80	Level	0	0	1.000	1.00	37
UpStream	74	0.80	Level	0	0	1.000	1.00	92
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 2087 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	2124	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2124	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$$

D_R = 20.6 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.336 (Exibit 13-11)

S_R= 57.3 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 57.3 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	MB	Freeway/Dir of Travel	WB I-80
Agency or Company	KDA	Junction	Alpine pm 38.35
Date Performed	10/28/2013	Jurisdiction	CT
Analysis Time Period	PM peak	Analysis Year	2030

Project Description Future base

Inputs

Upstream Adj Ramp			Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N	2	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N	1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A		L_{down} = 800 ft
V_u = veh/h	Deceleration Lane Length L_D	180	V_D = 19 veh/h
	Freeway Volume, V_F	1390	
	Ramp Volume, V_R	20	
	Freeway Free-Flow Speed, S_{FF}	65.0	
	Ramp Free-Flow Speed, S_{FR}	40.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	1390	0.92	Rolling	13	6	0.797	1.00	1896
Ramp	20	0.71	Level	0	0	1.000	1.00	28
UpStream								
DownStream	19	0.71	Level	0	0	1.000	1.00	27

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 1896 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1896	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	1868	Exhibit 13-8	4700	No
V_R	28	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1896	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = 18.9 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.366 (Exhibit 13-12)

S_R= 56.6 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 56.6 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	MB	Freeway/Dir of Travel	WB I-80
Agency or Company	KDA	Junction	Alpine pm 38.35
Date Performed	10/25/2013	Jurisdiction	CT
Analysis Time Period	PM peak	Analysis Year	2030

Project Description Future base

Inputs

Upstream Adj Ramp			Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N	2	☑ Yes ☐ On
☑ No ☐ Off	Ramp Number of Lanes, N	1	☐ No ☑ Off
L_{up} = ft	Acceleration Lane Length, L_A	285	L_{down} = 3100 ft
V_u = veh/h	Deceleration Lane Length L_D		V_D = 30 veh/h
	Freeway Volume, V_F	1390	
	Ramp Volume, V_R	19	
	Freeway Free-Flow Speed, S_{FF}	65.0	
	Ramp Free-Flow Speed, S_{FR}	30.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1390	0.92	Rolling	13	6	0.797	1.00	1896
Ramp	19	0.71	Level	0	0	1.000	1.00	27
UpStream								
DownStream	30	0.80	Level	0	0	1.000	1.00	37

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1896 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1923	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1923	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 18.7 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.331 (Exibit 13-11)

S_R= 57.4 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 57.4 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

Analyst	MB	Freeway/Dir of Travel	EB I-80
Agency or Company	KDA	Junction	Alpine pm 38.35
Date Performed	10/28/2013	Jurisdiction	CT
Analysis Time Period	AM peak	Analysis Year	2030

Project Description Future plus project

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	200
Freeway Volume, V_F	1000
Ramp Volume, V_R	55
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp: ☑ Yes ☑ On ☐ No ☐ Off; L_{down} = 1270 ft; V_D = 19 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1000	0.92	Rolling	13	6	0.797	1.00	1364
Ramp	55	0.60	Level	43	0	0.823	1.00	111
UpStream								
DownStream	19	0.60	Level	15	0	0.930	1.00	34

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 1364 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1364	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	1253	Exhibit 13-8	4700	No
V_R	111	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1364	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D_R = 14.2 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.373 (Exhibit 13-12)

S_R= 56.4 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 56.4 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	MB	Freeway/Dir of Travel	EB I-80
Agency or Company	KDA	Junction	Alpine pm 38.35
Date Performed	10/25/2013	Jurisdiction	CT
Analysis Time Period	AM peak	Analysis Year	2030

Project Description Future plus project

Inputs

Upstream Adj Ramp

☑ Yes ☐ On

☐ No ☑ Off

L_{up} = 1270 ft

V_u = 55 veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	220
Deceleration Lane Length L_D	
Freeway Volume, V_F	1000
Ramp Volume, V_R	19
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{down} = ft

V_D = veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1000	0.92	Rolling	13	6	0.797	1.00	1364
Ramp	19	0.60	Level	15	0	0.930	1.00	34
UpStream	55	0.60	Level	43	0	0.823	1.00	111
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1364 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1398	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1398	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$$

D_R = 15.0 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.319 (Exibit 13-11)

S_R= 57.7 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 57.7 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	MB	Freeway/Dir of Travel	WB I-80
Agency or Company	KDA	Junction	Alpine pm 38.35
Date Performed	10/28/2013	Jurisdiction	CT
Analysis Time Period	AM peak	Analysis Year	2030

Project Description Future plus project

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☐ Yes ☐ On	Freeway Number of Lanes, N: 2	☑ Yes ☑ On
☑ No ☐ Off	Ramp Number of Lanes, N: 1	☐ No ☐ Off
L_{up} = ft	Acceleration Lane Length, L_A:	L_{down} = 800 ft
V_u = veh/h	Deceleration Lane Length L_D: 180	V_D = 84 veh/h
	Freeway Volume, V_F: 870	
	Ramp Volume, V_R: 18	
	Freeway Free-Flow Speed, S_{FF}: 65.0	
	Ramp Free-Flow Speed, S_{FR}: 40.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	870	0.92	Rolling	13	6	0.797	1.00	1187
Ramp	18	0.71	Level	8	0	0.962	1.00	26
UpStream								
DownStream	84	0.71	Level	47	0	0.810	1.00	146

Merge Areas	Diverge Areas

Estimation of v_{12}

Merge Areas

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Diverge Areas

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 1187 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

Merge Areas

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Diverge Areas

	Actual	Capacity		LOS F?
V_F	1187	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	1161	Exhibit 13-8	4700	No
V_R	26	Exhibit 13-10	2100	No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1187	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

Merge Areas

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Diverge Areas

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 12.8 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

Merge Areas

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

D_s = 0.365 (Exhibit 13-12)

S_R= 56.6 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 56.6 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	MB	Freeway/Dir of Travel	WB I-80
Agency or Company	KDA	Junction	Alpine pm 38.35
Date Performed	10/25/2013	Jurisdiction	CT
Analysis Time Period	AM peak	Analysis Year	2030

Project Description Future plus Project

Inputs

Upstream Adj Ramp: ☐ Yes ☐ On ☑ No ☐ Off; L_{up} = ft; V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	285
Deceleration Lane Length L_D	
Freeway Volume, V_F	870
Ramp Volume, V_R	84
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	30.0

Downstream Adj Ramp: ☑ Yes ☐ On ☐ No ☑ Off; L_{down} = 3100 ft; V_D = 30 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	870	0.92	Rolling	13	6	0.797	1.00	1187
Ramp	84	0.71	Level	47	0	0.810	1.00	146
UpStream								
DownStream	30	0.80	Level	0	0	1.000	1.00	37

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1187 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1333	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1333	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = 14.0 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.319 (Exibit 13-11)

S_R= 57.7 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 57.7 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	MB	Freeway/Dir of Travel	EB I-80
Agency or Company	KDA	Junction	Alpine pm 38.35
Date Performed	10/28/2013	Jurisdiction	CT
Analysis Time Period	PM peak	Analysis Year	2030

Project Description Future plus project

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	200
Freeway Volume, V_F	1530
Ramp Volume, V_R	82
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp

☑ Yes ☑ On

☐ No ☐ Off

L_{down} = 1270 ft

V_D = 30 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	v = V/PHF x f_{HV} x f_p
Freeway	1530	0.94	Rolling	13	6	0.797	1.00	2043
Ramp	82	0.82	Level	14	0	0.935	1.00	107
UpStream								
DownStream	30	0.82	Level	0	0	1.000	1.00	37

Merge Areas

Estimation of v_{12}

$V_{12} = V_F (P_{FM})$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * $V_{12}/2$ ☐ Yes ☐ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\ v_R + 0.0078\ V_{12} - 0.00627\ L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$V_{12} = V_R + (V_F - V_R)P_{FD}$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 2043 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * $V_{12}/2$ ☐ Yes ☑ No

If Yes,V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	2043	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	1936	Exhibit 13-8	4700	No
V_R	107	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	2043	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\ V_{12} - 0.009\ L_D$

D_R = 20.0 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

D_s = 0.373 (Exhibit 13-12)

S_R= 56.4 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 56.4 mph (Exhibit 13-13)

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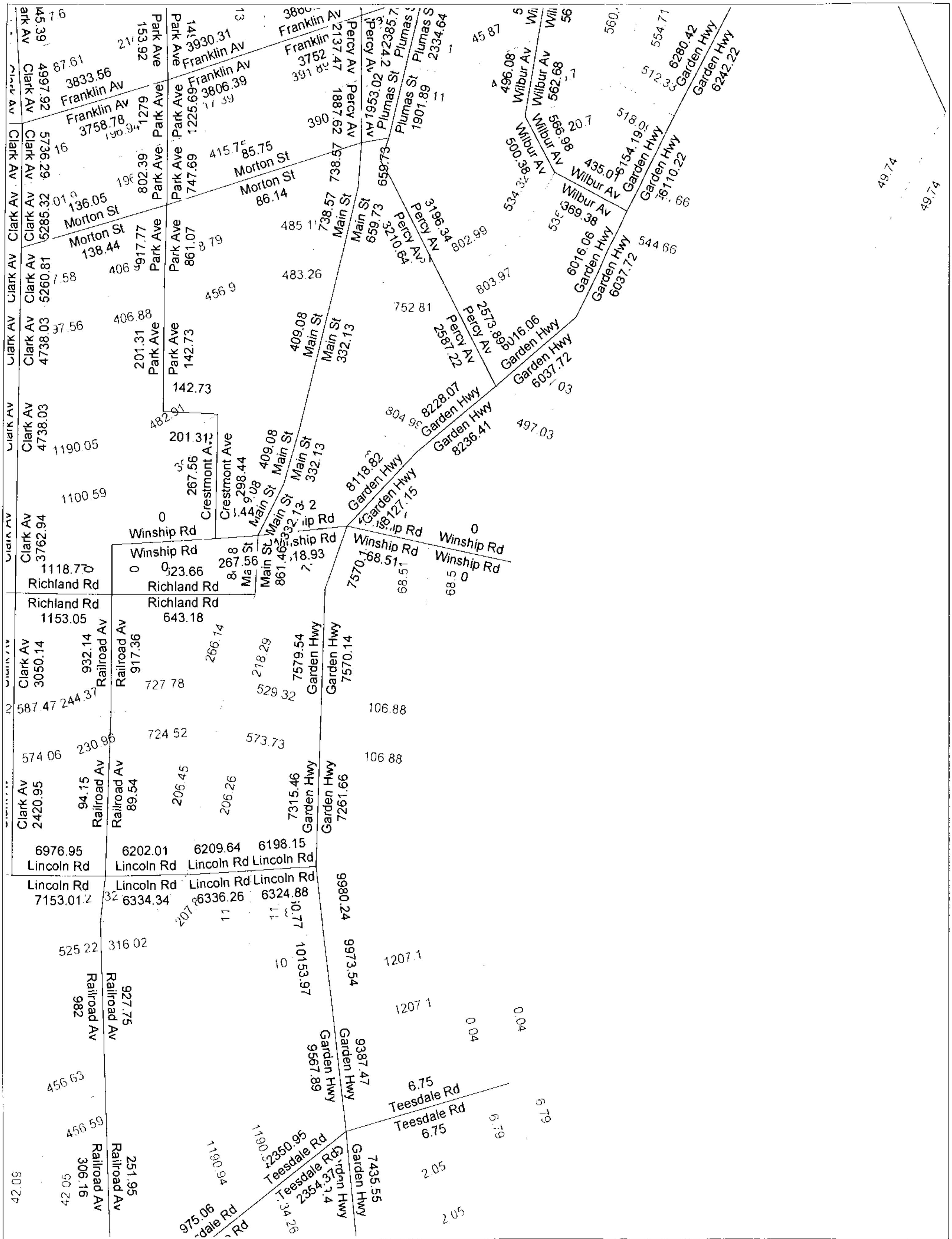
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Park Ave
Franklin Av
Morton St
Percy Av
Plumas St
Main St
Wilbur Av
Garden Hwy
Crestmont Ave
Winship Rd
Richland Rd
Railroad Av
Lincoln Rd
Teesdale Rd
3930.31
3833.56
3806.39
3758.78
3752
5736.29
5285.32
5260.81
4738.03
3762.94
3050.14
2420.95
6976.95
6202.01
6209.64
6198.15
7153.01
6334.34
6336.26
6324.88
8228.07
8236.41
8118.82
7579.54
7570.14
7315.46
7261.66
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9973.54
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7435.55
1153.05
643.18
1190.05
1100.59

RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	MB	Freeway/Dir of Travel	EB I-80
Agency or Company	KDA	Junction	Alpine pm 38.35
Date Performed	10/25/2013	Jurisdiction	CT
Analysis Time Period	PM peak	Analysis Year	2030

Project Description Future plus project

Inputs

Upstream Adj Ramp		Downstream Adj Ramp
☑ Yes ☐ On	Freeway Number of Lanes, N: 2	☐ Yes ☐ On
☐ No ☑ Off	Ramp Number of Lanes, N: 1	☑ No ☐ Off
L_{up} = 1270 ft	Acceleration Lane Length, L_A: 220	L_{down} = ft
V_u = 82 veh/h	Deceleration Lane Length L_D:	V_D = veh/h
	Freeway Volume, V_F: 1530	
	Ramp Volume, V_R: 30	
	Freeway Free-Flow Speed, S_{FF}: 65.0	
	Ramp Free-Flow Speed, S_{FR}: 40.0	

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1530	0.92	Rolling	13	6	0.797	1.00	2087
Ramp	30	0.80	Level	0	0	1.000	1.00	37
UpStream	82	0.80	Level	14	0	0.935	1.00	110
DownStream								

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 2087 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	2124	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	2124	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$$

D_R = 20.6 (pc/mi/ln)

LOS = C (Exhibit 13-2)

Speed Determination

M_S = 0.336 (Exibit 13-11)

S_R= 57.3 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 57.3 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information

Analyst	MB
Agency or Company	KDA
Date Performed	10/28/2013
Analysis Time Period	PM peak

Site Information

Freeway/Dir of Travel	WB I-80
Junction	Alpine pm 38.35
Jurisdiction	CT
Analysis Year	2030

Project Description Future plus project

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	
Deceleration Lane Length L_D	180
Freeway Volume, V_F	1390
Ramp Volume, V_R	20
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	40.0

Downstream Adj Ramp

☑ Yes ☑ On

☐ No ☐ Off

L_{down} = 800 ft

V_D = 32 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1390	0.92	Rolling	13	6	0.797	1.00	1896
Ramp	20	0.71	Level	0	0	1.000	1.00	28
UpStream								
DownStream	32	0.71	Level	32	0	0.862	1.00	52

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = using Equation (Exhibit 13-6)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}		Exhibit 13-8		

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}		Exhibit 13-8		

Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

M_S = (Exibit 13-11)

S_R= mph (Exhibit 13-11)

S_0= mph (Exhibit 13-11)

S = mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = 1.000 using Equation (Exhibit 13-7)

V_{12} = 1896 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F	1896	Exhibit 13-8	4700	No
$V_{FO} = V_F - V_R$	1868	Exhibit 13-8	4700	No
V_R	28	Exhibit 13-10	2100	No

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}	1896	Exhibit 13-8	4400:All	No

Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$

D_R = 18.9 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

D_s = 0.366 (Exhibit 13-12)

S_R= 56.6 mph (Exhibit 13-12)

S_0= N/A mph (Exhibit 13-12)

S = 56.6 mph (Exhibit 13-13)

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RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information / Site Information

Analyst	MB	Freeway/Dir of Travel	WB I-80
Agency or Company	KDA	Junction	Alpine pm 38.35
Date Performed	10/25/2013	Jurisdiction	CT
Analysis Time Period	PM peak	Analysis Year	2030

Project Description Future plus Project

Inputs

Upstream Adj Ramp

☐ Yes ☐ On

☑ No ☐ Off

L_{up} = ft

V_u = veh/h

Freeway Number of Lanes, N	2
Ramp Number of Lanes, N	1
Acceleration Lane Length, L_A	285
Deceleration Lane Length L_D	
Freeway Volume, V_F	1390
Ramp Volume, V_R	32
Freeway Free-Flow Speed, S_{FF}	65.0
Ramp Free-Flow Speed, S_{FR}	30.0

Downstream Adj Ramp

☑ Yes ☐ On

☐ No ☑ Off

L_{down} = 3100 ft

V_D = 30 veh/h

Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f_{HV}	f_p	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1390	0.92	Rolling	13	6	0.797	1.00	1896
Ramp	32	0.71	Level	32	0	0.862	1.00	52
UpStream								
DownStream	30	0.80	Level	0	0	1.000	1.00	37

Merge Areas

Estimation of v_{12}

$$V_{12} = V_F (P_{FM})$$

L_{EQ} = (Equation 13-6 or 13-7)

P_{FM} = 1.000 using Equation (Exhibit 13-6)

V_{12} = 1896 pc/h

V_3 or V_{av34} 0 pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☑ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☑ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_{FO}	1948	Exhibit 13-8		No

Flow Entering Merge Influence Area

	Actual	Max Desirable		Violation?
V_{R12}	1948	Exhibit 13-8	4600:All	No

Level of Service Determination (if not F)

$$D_R = 5.475 + 0.00734\, v_R + 0.0078\, V_{12} - 0.00627\, L_A$$

D_R = 18.9 (pc/mi/ln)

LOS = B (Exhibit 13-2)

Speed Determination

M_S = 0.331 (Exibit 13-11)

S_R= 57.4 mph (Exhibit 13-11)

S_0= N/A mph (Exhibit 13-11)

S = 57.4 mph (Exhibit 13-13)

Diverge Areas

Estimation of v_{12}

$$V_{12} = V_R + (V_F - V_R)P_{FD}$$

L_{EQ} = (Equation 13-12 or 13-13)

P_{FD} = using Equation (Exhibit 13-7)

V_{12} = pc/h

V_3 or V_{av34} pc/h (Equation 13-14 or 13-17)

Is V_3 or V_{av34} > 2,700 pc/h? ☐ Yes ☐ No

Is V_3 or V_{av34} > 1.5 * V_{12}/2 ☐ Yes ☐ No

If Yes, V_{12a} = pc/h (Equation 13-16, 13-18, or 13-19)

Capacity Checks

	Actual	Capacity		LOS F?
V_F		Exhibit 13-8		
$V_{FO} = V_F - V_R$		Exhibit 13-8		
V_R		Exhibit 13-10		

Flow Entering Diverge Influence Area

	Actual	Max Desirable		Violation?
V_{12}		Exhibit 13-8		

Level of Service Determination (if not F)

$$D_R = 4.252 + 0.0086\, V_{12} - 0.009\, L_D$$

D_R = (pc/mi/ln)

LOS = (Exhibit 13-2)

Speed Determination

D_s = (Exhibit 13-12)

S_R= mph (Exhibit 13-12)

S_0= mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

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Intersection LOS Calculations

Existing & Existing plus Project

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*MB*
Agency/Co.	*KDA*
Date Performed	*10/28/2013*
Analysis Time Period	*AM peak*

Site Information

Intersection	*EB ramps / overcrossing*
Jurisdiction	*CT*
Analysis Year	*2013*

Project Description *Existing conditions*

East/West Street: *EB ramps*	North/South Street: *overcrossing*
Intersection Orientation: *North-South*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*26*	*7*	*4*	*8*	
Peak-Hour Factor, PHF	*1.00*	*0.60*	*0.60*	*0.60*	*0.60*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*43*	*11*	*6*	*13*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*13*	*0*	*7*			
Peak-Hour Factor, PHF	*0.60*	*0.60*	*0.60*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*21*	*0*	*11*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*0*	*0*
Configuration		*LTR*				

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*					*LTR*	
v (veh/h)		*6*					*32*	
C (m) (veh/h)		*1564*					*976*	
v/c		*0.00*					*0.03*	
95% queue length		*0.01*					*0.10*	
Control Delay (s/veh)		*7.3*					*8.8*	
LOS		*A*					*A*	
Approach Delay (s/veh)	--	--				*8.8*		
Approach LOS	--	--				*A*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	MB	Intersection	WB ramps & connector road
Agency/Co.	KDA	Jurisdiction	CT
Date Performed	10/29/2013	Analysis Year	2013
Analysis Time Period	AM peak		

Project Description *Existing conditions*	
East/West Street: *WB ramps*	North/South Street: *connector road*
Intersection Orientation: *East-West*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	13	26			8	3
Peak-Hour Factor, PHF	0.71	0.71	1.00	1.00	0.71	0.71
Hourly Flow Rate, HFR (veh/h)	18	36	0	0	11	4
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LT					TR
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				9		4
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.71	1.00	0.71
Hourly Flow Rate, HFR (veh/h)	0	0	0	12	0	5
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT						LR	
v (veh/h)	18						17	
C (m) (veh/h)	1616						953	
v/c	0.01						0.02	
95% queue length	0.03						0.05	
Control Delay (s/veh)	7.3						8.8	
LOS	A						A	
Approach Delay (s/veh)	--	--				8.8		
Approach LOS	--	--				A		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*MB*	Intersection	*EB ramps / overcrossing*
Agency/Co.	*KDA*	Jurisdiction	*CT*
Date Performed	*10/28/2013*	Analysis Year	*2013*
Analysis Time Period	*PM peak*		

Project Description *Existing conditions*	
East/West Street: *EB ramps*	North/South Street: *overcrossing*
Intersection Orientation: *North-South*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*7*	*12*	*8*	*8*	
Peak-Hour Factor, PHF	*1.00*	*0.82*	*0.82*	*0.82*	*0.82*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*8*	*14*	*9*	*9*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*8*	*0*	*43*			
Peak-Hour Factor, PHF	*0.82*	*0.82*	*0.82*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*9*	*0*	*52*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*0*	*0*
Configuration		*LTR*				

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*					*LTR*	
v (veh/h)		*9*					*61*	
C (m) (veh/h)		*1607*					*1061*	
v/c		*0.01*					*0.06*	
95% queue length		*0.02*					*0.18*	
Control Delay (s/veh)		*7.3*					*8.6*	
LOS		*A*					*A*	
Approach Delay (s/veh)	--	--				*8.6*		
Approach LOS	--	--				*A*		

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	MB
Agency/Co.	KDA
Date Performed	10/29/2013
Analysis Time Period	PM peak

Site Information

Intersection	WB ramps & connector road
Jurisdiction	CT
Analysis Year	2013

Project Description *Existing conditions*

East/West Street: *WB ramps* | North/South Street: *connector road*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	9	7			9	4
Peak-Hour Factor, PHF	0.71	0.71	1.00	1.00	0.71	0.71
Hourly Flow Rate, HFR (veh/h)	12	9	0	0	12	5
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LT					TR
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				5		6
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.71	1.00	0.71
Hourly Flow Rate, HFR (veh/h)	0	0	0	7	0	8
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT						LR	
v (veh/h)	12						15	
C (m) (veh/h)	1613						1017	
v/c	0.01						0.01	
95% queue length	0.02						0.04	
Control Delay (s/veh)	7.2						8.6	
LOS	A						A	
Approach Delay (s/veh)	--	--				8.6		
Approach LOS	--	--				A		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	MB	Intersection	EB ramps / overcrossing
Agency/Co.	KDA	Jurisdiction	CT
Date Performed	10/28/2013	Analysis Year	2013
Analysis Time Period	AM peak		

Project Description *Existing plus project*	
East/West Street: *EB ramps*	North/South Street: *overcrossing*
Intersection Orientation: *North-South*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		26	7	6	8	
Peak-Hour Factor, PHF	1.00	0.60	0.60	0.60	0.60	1.00
Hourly Flow Rate, HFR (veh/h)	0	43	11	9	13	0
Percent Heavy Vehicles	0	--	--	33	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration			TR	LT		
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	37	0	7			
Peak-Hour Factor, PHF	0.60	0.60	0.60	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	61	0	11	0	0	0
Percent Heavy Vehicles	51	0	0	0	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	0	0	0	0
Configuration		LTR				

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT					LTR	
v (veh/h)		9					72	
C (m) (veh/h)		1374					842	
v/c		0.01					0.09	
95% queue length		0.02					0.28	
Control Delay (s/veh)		7.6					9.7	
LOS		A					A	
Approach Delay (s/veh)	--	--				9.7		
Approach LOS	--	--				A		

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*MB*
Agency/Co.	*KDA*
Date Performed	*10/29/2013*
Analysis Time Period	*AM peak*

Site Information

Intersection	*WB ramps & connector road*
Jurisdiction	*CT*
Analysis Year	*2013*

Project Description *Existing plus project*

East/West Street: *WB ramps* | North/South Street: *connector road*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	37	26			8	4
Peak-Hour Factor, PHF	0.71	0.71	1.00	1.00	0.71	0.71
Hourly Flow Rate, HFR (veh/h)	52	36	0	0	11	5
Percent Heavy Vehicles	51	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LT					TR
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				40		6
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.71	1.00	0.71
Hourly Flow Rate, HFR (veh/h)	0	0	0	56	0	8
Percent Heavy Vehicles	0	0	0	78	0	33
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT						LR	
v (veh/h)	52						64	
C (m) (veh/h)	1334						689	
v/c	0.04						0.09	
95% queue length	0.12						0.31	
Control Delay (s/veh)	7.8						10.8	
LOS	A						B	
Approach Delay (s/veh)	--	--				10.8		
Approach LOS	--	--				B		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*MB*	Intersection	*EB ramps / overcrossing*
Agency/Co.	*KDA*	Jurisdiction	*CT*
Date Performed	*10/28/2013*	Analysis Year	*2013*
Analysis Time Period	*PM peak*		

Project Description *Existing plus project*	
East/West Street: *EB ramps*	North/South Street: *overcrossing*
Intersection Orientation: *North-South*	Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*7*	*12*	*8*	*8*	
Peak-Hour Factor, PHF	*1.00*	*0.82*	*0.82*	*0.82*	*0.82*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*8*	*14*	*9*	*9*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*16*	*0*	*43*			
Peak-Hour Factor, PHF	*0.82*	*0.82*	*0.82*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*19*	*0*	*52*	*0*	*0*	*0*
Percent Heavy Vehicles	*50*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*0*	*0*
Configuration		*LTR*				

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*					*LTR*	
v (veh/h)		*9*					*71*	
C (m) (veh/h)		*1607*					*1008*	
v/c		*0.01*					*0.07*	
95% queue length		*0.02*					*0.23*	
Control Delay (s/veh)		*7.3*					*8.8*	
LOS		*A*					*A*	
Approach Delay (s/veh)	--	--				*8.8*		
Approach LOS	--	--				*A*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	MB	Intersection	WB ramps & connector road
Agency/Co.	KDA	Jurisdiction	CT
Date Performed	10/29/2013	Analysis Year	2013
Analysis Time Period	PM peak		
Project Description	Existing plus project		
East/West Street:	WB ramps	North/South Street:	connector road
Intersection Orientation:	East-West	Study Period (hrs):	0.25

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	17	7			9	4
Peak-Hour Factor, PHF	0.71	0.71	1.00	1.00	0.71	0.71
Hourly Flow Rate, HFR (veh/h)	23	9	0	0	12	5
Percent Heavy Vehicles	47	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LT					TR
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				18		6
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.71	1.00	0.71
Hourly Flow Rate, HFR (veh/h)	0	0	0	25	0	8
Percent Heavy Vehicles	0	0	0	45	0	0
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT						LR	
v (veh/h)	23						33	
C (m) (veh/h)	1352						874	
v/c	0.02						0.04	
95% queue length	0.05						0.12	
Control Delay (s/veh)	7.7						9.3	
LOS	A						A	
Approach Delay (s/veh)	--	--				9.3		
Approach LOS	--	--				A		

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Intersection LOS Calculations

Future & Future plus Project

TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	MB	Intersection	EB ramps / overcrossing
Agency/Co.	KDA	Jurisdiction	CT
Date Performed	10/28/2013	Analysis Year	2030
Analysis Time Period	AM peak		
Project Description	Future base		
East/West Street:	EB ramps	North/South Street:	overcrossing
Intersection Orientation:	North-South	Study Period (hrs):	0.25

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		39	11	6	12	
Peak-Hour Factor, PHF	1.00	0.60	0.60	0.60	0.60	1.00
Hourly Flow Rate, HFR (veh/h)	0	64	18	9	19	0
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration			TR	LT		
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	20	0	11			
Peak-Hour Factor, PHF	0.60	0.60	0.60	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	33	0	18	0	0	0
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	0	0	0	0
Configuration		LTR				

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT					LTR	
v (veh/h)		9					51	
C (m) (veh/h)		1528					943	
v/c		0.01					0.05	
95% queue length		0.02					0.17	
Control Delay (s/veh)		7.4					9.0	
LOS		A					A	
Approach Delay (s/veh)	--	--				9.0		
Approach LOS	--	--				A		

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	MB
Agency/Co.	KDA
Date Performed	10/29/2013
Analysis Time Period	AM peak

Site Information

Intersection	WB ramps & connector road
Jurisdiction	CT
Analysis Year	2030

Project Description *Future base*

East/West Street: *WB ramps* North/South Street: *connector road*

Intersection Orientation: *East-West* Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	20	39			12	5
Peak-Hour Factor, PHF	0.71	0.71	1.00	1.00	0.71	0.71
Hourly Flow Rate, HFR (veh/h)	28	54	0	0	16	7
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LT					TR
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				14		6
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.71	1.00	0.71
Hourly Flow Rate, HFR (veh/h)	0	0	0	19	0	8
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT						LR	
v (veh/h)	28						27	
C (m) (veh/h)	1605						907	
v/c	0.02						0.03	
95% queue length	0.05						0.09	
Control Delay (s/veh)	7.3						9.1	
LOS	A						A	
Approach Delay (s/veh)	--	--				9.1		
Approach LOS	--	--				A		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	*MB*	Intersection	*EB ramps / overcrossing*
Agency/Co.	*KDA*	Jurisdiction	*CT*
Date Performed	*10/28/2013*	Analysis Year	*2030*
Analysis Time Period	*PM peak*		

Project Description	*Future base*		
East/West Street:	*EB ramps*	North/South Street:	*overcrossing*
Intersection Orientation:	*North-South*	Study Period (hrs):	*0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*11*	*18*	*12*	*12*	
Peak-Hour Factor, PHF	*1.00*	*0.82*	*0.82*	*0.82*	*0.82*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*13*	*21*	*14*	*14*	*0*
Percent Heavy Vehicles	*0*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration			*TR*	*LT*		
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	*12*	*0*	*62*			
Peak-Hour Factor, PHF	*0.82*	*0.82*	*0.82*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*14*	*0*	*75*	*0*	*0*	*0*
Percent Heavy Vehicles	*0*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*0*	*0*
Configuration		*LTR*				

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*LT*					*LTR*	
v (veh/h)		*14*					*89*	
C (m) (veh/h)		*1591*					*1048*	
v/c		*0.01*					*0.08*	
95% queue length		*0.03*					*0.28*	
Control Delay (s/veh)		*7.3*					*8.8*	
LOS		*A*					*A*	
Approach Delay (s/veh)	--	--				*8.8*		
Approach LOS	--	--				*A*		

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	MB
Agency/Co.	KDA
Date Performed	10/29/2013
Analysis Time Period	PM peak

Site Information

Intersection	WB ramps & connector road
Jurisdiction	CT
Analysis Year	2030

Project Description Future base

East/West Street: WB ramps

North/South Street: connector road

Intersection Orientation: East-West

Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	14	11			14	6
Peak-Hour Factor, PHF	0.71	0.71	1.00	1.00	0.71	0.71
Hourly Flow Rate, HFR (veh/h)	19	15	0	0	19	8
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LT					TR
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				8		9
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.71	1.00	0.71
Hourly Flow Rate, HFR (veh/h)	0	0	0	11	0	12
Percent Heavy Vehicles	0	0	0	0	0	0
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT						LR	
v (veh/h)	19						23	
C (m) (veh/h)	1600						989	
v/c	0.01						0.02	
95% queue length	0.04						0.07	
Control Delay (s/veh)	7.3						8.7	
LOS	A						A	
Approach Delay (s/veh)	--	--				8.7		
Approach LOS	--	--				A		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	MB	Intersection	EB ramps / overcrossing
Agency/Co.	KDA	Jurisdiction	CT
Date Performed	10/28/2013	Analysis Year	2030
Analysis Time Period	AM peak		

Project Description *Future plus project*
East/West Street: *EB ramps* | North/South Street: *overcrossing*
Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		39	11	8	12	
Peak-Hour Factor, PHF	1.00	0.60	0.60	0.60	0.60	1.00
Hourly Flow Rate, HFR (veh/h)	0	64	18	13	19	0
Percent Heavy Vehicles	0	--	--	33	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration			TR	LT		
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	44	0	11			
Peak-Hour Factor, PHF	0.60	0.60	0.60	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	73	0	18	0	0	0
Percent Heavy Vehicles	51	0	0	0	0	0
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	0	0	0	0
Configuration		LTR				

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT					LTR	
v (veh/h)		13					91	
C (m) (veh/h)		1341					811	
v/c		0.01					0.11	
95% queue length		0.03					0.38	
Control Delay (s/veh)		7.7					10.0	
LOS		A					A	
Approach Delay (s/veh)	--	--				10.0		
Approach LOS	--	--				A		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	MB	Intersection	WB ramps & connector road
Agency/Co.	KDA	Jurisdiction	CT
Date Performed	10/29/2013	Analysis Year	2030
Analysis Time Period	AM peak		

Project Description *Future plus project*

East/West Street: *WB ramps* North/South Street: *connector road*

Intersection Orientation: *East-West* Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	44	26			12	6
Peak-Hour Factor, PHF	0.71	0.71	1.00	1.00	0.71	0.71
Hourly Flow Rate, HFR (veh/h)	61	36	0	0	16	8
Percent Heavy Vehicles	51	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration	LT					TR
Upstream Signal		0			0	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				45		8
Peak-Hour Factor, PHF	1.00	1.00	1.00	0.71	1.00	0.71
Hourly Flow Rate, HFR (veh/h)	0	0	0	63	0	11
Percent Heavy Vehicles	0	0	0	78	0	33
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	0
Configuration					LR	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	LT						LR	
v (veh/h)	61						74	
C (m) (veh/h)	1325						669	
v/c	0.05						0.11	
95% queue length	0.14						0.37	
Control Delay (s/veh)	7.8						11.0	
LOS	A						B	
Approach Delay (s/veh)	--	--				11.0		
Approach LOS	--	--				B		

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*MB*
Agency/Co.	*KDA*
Date Performed	*10/28/2013*
Analysis Time Period	*PM peak*

Site Information

Intersection	*EB ramps / overcrossing*
Jurisdiction	*CT*
Analysis Year	*2030*

Project Description *Future plus project*

East/West Street: *EB ramps* | North/South Street: *overcrossing*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		11	18	12	12	
Peak-Hour Factor, PHF	1.00	0.82	0.82	0.82	0.82	1.00
Hourly Flow Rate, HFR (veh/h)	0	13	21	14	14	0
Percent Heavy Vehicles	0	--	--	0	--	--
Median Type	Undivided					
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration			TR	LT		
Upstream Signal		0			0	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	20	0	62			
Peak-Hour Factor, PHF	0.82	0.82	0.82	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	24	0	75	0	0	0
Percent Heavy Vehicles	50	0	0	0	0	0
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	0	0	0	0
Configuration		LTR				

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		LT					LTR	
v (veh/h)		14					99	
C (m) (veh/h)		1591					1000	
v/c		0.01					0.10	
95% queue length		0.03					0.33	
Control Delay (s/veh)		7.3					9.0	
LOS		A					A	
Approach Delay (s/veh)	--	--				9.0		
Approach LOS	--	--				A		

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*MB*
Agency/Co.	*KDA*
Date Performed	*10/29/2013*
Analysis Time Period	*PM peak*

Site Information

Intersection	*WB ramps & connector road*
Jurisdiction	*CT*
Analysis Year	*2030*

Project Description *Future plus project*

East/West Street: *WB ramps* North/South Street: *connector road*

Intersection Orientation: *East-West* Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	*22*	*11*			*14*	*6*
Peak-Hour Factor, PHF	*0.71*	*0.71*	*1.00*	*1.00*	*0.71*	*0.71*
Hourly Flow Rate, HFR (veh/h)	*30*	*15*	*0*	*0*	*19*	*8*
Percent Heavy Vehicles	*47*	--	--	*0*	--	--
Median Type	*Undivided*					
RT Channelized			*0*			*0*
Lanes	*0*	*1*	*0*	*0*	*1*	*0*
Configuration	*LT*					*TR*
Upstream Signal		*0*			*0*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*21*		*9*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*0.71*	*1.00*	*0.71*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*29*	*0*	*12*
Percent Heavy Vehicles	*0*	*0*	*0*	*45*	*0*	*0*
Percent Grade (%)	*0*			*0*		
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*0*
Configuration					*LR*	

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration	*LT*						*LR*	
v (veh/h)	*30*						*41*	
C (m) (veh/h)	*1339*						*852*	
v/c	*0.02*						*0.05*	
95% queue length	*0.07*						*0.15*	
Control Delay (s/veh)	*7.8*						*9.4*	
LOS	*A*						*A*	
Approach Delay (s/veh)	--	--				*9.4*		
Approach LOS	--	--				*A*		

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Traffic Counts

Prepared by NDS/ATD

Volumes for: Tuesday, October 22, 2013 City: Placer County Project #: 13-7607-001

Location: Secret Town Road just east of I-80 overcrossing

Start	Eastbound		Hour Totals		Westbound		Hour Totals		Combined Totals	
Time	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	0	1			0	2				
12:15	0	2			0	2				
12:30	0	2			0	0				
12:45	0	4	0	9	0	3	0	7	0	16
1:00	0	0			0	2				
1:15	0	3			0	0				
1:30	0	2			0	1				
1:45	0	1	0	6	0	2	0	5	0	11
2:00	0	0			0	1				
2:15	0	1			0	2				
2:30	0	0			0	1				
2:45	1	2	1	3	1	7	1	11	2	14
3:00	0	0			0	1				
3:15	1	2			1	4				
3:30	0	5			1	1				
3:45	0	4	1	11	0	2	2	8	3	19
4:00	0	1			0	3				
4:15	0	2			0	1				
4:30	0	2			1	1				
4:45	3	3	3	8	0	2	1	7	4	15
5:00	1	1			0	1				
5:15	2	2			1	1				
5:30	2	0			6	4				
5:45	1	1	6	4	0	1	7	7	13	11
6:00	0	3			1	0				
6:15	0	0			0	0				
6:30	3	1			0	2				
6:45	2	1	5	5	3	1	4	3	9	8
7:00	1	3			3	0				
7:15	3	2			6	1				
7:30	6	0			2	0				
7:45	3	1	13	6	5	0	16	1	29	7
8:00	1	2			4	0				
8:15	2	1			2	0				
8:30	3	1			1	2				
8:45	1	0	7	4	3	0	10	2	17	6
9:00	3	0			1	0				
9:15	6	1			3	0				
9:30	1	0			1	1				
9:45	0	1	10	2	4	0	9	1	19	3
10:00	1	1			4	1				
10:15	3	0			2	0				
10:30	0	2			3	1				
10:45	1	0	5	3	2	0	11	2	16	5
11:00	0	0			1	0				
11:15	0	0			1	0				
11:30	5	1			1	0				
11:45	3	0	8	1	1	0	4	0	12	1
Total	59	62	59	62	65	54	65	54	124	116
Combined Total	121		121		119		119		240	
AM Peak	7:00 AM				7:15 AM					
Vol.	13				17					
P.H.F.	0.542				0.708					
PM Peak		3:15 PM				2:30 PM				
Vol.		12				13				
P.H.F.		0.600				0.464				
Percentage	48.8%	51.2%			54.6%	45.4%				

Prepared by NDS/ATD

Volumes for: Tuesday, October 22, 2013 City: Placer County Project #: 13-7607-002

Location: Chicago Park Powerhouse Road north of Secret Town Road

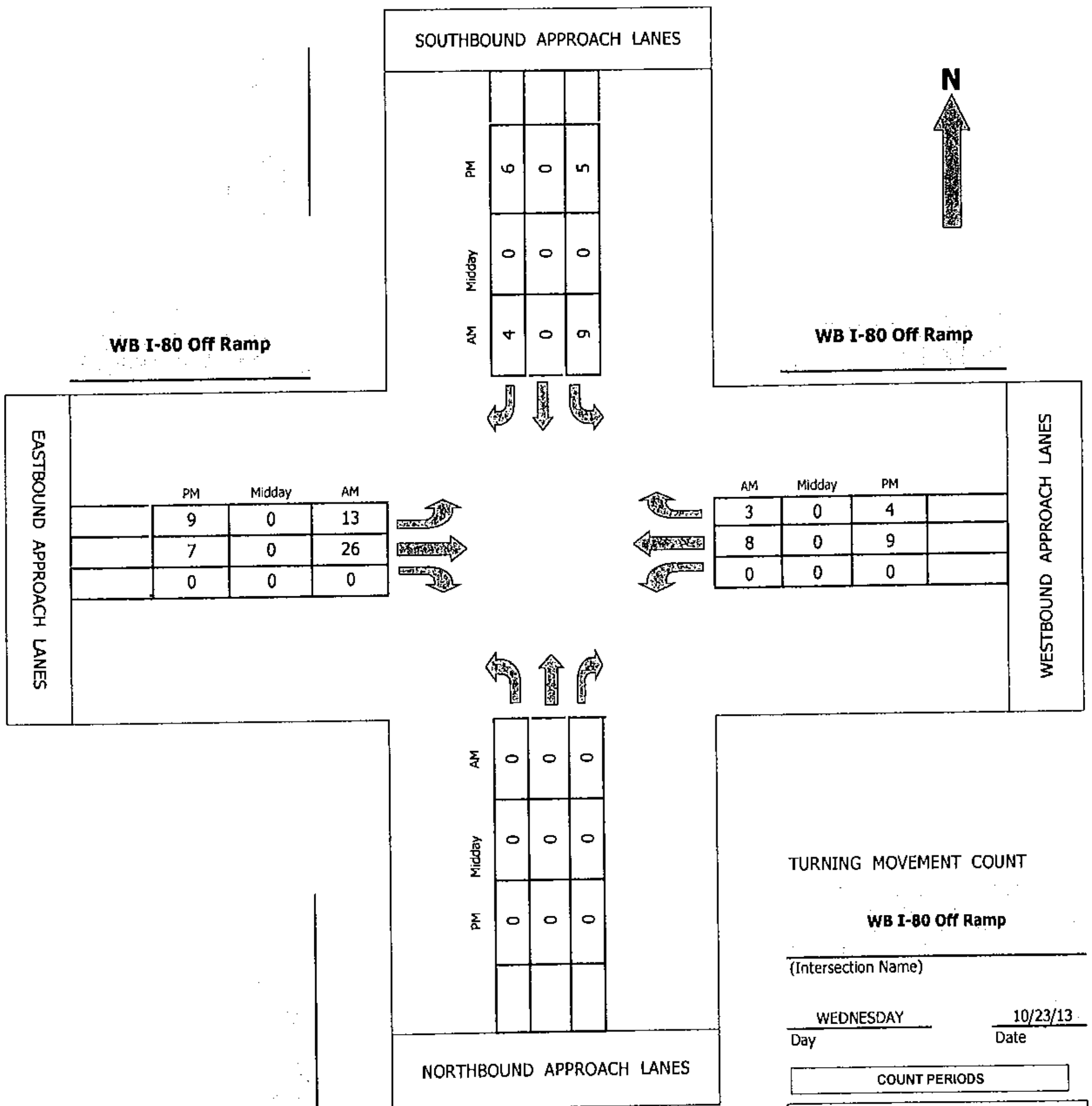
Start	Northbound		Hour Totals		Southbound		Hour Totals		Combined Totals	
Time	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00	0	0			0	0				
12:15	0	1			0	1				
12:30	0	2			0	1				
12:45	0	0	0	3	0	1	0	3	0	6
1:00	0	0			0	2				
1:15	0	1			0	0				
1:30	0	1			0	0				
1:45	0	0	0	2	0	0	0	2	0	4
2:00	0	0			0	2				
2:15	0	0			0	0				
2:30	0	0			0	0				
2:45	0	1	0	1	0	3	0	5	0	6
3:00	0	0			0	0				
3:15	0	0			0	3				
3:30	0	1			0	1				
3:45	0	0	0	1	0	1	0	5	0	6
4:00	0	0			0	1				
4:15	0	0			0	0				
4:30	0	0			0	0				
4:45	2	1	2	1	0	1	0	2	2	3
5:00	0	0			0	1				
5:15	0	0			2	0				
5:30	1	0			0	2				
5:45	0	0	1	0	0	0	2	3	3	3
6:00	0	0			0	0				
6:15	0	0			0	0				
6:30	0	0			0	1				
6:45	1	0	1	0	0	1	0	2	1	2
7:00	0	0			1	0				
7:15	1	0			0	0				
7:30	4	0			0	0				
7:45	2	0	7	0	0	0	1	0	8	0
8:00	0	1			1	0				
8:15	1	0			0	0				
8:30	3	0			0	1				
8:45	0	0	4	1	3	0	4	1	8	2
9:00	2	0			0	0				
9:15	4	0			0	0				
9:30	0	0			2	0				
9:45	1	0	7	0	3	1	5	1	12	1
10:00	0	0			0	0				
10:15	2	0			1	0				
10:30	0	0			2	0				
10:45	1	0	3	0	1	0	4	0	7	0
11:00	0	0			0	0				
11:15	0	0			1	0				
11:30	1	0			0	0				
11:45	1	0	2	0	1	0	2	0	4	0
Total	27	9	27	9	18	24	18	24	45	33
Combined Total	36		36		42		42		78	
AM Peak	8:30 AM				9:30 AM					
Vol.	9				6					
P.H.F.	0.563				0.500					
PM Peak		12:00 PM				2:45 PM				
Vol.		3				7				
P.H.F.		0.375				0.583				
Percentage	75.0%	25.0%			42.9%	57.1%				

Intersection Turning Movement

Prepared by:
KD Anderson Associates, Inc.

TMC Summary of /WB I-80 Off Ramp

Project #: 2448-01



TURNING MOVEMENT COUNT

WB I-80 Off Ramp

(Intersection Name)

WEDNESDAY	10/23/13
Day	Date

COUNT PERIODS

am	7:00 AM	-	11:00 AM
noon	11:00 AM	-	2:00 PM
pm	4:00 PM	-	6:00 PM

AM PEAK HOUR	700 AM
NOON PEAK HOUR	0 AM
PM PEAK HOUR	400 PM

Intersection Turning Movement

Prepared by:

N-S STREET: 0 — DATE: 10/23/13 — LOCATION:

E-W STREET: WB I-80 Off Ramp — DAY: WEDNESDAY — PROJECT# 2448-01

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:													
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM				4		0	2	11			2	1	20
7:15 AM				1		0	7	5			2	0	15
7:30 AM				3		3	4	8			4	0	22
7:45 AM				1		1	0	2			0	2	6
8:00 AM				0		0	1	0			2	2	5
8:15 AM				1		0	3	2			2	1	9
8:30 AM				0		1	0	1			1	0	3
8:45 AM				0		2	1	1			1	1	6
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES =	0	0	0	10	0	7	18	30	0	0	14	7	86

AM Peak Hr Begins at: 700 AM

PEAK VOLUMES =	0	0	0	9	0	4	13	26	0	0	8	3	63
PEAK HR. FACTOR:		0.000			0.542			0.750			0.688		0.716

CONTROL:

Intersection Turning Movement

Prepared by:

N-S STREET: 0 | DATE: 10/23/13 | LOCATION:

E-W STREET: WB I-80 Off Ramp | DAY: WEDNESDAY | PROJECT# 2448-01

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM				3		1	1	1			1	0	7
4:15 PM				1		0	2	1			2	0	6
4:30 PM				1		3	4	3			2	1	14
4:45 PM				0		2	2	2			4	3	13
5:00 PM				0		0	1	1			2	1	5
5:15 PM				1		3	1	1			0	0	6
5:30 PM				0		1	3	2			1	1	8
5:45 PM				0		2	1	1			1	0	5
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES =	0	0	0	6	0	12	15	12	0	0	13	6	64

PM Peak Hr Begins at: 400 PM

PEAK VOLUMES =	0	0	0	5	0	6	9	7	0	0	9	4	40
PEAK HR. FACTOR:		0.000			0.688			0.571			0.464		0.714

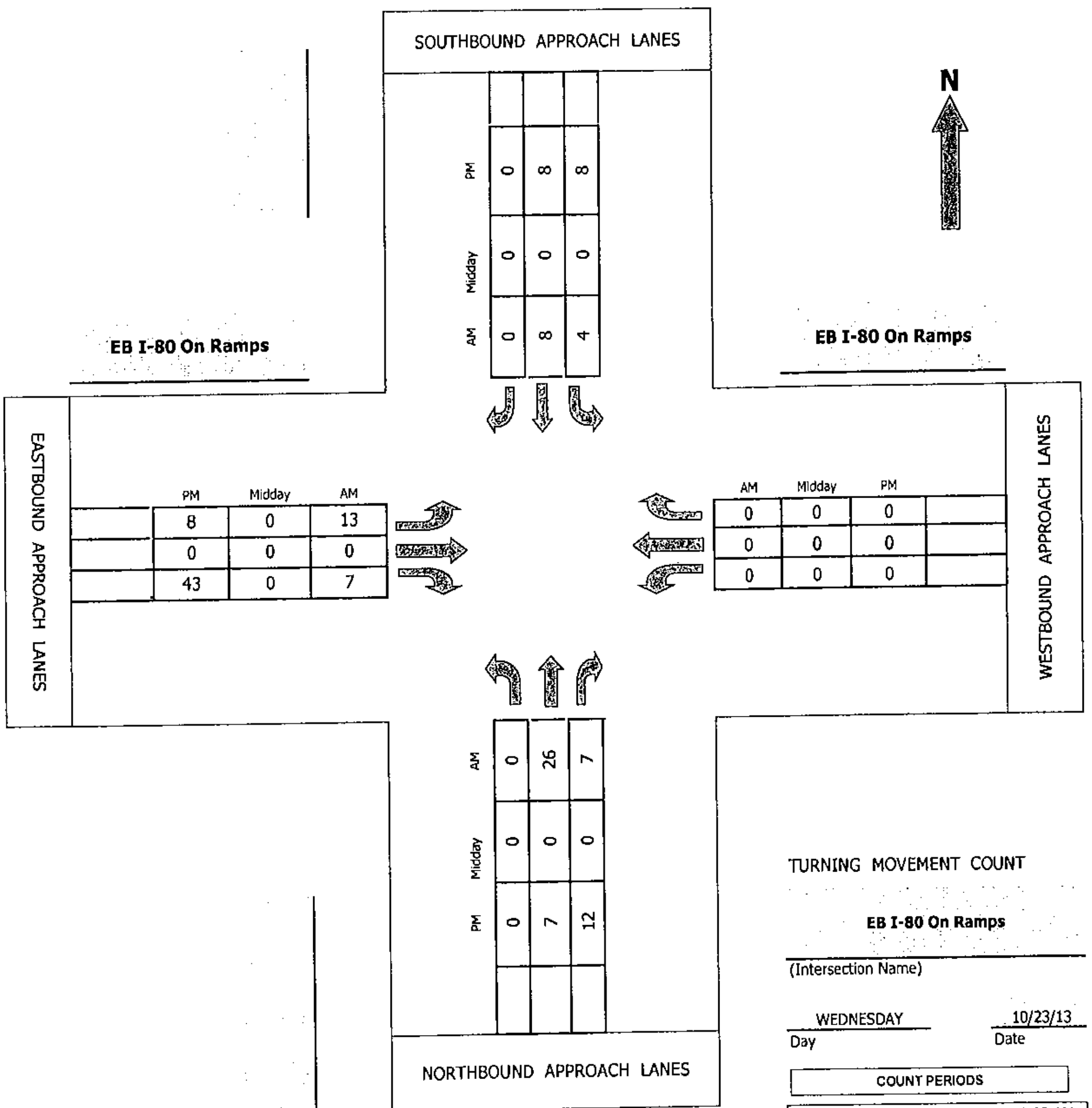
CONTROL:

Intersection Turning Movement

Prepared by:
KD Anderson Associates, Inc.

TMC Summary of /EB I-80 On Ramps

Project #: 2448-01



TURNING MOVEMENT COUNT

EB I-80 On Ramps

(Intersection Name)

Day	Date
WEDNESDAY	10/23/13

COUNT PERIODS			
am	7:00 AM	-	11:00 AM
noon	11:00 AM	-	2:00 PM
pm	4:00 PM	-	6:00 PM

AM PEAK HOUR	700 AM
NOON PEAK HOUR	0 AM
PM PEAK HOUR	430 PM

Intersection Turning Movement

Prepared by:

N-S STREET: 0 | DATE: 10/23/13 | LOCATION:

E-W STREET: EB I-80 On Ramps | DAY: WEDNESDAY | PROJECT# 2448-01

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:													
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM		11	2	0	2		2		1				18
7:15 AM		5	1	0	2		7		2				17
7:30 AM		8	4	3	4		4		4				27
7:45 AM		2	0	1	0		0		0				3
8:00 AM		0	4	0	2		1		1				8
8:15 AM		2	0	0	2		3		1				8
8:30 AM		1	1	1	1		0		2				6
8:45 AM		1	1	2	1		1		1				7
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES =	0	30	13	7	14	0	18	0	12	0	0	0	94

AM Peak Hr Begins at: 700 AM

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
PEAK VOLUMES =	0	26	7	4	8	0	13	0	7	0	0	0	65
PEAK HR. FACTOR:		0.635			0.429			0.556			0.000		0.602

CONTROL:

Intersection Turning Movement

Prepared by:

N-S STREET: 0 DATE: 10/23/13 LOCATION:

E-W STREET: EB I-80 On Ramps DAY: WEDNESDAY PROJECT# 2448-01

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM		1	1	1	1		1		7				12
4:15 PM		1	0	0	2		2		10				15
4:30 PM		3	3	3	2		4		8				23
4:45 PM		2	4	2	4		2		12				26
5:00 PM		1	2	0	2		1		14				20
5:15 PM		1	3	3	0		1		9				17
5:30 PM		2	1	1	1		3		4				12
5:45 PM		1	1	2	1		1		4				10
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES =	0	12	15	12	13	0	15	0	68	0	0	0	135

PM Peak Hr Begins at: 430 PM

PEAK VOLUMES =	0	7	12	8	8	0	8	0	43	0	0	0	86
PEAK HR. FACTOR:		0.792			0.667			0.850			0.000		0.827

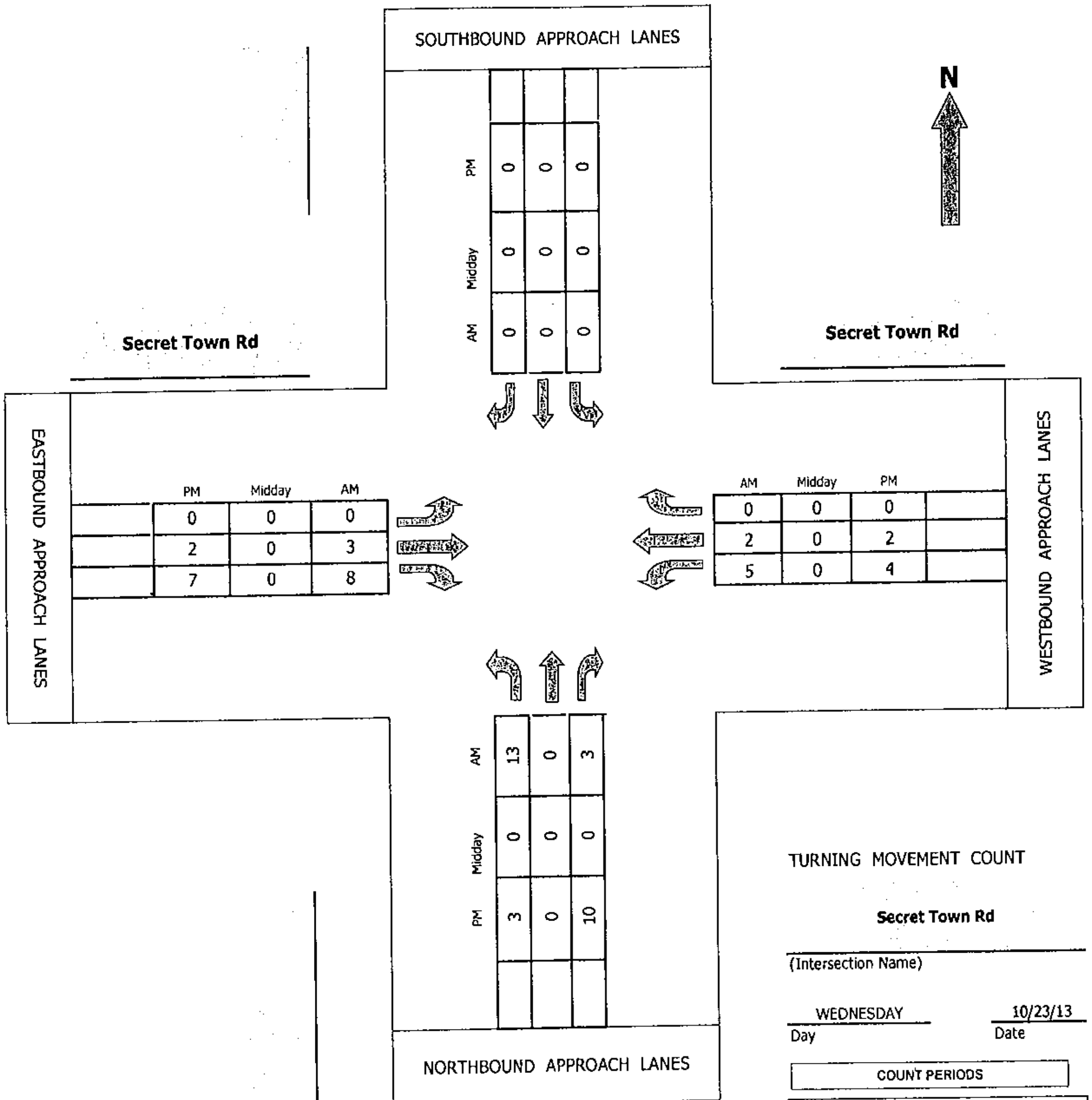
CONTROL:

Intersection Turning Movement

Prepared by:
KD Anderson Associates, Inc.

TMC Summary of /Secret Town Rd

Project #: 2448-01



TURNING MOVEMENT COUNT

Secret Town Rd

(Intersection Name)

Day	Date
WEDNESDAY	10/23/13

COUNT PERIODS			
am	7:00 AM	-	11:00 AM
noon	11:00 AM	-	2:00 PM
pm	4:00 PM	-	6:00 PM

AM PEAK HOUR	700 AM
NOON PEAK HOUR	0 AM
PM PEAK HOUR	400 PM

Intersection Turning Movement

Prepared by:

N-S STREET: 0 | DATE: 10/23/13 | LOCATION:

E-W STREET: Secret Town Rd | DAY: WEDNESDAY | PROJECT# 2448-01

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:													
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	2		1					0	3	1	1		8
7:15 AM	7		0					0	1	0	0		8
7:30 AM	3		1					1	3	3	1		12
7:45 AM	1		1					2	1	1	0		6
8:00 AM	3		1					0	0	0	0		4
8:15 AM	3		0					0	0	1	0		4
8:30 AM	0		0					0	1	0	0		1
8:45 AM	1		1					1	1	1	0		5
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													

TOTAL VOLUMES =	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
	20	0	5	0	0	0	0	4	10	7	2	0	48

AM Peak Hr Begins at: 700 AM

PEAK VOLUMES =	13	0	3	0	0	0	0	3	8	5	2	0	34
PEAK HR. FACTOR:		0.571			0.000			0.688			0.438		0.708

CONTROL:

Intersection Turning Movement

Prepared by:

N-S STREET: 0 | DATE: 10/23/13 | LOCATION:

E-W STREET: Secret Town Rd | DAY: WEDNESDAY | PROJECT# 2448-01

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	0		1					1	3	1	1		7
4:15 PM	0		2					0	1	0	1		4
4:30 PM	2		3					0	3	1	0		9
4:45 PM	1		4					1	0	2	0		8
5:00 PM	1		1					0	0	0	0		2
5:15 PM	0		1					1	1	3	0		6
5:30 PM	1		3					0	0	1	0		5
5:45 PM	0		1					0	0	2	0		3
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
TOTAL VOLUMES =	5	0	16	0	0	0	0	3	8	10	2	0	44

PM Peak Hr Begins at: 400 PM

PEAK VOLUMES =	3	0	10	0	0	0	0	2	7	4	2	0	28
PEAK HR. FACTOR:		0.650			0.000			0.563			0.750		0.778

CONTROL:

APPENDIX J

Bear River Project Technical Memo: Sediment Removal and Mercury Mobilization

TO: Nevada Irrigation District

FROM: Carrie Monohan, Ph.D., Science Director, The Sierra Fund

SUBJECT: Bear River Project Technical Memo: Sediment Removal and Mercury Mobilization Rev.1

DATE: February 24, 2015

Executive Summary

This document provides the Nevada Irrigation District (NID) with the most recent information on mercury mobilization and methylation research to inform the development of an alternative mining technique and to inform mitigation measures for the Bear River Sediment Removal Project at Rollins Reservoir. A conceptual model of the latest understanding of mercury fate and transport was used to inform potential best management practices for sediment removal and aggregate mining in areas impacted by hydraulic mining debris contaminated with mercury.

Project Background

NID hired environmental and engineering consultants to develop a project description for sediment removal in the Bear River near the confluence of Steephollow Creek. After reviewing the project description, environmental consultants identified the potential for mercury mobilization and methylation. The purpose of this technical memo is to provide information that can be used as a basis to develop an alternative to the project description that would minimize the potential for mercury mobilization and methylation.

Rollins Reservoir is an impoundment on the Bear River that captures sediment moving down the Bear River, Steephollow Creek and Greenhorn Creek. There was significant hydraulic mining and some hardrock mining in the Bear River watershed which used mercury to amalgamate fine grained gold. Previous studies have identified the Bear River watershed as one of the Sierra Nevada watersheds most severely impacted by hydraulic mining and mercury contamination (May et al., 1999; Alpers et al., in review). Today, Rollins Reservoir is 303(d)-listed as impaired for mercury by the Central Valley Regional Water Quality Control Board (CVRWQCB) and it has a fish consumption advisory for mercury in catfish (OEHHA, 2009). There are insufficient data for species-specific advisories for other fish species. The 303(d) listing and fish consumption advisory indicate that the reservoir continues to be contaminated by mercury.

Rollins Reservoir has a surface area of 900 acres, 26 miles of shoreline, and two arms (the Bear River Arm and the Greenhorn Creek Arm). The Bear River Sediment Removal project is in the Bear River Arm and includes Steephollow Creek. The Chicago Park Powerhouse influences the surface hydrology in the Bear River arm with regular releases from the penstock of 500-1100 cfs. The release schedule from Chicago Park Powerhouse and wet-season storm flows have created a highly heterogeneous sediment deposit that may be partially or totally mobilized annually depending on flows. Summer baseflows are dominated by the release from the powerhouse and do not mobilize the deposit.

The project description includes the re-establishment of a 75-acre aggregate mine as an instream, gravel skimming operation to remove accumulated sediments and restore water storage capacity to the pre-1965 condition. It also proposes excavation of gravels/sediments to occur to a maximum depth of six inches below the shallow groundwater table.

The concern for mercury mobilization is that the proposed skimming operations will expose fine grained sediment contaminated with mercury to the water column and, therefore be available for transport (HYD-2, Balance Hydrologic, Aug 28th, 2014).

An additional concern arose when a test dewatering channel was dug in 2013 in the deposit on the Greenhorn Creek arm of Rollins Reservoir. The low flow dewatering channel was colonized by bacteria that included methylated mercury. There was evidence of increasing methylmercury concentrations at the downstream end of the dewatering channel (Monohan, 2014). A second concern became apparent, in that a low flow dewatering channel would enable facultative heterotrophic bacteria to establish and allow mercury to more readily enter the aquatic food chain through methylation and incorporation into phytoplankton (algae) or periphyton (Stewart et al., 2008).

Conceptual Model

Recent research on mercury mobilization and methylation by the U.S. Geological Survey (USGS) in the Bear River and Yuba River watersheds is briefly summarized below. The USGS research is used to inform the conceptual model.

During 2002-04, the USGS studied mercury cycling in Camp Far West Reservoir, located downstream of Rollins Reservoir on the Bear River. Water, bed sediment, and zooplankton were sampled quarterly at several locations within the reservoir, and fish (treadfin shad, bluegill, and spotted bass) were sampled annually (Alpers et al. 2008; Stewart et al. 2008; Saiki et al. 2009). The USGS study at Camp Far West established the importance of the aquatic food web and mercury methylation in a reservoir contaminated by mercury from historical gold mining. Specifically, it identified the benthic and pelagic pathways by which mercury enters the food web and the biomagnification and bioaccumulation of mercury in the food web leading to fish tissue mercury levels that are harmful to human health.

In 2007-08, the USGS investigated the potential impacts of suction dredging for gold recovery on mercury transport, methylation, and bioaccumulation of mercury from a hydraulic mining debris deposit. The study took place on the South Yuba River near the confluence with Humbug Creek (Fleck et al., 2011). Water samples collected before, during, and after suction dredging were analyzed for total suspended solids, filterable total mercury (THg), particulate-bound total mercury (PHg), and methylmercury (MeHg) (Fleck et al., 2011). Biota (invertebrate larvae) was tested for mercury bioaccumulation (Fleck et al. 2011). A tank experiment was conducted to see how long sediment remained suspended after disturbing the sediment (Fleck et al., 2011). Samples of unconsolidated material were taken from, in, and around the South Yuba River confluence and were tested for grain size and mineralogy (Fleck et al., 2011), and run through a series of laboratory tests. The laboratory tests included (1) placing them under varying oxidation-reduction conditions to simulate riverine transport and (2) mixing with other sediments to simulate sediment deposition to evaluate potential MeHg formation in downstream environments including Englebright Lake and the Sacramento-San Joaquin Delta (Marvin-DiPasquale et al., 2011).

This seminal research on mercury mobilization improved our understanding of mercury in the environment and how mercury from historical hydraulic mining debris can be methylated. The following conceptual model was formed from the results of this research in the Yuba and Bear River watershes:

1. Mercury is primarily transported bound to particulate fine silts and clays (< 0.063 mm) during winter storms.

2. Mercury can be transported long distances from source areas and can accumulate in reservoirs where the water velocity slows and transport capacity decreases.
3. Mercury methylation typically occurs most efficiently during warm summer months in anoxic zones that establish at the bottoms of reservoirs and/or in the shallow groundwater table.
4. Mercury can be methylated when sulfate-reducing and/or iron-reducing bacteria are allowed to develop in low-flow, anoxic conditions.

Therefore, to design sediment removal operations that minimize the transport and methylation of mercury it is assumed that there is mercury associated with fine particles, silts and clays, in the sediment deposit. In addition, there may be droplets of liquid mercury, and grains of mercury-gold amalgam of various sizes. Due to the known presence of mercury, the following operational features should be considered in developing any gravel/sediment removal system in the Bear River:

- To minimize mercury transport, the disturbance of silts and clays should be limited in summer and fall months when anoxic zones form in the reservoir. This can be accomplished by sediment skimming in dry conditions which would minimize the creation of turbid water during operations.
- To minimize methylation of mercury in shallow groundwater where anoxic zones can also occur, the dewatering action should promote aeration and minimize stratification and the subsequent establishment of anoxic zones with methylating conditions. This can be accomplished by creating a flowing dewatering channel in the deposit.
- To further reduce the activity of potential mercury-methylating bacteria in the dewatering channel, the dewatering channel should be flushed with river water, which should limit the establishment of populations of Hg-methylating microbes (iron-reducing and/or sulfate-reducing bacteria). This can be accomplished by connecting the active channel to the dewatering channel and providing a constant flow of water through the dewatering channel.

In light of the above findings and conclusions regarding mercury mobilization, an additional mining alternative that avoids or minimizes these impacts is warranted.

Proposed Alternative

The proposed alternative does three things. First, it limits sediment skimming to dry conditions ("skimming in the dry") which means that the standing shallow groundwater table will not be disturbed and fines will not be suspended. Second, it forces the movement of the groundwater table towards the dewatering channel. Third, it eliminates stagnant, no-flow conditions in the dewatering channel by connecting it to the active channel.

- Excavate a "dewatering channel" along the southerly bank, approximately 125 feet wide by 3 feet deep which will create streamflow velocities of about 2.5 fps. The purpose of the dewatering channel is to dewater, by gravity, shallow groundwater in the gravel bars within the Bear River channel to allow for dry skimming extraction. Typically, after winter storms, the Bear River meanders through the river bed about 500 feet wetted width (natural channel) therefore, the dewatering channel, which can be relocated or modified daily, will be located in the most appropriate portion of the river bed to optimize dewatering and dry skimming extraction and minimize impacts to air quality, water quality, riparian habitat, and biological resources.

- The dewatering channel will be constructed (downstream to upstream) using a track-mounted excavator operating from the head (upstream) of the dewatering channel. This excavation technique will keep the excavator out of any surface water. Aggregate and sediment from the excavation will be used to reinforce the side of the dewatering channel, guide the river water to the dewatering channel, and provide additional freeboard to the channel flows.
- As the gravel bars are dewatered, the dry sediment will be excavated using scrapers, or front-end loaders and haul trucks. The sediment will be hauled to stockpiles and held for processing, or hauled directly to processing facilities for off-site export.
- At the end of each day during excavation of the dewatering channel, a portion of the Bear River will be directed into the dewatering channel to oxygenate and flush the channel to assure that methylating bacteria do not establish in the dewatering channel. Subsequent construction and/or extension of the dewatering channel upstream would necessitate re-directing the natural channel into the upstream end of the extended dewatering channel to oxygenate and flush the length of the entire dewatering channel. When the construction of the dewatering channel is complete, the dewatering channel becomes the new active channel, allowing all flows in the natural channel to dissipate or dry up. In this way the Bear River will be channelized along the southern boundary. The River is expected to create a new natural channel after winter storms flood the deposit, requiring a new dewatering channel prior to skimming operations.

Monitoring Mitigation

Fines cannot be prevented from moving during the winter erosional events but the operations described above should minimize the mobilization of fines in the summer months when methylation is likely to occur. This is accomplished by skimming in the dry, coupled with monitoring of any suspended sediment in standing water that is exposed or created by mining equipment. If water is found with mercury concentrations greater than 50 ng/L (the pertinent water-quality standard) then operations should be halted and standing water should be allowed to infiltrate.

To determine the effect of the mining activities on the contribution of methylmercury from the shallow groundwater in the deposit to the reservoir, a more robust monitoring effort is suggested. This would include multiple groundwater monitoring wells, or piezometers, that are installed in the deposit in several transects across the width of the Bear River deposit spanning the length of the deposit. The water table elevation in the deposit will be monitored from these shallow groundwater wells and samples of shallow groundwater from within the deposit will be collected (at a frequency to be determined but that will likely match changes in surface discharge). Coupled with information about flow into the dewatering channel, the concentrations will be used to calculate the annual load of methylmercury contributed by the deposit. A transect of monitoring wells located upstream of the skimming operation could be used to establish background conditions, in that it would represent the methylmercury in shallow groundwater that is not disturbed by the operations. The water quality in the most upstream transect would be compared to the water quality in the transects that are in the downstream skimming and dewatering areas to determine the effect of operations on shallow groundwater chemistry. It is expected that the conditions created by dewatering and regular flushing of the dewatering channel will reduce the methylmercury load to the reservoir.

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