

Mud Slough Restoration Project

Initial Study and CEQA Checklist

Prepared for

San Luis & Delta-Mendota Water Authority
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Acronyms and Abbreviations

APN	Assessor's Parcel Number
BAAQMD	Bay Area Air Quality Management District
BMPs	Best Management Practices
CAL FIRE	California Department of Forestry and Fire Protection
Cal-IPC	California Invasive Plant Council
CCaIC	Central California Information Center
CDFG	California Department of Fish and Game
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
cfs	Cubic Feet Per Second
CNDDDB	California Natural Diversity Data Base
CNPS	California Native Plant Society
CVRWQCB	Central Valley Regional Water Quality Control Board
CWA	Clean Water Act
GBP	Grassland Bypass Project
NRHP	National Register of Historic Places
NWR	National Wildlife Refuge
Project	Mud Slough Restoration Project
RWQCB	Regional Water Quality Control Board
SJRRP	San Joaquin River Restoration Program
SJVAPCD or Valley Air District	San Joaquin Valley Air Pollution Control District
SLD	San Luis Drain
SLDMWA, Water Authority	San Luis & Delta-Mendota Water Authority
SWRCB	State Water Resources Control Board
USACE	US Army Corps of Engineers
USFWS	U. S. Fish and Wildlife Service
WY	Water Year

1 ENVIRONMENTAL CHECKLIST

PROJECT INFORMATION

- | | |
|---|---|
| 1. Project Title: | Mud Slough Restoration Project |
| 2. Lead Agency Name and Address: | San Luis & Delta-Mendota Water Authority
P.O. Box 2157, Los Banos, CA 93635 |
| 3. Contact Person and Phone Number: | Joseph C. McGahan (559) 582-9237 |
| 4. Project Location: | North Grasslands Wildlife Area, China Island Unit (East of Newman) in Merced County |
| 5. Project Sponsor's Name and Address: | San Luis & Delta-Mendota Water Authority
P.O. Box 2157, Los Banos, CA 93635 |
| 6. General Plan Designation: | Agricultural (Merced County) |
| 7. Zoning: | Exclusive Agricultural (A-2) Zone. |
| 8. Surrounding Land Uses and Setting: | The Proposed Project is located in the China Island Unit of the North Grasslands Wildlife Management Area that is managed by the California Department of Fish and Wildlife (CDFW). The area is comprised of wetlands, riparian habitat, and uplands. Newman Lake is owned by the Newman Land Company and operated for duck hunting and is kept full of water from September 5 through January 10 |
| 9. Other public agencies whose approval is required: | US Army Corps of Engineers (USACE): Section 404 permit for discharge of fill into waters of the US

State Water Resources Control Board (SWRCB): Section 401 water quality certification from the Central Valley Regional Water Quality Control Board (CVRWQCB)

CDFW: Lake and Streambed Alteration Agreement |
| 10. Description of Project: | |

Background

Newman Lake is a privately-owned lake located in western Merced County, approximately 4 miles east of the community of Newman and west of the China Island Unit of the North Grasslands Wildlife Area. The Lake is managed by the California Department of Fish and Wildlife (CDFW) (Central Region) and is flooded seasonally to provide water that supports waterfowl habitat and duck hunting. It has a surface area of 6-9 acres during the winter season. Historically, prior to the implementation of the Grassland Bypass Project (GBP), Newman Lake received its water supply from Mud Slough (North) by way of a natural connection with the slough.

The GBP began in 1996 to separate drainage flows from the wetland water supply channels, and it has conveyed subsurface drainage from agricultural operations and storm water discharges through the Grassland Bypass Channel and the federal San Luis Drain (SLD), ultimately discharging to Mud Slough (North). By December 31, 2019, all agricultural drainage was managed within the Grassland Drainage Area such that it was no longer discharged to Mud Slough, in accordance with water quality objectives and Waste Discharge Requirements (WDRs). Only stormwater flows (no agricultural drainage) will continue to be routed to Mud Slough from January 1, 2020 through December 31, 2035 under new WDRs.

Accommodations were made to provide a combination of local well water and deliveries from Los Banos Creek to the Lake to satisfy the water demand of Newman Lake. Currently, the San Luis & Delta-Mendota Water Authority (Water Authority) is funding well pumping charges to provide water for Newman Lake. With the successful completion of the GBP in 2019, levels of naturally occurring selenium in Mud Slough have been reduced below thresholds of concern, and water from Mud Slough can now be delivered to Newman Lake.

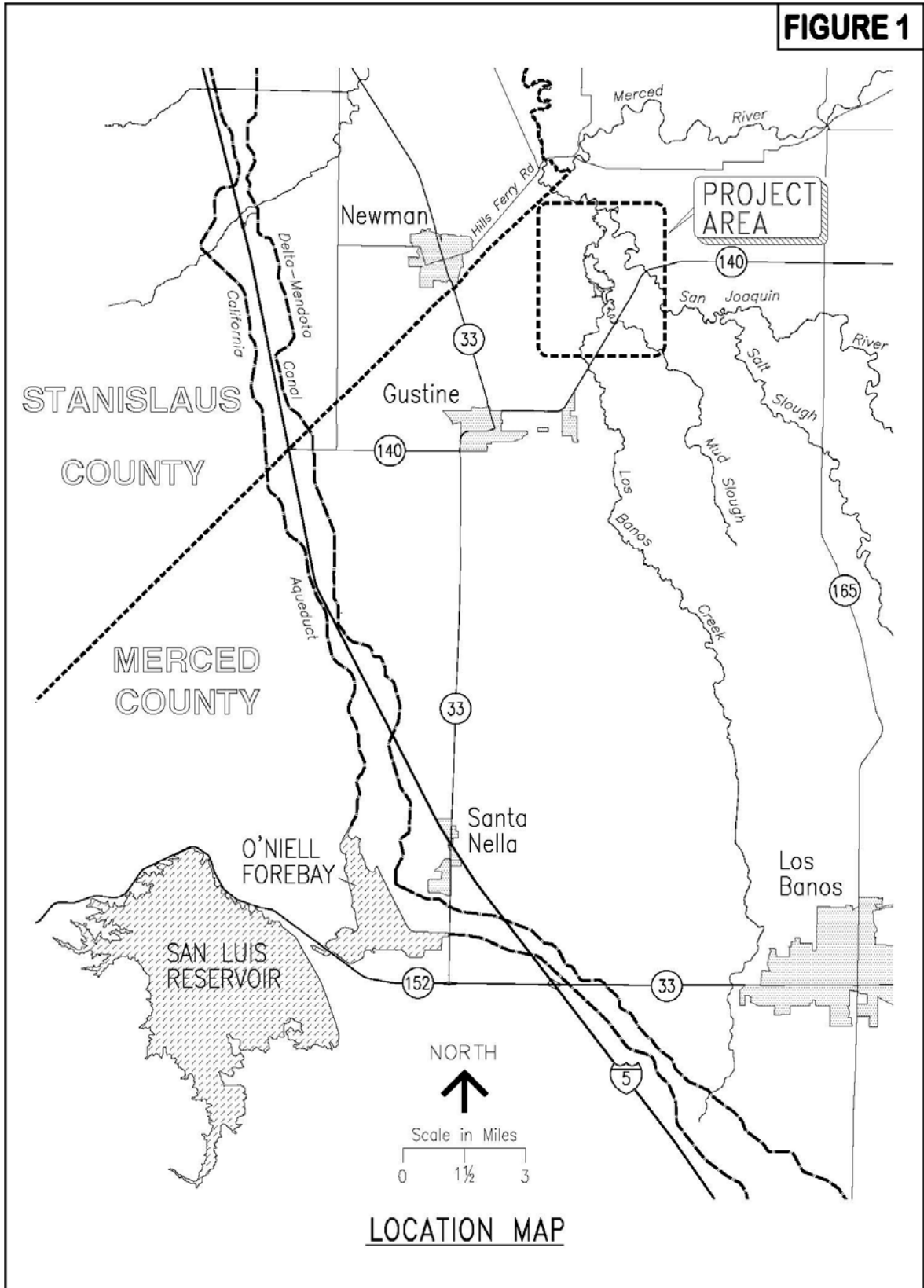
Newman Land Company owns approximately 1,600 acres of land within Merced County that was historically hydrologically connected to Mud Slough. Mud Slough water has been used not only to replenish Newman Lake but also for flooding waterfowl habitat and irrigation. Prior to implementation of the GBP, Newman Lake received its water supply from Mud Slough (North) by way of a natural connection with the slough.

Project Objective

The Mud Slough Restoration Project (Proposed Project) objective is to restore and enhance wildlife habitat on the China Island Unit of the North Grasslands Wildlife Management Area and on the Newman Land Company property by reestablishing Mud Slough flows to portions of those lands that were isolated from Mud Slough as a result of the GBP. The Proposed Project would replace the water supplies to Newman Lake through the restoration of the hydrologic connection between Mud Slough and the Lake. Natural erosion effects of flow in Mud Slough have caused the normal water level to drop, and it is currently approximately four feet below the Newman Lake water level. Therefore, hydraulic modification is required in order for the Lake to receive Mud Slough deliveries. See Figure 1, Mud Slough Restoration Project, Location Map for the Project Area location within Merced County, California and for key hydrologic features and roadways. The Project Area includes the area of evaluation for potential direct and indirect impacts. For this Project, that area includes approximately 368 acres: 78 acres on Newman Land Company and the remainder in the China Island Unit of the North Grasslands Wildlife Management Area (discussed in Section 1.4, Biological Resources).

Summary Description of Construction and Operation

The Proposed Project is to provide 1,663 acre-feet of water per year to Newman Lake. A new diversion structure would be constructed in Mud Slough, approximately 300 feet downstream of the confluence with Los Banos Creek. The structure would span the width of Mud Slough for the purpose of raising the water level in the slough to divert water into Newman Lake through a side channel connecting to Los Banos Creek. The structure would be designed as a reinforced concrete, broad-crested weir check with overshot spill structure to fine-tune upstream water levels and maintain downstream flow. The crest elevation would be designed to pass normal high flows without



exceeding the Mud Slough channel capacity. High flows would spill and inundate primarily the easterly floodplain

with localized inundation of seasonal wetland areas adjacent to the west bank of Mud Slough upstream of the proposed control structure, which is consistent with current conditions. An existing spill structure in Los Banos Creek would be removed. Figure 2, Proposed Project, illustrates the Project features.

Water delivered to Newman Lake would be a combination of Los Banos Creek flows and Mud Slough flows, depending on hydraulic conditions at the time in both waterways. Excess flows in Newman Lake would flow out the existing spill dam at the north end of the Lake.

Minimal channel excavation would be required to key the Mud Slough diversion structure into the channel bed and banks. The total construction footprint (including staging area) is estimated to be 1.4 acres.

Modifications to the existing side channel connecting Los Banos Creek to Newman Lake include the installation of a new culvert and road crossing and the removal of accumulated silt for the initial 200 feet of the side channel at Los Banos Creek. The silt would be removed and spread along the adjacent levee.

Additional activities include the removal of five abandoned water control structures within the China Island refuge and the reinforcement of the existing Newman Dam at Mud Slough.

As detailed in the *Mud Slough Restoration Project Hydrology Study (Appendix E, Summers Engineering, September 24, 2020)*, the overshot gate would be managed to divert up to 1,663 acre-feet of combined Mud Slough and Los Banos Creek flow into Newman Lake via the side channel connecting Los Banos Creek to Newman Lake. A majority of the diversion, estimated to be 1,523 acre-feet plus another 40 acre-feet to offset seepage and evaporation, would occur during the fall-winter period (September 5 – January 10). Diverted flow would not exceed 10 cubic feet per second (cfs). In extremely dry years (e.g., WY 2013-14, WY 2014-15, and WY 2015-16), Mud Slough flows would be insufficient to support both downstream flows and the entire Newman Lake water demand. When Mud Slough flows are less than 20 cfs, half of the flow would be devoted to Newman Lake water demands and the remaining half would continue downstream. In situations where Mud Slough flow exceeds 20 cfs, the full diversion of 10 cfs would occur at Newman Lake; and the remainder would continue downstream.

Outside the diversion period (January 11 to September 4), 100 acre-feet of water would be diverted as available for maintaining the water level in Newman Lake. The control gate in the Mud Slough diversion would be lowered (i.e., opened to allow all the flow through the structure) except during periods of short duration to allow replenishment water to be diverted to Newman Lake. This replenishment would occur monthly for a period of approximately 7 days each time. The actual timing would depend on the water availability, but in no case would the diversion occur for more than 7 days at a time during the summer period of operation (June through August). Flows would be maintained downstream equal to half of the total flow as during the primary diversion period.

The Proposed Project would raise the water levels in Mud Slough between the new proposed diversion structure and Highway 140 when the overshot gate is raised during seasonal operations. This area is often inundated during high flow conditions. The Proposed Project would inundate up to 7.21 acres more than under existing conditions for low to winter median flows (10-120 cfs) during seasonal operations.

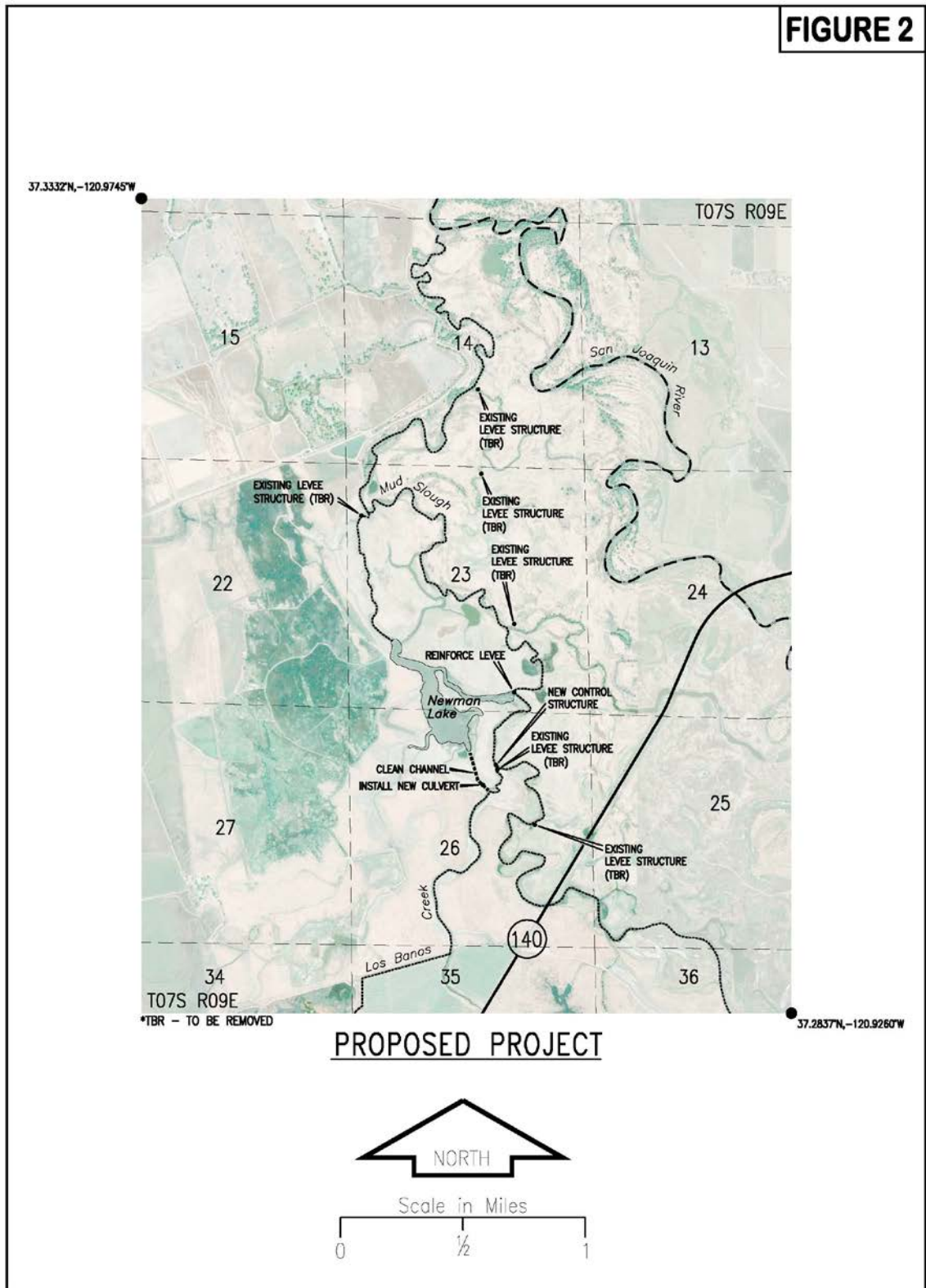
Operation of the Proposed Project would require periodic (<1 per week) visits to inspect conditions and remove trash, which is not different from existing conditions. Therefore, there is no incremental change to be considered for the impact analyses.

Project Construction

The Mud Slough Restoration Project would include multiple components:

- Install a culvert in the Newman Lake Connection Channel to facilitate the access of construction equipment to the proposed Mud Slough diversion structure.

FIGURE 2



- Clean silt from confluence of Newman Lake Connection Channel at Los Banos Creek to facilitate flow.
- Remove the existing Los Banos Creek spill structure at the confluence of Los Banos Creek and Mud Slough and restore the channel and creek banks.
- Dewater the diversion structure work area with temporary sheetpile cofferdams and bypass pipe.
- Construct the Mud Slough diversion structure downstream of the confluence of Los Banos Creek and Mud Slough.
- Recompact and armor the existing Newman Lake Dam.
- Remove abandoned water control structures within the China Island wildlife refuge.

A description of the construction efforts associated within each of these Project components, along with estimated equipment and construction duration, is provided below. *Appendix A, Mud Slough Restoration Project Drawings*, is attached to this Initial Study and referenced as needed.

Culvert Installation (*Appendix A, Sheet 6*): In order to allow heavy equipment access to the proposed Mud Slough diversion structure, a new 48 inches x 40 feet reinforced concrete culvert will be installed within the Newman Lake Connection Channel. Earthen backfill will be placed across the approximately 50-foot-wide channel to create a level, stable crossing for construction equipment and to allow access for future maintenance, if needed. A temporary construction staging area will be established on the east bank of the channel. This work is expected to require a single excavator for excavation, placement of the pipe, and backfill, a delivery truck to deliver the pipe joints, and a dump truck to deliver the riprap. Estimated construction duration is 4 days.

Silt Removal from confluence of Newman Lake Connection Channel at Los Banos Creek to facilitate flow (*Appendix A, Sheet 9*): Silt and vegetation will be cleaned out of the first 200 feet of the connection channel, beginning at confluence of Los Banos Creek and ending near the location of the proposed culvert (discussed above). The silt and vegetation will be removed by excavator and hauled 200 feet to the South-West where it will be spoiled outside of waters of the U.S. and State. The excavated material will not be deposited in adjacent wetlands or Coulter's Goldfields. The remaining 1200 feet of the connection channel will be mowed using a tow-behind mower capable of mowing on a side slope when the channel is dry. A temporary construction staging area will be established along each bank of the connection channel to facilitate this work. Equipment will include a single excavator and two dump trucks to haul and deposit the spoil material in the designated area. Estimated construction time is 2 days.

Los Banos Creek Spill Structure Removal and Channel Restoration (*Appendix A, Sheet 4*): Two pre-cast concrete flashboard risers and discharge pipes, as well as the levee supporting these structures will be removed at the confluence of Los Banos Creek and Mud Slough and the creek bed and banks will be restored to pre-GBP conditions. Construction equipment will be positioned in non-native grassland to the east and west of the structures. This work will involve one excavator for two days to remove the structures and stabilize the site. Approximately 560 cubic yards of material will be excavated to restore the creek bed and banks and create a stable transition from Los Banos Creek to Mud Slough.

Temporary Cofferdams and Dewatering (*Appendix A, Sheet 3*): Two sheetpile cofferdams will be installed across Mud Slough to dewater a 100-foot-long construction area. Once the upstream and downstream cofferdams are constructed, the site will be dewatered using a small portable pump. The water pumped from between the sheetpile cofferdams will be discharged back into Mud Slough downstream of the construction area or into the adjacent floodplain to the west of the construction site. The top of the sheetpile wall will be, at a minimum, 1 foot below the top bank of Mud Slough and may extend above the top bank, depending on the length of sheetpiles used. The preferred installation method for the sheetpile cofferdam is jacking (pressing) the sheetpiles into the soil using the weight of an excavator or like equipment, as this method creates minimal noise and sediment agitation. If subgrade conditions are not conducive to this method, a vibratory hammer will likely be used to drive the piles. During the dewatering process, any fish stranded between the sheetpile cofferdams will be relocated either

upstream or downstream of the dewatered area. After the area has been dewatered, a small submersible pump will be used to manage seepage through the cofferdams. A small pit will be constructed to collect seepage water. The pit will be lined with steel casing and gravel, keeping trash and other debris away from the dewatering pump intake and minimizing turbidity and sedimentation in pumped seepage water.

A bypass pipeline will be installed to allow flows in Mud Slough to continue downstream of the dewatered area during construction. Preliminary sizing indicates a 48-inch diameter pipe will be needed. The material will likely be corrugated polyethylene pipe, this material is preferred because of cost effectiveness and durability.

The sheetpile cofferdams will remain in place during the removal of the Los Banos Creek levee, flashboard risers and culverts. When the levee is excavated, sediment will be agitated and the water will become turbid. The inlet to the diversion pipeline will be closed during the excavation of the levee to keep sediment from moving downstream. Once the agitated sediment has settled out and turbidity has returned to pre-excavation levels, the inlet will be reopened to resume bypass flows.

Once construction of the new diversion structure and removal of the Los Banos Creek levees are completed, the bypass pipeline will be removed. The upstream sheetpile will be removed first with the downstream sheetpile removed second. When the sheetpiles are removed, effort will be made to minimize sedimentation and turbidity. These include slow removal of the sheetpiles (one at a time) and keeping the removed sheetpile above the waterline whenever possible to avoid additional sediment agitation.

This work is expected to require 2 excavators for approximately 5 days, and a delivery truck to deliver the pipe and sheetpile. The cofferdams will remain in place for approximately 6-7 weeks during construction of the diversion structure, culvert and removal of the Los Banos Creek spill structures and restoration of the channel.

Mud Slough Diversion Structure (*Appendix A, Sheet 3*): A permanent diversion structure will be constructed in Mud Slough, approximately 300 feet downstream of the confluence with Los Banos Creek. An equipment staging area will be positioned above top of bank on the west side of Mud Slough. The diversion structure would span the width of Mud Slough (approximately 80 feet) and will raise the water level in Mud Slough to match the operating water level in Newman Lake. The structure will consist of a reinforced concrete broad crested weir check with a top width of 8 feet and armored upstream and downstream faces. The structure will include an overshot spill gate to control water levels and maintain downstream flows. The structure and concrete lining will extend over the 52-foot length of Mud Slough, with 10 linear feet of riprap embedded in the channel upstream and downstream of the structure. The crest elevation is designed to pass normal high flows without exceeding the Mud Slough channel capacity. Extreme high flows would spill and inundate the adjacent floodplains, which is consistent with current conditions.

Minimal channel excavation would be required to key the structure into the channel bed and banks. The 48-inch low-flow bypass pipe described above will prevent dewatering of the downstream waterbody during construction.

Prior to construction, the site would be graded according to the design geometry. With the site prepared, required fill would be placed, graded and compacted according to design. This work is estimated to involve approximately 400 cubic yards of fill, which would be placed and compacted with one to two excavators. Concrete formwork would be constructed by hand labor according to the design drawings. The volume of reinforced concrete to construct the diversion structure is approximately 105 cubic yards. Construction duration is estimated to be 6 work weeks. Additionally, a riprap apron (approximately 45 cubic yards of material) will be placed on the upstream and downstream sides of the structure. Between two and four portable pumps (likely diesel powered) would be installed to keep the construction area dewatered during the 6-week period.

Newman Lake Dam Reinforcement (*Appendix A, Sheet 5*): A dam was constructed in 2000 to isolate Newman Lake from Mud Slough. Prior to construction of the dam, Newman Lake received surface flow from Mud Slough. The

existing berm that isolates Neman Lake from Mud Slough has become weak due to natural erosion in the Mud Slough channel. To prevent failure, the existing levee top will be compacted, and approximately 175 cubic yards of rock riprap will be imported and placed over approximately 120 linear feet of the inside (Newman Lake side) and outside (Mud Slough) faces of the berm. This work is expected to require one excavator for approximately 10 work days. Twenty-five trips from a side-dump truck would be required to transport the fill material, and another 13 trips would be needed to provide the riprap to the site.

Abandoned Structures Removal (*Appendix A, Sheet 7*): With the start of the Grassland Bypass Project in 1996, several hydraulic control structures were installed on the China Island Unit to prevent contaminated drain water from entering certain side-channels. These were all corrugated steel flash-board risers and pipelines that have mostly rusted away, and none of the structures serve any hydraulic purpose. However, five of these structures (L2, L11, L13, L14 and L15) exist with sufficient integrity that they can be removed. Removal of these structures will involve a single backhoe which will attach to the structure remnants with a lift chain, and pull them out and onto a flatbed or similar truck to be hauled away. Steep slopes and low points left behind by the structure removal will be smoothed with the bucket of the backhoe. Access to these structures will be via existing dirt roads and tracks. No earthwork for access will be conducted. The total duration of this work is expected to take two days.

Construction Best Management Practices

Best Management Practices (BMPs) refer to methods of controlling primarily for water pollutants for storm and surface water management (but also for soil and biological resource protection) that are inherent in implementation of a project of this type. BMPs are defined as schedules of activities, prohibitions of practices, maintenance procedures, and structural and/or managerial practices, that when used singly or in combination, prevent or reduce the release of pollutants to surface waters. The types of BMPs by general category are source control, runoff treatment, and flow control.

The primary purpose of using BMPs is to protect beneficial uses of water resources through the reduction of pollutant loads and concentrations, and through reduction of discharges (volumetric flow rates) causing stream channel erosion. While BMPs have evolved to protect water quality from nonpoint sources of pollution, they also promote soil conservation and protection of water-related resources (including fish) from point sources during construction activities where the construction site is a point source. Many of these practices have developed from permit requirements of state and federal agencies (especially the Environmental Protection Agency).

The following BMPs have been developed for implementation as part of the Proposed Project. They apply to all construction, operations, and maintenance activities. To simplify compliance during construction, implementation of the BMPs and permits issued by the State Water Resources Control Board (SWRCB) and CDFW will be incorporated into construction contracts. Day-to-day compliance and reporting responsibilities would be the responsibility of each construction contractor, who would maintain records of compliance for review by the Water Authority and the regulatory agencies.

- **Implementation of BMPs.** Construction, operations, and maintenance will comply with standard pollution prevention and minimization measures (best management practices).
- **Riparian vegetation.** The Mud Slough channel construction sites will be accessed via areas where riparian vegetation will be avoided.
- **Runoff.** Potential downstream runoff from the site will be controlled with sand bags, fiber mats, or other methods.
- **Concrete containment.** Washout areas for vehicles will be located at least 100 feet removed from Mud Slough, Los Banos Creek and the Connection Channel in areas where concrete materials cannot runoff into the channel.
- **Concrete management.** All concrete work will be washed and cured prior to coffer dam or other barrier removal to reduce potential for leaching.

- **Fuel containment.** All fueling and maintenance of construction equipment will occur at least 100 feet removed from the Mud Slough channel. If this is not feasible, containment materials will be used.
- **Equipment leaks.** When working in the channel or where there may be runoff to the channel, construction equipment will be fitted with absorbent materials at potential fuel, oil, and other fluid leak spots.
- **Leaks.** When construction equipment is used within Mud Slough, Los Banos Creek and the Connection Channel, all such equipment will be fitted with secondary containment materials at potential oil/fuel leakage sites.
- **Leak containment.** All construction equipment will be inspected prior to each work day to ensure that oil and/or gas/diesel fuel are not leaking from equipment.
- **Spill containment and isolation.** During construction and post-construction maintenance involving use of equipment in or adjacent to Mud Slough, Los Banos Creek and the Connection Channel, sand bags will be stockpiled on site so that they may be immediately filled and placed around any spill. In addition, any spills not contained within the maintenance area will immediately be isolated from the active channel. Spill material will be removed from the site.
- **Storage.** Secondary containment for fueling and chemical storage areas will be provided during construction.
- **Re-grading.** All channel margins and upland disturbed areas will be regraded to pre-Project contours and restored as a river bank.
- **Channel protection.** The construction zone will be isolated from the active channel during in-water construction activity using a cofferdam.
- **Wash water containment.** Secondary containment for equipment wash water will be provided to ensure that wash water is not allowed to run off the site.
- **Silt containment.** Silt traps, ponds, sediment management methods, and/or other means will be provided to prevent runoff from the construction site.
- **Stockpile runoff.** Material stockpiles will be covered to prevent runoff.
- **Soil erosion.** Loose soils will be protected from potentially erosive runoff.

For potential leaks of hazardous materials, an existing Spill Prevention Plan provides for onsite cleanup of small spills and proper disposal of the spill material in compliance with local regulations. It will be required as a standard management practice for equipment and vehicle use for the Proposed Project as well.

Construction Summary: The Proposed Project would involve limited use of construction equipment (excavators, backhoe, grader, roller-compactor, bottom-dump truck, side-dump truck, and water trucks) for the installation of a reinforced concrete diversion structure, installation of a culvert and clean out of approximately 200 feet of existing ditch, reinforcement of an existing dam, and the removal of five abandoned water control structures. All construction vehicles will be Tier 4 compliant; and standard best management practices for vehicle maintenance, site management, and dust control will be implemented. The Proposed Project is expected to require no more than 10 workers per day during construction, for a total of 20 trips (to and from) per day. These Project trips would only be during the construction period, estimated to be three months (for a total of 66 days) during the four-month dry period, June through September.

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages. Where checked below, the topic with a potentially significant impact will be addressed in an environmental impact report.

Aesthetics Agriculture and Forest Resources Air Quality

- | | | |
|--|---|---|
| <input type="checkbox"/> Biological Resources | <input type="checkbox"/> Cultural Resources | <input type="checkbox"/> Energy |
| <input type="checkbox"/> Geology / Soils | <input type="checkbox"/> Greenhouse Gas Emissions | <input type="checkbox"/> Hazards / Hazardous Materials |
| <input type="checkbox"/> Hydrology / Water Quality | <input type="checkbox"/> Land Use / Planning | <input type="checkbox"/> Mineral Resources |
| <input type="checkbox"/> Noise | <input type="checkbox"/> Population / Housing | <input type="checkbox"/> Public Services |
| <input type="checkbox"/> Recreation | <input type="checkbox"/> Transportation | <input type="checkbox"/> Tribal Cultural Resources |
| <input type="checkbox"/> Utilities / Service Systems | <input type="checkbox"/> Wildfire | <input type="checkbox"/> Mandatory Findings of Significance |
| | <input type="checkbox"/> None | <input checked="" type="checkbox"/> None with Mitigation Incorporated |

DETERMINATION

On the basis of this initial evaluation:

- I find that the proposed project could not have a significant effect on the environment, and a **NEGATIVE DECLARATION** will be prepared.
- I find that although the proposed project **COULD** have a significant effect on the environment, there **WILL NOT** be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A **MITIGATED NEGATIVE DECLARATION** will be prepared.
- I find that the proposed project **MAY** have a significant effect on the environment, and an **ENVIRONMENTAL IMPACT REPORT** is required.
- I find that the proposed project **MAY** have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An **ENVIRONMENTAL IMPACT REPORT** is required, but it must analyze only the effects that remain to be addressed.
- I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier **EIR** or **NEGATIVE DECLARATION** pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier **EIR** or **NEGATIVE DECLARATION**, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.



Signature

5/24/2021

Date

Federico Barajas

Printed Name

Executive Officer

Title

San Luis & Delta-Mendota Water Authority

Agency

EVALUATION OF ENVIRONMENTAL IMPACTS

An evaluation of potential environmental impacts (i.e., adverse effect on the environment in comparison to existing conditions), is provided in the checklist sections to explain each question and the designation according to 4 categories of impact and mitigation:

Potentially Significant Impact,

Less than Significant
with Mitigation Incorporated,

Less than Significant Impact, and

No Impact.

The information in the checklist is supported by four technical appendices (attached) and listed below in order of their discussion:

Appendix A. Mud Slough Restoration Project Drawings

Appendix B. Biological Resources Report for the Mud Slough Restoration Project, China Island Unit North Grasslands Wildlife Area, and Newman Land Company, East of Newman, Merced County, California

Appendix C. Cultural Resource Inventory for the Mud Slough Restoration Project, Merced County, California

Appendix D. Paleontological Technical Memorandum for the Mud Slough Restoration Project, Merced County, California

Appendix E. Mud Slough Restoration Project Hydrology Study

1.1 AESTHETICS

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
I. Aesthetics.				
Except as provided in Public Resources Code section 21099 (where aesthetic impacts shall not be considered significant for qualifying residential, mixed-use residential, and employment centers), would the project:				
a) Have a substantial adverse effect on a scenic vista?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage points.) If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

1.1.1 Environmental Setting

The China Island Unit is part of the 7,400-acre North Grasslands Wildlife Area that is comprised of wetlands, riparian habitat, and uplands that are managed by CDFW for waterfowl habitat and hunting. Project improvements are planned on the southern portion of the China Island Unit that is predominantly floodplain on which no major land improvements have been made. Photographs of the Mud Slough Restoration Project site are included in the *Biological Resources Report for the Mud Slough Restoration Project, China Island Unit North Grasslands Wildlife Area, and Newman Land Company, East of Newman, Merced County, California* attached to this Initial Study as *Appendix B* and in the *Cultural Resources Inventory for the Mud Slough Restoration Project, Merced County, California* attached as *Appendix C*.

Newman Lake is part of a private hunting club that provides opportunities for members to hunt waterfowl. Other areas are open to the public and regulated by CDFW.

The 2030 Merced County General Plan includes scenic resources policies in the Natural Resources Element (Merced County 2013, 2016¹). The scenic resources section states that: "The rural and agricultural landscapes provide the

¹ Merced County, *2030 Merced County General Plan*, 2013, 2016. The 2030 Merced County General Plan, as adopted on December 10, 2013, consists of the November 30, 2012 version of the Draft 2030 Merced County General Plan, with the addition of the Policies and Implementation Programs contained in the "CEQA Findings of Fact and Statement of Overriding Considerations," and also reflects the modifications presented to the Planning Commission in "Attachment A" to the November 6, 2013 Planning Commission Staff Report, and "Submittal 3" to the December 10, 2013 Board Agenda Item on the General Plan Update (CED 664). It was amended on July 12, 2016. The 2030 General Plan document referenced herein and available online is dated December 10, 2013. See <https://www.co.merced.ca.us/DocumentCenter/View/6766/2030-General-Plan?bidId>

primary scenic resources in Merced County. The County also has many scenic vistas, such as the Coastal and Sierra Nevada mountain ranges, and the Los Banos Creek, Merced, San Joaquin, and Bear Creek river corridors” (p. NR-8). Also see Policy NR-4.1: Scenic Resource Preservation that calls for promotion of the preservation of agricultural land, ranch land, and other open space areas as a means of protection the County’s scenic resources.

1.1.2 Discussion

a) Have a substantial adverse effect on a scenic vista?

A limited view of the Mud Slough floodplain off of State Route 140 (Central Yosemite Highway) along with portions of Mud Slough and Los Banos Creek at their respective bridges are the only public vistas of the area.

The Proposed Project would be implemented outside of the waterfowl hunting season. The wildlife refuges are managed primarily for waterfowl and other species, not for high intensity general recreation. The diversion structure would be built within the channel and would not be visible at the ground level. Furthermore, the channel improvements would include channel restoration (silt removal and raised water levels) that could enhance the scenic quality for hunters in the open space area.

b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

State Route 140 (SR 140) is a state highway in the state of California, 102 miles (164 km) in length. It begins in the San Joaquin Valley at Interstate 5 near Gustine, and runs east into Sierra Nevada, terminating in Yosemite National Park. While SR 140 is eligible to be included in the State Scenic Highway System, only the part of the road from Mariposa to El Portal is designated as a scenic highway (https://en.wikipedia.org/wiki/California_State_Route_140). However, this portion is not in the Project Area.

c) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage points.) If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?

The Proposed Project is located in a non-urbanized area, and public views of the site would not be affected given the short-term construction period (three months) and would occur outside of the peak public use of the area. Once construction is complete, components of the Project would not be visible from the ground level.

d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

Once constructed, the improvements to deliver water to Newman Lake do not interfere with the open space character of the area nor do they include any artificial lights.

1.2 AGRICULTURE AND FOREST RESOURCES

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
II. Agriculture and Forest Resources.				
In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997, as updated) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland.				
In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state’s inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board.				
Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with existing zoning for agricultural use or a Williamson Act contract?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Result in the loss of forest land or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Involve other changes in the existing environment, which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

1.2.1 Environmental Setting

The Proposed Project is located in an unincorporated area designated as Agricultural. See the Merced County Land Use Policy Diagram map that is located at http://web2.co.merced.ca.us/pdfs/planning/generalplan/landusemaps/draft_general_plan_county.pdf

On October 22, 2019, the Board of Supervisors adopted Merced County's new Zoning Ordinance. This update became effective November 21, 2019. Section 18.10 provides the revised codes for three agricultural zones. See <http://online.encodeplus.com/regs/mercedcounty-ca/doc-viewer.aspx#secid-1467>.

The Project Area is located in the A-2 Exclusive General Agriculture Zone. The applicable land use and zoning codes for this designation are.

Merced County**Chapter 18.10 AGRICULTURAL ZONES (A-1, A-1-40, A-2)****18.10.010 Purpose.****C. A-2 Exclusive General Agriculture Zone**

1. Exclusive Agricultural (A-2) Zone. The purpose of the Exclusive Agricultural Zone (A-2) is to provide for areas with considerably expanded agricultural enterprises, due mainly to the requirement of large parcels which are more economically suitable to support farming activities. The 160-acre minimum parcel size facilitates farming and ranching operations and a variety of open space functions that are typically less dependent on soil quality and are often connected more with foothill and wetlands locations; grazing and pasture land; and wildlife habitat and recreational areas. This zone implements the Agriculture (A), Agriculture Residential (AR), Foothill Pasture (FP), and Urban Reserve (UR) land use designations in the General Plan.

Agricultural lands in the vicinity of the Proposed Project (south of Newman Lake) are owned by Newman Land Company.

The 2030 Merced County General Plan (2013) contains policies on the agricultural economy, preservation, and compatibility with urban areas in the Agricultural Element.

1.2.2 Discussion

- a) **Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?**

Under the Proposed Project, no farmland is to be converted to nonagricultural uses.

- b) **Conflict with existing zoning for agricultural use or a Williamson Act contract?**

No, the improvements are to waterways within the wildlife management area and are focused on conveying water to Newman Lake. No lands currently in agricultural production would be affected. Irrigation water deliveries to these lands would not be affected.

- c) **Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?**

No forestland is located within the Project Area. No trees would be removed to complete the improvements.

- d) **Result in the loss of forest land or conversion of forest land to non-forest use?**

No. See discussion under c above.

- e) **Involve other changes in the existing environment, which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use?**

There are no secondary impacts to agricultural land within the Project vicinity.

1.3 AIR QUALITY

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
III. Air Quality.				
Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied on to make the following determinations.				
Are significance criteria established by the applicable air district available to rely on for significance determinations?				
	<input checked="" type="checkbox"/> Yes		<input type="checkbox"/> No	
Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) 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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Expose sensitive receptors to substantial pollutant concentrations?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

1.3.1 Environmental Setting

The Project site is located in the San Joaquin Valley Air Pollution Control District (SJVAPD or Valley Air District). Air quality impacts are typically assessed when a proposed project has the potential to either generate new or exacerbate existing sources of air pollutants either from construction or from operation of the project over the long term. To protect public health and the environment, the U.S. Environmental Protection Agency set national standards for six common air pollutants, known as criteria pollutants:

- Ground-level ozone
- Particulate matter
- Carbon monoxide
- Nitrogen dioxide
- Sulfur dioxide
- Lead

A project is consistent with an air quality plan if it will not result in an increase in the frequency or severity of existing air quality violations or cause or contribute to new violations with respect to criteria pollutants or delay timely attainment of air quality standards or emissions reductions in an air quality plan. Equipment use involves excavators, backhoe, grader, roller-compactor, bottom-dump truck, side-dump truck, and water trucks during a 12 work weeks (66 days) construction period. Since the Proposed Project would involve limited use of equipment to make the modifications to convey water to Newman Lake (i.e., to clean silt out an existing delivery ditch and construct a

diversion structure), activities that are short term and temporary within a wetland habitat area, this use would not introduce new point sources or worsen existing sources of air pollutants, and a full quantification of emissions and evaluation of air quality impacts was not deemed necessary, consistent with the project location and size criteria described below.

- The primary concern in agricultural areas is fugitive dust emissions/particulate matter generated by ongoing plowing/soil disturbance. No additional (new) agricultural land is proposed to come into production, only improvements to the Lake that facilitate duck hunting. The affected portion of the Newman Land Company is Newman Lake and the following waterways: Los Banos Creek and Mud Slough.
- Using project size (i.e., vehicle trips, housing units, square footage of development) and type (land use), the Valley Air District has pre-quantified emissions and determined a size below which it is reasonable to conclude that a project would not exceed applicable thresholds of significance for criteria pollutants. These types of projects do not address wetland habitats. However, the small project analysis level by vehicle trips addressed 5 categories of urban land use with vehicle trips ranging from 1,453 trips/day for residential housing to 1,707 trips/day for institutional land use projects (SJVAPCD 2017).

The Proposed Project is expected to require no more than 10 workers per day during construction, for a total of 20 trips (to and from) per day which is substantially less than the lowest threshold of 1,453 trips/day. These Project trips would only be during the construction period (estimated to be up to three months in the dry season, June through September). Given the limited activities proposed for the Newman Lake area and the estimated number of workers and trips needed to construct the improvements, it is reasonable to conclude that the Project would not exceed applicable thresholds of significance for criteria pollutants.

Two sheetpile cofferdams will be installed across Mud Slough to dewater a 100-foot-long construction area. Once the upstream and downstream cofferdams are constructed, the site will be dewatered using a small portable diesel pump. After the area has been dewatered, a small submersible pump will be used to manage seepage through the cofferdams. Given the three-month construction period, the use of the diesel pump in the habitat area would not result in levels of pollutants that would exceed applicable thresholds.

The 2030 Merced County General Plan (2013) contains an Air Quality Element that addresses toxic and hazardous emission and criteria pollutants, and it calls for mitigation of significant local and regional air quality impacts of projects through the CEQA process. In particular, Policy AQ-2.1 requires all development projects to comply with applicable regional air quality plans and policies (p. AQ-4).

1.3.2 Discussion

a) Conflict with or obstruct implementation of the applicable air quality plan?

The construction of the proposed diversion structure and clean out of the existing deliver ditch would not be large enough (given short term equipment use and only 20 worker vehicle trips per day) to interfere with implementation of the Valley Air District's air quality plan and any CMP by any affected landowner. Construction activities would be completed within 12 weeks and would occur over a three-month period during the four-month dry season (June through September). Contributions to emissions and particulates are from the use of equipment for construction of the Project are insubstantial as well as short term and temporary, removed from sensitive receptors in a wetland habitat area within a larger wildlife habitat and agricultural area, north of SR 140. A water truck would be used to ensure dust is controlled at the construction sites.

b) 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?

An evaluation of the emissions related to construction activities is included in Section 1.8, Greenhouse Gas Emissions. The increases in oxides of nitrogen, reactive organic gases, and particulate matter from Project construction are

incrementally insubstantial in part due to limited ground disturbance/trenching and for reasons cited in (a) above, and would not be cumulatively considerable in the Project Area and vicinity within the Valley Air District. A water truck would be used to control dust at the construction sites, and all construction vehicles would be Tier 4 compliant. Sediments removed as a result of the delivery ditch cleanout will retain sufficient moisture to prevent dust generation and will be spread along the existing ditch levee.

c) Expose sensitive receptors to substantial pollutant concentrations?

The Proposed Project is located within the China Island Unit of the North Grasslands Wildlife Area, north of the San Luis NWR; and there are no sensitive receptors within the vicinity of the Project. Nearby agricultural workers (if present) would not be exposed to substantial particulates; they are not sensitive receptors (i.e., not children or the elderly). People do not live within close proximity to the construction locations which are within the wildlife refuge area. The nearest communities are to the west of the Project site, i.e., Newman at Hwy 33 and Gustine on SR 140, approximately 4 - 5 miles away.

d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

There are no odors emanating from the construction site or as a result of the Proposed Project, and there are no residences close to Newman Lake and the affected waterways in the Project Area.

1.4 BIOLOGICAL RESOURCES

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
IV. Biological Resources.				
Would the project:				
a) 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 the U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by the California Department of Fish and Wildlife or the U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) 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?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

1.4.1 Environmental Setting

Information in this section is summarized and/or copied from the *Biological Resources Report for the Mud Slough Restoration Project, China Island Unit North Grasslands Wildlife Area, and Newman Land Company, East of Newman, Merced County, California* that is attached to this Initial Study as *Appendix B*. It provides the regulatory background (federal, state, and local) and the results of the biological resources assessment. Note that this report also contains appendices that are called out in the material herein (but not in italics). The *Appendix B* introduction (Section 1.0) includes the following:

The objective of the Proposed Project is to restore and enhance wildlife habitat on the China Island Unit of the North Grasslands Wildlife Management Area and on the Newman Land Company property by

reestablishing Mud Slough flows to portions of those lands that were isolated from Mud Slough as a result of the GBP. The Proposed Project will fulfill the commitment to restore Mud Slough to its pre-GBP condition as described in the 2010 Memorandum of Understanding between the California Department of Fish and Game and the San Luis and Delta-Mendota Water Authority Regarding the Grassland Bypass Project (CDFW and SLDMWA, 5/26/2010). Natural erosion effects of flow in Mud Slough during the past 20 plus years have caused the normal water level to drop, and it is currently approximately four feet below the Newman Lake water level. Therefore, hydraulic modification is required in order to restore Mud Slough flow to Newman Lake and its downstream channel.

The purpose of this biological resources report is to characterize the habitats that are present within the Study Area, evaluate the impact of the Proposed Project on biological resources, and describe avoidance/minimization/mitigation measures to reduce potential impacts of the Project on biological resources.

Background literature searches and reconnaissance-level surveys were conducted to determine whether special-status species (see definitions in *Appendix B, Section 4.2*) have potential to inhabit the Project Area based on documented occurrences, range distribution and suitable habitat. Information sources included the California Natural Diversity Data Base (CNDDDB), the online California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants, and survey records for the China Island Unit provided by CDFW staff. Special-status species were analyzed for their potential to occur in the Study Area based on the availability of suitable habitat. Within the *Appendix B Biological Resources Report, Appendix B* (plants) and *Appendix C* (wildlife) describe special-status species documented to occur in the Study Area region and the potential for occurrence within the Project site.

Appendix B, Section 5.0, describes the Project Area (referred to herein as the Study Area) as follows:

The 367.62-acre Study Area shown on Figure 1 encompasses a 366.1-acre area (Area 1) and a 1.52-acre area split between four small areas on the China Island Unit (Area 2). The Study Area is located in the San Joaquin Valley northwest of Highway 140, roughly 3.5 miles northeast of Gustine, in Merced County, California (Figure 1). Approximately 78 acres in the west and northwest portions of the Study Area are privately owned by Newman Land Company and are managed primarily for waterfowl habitat and hunting, are grazed with cattle, and include fencing and unpaved access roads. The remainder of the Study Area is located on the China Island Unit of CDFW's 7,400-acre North Grasslands Wildlife Area. The North Grasslands Wildlife Area consists of wetlands, uplands, and riparian habitat, and is managed by CDFW for waterfowl habitat and hunting. Historically, prior to purchase for the State of California by the Wildlife Conservation Board in April 1990, land uses on the North Grasslands Wildlife Area consisted of irrigated pasture, grazing land, and seasonal hunting and fishing, with the China Island Unit primarily used for cattle grazing (California Department of Fish and Game 1998). Barbwire fencing is present in Area 1, along with one lightly used dirt track entering from Highway 140 and extending toward the northwest. Area 1 is not currently grazed and no active land uses were observed during the surveys conducted for this report.

Area 2 encompasses 1.52 acres in four areas on the China Island Unit: L11 (0.533 acre), L13 (0.23 acre), L14 (0.509 acre), and L15 (0.252 acre). These areas consist of the Mud Slough channel, tributaries, and adjacent floodplain and uplands, including berms and water control structures that are proposed for removal as part of the Mud Slough Restoration Project.

Vegetation: Seven vegetation types/habitats are present on the Study Area: Non-Native Grassland, Valley Wildrye Grassland, Valley Sink Scrub, Cismontane Alkali Marsh, Coastal and Valley Freshwater Marsh, Open Water, and Developed/Ruderal. Vegetation types as well as Open Water are shown on Figure 4, and acreages are shown in Table 1.

Table 1. Vegetation Types and Open Water in the Study Area

Vegetation Type/Habitat	Acres
Non-Native Grassland	171.82
Valley Wildrye Grassland	11.95
Valley Sink Scrub	5.90
Cismontane Alkali Marsh	96.0
Coastal & Valley Freshwater Marsh	52.12
Open Water	28.85
Developed/Ruderal	0.96
Total	367.62

Appendix B presents detailed descriptions of special-status plant, fish, wildlife and other sensitive species. Excerpts are provided below in summary form for this Environmental Setting. Figures, appendices, and reference/source citations referenced are contained in *Appendix B*.

Special-status Plants: Twenty special-status plant species have been documented in the Study Area region based on the background literature search discussed in *Appendix B, Section 3.0*. A list of these species is included in *Appendix B*. The Study Area is not located within designated Critical Habitat for any federally-listed plant species (USFWS 2020). Four special-status plants have been documented to occur on the Study Area in the CNDDB (CDFW 2020): alkali milk-vetch (*Astragalus tener* var. *tener*), vernal pool smallscale (*Atriplex persistens*), Delta button-celery (*Eryngium racemosum*), and spiny-sepaled button-celery (*Eryngium spinosepalum*). In addition, numerous other special-status plant species have been documented within three miles of the Study Area (Figure 6).

During the April, May, and July 2020 botanical surveys conducted on the Study Area, four special-status plant species were observed: alkali milk-vetch, Coulter's goldfields (*Lasthenia glabrata* subsp. *coulteri*), Delta button-celery, and crownscale (*Atriplex coronata* var. *coronata*) (Figure 7). These species are discussed below and in *Appendix B*. In addition, a taxonomically problematic species similar to little mousetail (*Myosurus minimus* subsp. *apus*), a potentially rare species, was observed on the Study Area.

Special-status Fish: Twelve special-status fish species were identified as having potential to occur within the lower San Joaquin River based on the literature review and were assumed to potentially occur in Mud Slough or inhabit areas downstream and therefore be potentially affected indirectly by changes in San Joaquin River hydrology or water quality as a result of the Proposed Project construction and operations. Using the criteria described above, brief descriptions of the five listed and special-status fish species that are present or have potential to occur in Mud Slough are provided below. They are Central Valley spring-run Evolutionarily Significant Unit (ESU) and Central Valley fall-run ESU of Chinook salmon, Pacific lamprey, Sacramento hitch and hardhead. Descriptions of the seven fish species with a low potential to occur or are absent are discussed in *Appendix C*.

Special-status Wildlife: Based on the site reconnaissance, review of available databases and literature, and familiarity with local fauna, a total of 76 special-status fish and wildlife species were considered as part of this assessment (USFWS 2019a,b; CDFW2019a,b; CNDDB 2020). Of these, the presence of 37 taxa were ruled out based on the lack of suitable habitat, local range restrictions, regional extirpations, lack of connectivity between areas of suitable or occupied habitat, lack of secondary sign, absence of host plants, and/or incompatible land use and habitat degradation/alteration of on-site or adjacent lands.

For the purpose of this report, only special-status species and nesting migratory birds and raptors with potential to occur on site and be directly or indirectly affected by Project activities are discussed in more detail below (*Appendix C*). A total of 39 special-status species have potential to occur onsite, including 11

federally or state listed, proposed, candidate or fully protected species, and 28 sensitive and locally rare species (*Appendix C*). Based on the field investigations, review of available databases and literature, familiarity with local flora, and assessment of habitat suitability, 11 federally- or State-listed, Proposed, Candidate, or Fully Protected wildlife species have the potential to occur within the Study Area: Conservancy fairy shrimp, longhorn fairy shrimp, vernal pool fairy shrimp, vernal pool tadpole shrimp, California tiger salamander (Central California Distinct Population Segment (DPS)), giant garter snake, greater sandhill crane, Swainson's hawk, tri-colored blackbird, white-tailed kite, and San Joaquin kit fox (*Appendix C*).

Sensitive Species: Based on the field investigations, review of available databases and literature, familiarity with local fauna, and on-site habitat suitability, 28 species designated as rare, sensitive, declining, locally endemic, special concern, high priority, or having limited or restricted distribution are considered to have the potential to occur within the Study Area: Western bumble bee, midvalley fairy shrimp, California linderiella, Molestan blister beetle, western spadefoot, western pond turtle, San Joaquin coachwhip, Cooper's hawk, grasshopper sparrow, lesser sandhill crane, short-eared owl, redhead, ferruginous hawk, western snowy plover (interior population), northern harrier, California horned lark, merlin, yellow-breasted chat, least bittern, loggerhead shrike, white-faced ibis, Oregon vesper sparrow, yellow warbler, yellow-headed blackbird, pallid bat, western red bat, hoary bat and Yuma myotis. A brief description of these species, their habitat requirements, local occurrences, survey results, assessment of impacts, and impact avoidance/ minimization measures are discussed in *Appendix B, Section 6.4*.

The unincorporated lands of Merced County fall under the jurisdiction of the county. The 2030 Merced County General Plan contains a Natural Resources Element with goals and policies pertaining to biological resources of Merced County (Merced County, December 2013, as cited in *Appendix B*). Those goals and policies that are most relevant to biological resources for the Mud Slough Restoration Project are presented below:

GOAL NR-1: Preserve and protect, through coordination with the public and private sectors, the biological resources of the County.

Policy NR-1 : Habitat Protection (RDR/PSR). Identify areas that have significant long-term habitat and wetland values including riparian corridors, wetlands, grasslands, rivers and waterways, oak woodlands, vernal pools, and wildlife movement and migration corridors, and provide information to landowners.

Policy NR-1.2: Protected Natural Lands (RDR/PSR). Identify and support methods to increase the acreage of protected natural lands and special habitats, including but not limited to, wetlands, grasslands, vernal pools, and wildlife movement and migration corridors, potentially through the use of conservation easements.

Policy NR-1.5: Wetland and Riparian Habitat Buffer (PSR/RDR). Identify wetlands and riparian habitat areas and designate a buffer zone around each area sufficient to protect them from degradation, encroachment, or loss.

Policy NR-1.6: Terrestrial Wildlife Mobility (SO). Encourage property owners within or adjacent to designated habitat connectivity corridors that have been mapped or otherwise identified by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service to manage their lands in accordance with such mapping programs. In the planning and development of public works projects that could physically interfere with wildlife mobility, the County shall consult with the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service to determine the potential for such effects and implement any feasible mitigation measures.

Policy NR-1.10: Aquatic and Waterfowl Habitat Protection (MPSP). Cooperate with local, State, and Federal water agencies in their efforts to protect significant aquatic and waterfowl habitats against excessive water withdrawals or other activities that would endanger or interrupt normal migratory patterns or aquatic habitats.

Policy NR-1.11: On-Going Habitat Protection and Monitoring (PSR). Cooperate with local, State, and Federal agencies to ensure that adequate on-going protection and monitoring occurs adjacent to rare and endangered species habitats or within identified significant wetlands.

Policy NR-1.17: Agency Coordination (MPSP/IGC/JP). Consult with private, local, State, and Federal agencies to assist in the protection of biological resources and prevention of degradation, encroachment, or loss of resources managed by these agencies.

Policy NR-1.21: Special Status Species Surveys and Mitigation (RDR/SO/IGC). Incorporate the survey standards and mitigation requirements of state and federal resource management agencies for use in the County's review processes for both private and public projects.

1.4.2 Discussion

Impacts of the Proposed Project and suggested mitigation measures are listed in *Appendix B, Section 7.0* and below. Impacts are either less than significant or potentially significant and would be rendered less than significant with implementation of the mitigation measures described below. The impact analysis contained in this section assumes that the site will be developed in a manner and scale substantially similar to the Project description in Section 1 of this checklist, *Section 2.0 of Appendix B*, and the *Appendix A* Project drawings. The discussion below is summarized or copied from *Section 7.0 of Appendix B*.

- a) 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 the U.S. Fish and Wildlife Service?

Impacts to Special-status Plants (*Appendix B, Section 7.2*)

Based on the April, May, and July 2020 rare plant surveys, four special-status plant species, alkali milk-vetch, Coulter's goldfields, Delta button-celery and crownscale are present on the Study Area.

Impact Plants BIO-1. Special-status Plants

Project impacts to alkali milk-vetch, Coulter's goldfields, Delta button-celery, and crownscale may consist of: (1) direct impacts to individuals due to grading, vegetation removal, material stockpiling, crushing by equipment, and changes in water levels—including a 1.5- to 5-foot increase in the depth of Mud Slough between the diversion structure and Highway 140, and a reduction in Mud Slough flow downstream of the diversion structure of up to 10 cfs, although the depth of Mud Slough would be essentially the same as pre-project conditions (see Figures 2 – 7 of *Appendix E, Mud Slough Restoration Project Hydrology Study*); and (2) indirect impacts due to alterations in surrounding hydrology, dust during construction, and introduction of invasive plant species in fill material or other sources.

Coulter's goldfields: Based on the results of the April-July 2020 rare plant surveys, Project construction is likely to result in temporary disturbance to Coulter's goldfields present in Seasonal Wetlands crossed by the access road east of the Newman Lake Dam, the access road from Highway 140, as well as Seasonal Wetland habitat in the temporary staging area for the proposed culvert and east of the Connection Channel during channel cleaning. Equipment movement on the access roads and staging areas could crush or bury the seed of this annual plant or reduce vegetative cover by compacting soils (direct impacts). These impacts to Coulter's goldfields from Project construction would be potentially significant, but implementation of the mitigation measures described below would reduce this impact to less than significant. The movement of construction equipment could also result in dust deposition on plant populations, potentially impacting photosynthesis and/or reproduction (indirect impacts), although dust control measures implemented as

described in the Construction Summary of Section 1 would reduce dust impacts on Coulter's goldfields to less than significant.

Based on projected post-Project (operational) inundation of Coulter's goldfields, 0.42 acres of Coulter's goldfields occurrences (representing 0.49% of the 84.93 acres of Coulter's goldfields mapped during the April-July 2020 rare plant surveys) may be inundated due to increases in post-project inundation levels along Mud Slough upstream of the diversion structure. Coulter's goldfields is designated as a hydrophyte with a Wetland Indicator Status of FACW (USACE 2018), and is therefore adapted to wetland hydrology. While Coulter's goldfields on the Study Area was observed primarily in Cismontane Alkali Marsh with Seasonal Wetland conditions (occurrences covering 49.77 acres in this habitat), Coulter's goldfields was observed in every habitat on the Study Area during April-July 2020 surveys, including Non-Native Grassland (29.37 acres), Coastal and Valley Freshwater Marsh (4.40 acres), Open Water (bare flats and basins present after drawdown; 0.66 acres), Valley Sink Scrub (0.55 acres), Developed/Ruderal (0.14 acres), and Valley Wildrye Grassland (0.05 acres). Though the replacement of intermittent with perennial hydrology (and therefore replacement of Cismontane Alkali Marsh with Coastal and Valley Freshwater Marsh or Open Water) may alter habitat for Coulter's goldfields over a maximum area of 0.42 acres, hydrologic changes associated with the Project are anticipated to result in increased inundation primarily during the main diversion period of September 5 to January 10, when Coulter's goldfields typically exists either: (1) in seed form in the soil prior to germination; or (2) as a seed or seedling under moist, saturated, or inundated soil conditions with the establishment of fall/winter rains. During the January 11-September 4 period, monthly gate closures (as needed, not lasting more than 7 days) could result in pulses of inundation lasting up to 7 days each month. During the winter-spring period, Seasonal Wetland basins would typically be inundated, saturated, or dry depending on the timing and magnitude of rainfall (and could fill and drain repeatedly depending on rainfall, temperature, and other conditions that are expected to vary from year to year), and therefore pulses of inundation lasting up to 7 days could mimic natural conditions during this period. Seasonal Wetland basins typically drawdown in the late spring after rains cease with the onset of the summer drought, which generally coincides with the February-June blooming period of Coulter's goldfields. Hydrologic factors affecting seasonal drawdown can in turn affect the extent of flowering and seed-set. While the Project is expected to result in increased inundation compared to existing conditions over a maximum area of 0.42 acres, representing 0.49% of the 84.93 acres of Coulter's goldfields mapped during the April-July 2020 surveys, the Coulter's goldfields population was observed growing in every habitat on the Study Area including Coastal and Valley Freshwater Marsh and Open Water (in bare flats and basins after drawdown), and was temporally dynamic (e.g., blooming was observed to occur earlier in drier areas and later in wetter areas). Therefore, some or all of the 0.42 acres of Coulter's goldfield habitat subject to increased inundation would continue to provide suitable habitat for Coulter's goldfields.

The Study Area is hydrologically dynamic, with frequent flooding events inundating the entire floodplain, and therefore—based on its annual lifeform, FACW status, and large population on the Study Area over a wide variety of habitats—Coulter's goldfields is anticipated to be adapted to variable hydrology. Any potential direct inundation impacts to Coulter's goldfields are anticipated to be at least partially offset by the expansion of Seasonal Wetland hydrology into existing uplands (typically dominated by Non-Native Grassland on the Study Area, where the species was frequently observed growing during the April-July 2020 botanical surveys), which could result in new areas of suitable habitat for Coulter's goldfields on the Study Area. Therefore, since (1) Coulter's goldfields was observed in a wide a range of hydrologic conditions and habitats on the Study Area (from upland to inundated); (2) any hydrologic alterations would be restricted to a maximum area of 0.42 acres, representing 0.49% of the 84.93 acres of Coulter's goldfields mapped during the April-July 2020 surveys, much of which would mimic natural hydrologic conditions during the winter-spring period; and (3) some or all of the increased inundation may either be tolerated or allow for expansion of Coulter's goldfields into previously unoccupied habitat, increased inundation in up to 0.42 acres is not anticipated to result in significant impacts to Coulter's goldfields or its habitat.

Other Special-Status Plants: The Project is not expected to adversely affect alkali milk vetch, crownscale or Delta button celery. These plants occur in areas that would not be subject to direct impacts from the Project. Alkali milk vetch is located more than 1,400 feet from Project activities, and crownscale is located roughly 120 feet south of inundation effects of the Project. Delta button celery is located east of Newman Lake and west of Mud Slough, more than 420 feet from the closest Project construction activities. The post-Project operation of Newman Lake water levels will be consistent with existing operations, so Delta button celery habitat would be unchanged (i.e., no impact). The Project has some potential to result in indirect impacts on alkali milk vetch, crownscale and Delta button celery due to dust during construction. Dust control measures implemented as described in the Construction Summary of the Project Description (Section 1 of the checklist) would reduce the impact of construction dust on alkali milk vetch, crownscale and Delta button celery to less than significant.

The Project has the potential to introduce invasive plant species in fill material or other sources, which could displace and/or reduce the populations of Coulter's goldfields, alkali milk vetch, crownscale and Delta button celery within the Study Area, a potentially significant indirect impact. Implementation of the mitigation measure below would reduce potential impacts to Coulter's goldfields, alkali milk vetch, crownscale and Delta button celery from the introduction of invasive species to less than significant.

In summary, although increased inundation in up to 0.42 acres of habitat suitable for Coulter's goldfields is not anticipated to result in significant direct impacts based on the above analysis, direct impacts to Coulter's goldfields from equipment movement on access roads and staging areas during construction and soil compaction, and indirect impacts on Coulter's goldfields, alkali milk vetch, crownscale and Delta button celery from the introduction of invasive plant species that may result from the Proposed Project would be potentially significant. Implementation of the mitigation measures described below would avoid or reduce those potential impacts to less than significant.

With implementation of Mitigation Measure PLANT BIO-1, the impact of the Proposed Project on special-status plants will be reduced to less than significant.

Mitigation Measure PLANT BIO-1(a). The Project shall be designed to avoid or substantially reduce the potential for direct impacts to special-status plants on the Study Area. Measures to avoid or substantially reduce direct impacts to special-status plants shall include the following:

1. No vegetation shall be removed unless necessary to implement the Project as described in Section 1 of the Project Description, and in accordance with Mitigation Measure PLANT BIO-1(a), #2-4.
2. Earthwork for Project construction shall be located outside of special-status plant populations;
3. The use of access roads, staging/storage areas and other Project ground disturbance located in or adjacent to special-status plant occurrences shall be conducted in the summer and fall after annual special-status plant species (such as alkali milk-vetch and Coulter's goldfields) have already completed their life cycle and set seed.
4. When work is conducted within 50 feet of special-status plant populations, temporary fencing (orange construction fencing or similar materials) shall be installed around special-status plant populations to ensure no equipment, materials, or construction personnel stray from the work area and impact special-status plants. The fencing shall be removed after Project construction is complete.

Mitigation Measure Plants BIO-1(b). In order to avoid or substantially reduce indirect impacts to special-status plants, seed mixes used for erosion control or soil stabilization shall not contain any species listed on the California Invasive Plant Council (Cal-IPC) Inventory. Any straw or other erosion control materials shall be certified weed free.

Impacts to Special-status Fish (*Appendix B, Section 7.3*)

The assessment of potential impacts of the Mud Slough Restoration Project on listed and special-status fish species is summarized below. The assessment included consideration of both direct (i.e., construction related impacts) and indirect (i.e., hydrology) impacts. The potential for construction-related activities to adversely affect special-status fishes by direct or indirect injury or lethality, altering habitat, degrading water quality, or disrupting migration considered the following factors:

- Fish species, ESU, or DPS and life stages potentially occurring in the Project vicinity during construction;
- The nature and timing of occurrences in the Project vicinity;
- The type, degree, and duration of water quality impacts resulting from construction-related activities; and
- The area of disturbance.

The potential impacts on fishery resources associated with long-term operations and maintenance of the Mud Slough Diversion were also assessed qualitatively and considered:

- Fish species, ESU, or DPS and life stages potentially occurring in the Project vicinity in the future (e.g., upon successful reintroduction of salmonids);
- The nature and timing of occurrences in the Project vicinity; and
- Changes in Mud Slough and flows downstream within the San Joaquin River and Delta under long-term operations.

Impact FISH BIO-2a. Construction-related Direct Injury or Lethality of Fish

Construction-related activities associated with removal of the existing water control structures and removal of the Los Banos Creek spill structure, cofferdam installation and dewatering, installation of the new Mud Slough Diversion Structure, installation of a culvert in the Connection Channel, and reinforcement of the Newman Lake dam will utilize heavy machinery which could potentially injure or kill fish, including special-status fishes such as spring-run and fall-run Chinook salmon, hardhead, Pacific lamprey or hitch, should they be present in the vicinity of the Proposed Project during construction. A number of measures (Project BMPs) will be implemented as described in the Project Description in Section 1 (and in *Appendix B, Section 2.0*) to protect water resources that would effectively minimize or avoid impacts on special-status fishes.

Construction-related activities will cause short-term and localized impacts on aquatic habitats within the immediate vicinity of the construction. The area of construction is estimated to be approximately 1.4 acres for the new Mud Slough diversion structure and 2.4 acres of disturbance for other elements of Project construction. Habitat conditions in Mud Slough and Los Banos Creek are generally poor, especially during the warmer summer months and sensitive species of special concern are not expected to be in the vicinity of the proposed Project site. Based on these considerations, construction-related activities associated with recontouring and installation of the new diversion structure in Mud Slough would have temporary and localized impacts on the aquatic, riparian, and benthic habitats in the Study Area and immediately downstream. Although Project BMPs outlined in the Project Description in Section 1 will contribute to some protection of fish and their habitat, the direct and indirect impacts of construction of the Proposed Project on resident and migratory fish, including special-status fishes and their habitats including EFH² for Pacific salmon, inhabiting Mud Slough were considered to be significant without mitigation.

² Essential Fish Habitat

With implementation of Mitigation Measure FISH BIO-2, the direct and indirect construction-related impacts of the Proposed Project on fish and their habitat will be reduced to less than significant.

Mitigation Measure FISH BIO-2

1. **Fish and wildlife rescue.** Installation of the temporary cofferdam has the potential to isolate juvenile salmon and other fish and wildlife from Mud Slough, and the potential for those fish and wildlife to be stranded and lost as a result of dewatering. To avoid or substantially reduce the potential adverse impacts to fish during dewatering, a fish and wildlife rescue and relocation effort will be implemented by a qualified biologist³ engaged by the applicant (Water Authority) during installation of the cofferdam and initial dewatering of the work area. The fish and wildlife rescue and relocation will be conducted in accordance with standard methods to reduce harm, harassment, and mortality of fish and wildlife from cofferdam construction and dewatering associated with in-water construction activities.
2. **Seasonal Work Window.** In-water construction-related activities with the potential to temporarily affect aquatic habitats will be limited to a June 1 through October 31 seasonal work window of a single year. During this period, water temperatures in Mud Slough typically exceed the temperature thresholds for suitable habitat conditions for juvenile and adult Chinook salmon including Central Valley spring-run ESU Chinook salmon.

Based on implementation of the mitigation measures identified above, the short term of the construction and construction window, and the small size and relatively low quality of habitat to be temporarily disturbed, impacts on fish, are reduced to be less than significant. With a fish rescue effort during dewatering, and the construction June 1 to October 31 seasonal work window, the potential for direct injury or lethality of fish, including any listed and special-status fish species, resulting from construction-related activities is insubstantial.

Impact FISH BIO-2b. Construction-related Impacts on Water Quality

Construction-related activities would involve site preparation, cofferdam installation and removal, clean riprap rock placement, removal of the existing Los Banos Creek spillway structure and restoration of the channel, and Newman Lake dam reinforcement. Each of these activities has the potential to disturb soils and discharge or resuspend sediments and increase turbidity in the immediate vicinity and downstream of the construction site.

Any increases in turbidity or temperature associated with in-water construction would be small, highly localized to within a short distance of the construction area, and temporary (lasting hours or days). This is attributed to the small area of disturbance and the timing of construction during the period of low flow. In addition, pollution prevention BMPs would be implemented as part of the Project, and water quality monitoring would be required by the Clean Water Act (CWA) Section 401 Water Quality Certification issued by the Regional Water Quality Control Board (RWQCB) for the Proposed Project to ensure that construction-related activities do not cause turbidity, temperature, or dissolved oxygen concentrations within or downstream of the Project site to exceed thresholds for maintaining aquatic life.

³ A qualified biologist is defined as an individual who has a minimum of five years academic training and professional experience in biological sciences and related resource management activities with a minimum of two years of survey experience with the subject species.

Any increases in suspended sediments or turbidity resulting from construction-related activities are anticipated to be localized and temporary and, with implementation of the Project BMPs, these parameters would not be elevated to levels that would cause significant impacts on aquatic communities of Mud Slough or the San Joaquin River. For these reasons, the potential water quality-related impacts of the Proposed Project associated with in-water construction are expected to be insubstantial and thus, would not have adverse impacts on fish, including special-status fish species or their aquatic habitats in Mud Slough or the lower San Joaquin River.

The construction-related Project BMPs have proven to be effective in reducing and avoiding the risk of accidental spills of oil, grease, concrete, and other hazardous materials during construction activity. Compliance with the BMPs is expected to protect water quality from contamination during construction.

The construction-related impacts of the Proposed Project on water quality will be less than significant. No mitigation is required.

Impact FISH BIO-2c. Diversion Structure Impacts

As part of the Proposed Project, the existing Los Banos Creek spill structure, located at the confluence of Los Banos Creek and Mud Slough, will be removed and a new diversion structure will be constructed downstream of the confluence of Los Banos Creek and Mud Slough. The Mud Slough Diversion Structure, will span the entire width of Mud Slough with a crest elevation 8 feet high. The diversion structure is expected to be a complete barrier to the upstream passage of migratory fish including Chinook salmon, steelhead, and sturgeon when the control gate is closed during the fall and winter diversion period and during summer re-filling, and an impediment to migration during the summer when the control gate is open. Habitat conditions in Mud Slough upstream of the proposed diversion structure are considered to be poor to unsuitable as spawning and juvenile rearing habitat for migratory fish. Passage conditions with the new diversion structure in place are expected to be comparable to the baseline conditions with the existing Los Banos Creek spill structure.

The operational impacts of the proposed new diversion structure located in Mud Slough on fish, when compared to the existing baseline conditions with the Los Banos spill structure, are considered to be less than significant. No mitigation is required.

Impact FISH BIO-2d. Impacts Associated with Long-term Operations and Maintenance

Because the San Joaquin River Restoration Program (SJRRP) aims to restore flows in the San Joaquin River and includes anadromous fish reintroduction efforts, special-status fishes potentially occurring in the Study Area in the future may include Central Valley spring-run ESU Chinook salmon, Central Valley fall-run ESU Chinook salmon, California Central Valley steelhead, green sturgeon, Sacramento hitch, and hardhead. The movement of these fish from the lower San Joaquin River upstream in Mud Slough would be blocked by the barrier to migration created by the new Mud Slough diversion structure when the control gate is closed for diversions and an impediment to migration when the control gate is open during the summer period. As a result of the migration barrier, these fish would not have access upstream of the barrier and, therefore, would not be at risk of being entrained into water diverted into Newman Lake by the Proposed Project.

Operation of the diversion structure is not anticipated to have any significant impacts on water quality of the San Joaquin River in the vicinity of the Proposed Project in Mud Slough, including EFH for Chinook salmon. However, routine maintenance of the diversion structure has the potential to cause short-term and localized increases in suspended sediment loads and debris removal from the diversion structure. The potential for routine maintenance to result in site disturbance and elevated turbidity will be avoided by adherence to the Project BMPs. The diversion structure has a permanent, manually operated overshot gate that is not expected to need frequent, major maintenance. Routine inspections and maintenance of the diversion

structure would be expected to result in minimal disturbance or increased turbidity and would be similar to activities occurring currently in the area.

Based on the self-cleaning operation and design of the Mud Slough diversion structure, long-term operations and maintenance are not anticipated to cause suspended sediment or turbidity to become elevated to levels that would cause impacts on fish or habitat suitability in Mud Slough or the San Joaquin River. Consequently, long-term operations and maintenance of the Proposed Project are not anticipated to have any substantial impacts on fish, including special-status fishes or their aquatic habitats.

The impacts of long-term operations and maintenance of the Proposed Project, when compared to existing baseline conditions, on fish and aquatic habitats are considered to be less than significant. No mitigation is required.

Impact FISH BIO-2e. Infrastructure Removal

The Proposed Project includes the removal of abandoned and obsolete water control structures from the China Island wildlife refuge. Five existing structures will be removed from the Study Area using a backhoe and flatbed or similar truck to remove waste from the site. Removal of existing water control structures is expected to result in short-term (hours or days) localized increases in turbidity and suspended sediments within the area immediately adjacent to each structure. Water quality is expected to return to ambient conditions immediately following structure removal. Fish species present in the area during the June 1 to October 31 work window are typically tolerant of short exposure to elevated turbidity and would not be expected to experience lethal conditions. Disturbance during removal of structures would likely result in localized behavioral avoidance of the immediate work area until removal is completed. Removal of the existing water control structures is expected to be completed in two days. Removal of abandoned water control structures is expected to contribute to long-term net environmental benefits for resident fish inhabiting the China Island refuge ponds.

The direct construction-related impacts associated with abandoned infrastructure removal are considered to be less than significant to fish. No mitigation is required.

Impact FISH BIO-2f. Hydrologic Impacts

Currently, water supplied to Newman Lake is pumped groundwater, although surface water diversion occurred previously using the Los Banos Creek spill structure (i.e., the old structure that will be removed as part of the Proposed Project). The diversion of surface water by the Proposed Project during high flow winter months from Mud Slough will result in a reduction in flow passing downstream into the lower San Joaquin River. The Proposed Project will have no impact on instream flows released from Friant Dam as part of the San Joaquin River Restoration Program. A reduction in winter flows passing downstream from Mud Slough into the lower San Joaquin River and the Delta has the potential to contribute to a small (not more than 10 cfs) incremental reduction in attraction flows for upstream migrating adult Chinook salmon and other fish and to potentially reduce the survival of downstream migrating juvenile salmonids (assuming that a flow-survival relationship exists for juvenile Chinook salmon in the San Joaquin River restoration area). A reduction of flow from Mud Slough into the San Joaquin River also has the potential to reduce the magnitude of seasonal floodplain inundation (by 10 cfs or less). A reduction in San Joaquin River flow also has a potential to impact Delta outflow which is thought to be important for longfin smelt reproduction and the location of the low salinity zone, thought to be important for delta smelt by 10 cfs or less. Maintaining a minimum instream flow in lower Mud Slough, and avoiding dewatering the slough, are important to resident fish and maintenance of riparian vegetation along the slough margins. A reduction in flow from Mud Slough into the lower San Joaquin River has the potential to result in a small incremental reduction in attraction of adult Chinook salmon and other fish into Mud Slough, where habitat conditions are not suitable for successful spawning or juvenile rearing, which would be a Project benefit rather than an impact.

The proposed Mud Slough diversion structure includes an overshoot gate that will allow bypass flow downstream of the structure to avoid dewatering the Mud Slough channel. Water diversions from Mud Slough to Newman Lake would occur in the fall and early winter, as well as minor amounts in other times to maintain the water level in Newman Lake. Bypass flows would be maintained year-round as described in *Appendix B, Section 2.0*, and would be based on a percentage of the Mud Slough and Los Banos Creek inflow with no diversions exceeding 10 cfs. Bypass flows to lower Mud Slough would be maintained to avoid dewatering the slough and will provide habitat to support the resident fish community inhabiting the slough and associated riparian vegetation along the channel margin. The minimum bypass flow will be dependent on upstream hydrologic conditions and will vary with time of year and water year type.

The Mud Slough diversion structure will be equipped with a high-flow surface spillway that will pass high winter flows downstream that will contribute to winter flows in the lower San Joaquin River, floodplain inundation, and ultimately Delta inflow and Delta outflow. Winter spill of high flows within Los Banos Creek and Mud Slough will be similar to those occurring under existing conditions and are not expected to result in impacts to resident or anadromous fish or their habitat.

Effects of the Proposed Project on Mud Slough hydrology were analyzed with a hydraulic model that assessed four flow conditions with inflow rates of 10, 50, 120 and 450 cfs representing low, moderate, winter median and high flow conditions (*Appendix E*). The Proposed Project will alter water surface elevations in Mud Slough above and below the Diversion Structure as well as in Los Banos Creek upstream of the Diversion Structure. Mud Slough water depth would increase by 1.5 to 5 feet over approximately 1.4 miles upstream to Highway 140, with the change in water depth diminishing with distance from the Diversion Structure. Water depth during gate closure would increase by 4.5 to 5 feet during low flows of 10 cfs, 2.5 to 3 feet during flows of 50 cfs, and 1.5 to 2.5 feet above pre-project or gate open conditions during the winter median flow of 120 cfs. Water depth downstream of the Diversion Structure would be negligibly reduced (from no reduction during 10 cfs flows to roughly 3 inches during 50 cfs flows) during gate closure.

The Proposed Project will also contribute to small incremental (less than 10 cfs) reductions in Mud Slough flows and flow discharged from Mud Slough into the lower San Joaquin River and Delta. The predicted changes in Mud Slough flows have been evaluated using a site-specific hydrologic analysis that serves, in part, as the technical basis for this impact analysis. Proposed diversion operations to supply surface water to Newman Lake is anticipated to be up to 1,632 acre-feet each year. Diversion in the fall and early winter would be at a rate not to exceed 10 cfs. Summertime diversions to maintain the water level in Newman Lake would occur on a monthly basis as needed for not more than seven days, with diversion rates between 1 and 10 cfs, depending on inflow and the established bypass flow criteria that will be in effect year-round. This diversion rate is insubstantial compared to baseline hydrologic conditions within the watershed and would not have a detectable impact on the location of the low salinity zone downstream in the Delta for delta smelt, the flow-abundance relationship for longfin smelt, or the flow-survival relationship for juvenile Chinook salmon and steelhead.

Based on the magnitude of proposed diversions (approximately 10 cfs during the winter diversion period and periodic diversions of 1-10 cfs during other times of the year) and corresponding small incremental reductions in flows in Mud Slough and the lower San Joaquin River, hydrologic impacts of the Proposed Project on fish and aquatic habitat are considered to be less than significant. No mitigation is required.

Impacts to Special-status Wildlife (*Appendix B, Section 7.4*)

The assessment of potential impacts of the Mud Slough Restoration Project on special-status and sensitive wildlife species is detailed below. The assessment included consideration of both direct (i.e., construction related impacts) and indirect (i.e., hydrology) impacts, as well as the impact of long-term operations and maintenance. Impacts are described by species, followed by species-specific mitigation measures where needed. Where mitigation measures

would be applicable and appropriate to more than one species, the appropriate measure is listed but the text is not duplicated.

Vernal Pool Branchiopods (VPB)

Impact VPB BIO-3. Construction-related Direct Injury, Lethality or Harassment of Vernal Pool Branchiopods

Construction-related activities associated with the creation and usage of access roads, construction of the new culvert and crossing, and addition of the Mud Slough diversion structure has the potential to result in the injury or mortality of vernal pool branchiopods if these activities are conducted in or adjacent to occupied seasonal wetland habitat. These activities will not impact seasonal wetlands SW1, SW2, SW7 and SW20 that have the greatest potential to support vernal pool branchiopods. Other seasonal wetlands have a minimal potential to support vernal pool branchiopods. Existing access roads will be used, and temporary access to the abandoned water control structures and to construct the new culvert and diversion structure will avoid seasonal wetlands SW1, SW2, SW7 and SW20. Construction at the Newman Lake dam is not located within or adjacent to suitable habitat. Compliance with construction-related Project BMPs to protect water quality will protect vernal pool branchiopods from contamination during construction.

Construction activities will not impact seasonal wetlands SW1, SW2, SW7 and SW20 that have potentially suitable habitat for vernal pool branchiopods. Due to the avoidance of potentially suitable habitat, the Project is not expected to result in significant impacts to vernal pool branchiopods.

The impact of the Proposed Project on vernal pool branchiopods is considered to be less than significant. No mitigation is required.

California Tiger Salamander (CTS)

Impact CTS BIO-4a. Construction-related Direct Injury or Lethality of California Tiger Salamanders

Impacts to breeding California tiger salamanders are not expected, since no work will occur in or near the location of the freshwater pond located in SW2. The Project elements that may impact California tiger salamanders include work in and around the riprap associated with the removal of the Los Banos Creek spill structure and restoration of the natural channel, construction of Mud Slough diversion structure, and disturbance of higher elevation areas along access roads and Project features that support small mammal burrows during the construction phase.

Construction-related activities associated with removal of the Los Banos Creek spill structure and restoration of natural channel and the installation of the Mud Slough diversion structure will utilize heavy machinery, require on site workers, and utilize vehicles and materials which could directly impact California tiger salamanders, should they be present in the vicinity of the Proposed Project elements during construction. Impacts could include entombment, mortality, injury or harassment of individuals. Construction activity could cause individuals to flush from upland habitat into open areas exposing them to depredation by avian predators and being crushed by vehicles, equipment, and construction workers. Project features that will not impact California tiger salamanders are the culvert installation, or the removal of abandoned water control structures L2, L11, and L13-15. The mitigation measures outlined below will be implemented to reduce significant impacts on California tiger salamanders.

Based on the small footprint of these Project elements, lack of breeding sites near the proposed construction areas, and sparse upland habitat with small mammal burrowing activity, and other underground refugia, no indirect impacts are anticipated.

Construction-related impacts on California tiger salamander that may result from the Proposed Project would be significant, but implementation of the mitigation measures described below would reduce this impact to a less than significant level.

Impact CTS BIO-4b. Diversion Structure Impacts

As part of the Proposed Project, the existing Los Banos Creek spill structure, located at the confluence of Los Banos Creek and Mud Slough, will be removed and a new diversion structure will be constructed downstream of the confluence of Los Banos Creek and Mud Slough. The proposed Mud Slough Diversion Structure, will span the entire width of Mud Slough with a crest elevation 4 to 8 feet high. It will result in changes in water levels—including a 1.5 to 5-foot increase in the depth of Mud Slough between the diversion structure and Highway 140, and a reduction in Mud Slough flow downstream of the diversion structure of up to 10 cfs, although the depth of Mud Slough downstream of the diversion structure would be essentially the same as pre-project conditions (see Figures 2 – 7 of *Appendix E, Mud Slough Restoration Project Hydrology Study*). No effects to California tiger salamanders are expected downstream of the diversion structure based on the proposed operating regime that prioritizes maintaining sufficient downstream flows to minimize the downstream effect on species and habitats. The effects to California tiger salamanders upstream of the diversion structure would be minimal and potentially beneficial to the species, as closed-gate bypass backwater would potentially increase the inundated areas of existing seasonal wetland habitat by 0.65-1.05 acres and freshwater marsh habitat by 2.32-4.58 acres compared to pre-project open-gate conditions. This could potentially provide breeding, rearing and foraging habitat. These conditions would primarily occur during the main diversion period from September 5 through January 10 and periodically for no more than 7 days at a time between January 11 and September 4. Temporary inundation in grassland habitat outside of the breeding season could result in upland over-summering habitat to become inundated, causing California tiger salamanders to flush from retreats and seek new upland habitat. If present within the inundation areas, this could result in harassment, stress, increased energy expenditure, and increased risk of predation.

With implementation of Mitigation Measure CTS BIO-4, the impact of the Proposed Project on California tiger salamander will be reduced to less than significant.

Mitigation Measure CTS BIO-4. Impacts on California tiger salamander will be avoided or substantially reduced by implementing the following measures.

1. **Seasonal Avoidance.** Construction shall occur between June 1 and October 31 outside of the California tiger salamander breeding season when adult individuals are not migrating overland to and from breeding sites.
2. **Environmental Awareness Training.** Prior to the start of construction, a qualified biologist engaged by the applicant (Water Authority) who is experienced in the ecology and biology of California tiger salamanders shall conduct an environmental awareness training program for all construction personnel including subcontractors. The training will include, at a minimum, a description of the California tiger salamander and its habitat; sensitive habitats within the Study Area; an explanation of the status and protection under state and federal laws; the measures to be implemented to avoid impacts; communication and work stoppage protocols in case a listed species is observed within the Study Area; and an explanation of the environmentally sensitive areas and wildlife exclusion fencing and the importance of maintaining these structures. A fact sheet conveying this information shall be prepared and distributed to all construction personnel. Upon completion of the training, personnel shall sign a form stating that they attended the training and understand all the avoidance measures and implications of the governing environmental regulations.
3. **Designation of Environmentally Sensitive Areas (ESA).** Prior to the start of construction, ESAs—defined as areas containing sensitive habitats adjacent to or within construction work areas where physical disturbance is not allowed— shall be clearly delineated by a qualified biologist using high-visibility orange safety fencing. Construction work areas include the active construction site and all access roads, vehicle parking and staging areas. The qualified biologist shall work with the contractor to determine where ESA fencing will be installed. The ESA fencing shall remain in place throughout the duration of the Project, while construction activities are ongoing, and be regularly inspected and fully maintained at all times. The final Project plans shall depict all locations where ESA fencing will be installed and shall provide installation specifications. The bid solicitation package shall clearly

describe acceptable fencing materials and prohibited construction-related activities, including vehicle operation, material and equipment storage, and other surface-disturbing activities within ESAs.

4. **Proper Use of Erosion Control Devices.** To prevent California tiger salamanders from becoming entangled or trapped in erosion control materials, plastic mono-filament netting (i.e., erosion control matting) or similar material shall not be used within the Study Area.
5. **Preconstruction and Daily Surveys.** Immediately prior to the initiation of any construction activities that may result in take of California tiger salamanders (e.g., vegetation clearing, grubbing, grading, cut and fill, removal of riprap or other ground-disturbing activities), a qualified biologist shall conduct preconstruction surveys for California tiger salamanders. After vegetation removal and removal of riprap, the qualified biologist shall conduct clearance surveys at the beginning of each day to ensure California tiger salamanders are not present in the active construction areas.
6. **Biological Monitoring.** The qualified biologist shall be present on site to monitor for California tiger salamanders while construction is occurring. The qualified biologist shall have the authority to halt construction if a California tiger salamander is observed within or near the work area.
7. **Protocol if California Tiger Salamander is Observed Onsite.** If a California tiger salamander is observed onsite, all work within 50 feet of the individual shall cease immediately. If the qualified biologist is not on site, the Resident Engineer shall immediately notify the qualified biologist. California tiger salamanders shall not be handled without authorization from the USFWS/CDFW and shall be allowed to exit the work area on their own. Based on the professional judgment of the qualified biologist, if Project activities can be conducted without injuring or harassing the animal, it may be left at the location of discovery and monitored by the biologist while work continues. If construction activities pose a risk to the animal, work shall not proceed until the animal has left the area on its own accord. All Project personnel shall be notified, and at no time shall work occur within 50 feet of the California tiger salamander(s) without a qualified biologist present.
8. **Avoidance of Entrapment.** To prevent inadvertent entrapment of California tiger salamanders during construction, all excavated, steep-walled holes or trenches more than 2-foot deep shall be covered with plywood or similar materials at the close of each working day or provided with one or more escape ramps constructed of earth fill or wooden planks. The qualified biologist shall inspect all holes and trenches at the beginning of each workday and before such holes or trenches are filled. All staged materials, equipment, and vehicles shall be inspected by the biologist prior to moving.
9. **Construction Site Management Practices.** The following site restrictions shall be implemented to avoid or substantially reduce impacts on California tiger salamanders and their habitat:
 - a. A speed limit of 15 miles per hour (mph) in unpaved surfaces of the Study Area shall be enforced to reduce dust and excessive soil disturbance. The exception is on county roads and State and Federal highways. Night-time construction, if applicable, shall be minimized to the extent possible. However, if it does occur, then the speed limit shall be reduced to 10-mph. Off-road traffic outside of the Proposed Project construction area shall be prohibited.
 - b. Construction access, staging, storage, and parking areas, shall be located outside of any designated ESA or in areas environmentally cleared by the contractor. Access routes and the number and size of staging and work areas will be limited to the minimum necessary to construct the proposed Project. Routes and boundaries of roadwork shall be clearly marked prior to initiating construction or grading.
 - c. All food and food-related trash items shall be enclosed in sealed trash containers and properly disposed of off-site.

- d. No pets from Project personnel shall be allowed anywhere in the Study Area during construction.
- e. No firearms shall be allowed on the Project site except for those carried by authorized security personnel, or local, State or Federal law enforcement officials.
- f. A Spill Response Plan shall be prepared. Hazardous materials such as fuels, oils, solvents, etc. shall be stored in sealable containers in a designated location that is at least 50 feet from hydrologic features.
- g. All equipment shall be properly maintained and free of leak. Servicing of vehicles and construction equipment including fueling, cleaning, and maintenance will occur at least 50 feet from any hydrologic features unless it is an existing gas station.

Giant Garter Snake (GGS)

Impact GGS BIO-5a. Construction-related Direct Injury, Lethality or Harassment of Giant Garter Snakes

Construction-related activities associated with removal of the Los Banos Creek spill structure and restoration of the natural channel, construction of the Mud Slough diversion structure, culvert installation, Newman Lake Dam reinforcement, clearing of the Connection Channel, and the removal of abandoned water control structures L2, L11 and L13-15 have the potential to result in the injury to or mortality of any giant garter snakes if these activities are conducted in occupied upland and aquatic habitat. These activities will require the movement and operation of equipment, the movement of vehicles on existing or temporary access roads, and ground disturbance associated with the removal and construction of Project elements. Fuel or oil spills from equipment into aquatic habitat could also cause the injury or mortality of giant garter snakes directly or through impacts to their prey base, and Project BMPs that address potential leaks and spills would avoid this specific impact.

The giant garter snake also has the potential to be affected by noise, vibrations, and visual disturbance associated with the operation of the construction equipment, workers, vehicles and the movement, staging and placement of materials, which could alter normal behavior. This could result in decreased fitness, reduce foraging efficiency, cause individuals to flush from refugia or increase dispersal time away from cover and make individuals more vulnerable to predators and being crushed by vehicles, equipment, and construction workers. The mitigation measures outlined below will be implemented to reduce significant impacts on giant garter snakes.

Impact GGS BIO-5b. Diversion Structure Impacts

As part of the proposed Project the existing Los Banos Creek spill structure, located at the confluence of Los Banos Creek and Mud Slough, will be removed and a new diversion structure will be constructed downstream of the confluence of Los Banos Creek and Mud Slough. The Mud Slough Diversion Structure will span the entire width of Mud Slough with a crest elevation 4 to 8 feet high. It will result in changes in water levels—including a 1.5 to 5-foot increase in the depth of Mud Slough between the diversion structure and Highway 140, and a reduction in Mud Slough flow downstream of the diversion structure of up to 10 cfs, although the depth of Mud Slough downstream of the diversion structure would be essentially the same as pre-project conditions (see Figures 2 – 7 of Mud Slough Restoration Project Hydrology Study, Summers Engineering, Inc., 9/24/2020). The diversion structure is expected to reduce the flow of water downstream and may impact the amount and quality of habitat. This could indirectly impact the giant garter snake by reducing prey availability, foraging habitat, and refugia quality and quantity. No impacts to giant garter snakes are expected downstream of the diversion structure based on the proposed operating regime that prioritizes maintaining sufficient downstream flows to minimize the downstream effect on species and habitats.

The effects to giant garter snakes upstream of the diversion structure would be minimal and potentially beneficial to the species; as closed-gate bypass backwater would potentially increase inundation of the freshwater marsh habitat by 2.32-4.58 acres, open water habitat by 0.24-1.31 acres, and seasonal wetland habitat by 0.65-1.05 acres compared to pre-project open-gate conditions. This could potentially provide more foraging and open-water refugia habitat. These conditions would primarily occur during the main diversion period from September 5 through January 10 and periodically for no more than 7 days at a time between January 11 and September 4. The winter diversion period may adversely affect giant garter snakes during their dormant period when they overwinter in subterranean hibernacula from approximately November 1 to April 1. Although overwintering habitat could be inundated during Project operations, the entire Study Area is already subject to frequent winter flooding events which can force giant garter snakes out of their retreats, causing stress, increased energy expenditure, and increased risk of predation while searching for a new retreat. The incremental effect of the Project on winter flooding of giant garter snake overwintering habitat is considered to be less than significant, given existing widespread winter flooding of the Study Area.

Impact GGS BIO-5c. Construction-related Impacts on Water Quality

Construction-related activities would involve site preparation, cofferdam installation and removal, riprap rock placement, removal of the existing Los Banos Creek spillway structure and channel restoration. Each of these activities has the potential to disturb soils and discharge or re-suspend sediments and increase turbidity in the immediate vicinity and downstream of the construction site.

Any increases in turbidity or temperature associated with in-water construction would be small, highly localized to within a short distance of the construction area, and temporary (lasting hours or days). This is attributed to the small area of disturbance and the timing of construction during the period of low flow. In addition, Project BMPs described in the Project Description in Section 1 would be implemented during construction as part of the Proposed Project, and water quality monitoring would be required by the Clean Water Act (CWA) Section 401 Water Quality Certification issued by the Regional Water Quality Control Board (RWQCB) for the Proposed Project to ensure that construction-related activities do not cause turbidity, temperature, or dissolved oxygen concentrations within or downstream of the Project site to exceed thresholds for maintaining aquatic life.

Any increases in suspended sediments or turbidity resulting from construction-related activities are anticipated to be localized and temporary and, with implementation of the BMPs included in the Proposed Project, would not be elevated to levels that would cause impacts on aquatic communities of Mud Slough or the San Joaquin River. For these reasons, the potential water quality-related impacts of the Proposed Project associated with in-water construction are expected to be insubstantial and thus, would not have impacts on giant garter snakes or their aquatic habitats in Mud Slough or downstream in the lower San Joaquin River.

Impact GGS BIO-5d. Infrastructure Removal

The Proposed Project includes the removal of abandoned and obsolete water control structures from the China Island refuge. Five existing structures (L2, L11, and L13-15) will be removed from the Study Area using a backhoe and flatbed or similar truck to remove waste from the site. Removal of existing water control structures is expected to result in short-term (hours or days) localized increases in turbidity, suspended sediments, and ground disturbance within the area immediately adjacent to each structure. Water quality is expected to return to ambient conditions immediately following structure removal and the disturbed ground and vegetation would be minimal, localized, and would return to near existing conditions within one calendar year. Giant garter snakes present in the area during the June 1 to October 31 work window are in their active period and would be able to escape the area during the removal of the structures. Disturbance during removal of structures would likely result in localized behavioral avoidance of the immediate work area until removal is completed. Removal of the existing water control structures is expected to be completed in two

days. Removal of abandoned water control structures is expected to contribute to long-term net environmental benefits for giant garter snakes and their prey inhabiting the China Island refuge ponds.

Impact GGS BIO-5e. Cleaning of the Connection Channel between Los Banos Creek and Newman Lake.

Cleaning of the Connection Channel between Los Banos Creek and Newman Lake could directly impact giant garter snakes if present in the work area by injuring or killing individuals while operating heavy equipment in the channel lined with emergent vegetation. This would temporarily increase turbidity, stir up bottom sediment, and reduce water quality. The removal of emergent vegetation would reduce suitable foraging and refugia habitat, but this effect would be localized and is considered to be insignificant given the amount of suitable emergent foraging and refugia habitat present in the Study Area. Clearing of the channel also has the potential to harass giant garter snakes and cause flushing from habitat and temporary disturbance of the impact area due to the presence of vehicles, heavy equipment, and human activity. With implementation of the mitigation measures below, potential impacts to giant garter snake from Connection Channel cleaning would be less than significant.

Impact GGS BIO-5f. Impacts Associated with Long-term Operations and Maintenance.

Routine operation and maintenance would require infrequent visits to the diversion structure and other elements of the Project to regulate water flows and verify proper operation, flows, and quantities. This would require vehicles and personnel to use access roads for short (less than 1-day) visits. Due to the amount of aquatic and adjacent upland habitat, it is possible that giant garter snakes could be subject to injury, mortality or harassment from vehicle traffic and human presence

In summary, some Project elements would not impact the giant garter snake, However, construction, operations and maintenance activities can produce impacts on giant garter snake that would be significant, but implementation of the mitigation measures described below would reduce these impacts to less than significant.

With implementation of Mitigation Measure GGS BIO-5, the impact of the Proposed Project on giant garter snake will be reduced to less than significant.

Mitigation Measure GGS BIO-5. The following measures shall be implemented to avoid or substantially reduce impacts to giant garter snakes.

1. **Implementation of Mitigation Measures FISH BIO-2 (1-2), CTS BIO-4 (1-4, 8-9).**
2. **Wildlife Exclusion Fencing (WEF).** Prior to the start of any construction that will take longer than 2 days, WEF shall be installed along the active construction footprint, including the Los Banos Creek spill structure, Mud Slough diversion structure, culvert installation, Newman Lake Dam, restoration of natural channel. WEF is not required for the removal of abandoned water control structures L2, L11, and L13-15 or clearing of the Connection Channel. A WEF Plan shall be prepared by a qualified biologist engaged by the applicant (Water Authority), detailing the location, fencing and installation specifications and monitoring and repair criteria. The WEF Plan shall be submitted to the California Department of Fish and Wildlife for review and approval prior to the start of construction. Vegetation shall be cleared at least 3 feet from the non-Project side of the WEF and kept clear for the duration of the Project. The fencing shall extend at least 36-inch above ground and be keyed into the ground a minimum of 4 inches and backfilled with soil to prevent giant garter snakes from accessing the Project site by passing under the fence. WEF and erosion/sediment control fencing shall not be layered together for multifunctional purposes as it creates pockets that can trap, injure or kill snakes and other species. Stakes shall be installed on the Project side of the fence to prevent giant garter snakes from using these features to climb over the WEF. Jump-outs or one-way exits will be incorporated into the WEF design to allow giant garter snakes to exit the Project site if present within the active construction site. The WEF specifications,

installation, and maintenance criteria shall be included in the final Project plans and bid solicitation package (from the Water Authority). The WEF shall remain in place throughout the duration of the Project and be regularly inspected and fully maintained. Repairs to the WEF shall be made within 48 hours of discovery. Upon Project completion the WEF shall be completely removed, the area cleaned of debris and trash, and the area returned to natural conditions.

3. **Preconstruction Surveys and Biological Monitoring.** A qualified biologist shall survey work areas within 200 feet of giant garter snake aquatic habitat for snakes immediately prior to the start of construction activities and each morning construction activity occurs. The qualified biologist shall visually check for giant garter snakes under vehicles and equipment prior to contractors moving them. The biologist shall ensure that the contractor caps all materials onsite (culverts, pipes, etc.), precluding wildlife from becoming entrapped. The biologist shall check any crevices or cavities in the work area where individuals may be present including stockpiles that have been left for more than 24 hours where cracks/crevices may have formed. The qualified biologist shall remain on site to monitor for giant garter snakes while active construction is occurring.
4. **Vegetation Removal.** Any vegetation that is within the cut and fill line or growing in locations where permanent or temporary structures are to be placed (e.g., retaining wall or temporary road bypass) shall be cleared. Vegetation shall be cleared only when necessary and shall be cut above soil level except in areas that will be excavated for roadway construction. This will allow plants that reproduce vegetatively to resprout after construction. All clearing and grubbing of woody vegetation will occur by hand or by light construction equipment outside of the bird nesting season and prior to the rainy season, if feasible. If for any reason this schedule cannot be met, surveys for nesting migratory birds will be conducted before clearing begins. All nest avoidance requirements of the Migratory Bird Treaty-Act (MBTA) and California Fish and Game Code will be observed. A qualified biologist will be present during all grubbing and vegetation clearing activities. If at any point a giant garter snake or other listed species is discovered during these activities, all work will cease until the individual has left the work area. After Project completion, all temporarily affected areas shall be protected with erosion control measures, and revegetated with native species appropriate for the region and habitat communities on site.
5. **Protocol if Giant Garter Snake is Observed Onsite.** If a giant garter snake is observed onsite, all work within 50 feet of the individual shall cease immediately. Giant garter snakes shall not be handled without authorization from the USFWS/CDFW and shall be allowed to exit the work area on its own. Based on the professional judgment of the qualified biologist, if Project activities can be conducted without injuring or harassing the animal, it may be left at the location of discovery and monitored by the biologist while work continues. If construction activities pose a risk to the animal, work shall not proceed until the animal has left the area on its own accord. All Project personnel shall be notified, and at no time shall work occur within 50 feet of the giant garter snake(s) without a qualified biologist present.

Greater Sandhill Crane (GSHC)

The construction phase of the Project is scheduled to occur from June 1 to September 31 which will avoid impacts to wintering greater sandhill cranes.

Impact GSHC BIO-6. Impacts Associated with Long-term Operations and Maintenance

Routine operation and maintenance would require infrequent visits to the diversion structure and other elements of the Project to regulate water flows and verify proper operation, flows, and quantities. This would require vehicles and personnel to use access roads for short (less than 1-day) visits and could subject greater sandhill cranes to temporary harassment from vehicle traffic and human presence.

Long-term operations and maintenance impacts to greater sandhill crane that may result from the Proposed Project would be significant, but implementation of the mitigation measures described below would reduce this impact to less than significant.

With implementation of Mitigation Measure GSHC BIO-6, the impact of the Proposed Project on greater sandhill crane will be reduced to less than significant.

Mitigation Measure GSHC BIO-6

Implement the seasonal work window in Mitigation Measure CTS BIO-4 (2, 9).

San Joaquin Kit Fox (SJKF)

Impact SJKF BIO-7a. Construction-related Direct Injury, Lethality or Harassment of San Joaquin Kit Fox.

Construction-related activities associated with removal or construction of the Los Banos Creek spill structure and restoration of the natural channel, Mud Slough diversion structure, culvert installation, Newman Lake Dam, clearing of the Connection Channel, and the removal of abandoned water control structures L2, L11 and L13-15 have the potential to result in the injury or mortality of a San Joaquin kit fox if they are present in the area. These activities will require the movement and operation of equipment, the movement of vehicles on existing or temporary access roads, and ground disturbance associated with the removing and constructing Project elements. Kit fox could seek refuge within materials staged on site; and if construction workers are not diligent about checking for wildlife before moving the materials with heavy equipment, they could inadvertently injure or kill a kit fox.

The San Joaquin kit fox has the potential to be affected by noise, vibrations, and visual disturbance associated with the operation of the construction equipment, workers, vehicles and the movement, staging and placement of materials, which could reduce foraging efficiency. This could result in decreased fitness, cause individuals to flush from refugia or increase dispersal time away from cover and make individuals more vulnerable to predators. The mitigation measures outlined for the California tiger salamanders and giant garter snakes will also avoid or substantially reduce impacts to the San Joaquin kit fox.

Impact SJKF BIO-7b. Impacts Associated with Long-term Operations and Maintenance.

Routine operation and maintenance would require infrequent visits to the diversion structure and other elements of the Project to regulate water flows and verify proper operation, flows, and quantities. This would require vehicles and personnel to use access roads for short (less than 1-day) visits and could subject San Joaquin kit fox to temporary harassment or avoidance from vehicle traffic and human presence.

Impacts of construction and long-term operations and maintenance on San Joaquin kit fox that may result from the Proposed Project from equipment movement and ground disturbance would be significant, but implementation of the mitigation measures described below would reduce this impact to less than significant.

With implementation of Mitigation Measure SJKF BIO-7, the impact of the Proposed Project on San Joaquin kit fox will be reduced to less than significant.

Mitigation Measure SJKF BIO-7. The following measures shall be implemented to avoid or substantially reduce impacts to San Joaquin kit fox.

1. **Implementation of Mitigation Measures CTS BIO-4 (2-3, 9).**
2. **Implementation of Preconstruction Surveys.** No earlier than 14 days and no more later than 30 days prior to the commencement of vegetation- and ground-disturbing activities, a qualified biologist engaged by the applicant (Water Authority) shall conduct pre-construction den surveys within suitable habitat in the project footprint and temporary access roads to determine if any burrows or dens potentially used by San Joaquin kit fox are present. If likely dens are located, the den shall be flagged and the qualified biologist shall determine the status of the den pursuant to USFWS

- protocols and definitions for San Joaquin kit fox (USFWS 1999) and appropriate avoidance measures taken pursuant to USFWS protocols (USFWS 2011). For dens determined to be “known” or “natal” dens (as defined by USFWS 1999), den avoidance measures include establishing construction exclusion zones around burrows/dens potentially used by kit foxes pursuant to the exclusion zone design and setback distances defined in USFWS 2011, shall be implemented. The exclusion zones shall be maintained until all construction related disturbances have been terminated.
3. **Avoidance of Entrapment.** Kit foxes are attracted to den-like structures such as pipes and may enter stored pipes and become trapped or injured. All construction pipes, culverts, or similar structures with a diameter of 4-inches or greater that are stored at a construction site for one or more overnight periods shall be thoroughly inspected for kit foxes before the pipe is subsequently buried, capped, or otherwise used or moved in any way. If a kit fox is discovered inside a pipe, that section of pipe shall not be moved until the USFWS has been consulted. If necessary, and under the direct supervision of the qualified biologist, the pipe may be moved only once to remove it from the path of construction activity, until the fox has escaped.
 4. **Restriction on Use of Rodenticides and Herbicides.** Use of rodenticides and herbicides in the 367.62-acre Study Area (shown on Figure 1, *Appendix B*) shall be restricted. This is necessary to prevent primary or secondary poisoning of kit foxes and the depletion of prey populations on which they depend. All uses of such compounds shall observe label and other restrictions mandated by the U.S. Environmental Protection Agency, California Department of Food and Agriculture, and other State and Federal legislation. If rodent control must be conducted, zinc phosphide shall be used because of a proven lower risk to kit fox than other rodenticides.
 5. **Escape of Trapped Animals.** In the case of trapped animals, escape ramps or structures shall be installed immediately to allow the animal(s) to escape.

Swainson's Hawk (SWHA)

Impact SWHA BIO-8. Construction-related Direct Lethality, Harassment or Nest Abandonment of Swainson's Hawks

Construction-related activities associated with removal or construction of the Los Banos Creek spill structure and restoration of the natural channel, Mud Slough diversion structure, culvert installation, Newman Lake Dam, clearing of the Connection Channel, and removal of abandoned water control structures L2, L11 and L13-15 have the potential to result in disturbance to nesting Swainson's hawks if they establish nests in proximity to construction areas. The increased human activity, presence of heavy equipment and temporary construction activity could result in flushing from the nest(s), hesitation approaching the nest(s), behavioral shifts in nest tending, foraging, or mate/nestling feeding, or conspicuous atypical behavior that could lead to interspecies harassment or depredation. Such activity could lead to nest abandonment, unviable eggs or nestling mortality. Environmental education to inform construction personnel of the species and working in the vicinity of active nests, preconstruction surveys to identify nesting Swainson's hawks within ½-mile of the construction areas, nest monitoring by qualified biologists, and establishing non-disturbance buffer zones will help to locate active nests, identify signs of nest disturbance early, and minimize issues before they cause nest abandonment or egg/nestling mortality.

Swainson's hawks have the potential to be affected by noise, vibrations, and visual disturbance associated with the operation of the construction equipment, workers, vehicles and the movement, staging and placement of materials, which could reduce foraging efficiency. This could result in decreased fitness and food available for nestlings, increased time off the nest, and changes to foraging behaviors. Preconstruction surveys and biological monitoring will identify nest sites and signs of disturbance early so adaptive measures can be implemented to further avoid or minimize the effects of disturbance. The large amount of available undeveloped foraging habitat will help to minimize the impacts to temporary avoidance of foraging habitat.

Construction-related impacts on Swainson's hawk that may result from the Proposed Project would be significant, but implementation of the mitigation measure described below would reduce this impact to less than significant.

With implementation of Mitigation Measure SWHA BIO-8, the impact of the Proposed Project on Swainson's hawk will be reduced to less than significant.

Mitigation Measure SWHA BIO-8

1. Implement Mitigation Measures CTS BIO-4 (2, 9).
2. If Project construction begins during the breeding season, i.e., March 1 and September 15, preconstruction surveys shall be conducted within the Project footprint and a ½-mile radius, by a qualified biologist no more than two weeks prior to equipment or material staging, pruning/grubbing or surface-disturbing activities. Surveys shall be conducted in accordance with the Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley (CDFG 2000), as follows:
 - a. All potential nest trees within a ½-mile radius shall be surveyed for presence of nests. If nests are found during the breeding season, a Monitoring and Mitigation Plan shall be prepared in consultation with CDFW and the lead agency, identifying appropriate buffers and avoidance of disturbance to adjacent foraging habitat. Surveys shall be conducted for at least two of the following periods immediately prior to Project initiation:
 - Period 1: One survey January-March 20 (optional)
 - Period 2: Three surveys March 20-April 15 (nest-building)
 - Period 3: Three surveys April 5-20 (egg-laying)
 - Period 4: Monitor known nest sites only April 21-June 10
 - Period 5: Three surveys June 10-July 30 (fledging, post-fledging)
3. If active nests (i.e., nests in the egg laying, incubating, nestling or fledgling stages) are found within ½-mile of the Project footprint, non-disturbance buffers shall be established at a distance sufficient to minimize disturbance based on the nest location, topography, cover, the nesting pair's tolerance to disturbance and the type/duration of potential disturbance. No work shall occur within the non-disturbance buffers until the young have fledged as determined by a qualified biologist. Buffer size shall be determined in cooperation with CDFW and USFWS based on the type of work activity to be performed and the sensitivity of the species/individual(s) to disturbance. If buffers are established and it is determined that Project activities are resulting in nest disturbance, work shall cease immediately and the CDFW and USFWS shall be contacted for further guidance.

Tricolored Blackbird (TRBB)

Impact TRBB BIO-9. Construction-related Direct Lethality, Harassment or Nest Abandonment of Tricolored Blackbirds.

Construction-related activities associated with removal or construction of the Los Banos Creek spill structure and restoration of the natural channel, Mud Slough diversion structure, culvert installation, Newman Lake Dam reinforcement, and clearing of the Connection Channel have the potential to result in disturbance to nesting tricolored blackbirds if they establish nests in proximity to construction areas. The increased human activity, presence of heavy equipment and temporary construction activity could result in flushing from the nest(s), hesitation approaching the nest(s), behavioral shifts in nest tending, foraging, or mate/nestling feeding, or conspicuous atypical behavior that could lead to interspecies harassment or depredation. Such activity could lead to nest abandonment, unviable eggs or nestling mortality. Tricolored blackbirds have the

potential to be affected by noise, vibrations, and visual disturbance associated with the operation of the construction equipment, workers, vehicles and the movement, staging and placement of materials, which could reduce foraging efficiency and cause flushing from the nest. This could result in decreased fitness and food available for nestlings, increased time off the nest, and changes to foraging behaviors.

Construction-related disturbance of nesting tri-colored blackbird that may result from the Proposed Project would be a significant impact, but implementation of the mitigation measures described below would reduce this impact to less than significant.

With implementation of Mitigation Measure TRBB BIO-9, the impact of the Proposed Project on tricolored blackbird will be reduced to less than significant.

Mitigation Measure TRBB BIO-9

Implement Mitigation Measures CTS BIO-4 (2, 9) and WTK BIO-10 (2-4).

White-tailed Kite (WTK)

Impact WTK BIO-10. Construction-related Direct Lethality, Harassment or Nest Abandonment of White-tailed Kites.

Construction-related activities associated with removal or construction of the Los Banos Creek spill structure and restoration of the natural channel, Mud Slough diversion structure, culvert installation, Newman Lake Dam reinforcement, clearing of the Connection Channel, and removal of abandoned water control structures L2, L11 and L13-15 have the potential to result in disturbance to nesting white-tailed kites if they establish nests in proximity to construction areas. The increased human activity, presence of heavy equipment and temporary construction activity could result in flushing from the nest(s), hesitation approaching the nest(s), behavioral shifts in nest tending, foraging, or mate/nestling feeding, or conspicuous atypical behavior that could lead to interspecies harassment or depredation. Such activity could lead to nest abandonment, unviable eggs or nestling mortality. Environmental education to inform construction personnel of the species and working in the vicinity of active nests, preconstruction surveys to identify nesting white-tailed kites within 300 feet of the construction areas, nest monitoring by qualified biologists, and establishing non-disturbance buffer zones will help to locate active nests, identify signs of nest disturbance early, and minimize issues before they cause nest abandonment or egg/nestling mortality.

White-tailed kites have the potential to be affected by noise, vibrations, and visual disturbance associated with the operation of the construction equipment, workers, vehicles and the movement, staging and placement of materials, which could reduce foraging efficiency. This could result in decreased fitness and food available for nestlings, increased time off the nest, and changes to foraging behaviors. Preconstruction surveys and biological monitoring will identify nest sites and signs of disturbance early so adaptive measures can be implemented to further avoid or minimize the effects of disturbance. The large amount of available undeveloped foraging habitat will help to minimize the impacts to temporary avoidance of foraging habitat. Construction-related impacts on nesting white-tailed kite that may result from the Proposed Project would be significant, but implementation of the mitigation measure described below would reduce this impact to less than significant.

With implementation of Mitigation Measure WTK BIO-10, the impact of the Proposed Project on white-tailed kite will be reduced to less than significant.

Mitigation Measure WTK BIO-10

1. Implement Mitigation Measures CTS BIO-4 (2, 9).

2. If tree removal, pruning, or grubbing activities are necessary, such activities shall be conducted during the non-breeding season (i.e., between September 1st and January 31st) to avoid impacts to nesting white-tailed kites.
3. If Project construction begins during the breeding season (February 1 to August 31), preconstruction surveys shall be conducted within the Project footprint and a 300-foot buffer, by a qualified biologist no more than 2 weeks prior to equipment or material staging, pruning/grubbing, and surface-disturbing activities including creation of temporary access roads. If no active nests are found, no further mitigation is necessary. Should a delay in construction activities of greater than 14 days occur at any of the proposed impact areas, a follow-up nesting bird and raptor survey shall be performed to document the presence of any new active nests or observed nesting behaviors.
4. If active nests (i.e., nests with eggs or young birds present) are found, non-disturbance buffers shall be established at a distance sufficient to minimize disturbance based on the nest location, topography, cover, the nesting pair's tolerance to disturbance and the type/duration of potential disturbance. The non-disturbance zone may be further reduced if a biological monitor is present to educate workers about the sensitivity of working in proximity to active nests and be onsite to monitor the nest during work adjacent to the buffer to determine if Project activities are causing nest disturbance. The monitor shall conduct regular monitoring visits to document nest phenology and potential for disturbance during the different nest stages. If buffers are established and it is determined that Project activities are resulting in nest disturbance, work shall cease immediately and the CDFW and the USFWS Migratory Bird Regional Permit Office shall be contacted for further guidance. A Service approved biologist shall be present for tree removal and initial ground disturbing activities.

Western Bumble Bee (WBB)

Impact WBB BIO-11. Construction-related Loss of Food Plants.

Construction-related activities associated with construction of the Mud Slough diversion structure, clearing of the Connection Channel, and the removal of the Los Banos Creek spill structure and abandoned water control structures L2, L11 and L13-15 have the potential to result in the temporary loss of *Melilotus* spp., *Cirsium* spp., *Trifolium* spp., and *Centaurea* spp. food plants. These species are relatively fast growing, respond well to disturbance and are expected to regrow within one calendar year. Furthermore, the Project design and BMPs minimize the Project footprint to limit impacts to habitat.

Due to the limited area of construction disturbance and the fast-growing nature of food plants, the impact of the Project on western bumble bee is less than significant. No mitigation is required.

Midvalley Fairy Shrimp and California Linderiella (VPB)

See Impact VPB BIO-3. No significant impact.

Molestan Blister Beetle (MBB)

Impact MBB BIO-12. Construction-related Loss of Food Plants.

Construction-related activities associated with construction of the Mud Slough diversion structure, clearing of the Connection Channel, and the removal of the Los Banos Creek spill structure and abandoned water control structures L2, L11, and L13-15 have the potential to result in the temporary loss of *Eriodinium* spp. and *Lupinus* spp. food plants. These species are relatively fast growing, respond well to disturbance and are expected to regrow within one calendar year. The Project design and BMPS minimize the Project footprint to limit impacts to habitat.

Due to the limited area of construction disturbance and the fast-growing nature of food plants, the impact of the Project on Molestan blister beetle is less than significant. No mitigation is required.

Western Spadefoot (WS)

Impact WS BIO-13a. Construction-related Direct Injury or Lethality of Western Spadefoot.

Construction-related activities associated with removal of the Los Banos Creek spill structure and restoration of the natural channel, clearing of the Connection Channel, and installation of the Mud Slough diversion structure will utilize heavy machinery, require on site workers, vehicles and materials which could directly impact western spadefoot, should they be present in the vicinity of the proposed Project elements during construction. Impacts could include mortality, injury or harassment of individuals. Construction will occur outside of their breeding season corresponding to their aestivation period and may be protected from minor surface disturbance such as movement of vehicles or heavy equipment. Construction activity could cause individuals to flush from underground refugia into open areas exposing them to depredation by avian predators and being crushed by vehicles, equipment, and construction workers. The mitigation measures for California tiger salamanders and giant garter snakes, including wildlife exclusion fencing, avoidance of monofilament erosion control devices, environmental education to inform construction personnel of the species, preconstruction surveys to identify western spadefoot in the construction areas, and biological monitoring during construction activities will avoid or substantially reduce these significant impacts on western spadefoot.

Construction-related impacts on western spadefoot that may result from the Proposed Project would be significant, but implementation of the mitigation measure described below would reduce this impact to less than significant.

Impact WS BIO-13b. Diversion Structure Impacts.

As part of the Proposed Project the existing Los Banos Creek spill structure, located at the confluence of Los Banos Creek and Mud Slough, will be removed and a new diversion structure will be constructed downstream of the confluence of Los Banos Creek and Mud Slough. The Mud Slough Diversion Structure will span the entire width of Mud Slough with a crest elevation 4 to 8 feet high. It will result in changes in water levels—including a 1.5 to 5-foot increase in the depth of Mud Slough between the diversion structure and Highway 140, and a reduction in Mud Slough flow downstream of the diversion structure of up to 10 cfs, although the depth of Mud Slough would be essentially the same as pre-project conditions (see Figures 2 – 7 of *Mud Slough Restoration Project Hydrology Study, Appendix E*). No effects to western spadefoot are expected downstream of the diversion structure based on the proposed operating regime that prioritizes maintaining sufficient downstream flows to minimize the downstream effect on species and habitats. The effects to western spadefoot upstream of the diversion structure would be insubstantial and potentially beneficial to the species; as closed-gate bypass backwater would potentially increase the inundation of seasonal wetland habitat by 0.65-1.05 acres, freshwater marsh habitat by 2.32-4.58 acres, and non-native grassland by 0.09-.0.27 acres, compared to pre-project open-gate conditions. This could potentially provide more breeding, rearing and foraging habitat. These conditions would primarily occur during the main diversion period from September 5 through January 10 and periodically for no more than 7 days at a time between January 11 and September 4. Although dry season inundation could cause western spadefoot to temporarily exit subsurface retreats, potentially resulting in increased stress, energy expenditure, and risk of predation, the impact of dry season inundation events on western spadefoot are not considered to be significant based on the short-term, temporary nature and location of inundation within the larger matrix of seasonal wetlands and grasslands present within the Study Area.

With implementation of Mitigation Measure WS BIO-13, construction-related impacts of the Proposed Project on western spadefoot will be reduced to less than significant.

Mitigation Measure WS BIO-13

Implement Mitigation Measures CTS BIO-4 (1-6, 8-9) and GGS BIO-5 (2) to reduce construction-related impacts.

Western Pond Turtle (WPT)

Impact WPT BIO-14a. Construction-related Direct Injury, Lethality or Harassment of Western Pond Turtles

Construction-related activities associated with removal or construction of the Los Banos Creek spill structure and restoration of the natural channel, Mud Slough diversion structure, clearing of the Connection Channel, culvert installation, Newman Lake Dam reinforcement, and removal of abandoned water control structures L2, L11 and L13-15 have the potential to result in the injury or mortality of western pond turtles if these activities are conducted in occupied aquatic habitat. Additionally, work in upland habitat within 500 meters could result in the destruction of western pond turtle nests. These activities will require the movement and operation of equipment, the movement of vehicles on existing or temporary access roads, and ground disturbance associated with the removing and constructing Project components. Mitigation measures of environmental education to inform construction personnel of the species, preconstruction surveys to identify western pond turtles in the construction areas, and biological monitoring during construction activities will avoid or substantially reduce the potential of impacting western pond turtles.

Disturbance to upland habitat adjacent to aquatic features could result in the destruction of western pond turtle nests and eggs, a significant impact. Pond turtle nests are difficult to detect and visual surveys are an unreliable methodology. Mitigation would involve using detection dogs trained to locate western pond turtle nest that would minimize the risk of unknowingly destroying nests within the work area. Additionally, environmental education of the construction crews and biological monitoring would reduce the potential for adverse impacts to this species.

The western pond turtle has the potential to be affected by noise, vibrations, and visual disturbance associated with the operation of the construction equipment, workers, vehicles and the movement, staging and placement of materials, which could reduce foraging efficiency. This could result in decreased fitness, cause individuals to flush from refugia or increase dispersal time away from cover and make individuals more vulnerable to predators and being crushed by vehicles, equipment, and construction workers. The mitigation measures outlined below will be implemented to avoid or substantially reduce construction-related impacts on western pond turtles to less than significant.

Impact WPT BIO-14b. Diversion Structure Impacts

As part of the Proposed Project the existing Los Banos Creek spill structure, located at the confluence of Los Banos Creek and Mud Slough, will be removed and a new diversion structure will be constructed downstream of the confluence of Los Banos Creek and Mud Slough. The Mud Slough Diversion Structure will span the entire width of Mud Slough with a crest elevation 4 to 8 feet high. It will result in changes in water levels—including a 1.5 to 5-foot increase in the depth of Mud Slough between the diversion structure and Highway 140, and a reduction in Mud Slough flow downstream of the diversion structure of up to 10 cfs, although the depth of Mud Slough would be essentially the same as pre-project conditions (see Figures 2 – 7 of *Mud Slough Restoration Project Hydrology Study*, Appendix E). No effects to western pond turtles are expected downstream of the diversion structure based on the proposed operating regime that prioritizes maintaining sufficient downstream flows to minimize the downstream effect on species and habitats. The effects to western pond turtles upstream of the diversion structure would be insubstantial and potentially beneficial to the species as closed-gate bypass backwater would potentially increase inundation of freshwater marsh habitat by 2.32-4.58 acres, open water habitat by 0.24-1.31 acres, seasonal wetland habitat by 0.65-1.05 acres compared to pre-project open-gate conditions. This could potentially provide more foraging and refugia habitat. These conditions would primarily occur during the main diversion period from

September 5 through January 10 and periodically for no more than 7 days at a time between January 11 and September 4. Upland nest sites in grassland habitat could be temporarily inundated during late spring and summer months, but are expected to recede shortly after the short 1-7-day diversions cease. However, it is unclear what effect this would have on the viability of western pond turtle eggs, since they are buried and backfilled with soil, but it may have a temporary effect on gas exchange across the surface of the egg or the sex ratio of individuals within a nest subject to inundation as the sex of turtles is temperature dependent. Such effects are conceivable, but the probability is unknown at this time and is considered to be less than significant.

Impact WPT BIO-14c. Construction-related Impacts on Water Quality

Construction-related activities would involve site preparation, cofferdam installation and removal, riprap rock placement, removal of the existing Los Banos Creek spillway structure and associated appurtenances, and restoration of the channel. Each of these activities has the potential to disturb soils and discharge or re-suspend sediments and increase turbidity in the immediate vicinity and downstream of the construction site. Increases in turbidity associated with in-water construction would be small, highly localized to within a short distance of the construction area, and temporary (lasting hours or days). This is attributed to the small area of disturbance and the timing of construction during the period of low flow. In addition, numerous BMPs described in the Project Description in Section 1 would be implemented as part of the Project, and water quality monitoring would be required by the Clean Water Act (CWA) Section 401 Water Quality Certification issued by the Regional Water Quality Control Board (RWQCB) for the Proposed Project to ensure that construction-related activities do not cause turbidity, temperature, or dissolved oxygen concentrations within or downstream of the Project site to exceed thresholds for maintaining aquatic life.

Any increases in suspended sediments or turbidity resulting from construction-related activities are anticipated to be localized and temporary and, with implementation of the Project BMPs, would not be elevated to levels that would cause impacts on aquatic communities of Mud Slough or the San Joaquin River. For these reasons, the potential water quality-related impacts of the Proposed Project associated with in-water construction are expected to be insubstantial and thus, would not have impacts on western pond turtles or their aquatic habitats in Mud Slough or the lower San Joaquin River.

Impact WPT BIO-14d. Cleaning of the Connection Channel between Los Banos Creek and Newman Lake.

Cleaning of the connection channel between Los Banos Creek and Newman Lake could directly impact western pond turtles if present in the work area by injuring or killing individuals while operating heavy equipment in the channel and along the bank. This would temporarily increase turbidity, stir up bottom sediment, and reduce water quality. Clearing of the channel also has the potential to harass western pond turtles and cause flushing from habitat and temporary of the impact area due to the presence of vehicles, heavy equipment, and human activity. Channel clearing activities that injure, kill or harass western pond turtles would be a significant impact, but implementation of Mitigation Measure WPT BIO-14 would reduce the impact to less than significant.

Impact WPT BIO-14e. Infrastructure Removal

The Proposed Project includes the removal of abandoned and obsolete water control structures from the China Island refuge. Five existing structures (L2, L11 and L13-15) will be removed from the Study Area using a backhoe and flatbed or similar truck to remove waste from the site. Removal of existing water control structures is expected to result in short-term (hours or days) localized increases in turbidity, suspended sediments, and ground disturbance within the area immediately adjacent to each structure. Water quality is expected to return to ambient conditions immediately following structure removal and the disturbed ground and vegetation would be minimal, localized, and would return to near existing conditions within one calendar year. Western pond turtles present in the area would likely flush from the area during the removal of the structures. It is possible that they could flush under these structures and could be injured during removal. Disturbance during removal of structures would likely result in localized behavioral avoidance of the

immediate work area until removal is completed. Removal of the existing water control structures is expected to be completed in two days. Removing structures in a slow and controlled motion would give western pond turtles time to flush from the area while minimizing the potential of injury. Western pond turtle injury during infrastructure removal would be a significant impact, but with implementation of Mitigation Measure WPT BIO-14 the impact would be reduced to be less than significant.

Impact WPT BIO-14f. Impacts Associated with Long-term Operations and Maintenance

Routine operation and maintenance would require infrequent visits to the diversion structure and other elements of the Project to regulate water flows and verify proper operation, flows, and quantities. This would require vehicles and personnel to use access roads for short (less than 1-day) visits. Due to the amount of aquatic and adjacent upland habitat, it is possible that western pond turtles could be subject to harassment from vehicle traffic and human presence. However, Project BMPs serve to reduce speed limits and worker access would ensure that impacts associated with long-term operations and maintenance would be less than significant.

Construction-related, channel cleaning, and infrastructure removal activities that could injure or kill western pond turtle that may result from the Proposed Project would be significant impacts, but implementation of the mitigation measures described below would reduce these impacts to a less than significant level.

With implementation of Mitigation Measure WPT BIO-14, the impact of the Proposed Project on western pond turtle will be reduced to less than significant.

Mitigation Measure WPT BIO-14. Impacts to western pond turtles from Project construction, cleaning, and removal activities will be avoided or substantially reduced by implementing the following measures:

1. Implement Mitigation Measures Fish BIO-2 (1), CTS BIO-4 (2-6, 9), GGS BIO-5 (2),
2. A qualified biologist shall conduct a preconstruction survey for western pond turtles immediately prior to work activities at the Los Banos Creek spill structure, Mud Slough diversion structure, culvert installation, Newman Lake Dam, clearing of the Connection Channel, restoration of natural channel, and the removal of abandoned water control structures L2, L11 and L13-15. If western pond turtles are detected within the work area, no work shall occur until they are outside of the work area. The qualified biologist shall determine if capturing and translocating the individual(s) is necessary. If authorized by CDFW, only a biologist in possession of a valid Scientific Collecting Permit shall handle or translocate the turtles.
3. Prior to ground disturbing activities at Los Banos Creek spill structure and restoration of the natural channel, Mud Slough diversion structure, culvert installation, Newman Lake Dam, clearing of the Connection Channel, and the removal of abandoned water control structures L2, L11 and L13-15, detection dogs trained to identify western pond turtle nests shall be used to survey the area within 50 feet of each location. If a nest is located, it shall be flagged and a buffer zone established at a sufficient distance to ensure Project activities do not harm the nest. A biological monitor shall be onsite during construction activities being conducted within 200 feet of a western pond turtle nest. If trained detection dogs are not available, the preconstruction survey shall be conducted by a qualified biologist with experience conducting surveys for western pond turtle.

San Joaquin Coachwhip (SJC)

Impact SJC BIO-15a. Construction-related Direct Injury, Lethality or Harassment of San Joaquin Coachwhip

Construction-related activities associated with construction of the Los Banos Creek spill structure and restoration of the natural channel, Mud Slough diversion structure, culvert installation, Newman Lake Dam, clearing of the Connection Channel, and removal of abandoned water control structures L2, L11 and L13-15,

have the potential to result in the injury or mortality of San Joaquin coachwhips especially by moving vehicles. Snakes may seek refuge under parked vehicles, heavy equipment, or materials during the day. Moving vehicles, equipment or supplies without thoroughly searching underneath could result in snakes being crushed or injured. Fuel or oil spills from equipment within upland habitat could cause the harm to individual snakes if present at the location of the spill. The Project BMPs would be implemented to prevent impacts from equipment and vehicle leaks and spills.

The San Joaquin coachwhips could be affected by noise, vibrations, and visual disturbance associated with the operation of the construction equipment, workers, vehicles and the movement, staging and placement of materials, which could reduce foraging efficiency. This could cause individuals to flush from refugia or increase dispersal time away from cover and make individuals more vulnerable to predators and being crushed by vehicles, equipment, and construction workers. The mitigation measures outlined for the California tiger salamander and giant garter snake will avoid or substantially reduce impacts on San Joaquin coachwhips to less than significant.

Impact SJC BIO-15b. Impacts Associated with Long-term Operations and Maintenance.

Routine operation and maintenance would require infrequent visits to the diversion structure and other elements of the Project to regulate water flows and verify proper operation, flows, and quantities. This would require vehicles and personnel to use access roads for short (less than 1-day) visits. During the active period, vehicle traffic would subject San Joaquin coachwhips to the potential for being crushed or injured and could cause snakes to flush from vehicle traffic and human presence.

Construction-related and operations and maintenance impacts on San Joaquin coachwhip that may result from the Proposed Project would be significant, but implementation of the mitigation measures described below would reduce these impacts to less than significant.

With implementation of Mitigation Measure SJC BIO-15, the impact of the Proposed Project on San Joaquin coachwhip will be reduced to less than significant.

Mitigation Measure SJC BIO-15

Implement Mitigation Measures CTS BIO-4 (2-6, 8-9), and GGS BIO-5 (2-5).

Other Nesting Native Bird Species (NNB)

Impact NNB BIO-16. Construction-related Direct Lethality, Harassment or Nest Abandonment of Migratory Birds and Raptors

Construction-related activities associated with construction of the Los Banos Creek spill structure and restoration of the natural channel, Mud Slough diversion structure, culvert installation, Newman Lake Dam reinforcement, clearing of the Connection Channel, and removal of abandoned water control structures L2, L11 and L13-15 have the potential to result in disturbance to nesting or wintering migratory birds and raptors within proximity to construction areas. The increased human activity, presence of heavy equipment and temporary construction activity could result in flushing from the nest(s), hesitation approaching the nest(s), behavioral shifts in nest tending, foraging, or mate/nestling feeding, avoidance of winter roosts or favored perches, or conspicuous atypical behavior that could lead to interspecies harassment or depredation. Such activity could lead to nest abandonment, unviable eggs or nestling mortality. Environmental education to inform construction personnel of the species and working in the vicinity of active nests or winter roosts, preconstruction surveys to identify active nests or winter roosts within 300 feet of the construction areas, nest monitoring by qualified biologists, and establishing non-disturbance buffer zones are mitigation measures that will help to locate active nests, and identify signs of nest disturbance early.

Nesting or wintering migratory birds and raptors have the potential to be affected by noise, vibrations, and visual disturbance associated with the operation of the construction equipment, workers, vehicles and the movement, staging and placement of materials, which could reduce foraging efficiency. This could result in decreased fitness and food available for nestlings, increased time off the nest, changes to foraging behaviors, or avoidance of roost sites or foraging habitat. Preconstruction surveys and biological monitoring will identify active nests and roosts, so mitigation measures can be implemented to avoid or substantially reduce the effects of disturbance.

Construction-related impacts on nesting native birds that may result from the Proposed Project would be significant, but implementation of the mitigation measures described below would reduce impacts to a less than significant level.

With implementation of Mitigation Measure NNB BIO-16, the impact of the Proposed Project on nesting native birds will be reduced to less than significant.

Mitigation Measure NNB BIO-16

Implement Mitigation Measures CTS BIO-4 (2-3), WTK BIO-10 (1-3), and GGS BIO-4 (4).

Special-status Bats (BATS)

Impact BATS BIO-17. Construction-related Harassment Roosting Bats

Construction-related activities associated with removal of abandoned water control structures L13 and L15 has the potential to result in disturbance to roosting bats. The increased human activity, presence of heavy equipment and temporary construction activity could result in roosting bats waking from daily torpor, flushing from roost sites, and causing harassment in bats roosting in nearby trees. The duration of the work at these sites will not take more than 1-2 days. The disturbance is not anticipated to be significant. Construction-related impacts on roosting bats that may result from the Proposed Project would be significant, but implementation of the mitigation measure described below would reduce impacts to less than significant.

With implementation of Mitigation Measure BATS BIO-17, the impact of the Proposed Project on special-status bats will be reduced to less than significant.

Mitigation Measure BATS BIO-17

Implement Mitigation Measures CTS BIO-4 (1-6, 9), WTK BIO-10 (1-3), and GGS BIO-4 (4).

- b) **Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by the California Department of Fish and Wildlife or the U.S. Fish and Wildlife Service?**

The assessment of potential impacts of the Mud Slough Restoration Project on riparian and sensitive natural communities considered both direct (i.e., construction-related impacts) and indirect (i.e., hydrology) impacts. Direct impacts to riparian and sensitive natural communities would result from earthwork and construction activities that result in a permanent loss of riparian and sensitive natural communities. Indirect impacts could occur from changes in the duration and area of inundation resulting from long-term operations and maintenance of the Mud Slough Diversion Structure. Indirect impacts due to changes in hydrology are based on the *Mud Slough Restoration Project Hydrology Study (Appendix E)*, and operations of the overshot gate as described in the Project Description (and *Appendix B, Section 7.5*)

Impact WET BIO-18. Construction-related Direct Impacts to Riparian and Sensitive Natural Communities

Construction-related activities would involve site preparation, cofferdam installation and removal, clean riprap rock placement, removal of the existing Los Banos Creek spillway structure and restoration of the natural channel, construction of the Mud Slough diversion structure, construction of the culvert in the Connection Channel and Connection Channel cleaning, Newman Lake dam reinforcement, and removal of the abandoned structures L2, L11, L13-15. These construction activities will result in direct, construction-related permanent and temporary impacts to sensitive natural communities, including Cismontane Alkali Marsh, Coastal and Valley Freshwater Marsh and Open Water habitat. Table 2 includes temporary and permanent construction impacts resulting from the Proposed Project. Permanent impacts include the loss of 0.21 acres of Coastal and Valley Freshwater Marsh and 0.07 acres of Open Water from the discharge of rock riprap and concrete to these communities. Temporary impacts include those resulting from earthwork where the impact is short term (one year or less, e.g., surface disturbance of vegetation at staging areas, removal of abandoned water control structures and Connection Channel excavation). The Project would result in temporary impacts to 0.41 acres of Cismontane Alkali Marsh, 0.78 acres of Coastal and Valley Freshwater Marsh, 0.09 acres of Open Water and 1.18 acres of Non-native Grassland. Construction will not impact riparian trees. Non-Native Grassland is not considered a sensitive natural community, and the area of permanent and temporary impacts are small. This vegetation community is abundant within the Study Area, and impacts of the Project on it are considered to be less than significant.

Table 2. Construction Impacts by Vegetation Type¹

Vegetation Type	Permanent Impact (acres)	Temporary Impact (acres)
Non-Native Grassland	0.03	1.18
Valley Wildrye Grassland	0	0
Valley Sink Scrub	0	0
Cismontane Alkali Marsh	0	0.41
Coastal & Valley Freshwater Marsh	0.21	0.78 ²
Open Water	0.07	0.09 ³
Developed/Ruderal	0	0
Totals	0.31	2.46

¹ Wetland and other waters areas are subject to determination by U.S. Army Corps of Engineers; mapping based on Aquatic Resources Delineation Report (Appendix D)

² Includes 0.059 ac of wetland excavation and restoration in place for Los Banos Creek structure removal, and 0.245 ac of excavation in the Connection Channel

³ Includes 0.054 ac of other waters excavation and restoration in place for Los Banos Creek structure removal

Construction activities associated with the removal of the existing water control structures and removal of the Los Banos Creek spill structure, installation of the new Mud Slough Diversion Structure, installation of the culvert in the Connection Channel, reinforcement of the Newman Lake dam, and installation and removal of the cofferdam will require the permanent discharge of fill material (concrete, culvert, rock riprap) into Coastal and Valley Freshwater Marsh and Open Water habitats, resulting in a permanent loss of 0.21 acres of Coastal and Valley Freshwater Marsh and 0.07 acres of Open Water. Equipment staging, the movement of construction equipment, cofferdam installation, bypass pipe, removal of the abandoned water control

structures, sediment excavation and temporary riprap installation will temporarily disturb 0.78 acres of Coastal and Valley Freshwater Marsh and 0.09 acres Open Water habitats. Equipment staging and the movement of construction equipment will temporarily disturb 0.41 acres of Cismontane Alkali Marsh.

Removal of the Los Banos Creek spill structures and culverts will require the excavation of 0.06 acre of Coastal and Valley Freshwater Marsh and 0.05 acre of Open Water on the bed and banks of the work area. The confluence of Los Banos Creek and Mud Slough will be restored to pre-GBP conditions and emergent wetland vegetation is expected to quickly re-establish in the restored channel. Sediment removal in the Connection Channel will require excavation of 0.25 acres of Coastal and Valley Freshwater Marsh. These impacts are considered to be temporary because Coastal and Valley Freshwater Marsh wetland vegetation is expected to rapidly re-establish in the excavated areas.

Removal of the abandoned water control structures within the China Island refuge will result in small areas of surficial soil and vegetation disturbance in Non-native Grassland, Open Water, Coastal and Valley Freshwater Marsh and Cismontane Alkali Marsh as the structures are removed, and disturbed soils are tamped back in place. At L15, a small area of levee supporting Non-native Grassland (160 square feet) will be removed to restore aquatic habitat in a side channel. The areas of temporary impacts are included in Table 2.

Authorization for the discharge of fill into waters of the U.S. and state will be required under Sections 401 (RWQCB) and 404 of the Clean Water Act (Corps of Engineers), and Section 1600 of the California Fish and Wildlife Code (CDFW). State and federal agencies will require avoidance, minimization and compensatory mitigation for the loss of wetland habitat.

The discharge of fill material into Coastal and Valley Freshwater Marsh wetlands and Open Water if not completely avoidable, and temporary disturbance of Coastal and Valley Freshwater Marsh, Cismontane Alkali Marsh and Open Water (if not completely avoidable) would be significant, but implementation of the mitigation measures described below would reduce or compensate for this impact to be less than significant.

With implementation of Mitigation Measure WET BIO-18, the impact of the Proposed Project on special-status natural communities including potentially jurisdictional wetlands and other waters will be reduced to less than significant.

Mitigation Measure WET BIO-18. The fill of jurisdictional wetlands will be avoided to the extent feasible. Authorization for any unavoidable impacts to waters of the U.S. and state shall be obtained by the applicant prior to the start of construction. Either of these impacts would result in compensatory mitigation for the permanent loss of wetlands and other waters that shall be accomplished through one of the following options: 1) the purchase of credit at an approved mitigation bank, 2) payment through an in-lieu fee program, or 3) the creation of wetland and open water habitat within the Study Area. Compensatory mitigation through one of these options would be at not less than a 1:1 replacement to loss ratio, consistent with USACE and SWRCB "no net loss" policies. Mitigation for temporary disturbance of wetland and other habitats shall be accomplished by removing temporary fills and revegetating areas disturbed during construction through the application of native plant seed mixes.

1. **Compensatory mitigation for permanent impacts.** Compensatory mitigation to offset the permanent loss of 0.21 acres of Coastal and Valley Freshwater Marsh wetlands and 0.07 acres of Open Water shall be accomplished offsite through the purchase of wetland credit at a USACE-approved mitigation bank **or** through payment into a USACE-approved In-Lieu Fee Program fund at not less than a 1:1 replacement to loss ratio, subject to approval by the regulatory agencies. The applicant (Water Authority) shall provide documentation of agency approval and payment for bank or in-lieu fee program mitigation credit prior to the start of construction.

If compensatory mitigation credit is not available at an approved bank or through the In-Lieu Fee Program, compensatory mitigation would be implemented by the applicant (Water Authority) within the Study Area through the creation, restoration, and re-establishment of Coastal and Valley Freshwater

Marsh, Cismontane Alkali Marsh and Open Water at not less than a 1:1 replacement to loss ratio. The mitigation goal would be to create, restore and re-establish aquatic habitat with habitat values greater than or equal to those that will be impacted by the Proposed Project. Compensatory mitigation within the Study Area could be accomplished at the following locations:

- a. West Bank of Los Banos Creek. Create approximately 0.28 acres of Coastal and Valley Freshwater Marsh and Cismontane Alkali Marsh wetlands by excavating 0.28 acres of existing upland, Non-native Grassland along the west bank of Los Banos Creek near the confluence with the Connection Channel. The excavated area would conform to the elevations of adjacent wetland habitats and would transition to the elevation of Non-native Grassland at the western boundary of the wetland creation area.
- b. Confluence of Los Banos Creek and Mud Slough. Re-establish 0.05 acres of Coastal and Valley Freshwater Marsh and Open Water in the restored channel following removal of the Los Banos Creek spill structure, culvert and levee which presently supports Non-native Grassland. An additional 0.11 acres of existing Coastal and Valley Freshwater Marsh and other waters would be restored in place at this location with the excavation of the structures, and restoration of the bed and banks of Los Banos Creek and Mud Slough.
- c. East Bank of Mud Slough. Approximately 0.23 acres of Coastal and Valley Freshwater Marsh and Open Water habitat would be constructed by excavating 0.23 acres of existing upland, Non-native Grassland to match the elevations of the adjacent wetlands and other waters upstream and east of the proposed Diversion Structure.

Prior to ground disturbance, a compensatory wetland mitigation plan for wetland mitigation within the Study Area would be prepared by a qualified biologist engaged by the applicant (Water Authority). The plan would include appropriate measures, activities, and best management practices to be implemented prior to and during ground disturbance to ensure that no direct or indirect impacts to special-status plants, fish, wildlife, or riparian or sensitive natural communities would occur.

The Project's compensatory wetland mitigation plan would be submitted to the USACE, SWRCB, and CDFW for review and approval prior to the start of construction, and would:

- Be prepared consistent with the Final Regional Compensatory Mitigation and Monitoring Guidelines (USACE 2015);
- Define the location of all restoration activities;
- Describe measures that would ensure that adjacent land uses would not adversely affect the restored wetland habitat;
- Provide evidence of adequate hydrology to support restored wetland habitat;
- Identify the species, quantity, and location of plants to be installed in the restoration area;
- Identify the time of year for planting and method for supplemental watering, if any, during the establishment period;
- Identify the monitoring period, which shall be not less than five years for wetland restoration;
- Define success criteria that will be required for restoration efforts to be deemed a success, including:
 - Minimum standards for the establishment of native wetland plant cover measured three and five years after construction,
 - Establish not less than 0.21 acres of Coastal and Valley Freshwater Marsh and 0.07 acres of Open Water habitat,
 - Non-native invasive plant cover standards,
 - Standards to assess bed, bank and slope stability, and
 - Performance absent substantial maintenance measures.

- Define adaptive management and maintenance activities, including weeding, supplemental irrigation, site protection; and
- Define responsibility for maintaining, monitoring and ensuring the preservation of the mitigation site in perpetuity.

Construction of compensatory wetland mitigation within the Study Area would result in the conversion of approximately 0.56 acres of Non-native Grassland to Coastal and Valley Freshwater Marsh, Cismontane Alkali Marsh and Open Water. The conversion of Non-native Grassland, which is dominated by non-native grasses and forbs that are adapted to disturbance is abundant in the Study Area, would represent a loss of 0.3 percent of this vegetation community from the Study Area, and replacement with valuable wetland and open water habitats. The impact would be less than significant. No additional mitigation would be required.

Compensatory wetland mitigation construction within the Study Area would utilize heavy machinery and could result in direct impacts to California tiger salamanders, giant garter snake, San Joaquin kit fox, Swainson's hawk, tricolored blackbird, white-tailed kite, western spadefoot, western pond turtle, San Joaquin coachwhip, and nesting native birds as described in Impacts CTS BIO-4a, GGS BIO-5a, SJKF BIO-7a, SWHA BIO-8, TRBB BIO-9, WTK BIO-10, WS BIO-13a, WPT BIO-14a, SJC BIO-15a, and NBB BIO-16. Construction-related impacts on these species would be significant, but implementation of the mitigation measures described below would reduce these impacts to less than significant.

With implementation of Mitigation Measures CTS BIO-4, GGS BIO-5, SJKF BIO-7, SWHA BIO-8, TRBB BIO-9, WTK BIO-10, WS BIO-13, WPT BIO-14, SJC BIO-15, and NBB BIO-16, the impact of compensatory wetland mitigation construction within the Study Area on California tiger salamanders, giant garter snake, San Joaquin kit fox, Swainson's hawk, tricolored blackbird, white-tailed kite, western spadefoot, western pond turtle, San Joaquin coachwhip, and nesting native birds would be reduced to less than significant.

2. **Restoration of temporary impacts.** The temporary cofferdams, riprap and other fill materials utilized during Project construction will be removed, and areas subject to temporary disturbance will be restored consistent with *Appendix A, Mud Slough Restoration Project Drawings*. Wetland, grassland and open water habitats temporarily disturbed by earthwork during Project construction will be revegetated with locally native seed mixes before the start of the rainy season. A qualified biologist engaged by the applicant (Water Authority) will prepare a temporary impacts restoration plan that describes restoration actions, methods, performance criteria and performance criteria. The plan will be submitted to the USACE, SWRCB and CDFW for review and approval prior to the start of construction.

Impact WET BIO-19. Hydrologic Impacts on Open Water and Wetland Habitats

Mud Slough hydrology would be altered by construction and operation of the proposed diversion structure. The proposed structure consists of an overshot gate and broad-crested weir. The overshot gate would provide the flexibility to control water level in a variety of low to moderate flow conditions, and the broad-crested weir would provide additional capacity needed in high flow conditions. The Proposed Project would alter Mud Slough hydrology during the main diversion period of September 5 through January 10, when most of the diversion to Newman Lake (approximately 1,532 acre-feet) would occur through diversions of up to 10 cubic feet per second (cfs) of combined Los Banos Creek and Mud Slough flow to Newman Lake. A smaller volume of water (approximately 100 acre-feet) would be diverted between January 11 and September 4.

Effects of the Project on Mud Slough hydrology and wetland habitats were analyzed using the results of the *Mud Slough Restoration Project Hydrology Study (Appendix E)* and the Aquatic Resource Delineation Report (CRB May 2020). Water depth, area, duration and time of year of project-related inundation were considered in assessing the effect of the Project on open water and wetland habitats.

The hydrology study employed a hydraulic model to analyze four flow conditions with inflow rates of 10, 50, 120 and 450 cfs representing low, moderate, winter median and high flow conditions. Hydrologic impacts were assessed by comparing the area inundated by Mud Slough flows both pre-project (equivalent to gate open) and during diversions to Newman Lake (gate closed). When the gate is open, no diversion to Newman Lake would occur and all flow would continue downstream in the Mud Slough channel. Pre-project inundation and post-project inundation with the gate open would result in the same water surface elevations due to the unimpeded passage of most flow downstream of the control structure. When the gate is closed, the water surface upstream of the control structure would be raised to facilitate diversions to Newman Lake. Water surface elevation in Newman Lake would be maintained by the Proposed Project, consistent with existing conditions.

The change in water surface elevations in Mud Slough upstream and downstream of the control structure, as well as the change in areas of wetland and other vegetation communities inundated as a result of the Project were calculated and reported in the hydrology study. The water lines (areas of inundation) developed via the hydraulic model were plotted over the vegetation communities mapped for this report to determine the areas of mapped vegetation communities that would be inundated both pre-project (gate open) and during diversions to Newman Lake (gate closed). Effects of the project on Open Water and wetland habitats (i.e., Coastal and Valley Freshwater Marsh and Cismontane Alkali Marsh) were assessed due to their status as regulated, special-status natural communities. The effects upstream of the control structure were separated from the downstream effects because upstream effects would result in a net increase in inundated area when the gate is closed, while downstream effects result in an insubstantial decrease in inundated area.

Appendix E provides additional information on wetlands impacts upstream of the control structure including inundation areas by vegetation type, changes in water surface elevations, and key variables (including time of year, duration and depth of inundation). Natural vegetation disturbance due to flooding and significant annual and seasonal hydrologic variability is a common occurrence on the Study Area. Therefore, some impacts to the existing area and locations of Coastal and Valley Freshwater Marsh and Cismontane Alkali Marsh habitats from water level changes would be offset by natural migration of these vegetation types into areas of suitable hydrology and/or persistence of existing vegetation types in situ due to a tolerance of a broad range of hydrologic conditions, as demonstrated by the high natural hydrologic variability present on the study area. Overall, the Proposed Project is likely to result in an increase in the area of Open Water, but is not expected to result in a net loss Coastal and Valley Freshwater Marsh or Cismontane Alkali Marsh.

Concerning wetlands impacts downstream of the control structure, *Appendix E* estimates projected areas of inundation by vegetation type. During the main diversion period, these small reductions in inundation would coincide with a period of increasing plant senescence, while reductions in flow would be short-term (not more than seven days, once a month) during the rest of the year. Given the small areas of effect, dormancy of vegetation during the main diversion period, and the adaptation of plant communities to existing fluctuations in flow, the effect of the project on Open Water, Coastal and Valley Freshwater Marsh and Non-native Grassland downstream of the control structure is expected to be negligible.

While changes to Mud Slough hydrology are expected to result in some shifts in the location of Open Water, Coastal and Valley Freshwater Marsh and Cismontane Alkali Marsh upstream of the diversion structure, an upslope migration of Coastal and Valley Freshwater Marsh and Cismontane Alkali Marsh is expected to occur as a result of increased water depth and inundation. With upslope migration of Open Water and wetland habitats, the Project is not expected to result in a net loss of Open Water, Coastal and Valley Freshwater Marsh or Cismontane Alkali Marsh.

With operation of the overshot gate consistent with the Project Description, the impact of the Proposed Project on special-status natural communities, including Open Water, Coastal and Valley Freshwater Marsh and Cismontane Alkali Marsh, is expected to be less than significant. No mitigation is required.

- c) **Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?**

See discussion under subsection (b), above, regarding the relationship of Proposed Project activities and state or federally protected wetlands. The discharge of fill material into Coastal and Valley Freshwater Marsh wetlands would be significant, but implementation of Mitigation Measure WET BIO-18 would avoid or substantially reduce this impact to less than significant. During periods of gate closure, the increase in habitat areas inundated are less than significant.

- d) **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?**

As discussed in Impact FISH BIO-2, the diversion structure is expected to be a complete barrier to the upstream passage of migratory fish including Chinook salmon, steelhead, and sturgeon when the control gate is closed to allow diversions and an impediment to upstream and downstream migration by fish when the control gate is open. As a result of the migration barrier, these fish would not have access upstream of the barrier and therefore would not be at risk of being entrained into water diverted into Newman Lake by the Proposed Project. Habitat conditions for special status fish species in Mud Slough is poor under existing conditions and does not provide suitable habitat for spawning and juvenile rearing by sensitive fish species such as Chinook salmon, steelhead, sturgeon, and others. By preventing the upstream passage of migratory fish into unsuitable spawning and juvenile rearing habitat, the Proposed Project would not adversely affect special-status migratory fish.

The Project would not interfere or impede in the movement of other native wildlife. Surface flow in Mud Slough will be maintained, although diversions to Newman Lake will diminish flow during the September 5th through January 10th diversion period. Aquatic species such as the giant garter snake and western pond turtle will be able to easily circumvent the diversion dam. The entire Study Area is set within a broader matrix of undeveloped habitat and the scope and footprint of the Project are insubstantial in the context of the surrounding available habitat. For these reasons the Project would not interfere substantially with species' movements or ability to use nursery sites.

The Project would not result in significant impacts to the movement of native fish, wildlife or established wildlife corridors. No mitigation is required.

- e) **Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?**

As explained in *Appendix B, Section 7.7*, the Proposed Project was designed to be consistent with Merced County General Plan Natural Resource Policies described in *Appendix B, Section 4.9* (and repeated above in the Project Description in Section 1). The Project would protect wetland, grassland, and waterway habitats, and impacts identified in Section 1.4.2 (parts, a, b, and c) would be mitigated to less than significant. Through careful design, construction of the Proposed Project would both protect existing habitat for rare and endangered plant and wildlife species and wetlands and would not impede the mobility of terrestrial wildlife. Special-status species surveys and mitigation requirements consistent with current agency protocols and standards were used to map resources and mitigate impacts of the Proposed Project. Restoration of Mud Slough flows to waterfowl habitat in Newman Lake would reduce the need for groundwater pumping to support water levels in Newman Lake.

The Project Description detailed in Section 1 of this checklist (and in *Appendix B, Section 2.0*) was developed following extensive consultation and coordination between representatives for the Project proponent and representatives of the Newman Land Company and CDFW China Island Unit refuge staff (personal communications Joseph McGahan [for SLDMWA]); Ron DePauw and Mark Trinta (Newman Land Company); and China Island wetland management staff from CDFW, (12/6/2019, 3/17/2020, 6/22/2020); and China Island wetland management staff from CDFW (08/21/2020).

- f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

No local, regional or statewide habitat conservation plans have been adopted for the area in which the Proposed Project is located; therefore, there is no conflict. No mitigation is required.

1.5 CULTURAL RESOURCES

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
V. Cultural Resources.				
Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Disturb any human remains, including those interred outside of dedicated cemeteries?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

1.5.1 Environmental Setting

Cultural resources are defined as prehistoric and historic archeological sites, architectural properties (e.g., buildings, bridges, and structures), and traditional properties with significance to Native Americans or other ethnic groups. For the purposes of the present document, the term “historic properties” are those resources eligible for listing in the National Register of Historic Places (NRHP)(36 Code of Federal Regulations [CFR] 60.4). Any property eligible for listing in the NRHP is by default considered eligible for the California Register of Historical Resources (Public Resources Code, Section 5024.1). Archeological and historic architectural properties provide scientifically important information about California’s history and cultural heritage. The California Register of Historical Resources (California Register) includes buildings, sites, structures, objects and districts significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California.

The information in this section is summarized or taken directly from the report *Cultural Resource Inventory for the Mud Slough Restoration Project, Merced County, California* by Applied Earth Works, Inc. (October 2020) that is attached to this Initial Study as *Appendix C*. There is no culturally sensitive information in the report that is at risk of being compromised by its released to the public through this Initial Study. Figures referenced below are located in *Appendix C*. The references cited herein are listed in *Appendix C* Section 6. Other sections of the report are: 1) Introduction, 2) Background, 3) Methods, 4) Findings, and 5) Summary and Recommendations.

“Following this introduction, Chapter 2 describes the natural environment, prehistoric and ethnographic setting, and regional history. Chapter 3 discusses the methods employed for background research, archaeological survey, buried site sensitivity assessment, and presence/absence subsurface testing. The results of the background research, buried site sensitivity assessment, archaeological survey, and subsurface testing are provided in Chapter 4. Chapter 5 provides a summary of findings and recommendations. References cited are provided in Chapter 6, followed by Appendices A–C.” (p. 9)

“Applied Earth Works, Inc. (Æ) performed a cultural resource inventory for the San Luis & Delta-Mendota Water Authority (SLDMWA) Mud Slough Restoration Project (Project) in Merced County, California. The Project would restore the connection between Newman Lake and Mud Slough through alterations to and removal of bypass and levee structures. The restoration Project requires a Clean Water Act Section 404 permit from the U.S. Army Corps of Engineers, Sacramento District. Thus, compliance with Section 106 of the National Historic Preservation Act is required. The Project also must comply with the California Environmental

Quality Act (CEQA). Both federal and state regulations require that government agencies consider the impacts of their discretionary projects on the cultural environment.

"To meet federal and state standards, Æ completed a cultural resource inventory under contract to SLDMWA to identify cultural resources in the Area of Potential Effects (APE). Æ's cultural resource inventory included: (1) a records search of the California Historical Resources Information System at the Central California Information Center (CCaIC) at California State University, Stanislaus; (2) desktop archival research; (3) a search of the Native American Heritage Commission (NAHC) Sacred Lands File and nongovernmental outreach to local Native American tribes; (4) historical research to better understand land use in the APE and assess the likelihood for significant archaeological deposits; (5) a desktop buried site sensitivity assessment; (6) an intensive pedestrian survey of the APE to identify and record cultural resources; and (7) presence/absence subsurface testing in areas of proposed ground disturbance within the APE." (pp. iii)

"The APE is defined as "the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if any such properties exist" (36 CFR 800.16[d]). Moreover, the APE consists of both *horizontal and vertical limits* of proposed Project activities and encompasses all portions of the proposed Project area. The APE described below was established in coordination with the SLDMWA and Summers Engineering.

"The 4.6-acre APE includes 4.4 acres of Assessor's Parcel Number (APN) 540-080-008 and 0.2 acres of APN 540-070-001 (Figure 1-3). The vertical limits of the APE are bounded by the maximum height of the tallest structure and maximum depth of ground disturbance. The proposed APE extends to a maximum depth of 5 feet below the ground surface to accommodate pile driving and excavations. The maximum height of the tallest structure modification will extend no more than 4 feet above the existing banks of Mud Slough." (p. 8)

"The Project area is within the boundaries of the Northern Valley Yokuts territory at the north end of the San Joaquin Valley, near the Merced-Stanislaus County boundary. "Yokuts" is a term applied to a large and diverse group of native people inhabiting the San Joaquin Valley and Sierra Nevada foothills of central California (Wallace 1978). The Northern Valley Yokuts occupied an area straddling the San Joaquin River, south of the Mokelumne River, east of the Diablo Range, and north of the sharp bend that the San Joaquin River takes to the northeast (Wallace 1978).

"Although the Northern Valley Yokuts appear to have been the predominant group in the region, there is evidence suggesting a strong coastal influence by Costanoan (Ohlone) groups. Olsen and Payen (1969), Kroeber (1925), and others have suggested western Northern Valley Yokuts from the Pacheco Pass area had just as much in common with the Costanoan as they did with the valley Yokuts. Routes through Pacheco Pass facilitated contact between coastal and interior tribal groups and provided for easy exchange of goods and cultural traits in prehistoric and early historic times. Ethnographic accounts of the early historic Northern Valley Yokuts are sparse and are supplemented with archaeological evidence. The Project is also near the southernmost reaches of Delta Yokuts territory and the eastern reaches of Western Miwuk groups (Golla 2011:149).

"At the time of European contact, the Northern Valley Yokuts built their villages on mounds along riverbanks to avoid the spring floods that resulted from heavy Sierra snow melts. The San Joaquin River and its main tributaries served as a lifeline for valley occupants as a source of fish and game in an environment favorable to another important food source, the valley oak (*Quercus lobata*). Acorns, in addition to other types of nuts, seeds, fruits, and roots, were also important subsistence items (Hatoff et al. 2006; Wallace 1978). Hunting provided geese, ducks, pronghorn, elk, deer, and brown bear. The surrounding woodland, grasslands, and marshes provided acorns, seeds, and tule roots (Wallace 1978).

"Ethnographic accounts indicate that as many as 63 groups may have inhabited the Northern Valley Yokuts' territory (Latta 1999). According to a map of the San Joaquin Valley Yokuts region (Latta 1999), the Kahwathwah occupied the area surrounding Little Panoche Creek and the modern towns of Firebaugh, Los Banos, and Ingomar. A village, *Kahtomah*, was inhabited just north of Los Banos on the south bank of Los

Banos Creek. Wallace (1978) describes a similar distribution of ethnographic groups within the Northern Valley Yokuts territory. However, Wallace identifies the Nopchinchí, rather than the Kahwatchwah, as the group occupying the area west of the San Joaquin River near Firebaugh (55 miles southeast of the proposed Project site), Los Banos (20 miles southeast of the proposed Project site), and Ingomar (10 miles southwest of the proposed Project site)." (pp. 13-14)

"Currently there are three Native American tribal groups identified by the NAHC with ancestral ties to the APE, including the Amah Mutsun Tribal Band, North Valley Yokuts Tribe, and the Southern Sierra Miwuk Nation. Several Northern Valley Yokuts tribes have survived the effects of colonization. Several Yokuts tribal groups are governed by elders' councils and operate auxiliary departments that serve local tribal populations in areas of healthcare, education, and cultural resource management." (p. 15)

1.5.2 Discussion

a) Cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5?

"The CCalC records search reported that one cultural resource investigation (ME-7024) has occurred within the APE, and 10 cultural resource studies have been conducted within 0.5 mile of the APE. There are no previously recorded archaeological sites within the APE; however, the CCalC identified four previously recorded resources within a 0.5-mile radius surrounding the APE. These include three prehistoric archaeological sites (CA-MER-6, -54, and -324), and Bridge 39-107 at the Mud Slough Overflow (P-24-001700). A search of the NAHC Sacred Lands File did not result in the identification of sacred or special sites within the APE. No information was provided by tribal representatives as a result of Æ's best practices (i.e., nongovernmental) tribal outreach. Æ's buried site sensitivity assessment identified a high to very high probability of encountering intact paleosols that may contain cultural deposits within the APE. Due to this finding and the poor ground visibility during the pedestrian survey, Æ conducted presence/absence testing for cultural material using hand-excavated augers and shovel probes in two areas of the APE to better assess the probability that the undertaking would impact historic properties/historical resources. Æ's testing resulted in the removal of 0.157 cubic meters of soils and extended a maximum depth of 2 meters (approximately 6 feet) below ground surface and yielded no cultural material. Thus, Æ concludes there are no historic properties within the APE; therefore, no historic properties or historical resources will be affected by the proposed undertaking." (p. iii)

"Æ's archaeological pedestrian survey did not identify prehistoric or historic-era archaeological sites, features, or isolated artifacts on the ground surface. Surveyors examined all accessible ground surface exposures for evidence of soil changes and cultural resources, but none were identified (Figure 4-7). Æ observed dams, levees, risers, and bypass pipes in the APE along Los Banos Creek and Mud Slough. Prefield research confirmed that these are modern features installed in the 1990s for the GBP and do not meet the 50-year age requirement to be considered cultural resources and potentially historically significant." (p. 25)

However, to ensure that no unknown pre-historic resources would be significantly impacted during construction, the following mitigation measure applies. The Water Authority will add the following measure to Project construction contracts.

Consistent with state and federal statutes, in the unlikely event that archaeological resources (sites, features, or artifacts) are encountered during Project development or ground-disturbing activities in the APE, all construction work occurring within 15 meters (50 feet) of the find shall immediately stop until a qualified archaeologist, meeting the Secretary of the Interior's Professional Qualification Standards, can evaluate the significance of the find and determine whether additional study is warranted. This work exclusion buffer may be adjusted by the qualified archaeologist in consultation with the Water Authority. Depending upon the significance of the find under CEQA (14 CCR 15064.5(f); Public Resources Code section 21082), the archaeologist may simply record the find and allow work to continue. Prior to any disturbing investigative techniques, the feasibility of resource avoidance shall be considered. If the discovery proves significant,

additional work, such as preparation of an archaeological treatment plan, testing, or data recovery may be warranted and would be implemented by the Water Authority.

b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?

No. See response (a) above. In addition, the following mitigation measure is identified to ensure no significant impact to undiscovered archaeological resources:

Consistent with state and federal statutes, in the unlikely event that archaeological resources (sites, features, or artifacts) are encountered during Project development or ground-disturbing activities in the APE, all construction work occurring within 15 meters (50 feet) of the find shall immediately stop until a qualified archaeologist, meeting the Secretary of the Interior's Professional Qualification Standards, can evaluate the significance of the find and determine whether additional study is warranted. This work exclusion buffer may be adjusted by the qualified archaeologist in consultation with the Water Authority. Depending upon the significance of the find under CEQA (14 CCR 15064.5(f); Public Resources Code section 21082), the archaeologist may simply record the find and allow work to continue. Prior to any disturbing investigative techniques, the feasibility of resource avoidance shall be considered. If the discovery proves significant, additional work, such as preparation of an archaeological treatment plan, testing, or data recovery may be warranted and would be implemented by the Water Authority.

c) Disturb any human remains, including those interred outside of formal cemeteries?

No. *Appendix C* did not identify the presence of human remains. The California Health and Safety Code, Section 7050.5(b) addresses the event of discovery or recognition of any human remains in any location other than a dedicated cemetery. Work must stop until the county coroner can make a determination that the remains are not subject to provisions of Section 27491 of the Government Code. Therefore, the following mitigation measure is recommended for inclusion by the Water Authority in its contract with the Project construction firm to ensure no significant impact to unidentified human remains:

"In addition, if human remains are uncovered during construction, the Merced County Coroner is to be notified immediately to arrange their proper treatment and disposition. If the remains are identified on the basis of archaeological context, age, cultural associations, or biological traits to be those of a Native American, then the California Health and Safety Code 7050.5 and Public Resource Code 5097.98 require that the county coroner notify the NAHC within 24 hours of discovery. The NAHC will then identify the Most Likely Descendant, who will be afforded the opportunity to recommend treatment of the human remains following protocols in California Public Resources Code 5097.98." (pp. iv, 33)

1.6 ENERGY

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
VI. Energy.				
Would the project:				
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

1.6.1 Environmental Setting

The 2030 Merced County General Plan (2013) includes energy resources and efficiency policies within the Natural Resources Element. This element contains policies that “promote energy conservation practices and focus on renewable energy production within Merced County” (p. NR-4). Policy NR-2.9: Energy Conservation states: “Encourage and maximize energy conservation and identification of alternative energy sources (e.g., wind or solar)” (p. NR-5).

The County is also preparing a Climate Action Plan (CAP) defined as a long-range plan that outlines specific strategies to reduce greenhouse gas (GHG) emissions, and its creation is required by Merced County’s 2030 General Plan. This topic is described further in Section 1.8 of this Initial Study.

As stated in the Project Description (Section 1) section:

- ▶ Construction: The Proposed Project would involve limited use of construction equipment (excavators, backhoe, grader, roller-compactor, bottom-dump truck, side-dump truck, and water trucks) for the clean out of approximately 200 feet of existing ditch, reinforcement of an existing dam, and the construction of the reinforced concrete diversion structure. All construction vehicles will be Tier 4 compliant. The Proposed Project is expected to require no more than 10 workers per day during construction, for a total of 20 trips (to and from) per day. These Project trips would only be during the construction period, estimated to be three months/12 work weeks (for a total of 66 days) during the dry period, June through September.
- ▶ Operation: Operation of the Project would require periodic (<1 per week) visits to inspect condition and remove trash, which is not different from existing conditions. The Project contains no electrically operated components.

1.6.2 Discussion

- a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?

Project construction involves limited use of equipment and travel to the site during a three month period. The Proposed Project modifications would not result in a new significant impact to energy resources or in significant impacts to existing utilities and infrastructure from the short term, temporary construction period or the ongoing site inspections. The Proposed Project would eliminate local well pumping by replacing groundwater supplies with

surface water diversions from Mud Slough and Los Banos Creek, reducing the local electrical demand by approximately 160,000 kwh per year.

b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency

There is no conflict because the Project does not require energy resources to operate the modified conveyance system of water delivery to Newman Lake. The inspection trips by truck or by boat are the same as occur at present. Energy efficiency associated with the inspection vehicles can be expected to improve over time as they are replaced with newer models that meet California fuel efficiency standards.

1.7 GEOLOGY AND SOILS

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
VII. Geology and Soils.				
Would the project:				
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) 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 or based on other substantial evidence of a known fault? (Refer to California Geological Survey Special Publication 42.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
ii) Strong seismic ground shaking?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
iii) Seismic-related ground failure, including liquefaction?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
iv) Landslides?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Result in substantial soil erosion or the loss of topsoil?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) 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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994, as updated), creating substantial direct or indirect risks to life or property?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) 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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

1.7.1 Environmental Setting

Geology

The Project Area in Merced County contains the San Joaquin Fault Zone and is located east of the Ortigalita Fault. (<https://maps.conservation.ca.gov/cgs/fam/>)

According to the [Fresno County 2040 General Plan, Background Report](#) (Fresno County 2017), Chapter 8, Hazards and Safety (page 8-6):

"The Ortigalita fault zone is approximately 50 miles long, originating near Crow Creek in western Stanislaus County and extending southeast to a few miles north of Panoche in western Fresno County. Most of the fault is considered active due to displacement during Holocene time and is designated an earthquake fault zone under the Alquist-Priolo Earthquake Fault Zoning Act of 1994. As illustrated in Figure 4.20, the southernmost extension of the fault lies in Fresno County."

Concerning a high water table which affects the potential for liquefaction during a seismic event, the 2009 Grassland Bypass Project, Final EIS/EIR noted in Section 5.1.1 the following environmental setting:

"In the western San Joaquin Valley, sediments eroded from the Coast Range form gently sloping alluvial fans. The alluvium is more than 800 feet thick along the Coast Range and thins to 0 foot near the valley axis (Miller et al. 1971). The alluvium is a mixture of gravel, sand, silt, and clay.

"The groundwater system is divided into a lower confined zone and upper semiconfined zone, separated by the Corcoran Clay (Figure 5-2). In the upper fan areas, the water table is typically located several hundred feet below land surface. In contrast, most downslope areas are underlain by a shallow water table within 7 feet of land surface (Belitz and Heimes 1990). The shallow water table is located within the semiconfined zone, and tile drainage systems are employed to manage water table depth.

"Shallow water levels since 2000 continue to show spatial and seasonal variability, but have remained fairly stable over time (Figure 5-3); in some wells, water levels may have declined slightly as a result of long-term reductions in water table recharge and possible increases in pumpage (for example, Well 12S/12E-32J3)." (pp. 5-2, 5-3)

The 2030 Merced County General Plan (2013) includes a Health and Safety Element with geologic and seismic hazards policies. The overall goal is to minimize the loss of life, injury, and property damage of County residents due to seismic and geologic hazards. It is concerned with the location of new development and improvement of existing facilities, especially habitable structure. One policy requires earthquake resistant design for proposed critical structures including dams that are subject to County permitting requirements. For the Proposed Project, a levee is included, not a dam.

Soils

The surface soils of the San Joaquin Valley are a heterogeneous assemblage of alluvium consisting of channel gravels, riverbank sand, silt, and clay, derived from granitic and sedimentary sources (University of California Davis 2008; U.S. Department of Agriculture 2019, cited in AECOM 2019). Most of these sediments were deposited in the Pleistocene and Holocene during times of increased precipitation by runoff from the surrounding Sierra Nevada, Tehachapi, and Coastal ranges. The bedrock beneath the alluvium consists of older marine sediments deposited during the mid-Mesozoic to Cenozoic eras. A series of turbidity currents, likely caused by undersea earthquakes, landslides, or volcanic eruptions, moved large amounts of sediments downslope to a rapidly subsiding ocean basin. The variable and mixed marine sedimentary, volcanic, and metamorphic rock formations found in the San Joaquin Valley, such as mudstone, sandstone, shale, basalt, andesite, and serpentine, are the result of such erosions and depositions (DeCourten 2010, cited in AECOM 2019).

Concerning soil resource protection from erosion, contamination, and other effects that substantially reduce their value or lead to the creation of hazards, see the Natural Resources Element of the 2030 Merced County General Plan (Merced County 2013) section on Soil and Mineral Resources. One policy (NR-3.2) on soil erosion calls for minimal disturbance of vegetation during construction to improve soil stability, reduce erosion, and improve stormwater quality. The Project's construction activities would occur during dry weather in a flat wildlife habitat area, not on steep slopes.

Paleontological Resources

The results of an investigation by Applied Earth Works, Inc. (Æ), are attached to this Initial Study as *Appendix D. Paleontological Technical Memorandum for the Mud Slough Restoration Project, Merced County, California*. Key

background material and findings from this technical memorandum are included here and in the discussion (f) below. References cited below are listed in *Appendix D*.

The memorandum describes the surficial geology of the entire Project Area as consisting of flood basin deposits informally referred to as the Dos Palos Alluvium (Qdp) (Lettis, 1982). There is a vast exposure of the Modesto Formation (Qm) approximately 1 mile northeast of the Project Area and a much smaller exposure approximately 1 mile southwest of the Project Area. An extensive exposure of the San Luis Alluvium (Qsl) is approximately 2 miles west of the Project Area.

The surficial deposits of the Dos Palos Alluvium are unlikely to preserve fossils, as sediments less than 5,000 years old generally are too young for fossilization to occur (SVP, 2010). Records search results indicate that there are no known fossil localities in the Project Area or within any alluvial sediments in the vicinity or within a 10-mile radius. However, the sediments may overlie older deposits that are potentially fossiliferous. Geologic units of similar lithology have yielded a variety of significant fossils elsewhere in the Central Valley. For instance, the Modesto and Riverbank formations preserve an abundance of megafauna, including mammoth, camel, horse, saber-toothed cat, dire wolf, ground sloth, and bison as well as various rodents and reptiles dating from the Irvingtonian North American Land Mammal Age (NALMA) to Rancholabrean NALMA (middle to late Pleistocene ages) (Jefferson, 1991; Dundas, 2009).

1.7.2 Discussion

- a) **Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:**
- i) **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 or based on other substantial evidence of a known fault? (Refer to California Geological Survey Special Publication 42.)**

The Proposed Project is not located near a known fault, and the Proposed Project is not located in an area that would result in loss, injury, or death even in the unlikely event that a severe earthquake resulted in structural failure.
 - ii) **Strong seismic ground shaking?**

The Proposed Project does not include any elements that would result in property loss, injury, or death from substantial ground shaking.
 - iii) **Seismic-related ground failure, including liquefaction?**

The Proposed Project would not contribute to or increase risk due to ground failure or liquefaction beyond existing conditions.
 - iv) **Landslides?**

The Proposed Project is located within flat topography that will not be subject to risk of impacts from landslides.

b) Result in substantial soil erosion or the loss of topsoil?

Proposed Project construction will not be located within an area containing topsoil and will not increase erosion beyond existing conditions. Increased water surface elevations as a result of the Project will remain within the existing channels.

c) 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?

The Proposed Project site has sufficient stability to support the entire Proposed Project.

d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994, as updated), creating substantial direct or indirect risks to life or property?

The Proposed Project does not include elements that would attract the public and is not located in an area that could cause a substantial risk to life or property. In the extreme event of complete structural failure, site conditions would essentially revert to pre-project conditions.

e) 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?

The Proposed Project does not include any septic tanks or water disposal systems, nor are there any similar systems in the vicinity of the Project.

f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

There are no unique paleontological or unique geologic features in the Project Area, only shallower fan deposits that are called the Dos Palos Alluvium.

Æ used the Society of Vertebrate Paleontology (SVP, 2010) sensitivity criteria to determine the paleontological resource potential of geologic units within the Project Area. According to the results of the desktop studies and museum record searches, Æ assigns the Dos Palos Alluvium, and therefore the entire Project Area, to Low Potential for unique paleontological resources. While the subsurface extent of the Dos Palos Alluvium is not currently known, the maximum proposed depth of Project-related ground disturbance is 5 feet bgs (below ground surface), which would not likely impact deposits old enough to bear significant fossils. This suggests a less-than-significant impact to a unique paleontological resource.

However, there is the potential to encounter unanticipated fossils during construction. The following mitigation measures are recommended to ensure no significant impact to a fossil resource.

- Worker Environmental Awareness Program (WEAP) training of construction workers is necessary in order to recognize unanticipated fossils, if present, during Project construction. The Water Authority will include this requirement in the construction contractor solicitation for proposals (bids) for Project. If the contracted workers have not received this training previously, then training will be initiated prior to the start of construction. The WEAP training must be given by a qualified paleontologist.
- If unanticipated fossils are encountered during construction, all ground-disturbing activities within the area of the find will cease and the Water Authority will retain a qualified paleontologist to oversee the documentation of the extent and potential significance of the find as well as recovery efforts. If the fossil is significant per SVP (2010) criteria, then paleontological monitoring would be

conducted for further ground-disturbing activities in the Project Area. The frequency and duration of construction monitoring would be determined by the Water Authority in consultation with the project paleontologist on the basis of the nature and extent of the initial significant paleontological find.

1.8 GREENHOUSE GAS EMISSIONS

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
VIII. Greenhouse Gas Emissions.				
Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

1.8.1 Environmental Setting

Naturally occurring GHGs include water vapor (H₂O), carbon dioxide (CO₂), methane (CH₄), nitrous oxide (NO₂), and ozone (O₃). Several classes of halogenated substances that contain fluorine, chlorine, or bromine are also GHGs, but they are, for the most part, solely a product of industrial activities. Chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs) are halocarbons that contain chlorine, while halocarbons that contain bromine are referred to as bromofluorocarbons (i.e., halons). In the amended CEQA Guidelines Section 15364.5, greenhouse gas emissions (GHGs) include, but are not limited to, carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. In California, due to stringent air pollution control rules and regulations, natural gas is the only fossil fuel used to fire steam turbine, gas turbine, or combined cycle power plants. The primary concern here is for emissions that would be generated from equipment use (carbon dioxide and nitrous oxide through the burning of fossil fuels) rather than the emissions associated with ongoing agricultural practices (methane and nitrous oxide) and industrial activities (nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride). The GHG of most concern is CO₂; since it is generated in extremely large quantities by the burning of fossil fuels, can last in the atmosphere for two centuries, and forces climate change more than any other GHG. In California, CO₂ is the major component of power plant GHG emissions, about 99.995 percent.

The Proposed Project would involve limited use of construction equipment (excavators, backhoe, grader, roller-compact, bottom-dump truck, side-dump truck, and water trucks) for the clean out of approximately 1,500 feet of existing ditch and the construction of the reinforced concrete diversion structure. All construction vehicles will be Tier 4 compliant, and these activities are short term (i.e., approximately three months of construction time during June through September).

Plans, policies, and regulations are under consideration at the federal and state and regional levels, and they focus on energy efficiency for vehicle use and goals for reducing overall GHGs at the state level.

Regional and local policies for reducing GHGs include the following:

- ▶ **San Joaquin Valley Air Pollution Control District, Climate Change Action Plan.** The SJVAPCD adopted the Climate Change Action Plan (CCAP) in August 2008, which required the District Air Pollution Control Officer to develop guidance for assessing and reducing project-specific GHG emissions. In December 2009, the SJVAPCD adopted the "Guidance for Valley Land-use Agencies in Addressing GHG Emissions Impacts for New Projects Under CEQA". The SJVAPCD also adopted a new district policy, Addressing GHG Emission Impacts for Stationary Source Projects Under CEQA When Serving as the Lead Agency. Both the guidance and policy rely on Best Performance Standards (BPS), which assess the significance of project-specific GHG emissions. (page 9-4)

According to the Valley Air District (SJVAPCD), GHG emission from development projects, primarily occur through energy consumption and vehicle miles traveled (VMT). For development projects, BPS includes project design elements, land use decisions, and technologies that reduce GHG emissions. Project proponents can reduce GHG emissions from energy consumption through building designs that increase energy efficiency, water conservation, and the use of energy efficient appliances. For development projects, BPS also includes project design elements, land use decisions, and technologies that reduce GHG emissions during project operation over time. Project proponents can reduce GHG emissions from energy consumption through building designs that increase energy efficiency, water conservation, and the use of energy efficient appliances.

- ▶ **Merced County:** The Climate Change chapter of the Merced County General Plan Update Background Report (November 2012) provides the baseline emissions inventory for 1990 and 2005 for Merced County. The GHG emissions inventory is designed to assist policy makers and planners with identifying the current emission sources, relative contribution from each source, and the overall magnitude of Merced County's GHG emissions. This aids in development of more specific and effective policies and emissions control strategies to reduce GHG emissions consistent with State mandates (i.e., AB 32). Local governments, such as the County, will play a role in achieving the emission reduction goals mandated in AB 32 and SB 375. The County's 2012 Report (Chapter 12 Climate Change) found that:
 - Agricultural activities are the dominant source of GHG emissions within Merced County (69 percent of total 2010 emissions in unincorporated Merced County, and 42 percent of total 2010 countywide emissions, including the incorporated cities).
 - Transportation activities are the second leading source of GHG emissions (during 2010, 23 percent in unincorporated Merced County and 39 percent in total Merced County).
 - Agricultural activities in the unincorporated area include the raising of livestock that produce methane which has a greater impact on climate change than does carbon dioxide.

The 2030 Merced County General Plan (2013) Air Quality Element contains a section of greenhouse gas reduction and climate change adaptation. The policies in this section require energy conservation, greenhouse gas emission reduction, and global and local climate change adaptation. The policies are primarily focuses on specific types of development and land uses. They encourage all businesses to: replace high mileage fleet vehicles with more efficient and/or alternative fuel vehicles.

Merced County is in the process of developing a Climate Action Plan (CAP) "In general, a CAP is a long-range plan that outlines specific strategies to reduce greenhouse gas (GHG) emissions, and its creation is required by Merced County's 2030 General Plan. The County of Merced's CAP will set a baseline for past and current GHG emissions, included forecasts of future emissions, and established targets to help California reduce future emissions.

"California legislation mandates that California reach the following GHG reduction targets:

- Reduce GHG emissions to 1990 levels by 2020 (a target established by the Global Warming Solutions Act of 2006, also known as Assembly Bill (AB) 32)
- Reduce GHG emissions to 40 percent below 1990 levels by 2030 (a target established by Senate Bill (SB) 32)

"In the long term, the CAP will also help achieve multiple community goals such as lowering energy costs, reducing air pollution, supporting local economic development, and improving public health and quality of life." (Merced County 2020).

1.8.2 Discussion

a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

This equipment used to construct the Proposed Project involves the combustion of fossil fuels, a direct impact on the production of CO₂ and CH₄ with an indirect effect on CO₂ from the manufacturing of cement and from power production (generation of electricity from fossil fuels rather than hydropower) during project construction. The operation of the Project will not involve electrically- or fossil fuel-powered equipment and would not result in any new GHG emissions. Operation of the Project would require periodic (<1 per week) visits to inspect condition and remove trash, which is not different from existing conditions.

A CalTrans emissions model was used to estimate the impacts to air quality and emissions of GHGs for the construction of the Proposed Project. This modeling assumed simultaneous construction of all project components, providing a conservative, worst-case air quality and GHG emissions impact estimate. Table 3 below shows the results of the construction modeling by component as well as the total daily emissions if all components were being constructed at the same time (worst case).

Table 3. GHG Emissions from Project Construction

	NOx	ROG	PM10	PM2.5
<i>Threshold (lb per day)*</i>	<i>54</i>	<i>54</i>	<i>82</i>	<i>54</i>
Newman Lake Channel Cleanout + Culvert Daily Emissions (lb/day)	1.32	0.66	2.57	2.5
Mud Sl. Diverion + Los Banos Creek Spill Removal Daily Emissions (lb/day)	2.59	1.29	2.63	2.64
Newman Lake Dam Rehab. Daily Emissions (lb/day)	1.54	0.76	2.08	0.49
Total:	5.45	2.71	7.28	5.63

*Thresholds per Bay Area Air Quality Management District

In the absence of Valley Air District thresholds, the BAAQMD thresholds were used. Even with this conservative modeling approach, the estimated construction emissions (short term, peak emissions) are well below the thresholds of significance and result in a less-than-significant impact.

Operation of the Proposed Project will not contribute to GHG emissions compared to existing conditions, as there are no powered components associated with Project operation which is a continuation of existing conditions.

b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

The Valley Air District's CEQA guidelines are for land use agencies and apply to stationary sources and development projects (SJVAPCD 2009). The Proposed Project is not a stationary source of emissions associated with land development. Rather, emissions associated with the Project are limited to its construction only. There will not be emissions associated with the project once construction is complete. Although the Valley Air District has not developed GHG emission thresholds of significance, those thresholds have been developed by the Bay Area Air Quality Management District (BAAQMD). Because the GHG emissions are lower than the thresholds established by

the BAAQMD, it would not result in sufficient emissions to be more than a less-than-significant impact as stated above. Therefore, there is no impact on applicable plans and policies.

Merced County plans and policies focus on the primary sources of emissions: agriculture and transportation. The Mud Slough Restoration Project is focused on the enhancement of wetland habitat. Therefore, there is no impact on or inconsistency with applicable plans and policies.

1.9 HAZARDS AND HAZARDOUS MATERIALS

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
IX. Hazards and Hazardous Materials.				
Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and/or accident conditions involving the release of hazardous materials into the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) 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 a result, would it create a significant hazard to the public or the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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 result in a safety hazard or excessive noise for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

1.9.1 Environmental Setting

According to the California Health and Safety Code Section 25501(o), "hazardous material" means a material that, because of its quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or the environment. Hazardous materials include, but are not limited to, hazardous substances, hazardous waste, and any material which a handler or the administering regulatory agency has a reasonable basis for believing would be injurious to the health and safety of persons or harmful to the environment if released into the workplace or environment. A number of properties may cause a substance to be considered hazardous including toxicity, ignitibility, corrosivity, or reactivity.

The Health and Safety Element of the 2030 Merced County Plan (2013) contains policies governing hazardous materials and waste under the overall Goal HS-5 to protect residents, visitors, and property through providing for the safe use, storage, transport, and disposal of hazardous materials and wastes. (p. HS-5)

1.9.2 Discussion

- a) **Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?**

There would be no routine transport, use, or disposal of hazardous materials as defined above.

- b) **Create a significant hazard to the public or the environment through reasonably foreseeable upset and/or accident conditions involving the release of hazardous materials into the environment?**

While there is potential for construction equipment and vehicles to have an accidental release of petroleum products during transport to the Project site or while in use at the Project site, this accidental spill is likely to be less than 5 gallons of product which would not pose a hazard to people or the environment. Project BMPs on fuel, leaks, and spill containment and isolation provide for onsite cleanup of small spills and proper disposal of the spill material in compliance with local regulations. They will be required as a standard management practice for equipment and vehicle use for the Proposed Project as well and included in the Project construction company contract with the Water Authority. Given the use of this equipment in the wildlife refuge area on a very limited basis during three months of construction and access for inspections during operation, the impact would be less than significant.

- c) **Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?**

There are no hazardous emissions or materials proposed for use at the Project site located in a wildlife habitat area (China Island Unit) that is not within one-quarter mile of any school.

- d) **Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code §65962.5 and, as a result, would it create a significant hazard to the public or the environment?**

The Project activities would occur within a wildlife habitat area. It is not located on any hazardous materials disposal sites or sites with leaking underground storage tanks or other active cleanup and abatement activities (i.e., not on the "Cortese list").

- 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 result in a safety hazard or excessive noise for people residing or working in the project area?**

The Project site is not located within an airport land use plan or within 2 miles of a public use airport as it is within a wildlife refuge. The nearest public airport is Los Banos Municipal Airport which is a city-owned, public-use airport located nearly 20 miles south of the Proposed Project Area.

- f) **Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?**

Concerning emergency response plans of any public or private agency, the improvements would not interfere with access to people and animals in case of emergency or for them to use existing roadways identified in an emergency evacuation plan. No new canals/channels are being added, just a new culvert and road crossing. Existing roads are

sufficient to reach the spill structure and new diversion structure and to conduct other activities within the refuge. SR 140 would not be affected. Therefore, the Project will not impair implementation of, or physically interfere with, an emergency response or evacuation plan.

g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires?

Work within the Project site would not subject people to risk of wildland fires because all work and inspections occur within a wildlife refuge that is dominated by wetlands (Newman Lake and Mud Slough). Project construction during the dry months of June through September is subject to BMPs for possible leaks from equipment/vehicles and spill prevention practices. during the dry season, when recreationists (primarily duck hunters) are limited in number. The marsh and riparian habitat does not contain the type of vegetation that poses risk of a wildland fire. See Section 1.20.

1.10 HYDROLOGY AND WATER QUALITY

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
X. Hydrology and Water Quality.				
Would the project:				
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:				
i) Result in substantial on- or offsite erosion or siltation;	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
ii) Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
iii) 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; or	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
iv) Impede or redirect flood flows?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

1.10.1 Environmental Setting

Local Policy

The 2030 Merced County Plan (2013) elements that are most relevant to this discussion of surface water and groundwater and flood hazards are: (1) Health and Safety Element, Flood Hazards section, and (2) Water Element, Watershed Management section. Most of the flood hazard policies are concerned with the protection of urban land uses and structures from flooding. However, Policy HS-2.13: Open Space Use seeks to encourage open space uses in flood hazard areas (p. HS-4). The Watershed Management section includes the following goal to address all watershed users and beneficiaries:

“Goal W-4. Enhance and protect County watersheds through responsible water and land use management practices that address water bodies, open spaces, soils, recreation, habitat, vegetation, groundwater recharge, and development.” (p. W-6)

Existing Conditions

Historically, Mud Slough flowed through Newman Lake to the San Joaquin River. In the late 1990s, because of water quality concerns related to selenium, Mud Slough was routed around Newman Lake to facilitate the Grassland Bypass Project (GBP). A levee was placed between Mud Slough and Newman Lake to keep Mud Slough flows from entering the Lake. Since the installation of the levee, the water surface in Mud Slough has lowered; and it is no longer possible for Mud Slough to flow through Newman Lake at this location. The water quality concerns from GBP agricultural drainage have been eliminated; and it is now desired to reroute Mud Slough flows back into Newman Lake. *Appendix E, Mud Slough Restoration Project Hydrology Study*, is the basis for the analysis in this hydrology and water quality section. Furthermore, *Appendix A* includes a Figure 1 that depicts the Project Area and shows features discussed above and in the following paragraphs.

Newman Lake water levels have been sustained over the course of the GBP with Los Banos Creek flows and groundwater. Los Banos Creek flows are currently diverted into Newman Lake via a connection channel, and water levels in Los Banos Creek are maintained using an existing control structure in Los Banos Creek at the confluence of Los Banos Creek and Mud Slough (*Appendix D, Figure 1*).

Generally, Los Banos Creek flows are a small percentage of Mud Slough flows. Peak flows in Mud Slough and Los Banos Creek generally occur in March, begin in December, and can sustain through April in wet years. Flows diminish in May and are low through the Summer and begin to increase again in September. The area is prone to flooding during the winter months. Once the San Joaquin River reaches flood stage, backwater conditions develop in Mud Slough. When these conditions are present the banks of Mud Slough overtop and flooding occurs.

Mud Slough annual discharges and average monthly flows over the past decade are shown in *Appendix E, Tables 1 and 2*. The average annual discharge from Mud Slough is around 60,000 acre-feet. The anticipated annual water demand at Newman Lake is 1,663 acre-feet. This constitutes 2% (wet year) - 8% (critically dry year) of the annual Mud Slough inflow.

Poor water quality (primarily stagnant conditions with aquatic vegetation) can contribute to mosquito production. While residences are not in close proximity to the China Island wildlife refuge, mosquitoes can travel several miles, depending on the species. Of greatest concern to public health is the West Nile virus spread by the *Culex* species of mosquito, especially *Culex pipiens* and *Culex tarsalis* in California. A new invasive mosquito species found in Merced County is *Aedes aegypti* that can potentially spread diseases including Zika, dengue, and chikungunya.

Project Operation

To restore Mud Slough flows to Newman Lake, the existing control structure in Los Banos Creek will be removed and relocated downstream in Mud Slough. While the new proposed control structure will be larger to accommodate combined Mud Slough and Los Banos Creek flows, it serves the same purpose as the existing control structure. However, by relocating the control structure, it will be possible to divert both Los Banos Creek and Mud Slough flows.

The proposed control structure will consist of an overshot gate and broad-crested weir. The overshot gate provides the flexibility to control water level in a variety of low to moderate flow conditions, and the broad-crested weir provides additional capacity needed in high flow conditions.

The combination of Mud Slough and Los Banos Creek flows are adequate to meet water demand at Newman Lake in all except extremely dry conditions. Annual water demand at Newman Lake for waterfowl habitat and agriculture is 1,663 acre-feet, constituting 2%-8% of the total annual Mud Slough discharge, depending on water year type. Los Banos Creek discharge diminishes this percentage further. The proposed control structure will have little effect on downstream flows (see Table 5, *Appendix D*). The proposed control structure is not intended to divert all Mud Slough flows through Newman Lake, and the effect of doing so would not be desirable. Outside the primary

diversion period (September 5-January 10), most if not all Mud Slough flows will pass the proposed control structure and continue downstream.

The Proposed Project would construct a diversion structure within Mud Slough downstream of the confluence with Los Banos Creek. The purpose of this structure is to raise the water surface within Mud Slough upstream of structure so that a portion of Mud Slough and Los Banos Creek flows will pass through Newman Lake, where it can be diverted into refuge ponds to support waterfowl habitat. The Proposed Project would raise the normal water surface by up to 5 feet, and divert up to 10 cfs through an existing side channel and into Newman Lake. A portion of the flow from Newman Lake would be diverted for waterfowl habitat with the remaining water passing through a spill structure within the lake and back into Mud Slough. A bypass overshot gate will be included in the diversion structure and operated to maintain a minimum flow in Mud Slough downstream of the structure, as set forth in further detail in the Project Description (Section 1).

Project Construction

During the construction phase of the Proposed Project, sheetpile coffer dams will be installed to isolate and dewater the project site. Standard management practices will be followed to limit and control soil disturbances and ensure that any resulting short-term turbidity increase is insubstantial.

1.10.2 Discussion

a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?

Installation and removal of the sheetpile coffer dam may result in an increase of turbidity. Both the installation and removal of the sheetpile will be done using methods designed to limit and control any resulting turbidity impact. This increase will be short in duration, insubstantial in magnitude, and limited to the immediate vicinity of the Project site. This is a less-than-significant impact.

The Proposed Project will raise water levels upstream of the control structure from late September to January. The Project will deliver summer maintenance flows to Newman Lake. Delivery of maintenance flows will increase water levels upstream of the proposed control structure for a short duration (no more than 7 days). After the 7-day period, the gate will be opened and water levels will return to pre-project conditions. The Proposed Project will not raise water levels in Newman Lake higher than existing conditions, as summer maintenance flows occur under current conditions from groundwater. Because a majority of the Project effects occur during the fall and early winter months during periods of lower temperatures, it is not anticipated that the Project will have a significant effect on mosquito population (i.e., encourage new breeding activity). The short-term deliveries made in the summer months occur over a short duration and will not raise Newman Lake water levels higher than pre-project conditions. **b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?**

The Proposed Project will not reduce or degrade groundwater. The Proposed Project will reduce groundwater pumping offsite by providing surface water from Los Banos Creek and Mud Slough instead, a benefit to groundwater resources.

c) **Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:**

i) **Result in substantial on- or offsite erosion or siltation;**

Although the Proposed Project would increase the water surface elevation in Los Banos Creek and Mud Slough upstream of the diversion structure, flow will be retained within the existing banks and flow velocity would be reduced by an insignificant amount resulting in no additional erosion. Extreme precipitation events would result in high flows and flooding outside of the banks; however, this effect is not different from existing conditions.

A majority of the upstream hydrologic impacts associated with the new proposed control structure will manifest in low flow conditions with the gate raised to divert water to Newman Lake. Outside the diversion period, water levels will be kept below the top of the Newman Lake overflow dam and no diversions will be pumped out of Newman Lake. Consequently, a majority of the flow through both Mud Slough and Los Banos Creek will pass the proposed control structure and continue downstream toward the San Joaquin River. In addition to the Newman Lake overflow dam, a flashboard riser in Newman Lake is capable of passing small flows prior to spill at the overflow dam. The elevation of the weir board in the flashboard riser is 0.7' below the overflow dam, and is capable of passing up to 10 cfs prior to spill occurring at the overflow dam. During summer months, the water surface elevation in Newman Lake will be maintained roughly 0.5' below the top of the overflow dam, which is consistent with current conditions. If the weir board is left in its current position, this will correlate to a 5 cfs outflow from the lake. Remaining Mud Slough flows pass the proposed control structure. Outflows at Newman Lake can be manipulated as needed by adjusting the overshot gate position at the proposed control structure.

In above normal and wet years, summer inflows can sustain both downstream Mud Slough flows and maintain outflow at Newman Lake. In dry and critical years, summer inflows are minimal to non-existent. In these situations, regulation of the flows in Mud Slough and diversion to Newman Lake will be by operation of the overshot gate. In extremely dry conditions when the flows in Mud Slough are 20 cfs or less and deliveries to Newman Lake are occurring, the overshot gate will be adjusted so that 50% of the flow is diverted through Newman Lake and 50% of the flow is discharged downstream into Mud Slough.

During periods of high flow, including the primary diversion period of September 5 to January 10, diligent operation of the overshot gate will minimize upstream effects. However, when flood flows (in excess of 450 cfs) occur and backwater conditions develop in the San Joaquin River, flooding is unavoidable and is consistent with existing conditions.

ii) **Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;**

The Proposed Project would not increase flow as explained in (i) above and, therefore, would not substantially affect surface runoff.

Hydrologic impacts are explained further in *Appendix D*. Hydrologic Impacts were assessed by comparing the area inundated by Mud Slough flows both pre-project (gate open) and during diversions to Newman Lake (gate closed). The effects upstream of the proposed control structure were separated from the downstream effects. The impacts are separated because the upstream effects result in a net increase in inundated area, and the downstream effects result in a decrease in inundated area. The net loss of inundated area downstream of the proposed control structure is insubstantial as illustrated in *Appendix D*, Figures 6 and 7 and Table 5.

- iii) **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; or**

The Proposed Project would not create or contribute additional runoff/flows.

- iv) **Impede or redirect flood flows?**

The Proposed Project would redirect flows, including flood flows from Mud Slough into Newman Lake. Both Newman Lake and the proposed diversion structure include spill systems to bypass high flow conditions. Additionally, periodic seasonal flooding of the region is consistent with existing conditions and would not be exacerbated by the Proposed Project.

- d) **In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?**

The Proposed Project is not located in a flood hazard, tsunami, or seiche zone, or risk the release of pollutants. Periodic seasonal flooding within the refuge is consistent with existing conditions.

- e) **Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?**

The Proposed Project does not conflict with any water quality control plan by generating pollutants and does not adversely affect groundwater through withdrawals or extraction. The Proposed Project will reduce groundwater pumping offsite by providing surface water from Los Banos Creek and Mud Slough to Newman Lake.

1.11 LAND USE AND PLANNING

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XI. Land Use and Planning.				
Would the project:				
a) Physically divide an established community?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

1.11.1 Environmental Setting

The 2030 Merced County General Plan (2013) contains a Land Use and Community Character Element that focuses on urban and rural development. The policies in this element are not applicable to the Mud Slough Restoration Project which occurs in a wildlife refuge in proximity to agricultural land uses discussed in Section 1.2. The closest established communities are Newman and Gustine, approximately 4-5 miles to the east of the Project site.

1.11.2 Discussion

a) Physically divide an established community?

All of the proposed activities occur outside of the communities of Newman and Gustine, and there are no other residential or commercial enclaves that would be “divided”. Project activities occur entirely within the China Island Unit of the North Grasslands Wildlife Area and do not create any physical barriers that change the connectivity between any areas of a community. Connectivity is typically provided by roadways, pedestrian paths, and bicycle paths.

b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?

During development of the Mud Slough Restoration Plan, Project proponents coordinated closely with the California Department of Fish and Wildlife (CDFW), which manages the China Island Unit of the North Grasslands Wildlife Area. Modifications to the Proposed Project were made based on CDFW recommendations to maintain refuge and wetland habitat while meeting the project goals. There are no conflicts with any land use plan, policy, or existing regulation to mitigate an environmental effect.

1.12 MINERAL RESOURCES

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XII. Mineral Resources.				
Would the project:				
a) 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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) 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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

1.12.1 Environmental Setting

Mineral resources in Merced County are described in the following report: Mineral Land Classification of Merced County, California, Open File Report 99-08, by John P. Clinkenbeard, California Department of Conservation, Division of Mines and Geology, Sacramento, 1999.

In summary, approximately 38 square miles of Merced County, in ten resource areas, have been classified MRZ-2a or MRZ-2b for concrete aggregate in this study. This represents approximately 2% of the land area of the county. The ten identified resource areas contain an estimated 1.18 billion tons of concrete aggregate resources with approximately 574 million tons in western Merced County and approximately 605 million tons in eastern Merced County. (Due to the cost of transporting aggregate, two distinct market regions exist in Merced County, one in the west and one in the east.) In addition to concrete aggregate, parts of the county have been classified MRZ-3a for lode gold, clay, and diatomite/gypsite. These are areas in which further exploration might uncover significant deposits of the identified commodities. The alluvial deposits of the San Joaquin Valley support almost all of the current mining operations in Merced County and, historically, have supplied the majority of the county's construction aggregate needs. Occurrences of kaolinitic clay are associated with the Lone Formation in eastern Merced County. Most of the construction aggregate mined in the county has come from sand and gravel deposits along Los Banos Creek in western Merced County and the Merced River in eastern Merced County.

The 2030 Merced County General Plan (2013) includes policies covering soil and mineral resources in the Natural Resources Element. Under the overarching goal of facilitating orderly development and extraction of mineral resources while preserving open space, natural resources, and soil resources and avoiding or mitigating significant adverse impacts, there are policies to protect riparian and critical habitat that support threatened, endangered, or otherwise sensitive species. (pp. NR-5,6)

1.12.2 Discussion

- a) **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?**

The proposed activities to provide water to Newman Lake from both Los Banos Creek and Mud Slough would not impact known mineral resources in Merced County including sand and gravel. *Appendix B* identified the following soil types in the Project Area:

Eight soil types have been mapped in the Study Area in the Web Soil Survey (NRCS 2020a):

- 101—Agnal clay loam
- 104—Alros clay loam
- 143—Britto clay loam, ponded
- 173—Dospalos-Bolfar complex, occasionally flooded
- 175—Edminster loam
- 186—Fluvaquents, channeled
- 234—Pedcat loam, 0 to 2 percent slopes
- 256—Triangle clay

b) 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?

The Proposed Project is not located at an important mineral recovery site. The site is primarily used for wildlife habitat and recreation, including wildlife viewing, fishing, and duck hunting.

1.13 NOISE

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XIII.Noise.				
Would the project result in:				
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or in other applicable local, state, or federal standards?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Generation of excessive groundborne vibration or groundborne noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) For a project located within the vicinity of a private airstrip or 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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

1.13.1 Environmental Setting

Noise is generally defined as unwanted sound produced by human activities such as the operation of equipment that interfere with communication, work, rest, recreation, or sleep. The Noise section of the Health and Safety Element of the 2030 Merced County General Plan (2013) contains exterior noise standards for noise-sensitive areas affected by traffic, railroad, or airport noise sources in the County, including residential areas, hospitals, nursing homes, office buildings, playgrounds and parks, and others (Table HS-1, p. HS-10). Agriculture is not identified as a noise-sensitive land use. Both noise levels and ground vibration that exceed the standards are of concern. In addition to these and interior standards, there are policies in this section that address ways to reduce or eliminate existing and future conflicts between land uses and noise. Note Policy HS-7.3: Existing Rural Sources (RDR). Discourage new noise sensitive land uses in rural areas with authorized existing noise generating land uses (p. HS-12).

Community noise levels depend on the intensity of nearby human activity. Noise levels are generally considered low when ambient levels are below 45 dBA, moderate in the 45- to 60-dBA range, and high above 60 dBA. In rural and undeveloped areas, Ldn can fall below 35 dBA. Levels above 75 to 80 dBA are more common near major freeways and airports. Typical noise levels from both mobile and stationary sources are included in Table 4.

Table 4. Typical Stationary and Mobile Noise Source Sound Levels in dBA

Noise Source	Sound Level in dBA
Sprayer, handheld	10-20
Noise at ear level from rustling leaves	20
Room in a quiet dwelling at midnight	32
Soft whisper at 5 feet	34
Large department store	50 to 65
Room with window air conditioner	55
Leaf blower/vac	55-105
Conversational speech	60 to 75
Pump station equipment with noise abatement	62
Sprayer, powered, truck- or trailer-mounted	65-105
Passenger car at 50 feet	69
Vacuum cleaner in private home at 10 feet	69
Tractor, agricultural	76-110
Ringing alarm at 2 feet	80
Brush/weed cutter	90-97
Roof-top air conditioner	85
Small bulldozer (Cat D3) or excavator (Cat 320)	74-80
Heavy bulldozer at 50 feet	87
All-terrain vehicle (ATV)	87-109
Heavy city traffic	90
Lawn mower	91-98
Chainsaw	100-120
Jet aircraft at 500 feet overhead	115
Human pain threshold	120
Construction blast	120 to 145 at 50 feet

Sources: Equipment manufacturer specification sheets, Noise Control Reference Handbook, Industrial Acoustics Company

Note: **Bold** indicates equipment used in the Proposed Project.

The China Island Unit is part of the 7,400-acre North Grasslands Wildlife Management Area that is comprised of wetlands, riparian habitat, and uplands that are managed by CDFW for waterfowl habitat and hunting. Project improvements are planned on the southern portion of the China Island Unit that is predominantly floodplain on which no major land improvements have been made.

Newman Lake is part of a private hunting club that provides opportunities for members to hunt waterfowl. The China Island Unit is seasonally open to the public subject to CDFW hunting regulations on Department lands (i.e., between October 24 and January 31 for 2020-2021), See <https://wildlife.ca.gov/Hunting/Waterfowl#877768-regulations>. The Proposed Project's planned construction period is three months during the dry season (June through September). The types of equipment proposed for use are: excavators, backhoe, grader, roller-compactor, bottom-

dump truck, side-dump truck, and water trucks. An estimated 10 workers would be onsite during construction. Operation of the Proposed Project would not generate any noise or vibration.

1.13.2 Discussion

- a) **Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or in other applicable local, state, or federal standards?**

The construction period of three months (June through September) is when some equipment noise would be heard by anyone present in the wildlife refuge and by wildlife. However, the Newman Lake area is used for duck hunting during the winter months, and after construction is completed. Duck hunting involves potential noise from people, dogs, boats, and guns. Project operation does not involve equipment use beyond a truck to access the site. Construction activity would not occur in close proximity to any of the sensitive land uses within urban areas and would not increase ambient noise levels in populated areas in excess of local or other standards. While construction activities in wildlife habitat areas could disturb wildlife, this use is short term and temporary; and wildlife would be able to move away and return as desired given the scale of these habitat areas at Newman Lake and the refuge. This is a less-than-significant impact.

- b) **Generation of excessive groundborne vibration or groundborne noise levels?**

Project workers would be exposed to equipment noise and possible ground vibration that would be short term and temporary. Earphones can be worn if any noise levels are unhealthful to any individual worker. This is a less-than-significant impact.

- c) **For a project located within the vicinity of a private airstrip or 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?**

The Proposed Project is not located in an area covered by an airport land use plan, as there are no public airports within 2 miles of the construction site. Neither would the Proposed Project activities occur within the vicinity of a private airstrip.

1.14 POPULATION AND HOUSING

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XIV. Population and Housing.				
Would the project:				
a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

1.14.1 Environmental Setting

The Proposed Project occurs in a wildlife habitat area in close proximity to agricultural land. It involves no more than 10 workers onsite at any one time during the three month construction period and 1-2 workers during project operation to inspect the diversion structure, dam, and culvert with road crossing and to remove any trash, consistent with existing uses. A substantial impact is where the project would influence population growth and that growth could not be supported by existing or new public services (such as fire protection, police protection, schools, utilities, and other essential service provided by local governments).

The affected construction sites do not involve the direct removal of any existing housing units nor would Project features result in the indirect displacement of housing through any change in land use.

1.14.2 Discussion

- a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?

The Project is not large enough to need to attract workers from outside Merced County who would need to relocate. Nor would the improved water supply infrastructure serve any purpose other than conveyance to Newman Lake from Los Banos Creek and/or Mud Slough. Therefore, it would not stimulate the production of housing or worker relocation such that it would not induce any population growth.

- b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?

The affected construction sites do not involve the direct removal of any existing housing units nor would they result in the indirect displacement of housing through any change in land use.

1.15 PUBLIC SERVICES

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XV. Public Services.				
Would the project:				
a) 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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Police protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Schools?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Parks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Other public facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

1.15.1 Environmental Setting

The Proposed Project is designed to support existing wildlife habitat with an improved water supply conveyance system to handle 1,663 acre-feet per year from the Water Authority to Newman Lake. Water delivered to Newman Lake would be a combination of Los Banos Creek flows and Mud Slough flows, depending on hydraulic conditions at the time in both waterways. Excess flows in Newman Lake would flow out the existing spill dam at the north end of the lake. The proposed diversion structure would include a bypass spillway to divert extreme flows as well as maintain minimum flows to prevent dewatering of the downstream waterbody. Minimal channel excavation would be required to key the diversion structure into the channel bed and banks. A culvert at the Newman Lake connection channel would be constructed to facilitate access to the proposed diversion structure.

The North Grasslands Wildlife Area provides the following recreational opportunities: wildlife viewing, fishing, and hunting. Restricted hunter access occurs during waterfowl and pheasant hunting seasons. CDFW manages the China Island Unit, and Newman Lake provides private hunting opportunities (see Section 1.16). The Proposed Project supports these activities at their current level and would not bring more people into the area.

1.15.2 Discussion

- a) 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?

No. See below.

Police protection?

No. See below.

Schools?

No. See below.

Parks?

No. See below.

Other public facilities?

The Proposed Project modifications in the Newman Lake area do not add a substantial number of people whether as residents or as nonresident workers to the Project Area within Merced County who could then affect the levels of public services including the response time for public safety personnel or the capacity of sewage treatment plants, water plants, and solid waste disposal facilities.

1.16 RECREATION

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XVI. Recreation.				
Would the project:				
a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

1.16.1 Environmental Setting

The China Island Unit is part of the 7,400-acre North Grasslands Wildlife Area that is comprised of wetlands, riparian habitat, and uplands that are managed by CDFW for waterfowl habitat and hunting. Project improvements are planned on the southern portion of the China Island Unit that is predominantly floodplain on which no major land improvements have been made.

Newman Lake is part of a private hunting club that provides opportunities for members to hunt waterfowl. The China Island Unit is seasonally open to the public subject to CDFW hunting regulations on Department lands.

1.16.2 Discussion

- a) **Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?**

The Proposed Project modifications do not add activities that would affect urban recreation land uses, including neighborhood and regional parks that provide intensive recreational opportunities such as playgrounds and sports fields.

- b) **Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?**

The Proposed Project is designed to improve the conveyance of water into Newman Lake. It does not provide for any new recreation facilities. When ongoing inspections occur, any trash in the area would be removed which occurs under existing conditions and enhances the area for both wildlife and visitors.

1.17 TRANSPORTATION

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XVII. Transportation.				
Would the project:				
a) Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Result in inadequate emergency access?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

1.17.1 Environmental Setting

The 2030 Merced County General Plan (2013) contains a Transportation and Circulation Element that provides for the safe and efficient circulation of people, vehicles, and goods throughout the County. Roadways, rail, and air are the three primary travel conduits in Merced County. Policy CIR-1.8: Private Roadway Improvements provides for the following:

"Require private roads and related improvements to be designed and installed to County standards as contained in the Improvement Standards and Specifications Manual (Title 16 of County Code) and Subdivision Code (Title 17), unless it can be demonstrated to the satisfaction of the approval authority that alternative improvements will be provided sufficient to fulfill the goals and objectives of this Chapter and the respective Codes." (p. CIR-8)

The construction of the new facilities and dam/channel rehabilitation as part of the Proposed Project do not involve increases in vehicular traffic to regional roadways or the overall circulation system in the Project Area. With a maximum of 10 workers onsite for approximately three months (total of 20 trips per day on public roads if they travel independently), existing rural roads are sufficient to handle Project traffic consisting of five pickup trucks and SUVs once the other heavy equipment is onsite. Road access to the construction site is from SR 140 and by unimproved roads within the refuge and to Newman Lake. Heavy equipment is to be left onsite until the construction task is completed; it is not moved on local roadways on a daily basis.

1.17.2 Discussion

- a) **Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities?**

The Proposed Project modifications do not involve sufficient vehicular traffic to affect the function of any county or state roadways. Vehicle trips by the construction crew occur only during a three month construction period. The Project does not generate ongoing vehicle miles travelled on county or state roads and, therefore, would not conflict with circulation system policies.

b) Conflict or be inconsistent with CEQA Guidelines section 15064.3(b), which pertains to vehicle miles travelled?

The Proposed Project is a small water conveyance project located in a wildlife refuge within a rural, agricultural unincorporated area. It is not a land use or transportation project; therefore, this section is not applicable (i.e., no impact). Furthermore, the short-term, temporary construction aspect involving up to 10 workers onsite does not require a "vehicle miles travelled" (VMT) approach that identifies the amount and distance of automobile traffic attributable to the project. The VMT approach is most suitable for large projects that involve urban land uses and roadway capacity improvements.

c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

There is no design feature that would pose a hazard to the public. Proposed equipment is typical of earthwork type construction projects, is common to the area, and it would be used primarily in a Project Area where the majority of existing road use is by farm equipment and trucks. SR 140 is the exception, as it is used by through traffic to Merced and Highway 33. With only a maximum of 10 workers generating up to 20 trips per day (assuming one person per vehicle) during the Project construction period (three months, between June and September), these public routes would not experience traffic hazards due to the Project. Furthermore, construction equipment would be hauled to the Project site and stored onsite during its period of use over the construction period, rather than entering and exiting on a daily basis. Sediments removed from the channel to Newman Lake, rehabilitation of the Newman Lake Dam, and construction of the Mud Slough Diversion and Bypass and the new access road involve limited equipment use on the refuge access roads. With Project construction occurring during the dry season, visitors would be largely unaffected because their period of interest is primarily the winter duck hunting season.

d) Result in inadequate emergency access?

The proposed equipment use would not inhibit emergency access to any of the area. Equipment would not block local farm roads and wildlife refuge access roads to fire trucks and other response vehicles.

1.18 TRIBAL CULTURAL RESOURCES

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XVIII. Tribal Cultural Resources.				
Has a California Native American Tribe requested consultation in accordance with Public Resources Code section 21080.3.1(b)?	<input type="checkbox"/> Yes			<input checked="" type="checkbox"/> No
Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:				
a) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

1.18.1 Environmental Setting

PRC Section 21074 (a)(1)(A) and (B) defines tribal cultural resources as “sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe” and meets either of the following criteria: a. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or b. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1.

CEQA establishes a formal consultation process for California Native American tribes regarding the resource category defined as “tribal cultural resources.” The formal consultation process must be completed before a CEQA document can be released if a California Native American tribe traditionally and culturally affiliated with the geographic area of the proposed project requests consultation from the lead agency (PRC Section 21080.3.1). California Native American tribes to be included in the process are those that have requested notice of any proposed projects within the jurisdiction of the lead agency.

The *Cultural Resource Inventory* prepared for the Proposed Project (*Appendix C*) reported the following:

“On April 1, 2020, Applied EarthWorks, Inc. (Æ) requested the Native American Heritage Commission (NAHC) conduct a search of its Sacred Lands File and provide contact information for local Native American representatives who may have information about the APE. The NAHC responded on April 3, 2020, with its findings and attached a list of Native American tribes and individuals culturally affiliated with the APE. On April 27, 2020, Æ prepared and mailed an outreach letter to each of the contacts identified by the NAHC,

and on May 29, 2020, followed-up with email and telephone outreach. The outreach letter is standard best practices for a cultural resource inventory and is not part of a formal government-to-government consultation under NHPA Section 106 or CEQA Assembly Bill 52. Æ's record of correspondence is included in *Appendix C.*" (p. 19)

1.18.2 Discussion

Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

- a) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k)?

Section 1.5.2 (a) of this Initial Study explained that there are no historic properties within the APE; therefore, no historic properties or historical resources will be affected by the Proposed Project

- b) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe?

The NAHC responded to Æ's request on April 3, 2020, and stated that its search of the Sacred Lands File did not identify any sacred sites in the APE; however, the NAHC cautioned that the absence of information in the Sacred Lands File does not indicate the absence of Native American cultural resources within the APE (Appendix C). The NAHC supplied a list of tribal representatives to be contacted for information regarding locations of sacred or special sites of cultural and spiritual significance in the APE and surrounding 0.5-mile area, including:

Chairperson Valentin Lopez of the Amah Mutsun Tribal Band;

Chairperson Katherine Perez of the North Valley Yokuts Tribe; and

Chairperson William Leonard of the Southern Sierra Miwuk Nation

On April 27, 2020, Æ sent a letter describing the Project to each of the contacts identified above. Follow-up contact by email and telephone was completed on May 29, 2020. Chairperson Valentin Lopez of the Amah Mutsun Tribal Band responded by phone on May 29, 2020, and requested that Æ email him a copy of the outreach letter and map. PDF copies of the documents were sent to him via email that day. No additional responses have been received to date. Therefore, no information has been obtained to date on any resources significant to the three tribes contacted; there is no impact to tribal cultural resources from the Proposed Project.

1.19 UTILITIES AND SERVICE SYSTEMS

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XIX. Utilities and Service Systems.				
Would the project:				
a) Require or result in the relocation or construction of construction of new or expanded water, wastewater treatment or stormwater drainage, electric power, natural gas, or telecommunication facilities, the construction or relocation of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Result in a determination by the wastewater treatment provider that 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?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

1.19.1 Environmental Setting

As summarized in Section 1.15, the Proposed Project is designed to support existing wildlife habitat with an improved water supply conveyance system to handle 1,663 acre-feet per year from the Water Authority to Newman Lake. Water delivered to Newman Lake would be a combination of Los Banos Creek flows and Mud Slough flows, depending on hydraulic conditions at the time in both waterways. Excess flows in Newman Lake would flow out the existing spill dam at the north end of the lake that would be repaired and reinforced. At Mud Slough, a bypass spillway would be included to divert extreme flows as well as a low-flow bypass to prevent dewatering of the downstream waterbody. Minimal channel excavation would be required to key the diversion structure into the channel bed and banks. An access road would be constructed from the Mud Slough diversion and bypass structure to the culvert at the Newman Lake connection channel.

Silt removed from the channel into the south end of the Lake would be spoiled on-site. No offsite disposal is required. During Project construction, a portable toilet will be used and serviced regularly.

1.19.2 Discussion

- a) **Require or result in the relocation or construction of construction of new or expanded water, wastewater treatment or stormwater drainage, electric power, natural gas, or telecommunication facilities, the construction or relocation of which could cause significant environmental effects?**

There would be no discharge of wastewater to a community sewer system. No new wastewater treatment is needed, and no demand will be placed on existing municipal or private septic systems. No new water supply facilities would be installed. Conveyance improvements for water to Newman Lake will be completed, but these do not affect any public water treatment plants or water distribution lines.

- b) **Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?**

The Proposed Project modifications do not add residents or employment to the area such that no new water supplies are required. No new lands would be placed in agricultural production. No new wetlands would be created. The construction crew would bring their own daily water supply to the site.

- c) **Result in a determination by the wastewater treatment provider that 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?**

The water supply and conveyance project does not serve urban development or stimulate population or economic growth, and would not affect wastewater treatment system capacity. The construction crew would use a portable toilet.

- d) **Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?**

The Proposed Project would not generate sufficient solid waste that would require disposal at a local landfill. Sediments removed from the channel would be used onsite, not hauled away.

- e) **Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?**

The Mud Slough Restoration Project will comply with all solid waste regulations; however, an insubstantial amount of waste material would be generated. Soil and sediments can be reused within the Project site.

1.20 WILDFIRE

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XX. Wildfire.				
Is the project located in or near state responsibility areas or lands classified as high fire hazard severity zones?	<input type="checkbox"/> Yes		<input checked="" type="checkbox"/> No	
If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:				
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Require the installation of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

1.20.1 Environmental Setting

The 2018 California Strategic Fire Plan "...reflects CAL FIRE’s focus on (1) fire prevention and suppression activities to protect lives, property, and ecosystem services, and (2) natural resource management to maintain the state’s forests as a resilient carbon sink to meet California’s climate change goals and to serve as important habitat for adaptation and mitigation. A vision for a natural environment that is more fire resilient; buildings and infrastructure that are more fire resistant; and a society that is more aware of and responsive to the benefits and threats of wildland fire; all achieved through local, state, federal, tribal, and private partnerships."

CAL FIRE provides maps for the state of California showing zones of moderate, high and very high risk of fire severity.

In western Fresno and Merced County, a moderate fire severity zone has been identified adjacent to and westerly of Interstate 5 (I-5), which transitions to a high fire severity zone further west into the Coastal Mountain range. The most westerly component of the Proposed Project is located about 10 miles from I-5 and the zone identified as a moderate fire severity zone. None of the Project components are located within an identified fire hazard severity zone.

1.20.2 Discussion

- a) **Substantially impair an adopted emergency response plan or emergency evacuation plan?**

The Proposed Project is not located in or near a state responsibility area or high fire severity zone and will not impair any emergency response or evacuation plan in large part because it is within a wildlife habitat area that includes wetlands and other water features.

- b) **Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?**

Project occupants are mostly wildlife and people who engage in wildlife watching as this occurs at present (existing condition). The improvements to convey water to Newman Lake are in a low lying, relatively flat area, not on slopes with winds that exacerbate the risk of wildfires. During the construction period, onsite workers would carry fire suppression devices when operating construction equipment to ensure fire safety from equipment use.

- c) **Require the installation of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?**

The Proposed Project includes an access road within the site for construction and maintenance of the improvements. None of the Project elements require the installation of any associated infrastructure (such as power lines) that could exacerbate wildfire risk.

- d) **Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?**

The Project would not expose people or structures to significant risks. The Project is located in a relatively flat area and does not include changes to topography that would increase the risk of downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes.

1.21 MANDATORY FINDINGS OF SIGNIFICANCE

ENVIRONMENTAL ISSUES	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
XXI. Mandatory Findings of Significance.				
a) Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of an endangered, rare, or threatened species, or eliminate important examples of the major periods of California history or prehistory?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Does the project have impacts that are individually limited, but cumulatively considerable? (“Cumulatively considerable” means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
c) Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Discussion

- a) Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of an endangered, rare, or threatened species, or eliminate important examples of the major periods of California history or prehistory?

The Proposed Project is designed to improve the quality of the habitat at Newman Lake and its vicinity. Water delivered to Newman Lake would be a combination of Los Banos Creek flows and Mud Slough flows, depending on hydraulic conditions at the time in both waterways. The average annual discharge from Mud Slough is around 60,000 acre-feet. The anticipated annual water demand at Newman Lake is 1,663 acre-feet. This constitutes 2% (wet year) - 8% (critically dry year) of the annual Mud Slough inflow. Excess flows in Newman Lake would flow out the existing spill dam at the north end of the Lake and proceed to the San Joaquin River. Minimal channel excavation would be required to key the diversion structure into the channel bed and banks. The total construction footprint (including staging area) is estimated to be 1.4 acres. Construction-related activities would involve site preparation, cofferdam installation and removal, clean riprap rock placement, removal of the existing Los Banos Creek spillway structure and associated appurtenances, and restoration of the shoreline. Each of these activities has the potential to disturb soils and discharge or resuspend sediments and increase turbidity in the immediate vicinity and downstream of the construction site.

This Initial Study and its Appendices address all potential environmental effects associated with construction and operation of the Proposed Project, including direct and indirect impacts in each resource area in the Environmental Checklist. Potential impacts of the Proposed Project on the physical environment are less than significant with implementation of mitigation measures, as explained in Section 1.4 (discussing potential impacts and mitigation measures related to biological resources, including rare plants, rare wildlife species and sensitive habitats, and fish and aquatic resources), 1.5 (discussing potential impacts and mitigation measures related to cultural resources, including historical and archaeological resources), and 1.7 (discussing potential impacts to paleontological resources). Therefore, the Proposed Project does not have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory, as discussed in the previous sections of the Environmental Checklist.

b) Does the project have impacts that are individually limited, but cumulatively considerable? (“Cumulatively considerable” means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)

As described in the discussions in the Environmental Checklist Sections 1.1 through 1.20, the Proposed Project would have no impact, a less-than-significant impact, or a less-than-significant impact after mitigation with respect to all environmental resource areas. Individually limited impacts are described in the individual resource sections: Air Quality, Biological Resources, Cultural Resources, Paleontological Resources, Greenhouse Gas Emissions, Hazardous Materials, Hydrology, and Noise. The incremental impacts of the Proposed Project, when viewed in connection with the effects of ongoing activities in the Project vicinity in adjacent agricultural lands, at the wildlife refuge, and along the San Joaquin River, are not cumulatively considerable as explained below.

Air Quality

The increase in emissions/particulate matter from the Mud Slough Restoration Project construction is insubstantial in large part due to limited ground disturbance/trenching. Contributions to emissions and particulates are from the use of equipment for construction of the Project that are insubstantial as well as short term and temporary (over a three-month period) and that are removed from sensitive receptors in a wetland habitat area within a larger wildlife habitat and agricultural area, north of SR 140. A water truck would be used to minimize dust at the construction sites, and all construction vehicles would be Tier 4 compliant. Sediments removed as a result of the delivery ditch cleanout will retain sufficient moisture to prevent dust generation and will be spread along the existing ditch levee. These short term, insubstantial construction impacts would not be cumulatively considerable within the Valley Air District.

Biological Resources

The potential impacts to biological resources such as a sensitive species or vegetation community would be due primarily to potential disturbance from short-term construction activities within the Project site but also due to Project operation including inundation area changes. Construction-related activities would involve site preparation, cofferdam installation and removal, clean riprap rock placement, removal of the existing Los Banos Creek spillway structure and associated appurtenances, Connection Channel cleaning, and restoration of areas temporarily disturbed during construction.

Vegetation: The incremental impact of a loss of up to 0.42 acres of Coulter’s goldfields habitat does not pose a risk to the overall population of this species in the Project vicinity, given its adaptability to hydrologic conditions. Therefore, the Proposed Project would not cause a cumulatively significant impact. Construction activities resulting in a permanent loss of 0.212 acres of Coastal and Valley Freshwater Marsh and 0.066 acres of Open Water can be

mitigated such that there is no residual impact that would contribute substantially to a cumulative impact to these resources within the Project vicinity.

Wildlife: The impacts to species described in Section 1.4.1 would not affect the health and size of populations of the affected species in the Project vicinity over time. Therefore, the Project would not contribute to a cumulative impact in the Project vicinity.

Fish: Given the substantial efforts under the San Joaquin River Restoration Program (SJRRP,) to modify substantially river flows in order to restore salmon runs and related riparian habitat to the upper San Joaquin River (above Vernalis, see <https://www.restoresjr.net>), the primary cumulative impact issue is whether the Proposed Project could impact this restoration effort. The response is the Project would not have a substantial cumulative impact for reasons explained below.

Implementation of the Proposed Project will have short-term construction-related impacts and less-than-significant long-term- operational and maintenance-related impacts on fishery resources of the San Joaquin River and Mud Slough in the vicinity of the Proposed Project. The potential for construction-related impacts on fish, including special-status fish, largely will be avoided by implementing the mitigation measure to restrict the construction window to a period when sensitive species and life stages will not be present, or present in low abundance, and by implementing the Project BMPs. Project impacts to fish and other aquatic resources in the Project Area would not be incrementally significant. Nor would these insubstantial incremental effects trigger or contribute to a cumulative impacts on fish species or habitat occurring in the Project vicinity (including the San Joaquin River).. Water quality impacts on fish and aquatic invertebrate communities, and aquatic habitats, including EFH for Pacific salmon, of the San Joaquin River and Mud Slough, would not be cumulatively considerable.

As reported in *Appendix B*: The Mud Slough diversion structure would form a complete barrier to upstream passage of fish into portions of Mud Slough and Los Banos Creek when the control gate is closed for diversions and an impediment to migration when the control gate is open during the summer period. However, habitat conditions for special-status fish species are poor under existing conditions and do not provide suitable habitat for spawning and juvenile rearing by sensitive fish species such as Chinook salmon, steelhead, sturgeon, and others.

The diversion structure would alter local hydrologic patterns by redirecting flow that would have passed downstream in Mud Slough into the lower San Joaquin River, into Newman Lake during the high flow winter months. A low-flow bypass is included in the Mud Slough diversion structure to provide instream flows in Mud Slough downstream of the diversion year-round to support resident fish and avoid dewatering aquatic habitat. The Proposed Project also includes a surface spillway to convey higher flows downstream into Mud Slough which would be similar to those that occurred under existing baseline conditions. Diversions by the Proposed Project will have no effect on instream flow releases from Friant Dam into the San Joaquin River. The diversion would be limited to 10 cfs or less depending on demand and hydrologic conditions with Mud Slough and Los Banos Creek and, therefore, would have a less-than-significant impact on: (1) instream flows within the San Joaquin River downstream of the confluence with Mud Slough, (2) flow-survival relationships for migratory fish such as juvenile Chinook salmon, (3) adult attraction flows in the lower San Joaquin River, (4) Delta inflow and outflows, (5) flow-abundance relationships for longfin smelt and other estuarine fish species, and (5) the location of the low salinity zone within the Bay-Delta estuary. Based on these considerations, the Proposed Project construction and operation is expected to result in an insubstantial incremental impact on special-status fish species and their habitat (10 cfs or less), but the overall impact is considered to be less than significant and not cumulatively considerable.

With implementation of the Project BMPs, the direct construction-related impacts, diversion structure, infrastructure removal, hydrologic and the long-term operations and maintenance impacts of the Proposed Project on fish and aquatic habitat are substantially avoided or reduced. As a result of including year-round bypass flow releases from the Proposed Project to avoid dewatering the downstream reach of Mud Slough, limiting maximum diversion rate to less than 10 cfs, and providing a surface spillway to convey water downstream during high flow events, potential effects of the diversion on instream habitat within Mud Slough, lower San Joaquin River, and Bay-Delta estuary are considered to be less than significant and do not contribute to cumulative impacts in the San Joaquin River and Bay-Delta estuary.

Cultural Resources

There are no previously recorded archaeological sites within the APE. An archaeological pedestrian survey did not identify prehistoric or historic-era archaeological sites, features, or isolated artifacts on the ground surface. A presence/absence testing for cultural material using hand-excavated augers and shovel probes in two areas of the APE was conducted to better assess the probability that the undertaking would impact historic properties/historical resources. This testing yielded no cultural material. Thus, there are no historic properties within the APE; therefore, no historic properties or historical resources would be affected by the proposed undertaking. No important examples of prehistoric or historic cultural resources would be removed or damaged by the new Project features to support water delivery to Newman Lake. Ongoing coordination with resources agencies and affected tribes will maintain impacts to either no impact or a less-than-significant level. Mitigation measures are to be incorporated into construction contracts to minimize the potential for impacts to unknown buried resources and human remains if present. In conclusion, there would be no cumulatively considerable impact to historical and archaeological resources in the Project Area and vicinity.

Geology/Paleontology

For the Project Area, the paleontological resource potential of geologic units within the Dos Palos Alluvium has Low Potential for unique paleontological and geologic resources. While the subsurface extent of the Dos Palos Alluvium is not currently known, the maximum proposed depth of Project-related ground disturbance is 5 feet bgs, which would not likely impact deposits old enough to bear significant fossils. This suggests a less-than-significant impact to a unique paleontological resource. However, there is the potential to encounter unanticipated fossils during construction, and mitigation measures are recommended to ensure no significant impact to an undiscovered fossil resource. As a result, the Proposed Project would not contribute to a cumulative impact to paleontological resources in the Project Area and vicinity.

Greenhouse Gas Emissions

As provided in Section 1.8, GHG emissions are estimated to be substantially less than the significance thresholds developed by the BAAQMD. Considering that the construction impacts would occur only during a three-month period, and that standard management practices (such as Tier 4 compliant vehicles) will be implemented, this impact is less than significant. Operational impacts are limited to inspections of the Project site, as occurs at present. In summary, emissions are insubstantial and would not contribute significantly to regional emissions.

Hazards/Hazardous Materials

Project best management practices for avoidance and containment of potential leaks and spills of hazardous materials such as equipment fuel and oil would keep this potential impact to water quality, wildlife, and workers onsite to less than significant. There is no hazardous materials issue in the wildlife refuge and in the San Joaquin River that would result in a cumulative impact from the limited amount of vehicle and equipment use at the Project site.

Hydrology:

The Proposed Project would not impact water quality in Los Banos Creek, Mud Slough and Newman Lake, and the San Joaquin River compared to existing conditions beyond a short-term turbidity increase during construction at the coffer dam. There would be no additional erosion of existing banks, but flooding outside of the banks could occur, similar to existing conditions. Inundated areas would not change significantly (an insubstantial net loss).

The Mud Slough Diversion Structure, constructed downstream of the confluence of Los Banos Creek and Mud Slough, will span the entire width of Mud Slough with a crest elevation 4 to 8 feet high. It will result in changes in water levels—including a 1.5 to 5-foot increase in the depth of Mud Slough between the diversion structure and Highway 140, and a reduction in Mud Slough flow downstream of the diversion structure of up to 10 cfs, although the depth of Mud Slough would be essentially the same as pre-project conditions. The diversion structure is expected to reduce the flow of water downstream and may impact a limited amount and quality of habitat that would not be cumulatively considerable in the Project Area and vicinity.

Installation and removal of the sheetpile coffer dam may result in an increase of turbidity. Both the installation and removal of the sheetpile will be done using methods designed to minimize turbidity impact. This increase will be short in duration, small in magnitude, and limited to the immediate vicinity of the Project site rather than to other portions of the San Joaquin River system such that there would be, no cumulative impact.

A majority of the upstream hydrologic impacts associated with the new proposed control structure would occur in low flow conditions with the gate raised to divert water to Newman Lake. Outside the diversion period, water levels will be kept below the top of the Newman Lake overflow dam and no diversions will be pumped out of Newman Lake. Consequently, a majority of the flow through both Mud Slough and Los Banos Creek will pass the proposed control structure and continue downstream toward the San Joaquin River. Therefore, the Project flows would not trigger or have a significant cumulative impact on San Joaquin River flows.

The net loss of inundated area downstream of the proposed control structure is insubstantial.

The Proposed Project would redirect flows, including flood flows from Mud Slough into Newman Lake. Both Newman Lake and the proposed diversion structure include spill systems to bypass high flow conditions. Additionally, periodic seasonal flooding of the region is consistent with existing conditions and would not be exacerbated by the Proposed Project. There would be no cumulative impact on regional flooding.

Noise

The construction period of three months (during June through September) is when some equipment noise would be heard by anyone present in the wildlife refuge and by wildlife. However, the Newman Lake area is subject to duck hunting at present during the winter months, and after construction is completed. Project operation does not involve equipment use beyond a truck to access the site. Construction activity would not occur in close proximity to any of the sensitive land uses within urban areas. While construction activities in wildlife habitat areas could disturb wildlife over a three-month period, wildlife would be able to move away and return as desired given the scale of these habitat areas at Newman Lake and the refuge. This is a less-than-significant impact that would not have a cumulative impact on noise in the wildlife refuge in the Project Area and vicinity

c) Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?

In general, impacts to human beings are associated with air quality, hazards and hazardous materials, traffic hazards, and noise impacts. As detailed in the preceding sections, the Proposed Project as mitigated would not result, either directly or indirectly, in significant impacts in these resource areas. Further, because the Proposed Project modifications for water delivery to Newman Lake do not encourage employment and population growth, do not impact public facilities or residential areas, and do not degrade air quality, the Proposed Project has no environmental effects that would cause substantial effects on human beings.

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Personal Communications

- Joseph McGahan for SLDMWA, Ron DePauw and Mark Trinta for Newman Land Company, and CDFW China Island wetland management staff; 12/6/2019, 3/17/2020, 6/22/2020
- Joseph McGahan for SLDMWA and CDFW China Island wetland management staff; 08/21/2020

Authority for the Environmental Checklist: Public Resources Code Sections 21083, 21083.5.

Reference: Government Code Sections 65088.4.

Public Resources Code Sections 21080, 21083.5, 21095; *Eureka Citizens for Responsible Govt. v. City of Eureka* (2007) 147 Cal.App.4th 357; *Protect the Historic Amador Waterways v. Amador Water Agency* (2004) 116 Cal.App.4th at 1109; *San Franciscans Upholding the Downtown Plan v. City and County of San Francisco* (2002) 102 Cal.App.4th 656.