

Appendix 3.F, General Avoidance and Minimization Measures

3.F General Avoidance and Minimization Measures

3.F.1 Introduction

The general avoidance and minimization measures (AMMs) described here have been developed to avoid and minimize effects that could result from the proposed action (PA) on listed species, defined to include the species listed in Table 1-3 of the biological assessment. These AMMs will be implemented as specified in the PA¹ (Chapter 3). General AMMs are implemented at all phases of a project, from siting through design and construction, and on to operations and maintenance. Table 3.F-1 briefly summarizes the general AMMs.

Table 3.F-1. Summary of the General Avoidance and Minimization Measures

Number	Title	Summary
AMM1	Worker Awareness Training	Includes procedures and training requirements to educate construction personnel on the applicable environmental rules and regulations, the types of sensitive resources in the project area, and the measures required to avoid and minimize effects on these resources.
AMM2	Construction Best Management Practices and Monitoring	Standard practices and measures that will be implemented prior to, during, and after construction to avoid or minimize effects of construction activities on sensitive resources (e.g., species, habitat), and monitoring protocols for verifying the protection provided by the implemented measures.
AMM3	Stormwater Pollution Prevention Plan	Includes measures that will be implemented to minimize pollutants in stormwater discharges during and after construction, and that will be incorporated into a stormwater pollution prevention plan to prevent water quality degradation related to project area runoff to receiving waters.
AMM4	Erosion and Sediment Control Plan	Includes measures that will be implemented for ground-disturbing activities to control short-term and long-term erosion and sedimentation effects and to restore soils and vegetation in areas affected by construction activities, and that will be incorporated into plans developed and implemented as part of the National Pollutant Discharge Elimination System permitting process for covered activities.
AMM5	Spill Prevention, Containment, and Countermeasure Plan	Includes measures to prevent and respond to spills of hazardous material that could affect navigable waters, as well as emergency notification procedures.
AMM6	Disposal and Reuse of Spoils, Reusable Tunnel Material, and Dredged Material	Includes measures for handling, storage, and disposal of excavation or dredge spoils and reusable tunnel material, including procedures for the chemical characterization of this material or the decant water to comply with permit requirements, and reducing potential effects on aquatic habitat, as well as specific measures to avoid and minimize effects on species in the areas where reusable tunnel material would be used or disposed.
AMM7	Barge Operations Plan	Includes measures to avoid or minimize effects on aquatic species and habitat related to barge operations by establishing specific protocols for the operation of all project-related vessels at the construction and/or barge landing sites. Also includes monitoring protocols to verify compliance with the plan and procedures for contingency plans.

¹ Note that the PA, including the AMMs presented in this appendix, has not yet received approval. Consistent with the environmental review process under various regulatory requirements, the PA including these AMMs might require revision.

Number	Title	Summary
AMM8	Fish Rescue and Salvage Plan	Includes measures that detail procedures for fish rescue and salvage to avoid and minimize the number of Chinook salmon, steelhead, green sturgeon, and other listed species of fish stranded during construction activities, especially during the placement and removal of cofferdams at the intake construction sites.
AMM9	Underwater Sound Control and Abatement Plan	Includes measures to minimize the effects of underwater construction noise on fish, particularly from impact pile driving activities. Potential effects of pile driving will be minimized by restricting work to the least sensitive period of the year and by controlling or abating underwater noise generated during pile driving.
AMM10	Methylmercury Management	Design and construct wetland mitigation sites to minimize ecological risks of methylmercury production.
AMM11	Design Standards and Building Codes	Ensure that the standards, guidelines, and codes, which establish minimum design criteria and construction requirements for project facilities, will be followed. Follow any other standards, guidelines, and code requirements that are promulgated during the detailed design and construction phases and during operation of the conveyance facilities.
AMM12	Transmission Line Design and Alignment Guidelines	Design the alignment of proposed transmission lines to minimize impacts on sensitive terrestrial and aquatic habitats when siting poles and towers. Restore disturbed areas to preconstruction conditions. In agricultural areas, implement additional best management practices (BMPs). Site transmission lines to avoid greater sandhill crane roost sites or, for temporary roost sites, relocate roost sites prior to construction if needed. Site transmission lines to minimize bird strike risk.
AMM13	Noise Abatement	Develop and implement a plan to avoid or reduce the potential in-air noise impacts related to construction, maintenance, and operations.
AMM14	Hazardous Material Management	Develop and implement site-specific plans that will provide detailed information on the types of hazardous materials used or stored at all sites associated with the water conveyance facilities and required emergency-response procedures in case of a spill. Before construction activities begin, establish a specific protocol for the proper handling and disposal of hazardous materials.
AMM15	Construction Site Security	Provide all security personnel with environmental training similar to that of onsite construction workers, so that they understand the environmental conditions and issues associated with the various areas for which they are responsible at a given time.
AMM16	Fugitive Dust Control	Implement basic and enhanced control measures at all construction and staging areas to reduce construction-related fugitive dust and ensure the project commitments are appropriately implemented before and during construction, and that proper documentation procedures are followed.
AMM17	Notification of Activities in Waterways	Before in-water construction or maintenance activities begin, notify appropriate agency representatives when these activities could affect water quality or aquatic species.

The PA has been designed to avoid and minimize effects on listed species. DWR will ensure that activities under the PA are sited and designed to minimize take of listed species, by means of the applicable AMMs. During the project design phase, measures set forth in AMMs to avoid and minimize effects on listed species will be included in the following plans developed as needed to comply with state and federal regulations.

- Stormwater pollution prevention plan (SWPPP) as required by the Central Valley Regional Water Quality Control Board (AMM3).
- Erosion and sediment control plan (AMM4).

- Spill prevention, containment, and countermeasure (SPCC) plan (AMM5).
- Disposal and reuse of spoils, reusable tunnel material (RTM), and dredged material (AMM6).
- Barge operations plan (AMM7).
- Fish rescue and salvage plan (AMM8).
- Underwater sound control and abatement plan (AMM9).

3.F.2 Avoidance and Minimization Measures

3.F.2.1 AMM1 Worker Awareness Training

DWR or its designees will provide training to field management and construction personnel on the importance of protecting sensitive natural resources (i.e., listed species and designated critical and/or suitable habitat for listed species). Training will be conducted during preconstruction meetings so that construction personnel are aware of their responsibilities and the importance of compliance. All trainees will be required to sign a sheet indicating their attendance and completion of environmental training. The training sheets will be provided to the fish and wildlife agencies if requested. These requirements also pertain to operations and maintenance personnel working in and adjacent to suitable habitat for listed species.

Construction personnel will be educated on the types of sensitive resources located in the project area and the measures required to avoid and minimize effects on these resources. Materials covered in the training program will include environmental rules and regulations for the specific project, requirements for limiting activities to approved work areas, timing restrictions, and avoidance of sensitive resource areas. In general, trainings will include the following components.

- Important timing windows for listed species (i.e., timing of fish migration, spawning, and rearing; and wildlife mating, nesting, and fledging).
- Specific training related to the relevant AMMs that will be implemented during construction for the protection of listed species and their habitat.
- The legal requirements for resource avoidance and protection.
- Identification of listed species potentially affected at the worksite, which will depend upon the work to be performed and the location of the work.
- Protocol for identifying the proper AMMs to implement for the protection of listed species based upon the nature, timing, and location of construction activities to be performed.
- Brief discussions of listed species of concern.

- Boundaries of the work area.
- Avoidance and minimization commitments.
- Exclusion and construction fencing methods.
- Roles and responsibilities.
- What to do when listed species are encountered (dead, injured, stressed, or entrapped) in work areas.
- Penalties for noncompliance.

A fact sheet or other supporting materials containing this information will be prepared and will be distributed along with a list of contacts (names, numbers, and affiliations) prior to initiating construction activities. A representative will be appointed by the project proponent to be the primary point of contact for any employee or contractor who might inadvertently take a listed species, or a representative will be identified during the employee education program and the representative's name and telephone number provided to the fish and wildlife agencies.

If new construction personnel are added to the project, the contractor will ensure that the personnel receive the mandatory training and sign a sheet indicating their attendance and completion of the environmental training before starting work. The training sheets for new construction personnel will be provided to the fish and wildlife agencies, if requested.

3.F.2.2 AMM2 Construction Best Management Practices and Monitoring

All construction and operation and maintenance activities in and adjacent to suitable habitat for listed species will implement BMPs and have construction monitored by a qualified technical specialist(s). Depending on the resource of concern and construction timing, construction activities and areas will be monitored for compliance with water quality regulations (SWPPP monitoring) and with AMMs developed for sensitive biological resources (biological monitoring).

Before initiating construction, DWR or its designee will prepare a construction monitoring plan for the protection of listed species. The plan will include, but not be limited to, the following elements.

- Reference to or inclusion of the SWPPP prepared under the Construction General Permit (CGP), where one is needed (AMM3).
- Summaries or copies of planning and preconstruction surveys (if applicable) for listed species.
- Description of AMMs to be implemented.
- Descriptions of monitoring parameters (e.g., turbidity), including the specific activities to be monitored (e.g., dredging, grading activities) and monitoring frequency and duration

(e.g., once per hour during all in-water construction activities), as well as parameters and reporting criteria.

- Description of the onsite authority of the monitors to modify construction activity and protocols for notifying CDFW, NMFS, and USFWS, if needed.
- A daily monitoring log prepared by the construction monitor, which documents the day's construction activities, notes any problems identified and solutions implemented to rectify those problems, and notifies the construction superintendent and/or the fish and wildlife agencies of any exceedances of specific parameters (e.g., turbidity) or observations of listed species. The monitoring log will also document construction start/end times, weather and general site conditions, and any other relevant information.

The following measures will be implemented prior to and during performance of the proposed action, for the protection of listed species and their habitat.

- All in-water construction activities within jurisdictional waters will be conducted during the ~~allowable following~~ in-water work windows ~~established by authorities having jurisdiction (USFWS, NMFS, and CDFW) for the protection of listed species:~~
Geotechnical exploration: August 1 to October 31;
Barge landings: July 1 to August 31;
NDDs: June 1 to October 31, except that in-water impact pile driving is limited to June 15 to September 15;
CCF and Banks/Jones Connections: July 1 to to October 31; and
HOR gate: August 1 to October 31.
Note: With regard to impact pile driving, work windows for the NDD may be lengthened subject to NMFS and USFWS approval based on success of bubble curtain and real-time monitoring for fish presence. In-water activities associated with mobilization and demobilization are not subject to the work windows. In-water impact pile installation may occur outside of the work windows if performed within a dewatered cofferdam and with in-channel acoustic monitoring to verify that generated sound thresholds do not exceed the 150 dB behavioral criterion. Apart from impact pile driving, any other work may occur within a dewatered cofferdam regardless of the timing of in-water work windows. Any extension/reduction of work windows would focus on half-month increments.
- Qualified biologists will monitor construction activities in areas identified as having listed species or their designated critical habitat. The intent of the biological monitoring is to ensure that specific AMMs that have been integrated into the project design and permit requirements are being implemented correctly during construction and are working appropriately and as intended for the protection of listed species.
- Biological monitors will be professional biologists selected for their knowledge of the listed species that may be affected by construction activities. The qualifications of the biologist(s) will be presented to the fish and wildlife agencies for review and written approval prior to initiating construction. The biological monitors will have the authority to temporarily stop work in any area where a listed species has been observed until that

individual has passively or physically been moved outside of the work area, or when any AMMs or BMPs are not functioning appropriately for the protection of listed species.

- Exclusionary fencing may be placed at the edge of active construction activities and staging areas (after having been cleared by biological surveys) to restrict wildlife access from the adjacent habitats. The need for exclusionary fencing will be determined during the preconstruction surveys and the construction planning phase and may vary depending on the species and habitats present. Exclusionary fencing will consist of taut silt fabric (non-monofilament), 24 inches high (36 inches high for California red-legged frog and giant garter snake), staked at 10-foot intervals, with the bottom buried 6 inches below grade. Fence stakes will face toward the work area (on the opposite side of adjacent habitat) to prevent wildlife from using stakes to climb over the exclusionary fencing. Exclusionary fencing will be maintained such that it is intact during rain events. Fencing will be checked by the biological monitor or construction foreman periodically throughout each work day. If fencing becomes damaged, it will be immediately repaired upon detection and the monitoring biologist will stop work in the vicinity of the fencing as needed to ensure that no sensitive wildlife species have entered. Active construction and staging areas will be delineated with high-visibility temporary fencing at least 4 feet in height, flagging, or other barrier to prevent encroachment of construction personnel and equipment outside the defined project footprint. Such fencing will be inspected and maintained daily by the construction foreman until completion of the project. Fencing will be removed from work areas only after all construction activities are completed and equipment is removed. No project-related construction activities will occur outside the delineated project construction areas.
- Project-related vehicles will observe a speed limit of 20 miles per hour in construction areas where it is safe and feasible to do so, except on county roads and state and federal highways. A vehicle speed limit of 20 miles per hour will be posted and enforced on all nonpublic access roads, particularly on rainy nights when California tiger salamanders and California red-legged frogs are most likely to be moving between breeding and upland habitats. Extra caution will be used on cool days when giant garter snakes may be basking on roads.
- All ingress/egress at the project site will be restricted to those routes identified in the project plans and description.
- All vehicle parking will be restricted to established areas, existing roads, or other suitable areas.
- To avoid attracting predators, all food-related trash items such as wrappers, cans, bottles, and food scraps will be disposed of in enclosed containers and trash will be removed and disposed of at an appropriate facility at least once a week from the construction or project site.
- To avoid injury or death to wildlife, no firearms will be allowed on the project site except for those carried by authorized security personnel or local, state, or federal law enforcement officials.

- To prevent harassment, injury, or mortality of sensitive wildlife by dogs or cats, no canine or feline pets will be permitted in the construction area.
- To prevent inadvertent entrapment of wildlife during construction, all excavated, steep-walled holes or trenches more than 1 foot deep will be covered at the close of each working day with plywood or similar material, and/or provided with one or more escape ramps constructed of earth fill or wooden planks. Before such holes or trenches are filled, they will be thoroughly inspected for trapped animals. If a listed species is encountered during construction work, to the extent feasible, construction activities should be diverted away from the animal until it can be moved by a USFWS- or CDFW-approved biologist.
- Capture and relocation of trapped or injured wildlife will only be performed by personnel with appropriate USFWS and CDFW handling permits. Any sightings and any incidental take will be reported to CDFW and USFWS via email within 1 working day of the discovery. A follow-up report will be sent to these agencies, including dates, locations, habitat description, and any corrective measures taken to protect listed species encountered. For each listed species encountered, the biologist will submit a completed CNDDDB field survey form (or equivalent) to CDFW no more than 90 days after completing the last field visit to the project site.
- Plastic monofilament netting or similar material will not be used for erosion control, because smaller wildlife may become entangled or trapped in it. This includes products that use photodegradable or biodegradable synthetic netting, which can take several months to decompose. Acceptable materials include natural fibers such as jute, coconut, twine, or other similar fibers or tackified hydroseeding compounds. This limitation will be communicated to the contractor through specifications or special provisions included in the construction bid solicitation package.
- Listed species of wildlife can be 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, construction equipment, or construction debris left overnight in areas that may be occupied by wildlife will be inspected by the biological monitor or the contractor prior to being used for construction. Such inspections will occur at the beginning of each day's activities, for those materials to be used or moved that day. If necessary, and under the direct supervision of the biologist, the structure may be moved up to one time to isolate it from construction activities, until the listed species has moved from the structure of their own volition, been captured and relocated, or otherwise been removed from the structure.
- Rodenticides and herbicides will be used in accordance with the manufacturer recommended uses and applications and in such a manner as to prevent primary or secondary poisoning of listed species and depletion of prey populations upon which they depend. All uses of such compounds will observe label and other restrictions mandated by the U.S. Environmental Protection Agency (EPA), the California Department of Pesticide Regulation, and other appropriate state and federal regulations, as well as additional project-related restrictions imposed by USFWS, NMFS and/or CDFW. If rodent control must be conducted in San Joaquin kit fox habitat, zinc phosphide should

be used because of its proven lower risk to kit fox. In addition, the method of rodent control will comply with provisions of the 4(d) rule published in the final listing rule for California tiger salamander (69 *Federal Register* [FR] 47211–47248).

- Nets or bare hands may be used to capture and handle individuals of listed species. A professional biologist will be responsible for and direct any efforts to capture and handle listed species. Any person who captures and handles listed species will not use soaps, oils, creams, lotions, insect repellents, solvents, or other potentially harmful chemicals of any sort on their hands within 2 hours before handling listed species. Latex gloves will not be used either. To avoid transferring diseases or pathogens between aquatic habitats during the course of surveys or the capture and handling of listed species, all species captured and handled will be released in a safe, aquatic environment as close to the point of capture as possible, and not transported and released to a different water body. When capturing and handling listed species of amphibians, the biologists will follow the Declining Amphibian Task Force’s *Code of Practice* (U.S. Fish and Wildlife Service no date). While in captivity, individual amphibians will be kept in a cool, moist, aerated environment such as a dark (i.e., green or brown) bucket containing a damp sponge. Containers used for holding or transporting these species will be sanitized and will not contain any standing water.
- CDFW, NMFS and/or USFWS will be notified within 1 working day of the discovery of, injury to, or mortality of a listed species that results from project-related construction activities or is observed at the project site. Notification will include the date, time, and location of the incident or of the discovery of an individual listed species that is dead or injured. For a listed species that is injured, general information on the type or extent of injury will be included. The location of the incident will be clearly indicated on a U.S. Geological Survey 7.5-minute quadrangle and/or similar map at a scale that will allow others to find the location in the field, or as requested by CDFW, NMFS and/or USFWS. The biologist is encouraged to include any other pertinent information in the notification.
- Permanent and temporary construction disturbances and other types of ongoing project-related disturbance activities in suitable habitat for listed species will be minimized by adhering to the following activities. Project designs will limit or cluster permanent project features to the smallest area possible while still permitting achievement of project goals. To minimize temporary disturbances, all project-related vehicle traffic and material storage will be restricted to established and/or designated ingress/egress points, construction areas, and other designated staging/storage areas. These areas will be included in preconstruction surveys and, to the extent possible, will be established in locations disturbed by previous activities to prevent further effects.
- Upon completion of the project, all areas subject to temporary ground disturbance will be recontoured to preproject elevations, as appropriate and necessary, and revegetated with native vegetation to promote restoration of the area to preproject conditions. An area subject to “temporary” disturbance is any area that is disturbed to allow for construction of the project, but is not required for operation or maintenance of any project-related infrastructure, will not be subject to further disturbance after project completion, and has the potential to be revegetated. Appropriate methods and native plant species used to

revegetate such areas will be determined on a site-specific basis in consultation with USFWS, NMFS, and/or CDFW, and biologists.

3.F.2.3 AMM3 Stormwater Pollution Prevention Plan

DWR commits to implementing measures, as described below, as part of the construction activities and in advance of any necessary permit(s). In accordance with these environmental commitments, DWR will ensure the preparation and implementation of SWPPPs to control short-term and long-term effects associated with construction-generated stormwater runoff. It is anticipated that multiple SWPPPs may be prepared for different aspects of the PA, each taking into account site-specific conditions (e.g., proximity to surface water, drainage). The SWPPPs will include all the necessary state requirements regarding construction-generated stormwater collection, detention, treatment, and discharge that will be in place throughout the construction period.

DWR is required to obtain coverage under the General Permit for Construction and Land Disturbance Activities (CGP) (currently, Order No. 2010-0014-DWQ) issued from the State Water Resources Control Board (SWRCB), for projects that will disturb 1 or more acres of land. The intent of the CGP is to protect receiving waters from pollutants potentially occurring in construction stormwater discharges. The CGP requires the development and implementation of a SWPPP for National Pollutant Discharge Elimination System (NPDES) permit coverage for stormwater discharges. Projects that disturb 1 or more acres of land have the potential to alter stormwater runoff. This includes projects that require excavation, grading, or stockpiling material at project sites, which could result in temporary and/or permanent changes to drainage patterns, paths, and facilities that would, in turn, cause changes in drainage flow rates, directions, and velocities of runoff, or constituents of runoff. For the PA, a series of separate but related SWPPPs will be prepared by a Qualified SWPPP Developer (QSD) and will be implemented under the supervision of a Qualified SWPPP Practitioner (QSP).

As part of the procedure to gain coverage under the CGP, the risk level of the site will be determined. This determination will be based on the probability of a significant risk of causing or contributing to an exceedance of a water quality standard, based on the construction activities to be performed, the existing water quality, soil and sediment conditions, without the implementation of additional requirements (per Order No. 2009-0009-DWQ as amended by Order Nos. 2010-0014-DWQ and 2012-2006-DWQ). The risk is calculated separately for sediment and receiving water, with two risk categories for receiving water (low and high) and three risk categories for sediment risk (low, medium, and high). The overall project risk levels (1, 2, or 3) are then determined through a matrix, where Risk Level 1 applies to projects with low receiving water and sediment risks, Risk Level 3 applies to projects with high receiving water and sediment risks, and Risk Level 2 applies to all other combinations of sediment and receiving water risks. These project risk levels determine the level of protection (i.e., BMPs) and monitoring that is required for the project. If the site is Risk Level 2 or 3, water sampling for pH and turbidity will be required and the SWPPP will specify sampling locations and schedule, sample collection and analysis procedures, and recordkeeping and reporting protocols. Other typical requirements for such situations are provided below under Risk Levels 2 and 3.

Changes in runoff characteristics associated with construction activities have the potential to be detrimental to listed species, as well as aquatic habitat associated with receiving waters, through changes in ambient water temperature, sediment, and pollutants resulting from stormwater runoff. The objectives of the SWPPP are to identify pollutant sources associated with construction activities and operations that may affect the quality of stormwater and to identify, construct, and implement stormwater pollution prevention measures to reduce pollutants in stormwater discharges during and after construction. The SWPPP will be kept onsite during construction activity and operations and will be made available upon request to representatives of the San Francisco Bay and Central Valley Regional Water Quality Control Boards.

In accordance with the CGP, the SWPPP will describe site topographic, soil, and hydrologic characteristics; construction activities and schedule; construction materials, including sources of imported fill material to be used and other potential sources of pollutants at the construction site; potential nonstormwater discharges (e.g., trench dewatering); erosion and sediment control measures; “housekeeping” BMPs to be implemented; a BMP implementation schedule; a site and BMP inspection schedule; and ongoing personnel training requirements. The SWPPP will also include a hazardous materials management plan, described in AMM14.

These SWPPP provisions are intended to prevent water quality degradation related to pollutant discharge to receiving waters, and to prevent or constrain changes to the pH of receiving waters. Performance standards will be met by implementing standard stormwater pollution prevention BMPs, as well as those tailored to site-specific conditions, including determining the risk level of individual construction sites. These environmental commitments mirror the requirements to gain and maintain coverage under the CGP. DWR will coordinate with the appropriate regional water quality control board to determine the appropriate aggregation of specific construction activities, or groups of activities, to be authorized under the CGP.

It is anticipated that multiple SWPPPs will be prepared for different construction sites, with a given SWPPP prepared to cover a specific project component (e.g., intermediate forebay or tidal habitat restoration site) or groups of components (e.g., intakes). The risk level will be identified for each action covered by a specific SWPPP. These SWPPPs will generally follow the EPA (2007) guidelines for such plans and will typically identify the following list of BMPs, which are requirements common to all risk-level sites; however, some detail is provided under the “Inspection and monitoring” bullet, below, on various risk-level requirements.

- Erosion control measures
 - Implement effective wind erosion BMPs, such as watering, application of soil binders/tackifiers, and covering inactive stockpiles.
 - Provide effective soil cover for inactive areas and all finished slopes and utility backfill areas, such as seeding with a native seed mix, application of hydraulic mulch and bonded fiber matrices, and installation of erosion control blankets and rock slope protection.
- Sediment control measures

- Prevent transport of sediment at the construction site perimeter, toe of erodible slopes, soil stockpiles, and into storm drains.
- Capture sediment via sedimentation and stormwater detention facilities.
- Reduce runoff velocity on exposed slopes.
- Reduce offsite sediment tracking.
- Management measures for construction materials
 - Cover and berm loose inactive stockpiled construction materials.
 - Store chemicals in watertight containers.
 - Minimize exposure of construction materials to stormwater.
 - Designate refueling and equipment inspection/maintenance locations.
 - Control drift and runoff from areas treated with herbicides, pesticides, and other chemicals that may be harmful to aquatic habitats.
- Waste management measures
 - Prevent offsite disposal or runoff of any rinse or wash waters.
 - Implement concrete and truck washout facilities and appropriately sized storage, treatment, and disposal practices.
 - Ensure the containment of sanitation facilities (e.g., portable toilets).
 - Clean or replace sanitation facilities (as necessary) and inspect regularly for leaks/spills.
 - Cover waste disposal containers during rain events and at end of any day when rain is forecast.
 - Protect stockpiled waste material from wind and rain.
- Construction site dewatering and pipeline testing measures
 - Reclaim site dewatering discharges to the extent practicable, or use for other construction purposes (e.g., dust control).
 - Implement appropriate treatment and disposal of construction site dewatering from excavations to prevent discharges to surface waters, unless discharge is permitted by authorities having jurisdiction.
 - Dechlorinate pipeline testing discharges to surface waters.

- Accidental spill prevention and response measures
 - Maintain equipment and materials necessary for cleanup of accidental spills onsite.
 - Clean up accidental spills and leaks immediately and dispose of properly.
 - Ensure that trained spill response personnel are available.
- Nonstormwater management measures
 - Control all nonstormwater discharges during construction.
 - Wash vehicles in such a manner as to prevent nonstormwater discharges to surface waters.
 - Clean streets in such a manner as to prevent nonstormwater discharges from reaching surface water.
 - Discontinue the application of any erodible landscape material during rain, or within 2 days before a forecasted rain event.
- Inspection and monitoring common to all risk-level sites
 - Ensure that all inspection, maintenance repair, and sampling activities at the construction site are performed or supervised by a QSP representing the discharger.
 - Develop and implement a written site-specific construction site monitoring program.
- Inspection, monitoring, and maintenance activities based on the risk level of the construction site (as defined in the SWRCB General Permit)
 - Risk Level 1 sites
 - Perform weekly inspections of BMPs, and at least once each 24-hour period during extended storm events.
 - At least 2 business days (48 hours) prior to each qualifying rain event (a rain event producing 0.5 inch or more of precipitation), visually inspect: stormwater drainage areas to identify any spills, leaks, or uncontrolled pollutant sources; all BMPs to identify whether they have been properly implemented in accordance with the SWPPP; and stormwater storage and containment areas to detect leaks and ensure maintenance of adequate freeboard.
 - Visually observe stormwater discharges at all discharge locations within 2 business days (48 hours) after each qualifying rain event, identify additional BMPs as necessary, and revise the SWPPP accordingly.

- Conduct minimum quarterly visual inspections of each drainage area for the presence of (or indications of prior) unauthorized and authorized nonstormwater discharges and their sources.
 - Collect one or more samples of construction site effluent during any breach, malfunction, leakage, or spill observed within the construction site during a visual inspection that could result in the discharge of pollutants to surface waters whether visually detectable or not.
 - Risk Level 2 sites
 - Perform all of the same visual inspection, monitoring, and maintenance measures specified for Risk Level 1 sites.
 - Perform sampling and analysis of stormwater discharges to characterize discharges associated with construction activity from the entire disturbed area at all points where stormwater is discharged offsite.
 - At a minimum, collect three samples per day of a qualifying rain event and analyze for pH and turbidity. The CGP also requires the discharger to revise the SWPPP and immediately modify existing BMPs and/or implement new BMPs such that subsequent discharges are below the relevant numeric action levels (NALs). It may be a violation of the CGP if the discharger fails to take corrective action to reduce the discharge below the NALs specified by the CGP.
 - When an active treatment system is deployed on the site or a portion of the site, collect active treatment system effluent samples and measurements from the discharge pipe or another location representative of the nature of the discharge.
 - Risk Level 3 sites
 - Perform all of the same visual inspection, monitoring, and maintenance measures specified for Risk Level 1 and 2 sites.
 - In the event that a numerical effluent limit (NEL) of the CGP (i.e., pH and turbidity) is violated and has a direct discharge into receiving waters, the discharger will subsequently sample receiving waters for all parameter(s) monitored in the discharge. An exceedance of the NEL is considered a violation of the CGP, and the discharger must electronically submit all storm-event sampling results to the state and regional water boards via Stormwater Multiple Application and Report Tracking System (SMARTS) no later than 5 days after the conclusion of the storm event.
 - If disturbing 30 acres or more of the landscape and discharging directly into receiving waters, conduct a benthic macroinvertebrate bioassessment of receiving waters prior to and after commencement of construction activities to determine if significant degradation to the receiving water's biota has occurred. However, if commencement of construction is outside of an index period (i.e., the period of

time during which bioassessment samples must be collected to produce results suitable for assessing the biological integrity of streams and rivers) for the site location, the discharger will participate in the State of California's Surface Water Ambient Monitoring Program (SWAMP).

The SWPPP will also specify the forms and records that must be uploaded to SWRCB online SMARTS, such as quarterly nonstormwater inspection and annual compliance reports.

If the QSP determines the site is Risk Level 2 or 3, water sampling for pH and turbidity will be required, and the SWPPP will specify sampling locations and schedule, sample collection and analysis procedures, and recordkeeping and reporting protocols. In accordance with the CGP NAL requirements, DWR's contractor's QSD will revise the SWPPP and modify existing BMPs or implement new BMPs when effluent monitoring indicates that daily average runoff pH is outside the range of 6.5 to 8.5 and that the daily average turbidity is greater than 250 nephelometric turbidity units (NTUs). Such BMPs may include those that are more costly to construct and maintain, such as construction of sediment traps and sediment basins, use of Baker tanks, installation of rock slope protection, covering of stockpiles with water-repellant geotextiles, dewatering basins, and use of Active Treatment Systems. The ability of other areas to withstand excessive erosion and sedimentation may be increased by applying additional mulching, bonded fiber matrices, and erosion control blankets; reseeding with a native seed mix; and installing additional fiber rolls, silt fences, and gravel bag berms. The QSD may also specify changes in the manner and frequency of BMP inspection and maintenance activities. The determination of which BMP should be applied in a given situation is very site-specific. QSDs typically refer to the California Stormwater Quality Association's *Stormwater Best Management Practice Handbook Portal: Construction* or the similar Caltrans manual for selecting BMPs for particular site conditions.

Additionally, if a given construction component is Risk Level 3, DWR will report to the SWRCB when effluent monitoring for that component indicates that daily average runoff pH is outside the range of 6.0 to 9.0 or the daily average turbidity is greater than 500 NTUs. In the event that the turbidity NEL is exceeded, DWR may also be required to sample and report pH, turbidity, and suspended sediment concentration of receiving waters to the SWRCB for the duration of construction.

The contractor will also conduct sampling of runoff effluent when a leak, spill, or other discharge of pollutants is detected.

The CGP has specific monitoring and action level requirements for the risk levels, which are summarized in Table 3.F-2.

Table 3.F-2. Stormwater Pollution Prevention Plan Monitoring and Action Requirements

Stormwater Pollution Prevention Plan Requirements	Risk Level/Type		
	1	2	3
Minimum stormwater and nonstormwater BMPs	✓	✓	✓
Numeric action levels (NAL) NAL for pH: 6.5–8.5 pH units NAL for turbidity: 250 NTU		✓	✓
Numeric effluent limitations (NEL) NEL for pH: 6–9 pH units NEL for turbidity: 500 NTU			✓
Visual monitoring (weekly; before, during, after rain events; non-stormwater)	✓	✓	✓
Runoff monitoring		✓	✓
Receiving water monitoring			✓
Note: The SWRCB has suspended the applicability of NELs for pH and turbidity at Risk Level 3/LUP Type 3 construction sites. In addition, because receiving-water monitoring is required only if the NELs are triggered, all receiving-water monitoring requirements are also suspended. The Level 3/Type 3 NEL are presented here assuming that such NELs will be reinstated when project construction commences. BMP = best management practice; pH = potential hydrogen; NTU = nephelometric turbidity unit.			

The QSD preparing a SWPPP may include in the SWPPP BMPs such as preservation of existing vegetation, perimeter control, seeding, mulching, fiber roll and silt fence barriers, erosion control blankets, protection of stockpiles, watering to control dust entrainment, rock slope protection, tracking control, equipment refueling and maintenance, concrete and solid waste management, and other measures to ensure compliance with the pH and turbidity level requirements defined by the CGP. Partly because the potential adverse effect on receiving waters depends on location of a work area relative to a waterway, the BMPs will be site-specific. For example, BMPs applied to level island-interior sites will be different than BMPs applied to water-side levee conditions. The QSP will be responsible for day-to-day implementation of the SWPPP, including BMP inspections, maintenance, water quality sampling, and reporting to SWRCB. If the water quality sampling results indicate an exceedance of NALs and NELs for pH and turbidity, as described above, the QSD will modify the type and/or location of the BMPs by amending the SWPPP to reduce pH, turbidity, and other contaminants to acceptable levels, consistent with NALs and NELs and with the water quality objectives and beneficial uses set forth in the Water Quality Control Plan (Basin Plan) for the California Regional Water Quality Control Board, Central Valley Region (Central Valley Regional Water Quality Control Board 2011).

3.F.2.4 AMM4 Erosion and Sediment Control Plan

An erosion and sediment control plan is typically required for ground-disturbing projects as part of the NPDES permitting process (U.S. Environmental Protection Agency 2007), depending on the size of the disturbed area. The proposed Phase II EPA rules would cover projects with greater than 1 acre of ground disturbance. DWR commits to implementing measures as described below as part of the construction activities and in advance of any necessary permit. In accordance with these environmental commitments, DWR will ensure the preparation and implementation of erosion and sediment control plans to control short-term and long-term erosion and sedimentation effects and to restore soils and vegetation in areas affected by construction activities. It is anticipated that multiple erosion and sediment control plans will be prepared for the construction activities included in the PA, each taking into account site-specific conditions

such as proximity to surface water, erosion potential, drainage, etc. The plans will include all the necessary state requirements regarding erosion control and will implement BMPs for erosion and sediment control that will be in place for the duration of construction activities. These BMPs will be incorporated into the SWPPP (Section 3.F.1.1.1, *Conduct Planning-Level Surveys*).

The following erosion control measures will be included in the SWPPP.

- Install physical erosion control stabilization BMPs (hydroseeding with native seed mix, mulch, silt fencing, fiber rolls, sand bags, and erosion control blankets) to capture sediment and control both wind and water erosion. Erosion control may not utilize plastic monofilament netting or similar materials.
- Maintain emergency erosion control supplies onsite at all times during construction and direct contractor(s) to use these emergency stockpiles as needed. Ensure that supplies used from the emergency stockpiles are replaced within 48 hours. Remove materials used in construction of erosion control measures from the work site when no longer needed (property of the contractor).
- Design grading to be compatible with adjacent areas and result in minimal disturbance of the terrain and natural land features and minimize erosion in disturbed areas to the extent practicable.
- Divert runoff away from steep, denuded slopes, or other critical areas with barriers, berms, ditches, or other facilities.
- Retain native trees and vegetation to the extent feasible to stabilize hillsides, retain moisture, and reduce erosion.
- Limit construction, clearing of native vegetation, and disturbance of soils to areas of proven stability.
- Implement construction management and scheduling measures to avoid exposure to rainfall events, runoff, or flooding at construction sites to the extent feasible.
- Conduct frequent site inspections (before and after significant storm events) to ensure that control measures are intact and working properly and to correct problems as needed.
- Install drainage control features (e.g., berms and swales, slope drains) as necessary to avoid and minimize erosion.
- Install wind erosion control features (e.g., application of hydraulic mulch or bonded fiber matrix).

The following sediment control measures will be included in the SWPPP.

- Use sediment ponds, silt traps, wattles, straw bale barriers, or similar measures to retain sediment transported by onsite runoff.

- Collect and direct surface runoff at non-erosive velocities to the common drainage courses.
- When ground-disturbing activities are required adjacent to surface water, wetlands, or aquatic habitat, use of sediment and turbidity barriers, and implement measures for soil stabilization and revegetation of disturbed surfaces.
- Prevent mud from being tracked onto public roadways by installing gravel on primary construction ingress/egress points, and/or truck tire washing.
- Deposit or store excavated materials away from drainage courses and cover if left in place for more than 5 days or if storm events are forecast within 48 hours.

After construction is complete, site-specific restoration efforts will include grading, erosion control, and revegetation. Self-sustaining, local native plants that require little or no maintenance and do not create an extreme fire hazard will be used. All disturbed areas will be recontoured to preproject contours as feasible, and seeded with a native seed mix. Consideration will also be given to additional replacement of or upgrades to drainage facilities to avoid and minimize erosion. Paved areas damaged from use over and above ordinary wear-and-tear from lawful use by construction activities will be repaved to avoid erosion due to pavement damage.

3.F.2.5 AMM5 Spill Prevention, Containment, and Countermeasure Plan

As required by local, state, or federal regulations, DWR will require that construction contractors develop an SPCC plan for implementation at each site where ground-disturbing activities occur. Each SPCC plan will comply with the regulatory requirements of the Spill Prevention, Control, and Countermeasure Rule (40 Code of Federal Regulations [CFR] 112) under the Oil Pollution Act of 1990. This rule regulates non-transportation-related onshore and offshore facilities that could reasonably be expected to discharge oil into navigable waters of the United States or adjoining shorelines. The rule requires the preparation and implementation of site-specific SPCC plans to prevent and respond to oil discharges that could affect navigable waters. Each SPCC plan will address actions used to prevent spills in addition to specifying actions that will be taken should any spills occur, including emergency notification procedures. The SPCC plans will include the following measures and practices.

- Discharge prevention measures will include procedures for routine handling of products (e.g., loading, unloading, and facility transfers) (*40 CFR 112.7(a)(3)(i)*).
- Discharge or drainage controls will be implemented such as secondary containment around containers and other structures and equipment, and procedures for the control of a discharge (*40 CFR 112.7(a)(3)(ii)*).
- Countermeasures will be implemented for discharge discovery, response, and cleanup (both the facility's capability and those that might be required of a contractor) (*40 CFR 112.7(a)(3)(iii)*).

- Methods of disposal of recovered materials will comply with applicable legal requirements (*40 CFR 112.7(a)(3)(iv)*).
- Personnel will be trained in emergency response and spill containment techniques, and will also be made aware of the pollution control laws, rules, and regulations applicable to their work.
- Petroleum products will be stored in nonleaking containers at impervious storage sites from which an accidental spill cannot escape.
- Absorbent pads, pillows, socks, booms, and other spill containment materials will be stored and maintained at the hazardous materials storage sites for use in the event of an accidental spill.
- Watertight forms and other containment structures will be used to prevent spills or discharge of raw concrete, wash water, and other contaminants from entering surface waters and other sensitive habitats during overwater activities (e.g., casting of barge decks).
- Contaminated absorbent pads, pillows, socks, booms, and other spill containment materials will be placed in nonleaking sealed containers until transported to an appropriate disposal facility.
- When transferring oil or other hazardous materials from trucks to storage containers, absorbent pads, pillows, socks, booms, or other spill containment material will be placed under the transfer area.
- Refueling of construction equipment will occur only in designated areas that will be a minimum of 150 feet from surface waters and other sensitive habitats, such as wetlands.
- Equipment used in direct contact with water will be inspected daily for oil, grease, and other petroleum products. All equipment will be cleaned of external petroleum products prior to beginning work where contact with water may occur in order to prevent the release of such products to surface waters.
- Oil-absorbent booms will be used when equipment is used in or immediately adjacent to waters.
- All reserve fuel supplies will be stored only within the confines of a designated staging area, to be located a minimum of 150 feet from surface waters and other sensitive habitats, such as wetlands.
- Fuel transfers will take place a minimum of 150 feet from surface waters and other sensitive habitats, such as wetlands, and absorbent pads will be placed under the fuel transfer operation.

- Staging areas will be designed to contain contaminants such as oil, grease, fuel, and other petroleum products so that should an accidental spill occur they do not drain toward receiving waters or storm drain inlets.
- All stationary equipment will be staged in appropriate staging areas and positioned over drip pans.
- In the event of an accidental spill, personnel will identify and secure the source of the discharge and contain the discharge with sorbents, sandbags, or other material from spill kits and will contact appropriate regulatory authorities (e.g., National Response Center will be contacted if the spill threatens navigable waters of the United States or adjoining shorelines, as well as other appropriate response personnel).

Methods of cleanup may include the following.

- Physical methods for the cleanup of dry chemicals include the use of brooms, shovels, sweepers, or plows.
- Mechanical methods could include the use of vacuum cleaning systems and pumps.
- Chemical methods include the use of appropriate chemical agents such as sorbents, gels, and foams.

3.F.2.6 AMM6 Disposal of Spoils, Reusable Tunnel Material, and Dredged Material

In the course of constructing or operating project facilities, substantial quantities of material are likely to be removed from their existing locations based upon their properties or the need for excavation of particular features. Spoils refer to excavated native soils and are associated with construction of proposed new facilities. RTM refers to the mixture of saturated soils and biodegradable soil conditioners or additives that will be generated by tunneling operations and are appropriate for reuse based upon chemical characterization and physical properties. Dredged material refers to sediment removed from the bottom of a body of water for the purposes of in-water construction or water conveyance operations (e.g., sediment collected at intake sites). The quantities of these materials generated by construction or operation of proposed facilities will vary based on various factors, such as location, topography, and structure being constructed. These materials will require handling, storage, and disposal, as well as chemical characterization. Storage areas are designated for these materials. Many of these materials will be suitable for reuse (e.g., as engineered fill or for purposes of habitat restoration), but such use is not part of the PA and projects using this material have not been identified.

3.F.2.6.1 Storage Area Determination

Spoils, RTM, and dredged material will be stored in designated storage areas, shown in Appendix 3.A *Mapbook*.

The designated storage areas are sized to accommodate all material expected to be generated by the PA, i.e., it is assumed that none of that material will be reused, sold, or otherwise relocated

under the PA. In practice, the area that will be needed for material storage will depend on several factors.

- The speed with which material is brought to the surface, stored, dried, tested, and moved to storage locations will be important in determining the final size of storage areas. If alternative end uses for the material can be identified and if those uses can be permitted within the timeframe of the PA (such permitting is not included in the PA, so separate authorizations would have to be obtained), then a smaller area may be needed for material storage.
- The depth to which the material is stacked. Material that is stored in deeper piles will require less area but may dry more slowly. Calculation of needed materials storage areas has assumed that materials would be placed in piles with a depth of six feet.

3.F.2.6.2 *Storage Site Preparation*

A portion of the storage sites selected for storage of spoils, RTM, and dredged material will be set aside for topsoil storage. The topsoil will be saved for reapplication to disturbed areas postconstruction. Vegetative material from work site clearing will be chipped, stockpiled, and spread over the topsoil after earthwork is completed, when practicable and appropriate to do so and where such material does not contain seeds of undesirable nonnative species (i.e., nonnative species that are highly invasive and threaten the ecological function of the vegetation community to be restored in that location). Cleared areas will be grubbed as necessary to prepare them for grading or other construction activities. Rocks and other inorganic grubbed materials will be used to backfill borrow areas. The contractor will remove from the work site all debris, rubbish, and other materials not directed to be salvaged, and will dispose of them in an approved disposal site after obtaining all permits required.

3.F.2.6.3 *Draining, Chemical Characterization, and Treatment*

RTM and associated decant liquid will undergo chemical characterization by the contractor(s) prior to reuse or discharge, respectively, to determine whether it will meet NPDES and the Central Valley Regional Water Quality Control Board requirements. Should RTM decant liquid constituents exceed discharge limits, these tunneling byproducts will be treated to comply with NPDES permit requirements. Discharges from RTM draining operations will be conducted in such a way as to not cause erosion at the discharge point. If RTM liquid requires chemical treatment, chemical treatment will ensure that RTM liquid will be nontoxic to aquatic organisms.

While additives used to facilitate tunneling will be nontoxic and biodegradable, it is possible that some quantity of RTM will be deemed unsuitable for reuse. In such instances, which are anticipated to occur in less than 1% each of excavated spoils, RTM, and dredged material, the material will be disposed of at a site for which disposal of such material is approved.

Hazardous materials excavated during construction will be segregated from other construction spoils and properly handled in accordance with applicable federal, state, and local regulations. Riverine or in-Delta sediment dredging and dredged material disposal activities may involve potential contaminant discharges not addressed through typical NPDES or SWRCB CGP

processes. Construction of dredge material disposal sites will likely be subject to the SWRCB General Permit (Order No. 2009-0009-DWQ).

As described in Appendix 3.F, *General Avoidance and Minimization Measures, AMM6 Disposal and Reuse of Spoils, Reusable Tunnel Material, and Dredged Material*, to better define potential effects to listed species or aquatic habitat, and to streamline the collection and incorporation of newer information (i.e., monitoring data or site-specific baseline information), the following protocol will be followed. The action agency will work with State and Federal resource agencies with authorization and jurisdiction to identify the timeline for information gathering in relation to initiation of the specific action, but it is anticipated to be at least several months prior to the initiation of the action. At that time, DWR and Reclamation will follow the protocol below.

- DWR will ensure the preparation and implementation of a pre-dredge sampling and analysis plan (SAP). The SAP will be developed and submitted by the contractor(s) as part of the water plan required per standard DWR contract specifications (Section 01570). Prior to initiating any dredging activity, the SAP will evaluate the presence of contaminants that may affect water quality from the following discharge routes.
 - Instream discharges during dredging.
 - Direct exposure to contaminants in the material through ingestion, inhalation, or dermal exposure.
 - Effluent (return flow) discharge from an upland disposal site.
 - Leachate from upland dredge material disposal that may affect groundwater or surface water.
- Concentrations of the identified chemical constituents in the core samples will be screened through appropriate contaminant screening tables to ensure compliance with applicable agency guidelines.
- Results of the sediment analyses and the quality guidelines screening will determine the risk associated with the disturbance of the sediment horizons by identifying specific pathways of exposure to adverse effects.
- Results of the testing will be provided to all relevant State and Federal agencies for their use in monitoring or regulating the activities under consideration.
- If the results of the chemical analyses of the sediment samples indicate that one or more chemical constituents are present at concentrations exceeding screening criteria, then additional alternative protocols to further minimize or eliminate the release of sediments into the surrounding water column must be implemented.
- The applicant must provide to CDFW, NMFS and USFWS a plan to reduce or eliminate the release of contaminated sediment prior to the start of any actions that will disturb the sediments in the proposed construction area. Plans using a shrouded hydraulic cutterhead, or an environmentally sealed clamshell bucket may be acceptable provided

that adequate supporting information is provided with the proposed plan. Plans should also include descriptions of the methods employed to treat, transport, and dispose of the contaminated sediment, as well as any resulting decant waters.

The following list of BMPs will be implemented during handling and disposal of any potentially hazardous dredged material.

- Conduct dredging within the allowable in-water work specified in AMM2 Construction Best Management Practices~~windows established by USEFWS, NMFS, and CDFW.~~
- Conduct dredging activities in a manner that will not cause turbidity in the receiving water, as measured in surface waters 300 feet down-current from the construction site, to exceed the Basin Plan objectives beyond an approved averaging period by the Central Valley Regional Water Quality Control Board and CDFW. Existing threshold limits in the Basin Plan for turbidity generation are as follows.
 - Where natural turbidity is between 0 and 5 NTUs, increases will not exceed 1 NTU.
 - Where natural turbidity is between 5 and 50 NTUs, increases will not exceed 20%.
 - Where natural turbidity is between 50 and 100 NTUs, increases will not exceed 10 NTUs.
 - Where natural turbidity is greater than 100 NTUs, increases will not exceed 10%.
- If turbidity generated during dredging exceeds implementation requirements for compliance with the Basin Plan objectives, silt curtains will be used to control turbidity. Exceptions to turbidity limits set forth in the Basin Plan may be allowed for dredging operations; in this case, an allowable zone of dilution within which turbidity exceeds the limits will be defined and prescribed in a discharge permit.
- The dredged material disposal sites will be designed to contain all of the dredged material. All systems and equipment associated with necessary return flows from the dredged material disposal site to the receiving water will be operated to maximize treatment of return water and optimize the quality of the discharge.
- The dredged material disposal sites will be designed by a registered professional engineer.
- The dredged material disposal sites will be designed, constructed, operated, and maintained to prevent inundation or washout due to floods with a 100-year return frequency.
- Two feet of freeboard above the 100-year flood event elevation will be maintained in all dredged material disposal site settling ponds at all times when they may be subject to washout from a 100-year flood event.

- Dredging equipment will be kept out of riparian areas and dredged material will be disposed of outside of riparian corridors.

Temporary storage sites will be constructed using appropriate BMPs such as erosion and sediment control measures (*AMM4 Erosion and Sediment Control Plan* and *AMM3 Stormwater Pollution Prevention Plan*) to prevent discharges of contaminated stormwater to surface waters or groundwater.

Once the excavated spoils, RTM, or dredged material have been suitably dewatered, and as the constituents of the material will allow, it will be placed in either a lined or unlined storage area suitable for long-term storage. These long-term storage areas may be the same areas in which the material was previously dewatered or it may be a new area adjacent to the dewatering site. The storage areas will be created by excavating and stockpiling the native topsoil for future reuse. Once the area has been suitably excavated, and if a lined storage area is required, an impervious liner will be placed on the invert of the material storage area and along the interior slopes of the berms surrounding the pond. Due to the expected high groundwater tables, it is anticipated that there will be minimal excavation for construction of the long-term material storage areas. Additional features of the long-term material storage areas will include berms and erosion protection measures to contain storm runoff as necessary and provisions to allow for truck traffic during construction.

3.F.2.7 AMM7 Barge Operations Plan

DWR will require that any construction contractor proposing to use barges (to perform construction or to transport materials or equipment) develop a barge operations plan as required by local, state, or federal regulation. Each plan will be developed and submitted by the construction contractors per standard DWR contract specifications as part of the traffic plans required by those specifications (Section 01570 of standard DWR construction contracts). Each barge operations plan will be part of a comprehensive traffic control plan coordinated with the U.S. Coast Guard for large channels. The comprehensive traffic control plan will address traffic routes and machines used to deliver materials to and from the barges. The barge operations plan will address the following.

- Bottom scour from propeller wash.
- Bank erosion or loss of submerged or emergent vegetation from propeller wash and/or excessive wake.
- Accidental material spillage.
- Sediment and benthic community disturbance from accidental or intentional barge grounding or deployment of barge spuds (extendable shafts for temporarily maintaining barge position) or anchors.
- Hazardous materials spills (e.g., fuel, oil, hydraulic fluids).

The barge operations plan will serve as a guide to barge operations and to a biological monitor who will evaluate barge operations on a daily basis during construction with respect to stated performance measures. This plan, when approved by the DWR and other resource agencies, will be read by barge operators and kept aboard all vessels operating at the construction sites and barge landings.

3.F.2.7.1 Sensitive Resources

The barge operations plan is intended to protect listed species of fish in the vicinity of barge operations. The plan will be developed to avoid barge-related effects on listed species of fish; if and when avoidance is not possible, the plan will include provisions to minimize effects on listed species of fish as described in Section 3.F.2.7.3, *Avoidance Measures*, Section 3.F.2.7.4, *Environmental Training*, and Section 3.F.2.7.5, *Dock Approach and Departure Protocol*. The sensitive resources potentially affected by barge maneuvering and anchoring in affected areas are listed below.

- Sediments that could cause turbidity or changes in bathymetry if disturbed.
- Bottom-dwelling (benthic) invertebrates that provide a prey base for listed species of fish.
- Riparian vegetation that provides shade, cover, habitat structure, and organic nutrients to the aquatic environment.
- Submerged aquatic vegetation that provides habitat structure and primary (plant) production.

3.F.2.7.2 Responsibilities

Construction contractors operating barges in the process of constructing the water conveyance facilities will be responsible for the following.

- Operate vessels safely and following the barge operations plan and other reasonable measures to prevent adverse effects on aquatic resources of the Delta.
- Read, understand, and follow the barge operations plan.
- Report to the project biological monitor any vessel grounding or other deviations from the barge operations plan that could have resulted in the disturbance of bottom sediments, damage to river banks, or loss of submerged, emergent, or riparian vegetation.
- Immediately report material fuel or oil spills to the CDFW Office of Spill Prevention and Response, the project biological monitor, and DWR.
- Follow all other relevant plans, including the hazardous materials management plan, SWPPP, and SPCC plan.

The biological monitor will be responsible for the following.

- Observe a sample of barge operation activities including loading and unloading at least one barge at each of the barge loading and unloading facilities.
- Provide same-day reports to DWR on any observed problems with barge operations.
- Provide annual reports to DWR, summarizing monitoring observations over the course of each construction year, including an evaluation of the plan performance measures. The annual report will also include a description of and representative photographs and/or videos of conditions of river banks and vegetation.
- Visit each intake and barge landing site to determine the extent of emergent and riparian vegetation, bank conditions, and general site conditions during the growing season prior to initiation of construction and then annually during and after construction. Monitor construction including observation of barge landing, loading, or unloading; departure of one or more barges at each active barge landing site and the condition of both river banks at each landing site; pile-driving; and other in-water construction activity as directed by DWR. The condition of river banks and vegetation will be photographed and verbally described in an annual monitoring report.

3.F.2.7.3 *Avoidance Measures*

The following avoidance measures will be implemented to ensure that the goal of avoiding impacts on aquatic resources from tugboat and barge operations will be achieved: training of tug boat operators; limiting vessel speed to minimize the effects of wake impinging on unarmored or vegetated banks and the potential for vessel wake to strand small fish; limiting the direction and/or velocity of propeller wash to prevent bottom scour and loss of aquatic vegetation; and prevention of spillage of materials and fluids from vessels.

If deviations from these procedures are required to maintain the safety of vessels and crew, the biological monitor will be informed of the circumstances and any apparent impacts on water quality, habitats, fish, or wildlife. Any such impacts will be brought to the attention of the applicable fish and wildlife agency to ascertain and implement appropriate remedial measures.

3.F.2.7.4 *Environmental Training*

All pilots operating at the barge landings and intake construction sites will be required to read and follow the barge operations plan and to keep a copy aboard and accessible. All pilots responsible for operating a vessel at either the intake or barge landing sites will read the barge operations plan and sign an affidavit as provided in the plan.

3.F.2.7.5 *Dock Approach and Departure Protocol*

DWR will require that construction contractors develop and implement a protocol for dock approach and departure to ensure the following.

- Vessel operators will obey all federal and state navigation regulations that apply to the Delta.

- All vessels will approach and depart from the intake and barge landing sites at dead slow in order to reduce vessel wake and propeller wash at the sites frequented by tug and barge traffic.
- To minimize bottom disturbance, anchors and barge spuds will be used to secure vessels only when it is not possible to tie up.
- Barge anchoring will be preplanned. Anchors will be lowered into place and not be allowed to drag across the channel bed.
- Vessel operators will limit vessel speed as necessary to maintain wake heights of less than 2 feet at shore.
- Vessel operators will avoid pushing stationary vessels up against the cofferdam, dock, or other structures for extended periods, because this could result in excessive directed propeller wash impinging on a single location. Barges will be tied up whenever possible to avoid the necessity of maintaining stationary position by tugboat or by the use of barge spuds.
- Barges will not be anchored where they will ground during low tides.
- All vessels will obey U.S. Coast Guard regulations related to the prevention, notification, and cleanup of hazardous materials spills.
- All vessels will keep an oil spill containment kit and spill prevention and response plan onboard.
- In the event of a fuel spill, CDFW Office of Spills Prevention and Response will be contacted immediately at 800-852-7550 or 800-OILS-911 (800-645-7911) to report the spill.
- When transporting loose materials (e.g., sand, aggregate), barges will use deck walls or other features to prevent loose materials from blowing or washing off of the deck.

3.F.2.7.6 *Performance Measures*

Performance will be assessed based on the results of the biological monitoring reports. The assessment will evaluate observations for the following indicators of impacts.

- **Emergent vegetation loss.** The extent and dominant species of emergent vegetation will be determined and mapped by a global positioning system (GPS) unit at and cross-channel from each of the intake and barge landing sites during the growing seasons prior to, during, and after construction. Extent will be mapped as linear coverage along the landing and opposite banks. In the event that the linear extent of emergent vegetation is found to have decreased by 20% or more following construction (or as otherwise conditioned by applicable CDFW streambed alteration agreements), the position and nature of the change will be evaluated for the probability that the loss was due to barge

grounding, propeller wash, or other effects related to barge operations. Adequate performance will be achieved if the linear extent of riparian and emergent vegetation following construction is at least 80% of the preconstruction extent (or as otherwise conditioned by applicable CDFW streambed alteration agreements).

- **Bank erosion and riparian vegetation loss.** The linear extent of bank erosion will be mapped by GPS at each of the intake and barge landing sites prior to, during, and after construction. Photos and written descriptions will be recorded for each area of eroded bank to describe the extent of the erosion. In the event that the linear extent of eroded bank is found to have increased by 20% or more following construction, the position and nature of the change will be evaluated for the probability (low, moderate, or high) that the erosion was due to barge grounding, propeller wash, or other effects related to barge operations, and preconstruction and postconstruction photographs will be compared to determine if riparian vegetation was also lost as a result of the erosion.
- **Cargo containment.** The biological monitor will note the use of deck walls or other appropriate containment during loading and unloading of sand, aggregate, or other materials from a barge at each landing site. Adequate performance will be achieved if appropriate measures are in use during each observed loading and unloading. In the unlikely event that an accidental spill occurs in spite of appropriate containment, the barge crew will describe the type, amount, and location of the spill to the biological monitor. The biological monitor will make observations at the site of the material spill and evaluate the potential impacts of the spill on biological resources. This will help the biological monitor evaluate whether mitigation is required and will be included in the annual monitoring report. Any such impacts will be brought to the attention of the applicable fish and wildlife agency to ascertain and implement appropriate remedial measures.
- **Fuels spill prevention.** Vessels operating in accordance with the SPCC plan and all applicable federal, state, and local safety and environmental laws and policies governing commercial vessel and barge operations will be considered to be performing adequately with regard to fuel spill prevention.
- **Barge grounding.** Barges are not to be grounded or anchored where falling tides are reasonably expected to cause grounding during a low tide. Barge grounding has the potential to disturb bottom sediments and benthic organisms, as well as creating a temporary obstacle to fish passage. Performance will be considered adequate if no cases of vessel grounding occur.

3.F.2.7.7 Contingency Measures

In the event that the performance measures are not met, DWR will coordinate with NMFS, USFWS, CDFW, and Central Valley Regional Water Quality Control Board to determine appropriate rectification or compensation for impacts on aquatic resources.

3.F.2.8 AMM8 Fish Rescue and Salvage Plan

Fish rescue operations will occur at any in-water construction site where dewatering and resulting isolation of fish may occur. Fish rescue and salvage plans will be developed by DWR or its contractors and will include detailed procedures for fish rescue and salvage to minimize the number of individuals of listed fish species subject to stranding during placement and removal of cofferdams. The plans will identify the appropriate procedures for removing fish from construction zones and preventing fish from reentering construction zones prior to dewatering and other construction activities. A draft plan will be submitted to the fish and wildlife agencies for review and approval. An authorization letter from NMFS, USFWS, and CDFW will be required before in-water construction activities with the potential for stranding fish can proceed.

Construction activities at the north Delta intakes, Clifton Court Forebay, and HOR gate include placement of cofferdams to isolate construction areas and minimize adverse effects to aquatic species and habitat during construction activities. However, these species can become trapped within the cofferdam and will need to be rescued or salvaged prior to dewatering. Although the following discussion focuses primarily on the application of this plan to cofferdam construction, the plan will also need to describe potential fish protection methods that may be implemented during other in-water activities with the potential to trap fish. For example, potential measures to exclude fish from active dredging areas in CCF include deployment of silt curtains in a manner that directs fish away from the silt curtains and prevents fish from re-entering these areas during dredging operations. Fish rescue operations at NCCF prior to dewatering will require special considerations given its large surface area, depth, and large numbers of fish that may be present.

All fish rescue and salvage operations will be conducted under the guidance of a qualified fish biologist and in accordance with required permits. Each fish rescue plan will identify the appropriate procedures for excluding fish from the construction zones, and procedures for removing fish, should they become trapped. The primary procedure will be to block off the construction area and use seines (nets) and/or dip nets to collect and remove fish, although electrofishing techniques may also be authorized under certain conditions. It is critical that fish rescue and salvage operations begin as soon as possible and be completed within 48 hours after isolation of a construction area to minimize potential predation and adverse water quality impacts (high water temperature, low dissolved oxygen) associated with confinement. In the case of cofferdam construction, the cofferdam will be installed to block off the construction area before fish removal activities occur. For other in-water construction activities, block nets or other temporary exclusion methods (e.g., silt curtains) could be used to exclude fish or isolate the construction area prior to the fish removal process. The appropriate fish exclusion or collection method will be determined by a qualified fish biologist, in consultation with a designated fish and wildlife agency biologist, based on site-specific conditions and construction methods. Capture, release, and relocation measures will be consistent with the general guidelines and procedures set forth in Part IX of the most recent edition of the *California Salmonid Stream Habitat Restoration Manual* (currently, California Department of Fish and Game 2010) to minimize impacts on listed species of fish and their habitat.

All fish rescue and salvage operations will be conducted under the guidance of a fish biologist meeting the qualification requirements of Section 3.F.2.8.1 *Qualifications of Fish Rescue Personnel*. The following description includes detailed fish collection, holding, handling, and

release procedures of the plan. Unless otherwise required by project permits, the construction contractor will provide the following:

- A minimum 7-day notice to the appropriate fish and wildlife agencies, prior to an anticipated activity that could result in isolating fish, such as installation of a cofferdam.
- A minimum 48-hour notice to the appropriate fish and wildlife agencies of dewatering activities that are expected to require fish rescue.
- Unrestricted access for the appropriate fish and wildlife agency personnel to the construction site for the duration of implementation of the fish rescue plan.
- Temporary cessation of dewatering if fish rescue workers determine that water levels may drop too quickly to allow successful rescue of fish.
- A work site that is accessible and safe for fish rescue workers.

3.F.2.8.1 *Qualifications of Fish Rescue Personnel*

Personnel active in fish rescue efforts will include at least one person with a 4-year college degree in fisheries or biology, or a related degree. This person also must have at least 2 years of professional experience in fisheries field surveys and fish capture and handling procedures. The person will have completed an electrofishing training course such as Principles and Techniques of Electrofishing (USFWS, National Conservation Training Center), or similar course, if electrofishing is used. In order to avoid and minimize the risk of injury to fish, attempts to seine and/or net fish will always precede the use of electrofishing equipment.

3.F.2.8.2 *Seining and Dipnetting*

Fish rescue and salvage operations will begin prior to or immediately after completing the cofferdam. For example, it may be necessary to herd fish from the construction area before installing the last sections of the cofferdam. For example, in CCF, where embankment cofferdams may extend for thousands of feet, fish exclusion and/or rescue activities may need to be conducted incrementally in coordination with cofferdam placement to minimize the number of fish subjected to prolonged confinement and stressful conditions associated with crowding, capture, and handling. If the enclosed area is wadable (less than 3 feet deep), fish can be herded out of the cofferdam enclosure by dragging a seine (net) through the enclosure, starting from the enclosed end and continuing to the cofferdam opening. Depending on conditions, this process may need to be conducted several times. After completing this fish herding process, the net or an exclusion screen will be positioned at the cofferdam opening to prevent fish from reentering the enclosure while the final section of the cofferdam is installed. The net or screen mesh will be no greater than 0.125 inch, with the bottom edge of the net (lead line) securely weighted down to prevent fish from entering the area by moving under the net. Screens will be checked periodically and cleaned of debris to permit free flow of water.

After installing the last sections of the cofferdam, remaining fish in the enclosed area will be removed using seines, dip nets, electrofishing techniques, or a combination of these depending

on site conditions. If the water depth within the cofferdam is too deep to effectively remove fish using these methods, dewatering activities may be used to reduce the water level to an appropriate and safe depth (Section 3.F.2.8.5, *Contingency Plans*). Dewatering activities will also conform to the guidelines specified below (Section 3.F.2.8.4, *Dewatering*).

Following each sweep of a seine through the enclosure, the fish rescue team will do the following.

- Carefully bring the ends of the net together and pull in the wings, ensuring the lead line is kept as close to the substrate as possible.
- Slowly turn the seine bag inside out to reveal captured fish, ensuring fish remain in the water as long as possible before transfer to an aerated container.
- Follow the procedures outlined in Section 3.F.2.8.3, *Electrofishing*, and relocate fish to a predetermined release site.

Dipnetting is best suited for very small, shallow pools in which fish are concentrated and easily collected. Dip nets will be made of soft (nonabrasive) nylon material and small mesh size (0.125 inch) to collect small fish.

3.F.2.8.3 *Electrofishing*

After conducting the herding and netting operations described above, electrofishing may be necessary to remove as many fish as possible from the enclosure. Electrofishing will be conducted in accordance with NMFS electrofishing guidelines (National Marine Fisheries Service 2000) and other appropriate fish and wildlife agency guidelines. Electrofishing will be conducted by one or two 3- to 4-person teams, with each team having an electrofishing unit operator and two or three netters. At least three passes will be made through the enclosed cofferdam areas to remove as many fish as possible. Fish initially will be placed in 5-gallon buckets filled with river water. Following completion of each pass, the electrofishing team will do the following.

- Transfer fish into 5-gallon buckets filled with clean river water at ambient temperature.
- Hold fish in 5-gallon buckets equipped with a lid and an aerator, and add fresh river water or small amounts of ice to the fish buckets if the water temperature in the buckets becomes more than 2°F warmer than ambient river waters.
- Maintain a healthy environment for captured fish, including low densities in holding containers to avoid effects of overcrowding.
- Use water-to-water transfers whenever possible.
- Release fish at predetermined locations.
- Segregate larger fish from smaller fish to minimize the risk of predation and physical damage to smaller fish from larger fish.

- Limit holding time to about 10 minutes, if possible.
- Avoid handling fish during processing unless absolutely necessary. Use wet hands or dip nets if handling is needed.
- Handle fish with hands that are free of potentially harmful products, including but not limited to sunscreen, lotion, and insect repellent.
- Avoid anesthetizing or measuring fish.
- Note the date, time, and location of collection; species; number of fish; approximate age (e.g., young-of-the-year, yearling, adult); fish condition (dead, visibly injured, healthy); and water temperature.
- If positive identification of fish cannot be made without handling the fish, note this and release fish without handling.
- In notes, indicate the level of accuracy of visual estimates to allow appropriate reporting to the appropriate fish and wildlife agencies (e.g., “Approx. 10–20 young-of-the-year steelhead”).
- Release fish in appropriate habitat either upstream or downstream of the enclosure, noting release date, time, and location.
- Stop efforts and immediately contact the appropriate fish and wildlife agencies if mortality during relocation or the limits on take (harm or harassment) of federally listed species exceeds 5%.
- Place dead fish of listed species in sealed plastic bags with labels indicating species, location, date, and time of collection, and store them on ice.
- Freeze collected dead fish of listed species as soon as possible and provide the frozen specimens to the appropriate fish and wildlife agencies, as specified in the permits.
- Sites selected for release of rescued fish either upstream or downstream of the construction area will be similar in temperature to the area from which fish were rescued, contain ample habitat, and have a low likelihood of fish reentering the construction area or being impinged on exclusion nets/screens.

3.F.2.8.4 *Dewatering*

Dewatering will be performed in coordination with fish rescue operations as described above. A dewatering plan will be submitted as part of the SWPPP/Water Pollution Control Program detailing the location of dewatering activities, equipment, and discharge point. Dewatering pump intakes will be screened to prevent entrainment of fish in accordance with NMFS screening criteria for salmonid fry (National Marine Fisheries Service 1997), including the following.

- Perforated plate: screen openings shall not exceed 3/32 inch (2.38 mm), measured in diameter.
- Profile bar: screen openings shall not exceed 0.0689 inch (1.75 mm) in width.
- Woven wire: screen openings shall not exceed 3/32 inch (2.38 mm), measured diagonally (e.g., 6–14 mesh).
- Screen material shall provide a minimum of 27% open area.

During the dewatering process, a qualified biologist or fish rescue team will remain onsite to observe the process and remove additional fish using the rescue procedures described above.

3.F.2.8.5 Contingency Plans

Where fish rescue and salvage operations cannot be conducted effectively or safely by fish rescue workers, it may be necessary to begin the dewatering process prior to fish rescue. During the dewatering process, a qualified biologist or fish rescue team will be onsite with the aim of minimizing the number of fish that become trapped in isolated areas or impinged on pump screen(s) or isolation nets, based on the professional judgment of the onsite fish biologist and the terms and conditions of the incidental take permit. In the event that the proposed methods are found to be insufficient to avoid undue losses of fish, the qualified biologist will modify these methods or implement alternative methods to minimize subsequent losses.

3.F.2.8.6 Final Inspections and Reporting

Upon dewatering to water depths at which neither electrofishing nor seining can effectively occur (e.g., less than 3 inches [0.1 meter]), the fish rescue team will inspect the dewatered areas to locate any remaining fish. Collection by dip net, data recording, and relocation will be performed as necessary according to the procedures outlined in Section 3.F.2.8.3, *Electrofishing*. The fish rescue team will notify the contractor when the fish rescue has been completed and construction can recommence. The results of the fish rescue and salvage operations (including date, time, location, comments, method of capture, fish species, number of fish, approximate age, condition, release location, and release time) will be reported to the appropriate fish and wildlife agencies, as specified in the pertinent permits.

3.F.2.9 AMM9 Underwater Sound Control and Abatement Plan

DWR will develop and implement an underwater sound control and abatement plan outlining specific measures that will be implemented to avoid and minimize the effects of underwater construction noise on listed species of fish, particularly the underwater noise effects associated with impact pile driving activities. Potential underwater noise effects on listed species from impact pile driving will be avoided and minimized by regulating the period during which impact pile driving is permitted and by controlling and/or abating underwater noise generated during impact pile driving.

The underwater sound control and abatement plan will be provided to the appropriate fish and wildlife agencies for their review and approval prior to implementation of any in-water impact

pile driving activities. The plan will evaluate the potential effects of underwater noise on listed species of fish in the context of applicable and interim underwater noise thresholds established for disturbance and injury of fish (California Department of Transportation 2009). The thresholds include the following.

- Injury threshold for fish of all sizes includes a peak sound pressure level of 206 decibels (dB) relative to 1 micropascal.
- Injury threshold for fish less than 2 grams is 183 dB relative to 1 micropascal cumulative sound exposure level, and 187 dB relative to 1 micropascal cumulative sound exposure level for fish greater than or equal to 2 grams.
- Disturbance threshold for fish of all sizes is 150 dB root mean square relative to 1 micropascal.

The specific number of pilings that will be driven per day with an impact pile driver, and thus the number of pile strikes per day, will be defined as part of the design of project elements that require pilings. See Appendix 3.E *Pile Driving Assumptions for the Proposed Action* for pile driving needs associated with each phase of the proposed action.

Most of the impact pile driving activities will occur at the north Delta intake sites, for either the installation of cofferdams to isolate subsequent intake construction activities from the water, or inside the work area isolated by the cofferdams. Additional impact pile driving may also occur at the barge landing sites, at construction sites at and near Clifton Court Forebay, and at the HOR gate construction site. The sound control and abatement plan will restrict in-water work to the in-water work windows specified in [permits issued by the fish and wildlife agencies](#) [AMM2 Construction Best Management Practices](#).

The underwater noise generated by impact pile driving will be abated using the best available and practicable technologies. Examples of such technologies include, but are not limited to, the use of cast-in-drilled-hole rather than driven piles; use of vibratory rather than impact pile driving equipment; using an impact pile driver to proof piles initially placed with a vibratory pile driver; noise attenuation using of pile caps (e.g., wood or micarta), bubble curtains, air-filled fabric barriers, or isolation piles; or installation of piling-specific cofferdams. Specific techniques to be used will be selected based on site-specific conditions

In addition to primarily using vibratory pile driving methods and establishing protocols for attenuating underwater noise levels produced during in-water construction activities, DWR will develop and implement operational protocols for when impact pile driving is necessary. These operational protocols will be used to minimize the effects of impact pile driving on listed species of fish. These protocols may include, but not be limited to, the following: monitoring the in-water work area for fish that may be showing signs of distress or injury as a result of pile driving activities and stopping work when distressed or injured fish are observed; initiating impact pile driving with a “soft-start,” such that pile strikes are initiated at reduced impact and increase to full impact over several strikes to provide fish an opportunity to move out of the area; restricting impact pile driving activities to specific times of the day and for a specific duration to be determined through coordination with the fish and wildlife agencies; and, when more than one

pile driving rig is employed, ensure pile driving activities are initiated in a way that provides an escape route and avoids “trapping” fish between pile drivers in waters exposed to underwater noise levels that could potentially cause injury. These protocols are expected to avoid and minimize the overall extent, intensity, and duration of potential underwater noise effects associated with impact pile driving activities.

3.F.2.10 AMM10 Methylmercury Management

Tidal restoration under the PA has the potential to result in increased availability of mercury, and specifically the bioavailable form methylmercury, to the foodweb in the Delta system. Due to the complex and very site-specific factors that will determine if mercury becomes mobilized into the foodweb, AMM10 Methylmercury Management is included to provide for site-specific evaluation for each restoration project. AMM10 will be implemented in coordination with other similar efforts to address mercury in the Delta, and specifically with the DWR Mercury Monitoring and Analysis Section, as further described below.

This AMM will promote the following actions.

- Assessment of pre-restoration conditions to determine the risk that the project could result in increased mercury methylation and bioavailability
- Definition of design elements that minimize conditions conducive to generation of methylmercury in restored areas
- Definition of strategies that can be implemented to monitor and minimize actual postrestoration creation and mobilization of methylmercury into environmental media and biota

The restoration design will always focus on the ecosystem restoration objectives and design elements to mitigate mercury methylation that will not interfere with restoration objectives. Design elements that help to mitigate mercury methylation will be integrated into site-specific restoration designs based on site conditions, community type (tidal marsh, nontidal marsh, floodplain), and potential concentrations of mercury in pre-restoration sediments. Strategies to minimize postrestoration creation and mobilization of methylmercury can be applied where site conditions indicate a high probability of methylmercury generation and effects on listed species.

3.F.2.10.1 Implementation

AMM10 will be developed and implemented in coordination with the Sacramento-San Joaquin Delta Methylmercury Total Maximum Daily Load (Methylmercury TMDL) (Central Valley Regional Water Quality Control Board 2011a) and Amendments to the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins for the Control of Methylmercury and Total Mercury in the Sacramento-San Joaquin Delta Estuary (Mercury Basin Plan Amendments)(Central Valley Regional Water Quality Control Board 2010 and 2011). AMM10 will also be implemented to meet requirements of the U.S. Environmental Protection Agency (EPA) or the California Department of Toxic Substances Control actions.

The DWR Mercury Monitoring and Evaluation Section is currently working on DWR's compliance with the Methylmercury TMDL and Mercury Basin Plan Amendments. The Methylmercury TMDL programs are responsible for developing measures to control methylmercury generation and loading into the Delta in accordance with Methylmercury TMDL goals. Phase I emphasizes studies and pilot projects to develop and evaluate management practices to control methylmercury. Phase I (effective October 2011) will be underway for the next 7 years, with an additional 2 years to evaluate Phase I results and plan for Phase II. Phase II involves implementation of mercury control measures.

The DWR Mercury Monitoring and Evaluation Section is required as part of Phase I to submit final reports that present the results and descriptions of methylmercury control options, their preferred methylmercury controls, and proposed methylmercury management plan(s) (including implementation schedules) for achieving methylmercury allocations. Results will be integrated into Project-Specific Mercury Management Plans, which will be developed for each tidal wetland restoration project. The Plans will include the components listed below.

- A brief review of available information on levels of mercury expected in site sediments/soils based on proximity to sources and existing analytical data.
- A determination if sampling for characterization of mercury concentrations
- A plan for conducting the sampling, if characterization sampling is recommended.
- A determination of the potential for the restoration action to result in increased mercury methylation
- If a potential for increased mercury methylation under the restoration action is identified, the following will also be included:
 - Identification of any restoration design elements, mitigation measures, adaptive management measures that could be used to mitigate mercury methylation, and the probability of success of those measures, including uncertainties
 - Conclusion on the resultant risk of increased mercury methylation, and if appropriate, consideration of alternative restoration areas

Because methylmercury is an area of active research in the Delta, each new project-specific methylmercury management plan will be updated based on the latest information about the role of mercury in Delta ecosystems or methods for its characterization or management. Results from monitoring of methylmercury in previous restoration projects will also be incorporated into subsequent project-specific methylmercury management plans.

In each of the project-specific methylmercury management plans developed under AMM10, relevant findings and mercury control measures identified as part of TMDL Phase I control studies will be considered and integrated into restoration design and management plans.

3.F.2.11 AMM11 Design Standards and Building Codes

DWR will ensure that the standards, guidelines, and codes listed below (or the most current applicable version at the time of implementation), which establish minimum design criteria and construction requirements for project facilities, will be followed by the design engineers. The design engineers will also follow any other standards, guidelines, and code requirements not listed below that are promulgated during the detailed design and construction and can feasibly be incorporated into the work. DWR will also ensure that the design specifications are properly executed during construction. The minimum design and construction requirements act as performance standards for engineers and construction contractors. Because the design and construction parameters of these codes and standards are intended to reduce the potential for structural damage or risks to human health due to the geologic and seismic conditions that exist at construction sites, project area and in the surrounding region, as well as climate change, an uncontrolled release of water, a flood event, and accidents during construction, their use is considered an environmental commitment of DWR. These standards, guidelines, and codes include the following.

- California Code of Regulations, Title 8.
- DWR Division of Flood Management FloodSAFE Urban Levee Design Criteria, May 2012.
- State of California Sea-Level Rise Task Force of the Coastal and Ocean Working Group of the California Climate Action Team, Sea-Level Rise Interim Guidance Document, 2010.
- U.S. Army Corps of Engineers (Corps, CESP-K-ED-G), Geotechnical Levee Practice, SOP EDG-03, 2004.
- USACE Design and Construction of Levees, EM 1110-2-1913, 2000.
- USACE Engineering and Design—Structural Design and Evaluation of Outlet Works, EM 1110-2-2400, 2003.
- USACE Slope Stability, EM 1110-2-1902, 2003.
- USACE Engineering and Design—Settlement Analysis, EM 1110-1-1904, 1990.
- USACE Engineering and Design—Design of Pile Foundations, EM 1110-2-2906, 1991.
- U.S. Department of the Interior and U.S. Geological Survey Climate Change and Water Resources Management: A Federal Perspective, Circular 1331.

3.F.2.12 AMM12 Transmission Line Design and Alignment

The location and design of the proposed new transmission lines will be in accordance with electric and magnetic field guidance adopted by the California Public Utility Commission (2006) *EMF Design Guidelines for Electrical Facilities*. The guidelines describe the routine magnetic

field reduction measures that all regulated California electric utilities will consider for new and upgraded transmission line and transmission substation construction.

The alignment of proposed transmission lines will be designed to avoid sensitive terrestrial and aquatic habitats when siting poles and towers, to the maximum extent feasible. Lines will be co-located where feasible, when such co-location would minimize effects on greater sandhill cranes and other sensitive resources. In cases where this is not feasible, DWR will ensure that impacts are minimized to the greatest degree feasible, and disturbed areas will be returned as near as reasonably and practically feasible to preconstruction conditions by reestablishing surface conditions through careful grading, reconstructing features such as irrigation and drainage facilities, and replanting vegetation and crops and/or compensating farmers for crops losses. Temporary transmission lines will be designed to avoid removal of wetted acres of vernal pools and alkali seasonal wetlands.

Further, tower and pole placement will avoid existing structures to the extent feasible. Where poles or towers are to be constructed in agricultural areas, the following BMPs will be implemented as applicable and feasible.

- Use single-pole structures instead of H-frame or other multiple-pole structures to reduce the potential for land impacts and minimize weed-encroachment issues.
- Locate new transmission lines along existing transmission line corridors to the extent feasible.
- Use special transmission designs to span existing irrigation systems or, if necessary, reconfigure the irrigation system at the utilities' expense, if feasible.

For stringing transmission lines between 230 kV towers, cranes and helicopters will be used. Helicopters may fly as low as the top of the transmission towers, which may be as low as 60 feet. They will take-off and land in the right of ways obtained for transmission line construction, within the corridor identified on the construction footprint, or on other property obtained for the project, and identified on the project construction footprint, or designated existing helicopter pads (airstrips). They will not be allowed to land in sensitive habitat.

3.F.2.13 AMM13 Noise Abatement

In addition to the underwater sound control and abatement plan (AMM9), DWR and contractors hired to construct any components of the water conveyance facilities will implement a noise abatement plan to avoid or reduce potential in-air noise impacts related to construction, maintenance, and operations. As applicable, the following components will be included in the plan.

3.F.2.13.1 Construction and Maintenance Noise

- To the extent feasible, the contractor will employ best practices to reduce construction noise during daytime and evening hours (7:00 a.m. to 10:00 p.m.) such that construction

noise levels do not exceed 60 dBA (A-weighted decibel) L_{eq} (1 hour) at the nearest residential land uses.

- Limit construction during nighttime hours (10:00 p.m. to 7:00 a.m.) such that construction noise levels do not exceed 50 dBA L_{max} ² at the nearest residential land uses. Limit pile driving to daytime hours (7 a.m. to 7 p.m.).
- In the event of complaints by nearby residents due to construction noise generated during nighttime hours, the contractor will monitor noise levels intermittently between 10:00 p.m. to 7:00 a.m. at the property line of the nearest residential use. In the event that construction noise during nighttime hours exceeds 50 dBA L_{max} , the construction contractor will cease nighttime construction activity in the area until sound-attenuating mitigation measures, such as temporary sound walls, are implemented, and nighttime construction noise at the nearest residential use is reduced to a level of 50 dBA L_{max} or lower.
- Locate, store, and maintain portable and stationary equipment as far as possible from nearby residents.
- Employ preventive maintenance including practicable methods and devices to control, prevent, and minimize noise.
- Route truck traffic in order to reduce construction noise impacts and traffic noise levels at noise-sensitive land uses (i.e., places where people reside, schools, libraries, and places of worship).
- To the extent feasible, schedule construction activities so that the loudest noise events, such as blasting, occur during peak traffic commute hours.
- Limit offsite trucking activities (e.g., deliveries, export of materials) to the hours of 7:00 a.m. to 10:00 p.m. to minimize impacts on nearby residences.

3.F.2.13.2 Operation Noise

Pump station facilities will be designed and constructed such that facility operation noise levels at nearby residential land uses do not exceed 50 dBA L_{eq} during daytime hours (7:00 a.m. to 10:00 p.m.) and 45 dBA L_{eq} during nighttime hours (10 p.m. to 7 a.m.). Acoustical measures such as terrain shielding, pump enclosures, and acoustical building treatments will be incorporated into the facility design to meet this performance standard.

3.F.2.14 AMM14 Hazardous Materials Management

DWR will ensure that each contractor responsible for site work under the PA will develop and implement a hazardous materials management plan (HMMP) before beginning construction. It is anticipated that multiple HMMPs will be prepared for the various construction sites, each taking

² L_{max} is the maximum sound level measured for a given interval of time.

into account site-specific conditions such as hazardous materials present onsite and known historical site contamination. A database on historical instances of contamination and results of any field inspections regarding the presence of hazardous chemicals will be maintained. The HMMPs will provide detailed information on the types of hazardous materials used or stored at all sites associated with the water conveyance facilities (e.g., intake pumping plants, maintenance facilities); phone numbers of applicable city, county, state, and federal emergency response agencies; primary, secondary, and final cleanup procedures; emergency-response procedures in case of a spill; and other applicable information. The HMMPs will include appropriate practices to reduce the likelihood of a spill of toxic chemicals and other hazardous materials during construction and facilities operation and maintenance. A specific protocol for the proper handling and disposal of hazardous materials will be established before construction activities begin and will be enforced by DWR.

The HMMPs will include, but not be limited to, the following measures or practices.

- Fuel, oil, and other petroleum products will be stored only at designated sites.
- Hazardous materials containment containers will be clearly labeled with the identity of the hazardous materials contained therein, handling and safety instructions, and emergency contact.
- Storage, use, or transfer of hazardous materials in or near wet or dry streams will be consistent with California Fish and Game Code (Section 5650) and/or with the permission of CDFW.
- Material Safety Data Sheets will be made readily available to the contractor's employees and other personnel at the work site.
- The accumulation and temporary storage of hazardous wastes will not exceed 90 days.
- Soils contaminated by spills or cleaning wastes will be contained and removed to an approved disposal site.
- Hazardous waste generated at work sites, such as contaminated soil, will be segregated from other construction spoils and properly handled, hauled, and disposed of at an approved disposal facility by a licensed hazardous waste hauler in accordance with state and local regulations. The contractor will obtain permits required for such disposal.
- Emergency spill containment and cleanup kits will be located at the facility site. The contents of the kits will be appropriate to the type and quantities of chemical or goods stored at the facility.

3.F.2.15 AMM15 Construction Site Security

To ensure adequate construction site security, the DWR or their contractors will arrange to provide for 24-hour onsite security personnel. Security personnel will monitor and patrol construction sites, including staging and equipment storage areas. Security personnel will serve

as the first line of defense against criminal activities and nuisances at construction sites. Private patrol security operators hired to provide site security will have the appropriate licenses from the California Bureau of Security and Investigative Services. Individual security personnel will have a minimum security guard registration license that meets the California Bureau of Security and Investigative Services requirements for training and continuation training as required for that license. All security personnel will also receive environmental training similar to that of onsite construction workers so that they understand the environmental conditions and issues associated with the various areas for which they are responsible at a given time.

Security operations and field personnel will be given the emergency contact phone numbers of environmental response personnel for rapid response to environmental issues resulting from vandalism or incidents that occur when construction personnel are not onsite. Security operations will also maintain a contact list of backup support from city police, county sheriffs, California Highway Patrol, water patrols (such as the Contra Costa County Marine Patrol), helicopter response, and emergency response (including fire departments, ambulances/emergency medical technicians). The appropriate local and regional contact list will be made available to security personnel by DWR or their contractors, as will the means to make that contact via landline phones, mobile phones, or radios. When on patrol, security personnel will always have the ability to contact backup using mobile phones or two way radios. Security personnel who are on patrol will have the appropriate geographic contact list for their location and the ability to summon appropriate backup or response via the security patrol local dispatch site or outside authorities.

3.F.2.16 AMM16 Fugitive Dust Control

DWR or their contractors will implement basic and enhanced control measures at all construction and staging areas to reduce construction-related fugitive dust. Although the following measures are outlined in the Sacramento Metropolitan Air Quality Management District's (SMAQMD) CEQA guidelines, they are required for the entirety of the construction area, including areas within the Bay Area Air Quality Management District (BAAQMD), San Joaquin Valley Air Pollution Control District (SJVAPCD), and Yolo-Solano Air Quality Management District (YSAQMD), and are sufficient to address BAAQMD, SJVAPCD, and YSAQMD fugitive dust control requirements. DWR or their contractors will ensure the project commitments are appropriately implemented before and during construction, and that proper documentation procedure is followed.

3.F.2.16.1 Basic Fugitive Dust Control Measures

DWR or their contractors will take steps to ensure that the following measures will be implemented to the extent feasible to control dust during general construction activities.

- Water will be applied to all exposed surfaces as reasonably necessary to prevent visible dust from leaving work areas. Frequency will be increased during especially dry or windy periods or in areas with a lot of construction activity. Exposed surfaces include (but are not limited to) soil piles, graded areas, unpaved parking areas, staging areas, and access roads.

- Cover or maintain at least 2 feet of freeboard space on haul trucks transporting soil, sand, or other loose material on the site. Any haul trucks that will be traveling along freeways or major roadways should be covered.
- Use wet power vacuum street sweepers to remove any visible trackout mud or dirt onto adjacent public roads at least once a day. Use of dry power sweeping is prohibited.
- Limit vehicle speeds on unpaved roads to 15 miles per hour.
- All roadway, driveway, sidewalk, and parking lot paving should be completed as soon as possible. In addition, building pads should be laid as soon as possible after grading unless seeding or soil binders, or other reasonable mitigation measures are used.

3.F.2.16.2 Enhanced Fugitive Dust Control Measures for Land Disturbance

DWR or their contractors will take steps to ensure that the following measures will be implemented to the extent feasible to control dust during soil disturbance activities.

- Water exposed soil with adequate frequency for continued moist soil. However, do not overwater to the extent that sediment flows off the site.
- Suspend excavation, grading, and/or demolition activity when wind speeds exceed 20 miles per hour.
- Install wind breaks (e.g., plant trees, solid fencing) on windward side(s) of construction areas.
- Plant vegetative ground cover (fast-germinating native grass seed) in disturbed areas as soon as possible after construction is completed. Water appropriately until vegetation is established.

3.F.2.16.3 Measures for Entrained Road Dust

DWR or their contractors will take steps to ensure that the following measures will be implemented to the extent feasible to control entrained road dust from unpaved roads.

- Install wheel washers for all exiting trucks, or wash off all trucks and equipment leaving the site.
- Treat site accesses to a distance of 100 feet from the paved road with a 6- to 12-inch layer of wood chips, mulch, or gravel to reduce generation of road dust and road dust carryout onto public roads.
- Post a publicly visible sign with the telephone number and person to contact at the lead agency regarding dust complaints. This person will respond and take corrective action within 48 hours. The phone number of the air quality management district will also be visible to ensure compliance.

3.F.2.16.4 Measures for Concrete Batching

DWR or their contractors will take steps to ensure that the following measures will be implemented to the extent feasible to control dust during concrete batching activities.

- Implementation of fugitive dust control measures to achieve a 70% reduction in dust from concrete batching.
- Implementation of fugitive dust control measures to achieve an 80% reduction in dust from aggregate and sand pile erosion at the concrete batch plants.
- Use of a hood system vented to a fabric filter/baghouse during cement delivery and hopper and central mix loading.

3.F.2.17 AMM17 Notification of Activities in Waterways

Similar to the requirements specified in the barge operations plan (AMM7), fish rescue and salvage plan (AMM8), and underwater sound control and abatement plan (AMM9), before in-water construction or maintenance activities begin, DWR will ensure notification of appropriate fish and wildlife agency representatives when these activities could affect water quality or aquatic species. The notification procedures will follow stipulations included in applicable permit documents for the construction operations. However, in general, the notification information will include site location(s), schedules, and work activities. Information on detours will include site-specific details regarding any temporary partial channel closures, including contacting the U.S. Coast Guard, boating organizations, marina operators, city or county parks departments, and the California Department of Pesticide Regulation, where applicable.

3.F.3 References Cited

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