3.9 Hydrology and Water Quality

This section describes the environmental and regulatory setting for hydrology and water quality. It also describes impacts on hydrology and water quality that would result from implementation of the program and the two individual projects and mitigation for significant impacts where feasible and appropriate.

3.9.1 Existing Conditions

Regulatory Setting

Federal

Clean Water Act

The following are potentially applicable sections of the Clean Water Act (CWA) (33 USC 1251–13176).

Section 303 and 305—Total Maximum Daily Load Program

The State of California adopts water quality standards to protect beneficial uses of state waters as required by CWA 303 Total Maximum Daily Load Program and the State's Porter-Cologne Water Quality Control Act of 1969 (Porter-Cologne Act). CWA 303(d) established the total maximum daily load (TMDL) process to guide the application of state water quality standards (see the discussion of state water quality standards below). To identify candidate water bodies for TMDL analysis, a list of water-quality–limited streams is generated. Such streams are considered to be impaired by the presence of pollutants, including sediments, and to have no additional assimilative capacity for these pollutants.

In addition to the impaired waterbody list required by CWA Section 303(d), CWA Section 305(b) requires states to develop a report assessing statewide surface water quality. Both CWA requirements are being addressed through the development of a 303(d)/305(b) Integrated Report, which will address both an update to the 303(d) list and a 305(b) assessment of statewide water quality. The State Water Resources Control Board (State Water Board) developed a statewide 2010 California Integrated Report based on the Integrated Reports from each of the nine Regional Water Quality Control Boards (Regional Water Boards). The 2010 California Integrated Report was approved by the State Water Board at a public hearing on August 4, 2010, and the report was submitted to the EPA for final approval. Although updates to the 303(d) list must be finalized by the EPA before becoming effective, this updated 303(d) list will be used for this analysis in order to have the most up-to-date information available.

Section 401—Water Quality Certification

CWA Section 401 requires that an applicant pursuing a federal permit to conduct any activity that may result in a discharge of a pollutant obtain a water quality certification (or waiver). Water quality certifications are issued by the Regional Water Boards in California. (The San Francisco Bay Regional Water Board is responsible for the Bay Area and the Central Valley Water Board is responsible for the Central Valley.) Because the program area contains watersheds draining to the

Central Valley as well as to San Francisco Bay, it is under the jurisdiction of both the Central Valley Water Board and the San Francisco Bay Regional Water Board. Under CWA, the state (as implemented by the relevant Regional Water Board) must issue or waive CWA Section 401 water quality certification for a project to be permitted under CWA Section 404. Water quality certification requires the evaluation of water quality considerations associated with dredging or the placement of fill materials into waters of the United States. Construction of the proposed project would require CWA 401 certification for the project if CWA Section 404 requirements are triggered.

Section 402—National Pollutant Discharge Elimination System Program

The 1972 amendments to the federal Water Pollution Control Act established the NPDES permit program to control discharges of pollutants from point sources (CWA Section 402). The 1987 amendments to the CWA created a new section of CWA devoted to stormwater permitting (CWA 402[p]). EPA has granted the State of California primacy in administering and enforcing the provisions of CWA and the NPDES permit program. The NPDES permit program is the primary federal program that regulates point-source and nonpoint-source discharges to waters of the United States.

The State Water Board issues both general and individual permits for certain activities. Although implemented at the state and local level, relevant general and individual NPDES permits are discussed below.

Construction Activities

Dischargers whose projects disturb 1 or more acres of soil or whose projects disturb less than 1 acre but are part of a larger common plan of development that in total disturbs 1 or more acres are required to file a notice of intent (NOI) to obtain coverage under the NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Order No. 2009-0009-DWQ) (Construction General Permit). Construction activities subject to this permit include clearing, grading, and disturbances to the ground such as stockpiling or excavation, but do not include regular maintenance activities performed to restore the original line, grade, or capacity of the facility.

The Construction General Permit requires the preparation and implementation of a stormwater pollution prevention plan (SWPPP), which must be completed before construction begins. The SWPPP should contain a site map that shows the construction site perimeter; existing and proposed buildings, lots, roadways, and stormwater collection and discharge points; general topography both before and after construction; and drainage patterns across the project site. The SWPPP must list best management practices (BMPs) the discharger will use to manage stormwater runoff and the placement of those BMPs. Additionally, the SWPPP must contain a visual monitoring program; a monitoring program for pollutants that are not visible to be implemented if there is a failure of BMPs; and a pH and turbidity monitoring program if the site discharges to a water body listed on the 303(d) list for sediment. Section A of the Construction General Permit describes the elements that must be contained in a SWPPP.

Postconstruction Stormwater Management

The individual NPDES permit (under Provision C.3, San Francisco Bay Regional Water Board areas only) requires that permanent water quality control devices treat all stormwater to the maximum extent practicable and result in no additional runoff. Runoff from new impervious surfaces of 10,000

square feet or more must be sized according to the volume or rate criteria identified in the permit. After treatment devices are installed, owners must enter into a maintenance agreement with the County to ensure the treatment devices are maintained, inspected, and reported on annually. Low impact development (LID) facilities are required for the project unless the project is eligible for LID reduction credit. LID includes rainwater harvesting, infiltration and bio treatment.

Section 404—Permits for Fill Placement in Waters and Wetlands

CWA Section 404 regulates the discharge of dredged and fill materials into "waters of the United States," which include oceans, bays, rivers, streams, lakes, ponds, and wetlands. Project proponents must obtain a permit from USACE for all discharges of dredged or fill material into waters of the United States before proceeding with a proposed activity. Before any actions that may affect surface waters are implemented, a delineation of jurisdictional waters of the United States must be completed, following USACE protocols, to determine whether the study area contains wetlands or other waters of the United States that qualify for CWA protection. These areas include the following.

- Sections within the ordinary high water mark (OHWM) of a stream, including non-perennial streams with a defined bed and bank and any stream channel that conveys natural runoff, even if it has been realigned.
- Seasonal and perennial wetlands, including coastal wetlands.

Section 404 permits may be issued for only the least environmentally damaging practical alternative (i.e., authorization of a proposed discharge is prohibited if there is a practical alternative that would have fewer significant effects and lacks other significant consequences). Section 404 might apply if construction would occur within waters of the United States.

State

Porter-Cologne Water Quality Control Act of 1969

The Porter-Cologne Act established the State Water Board and divided the state into nine regional basins, each with a Regional Water Board. The State Water Board is the primary state agency responsible for protecting the quality of the state's surface and groundwater supplies, while the regional boards are responsible for developing and enforcing water quality objectives and implementation plans. As mentioned, the San Francisco Bay Regional Water Board is responsible for the Bay Area region, and the Central Valley Water Board is responsible for the Central Valley area of the program which is the majority of the program area.

The Porter-Cologne Act authorizes the State Water Board to enact state policies regarding water quality in accordance with CWA 303. In addition, the act authorizes the State Water Board to issue waste discharge requirements (WDRs) for projects that would discharge to state waters. The Porter-Cologne Act requires that the State Water Board or the Regional Water Board adopt water quality control plans (basin plans) for the protection of water quality. A basin plan must perform the following functions.

- Identify beneficial uses of water to be protected.
- Establish water quality objectives for the reasonable protection of the beneficial uses.
- Establish a program of implementation for achieving the water quality objectives.

Basin plans also provide the technical basis for determining WDRs, taking enforcement actions, and evaluating clean water grant proposals. Basin plans are updated and reviewed every 3 years in accordance with Article 3 of Porter-Cologne Act and CWA 303(c) (San Francisco Bay Regional Water Quality Control Board 2011; Central Valley Regional Water Quality Control Board 2011).

California Regional Water Quality Control Board, San Francisco Bay Region and Central Valley Region—Basin Plans

Water quality in streams and aquifers of the region is guided and regulated by the San Francisco Bay Regional Water Quality Control Board Basin Plan (San Francisco Bay Regional Water Quality Control Board 2011). State policy for water quality control is directed at achieving the highest water quality consistent with the maximum benefit to the people of the state. To develop water quality standards consistent with the uses of a water body, the Regional Water Boards classify historical, present, and potential future beneficial uses for San Francisco Bay Area/Central Valley waters as part of the basin plans.

In general, beneficial uses can be classified to include municipal supply, cold freshwater habitat, groundwater recharge, fish migration, water contact recreation, noncontact water recreation, fish spawning, warm freshwater habitat, rare species habitat, and wildlife habitat (San Francisco Bay Regional Water Quality Control Board 2011, Central Valley Regional Water Quality Control Board 2011).

Local

Alameda County Stormwater Management Plan

The Department of Environmental Health developed a formal agreement with Public Works Agency to implement the industrial and commercial component of the Alameda County Clean Water Program's (ACCWP) Stormwater Management Plan for unincorporated Alameda County. The program includes inspection of facilities for compliance with the clean water regulations, provide outreach and education of best management practices to business owners, follow up inspection for enforcement action, and creation and maintenance of a database of businesses in Alameda County unincorporated area for the Clean Water Program. This program also addresses items addressed above under Construction Activities.

East County Area Plan

Relevant components of the ECAP to meet Water Quality goals for surface and groundwater are listed below (Alameda County 2000). These policies and implementation programs address similar components as in the Alameda County General Plan.

Policies

Policy 306: The County shall protect surface and groundwater resources by:

- preserving areas with prime percolation capabilities and minimizing placement of potential sources of pollution in such areas;
- minimizing sedimentation and erosion through control of grading, quarrying, cutting of trees, removal of vegetation, placement of roads and bridges, use of off-road vehicles, and animal-related disturbance of the soil;
- not allowing the development of septic systems, automobile dismantlers, waste disposal

- facilities, industries utilizing toxic chemicals, and other potentially polluting substances in creekside, reservoir, or high groundwater table areas when polluting substances could come in contact with flood waters, permanently or seasonally high groundwaters, flowing stream or creek waters, or reservoir waters; and,
- avoiding establishment of excessive concentrations of septic systems over large land areas.

Implementation Programs

Program 108: The County shall implement all federal, state and locally imposed statutes, regulations, and orders that apply to storm water quality. Examples of these include, but are not limited to:

- National Pollutant Discharge Elimination System (NPDES) stormwater permit issued by the California Regional Water Quality Control Board (RWQCB) to the Alameda County Urban Runoff Clean Water Program and amendments thereto;
- State of California NPDES General Permit for Storm Water Discharges (General Industrial Permit, General Construction Permit) and amendments thereto;
- Coastal Zone Management Act;
- Coastal Zone Act Reauthorization Amendments;
- Water Quality Control Plan, San Francisco Bay Basin Region (Basin Plan) and amendments thereto; and
- Letters issued by the RWQCB under the California Porter-Cologne Water Quality Act.

Program 109: The County shall endeavor to minimize herbicide use by public agencies by reviewing existing use and applying integrated pest management principles, such as mowing and mulching, in addition to eliminating or scaling back the need for vegetation control in the design phase of a project.

Program 110: The County shall conform with Alameda County Flood Control and Water Conservation District's (Zone 7) Wastewater Management Plan and the Regional Water Quality Control Board's San Francisco Bay Basin Plan.

Environmental Setting

Surface Water and Drainage

The program area is southwest of the San Joaquin–Sacramento Delta (Delta) in unincorporated northern Alameda County. Figure 3.9-1 shows the drainages in and around the program area. The preponderance of the program area—comprising (from north to south) the Brushy Creek, Clifton Court Forebay, Mountain House Creek, Lower Old River, Lower Corral Hollow Creek, and Upper Corral Hollow Creek watersheds—flow generally east toward the Central Valley. A narrower strip along the western portion of the program area—comprising the Upper Arroyo Las Positas and Arroyo Seco watersheds—drain west toward the San Francisco Bay region.

Additionally, some runoff enters a drainage ditch that borders the program area on the east, and some enters a canal that bisects the southern portion of the program area; both features drain to Mountain House Creek, a tributary of Old River.

According to the most recent CWA Section 303(d) List (2010), Mountain House Creek is impaired for chloride and salinity, and Old River is impaired for chlorpyrifos, electrical conductivity, total dissolved solids (TDS) and low dissolved oxygen (State Water Resources Control Board 2010).

Groundwater Resources

The program area is in the Tracy Subbasin (Basin Number 5-22.15), according to the California Department of Water Resources (DWR) Groundwater Bulletin 118. There are no published groundwater storage amounts for the entire basin; however, estimated groundwater storage capacity is approximately 4,040,000 acre-feet (af) (California Department of Water Resources 2006). Review of hydrographs for the Tracy subbasin indicates that, except for some seasonal variation resulting from recharge and pumping, the majority of water levels in wells have remained relatively stable over at least the last 10 years (California Department of Water Resources 2006).

Groundwater quality in the subbasin is characterized by a sodium water type and the southern part of the subbasin is characterized by calcium-sodium water type. The northern part of the subbasin is also characterized by a wide range of anionic water types including: bicarbonate; chloride; and mixed bicarbonate-chloride types. TDS concentrations in well water samples range from 50 to 3,520 milligrams per liter (mg/L), with an average of 463 mg/L. Areas of poor water quality exist throughout the subbasin. Elevated levels of chloride occur in several areas along the western side of the subbasin along with areas of elevated boron concentrations (California Department of Water Resources 2006).

Flooding

The program site is not within a 100-year flood hazard area (see Figure 3.9-1), as identified on a Flood Insurance Rate Map (FIRM) delineated by the Federal Emergency Management Agency (FEMA).

3.9.2 Environmental Impacts

This section describes the environmental impacts relating to hydrology, water quality and groundwater resources for the proposed program and two individual projects. It describes the methods used to determine the effects of the program and projects and lists the thresholds used to conclude whether an impact would be significant. The impacts that would result from implementation of the program and projects, findings with or without mitigation, and applicable mitigation measures are presented.

Methods for Analysis

This evaluation of hydrology, water quality, and groundwater resources is based on professional standards and information cited throughout the section.

The key impacts were identified and evaluated based on the environmental characteristics of the program/project area and the magnitude, intensity, and duration of activities related to the construction and operation of the proposed program and two individual projects.

Determination of Significance

In accordance with Appendix G of the State CEQA Guidelines, program Alternative 1, program Alternative 2, the Golden Hills project, or the Patterson Pass project would be considered to have a significant effect if it would result in any of the conditions listed below.

- Violate any water quality standards or waste discharge requirements.

- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge, resulting in a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted).
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation onsite or offsite.
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding onsite or offsite.
- Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff.
- Otherwise substantially degrade water quality.
- Place housing within a 100-year flood hazard area, as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map.
- Place within a 100-year flood hazard area structures that would impede or redirect floodflows.
- Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam.
- Contribute to inundation by seiche, tsunami, or mudflow.

Impacts and Mitigation Measures

Impact WQ-1a-1: Violate any water quality standards or waste discharge requirements—program Alternative 1: 417 MW (less than significant with mitigation)

Construction-related earth-disturbing activities associated with program Alternative 1 would introduce the potential for increased erosion and sedimentation, with subsequent effects on drainage and water quality. During construction, trenching and other construction activities create areas of bare soil that can be exposed to erosive forces for long periods of time. Bare soils are much more likely to erode than vegetated areas because of the lack of dispersion, infiltration, and retention properties created by covering vegetation. Construction activities involving soil disturbance, excavation, cutting/filling, stockpiling, and grading could result in increased erosion and sedimentation to surface waters, if proper BMPs are not used.

While existing activities at the program area may already result in the release of sediment, the extent of earth disturbance resulting from construction of the project is anticipated to result in a new and intensified potential for the release of sediments due to staging areas and turbine construction sites. If precautions are not taken to contain or capture sedimentation, earth-disturbing construction activities could result in substantial sedimentation in stormwater runoff and result in a significant impact on existing surface water quality.

Implementation of Mitigation Measure WQ-1 would minimize the potential erosion- and sedimentation-related water quality impacts and would reduce this impact to a less-than-significant level.

Mitigation Measure WQ-1: Comply with NPDES requirements

Project contractors will obtain coverage under the General Construction Permit before the onset of any construction activities, because all projects will entail disturbance of 1 acre or more. A SWPPP will be developed by a qualified engineer or erosion control specialist in accordance with the appropriate Board's requirements for NPDES compliance and implemented prior to the issuance of any grading permit before construction. The SWPPP will be kept onsite during construction activity and will be made available upon request to representatives of the Regional Water Boards.

Compliance and coverage with the *Storm Water Management Program* and General Construction Permit will require controls of pollutant discharges that utilize BMPs and technology to reduce erosion and sediments to meet water quality standards. BMPs may consist of a wide variety of measures taken to reduce pollutants in stormwater and other nonpoint-source runoff. Measures range from source control, such as reduced surface disturbance, to the treatment of polluted runoff, such as detention basins.

BMPs to be implemented as part of the *Storm Water Management Program* and General Construction Permit (and SWPPP) may include the following practices.

- Temporary erosion control measures (such as silt fences, staked straw bales/wattles, silt/sediment basins and traps, check dams, geofabric, sandbag dikes, and temporary revegetation or other ground cover) will be employed to control erosion from disturbed areas.
- Use a dry detention basin (which is typically dry except after a major rainstorm, when it will temporarily fill with stormwater), designed to decrease runoff during storm events, prevent flooding, and allow for off-peak discharge. Basin features will include maintenance schedules for the periodic removal of sediments, excessive vegetation, and debris that may clog basin inlets and outlets.
- Cover or apply nontoxic soil stabilizers to inactive construction areas (previously graded areas inactive for 10 days or more) that could contribute sediment to waterways.
- Enclose and cover exposed stockpiles of dirt or other loose, granular construction materials that could contribute sediment to waterways.
- Ensure that no earth or organic material will be deposited or placed where it may be directly carried into a stream, marsh, slough, lagoon, or body of standing water.
- Prohibit the following types of materials from being rinsed or washed into the streets, shoulder areas, or gutters: concrete, solvents and adhesives, thinners, paints, fuels, sawdust, dirt, gasoline, asphalt and concrete saw slurry, and heavily chlorinated water.
- Ensure that grass or other vegetative cover will be established on the construction site as soon as possible after disturbance.

The contractor will select a combination of BMPs (consistent with Section A of the Construction General Permit) that is expected to minimize runoff and remove contaminants from stormwater discharges. The final selection of BMPs will be subject to approval by the San Francisco Bay Regional Water Board and the Central Valley Water Board.

The contractor will verify that an NOI has been filed with the State Water Board and that a SWPPP has been developed before allowing construction to begin. The contractor will perform

inspections of the construction area, to verify that the BMPs specified in the SWPPP are properly implemented and maintained. The contractor will notify the appropriate Regional Water Board immediately if there is a noncompliance issue and will require compliance. If necessary, the contractor or their agent will require that additional BMPs be designed and implemented if those originally constructed do not achieve the identified performance standard.

Impact WQ-1a-2: Violate any water quality standards or waste discharge requirements—program Alternative 2: 450 MW (less than significant with mitigation)

Direct effects under Alternative 2 would be similar to those under Alternative 1, except the overall area of disturbance would be larger because the increased number of turbines and associated infrastructure would entail an estimated 8% increase in total disturbance area. Construction-related earth-disturbing activities associated with program Alternative 2 would introduce the potential for increased erosion and sedimentation, with subsequent effects on drainage and water quality. During construction, trenching and other construction activities create areas of bare soil that can be exposed to erosive forces for long periods of time. Bare soils are much more likely to erode than vegetated areas because of the lack of dispersion, infiltration, and retention properties created by covering vegetation. Construction activities involving soil disturbance, excavation, cutting/filling, stockpiling, and grading could result in increased erosion and sedimentation to surface waters, if proper BMPs are not used.

While existing activities at the program area may already result in the release of sediment, the extent of earth disturbance resulting from construction of the project is anticipated to result in a new and intensified potential for the release of sediments due to staging areas and turbine construction sites. If precautions are not taken to contain or capture sedimentation, earth-disturbing construction activities could result in substantial sedimentation in stormwater runoff and result in a significant impact on existing surface water quality.

Implementation of Mitigation Measure WQ-1 would minimize the potential erosion- and sedimentation-related water quality impacts and would reduce this impact to a less-than-significant level.

Mitigation Measure WQ-1: Comply with NPDES requirements

Impact WQ-1b: Violate any water quality standards or waste discharge requirements—Golden Hills Project (less than significant with mitigation)

As disclosed in the program-level analysis, construction of the Golden Hills Project would disturb soil and have the potential to affect water quality. As stated in Chapter 2, *Project Description*, the Golden Hills Project would be required to obtain coverage under the state's NPDES Construction General Permit (see additional discussion above in Mitigation Measure WQ-1).

Implementation of Mitigation Measure WQ-1 would minimize the potential erosion- and sedimentation-related water quality impacts and would reduce this impact to a less-than-significant level.

Mitigation Measure WQ-1: Comply with NPDES requirements

Impact WQ-1c: Violate any water quality standards or waste discharge requirements—Patterson Pass Project (less than significant with mitigation)

As disclosed in the program-level analysis, construction of the Patterson Pass Project would disturb soil and have the potential to affect water quality. As stated in Chapter 2, *Project Description*, the Patterson Pass Project would be required to gain coverage under the state's NPDES Construction General Permit (see additional discussion above in Mitigation Measure WQ-1).

Implementation of Mitigation Measure WQ-1 would minimize the potential erosion- and sedimentation-related water quality impacts and would reduce this impact to a less-than-significant level.

Mitigation Measure WQ-1: Comply with NPDES requirements

Impact WQ-2a-1: Substantially deplete groundwater supplies or interfere substantially with groundwater recharge, resulting in a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted)—program Alternative 1: 417 MW (less than significant)

Construction of the proposed program involves relatively small footprints that would not result in blocking groundwater infiltration to a point that would deplete groundwater supplies or interfere substantially with any nearby agricultural wells. In addition, project construction would not involve a substantial use of water with the exception of normal BMPs such as road and site dust control (this water would be trucked to the site). Operational water consumption would also be minimal. Therefore, this impact would be less than significant and no mitigation is required.

Impact WQ-2a-2: Substantially deplete groundwater supplies or interfere substantially with groundwater recharge, resulting in a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted)—program Alternative 2: 450 MW (less than significant)

Construction of the proposed program involves relatively small footprints that would not result in blocking groundwater infiltration to a point that would deplete groundwater supplies or interfere substantially with any nearby agricultural wells. In addition, project construction would not involve a substantial use of water with the exception of normal BMPs such as road and site dust control (this water would be trucked to the site). Operational water consumption would also be minimal. Therefore, this impact would be less than significant and no mitigation is required.

Impact WQ-2b: Substantially deplete groundwater supplies or interfere substantially with groundwater recharge, resulting in a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted)—Golden Hills Project (less than significant)

As disclosed in the program-level analysis, construction of the Golden Hills Project would not block groundwater infiltration to a point that would cause depletion of groundwater. All water for construction purposes would be trucked in and use of water for operations would be minimal. Therefore, this impact would be less than significant and no mitigation is required.

Impact WQ-2c: Substantially deplete groundwater supplies or interfere substantially with groundwater recharge, resulting in a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted)—Patterson Pass Project (less than significant)

As disclosed in the program-level analysis, construction of the Patterson Pass Project would not block groundwater infiltration to a point that would cause depletion of groundwater. All water for construction purposes would be trucked in and use of water for operations would be minimal. Therefore, this impact would be less than significant and no mitigation is required.

Impact WQ-3a-1: Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation onsite or offsite—program Alternative 1: 417 MW (less than significant with mitigation)

Program Alternative 1 would not construct any turbines within existing drainage areas and the program footprints would be designed to not cause any downstream erosion during the storm season. In addition, the proposed program would be required to adhere to the NPDES Construction General Permit. Therefore, implementation of Mitigation Measure WQ-1 would ensure that program-related stormwater runoff would not result in substantial erosion or downstream siltation.

Mitigation Measure WQ-1: Comply with NPDES requirements

Impact WQ-3a-2: Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation onsite or offsite—program Alternative 2: 450 MW (less than significant with mitigation)

Direct effects under Alternative 2 would be similar to those under Alternative 1, except the overall area of disturbance would be larger because the increased number of turbines and associated infrastructure would entail an estimated 8% increase in total disturbance area. Program Alternative 2 would not construct any turbines within existing drainage areas and the program footprints would be designed to not cause any downstream erosion during the storm season. In addition, the proposed program would be required to adhere to the NPDES Construction General Permit. Therefore, implementation of Mitigation Measure WQ-1 would ensure that program-related stormwater runoff would not result in substantial erosion or downstream siltation.

Mitigation Measure WQ-1: Comply with NPDES requirements

Impact WQ-3b: Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation onsite or offsite—Golden Hills Project (less than significant with mitigation)

As disclosed in the program-level analysis, the Golden Hills Project would not construct any turbines within existing drainage areas and the project footprints would be designed to not cause any downstream erosion during the storm season. In addition, the proposed project would be required to adhere to the NPDES Construction General Permit. Therefore, implementation of Mitigation

Measure WQ-1 would ensure that project-related stormwater runoff would not result in substantial erosion or downstream siltation.

Mitigation Measure WQ-1: Comply with NPDES requirements

Impact WQ-3c: Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation onsite or offsite—Patterson Pass Project (less than significant with mitigation)

As disclosed in the program-level analysis, the Patterson Pass Project would not construct any turbines within existing drainage areas and the project footprints would be designed to not cause any downstream erosion during the storm season. In addition, the proposed project would be required to adhere to the NPDES Construction General Permit. Therefore, implementation of Mitigation Measure WQ-1 would ensure that project-related stormwater runoff would not result in substantial erosion or downstream siltation.

Mitigation Measure WQ-1: Comply with NPDES requirements

Impact WQ-4a-1: Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding onsite or offsite—program Alternative 1: 417 MW (less than significant with mitigation)

Program Alternative 1 would not construct any turbines that would result in the substantial alteration of drainage patterns or the course of any stream. New turbines would constitute a maximum of approximately 16 acres of impervious surfaces; however the existing 4,200 turbine foundations that would be removed would be replaced by a maximum of 261 turbines, resulting in a net reduction of impervious surface. Consequently, this impact would be less than significant.

Although road improvements would result in a roughly 30% increase in the extent of graveled surfaces (which can result in increased runoff) from the extent of existing graveled roads, the soils underlying the program area are predominantly high runoff soils (i.e., Hydrologic Soil Group D) (Soil Conservation Service 1966, 1977). Compacted gravel roads have runoff potential similar to that of Hydrologic Soil Group D soils. Consequently, the expanded graveled roads would not result in a net increase in runoff potential than presently exists in the native soils where the new gravel would be placed. Accordingly, because there runoff would not increase as a result of the widened gravel roads, there would not be an increase in flooding onsite or offsite. In addition, all projects conducted under the program would be required to adhere to the NPDES stormwater Construction General Permit, which requires that postconstruction runoff management measures be implemented in the event that the project's SWPPP determines that a project could cause an increase in peak runoff flows from the program area. Implementation of Mitigation Measure WQ-1 would ensure that program-related stormwater runoff would not result in flooding onsite or offsite.

Mitigation Measure WQ-1: Comply with NPDES requirements

Impact WQ-4a-2: Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding onsite or offsite—program Alternative 2: 450 MW (less than significant with mitigation)

Program Alternative 2 would not construct any turbines that would result in the substantial alteration of drainage patterns or the course of any stream. New turbines would constitute a maximum of approximately 17 acres of impervious surfaces; however the existing 4,200 turbine foundations that would be removed would be replaced by a maximum of 281 turbines, resulting in a net reduction of impervious surface. Consequently, this impact would be less than significant.

Although road improvements would result in a roughly 30% increase in the extent of graveled surfaces (which can result in increased runoff) from the extent of existing graveled roads, the soils underlying the program area are predominantly high runoff soils (i.e., Hydrologic Soil Group D) (Soil Conservation Service 1966, 1977). Compacted gravel roads have runoff potential similar to that of Hydrologic Soil Group D soils. Consequently, the expanded graveled roads would not result in a net increase in runoff potential than presently exists in the native soils where the new gravel would be placed. Accordingly, because there runoff would not increase as a result of the widened gravel roads, there would not be an increase in flooding onsite or offsite. In addition, all projects conducted under the program would be required to adhere to the NPDES stormwater Construction General Permit, which requires that postconstruction runoff management measures be implemented in the event that a project's SWPPP determines that the project could cause an increase in peak runoff flows from the program area. Implementation of Mitigation Measure WQ-1 would ensure that program-related stormwater runoff would not result in flooding onsite or offsite.

Mitigation Measure WQ-1: Comply with NPDES requirements

Impact WQ-4b: Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding onsite or offsite—Golden Hills Project (less than significant with mitigation)

As disclosed in the program-level analysis, the Golden Hills Project would not construct any turbines that would result in the substantial alteration of drainage patterns or the course of any stream. New turbines would constitute a maximum of approximately 3 acres of impervious surfaces; however the existing 775 turbine foundations that would be removed would be replaced by a maximum of 52 turbines, resulting in a net reduction of impervious surface. Consequently, this impact would be less than significant.

Although road improvements would result in a roughly 30% increase in the extent of graveled surfaces (which can result in increased runoff) from the extent of existing graveled roads, the soils underlying the program area are predominantly high runoff soils (i.e., Hydrologic Soil Group D) (Soil Conservation Service 1966, 1977). Compacted gravel roads have runoff potential similar to that of Hydrologic Soil Group D soils. Consequently, the expanded graveled roads would not result in a net increase in runoff potential than presently exists in the native soils where the new gravel would be placed. Accordingly, because there runoff would not increase as a result of the widened gravel roads, there would not be an increase in flooding onsite or offsite. In addition, the proposed project would be required to adhere to the NPDES stormwater Construction General Permit, which requires that postconstruction runoff management measures be implemented in the event that the project's

SWPPP determines that the project could cause an increase in peak runoff flows from the project area. Implementation of Mitigation Measure WQ-1 would ensure that program-related stormwater runoff would not result in flooding onsite or offsite.

Mitigation Measure WQ-1: Comply with NPDES requirements

Impact WQ-4c: Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding onsite or offsite—Patterson Pass Project (less than significant with mitigation)

As disclosed in the program-level analysis, the Patterson Pass Project would not construct any turbines that would result in the substantial alteration of drainage patterns or the course of any stream. New turbines would constitute a maximum of approximately 1 acre of impervious surfaces; however the existing 336 turbine foundations that would be removed would be replaced by a maximum of 13 turbines, resulting in a net reduction of impervious surface. Consequently, this impact would be less than significant.

Although road improvements would result in a roughly 30% increase in the extent of graveled surfaces (which can result in increased runoff) from the extent of existing graveled roads, the soils underlying the program area are predominantly high runoff soils (i.e., Hydrologic Soil Group D) (Soil Conservation Service 1966, 1977). Compacted gravel roads have runoff potential similar to that of Hydrologic Soil Group D soils. Consequently, the expanded graveled roads would not result in a net increase in runoff potential than presently exists in the native soils where the new gravel would be placed. Accordingly, because there runoff would not increase as a result of the widened gravel roads, there would not be an increase in flooding onsite or offsite. In addition, the proposed project would be required to adhere to the NPDES stormwater Construction General Permit, which requires that postconstruction runoff management measures be implemented in the event that the project's SWPPP determines that the project could cause an increase in peak runoff flows from the project area. Implementation of Mitigation Measure WQ-1 would ensure that program-related stormwater runoff would not result in flooding onsite or offsite.

Mitigation Measure WQ-1: Comply with NPDES requirements

Impact WQ-5a-1: Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff—program Alternative 1: 417 MW (less than significant with mitigation)

The program area does not currently have existing or planned stormwater drainage facilities and buildout of the proposed program would not exceed capacities or increase the rate of polluted runoff. However, construction could generate polluted runoff as soil would be stripped, bare areas would be exposed, and stormwater could cause sedimentation. Implementation of Mitigation Measure WQ-1 would ensure that program-related stormwater runoff would not affect water quality.

Mitigation Measure WQ-1: Comply with NPDES requirements

Impact WQ-5a-2: Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff—program Alternative 2: 450 MW (less than significant with mitigation)

The program area does not currently have existing or planned stormwater drainage facilities and buildout of the proposed program would not exceed capacities or increase the rate of polluted runoff. However, construction could generate polluted runoff as soil would be stripped, bare areas would be exposed, and stormwater could cause sedimentation. Implementation of Mitigation Measure WQ-1 would ensure that program-related stormwater runoff would not affect water quality.

Mitigation Measure WQ-1: Comply with NPDES requirements

Impact WQ-5b: Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff—Golden Hills Project (less than significant with mitigation)

The Golden Hills Project area does not currently have existing or planned stormwater drainage facilities and construction of the proposed project would not exceed capacities or increase the rate of polluted runoff. However, construction could generate polluted runoff as soil would be stripped, bare areas would be exposed, and stormwater could cause sedimentation. Implementation of Mitigation Measure WQ-1 would ensure that project-related stormwater runoff would not affect water quality.

Mitigation Measure WQ-1: Comply with NPDES requirements

Impact WQ-5c: Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff—Patterson Pass Project (less than significant with mitigation)

The Patterson Pass Project area does not currently have existing or planned stormwater drainage facilities and construction of the proposed project would not exceed capacities or increase the rate of polluted runoff. However, construction could generate polluted runoff as soil would be stripped, bare areas would be exposed, and stormwater could cause sedimentation. Implementation of Mitigation Measure WQ-1 would ensure that project-related stormwater runoff would not affect water quality.

Mitigation Measure WQ-1: Comply with NPDES requirements

Impact WQ-6a-1: Otherwise substantially degrade water quality—program Alternative 1: 417 MW (less than significant with mitigation)

Although as described in the Environmental Setting section of this section, Mountain House Creek, a tributary of Old River, is listed as impaired for chloride and salinity, and Old River is impaired for chlorpyrifos, electrical conductivity, total dissolved solids (TDS) and low dissolved oxygen (State Water Resources Control Board 2010), the program area does not currently have any substantial water quality issues or drainages that could carry a substantial amount of polluted runoff to receiving waters. In addition, program operation is not anticipated to result in a substantial amount of additional runoff that could affect water quality. However, construction could generate polluted runoff as soil would be stripped, bare areas would be exposed, and stormwater could cause

sedimentation. Implementation of Mitigation Measure WQ-1 would ensure that program-related stormwater runoff would not affect water quality.

Mitigation Measure WQ-1: Comply with NPDES requirements

Impact WQ-6a-2: Otherwise substantially degrade water quality—program Alternative 2: 450 MW (less than significant with mitigation)

Although as described in the Environmental Setting section of this section, Mountain House Creek, a tributary of Old River, is listed as impaired for chloride and salinity, and Old River is impaired for chlorpyrifos, electrical conductivity, total dissolved solids (TDS) and low dissolved oxygen (State Water Resources Control Board 2010), the program area does not currently have any substantial water quality issues or drainages that could carry a substantial amount of polluted runoff to receiving waters. In addition, program operation is not anticipated to result in a substantial amount of additional runoff that could affect water quality. However, construction could generate polluted runoff as soil would be stripped, bare areas would be exposed, and stormwater could cause sedimentation. Implementation of Mitigation Measure WQ-1 would ensure that program-related stormwater runoff would not affect water quality.

Mitigation Measure WQ-1: Comply with NPDES requirements

Impact WQ-6b: Otherwise substantially degrade water quality—Golden Hills Project (less than significant with mitigation)

The Golden Hills project area does not currently have any substantial water quality issues or drainages that could carry a substantial amount of polluted runoff to receiving waters. In addition, project operation is not anticipated to result in a substantial amount of additional runoff that could affect water quality. However, construction could generate polluted runoff as soil would be stripped, bare areas would be exposed, and stormwater could cause sedimentation. Implementation of Mitigation Measure WQ-1 would ensure that project-related stormwater runoff would not affect water quality.

Mitigation Measure WQ-1: Comply with NPDES requirements

Impact WQ-6c: Otherwise substantially degrade water quality—Patterson Pass Project (less than significant with mitigation)

The Patterson Pass project area does not currently have any substantial water quality issues or drainages that could carry a substantial amount of polluted runoff to receiving waters. In addition, project operation is not anticipated to result in a substantial amount of additional runoff that could impact water quality. However, construction could generate polluted runoff as soil would be stripped, bare areas would be exposed, and stormwater could cause sedimentation. Implementation of Mitigation Measure WQ-1 would ensure that project-related stormwater runoff would not affect water quality.

Mitigation Measure WQ-1: Comply with NPDES requirements

Impact WQ-7a-1: Place housing within a 100-year flood hazard area, as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map—program Alternative 1: 417 MW (no impact)

The program area would not involve construction of housing or be constructed within the 100-year floodplain (see Figure 3.9-1). There would be no impact.

Impact WQ-7a-2: Place housing within a 100-year flood hazard area, as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map—program Alternative 2: 450 MW (no impact)

The program area would not involve construction of housing or be constructed within the 100-year floodplain (see Figure 3.9-1). This impact would be less than significant and no mitigation is required.

Impact WQ-7b: Place housing within a 100-year flood hazard area, as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map—Golden Hills Project (no impact)

The Golden Hills Project would not involve construction of housing and would not be constructed within the 100-year floodplain (see Figure 3.9-1). There would be no impact.

Impact WQ-7c: Place housing within a 100-year flood hazard area, as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map—Patterson Pass Project (no impact)

The Patterson Pass Project would not involve construction of housing and or be constructed within the 100-year floodplain (see Figure 3.9-1). There would be no impact.

Impact WQ-8a-1: Place within a 100-year flood hazard area structures that would impede or redirect floodflows—program Alternative 1: 417 MW (no impact)

The program area would not involve construction of housing or be constructed within the 100-year floodplain (see Figure 3.9-1). There would be no impact.

Impact WQ-8a-2: Place within a 100-year flood hazard area structures that would impede or redirect floodflows—program Alternative 2: 450 MW (no impact)

The program area would not involve construction of housing or be constructed within the 100-year floodplain (see Figure 3.9-1). There would be no impact.

Impact WQ-8b: Place within a 100-year flood hazard area structures that would impede or redirect floodflows—Golden Hills Project (no impact)

The Golden Hills Project would not involve construction of housing or be constructed within the 100-year floodplain (see Figure 3.9-1). There would be no impact.

Impact WQ-8c: Place within a 100-year flood hazard area structures that would impede or redirect floodflows—Patterson Pass Project (no impact)

The Patterson Pass Project would not involve construction of housing or be constructed within the 100-year floodplain (see Figure 3.9-1). There would be no impact.

Impact WQ-9a-1: Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam—program Alternative 1: 417 MW (no impact)

Because the program area is in rolling hills and there are no 100-year floodplains, the likelihood of a flood event in the area is considered minimal. In addition, because the proposed program would not involve construction of housing, if Bethany Reservoir Dam were to fail, the likelihood of significant risk or loss is considered minimal. There would be no impact.

Impact WQ-9a-2: Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam—program Alternative 2: 450 MW (less than significant)

Because the program area is in rolling hills and there are no 100-year floodplains, the likelihood of a flood event in the area is considered minimal. In addition, because the proposed program would not involve construction of housing, if Bethany Reservoir Dam were to fail, the likelihood of significant risk or loss is considered minimal. This impact would be less than significant and no mitigation is required.

Impact WQ-9b: Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam—Golden Hills Project (less than significant)

Because the Golden Hills Project area is in rolling hills and there are no 100-year floodplains, the likelihood of a flood event in the area is considered minimal. In addition, because the proposed project would not involve construction of housing, if Bethany Reservoir Dam were to fail, the likelihood of significant risk or loss is considered minimal. This impact would be less than significant and no mitigation is required.

Impact WQ-9c: Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam—Patterson Pass Project (less than significant)

Because the Patterson Pass Project area is in rolling hills and there are no 100-year floodplains, the likelihood of a flood event in the area is considered minimal. In addition, because the proposed project would not involve construction of housing, if Bethany Reservoir Dam were to fail, the likelihood of significant risk or loss is considered minimal. This impact would be less than significant and no mitigation is required.

Impact WQ-10a-1: Contribute to inundation by seiche, tsunami, or mudflow—program Alternative 1: 417 MW (less than significant with mitigation)

Because the proposed program area is in rolling hills and far from the ocean, the likelihood of a seiche or tsunami occurring is considered minimal. In addition, a mudflow is also highly unlikely, but could be possible in rolling hills if proper BMPs are not used during the construction process. Implementation of Mitigation Measure WQ-1 would ensure that program-related stormwater runoff would be properly contained and drain appropriately as to not build up or cause rills and sedimentation resulting in the potential for a mudflow.

Mitigation Measure WQ-1: Comply with NPDES requirements

Impact WQ-10a-2: Contribute to inundation by seiche, tsunami, or mudflow—program Alternative 2: 450 MW (less than significant with mitigation)

Because the proposed program area is in rolling hills and far from the ocean, the likelihood of a seiche or tsunami occurring is considered minimal. In addition, a mudflow is also highly unlikely, but could be possible in rolling hills if proper BMPs are not used during the construction process. Implementation of Mitigation Measure WQ-1 would ensure that program-related stormwater runoff would be properly contained and drain appropriately as to not build up or cause rills and sedimentation resulting in the potential for a mudflow.

Mitigation Measure WQ-1: Comply with NPDES requirements

Impact WQ-10b: Contribute to inundation by seiche, tsunami, or mudflow—Golden Hills Project (less than significant with mitigation)

Because the Golden Hills Project area is in rolling hills and far from the ocean, the likelihood of a seiche or tsunami occurring is considered minimal. In addition, a mudflow is also highly unlikely, but could be possible in rolling hills if proper BMPs are not used during the construction process. Implementation of Mitigation Measure WQ-1 would ensure that project-related stormwater runoff would be properly contained and drain appropriately as to not build up or cause rills and sedimentation resulting in the potential for a mudflow.

Mitigation Measure WQ-1: Comply with NPDES requirements

Impact WQ-10c: Contribute to inundation by seiche, tsunami, or mudflow—Patterson Pass Project (less than significant with mitigation)

Because the Patterson Pass Project is in rolling hills and far from the ocean, the likelihood of a seiche or tsunami occurring is considered minimal. In addition, a mudflow is also highly unlikely, but could be possible in rolling hills if proper BMPs are not used during the construction process. Implementation of Mitigation Measure WQ-1 would ensure that project-related stormwater runoff would be properly contained and drain appropriately as to not build up or cause rills and sedimentation resulting in the potential for a mudflow.

Mitigation Measure WQ-1: Comply with NPDES requirements

3.9.3 References Cited

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