4.10 Hydrology and Water Quality

This section describes the hydrology and water quality along the IC Project Alignment, as well as the potential impacts of construction and operation of the IC Project. Hydrology and water quality along the IC Project Alignment were evaluated through review of the following:

- City and county General Plans
- United States Geological Survey (USGS) 7.5 minute quadrangle maps
- Aerial photographs
- Jurisdictional delineation reports prepared for the Ivanpah-Coolwater-Kramer-Inyokern and Control-Haiwee projects (found in Appendix I to this PEA)
- Publicly available data sources including the U.S. Fish and Wildlife Service's National Wetlands Inventory and U.S. Geological Survey's National Hydrologic Dataset
- Lahontan Regional Water Quality Control Board Water Quality Control Plan (Basin Plan)
- 2014 and 2016 California Integrated Report (Clean Water Act Section 303(d) List/305(b) Report)

4.10.1 Environmental Setting

The IC Project Alignment is located in Inyo, Kern, and San Bernardino counties. Segment 1 is located within the Owens Valley. Elevations in the Owens Valley range from a low of approximately 3,500 feet above mean sea level (amsl) to a high of approximately 4,000 feet amsl near Bishop, in Inyo County. Surface water on large alluvial fans, bajadas, and mountain streams of the eastern Sierra and White Mountains drain into Owens Valley and eventually the Owens River and Owens Lake.

The southern portion of Segment 2 and Segments 3N, 3S, and 4 lie within basin and range topography that is typical for the Mojave Desert. Elevations along the IC Project Alignment range from a low of approximately 2,000 feet amsl to a high of approximately 5,500 feet amsl. Surface water on large alluvial fans and bajadas, which occur adjacent to the mountain fronts, form ephemeral streams which drain and deposit alluvial materials into valleys and eventually into dry lakes and or the Mojave River; these are found along the Segments. Soils across the IC Project Alignment vary from extremely-gravelly to sandy loam.

4.10.1.1 Surface Water Resources

Surface waters are delineated by the United States Geological Service (USGS), which divides surface waters into successively smaller hydrologic units classified into four levels: regions, sub-regions, accounting units, and cataloging units. The hydrologic units are arranged within each other, from the smallest (cataloging units) to the largest (regions). Each hydrologic unit is identified by a unique hydrologic unit code (HUC) consisting of two to eight digits based on the four levels of classification in the hydrologic unit system.

The first level of classification divides the Nation into 21 major geographic areas, or regions. The second level of classification divides the 21 regions into 221 sub-regions. A sub-region includes the area drained by a river system, a reach of a river and its tributaries in that reach, a closed basin(s), or a group of streams forming a coastal drainage area. The third level of classification subdivides many of the sub-regions into accounting units. The fourth level of classification is the cataloging unit, the smallest element in the hierarchy of hydrologic units. A cataloging unit is a geographic area representing part or all of a surface drainage basin, a combination of drainage basins, or a distinct hydrologic feature (sometimes referred to as watersheds).

The IC Project Alignment is within the Northern Mojave Accounting Unit (180902) and the Northern Mojave-Mono Lake Subregion (1809). The Project is located within the following HUCs: Indian Wells-Searles Valley (18090205), Coyote-Cuddeback Lakes (18090207), Antelope-Fremont Valleys (18090206), Death Valley-Lower Amargosa (18090203), Mohave (18090208), Owens Valley (18090103) and Ivanpah-Pahrump Valleys (16060015). Maps depicting the HUCs within the IC Project Alignment are provided in Figureset 4.10-1. Many of the HUCs and or Hydrologic Area/Subwatersheds have the potential to be closed isolated valleys or have endorheic basins/dry lakes. Within these areas, the drainages, including unnamed ephemeral drainages, flow from the surrounding mountains and alluvial fans to the valley floor and into dry lakes. Major surface features within the HUCs that are crossed by, or are in close proximity to, the IC Project Alignment include the Mojave River, Owens Lake, Owens River, Cuddeback Lake, Tinemaha Reservoir, North Haiwee Reservoir, and South Haiwee Reservoir. The Los Angeles Aqueduct occurs proximate to the IC Project Alignment. The Owens Valley is a closed drainage system and prior to the construction of the Los Angeles Aqueduct, precipitation runoff was transported by tributary streams to the Owens River south to Owens Lake, the terminus of the drainage system. Historically, Owens Lake was a large lake which exceeded 100 square miles and 20 feet deep. Currently, evapotranspiration exceeds inflow and except in wet years, the lake is a playa.

4.10.1.1.1 Waters of the U.S., including Wetlands

Waters of the U.S., including wetlands, occur throughout the IC Project Alignment. Drainages identified within the IC Project Alignment are typical ephemeral washes of the Mojave Desert and are characterized as single or compound channels (single, low-flow, meandering channels inset into wider braided channel network). These drainages are highly susceptible to widening and avulsions during moderate to high discharges, while reestablishing a low-flow channel during subsequent flows. In Segments 2, 3N, 3S, and 4, drainages are generally dry except following rainstorms; it is expected that these drainages would be dry during the construction period. In Segment 1, the Owens River and many of its drainages are perennial streams, and thus would be wet during the construction period. There are no known wet crossings along Segment 1, and the need for wet crossings in Segment 1 is not anticipated at this time. Within the IC Project alignment, approximately 197.6 acres of potentially jurisdictional non-wetland waters subject to the jurisdiction of the USACE and RWQCB were identified. The drainages totaled 728,089 linear feet.

Three wetland types occur within the IC Project Alignment: emergent wetland, scrub-shrub wetland, and forested wetland. Within the IC Project alignment, approximately 239.7 acres (10,441,332 square feet) of potentially jurisdictional wetlands were delineated. These features occur within the northern portion of the IC Project Alignment in Segments 1 and 2. Details on the waters of the U.S., including wetlands found along the IC Project Alignment, can be found in Appendix I to this PEA.

4.10.1.2 Groundwater Resources

Groundwater resources (basins) are delineated by the California Department of Water Resources. A basin is defined as an alluvial aquifer or a stacked series of alluvial aquifers with reasonably well-defined boundaries in a lateral direction and having a definable bottom. The groundwater basins crossed by the IC Project Alignment are presented in Section 4.7.1.13. Groundwater in the region is used for agricultural and urban supply, particularly in drought years. Aquifers range from large extensive alluvial valleys with thick multilayered aquifers and aquitards to small inland valleys. (DWR 2003) Depth to groundwater along the IC Project Alignment ranges considerably, from the surface to depths greater than 100 feet; in general, shallow groundwater, where present, is likely to be found proximate to surface water features.

4.10.1.2.1 Groundwater Hydrology

The South Lahontan hydrologic region (HR) represents about 17 percent of the land area in California. The region includes Inyo County and portions of Mono, San Bernardino, Kern, and Los Angeles counties. Groundwater basins found along the IC Project Alignment are shown in Figureset 4.10-2.

The South Lahontan HR is bounded to the north by the drainage divide between Mono Lake and East Walker River; to the west and south by the Sierra Nevada, San Gabriel, San Bernardino, and Tehachapi mountains; and to the east by the State of Nevada. Drainage for most of the watershed in the region is underground. Along with the arid climate, this accounts for the presence of many dry lakebeds or playas in the region. Major lakes in the region include Mono Lake, June Lake, Convict Lake, Crowley Lake, Tinemaha Reservoir, Lake Arrowhead, Silverwood Lake, and Lake Palmdale. Rivers in the region include the Owens River, the Mojave River, and the Amargosa River.

Within the South Lahontan HR, the IC Project Alignment is located within the following Hydrologic Units (HUs)/Hydrologic Areas (HAs): Ivanpah/Undefine, Amargosa/Silurian hills, Mojave/Baker/Afton/Lower Mojave/Middle Mojave/Lockhart, Antelope/North Muroc, Cuddeback/Undefined, Freemont/Koehn, and Indian Wells/China Lake.

4.10.1.2.1.1 Ivanpah Hydrologic Unit

The Ivanpah Hydrologic Unit is a north-trending valley located along the California/Nevada border in northeastern San Bernardino County. Elevation of the valley floor ranges from 2,595 feet amsl at Ivanpah Dry Lake to about 4,000 feet amsl at the southern end of the valley. The area is bounded by the Clark Mountains on the northwest, the Ivanpah Range on the west, and the New York Mountains to the southeast. Elevation in the bordering mountains ranges from 7,903 feet amsl at Clark Mountain to about 7,500 feet amsl in the New York Mountains. Average annual precipitation ranges from about 4 to 10 inches. Surface water from the bordering mountains drains toward Ivanpah Lake.

4.10.1.2.1.2 Amargosa Hydrologic Unit

The Amargosa Hydrologic Unit in San Bernardino County includes the Lower Kingston and Upper Kingston valleys. The Lower Kingston Valley includes approximately 375 square miles total drainage, with elevations ranging from 500 to 3,000 feet amsl. The area is bounded by the Kingston Range and Dumont Hills on the north, the Shadow Mountains on the east, the Avawatz Mountains to the west, and the Silurian Hills on the southeast. Annual precipitation ranges from 4 to 8 inches. Runoff from the surrounding mountains drains to Salt Creek, which flows northwest across the valley. Kingston Wash conveys runoff west from the adjacent Upper Kingston Valley, discharging into Salt Creek; Salt Creek discharges form the valley to the west into the Amargosa River.

The Upper Kingston Valley includes approximately 277 square miles total drainage, with elevations ranging from 3,000 to 5,000 feet amsl. This valley is bounded by the Mesquite Mountains on the north, the Ivanpah and Clark Mountains on the east, the Shadow Mountains on the west, and Teutonia Peak on the south. Annual precipitation ranges from 5 to 10 inches. Runoff from the surrounding mountains flows north to Kingston Wash, which discharges to the west into Valjean Valley.

4.10.1.2.1.3 Mojave Hydrologic Unit

The Mojave Hydrologic Unit is located entirely within San Bernardino County and includes approximately 1,600 square miles of total drainage. Approximately 210 square miles of this drainage area are located in the San Bernardino Mountains, which make up the headwaters of the Mojave River. Elevations within the watershed range from 8,500 feet amsl at Butler Peak in the San Bernardino Mountains to 1,400 feet amsl at Afton Canyon near the terminus of the Mojave River.

Deep Creek and the West Fork of the Mojave River are located in the San Bernardino Mountains and are the two perennial tributaries to the Mojave River. Both tributaries have multiple branch tributaries within the San Bernardino Mountains.

The main hydrologic feature of the watershed is the Mojave River, with its headwaters in the San Bernardino Mountains. Snow melt provides most of the water for the river. The Mojave River is the largest waterway in the vicinity of the IC Project Alignment. The majority of the river has subsurface flow with surface flow occurring during storm events and at the upper narrows between Victorville and Apple Valley, as well as downstream past Barstow at the lower narrows as the river flows through Afton Canyon.

4.10.1.2.1.4 Antelope Hydrologic Unit

The Antelope Hydrologic Unit is within the Antelope Valley, which is an extensive alluvial valley in the western Mojave Desert. The elevation of the valley ranges from 2,300 to 3,500 feet amsl. Antelope Valley is bounded on the northwest by the Garlock fault zone at the base of the Tehachapi Mountains and on the southwest by the San Andreas fault cone at the base of the San Gabriel Mountains. The valley is bounded on the east by ridges, buttes, and low hills that form a surface drainage divide and by Fremont Valley on the north.

4.10.1.2.1.5 Cuddeback Hydrologic Unit

The Cuddeback Hydrologic Unit is within the Cuddeback Valley, a roughly east trending valley in western San Bernardino County. Surface elevations range from about 2,550 feet amsl at Cuddeback Dry Lake to 2,800 feet amsl in the northeastern portion of the valley. The valley is bounded by the Lava Mountains on the north, the Rand Mountains on the west, Fremont Peak and the Gravel Hills on the south and southeast, and a series of granitic hills on the east. Annual rainfall is about 5 inches. Surface flows from the surrounding uplands drain toward Cuddeback Lake in the central part of the valley.

4.10.1.2.1.6 Fremont Hydrologic Unit

The Fremont Hydrologic Unit is within the Fremont Valley in eastern Kern County and northwestern San Bernardino County. The valley is bounded on the northwest by the Garlock fault zone, the El Paso Mountains, and the Sierra Nevada Range. The valley is bounded on the east by the Summit Range, Red Mountain, Lava Mountains, Rand Mountains, Castle Butte, Bissel Hills, and Rosamond Hills. The valley is bounded on the southwest by the Antelope Valley. Average annual rainfall in the Fremont Valley ranges from 4 to 12 inches. Surface water in the valley drains toward Koehn Dry Lake; however, surface drainage overlying the southwestern-most part travels southward toward the town of Rosamond.

4.10.1.2.1.7 Indian Wells Hydrologic Unit

The Indian Wells Hydrologic Unit is within the Indian Wells Valley. The valley is bound by the Sierra Nevada Range on the west, the Coso Range on the north, the Argus Range on the east, and the El Paso Mountains on the south. China Lake, a perennial lake, is situated in the central-northeastern portion of the valley.

4.10.1.3 Surface Water Quality

The IC Project Alignment is located within the jurisdiction of the Lahontan Regional Water Quality Control Board (RWQCB). The Lahontan RWQCB's Water Quality Control Plan for the Lahontan Region (Basin Plan) designates beneficial uses for surface waters and groundwater in the basin and also sets narrative and numerical objectives that must be attained or maintained to protect the designated beneficial uses and to conform to the State's antidegradation policy.

The Basin Plan identifies beneficial uses and water quality objectives that are the water quality standards for the area Lahontan Region. The Lahontan Region identifies 23 beneficial uses for the surface and groundwater resources within the region. Beneficial uses for drainages located along the IC Project Alignment are shown below in Table 4.10-1; the IC Project Alignment crosses each of the named features in this table.

Table 4.10-1: Beneficial Uses

Feature	MUN	AGR	PRO	IND	GWR	FRSH	NAV	POW	REC-1	REC-2	COMM	AQUA	COLD	WARM	SAL	WILD	BIOL	RARE	MGR	SPWN	WQE	FLD
Lahontan Region Basin Plan																						
Indian Wells Hydrologic Unit																						
China Lake Hydrologic Area																						
Minor Surface Waters	x	x			x				x	x	x		x	x		x						
Rose Hydrologic Area																						
Minor Surface Waters	x	x			x				x	x	x		x	x		x						
Owens Hydrologic Unit																						
Lower Owens Hydrologic Area																						
Little Lake*									x	x	x		x	x		x					x	x
Ash Creek	x	x			x				x	x	x			x		x	x			x		
Cottonwood Creek	x	x			x			x	x	x	x			x		x				x		
George Creek	x	x			x				x	x	x			x		x				x		
Stevens Canal	x	x			x				x	x	x			x		x				x		
Owens Lake									x	x	x		x	x	x	x			x			
Owens Lake Wetlands	x	x			x				x	x			x	x		x					x	x
Minor Surface Waters	x	x		x	x				x	x	x		x	x		x		x		x		
Minor Wetlands	x	x			x	x			x	x	x		x	x		x					x	x
Upper Owens Hydrologic Area																						
Owens River	x					x		x	x	x	x			x		x		x	x	x		
Owens River Wetlands	x	x			x				x	x			x	x		x			x		x	x
Tinemaha Creek	x	x			x				x	x	x			x		x				x		
Big Pine Creek	x	x		x					x	x	x			x		x						
Baker Creek																						
Rawson Creek	x	x			x				x	x	x			x		x						
Bishop Creek	x	x			x				x	x	x			x		x						
Minor Surface Waters	x	x			x	x			x	x	x					x				x		
Minor Wetlands	x	x			x	x			x	x	x			x		x		x		x	x	x
Ivanpah Hydrologic Unit																						
Minor Surface Waters*	x	x			x				x	x	x		x	x		x						
Amargosa Hydrologic Unit																						
Minor Surface Waters	x	x			x				x	x			x	x		x		x	x			
Silurian Hydrologic Area																						

Table 4.10-1: Beneficial Uses

Feature	MUN	AGR	PRO	IND	GWR	FRSH	NAV	POW	REC-1	REC-2	COMM	AQUA	COLD	WARM	SAL	WILD	BIOL	RARE	MGR	SPWN	WQE	FLD
Lahontan Region Basin Plan																						
Minor Surface Waters	x	x			x				x	x				x		x		x				
Mojave Hydrologic Unit																						
Minor Surface Waters	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Baker Hydrologic Unit																						
Minor Surface Waters	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Afton Hydrologic Unit																						
Minor Surface Waters	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lower Mojave Hydrologic Area																						
Minor Surface Waters	x	x			x				x	x			x	x		x						
Middle Mojave Hydrologic Area																						
Mojave River	x	x			x				x	x	x		x	x		x						
Minor Surface Waters	x	x			x			x	x	x			x	x		x						
Lockhart Hydrologic Area																						
Minor Surface Waters	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Antelope Hydrologic Unit																						
Minor Surface Waters	x	x			x				x	x	x			x		x						
North Muroc Hydrologic Unit																						
Minor Surface Waters	x	x			x				x	x	x		x	x		x						
Cuddeback Hydrologic Unit																						
Minor Surface Waters																						
Fremont Hydrologic Unit																						
Minor Surface Waters	x	x			x				x	x	x		x			x						
Koehn Hydrologic Unit																						
Minor Surface Waters	x	x			x		x		x	x			x			x						

Acronyms & Abbreviations:

AGR – Agricultural Supply
PRO – Industrial Process Supply
IND – Industrial Service Supply
GWR – Ground Water Recharge
FRSH – Freshwater Replenishment
NAV – Navigation
POW – Hydropower Generation
REC1 – Water Contact Recreation
REC2 – Non-contact Water Recreation
COMM – Commercial and Sport Fishing
AQUA – Aquaculture
COLD – Cold Freshwater Habitat
WARM – Warm Freshwater Habitat
SAL – Inland Saline Water Habitat
WILD – Wildlife Habitat
BIOL – Preservation of Biological Habitats of Special Significance
RARE – Rare, Threatened or Endangered Species
MGR – Migration of Aquatic Organisms
SPWN – Spawning, Reproduction, and Development
WQE – Water Quality Enhancement
FLD – Flood Peak Attenuation/Flood Water Storage
x – Existing Beneficial Uses
I – Intermittent Uses
NA – Not Available

4.10.1.4 Impaired Waterbodies Clean Water Act Section 303(d)

The State Water Resources Control Board (SWRCB) and RWQCBs assess water quality data for California's waters every two years to determine if they contain pollutants at levels that exceed protective water quality criteria and standards. This biennial assessment is required under Section 303(d) of the CWA. In the area surrounding the IC Project Alignment, only the Mojave River (receiving waters) is listed as a 303(d) impaired water; however, that portion of the Mojave River crossed by the IC Project Alignment is not listed (Table 4.10-2).

Table 4.10-2: Impaired Waterbodies per CWA Section 303(d)

Region	Region Name	Water Body Name	Water Body Type	Water Body Type Code	Pollutant	Pollutant Category	Final Listing Decision	TMDL Requirement Status
6	Regional Board 6 - Lahontan Region	Haiwee Reservoir	Lake/ Reservoir	L	Copper	Other Inorganics	List on 303(d) list (TMDL required list)	5A
6	Regional Board 6 - Lahontan Region	Mojave River (Mojave Forks Reservoir outlet to Upper Narrows)	River and Stream	R	Fluoride	Other Inorganics	List on 303(d) list (TMDL required list)	5A
6	Regional Board 6 - Lahontan Region	Mojave River (Upper Narrows to Lower Narrows)	River and Stream	R	Fluoride	Other Inorganics	List on 303(d) list (TMDL required list)	5A
6	Regional Board 6 - Lahontan Region	Mojave River (Upper Narrows to Lower Narrows)	River and Stream	R	Sulfates	Other Inorganics	List on 303(d) list (TMDL required list)	5A
6	Regional Board 6 - Lahontan Region	Mojave River (Upper Narrows to Lower Narrows)	River and Stream	R	Sulfates	Other Inorganics	List on 303(d) list (TMDL required list)	5A
6	Regional Board 6 - Lahontan Region	Mojave River (Upper Narrows to Lower Narrows)	River and Stream	R	Total Dissolved Solids	Salinity	List on 303(d) list (TMDL required list)	5A

Acronyms & Abbreviations:
R – Riverine
L – Lake
TMDL – Total Maximum Daily Loads
5A – 303(d) list requiring the development of a TMDL

4.10.1.5 Groundwater Quality

Groundwater along the IC Project Alignment is used for public and domestic water supply and for irrigation. The primary water bearing units are gravel, sand, silt, and clay derived from the surrounding mountains. Recharge to the groundwater system is primarily runoff from the Sierra Nevada and by direct filtration from irrigation. Because some recharge is a result of irrigation, inorganic constituents are generally found in groundwater within the region. Naturally occurring inorganic constituents do occur naturally in groundwater and the concentration can be affected by natural processes. (USGS 2013)

Groundwater along the IC Project Alignment has a preponderance of calcium and bicarbonate ions, but the range of dissolved constituents is generally considered small. (Hollett et al 1991)

4.10.1.6 Floodplains

As shown in Figureset 4.10-1, the majority of the IC Project Alignment is located in areas with a nominal mapped flood hazard. Portions of Segments 1 and 2 are routed through, and cross, 100-year floodplains (designated as Floodways on Figureset 4.10-1). No portions of Segments 3N or 3S are located within or cross a 100-year or 500-year floodplain. In Segment 4, a short portion of the IC Project Alignment near the existing Baker Substation crosses a 100-year floodplain. Floodplain areas that could result in impacts in the event of a flood are mapped (i.e., Mohave River). The smaller ephemeral and intermittent drainages crossed by the IC Project Alignment in Segments 2, 3N, 3S, and 4 would not be expected to result in a high potential for flood risk.

4.10.2 Regulatory Setting

Federal, state, and local regulations were reviewed for applicability to the IC Project.

4.10.2.1 Federal

4.10.2.1.1 Clean Water Act

Enacted in 1972, the Federal Clean Water Act (CWA; 33 U.S.C. § 1251 et seq.) and subsequent amendments outline the basic protocol for regulating discharges of pollutants to waters of the U.S. It is the primary federal law applicable to water quality of the nation's surface waters, including lakes, rivers, and coastal wetlands. Enforced by the USEPA, it was enacted "… to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." The CWA authorizes States to adopt water quality standards and includes programs addressing both point and non-point pollution sources. The CWA also established the NPDES, and provides the USEPA the authority to implement pollution control programs, such as setting wastewater standards for industry and water quality standards for surface waters (see below for a discussion of the NPDES program).

In California, programs and regulatory authority under the CWA have been delegated by USEPA to the SWRCB and its nine RWQCBs. Under Section 402 of the CWA as delegated to the State of California, a discharge of pollutants to navigable waters is prohibited unless the discharge complies with an NPDES permit. The SWRCB and RWQCBs have developed numeric and narrative water quality criteria to protect beneficial uses of state waters and waterways. Beneficial uses along the IC Project Alignment include water supply, groundwater recharge, aquatic habitat, wildlife habitat, and recreation.

4.10.2.1.2 Section 303(d), Impaired Water Bodies and Total Maximum Daily Loads

Section 303(d) of the CWA requires states to identify waters where adopted water quality standards and beneficial uses are still unattained. These lists of prioritized impaired water bodies, known as the "303(d) lists," are submitted to the USEPA every 2 years.

The law requires the development of Total Maximum Daily Loads (TMDL) to improve water quality of impaired water bodies. TMDLs are the quantities of pollutants that can be assimilated by a water body without violating water quality standards. A TMDL must account for point and nonpoint sources as well as background (natural) sources and are implemented by allocating the total allowable pollutant loading among dischargers. States are developing TMDLs for impaired water bodies to maintain beneficial uses, achieve water quality objectives, and reduce the potential for future water quality degradation.

4.10.2.1.3 Section 401, Water Quality Certification

Section 401 of the CWA specifies that the State Water Resources Control Board (SWRCB) or applicable RWQCB must certify that any discharge into waters of the U.S. complies with state water quality standards, including beneficial uses (23 CCR § 3830, et seq.). Under California's policy of no net loss of wetlands, the SWRCB and RWQCBs require mitigation for dredge and fill impacts to wetlands and waterways (see Section 4.4, Biological Resources). Dredge and fill activities in wetlands and waterways that impact waters of the U.S. will require a Federal Section 404 permit from the USACE. These permits trigger the requirement to obtain a Section 401 certification, which must be obtained prior to issuance of a Section 404 permit.

4.10.2.1.4 Section 402, National Pollution Discharge Elimination System

The SWRCB and the RWQCBs implement and enforce the NPDES program in California. Issued in 1972, the NPDES regulations initially focused on municipal and industrial wastewater discharges, followed by stormwater discharge regulations, which became effective in December 1990. NPDES permits provide two levels of control: technology-based limits and water quality-based limits. Technology-based limits are based on the ability of dischargers to treat wastewater, while water quality-based limits are required if technology-based limits are not sufficient to protect the water body. Additionally, stormwater permitting for construction site discharges is described below under state Regulations.

Dischargers with water quality-based effluent limitations must achieve water quality standards in the receiving water. Published by the USEPA on May 18, 2000, the California Toxics Rule (CTR) largely reflects the water quality criteria contained in the USEPA's Section 304(a) Gold Book (USEPA 1986) and the later National Recommended Water Quality Criteria. (USEPA 2006) With promulgation of the CTR, these federal criteria are legally applicable in California to inland surface waters, enclosed bays, and estuaries for all purposes and programs under the CWA. NPDES permits must also incorporate TMDL waste load allocations when they are developed.

4.10.2.1.5 Section 404, Placement of Dredge or Fill Material into Waters of the U.S., including Wetlands

The USACE is responsible for issuing permits under CWA Section 404 for placement of dredge or fill material into waters of the U.S, including wetlands. Waters of the U.S. refers to oceans, bays, rivers, streams (including non-perennial streams with a defined bed and bank), lakes, ponds, and seasonal and perennial wetlands. Project proponents must obtain a permit from the USACE for all discharges of fill or dredged material before proceeding with a proposed activity. The USACE may issue either an individual permit or a general permit.

4.10.2.2 State

4.10.2.2.1 Porter-Cologne Water Quality Act

The Porter-Cologne Water Quality Control Act (Porter-Cologne Act) requires protection of water quality by appropriate designing, sizing, and construction of erosion and sediment controls. The Porter-Cologne Act established the SWRCB and divided California into nine regions, each overseen by a RWQCB. The SWRCB is the primary state agency responsible for protecting the quality of the state's surface and groundwater supplies and has delegated primary implementation authority to the nine RWQCBs. The Porter-Cologne Act assigns responsibility to the SWRCB and the nine RWQCBs for implementing CWA, including Sections 401 through 402 (see above).

The nine RWQCBs also implement CWA Section 303(d). Under Section 303(d), the RWQCBs identify streams and waters that have "Water Quality Limited Segments," or portions that do not meet water quality standards even after point sources of pollution have installed the minimum required levels of pollution control technology. Pursuant to the CWA, the SWRCB establishes priority rankings for water on the lists and develops total maximum daily load criteria (i.e., the maximum quantity of a particular contaminant that a water body can assimilate without experiencing adverse effects) to improve water quality.

Under the Porter-Cologne Act and the NPDES, the SWRCB administers California's stormwater permitting program. This program requires all projects that will disturb more than one acre of land to implement stormwater BMPs to prevent discharge of sediments and stormwater. The permit (General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities, Order 2009-0009-DWQ as amended by Order 2010-0014-DWQ) requires preparation of a SWPPP and implementation of BMPs, stormwater sampling, and reporting.

The SWRCB and the RWQCBs are responsible for addressing dredge and fill impacts to wetlands and waterways in California to support the State goal of no net loss of wetlands. The SWRCB and the RWQCBs are responsible for the issuance of Section 401 water quality certifications for federal actions that result in dredge and fill activities in federally jurisdictional wetlands and waterways. Dredge and fill activities in non-federally jurisdictional wetlands and waterways must be covered under a waste discharge requirement (WDR) issued by the SWRCB or applicable RWQCB.

The Porter-Cologne Act requires the development and periodic review of water quality control plans (Basin Plans) that designate beneficial uses of California's major rivers and groundwater basins and establish narrative and numerical water quality objectives for those waters, provide the technical basis for determining waste discharge requirements, identify enforcement actions, and evaluate clean water grant proposals. The Basin Plans are updated every three years.

4.10.2.2.2 Lahontan Basin Plan

The majority of the IC Project Alignment falls within the jurisdiction of the Lahontan Regional Water Quality Control Board. The water quality objectives for the Lahontan Region, and specifically the Owens Valley and Mojave Desert, include measures to reduce the potential for contaminants. The Basin Plan lists restrictions on waste discharges and sediment and erosion control requirements. The Basin Plan identifies the majority of issues related to water quality within the Region are a result of non-point sources. The allocation of waters within the Region to areas outside the Region are also identified. The discussion of the Los Angeles Aqueduct and the State Water Project area also identified. Because of the size of the Region, careful consideration is between water quality and water quantity is a primary goal in the planning process for the Region.

4.10.2.2.3 California Fish and Game Code § 1600-1616

CFG Code Section 1600 et seq. sets forth guidelines for the protection and conservation of fish and wildlife, including habitat. The law requires any person, state or local governmental agency, or public utility to notify CDFW before beginning an activity that would substantially modify the bank or bed of a river, stream, or lake (i.e., prior to causing any potential hydrological impacts). If CDFW determines that the activity could substantially adversely affect a fish and wildlife resource, a Lake or Streambed Alteration Agreement is required. Refer to Section 4.4, Biological Resources, for additional information.

4.10.2.3 Local

The California Public Utilities Commission (CPUC) has sole and exclusive state jurisdiction over the siting and design of the IC Project. Pursuant to CPUC General Order 131-D (GO 131-D), Section XIV.B, "Local jurisdictions acting pursuant to local authority are preempted from regulating electric power line projects, distribution lines, substations, or electric facilities constructed by public utilities subject to the CPUC's jurisdiction. However, in locating such projects, the public utilities shall consult with local agencies regarding land use matters." Consequently, public utilities are directed to consider local regulations and consult with local agencies, but the counties' and cities' regulations are not applicable as the counties and cities do not have jurisdiction over the IC Project. Accordingly, the following discussion of local land use regulations is provided for informational purposes only.

4.10.2.3.1 Inyo County General Plan

The Inyo County General Plan Public Safety Element contains objectives to preserve natural water courses and reduce the potential for erosion and sedimentation, and encourage groundwater recharge. General Plan policies to improve water quality include development of detention basins, reducing channelization of water course, and restoration of degraded areas. It does not contain any specific goals or policies that are relevant to the IC Project.

4.10.2.3.2 Kern County General Plan

The Kern County General Plan Safety Element addresses watersheds, flooding, mudslides, and other hydrology-related topics. It does not contain any specific goals or policies that are relevant to the IC Project.

4.10.2.3.3 San Bernardino County General Plan

The County of San Bernardino General Plan does not contain any specific goals or policies that are relevant to the IC Project.

4.10.3 Significance Criteria

The significance criteria for assessing the impacts to hydrology and water quality come from the California Environmental Quality Act (CEQA) Environmental Checklist. According to the CEQA Checklist, a project causes a potentially significant impact if it would:

- Violate any water quality standards or waste discharge requirements
- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local ground water table level
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on site or off site
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or a substantial increase in the rate or amount of surface runoff in a manner which would result in flooding on site or off site
- Create or contribute to runoff water, which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff
- Otherwise substantially degrade water quality

- Place housing within a 100-year floodplain, as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map, or other flood hazard delineation map
- Place structures within a 100-year flood hazard area, which would impede or redirect flood flows
- Expose people or structures to a significant risk of loss, injury, or death involving flooding, including as a result of the failure of a levee or dam
- Expose people or structures to a significant risk of loss, injury, or death involving inundation by seiche, tsunami, or mudflow

4.10.4 Impact Analysis

4.10.4.1 Would the project violate any water quality standards or waste discharge requirements?

4.10.4.1.1 Construction

Less than Significant. Implementation of the IC Project would require ground-disturbing activities that could increase soil erosion rates, potentially resulting in violating water quality standards and impacts to beneficial uses in adjacent water bodies. The IC Project crosses erosion-prone areas and areas with potential for sedimentation. To minimize soil erosion and resulting impacts on water quality, SCE would comply with state stormwater regulations and the terms of ministerial grading permits from local and county jurisdictions (if such permits are necessary). Because the IC Project would disturb more than 1 acre of soils, SCE would apply for coverage under a General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities, Order 2009-0009-DWQ as amended by Order 2010-0014-DWQ. This general permit requires submittal of a Notice of Intent and preparation of a SWPPP and implementation of BMPs to address material management, non-stormwater discharge, sediment discharge, and erosion control to meet water quality standards. Site-specific BMPs would be developed including, but not limited to: erosion and sediment control, sediment stabilization, and good site housekeeping.

The IC Project crosses the Mojave River in two locations, one each east and west of the City of Barstow, and is located proximate to and upslope of Haiwee Reservoir. With implementation of the project-specific SWPPP and compliance with the terms and conditions of federal and state permits, IC Project activities would not result in water quality impacts or violate the TMDLs for the Mojave River or Haiwee Reservoir. IC Project-specific stormwater BMPs would not result in exceedances for total dissolved solids in the Mohave River or Haiwee Reservoir by retaining construction-related stormwater runoff onsite. Therefore, construction of the IC Project would not contribute to the degradation of water quality within a 303(d) listed waterbody.

Materials used during construction (e.g., diesel fuel, hydraulic fluid, oils, grease, and concrete) have the potential to be transported by storm water runoff and threaten aquatic life. These materials could violate water quality standards if they come in contact with storm water and/or are transported to nearby water resources or a municipal separate storm sewer system. The handling, storage, and disposal of potentially hazardous materials are discussed in Section 4.9, Hazards and Hazardous Materials, and specific measures to manage hazardous materials would be addressed in the SWPPP.

Wastewater would be generated by construction workers during construction of the IC Project. However, the wastewater generated during the construction period would be contained within portable restrooms and disposed of by a licensed contractor. No wastewater would be discharged from the site.

Potential water quality impacts during construction within jurisdictional drainages would be minimized through compliance with the conditions set forth in the federal or state permits and agreements, and coordination with the resource agencies. Work within CWQ wetlands and other waters may require a CWA Section 404 permit for the placement of dredge or fill material in federally jurisdictional waters of the U.S. As such, SCE would be required to obtain a Section 401 water quality certification from the SWRCB or applicable RWQCB. Work within streams or drainages may require a 1602 Lake or Streambed Alteration Agreement from CDFW. Obtaining permits for dredge and fill activities and compliance with the terms and conditions in these authorizations would ensure that these activities would not violate any water quality standards or waste discharge requirements.

Earth moving activities including vegetation removal, rehabilitation of existing access roads, and construction of new spur roads have the potential to create stormwater runoff during rain events and violate water quality standards. With the implementation of BMPs from the SWPPPs required under the state construction stormwater permit program, and compliance with terms and conditions of other required permits (including ministerial grading permits), the IC Project would not violate water quality standards or applicable waste discharge requirements associated with construction activities. With implementation of the IC Project-specific BMPs provided in the SWPPP and with proper disposal of any groundwater encountered during construction activities, the IC Project would not violate any water quality standards or waste discharge requirements; therefore, impacts would be less than significant.

4.10.4.1.2 Operations

No Impact. As presented in Chapter 3, SCE is currently performing operation and maintenance (O&M) activities, including inspections, along the subtransmission lines that would be rebuilt and reconductored under the IC Project. No material changes in O&M activities or the locations of these activities are anticipated with implementation of the IC Project, and therefore no impacts would be realized under this criterion during operations and maintenance.

4.10.4.2 Would the project substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local ground water table level?

4.10.4.2.1 Construction

Less than Significant Impact. During earth-disturbing activities, water would be used to control dust and stabilize unvegetated areas. Water for dust control would be obtained from existing surface water- and groundwater-fed supplies. It is estimated that up to 3,100 acre-feet of water may be used over the construction period; this is a highly conservative estimate, and actual water consumption would be substantially less due to refinements in construction scheduling during final engineering. The consumptive use of 3,100 acre-feet over the construction period would not result in a substantial depletion of groundwater supplies: the annual water supply in 2010 reported by the Mojave Water Agency (MWA, which covers the southern portion of Segment 2, all of Segments 3N and 3S, and the western portion of Segment 4) was 179,438 acre-feet; demand was 145,875 acre-feet. Forecast supply in 2020 is 192,339 acre-feet, with demand estimated to be 159,544 acre-feet. The MWA notes that almost all of the water use within the Region is supplied by pumped groundwater. (MWA 2014) The IC Project's approximate 1,000 acre-feet of annual water consumption represents approximately 3 percent of the annual supply surplus, and thus would not substantially deplete groundwater supplies and would not lower the local ground water table level.

During installation of TSPs and LWS poles and underground facilities, shallow groundwater may be encountered. In these instances, excavations would be dewatered and either discharged on-site to the surface or stored in Baker tanks or similar equipment prior to disposal off-site; this water may also be used for dust control. Groundwater dewatered from excavations and discharged to land or used for dust control would infiltrate into the existing groundwater system; during this process some groundwater would be lost to evapotranspiration, but this loss would be minor and would not substantially deplete groundwater supplies. Dewatering would be localized, of short duration, and of a small volume, and would not substantially deplete groundwater supplies.

The IC Project does not involve substantial grading operations or alterations to the existing terrain that would substantially alter existing drainage patterns that would affect groundwater supplies.

TSP foundations represent the only new impervious surfaces that would result from the IC Project. The total area of these foundations would be less than 1 acre; an increase in less than 1 acre of impervious surface would not impede groundwater recharge or restrict infiltration to the groundwater table. The new foundations would not create a contiguous impervious surface and would therefore not reduce the potential for infiltration and impacts would be less-than-significant.

Because of the relatively small volume of groundwater that would be used during construction when compared to the existing groundwater supplies in the area; the limited volumes of dewatering waters; and that TSP foundations would not impede groundwater recharge or restrict infiltration to the groundwater table, construction-related impacts under this criterion would be less than significant.

4.10.4.2.2 Operations

No Impact. As presented in Chapter 3, SCE is currently performing operation and maintenance (O&M) activities, including inspections, along the subtransmission lines that would be rebuilt and reconductored under the IC Project. No material changes in O&M activities or the locations of these activities are anticipated with implementation of the IC Project, and therefore no impacts would be realized under this criterion during operations and maintenance.

4.10.4.3 Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?

4.10.4.3.1 Construction

Less than Significant Impact. The IC Project crosses several ephemeral and intermittent drainages as well as the Owens River and Mojave River. The IC Project involves vegetation removal and grading associated with the rehabilitation of existing access and spur roads and the establishment of structure installation and removal sites, pull sites, and other construction work areas; the installation of replacement subtransmission poles; the construction of new spur roads; and the establishment and use of staging areas. Many of the existing access and spur roads cross ephemeral or intermittent drainages, or are located in areas that are prone to erosion and sedimentation. Rehabilitation of these existing access and spur roads and the construction of new spur roads may result in localized changes to the existing drainage patterns. Construction of new pole foundations would result in a small increase in above-ground impervious surfaces, but this would not result in a change in the drainage patterns that could result in erosion and sedimentation on or off-site. The new foundations would extend approximately 2 feet above the ground surface and be up to approximately 8 feet in diameter.

Removal of existing subtransmission structures may cause minor changes in existing drainage patterns; where foundations would be removed, final grading and contouring would return the removal areas to

pre-project conditions to the extent feasible. A site-specific SWPPP would be prepared that would identify BMPs to reduce runoff rates which would minimize the potential for erosion and sedimentation that could alter drainage patterns.

Work within streams or rivers would be avoided to the extent feasible. However, where work within drainages is required, SCE would implement measures contained in APM WET-1, including the implementation of appropriate Best Management Practices (BMPs) (e.g., silt fencing and straw wattles) to reduce the risk of an unintended release of sediments or other materials into jurisdictional waters. Where required, permits per CWA Sections 404 and 401, the Porter Cologne Act, and CDFW 1602 LSAA would be obtained and all conditions of compliance would be implemented including, but not limited to, returning all drainage features temporarily impacted during construction to pre-project conditions. Therefore, impacts would be less than significant during construction under this criterion.

4.10.4.3.2 Operations

No Impact. As presented in Chapter 3, SCE is currently performing operation and maintenance (O&M) activities, including inspections, along the subtransmission lines that would be rebuilt and reconductored under the IC Project. No material changes in O&M activities or the locations of these activities are anticipated with implementation of the IC Project, and therefore no impacts would be realized under this criterion during operations and maintenance.

4.10.4.4 Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or a substantial increase in the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?

4.10.4.4.1 Construction

Less than Significant Impact. As described above, work associated with the IC Project would result in a minor increase in impervious surface compared with existing conditions, and vegetation removal and grading would result in minor changes to drainage patterns. However, the overall drainage patterns would remain unchanged and the IC Project would not alter the course of a stream or river. The IC Project SWPPP would include measures to control stormwater runoff rates which would minimize the potential for significant alteration of drainage patterns that would result in flooding on-site or off-site. Improvements to existing access roads and spur roads and construction of new spur roads would include design considerations to maintain or improve drainage patterns. Through drainage design and SWPPP implementation, the IC Project would not substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or a substantial increase in the rate or amount of surface runoff in a manner which would result in flooding on- or off-site, and thus impacts would be less than significant.

4.10.4.4.2 Operations

No Impact. As presented in Chapter 3, SCE is currently performing operation and maintenance (O&M) activities, including inspections, along the subtransmission lines that would be rebuilt and reconductored under the IC Project. No material changes in O&M activities or the locations of these activities are anticipated with implementation of the IC Project, and therefore no impacts would be realized under this criterion during operations and maintenance.

4.10.4.5 Would the project create or contribute to runoff water, which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff?

4.10.4.5.1 Construction

Less than Significant Impact. As previously described, the IC Project would not substantially increase the area of impervious surfaces that could result in a substantial increase in runoff. Grading of construction work areas, rehabilitation of access roads and spur roads, construction of new spur roads, and construction of TSP foundations could contribute to minor increases of polluted runoff during construction. These activities would be temporary, and impacts would be reduced by the implementation of BMPs identified in the site-specific SWPPP. Because IC Project activities would not substantially increase polluted runoff, the minor increase in runoff resulting from IC Project activities would not exceed the capacity of existing or planned stormwater drainage systems. Therefore, impacts would be less than significant.

4.10.4.5.2 Operations

No Impact. As presented in Chapter 3, SCE is currently performing operation and maintenance (O&M) activities, including inspections, along the subtransmission lines that would be rebuilt and reconductored under the IC Project. No material changes in O&M activities or the locations of these activities are anticipated with implementation of the IC Project, and therefore no impacts would be realized under this criterion during operations and maintenance.

4.10.4.6 Would the project otherwise substantially degrade water quality?

4.10.4.6.1 Construction

Less than Significant Impact. As previously discussed, the IC Project would not increase or create new sources of potential water quality degradation, decrease the availability of groundwater sources, violate waste discharge requirements or water quality standards or result in substantial increases in impervious surfaces. As described in Chapter 3, project-specific BMPs would be implemented that would reduce the potential for water quality impacts during implementation of the IC Project. Therefore, less than significant impacts would be realized under this criterion.

4.10.4.6.2 Operations

No Impact. As presented in Chapter 3, SCE is currently performing operation and maintenance (O&M) activities, including inspections, along the subtransmission lines that would be rebuilt and reconductored under the IC Project. No material changes in O&M activities or the locations of these activities are anticipated with implementation of the IC Project, and therefore no impacts would be realized under this criterion during operations and maintenance.

4.10.4.7 Would the project place housing within a 100-year floodplain, as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?

4.10.4.7.1 Construction

No Impact. No housing is proposed as part of the IC Project. Therefore, the IC Project would not place housing within the 100-year flood hazard area as mapped on a Federal Flood Hazard map or Federal Insurance Map, and no impacts would result.

4.10.4.7.2 Operations

No Impact. No housing is proposed as part of the IC Project. Therefore, the IC Project would not place housing within the 100-year flood hazard area as mapped on a Federal Flood Hazard map or Federal Insurance Map, and no impacts would result.

4.10.4.8 Would the project place within a 100-year flood hazard area structures which would impede or redirect flood flows?

4.10.4.8.1 Construction

Less than Significant Impact. The replacement subtransmission structures to be installed under the IC Project would not alter drainage patterns and would not have a large cross section that would significantly impede flood flows. Therefore, any impacts from placing structures in a 100-year flood hazard zone would be less than significant.

4.10.4.8.2 Operation

No Impact. Operation and maintenance activities, that exist today, would not change as a result of the IC Project. Nor would any additional structures or facilities be placed in the 100-year flood zone, through operation and maintenance, which would potentially alter drainage patterns or impede water flows. Therefore, no impacts would occur during operation of the IC Project under this criterion.

4.10.4.9 Would the project 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?

4.10.4.9.1 Construction

Less than Significant Impact. Portions of the IC Project in Segment 1 at Control Substation, between Control Substation and Owens Lake, areas upstream of the South Haiwee Reservoir and downstream of the North Haiwee Reservoir dam, are located in areas that could be inundated during flooding or following a dam failure. In the unlikely event of flooding, including flooding as a result of the failure of a levee or dam, construction crews would evacuate in accordance to established evacuation plans and routes. Further, replacement structures installed in areas subject to flooding related to dam or levee failure are located in areas that are sparsely populated and where third-party infrastructure is not present; therefore, impacts related to dam or levee failure and risk of injury or death resulting from flooding would be less than significant.

4.10.4.9.2 Operations

No Impact. As presented in Chapter 3, SCE is currently performing operation and maintenance (O&M) activities, including inspections, along the subtransmission lines that would be rebuilt and reconductored under the IC Project. No O&M activities, including safety and evacuation procedures are expected to be altered, that would expose people or structures at greater risk. Therefore, no impacts would be realized under this criterion during operations and maintenance.

4.10.4.10 Would the project expose people or structures to a significant risk of loss, injury or death involving inundation by seiche, tsunami, or mudflow?

4.10.4.10.1 Construction

Less than Significant Impact. The IC Project is not located in an area subject to a tsunami. Seiches are waves generated within an enclosed large body of water (such as a lake) that are caused by an earthquake. Within the IC Project area, seiches could occur within the reservoirs along Segment 1. Replacement structures would generally be sited further away from the shorelines of the reservoirs than are the existing subtransmission poles and towers, and thus less susceptible to inundation by seiche. Therefore, in areas potentially subject to inundation by seiche, the replacement subtransmission poles would not expose third-party structures to any greater risk of loss, injury, or death than the existing subtransmission poles and towers pose to third-party structures.

The IC Project is routed through areas that may be susceptible to mudflows. However, the IC Project does not include the construction of residences or other structures or facilities designed for human occupation. Further, most of the IC Project is located in uninhabited, open space areas with few third-party structures or habited buildings. The installation of replacement structures in areas subject to mudflows would not expose third-party structures or people to any greater risk of loss, injury, or death than the existing subtransmission poles and towers pose to third-party structures or people. Therefore, impacts under this criterion would be less than significant.

4.10.4.10.2 Operations

No Impact. As presented in Chapter 3, SCE is currently performing operation and maintenance (O&M) activities, including inspections, along the subtransmission lines that would be rebuilt and reconductored under the IC Project. No O&M activities, including safety and evacuation procedures, are expected to be altered that would expose people or structures to a greater risk. Therefore, no impacts would be realized under this criterion during operations and maintenance.

4.10.5 Applicant Proposed Measures

Compliance with current laws and regulations, including adherence to the General Permit and SWPPP and implementation of BMPs, would result in less than significant impacts, and therefore no additional measures are proposed.

4.10.6 Alternatives

Alternatives to the IC Project are addressed in Section 5.2, Description of Project Alternatives and Impact Analysis.

4.10.7 References

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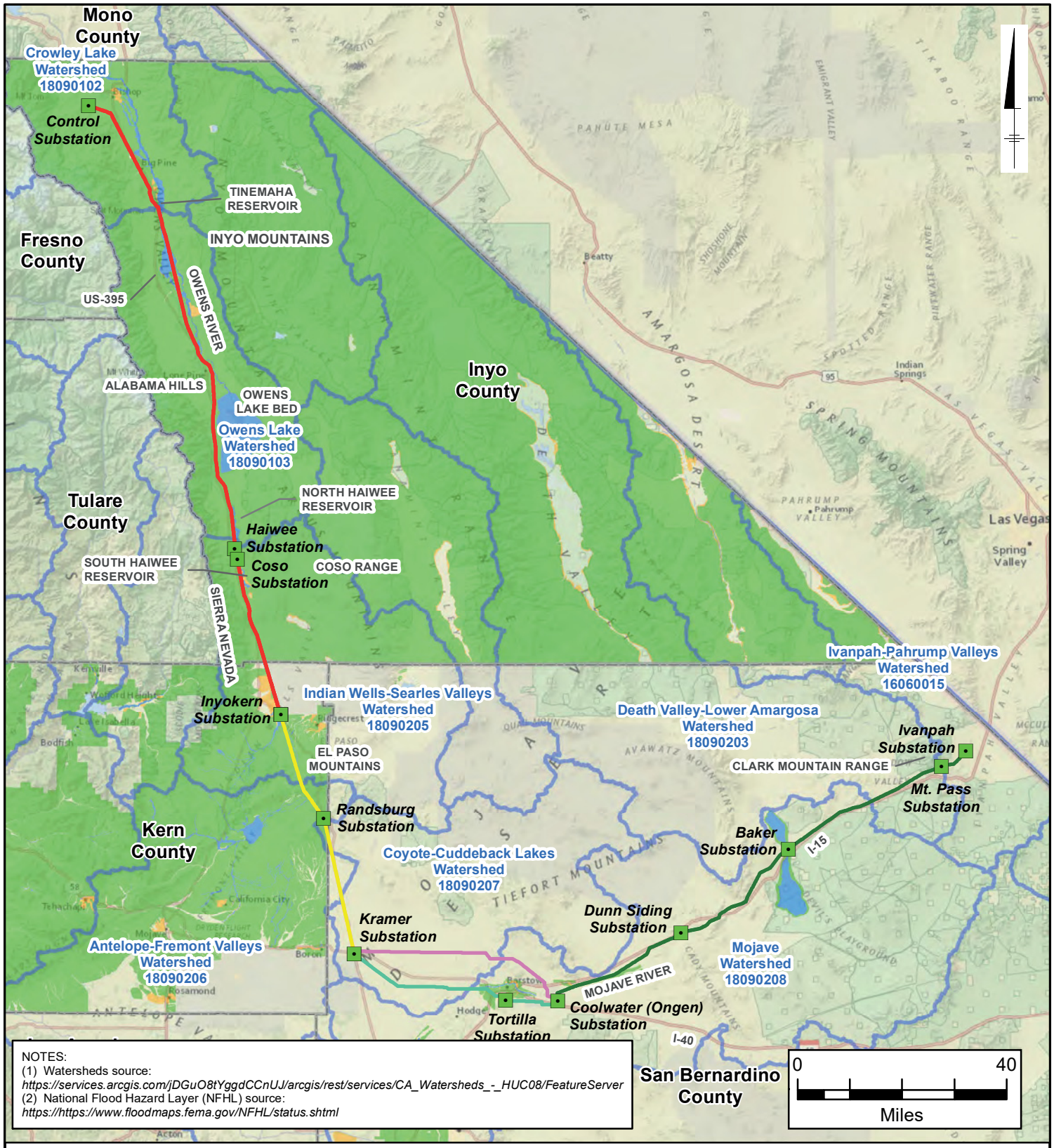

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(1) Watersheds source:
https://services.arcgis.com/jDGuO8tYggdCCnUJ/arcgis/rest/services/CA_Watersheds_-_HUC08/FeatureServer
(2) National Flood Hazard Layer (NFHL) source:
https://https://www.floodmaps.fema.gov/NFHL/status.shtml

Legend

- Substations
- Segment 1
- Segment 2
- Segment 3N
- Segment 3S
- Segment 4
- Counties
- Watersheds - HUC08

Flood Zone Subtype

- Floodway
- 0.2% Annual Chance Flood Hazard
- Area of Minimal Flood Hazard

IVANPAH-CONTROL PROJECT

WATERSHEDS AND FLOODPLAINS

ARCADIS | SOUTHERN CALIFORNIA EDISON

FIGURESET: 4.10-1

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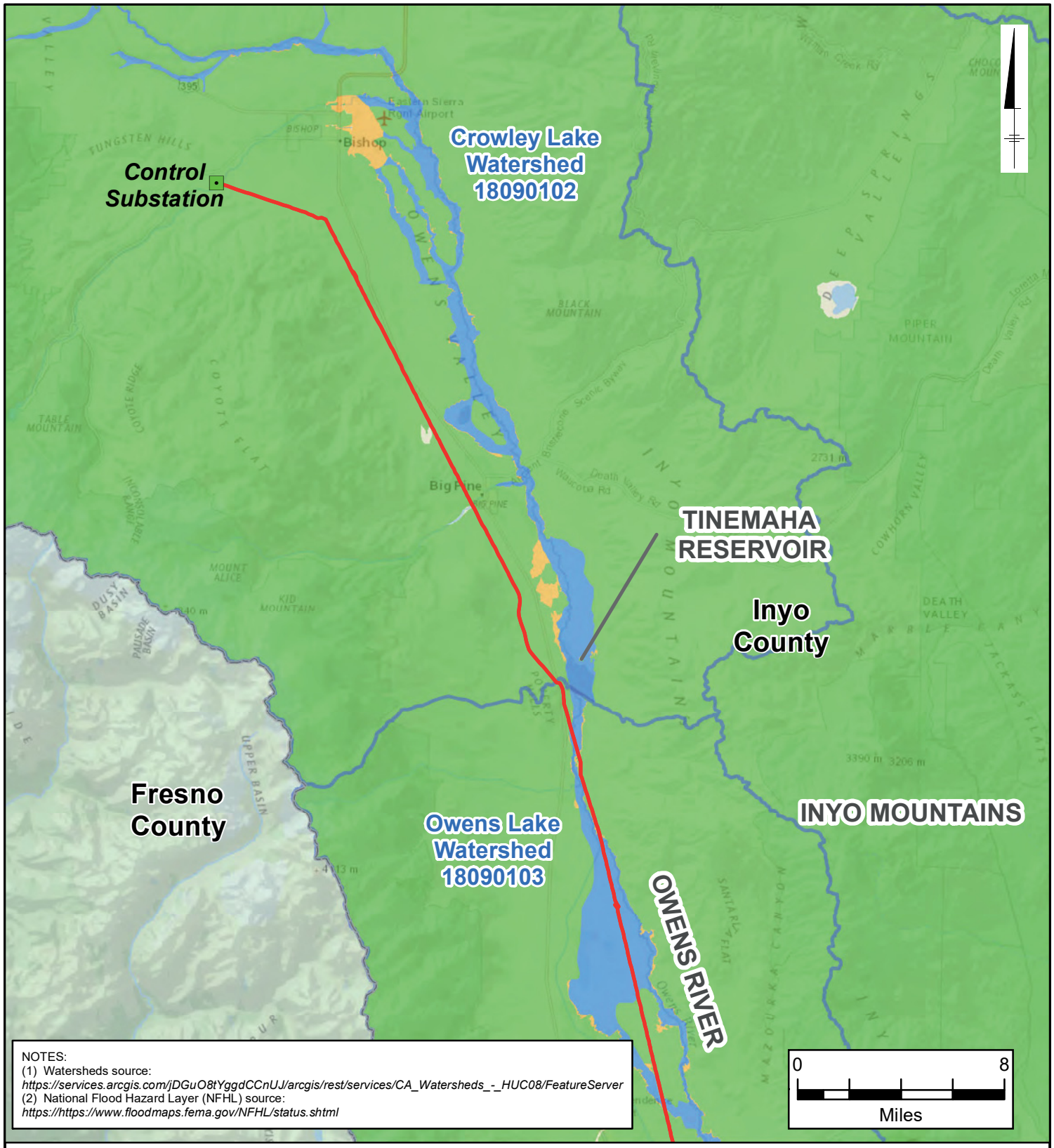

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- Substations
- Segment 1
- Segment 2
- Segment 3N
- Segment 3S
- Segment 4
- Counties
- Watersheds - HUC08

Flood Zone Subtype

- Floodway
- 0.2% Annual Chance Flood Hazard
- Area of Minimal Flood Hazard

IVANPAH-CONTROL PROJECT

WATERSHEDS AND FLOODPLAINS

ARCADIS | SOUTHERN CALIFORNIA EDISON

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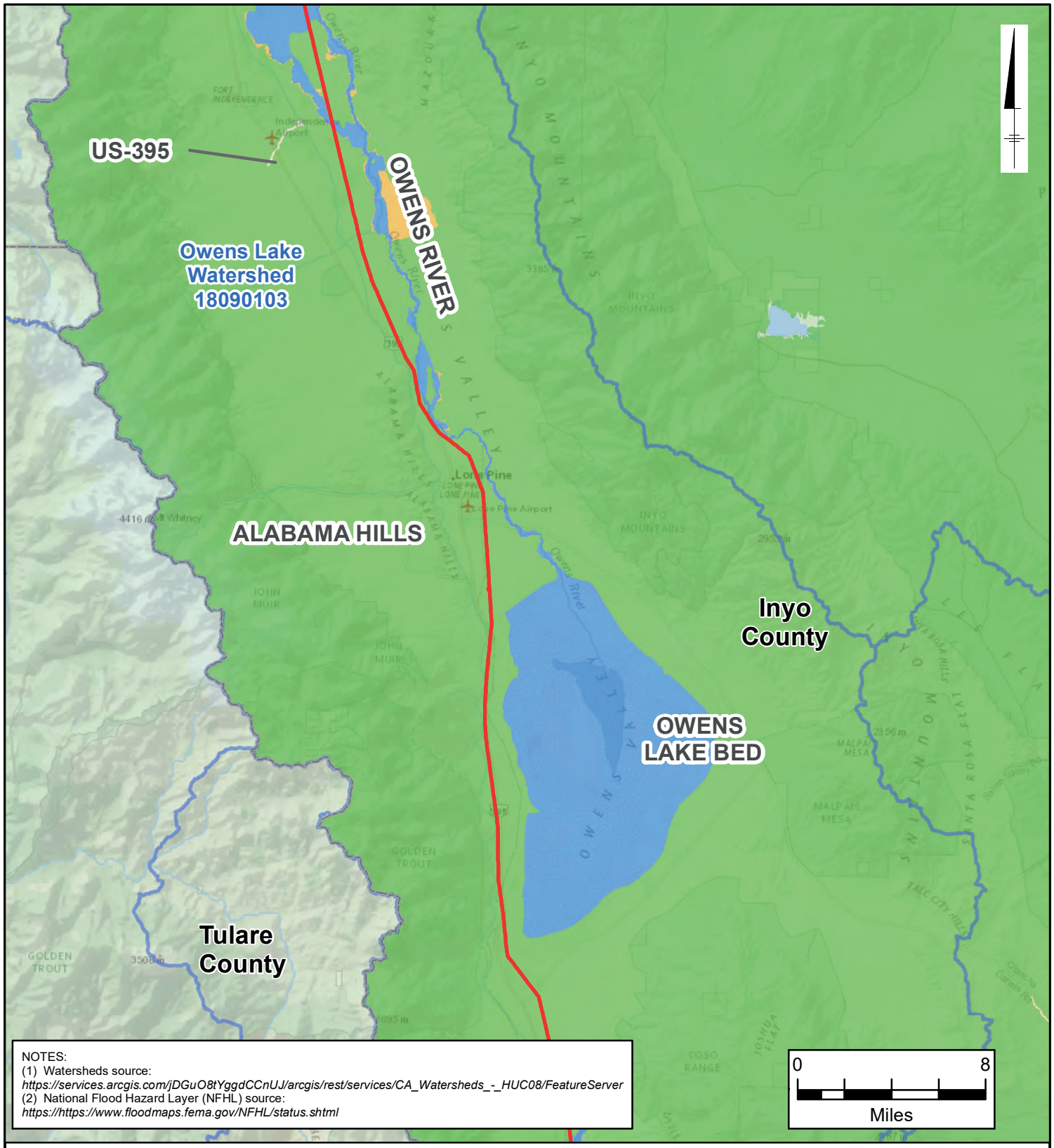

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- Substations
- Segment 1
- Segment 2
- Segment 3N
- Segment 3S
- Segment 4
- Counties
- Watersheds - HUC08

Flood Zone Subtype

- Floodway
- 0.2% Annual Chance Flood Hazard
- Area of Minimal Flood Hazard

IVANPAH-CONTROL PROJECT

WATERSHEDS AND FLOODPLAINS

ARCADIS | SOUTHERN CALIFORNIA EDISON

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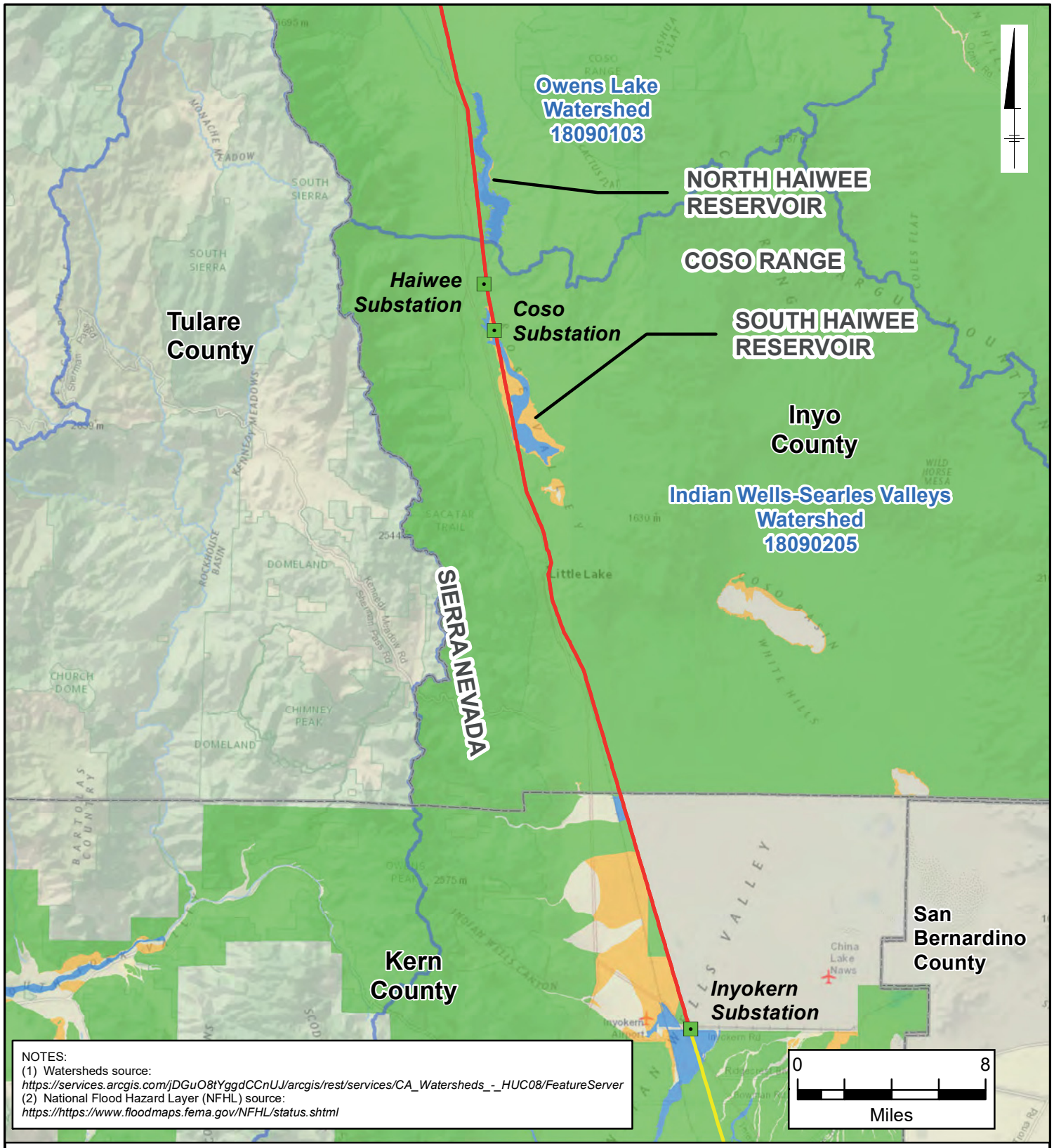

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- Substations
- Segment 1
- Segment 2
- Segment 3N
- Segment 3S
- Segment 4
- Counties
- Watersheds - HUC08

Flood Zone Subtype

- Floodway
- 0.2% Annual Chance Flood Hazard
- Area of Minimal Flood Hazard

IVANPAH-CONTROL PROJECT

WATERSHEDS AND FLOODPLAINS

ARCADIS | SOUTHERN CALIFORNIA EDISON

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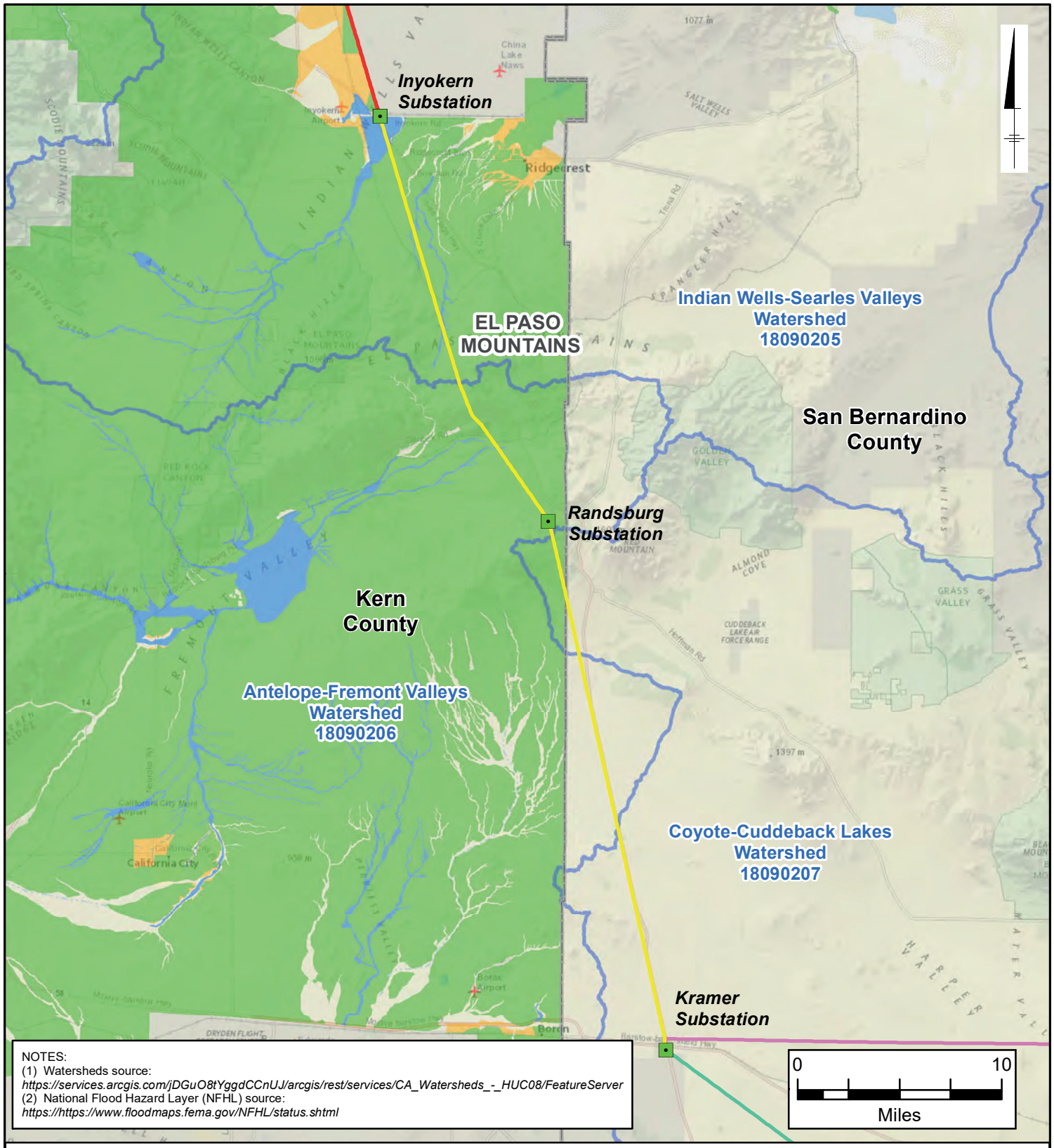

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Legend

- Substations
- Segment 1
- Segment 2
- Segment 3N
- Segment 3S
- Segment 4
- Counties
- Watersheds - HUC08

Flood Zone Subtype

- Floodway
- 0.2% Annual Chance Flood Hazard
- Area of Minimal Flood Hazard

IVANPAH-CONTROL PROJECT

WATERSHEDS AND FLOODPLAINS

ARCADIS | SOUTHERN CALIFORNIA EDISON

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Project (Project #)
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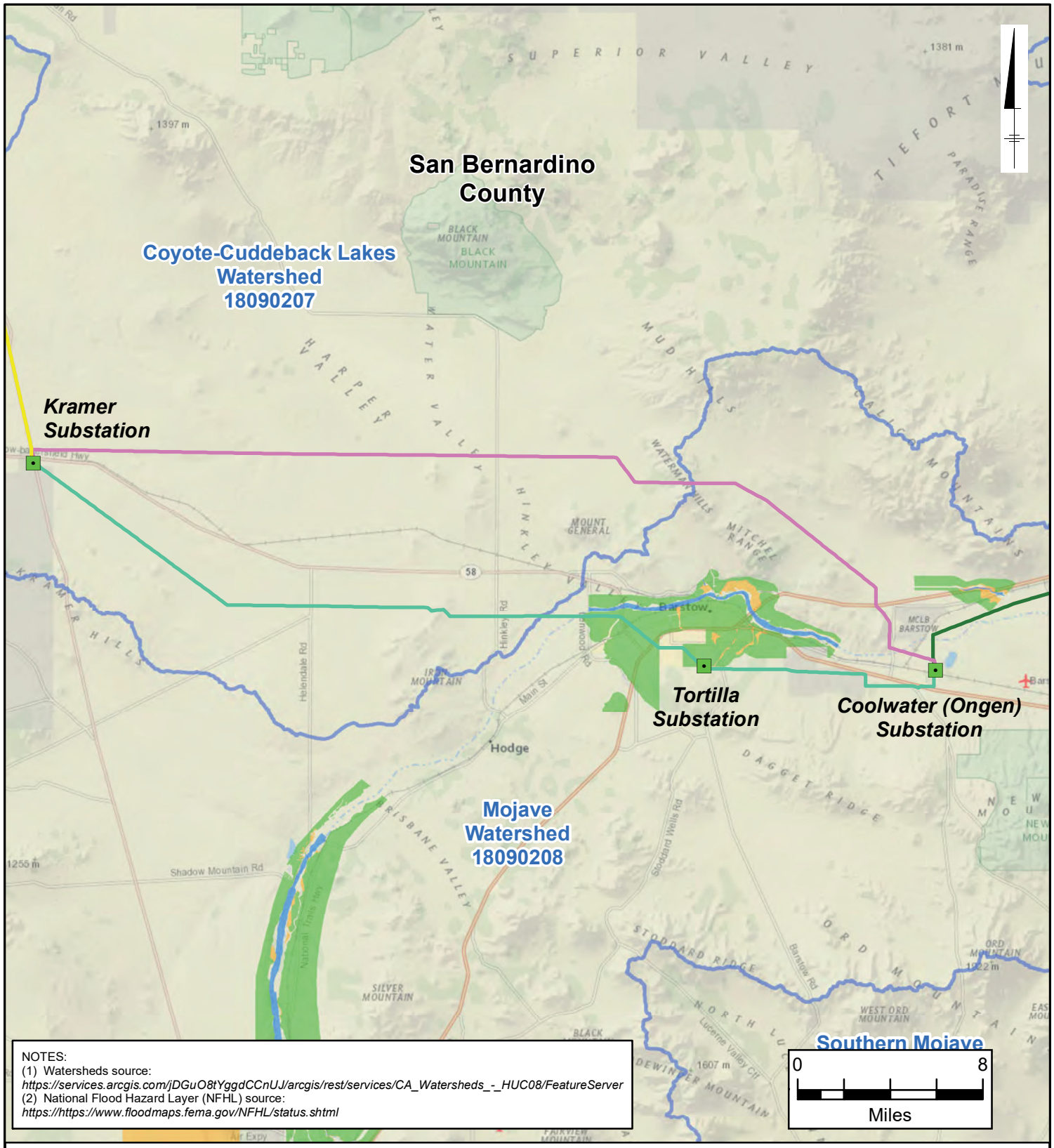

NOTES:
(1) Watersheds source:
https://services.arcgis.com/jDGuO8tYggdCCnUJ/arcgis/rest/services/CA_Watersheds_-_HUC08/FeatureServer
(2) National Flood Hazard Layer (NFHL) source:
https://https://www.floodmaps.fema.gov/NFHL/status.shtml

Legend

- Substations
- Segment 1
- Segment 2
- Segment 3N
- Segment 3S
- Segment 4
- Counties
- Watersheds - HUC08

Flood Zone Subtype

- Floodway
- 0.2% Annual Chance Flood Hazard
- Area of Minimal Flood Hazard

IVANPAH-CONTROL PROJECT

WATERSHEDS AND FLOODPLAINS

ARCADIS | SOUTHERN CALIFORNIA EDISON

FIGURESET: 4.10-1

City: Div/Group: Created By: Last Saved By: MGI01044
Project (Project #)
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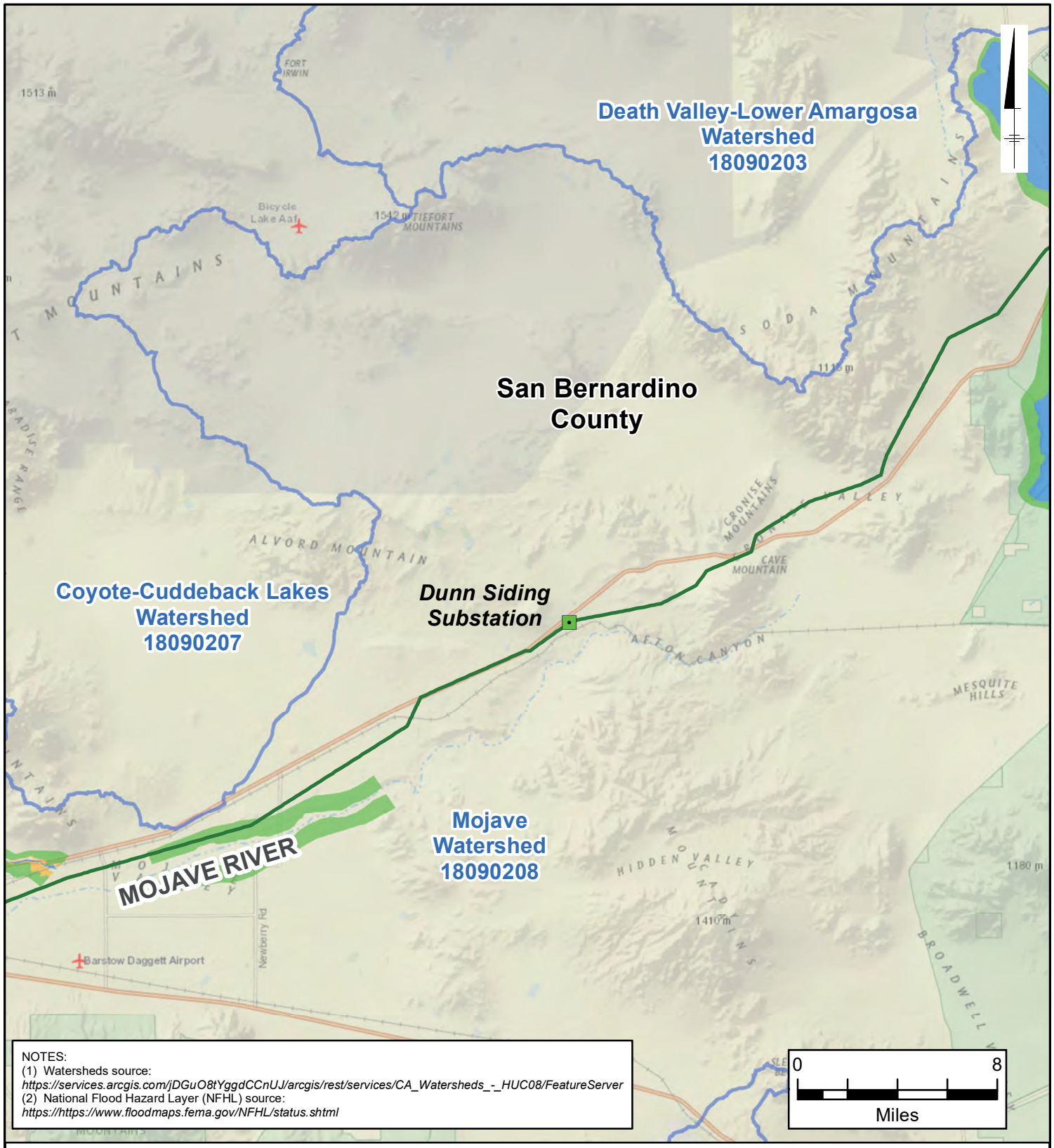

Legend

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IVANPAH-CONTROL PROJECT

WATERSHEDS AND FLOODPLAINS

ARCADIS | SOUTHERN CALIFORNIA EDISON

FIGURESET: 4.10-1

City: Div/Group: Created By: Last Saved By: MGI01044
Project (Project #)
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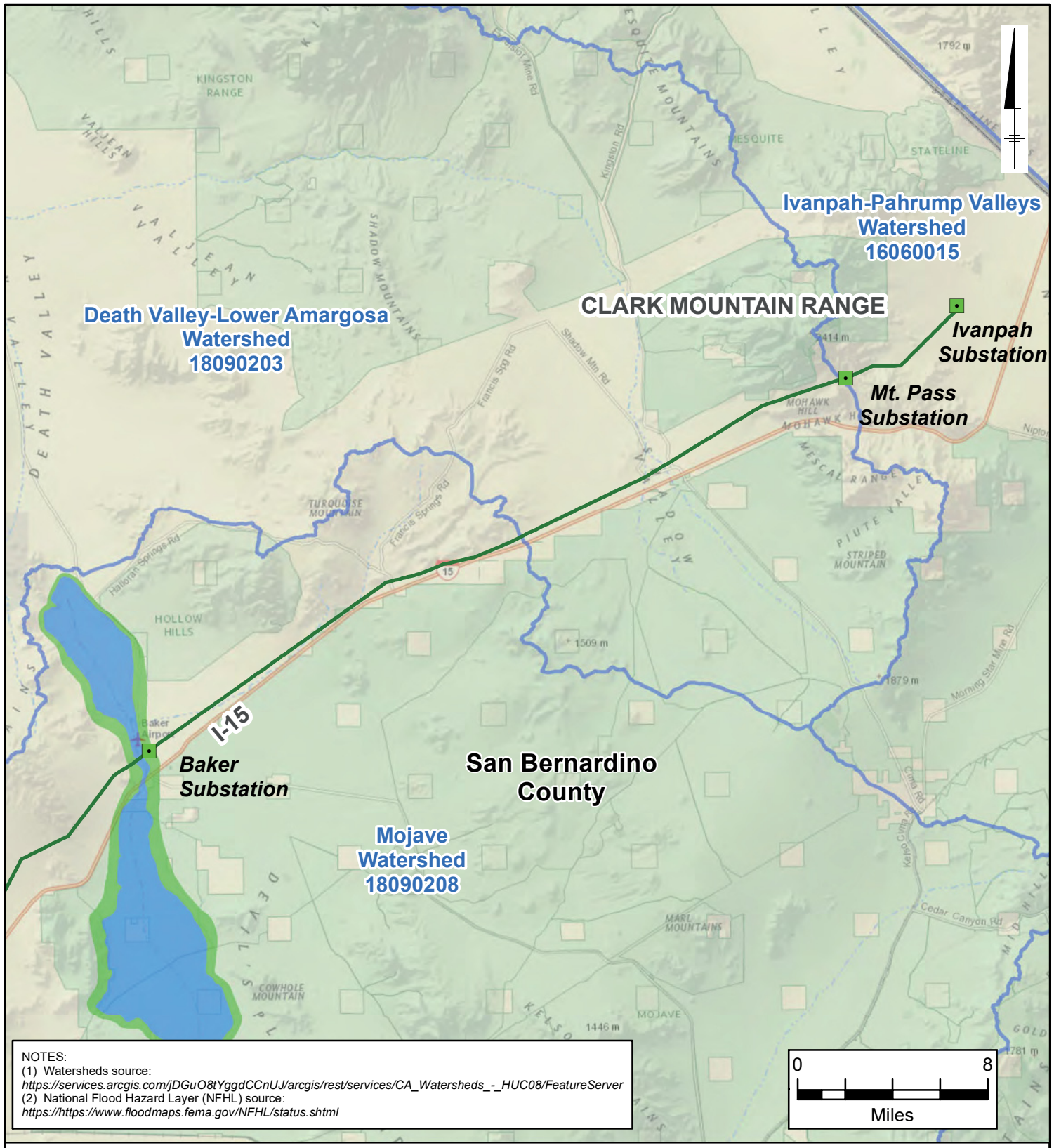

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IVANPAH-CONTROL PROJECT

WATERSHEDS AND FLOODPLAINS

ARCADIS | SOUTHERN CALIFORNIA EDISON

FIGURESET: 4.10-1

Legend

- Substations
- Segment 1
- Segment 2
- Segment 3N
- Segment 3S
- Segment 4
- Counties
- Groundwater Basins

0 40

Miles

IVANPAH-CONTROL PROJECT

GROUNDWATER BASINS

ARCADIS

SOUTHERN CALIFORNIA EDISON

FIGURESET: 4.10-2

City: Div/Group: Created By: Last Saved By: MGI01044
Project (Project #)
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Legend

- Substations
- Segment 1
- Segment 2
- Segment 3N
- Segment 3S
- Segment 4
- Counties
- Groundwater Basins

0 8

Miles

IVANPAH-CONTROL PROJECT

GROUNDWATER BASINS

ARCADIS

SOUTHERN CALIFORNIA EDISON

FIGURESET: 4.10-2

Legend

- Substations
- Segment 1
- Segment 2
- Segment 3N
- Segment 3S
- Segment 4
- Counties
- Groundwater Basins

0 8

Miles

IVANPAH-CONTROL PROJECT

GROUNDWATER BASINS

ARCADIS

SOUTHERN CALIFORNIA EDISON

FIGURESET: 4.10-2

Legend

- Substations
- Segment 1
- Segment 2
- Segment 3N
- Segment 3S
- Segment 4
- Counties
- Groundwater Basins

0 8
Miles

IVANPAH-CONTROL PROJECT

GROUNDWATER BASINS

ARCADIS | SOUTHERN CALIFORNIA EDISON

FIGURESET: 4.10-2

Legend

- Substations
- Segment 1
- Segment 2
- Segment 3N
- Segment 3S
- Segment 4
- Counties
- Groundwater Basins

0 10

Miles

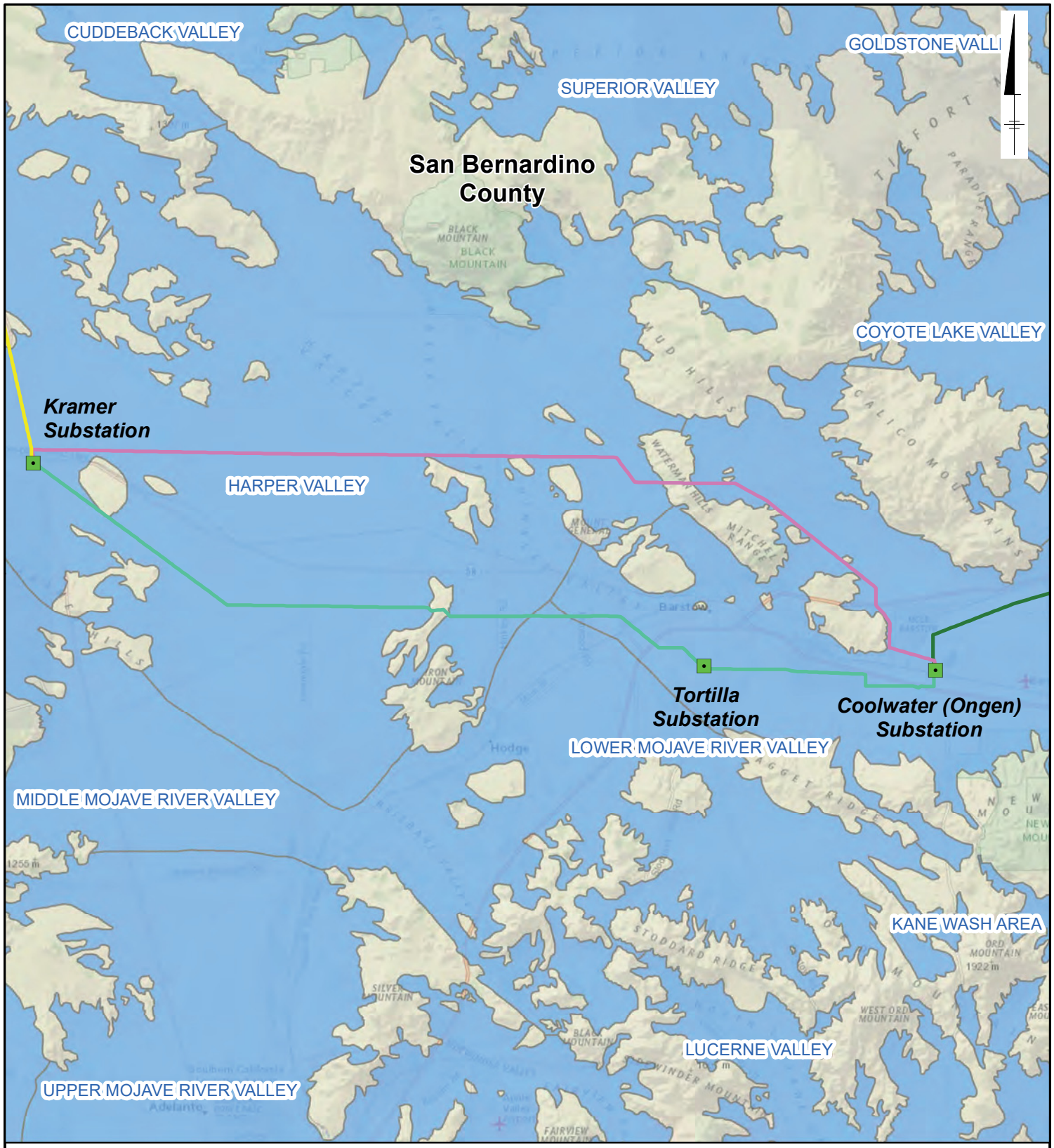
IVANPAH-CONTROL PROJECT

GROUNDWATER BASINS

ARCADIS

SOUTHERN CALIFORNIA EDISON

FIGURESET: 4.10-2



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GROUNDWATER BASINS

ARCADIS

SOUTHERN CALIFORNIA EDISON

FIGURESET: 4.10-2

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Legend

- Substations
- Segment 1
- Segment 2
- Segment 3N
- Segment 3S
- Segment 4
- Counties
- Groundwater Basins

0 8

Miles

IVANPAH-CONTROL PROJECT

GROUNDWATER BASINS

ARCADIS | SOUTHERN CALIFORNIA EDISON

FIGURESET: 4.10-2

Legend

- Substations
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Miles

IVANPAH-CONTROL PROJECT

GROUNDWATER BASINS

ARCADIS

SOUTHERN CALIFORNIA EDISON

FIGURESET: 4.10-2