

TABLE A-1 (continued)

Issue Area	Items that will be Impacted	Type of Data Required	Time Step (a)	Minimum Level of Detail	Other Comments		
Vegetation	Wetlands Riparian Vegetation Estuarian Vegetation Grassland and Foothill Vegetation Special Status Species	Acreages Adjacent Land Uses Vegetation Condition Surface Water and Ground Water Availability and Quality Reservoir Elevations and Surface Water Perimeter Refuge Vegetation Condition	Periodically	The analysis will focus on the vegetation along rivers, streams, reservoirs, and refuge wetted areas <u>by geographic subregions with CVP water users or facilities.</u>	Historic data will be limited to previously compiled data.		
			Periodically				
			Annual			The analysis will focus on vegetation changes due to changes in water availability and quality and on associated land use changes.	Alternative analyses will occur only for the Year 2022.
Wildlife	Waterfowl Habitat Agricultural Lands Habitat Upland Habitat Wetlands Habitat Critical Habitat Resident Populations Migrant Populations Special Status Species	Waterfowl Populations and Conditions Acreage, Location, and Value of Habitats, including Refuges Water Availability and Quality	Annual	The analysis will focus on wildlife that are dependent upon rivers, streams, reservoirs, refuges, and agricultural areas <u>in geographical subregions with CVP water users or facilities.</u>	Historic data will be limited to previously compiled data.		
			Annual and Periodically			The analysis will focus on wildlife changes due to changes in water availability and quality, associated land use changes, and changes due to habitat restoration.	Alternative analyses will occur only for the Year 2020.
			Annual				
Land Use	Agricultural Uses Municipal & Industrial Uses Open Space Uses	Acreages Crop Patterns Water Availability and Quality Water Supply Costs (including cost of pumping groundwater) Market Value of Crops Soil Suitability for Land Use Industries that could be Affected, such as Gravel Mining along Major Rivers	Periodically	The analysis for agricultural land uses will focus on changes in irrigated lands and crop patterns due to water availability, quality, and costs <u>in geographic subregions with CVP water users or facilities.</u>	The land use data collection will be based upon similar information used for recent evaluations conducted by the State Department of Water Resources which are only compiled periodically.		
			Periodically				
			Annual			The analysis for municipal & industrial land uses will focus on conversion of other land uses to urban uses and water availability, quality, and costs <u>in geographic subregions with CVP water users or facilities.</u>	
			Periodically				
			N/A				
			Periodically	The analysis for open space lands will be included in Vegetation Issue Area.			

TABLE A-1 (continued)

Issue Area	Items that will be Impacted	Type of Data Required	Time Step (a)	Minimum Level of Detail	Other Comments
Water continued	Groundwater	Groundwater Elevations Recharge Rates Withdrawal Rates Water Quality (metals and salts) Water Quality Standards Drainage Rates Drainage Water Quality (see above) Drainage Effluent Limitations Subsidence Rates	Annual Annual Annual Annual N/A Monthly Annual N/A Annual	Groundwater data will be collected and evaluated for <u>each geographical subregion in the Sacramento and San Joaquin Basins, Tulare Basin, the Santa Clara Valley portion of the San Francisco Bay Area, and Monterey Bay Area</u> . The evaluation will be based upon previously collected and compiled data.	Estimates will need to be used for groundwater withdrawals because these data are not specifically collected for most areas in California.
Fisheries	Anadromous Species Fresh Water Species Special Status Species	Anadromous Fish Populations by Species, Race, and Run Other Fish Populations Habitat Values Water Availability Water Quality Temperature Landing Data Other Constraints and Limiting Factors on Fishery Populations	Annual Annual Periodically Monthly Monthly Monthly Annual Annual and Periodically	Fishery habitat indices will be evaluated by analyzing flows; water quality; temperature; habitat changes due to changes in water quality, sediment, vegetation, predation, or diversions; and limiting factor changes. The analysis will focus on the populations in the major rivers. However, anadromous fish in the major rivers also rely upon conditions in the tributaries. Therefore, the analysis also will need to extend into the tributaries. The area for the analysis will include the <u>streams and reservoirs defined under the Surface Water Issue Area</u> .	Daily data will be collected for specific points in the Sacramento and San Joaquin Rivers and Delta for developing relationships between fish habitat indices and water flows and characteristics.

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TABLE A-1
LEVEL OF EFFORT FOR ISSUE AREAS TO BE ADDRESSED IN THE TITLE 34 PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

Issue Area	Items that will be Impacted	Type of Data Required	Time Step (a)	Minimum Level of Detail	Other Comments
Climate	None	Precipitation, Temperature, and Wind	Monthly	Average monthly data for streams and reservoirs. Obtain information <u>as for surface water and groundwater issue areas.</u>	Daily data will be aggregated to monthly values.
Air Quality	Particulates Sulfur Compounds Carbon Compounds	Existing Air Quality Emission Rates for Particulates Emission Rates for Fossil Fuel Power Plants used by Pacific Gas & Electric Company	Annual N/A N/A	Average annual data for <u>air quality basins in the Sacramento and San Joaquin Valleys, North Coast (Trinity/Klamath watersheds), and in the San Francisco Bay Area</u> where CVP contractors or facilities are located.	Monthly data will be aggregated to annual values. Analysis of potential emissions from power generation facilities to meet projected Western contracted loads.
Geology and Soils	Soil Erosion Subsidence (see Groundwater) Soil Salinity Soil Contamination (Drainage is included in Groundwater Issue Area)	Soil Types and Characteristics Land Uses (Cover and Types of Disturbances) Soil Erosion Rates due to Wind Erosion and Water Erosion Soil Types and Characteristics Applied Water Rate Leaching Rates Chemical Retention Rates Water Quality Land Uses	N/A Periodically N/A N/A Annual Annual N/A 10 years 10 years	Data will be collected from several sources with different geographical units. All data will be aggregated to <u>geographical subregions in the Sacramento and San Joaquin Valleys and the Trinity Basin.</u>	Historical data will focus on known problems, especially on the San Joaquin Drainage Plan Study Area and along the southeastern side of the San Joaquin Valley. Alternative analysis will occur only for the Year 2022.

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TABLE A-1 (continued)

Issue Area	Items that will be Impacted	Type of Data Required	Time Step (a)	Minimum Level of Detail	Other Comments
Water	Streams	Flows Precipitation Relationship with Groundwater Diversion/Storage Water Quality & Flow Standards Temperature Water Quality (including metals, mineral salts, trihalomethane precursors, pH, herbicides used in rice fields)	Monthly Monthly Annual Annual N/A Monthly Annual	<u>Major rivers</u> , (Sacramento, San Joaquin, American, and Trinity/Klamath Rivers); <u>major tributary rivers</u> , including Calaveras, Chowchilla, Cosumnes, Feather, Fresno, Kaweah, Kern, King, McCloud, Merced, Mokelumne, Pit, Stanislaus, Tule, Tuolumne, and Yuba Rivers; <u>streams studied by U.S. Fish and Wildlife Service and California Department of Fish and Game for anadromous fish; streams used by refuges; and the coastal areas used by the anadromous fish from the Central Valley and the Trinity/Klamath Rivers.</u> The area to be evaluated along tributary rivers and streams will generally be limited to <u>the area from the confluence with a major river to the first structure that is impassable by fish.</u>	Flow and temperature data will be for specific points in the Sacramento and San Joaquin Rivers will be used to confirm relationships between monthly average and extreme flow and temperature data in critical months, and effects on fish populations.
	Reservoirs	Storage Releases Water Surface Elevations Water Surface Area Water Quality (see above) Temperature	Monthly Monthly Monthly Monthly Annual Monthly	<u>Reservoirs on the rivers and streams identified above</u> because the information will be used to evaluate anadromous fish plans.	Daily data for the Delta also will be collected at specific points in the Delta. The daily data will only be used to estimate general relationships between flow and fishery habitat indices.
	Delta	Flows Water Quality (see above) Water Quality and Flow Standards	Monthly Monthly N/A	The Delta includes parts of the Sacramento and San Joaquin rivers and other streams that are addressed above.	

TABLE A-1 (continued)

Issue Area	Items that will be Impacted	Type of Data Required	Time Step (a)	Minimum Level of Detail	Other Comments
Economics	Agricultural Economics	Crop Acreages and Patterns	Annual	The analysis of agricultural and non-agricultural community economics will focus on changes due to changes in water supply availability, quality, and costs and associated changes in land use <u>in the geographic subregions</u> .	The analysis of agricultural economics is analyzed on an annual basis. The historical crop acreages are published every 5-7 years and interpolated on an annual basis. The alternative analysis will be on an annual basis.
		Water Availability and Quality	Annual		
		Water Supply Costs	Annual		
		Market Value of Crops	Annual		
		On-Farm Economics	Annual		
		Agricultural Community Economics (ie Income, Profit)	Annual		
		Regional Agricultural Economics	Annual		
		Indian Trust Land Economics	Annual		
		Non-Agricultural Community Economics (including Municipal and Industrial Economics)	Employment Data		
	Income Data		Annual		
	Water Availability and Quality		Annual		
	Water Supply Costs (including treatment costs)		10 Years		
	Housing Costs		Annual		
	Statewide Income, Sales, Employment		Annual		
	Recreation and Fish & Wildlife Economics (including Ocean Fishing for Anadromous Fish Economics)	Indian Trust Land Economics	Annual		
Sport/Commercial Fishing Take		Annual			
Indian Trust Land Economics		Annual			
Rafting Use		Annual			
Boating Use		Annual			
Sport and Commercial Hunting		Annual			
Camping Use	Annual				
Refuge Use	Annual				
Employment Data for Items Above	Annual				
Income Data for Items Above	Annual				

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TABLE A-1 (continued)

Issue Area	Items that will be Impacted	Type of Data Required	Time Step (a)	Minimum Level of Detail	Other Comments
Recreation	Sport Fishing Rafting Use Boating Use Sport Hunting Camping Use Refuge Use	Visitor Days Stream Flows and Quality Reservoir Elevations and Surface Areas Fish Populations Wildlife Populations Vegetation and Habitat Values	Annual Monthly Monthly Annual Annual Annual and Periodically	Changes in recreational opportunities will be estimated based upon results of analysis conducted under the Surface Water, Fisheries, Vegetation, Wildlife, Economics, and Demographics Issue Areas <u>in the geographic subregions with CVP water users or facilities and along the California Coast.</u>	
Demographics and Social Analysis	Populations in Agricultural, Municipal and Industrial, and Indian Communities	Population Data by Ethnic Group Housing Data by Type Education Data Employment Data by Sector Public Works Needs Public Safety (police, fire, hospitals) Social Well-Being (lifestyle values as determined by interviews)	Periodically Periodically Periodically Periodically Periodically Periodically	Data collection and analysis will generally focus on census data that is collected every 10 years. Demographic projections are generally available for 10, 20, or 30 year periods, depending upon the area of concern. Demographic data will be collected for the entire study area. However, the analysis will focus on the <u>same area as the Water, Fisheries, and Economics Issue Areas.</u> Interviews will occur throughout the study area to estimate the responses of different social groups to different project alternatives.	
Visual Aesthetics (as identified in the scoping efforts)	Viewsheds	Land Use Stream Flows Reservoir Elevations and Surface Areas Vegetation	Periodically Monthly Monthly Periodically	The analysis will focus on <u>rivers, streams, refuges, and reservoirs evaluated in the Water, Vegetation, and Recreation Issue Areas.</u>	

TABLE A-1 (continued)

Issue Area	Items that will be Impacted	Type of Data Required	Time Step (a)	Minimum Level of Detail	Other Comments
Cultural Resources	Historic Resources Archaeological Resources Ethnographic Resources Native American Traditional Cultural Properties	Identified Resources	N/A	The analysis will focus on potential changes that could directly occur at reservoirs, conveyance facilities, streams, and refuges directly due to changes in water flows, elevations, availability, or quality (as identified in the Water Issue Area); or indirectly due to changes in land use or recreational opportunities (as identified in the Land Use and Recreation Issue Areas).	
Public Health	Vectors Drinking Water Quality	Wetlands Acreage Habitat Value Vector Populations (primarily mosquitos) Potable Water Use for Surface Water and Groundwater Point Source and Non-Point Source Discharges Cost of Water Treatment based on Water Quality	Periodically Periodically Periodically Periodically Periodically Periodically	The analysis of vectors and drinking water quality will focus on potential changes that could occur in the <u>geographic subregions with CVP water users or facilities</u> that will be affected by changes in water availability and quality (as identified in the Water and Vegetation Issue Areas). The analysis of mosquitos will be based upon historical responses to changes in wetlands acreage.	

TABLE A-1 (continued)

Issue Area	Items that will be Impacted	Type of Data Required	Time Step (a)	Minimum Level of Detail	Other Comments
Power Production, Project Use, and Power Production Economics	Power Production Project Use	Water Releases and associated Generation Capacity from CVP Facilities Project Power Use Range of Costs for Replacement Power	Monthly Monthly Monthly	The analysis will focus on the changes in monthly power production by <u>CVP power plants</u> and monthly Project Use due to changes in CVP water releases and deliveries. The analysis will estimate the need for the Western Area Power Administration (Western) to purchase power to meet system loads, and the associated costs.	Hourly or daily data will not be used. The specific sources of supplemental power supplies to meet for Western's loads will not be identified.
Cost Allocation and Ratesetting Procedures	CVP Water Contractors Western Preference Power Customers	Water Deliveries Power Production Cost Allocation Water Rates Power Rates	Monthly Monthly Periodically Annual Annual	The analysis will focus on cost allocation, water, application of 1988 Reclamation Reform Act regulations, application of ability-to-pay procedures, application of water pricing alternatives, and application of Western's power marketing rates.	This analysis will not evaluate power pricing alternatives.

- NOTES:
- (a) N/A = Not Applicable.
 - (b) Periodically = Data generally available every 10, 20, or 30 years during the historical period.
 - (c) All water analyses will be based upon evaluation of environmental conditions with hydrological conditions that occurred in the 70 years between 1922 through 1992.
 - (d) Annual analyses will be based upon evaluation of data collected annually, however all analyses will be conducted to evaluate conditions that may occur with environmental conditions projected for the Year 2020.