

Chapter 4

Socioeconomics

This chapter presents potential economic effects of implementing the Folsom DS/FDR alternatives. This chapter is separate from other resources in Chapter 3 because economic effects are treated differently under CEQA and NEPA. See Section 4.2.1 below. Therefore, this chapter is also organized differently than the resource analyses contained in Chapter 3 of this EIS/EIR.

4.1 Regional Socioeconomic Setting

The study area includes Sacramento, Placer, and El Dorado Counties where potential economic effects could occur from implementation of the alternatives. These counties are included because they border Folsom Reservoir and the Folsom Lake State Recreation Area (FLSRA) where the action alternatives would be implemented. This section includes a description of the local economy in the three-county region, as well as for the City of Folsom, which is adjacent to Folsom Reservoir and Dam. This section also includes a description of recreational activity in three recreation use areas; Folsom Point, Beal's Point, and Granite Bay within the FLSRA.

4.1.1 Sacramento County

4.1.1.1 Population and Income¹

In 2005, Sacramento County had a population of about 1.37 million, an increase of 25,000 people from 2004. From 1990 to 2000, the compound annual growth rate was 1.6 percent; and, from 2000 to 2005, the compound annual growth rate increased to 2.3 percent. The county's population is projected to reach 2 million by 2020 (EDD 2004). According to the 2000 U.S. Census, Sacramento County's population was 64 percent white, 10 percent black or African American, 1 percent Native American, 11 percent Asian, 1 percent Pacific Islander, and the remaining classified as other or more than one race.

In 2003, total personal income in Sacramento County was about \$40.1 million and per capita personal income was \$30,129 (Bureau of Economic Analysis [BEA] 2005). From 1993-2003, average annual growth rate of per capita personal income in Sacramento County was 3.8 percent. Sacramento County ranked 10th among counties in the state in total personal income and 22nd in per capita personal income. In 1999, median family income was \$50,717; 10 percent of families lived below the poverty level (U.S. Census Bureau 2004a). In 2004, the poverty level for a family of two was an annual income of \$12,490 and \$18,550 for a family of four.

¹ Population data presented in this chapter may differ from data in Section 3.16 Population and Housing. The population and housing analysis relies on specific Census Tract Data; and data in this chapter is presented at the county-level for background purposes.

4.1.1.2 Industry

Table 4-1 shows 2001 to 2003 industry earnings in Sacramento County. Top earning industries include government and government enterprises, health care and social assistance, finance and insurance, construction and retail trade. From 2001 to 2003, total industry earnings grew the most in absolute terms in the government and government enterprises sector, about \$899.1 million. Finance and insurance industry earnings grew about \$514.5 million from 2001 to 2003. In terms of percentage, the fastest growing industries from 2001 to 2003 were real estate and rental and leasing (29 percent increase), finance and insurance (24 percent increase), educational services (23 percent increase), health care and social assistance (19 percent increase), and arts, entertainment, and recreation (19 percent increase).

<i>Industry</i>	<i>2001</i>	<i>2002</i>	<i>2003</i>
Forestry, fishing, related activities, and other	\$37,602	\$36,292	\$37,365
Mining	\$50,309	\$43,427	\$45,755
Construction	\$2,255,393	\$2,435,238	\$2,623,129
Manufacturing	\$2,138,755	\$2,122,699	\$2,132,785
Wholesale trade	\$1,023,739	\$1,070,828	\$1,199,264
Retail trade	\$2,205,556	\$2,291,242	\$2,404,667
Transportation and warehousing	\$557,641	\$528,025	\$542,263
Information	\$1,157,718	\$1,310,808	\$1,306,141
Finance and insurance	\$2,160,665	\$2,351,648	\$2,675,182
Real estate and rental and leasing	\$606,564	\$614,260	\$779,951
Management of companies and enterprises	\$508,441	\$486,469	\$499,216
Administrative and waste services	\$1,183,837	\$1,157,217	\$1,172,318
Educational services	\$231,920	\$264,631	\$286,381
Health care and social assistance	\$2,546,460	\$2,744,616	\$3,039,722
Arts, entertainment, and recreation	\$227,949	\$248,086	\$271,704
Accommodation and food services	\$664,808	\$721,401	\$742,131
Other services, except public administration	\$993,337	\$1,075,193	\$1,156,802
Government and government enterprises	\$10,249,518	\$10,833,501	\$11,148,663

Source: BEA 2005, Regional Economic Information System

4.1.1.3 Employment

Table 4-2 shows industry employment and compensation in Sacramento County from 2001 to 2003. In 2003, government and government enterprises employed the most people, followed by retail trade, health care and social assistance, and construction. Finance and insurance had the largest increase in employment from 2001 to 2003. Average compensation per job in Sacramento County was \$46,036 in 2001, \$48,597 in 2002, and \$50,939 in 2003.

Major employers in Sacramento County in 2005 include: Aerojet Fine Chemicals, LLC, Gen Corp Inc, Wild Zone, American River College, California State University, Sacramento City College, Kaiser Foundation Hospital, Mercy General

Hospital, Mercy San Juan Medical Center, Sutter Memorial Hospital, UC Davis Medical Center, University of California Surgery Clinic, Sacramento Municipal Utility District (SMUD), and the Sacramento Bee Newspaper. State government departments with high employment include Corrections, Health Services, Employment Development, Social Services, Water Resources, and Education. In 2003, Sacramento County unemployment rate was 5.5 percent.

**Table 4-2
Industry Employment and Compensation, Sacramento County, 2001 to 2003**

Industry	2001		2002		2003	
	Employment # Jobs	Compensation \$	Employment # Jobs	Compensation \$	Employment # Jobs	Compensation \$
Forestry, fishing, related activities, and other	1,724	23,453	1,527	22,622	1,498	23,578
Mining	643	18,326	550	17,809	488	18,095
Utilities	739	74,077	859	93,984	869	98,277
Construction	47,200	1,803,191	48,337	1,995,348	50,469	2,117,798
Manufacturing	34,048	2,082,225	33,260	2,068,202	31,851	2,075,531
Wholesale trade	20,870	964,751	20,754	999,424	21,312	1,099,592
Retail trade	77,170	1,931,694	77,822	2,036,071	80,478	2,140,781
Transportation and warehousing	15,627	477,039	14,999	465,475	14,667	477,840
Information	19,344	1,029,149	20,218	1,184,907	18,942	1,161,309
Finance and insurance	42,904	2,035,798	43,504	2,246,739	46,214	2,568,520
Real estate and rental and leasing	25,211	338,694	25,326	346,458	26,680	463,150
Professional and technical services	49,326	2,109,845	49,217	2,141,205	49,881	2,123,984
Management of companies and enterprises	8,372	507,911	7,520	484,377	7,160	497,148
Administrative and waste services	49,328	1,074,527	47,035	1,024,723	46,071	1,036,693
Educational services	9,955	214,249	11,112	249,267	11,976	272,202
Health care and social assistance	62,595	2,231,775	61,950	2,404,170	64,324	2,676,206
Arts, entertainment, and recreation	12,307	188,189	12,627	206,335	12,932	227,694
Accommodation and food services	43,886	625,053	44,937	685,460	45,167	704,571
Other services, except public administration	39,764	836,751	41,563	918,529	42,698	995,143
Government and government enterprises	183,042	10,249,518	184,768	10,967,368	181,926	11,437,807

4.1.2 Placer County

4.1.2.1 Population and Income

In 2005, Placer County had a population of about 305,675, an increase of close to 9,000 people from 2004. From 1990 to 2000, the compound annual growth rate was 3.6 percent; and, from 2000 to 2005, the compound annual growth rate increased to 4.2 percent. The county's population is projected to exceed 456,000 by 2020 (EDD 2004). In 2000, Placer County's population was 89 percent white, 1 percent black or African American, 1 percent Native American, 3 percent Asian, 0.2 percent Pacific Islander, and the remaining classified as other or more than one race.

In 2003, total personal income in Placer County was about \$10.8 million and per capita personal income was \$36,613 (BEA 2005). From 1993-2003, average annual growth rate of per capita personal income in Placer County was 4.2 percent. Placer County ranked 22nd among counties in the state in total personal income and 10th in per capita personal income. In 1999, median family income was \$65,858; 3.9 percent of families lived below the poverty level (U.S. Census Bureau 2004a).

4.1.2.2 Industry

Table 4-3 shows 2001 to 2003 industry earnings in Placer County. Top earning industries included manufacturing, wholesale trade, transportation and warehousing, accommodation and food services, and real estate, rental, and leasing. The manufacturing industry grew the most from 2001 to 2003 in earnings, about \$2.56 million. Real estate grew about \$2.12 million from 2001 to 2003.

Table 4-3
Industry and Industry Earnings, Placer County, 2001 to 2003 (in thousands)

Industry	2001	2002	2003
Forestry, fishing, related activities, and other	\$4,922	\$4,591	\$7,518
Mining	\$10,975	\$9,248	\$11,031
Construction	\$37,241	\$41,887	\$49,058
Manufacturing	\$901,263	\$980,166	\$1,157,539
Wholesale trade	\$852,240	\$822,349	\$787,771
Retail trade	\$174,041	\$188,765	\$174,608
Transportation and warehousing	\$666,449	\$718,250	\$771,645
Information	\$195,687	\$190,890	\$182,186
Finance and insurance	\$189,955	\$172,335	\$169,998
Real estate and rental and leasing	\$361,093	\$445,806	\$573,687
Management of companies and enterprises	\$218,644	\$244,938	\$285,636
Administrative and waste services	\$358,287	\$388,465	\$447,897
Educational services	\$142,512	\$112,365	\$123,698
Health care and social assistance	\$246,249	\$235,763	\$250,393
Arts, entertainment, and recreation	\$46,533	\$57,189	\$62,300
Accommodation and food services	\$489,273	\$587,032	\$639,535
Other services, except public administration	\$65,846	\$67,793	\$75,291
Government and government enterprises	\$216,313	\$227,633	\$251,391

Source: BEA 2005, Regional Economic Information System

4.1.2.3 Employment

Table 4-4 shows industry employment and compensation in Placer County from 2001 to 2003. In 2003, retail trade employed the most people, followed by construction, government and government enterprises, accommodation and food service, and health care and social assistance. Construction had the largest increase in employment from 2001 to 2003, about 2,600 people or 14 percent. Average compensation per job in Placer County was \$41,602 in 2001, \$43,505 in 2002, and \$45,262 in 2003.

Industry	2001		2002		2003	
	Employment # Jobs	Compensation \$	Employment # Jobs	Compensation \$	Employment # Jobs	Compensation \$
Forestry, fishing, related activities, and other	311	1,136	337	540	547	3,464
Mining	243	5,959	209	5,291	211	6,776
Utilities	494	36,963	502	42,251	494	49,573
Construction	18,888	671,474	19,439	751,680	21,470	896,463
Manufacturing	12,458	852,202	10,996	821,051	10,400	786,859
Wholesale trade	3,768	161,484	3,914	174,296	3,349	183,801
Retail trade	21,446	575,794	22,600	627,940	24,019	678,612
Transportation and warehousing	3,757	178,623	3,542	177,249	3,245	168,450
Information	3,215	181,129	3,223	163,766	3,106	159,696
Finance and insurance	7,469	302,149	8,417	392,317	9,488	520,444
Real estate and rental and leasing	8,841	89,738	9,134	109,630	9,606	125,808
Professional and technical services	9,069	241,728	9,528	275,615	10,661	330,717
Management of companies and enterprises	2,388	142,480	1,831	111,988	1,905	123,343
Administrative and waste services	9,782	221,824	9,497	206,516	9,942	220,560
Educational services	2,517	44,665	2,724	56,983	2,850	63,065
Health care and social assistance	11,698	377,342	13,106	458,065	13,420	501,602
Arts, entertainment, and recreation	4,108	58,299	4,430	60,331	4,693	67,906
Accommodation and food services	13,121	204,020	13,277	209,781	14,122	233,237
Other services, except public administration	9,067	173,656	8,837	169,603	8,274	147,196
Government and government enterprises	15,791	683,309	16,014	734,297	16,998	813,132

⁽¹⁾ Employment includes full- and part-time workers. Compensation is the sum of wage and salary disbursements and supplements, such as bonuses

Source: BEA 2005, Regional Economic Information System

Major employers in Placer County in 2005 include: Adventist Health, Formica Corp, Future Ford, Hewlett Packard Co, Home Depot, JR Pierce Plumbing Co Inc, NEC Electronic USA, Oracle Corp, Sierra Community College District, Sierra West Drywall Inc, Sutter Roseville Medical Center, Thunder Valley Casino, and Underground Construction Co. In 2003, Placer County unemployment rate was 4.6 percent.

4.1.3 El Dorado County

4.1.3.1 Population and Income

In 2005, El Dorado County had a population of about 173,407, an increase of approximately 3,000 people from 2004. From 1990 to 2000, the compound annual growth rate was 2.2 percent; and, from 2000 to 2005, the compound annual growth rate remained relatively constant at 2.1 percent. The county's population is projected to exceed 221,000 by 2020 (EDD 2004). In 2000, El Dorado County's population was 90 percent white, 0.5 percent black or African American, 1 percent Native American, 2 percent Asian, 0.1 percent Pacific Islander, and the remaining classified as other or more than one race.

In 2003, total personal income in El Dorado County was about \$6.2 million and per capita personal income was \$36,373 (BEA 2005). From 1993-2003, average annual growth rate of per capita personal income in El Dorado County was 4.9 percent. El Dorado County ranked 26th among counties in the state in total personal income and 12th in per capita personal income. In 1999, median family income was \$60,250; 5 percent of families lived below the poverty level (U.S. Census Bureau 2004a).

4.1.3.2 Industry

Table 4-5 shows 2001 to 2003 industry earnings in El Dorado County. Top earning industries in 2003 include manufacturing, administrative and waste services, accommodation and food services, and transportation and warehousing. The real estate, rental and leasing industry grew the most in earnings from 2001 to 2003, about \$7.1 million. Accommodations and food services grew about \$6.1 million and manufacturing grew about \$5.9 million in earnings from 2001 to 2003.

<i>Industry</i>	2001	2002	2003
Forestry, fishing, related activities, and other	\$23,451	\$24,497	\$23,965
Mining	\$6,490	\$5,010	\$5,247
Construction	\$10,168	\$10,763	\$11,761
Manufacturing	\$400,330	\$409,813	\$459,193
Wholesale trade	\$120,151	\$104,080	\$114,913
Retail trade	\$52,586	\$60,261	\$57,736
Transportation and warehousing	\$233,876	\$237,560	\$236,466
Information	\$25,085	\$29,064	\$26,404
Finance and insurance	\$30,563	\$31,053	\$33,764
Real estate and rental and leasing	\$103,020	\$146,883	\$173,045
Management of companies and enterprises	\$101,760	\$108,077	\$117,124
Administrative and waste services	\$402,939	\$398,346	\$401,838
Educational services	\$9,797	\$9,557	\$11,221
Health care and social assistance	\$75,359	\$84,369	\$82,421
Arts, entertainment, and recreation	\$8,628	\$10,880	\$8,841
Accommodation and food services	\$225,799	\$256,717	\$287,072
Other services, except public administration	\$54,888	\$62,945	\$62,033
Government and government enterprises	\$85,523	\$91,697	\$102,310

Source: BEA 2005, Regional Economic Information System

4.1.3.3 Employment

Table 4-6 shows industry employment and compensation in El Dorado County from 2001 to 2003. In 2003, retail trade employed the most people, followed by government and government enterprises, professional and technical services, and construction. Finance and insurance had the largest increase in employment from 2001 to 2003, about 1,700 people or 47 percent. Average compensation per job in El Dorado County was \$36,901 in 2001, \$38,154 in 2002, and \$39,456 in 2003.

Major employers in western El Dorado County in 2005 include: AmDocs Ltd, DST Output, Fortune 800, McClone Construction Co, and Sierra Pacific Industries. In 2003, El Dorado County unemployment rate was 5.1 percent.

4.1.4 City of Folsom

The City of Folsom is within Sacramento County, approximately 25 miles east of downtown Sacramento on Highway 50. Because of availability of data on a city level, data presented below differs from county economic discussions.

**Table 4-6
Industry Employment and Compensation⁽¹⁾, Placer County, 2001 to 2003**

Industry	2001		2002		2003	
	Employment # Jobs	Compensation \$	Employment # Jobs	Compensation \$	Employment # Jobs	Compensation \$
Forestry, fishing, related activities, and other	614	8,581	696	8,965	675	8,332
Mining	166	2,455	135	2,106	125	2,124
Utilities	168	9,873	142	10,645	133	11,661
Construction	8,579	215,792	8,260	215,955	8,396	235,356
Manufacturing	2,385	120,122	2,140	104,681	2,250	111,518
Wholesale trade	1,387	44,351	1,551	52,088	1,552	49,109
Retail trade	9,645	183,716	9,725	191,682	9,706	188,452
Transportation and warehousing	951	14,766	1,027	20,781	910	17,620
Information	1,058	21,582	966	21,072	889	23,490
Finance and insurance	3,529	64,710	4,551	112,691	5,199	138,982
Real estate and rental and leasing	6,030	25,391	6,179	30,378	6,254	25,610
Professional and technical services	8,766	284,858	8,953	280,927	9,241	280,018
Management of companies and enterprises	230	9,749	207	9,492	304	11,143
Administrative and waste services	3,770	55,450	3,848	60,326	3,672	57,415
Educational services	855	5,987	958	8,461	978	6,140
Health care and social assistance	6,243	157,789	6,518	182,583	6,944	207,262
Arts, entertainment, and recreation	3,455	36,439	3,500	38,303	3,443	36,787
Accommodation and food services	6,054	77,448	6,278	84,514	6,673	94,810
Other services, except public administration	5,090	54,093	5,407	64,198	5,724	74,145
Government and government enterprises	9,201	401,678	9,429	436,073	9,278	455,347

⁽¹⁾ Employment includes full- and part-time workers. Compensation is the sum of wage and salary disbursement and supplements

Source: BEA 2005, Regional Economic Information System

4.1.4.1 Population and Income

In 2005, the City of Folsom (Folsom) had a population of about 68,033, an increase of 2,000 people from 2004. In 1990, Folsom had a population of 29,802. From 1990 to 2000, the compound annual growth rate was 5.5 percent; and, from 2000 to 2005, the compound annual growth rate remained relatively constant at 5.6 percent. In 2000, Folsom's population was 78 percent white, 6 percent black or African

American, 0.6 percent Native American, 7 percent Asian, 0.2 percent Pacific Islander, and the remaining classified as other or more than one race.

In 1999, median family income was \$82,448; 3 percent of families lived below the poverty level (U.S. Census Bureau 2004a).

4.1.4.2 Industry

Table 4-7 shows the number of establishments and sales of major industries in Folsom. Retail trade has the most establishments and generates the highest sales for the city. Folsom has an outlet mall with 80 stores and the relatively new Folsom Gateway mall includes major retailers, such as Best Buy, Sam’s Club, Staples, and REI.

<i>Industry</i>	<i>Number of Establishments</i>	<i>Sales (1000 \$)</i>
Wholesale trade	38	\$741,726
Retail trade	207	\$1,364,104
Information	38	N/A
Real estate, rental, and leasing	58	\$41,509
Professional, scientific, technical services	172	N/A
Administrative, support, waste management and remediation service	54	\$55,204
Educational service	10	\$4,719
Healthcare and social assistance	138	\$157,960
Arts, entertainment, and recreation	15	\$10,884
Accommodation and food services	137	\$100,746
Other services (except public administration)	804	\$39,428

N/A – Not available

Source: 2002 Economic Census, U.S. Census Bureau 2006

4.1.4.3 Employment

Table 4-8 shows industry employment in Folsom. Education, health, and social services and manufacturing industries employ the most people, 16.3 and 13.5 percent of total employment, respectively.

Major employers in Folsom include: Intel Corporation, Folsom-Cordova Unified School District, Mercy Hospital, Kaiser Permanente, Maximus, Verizon, Costco, Walmart, Folsom State Prison, Home Depot, Mervyn's, Target, Lowe's, Trader Joe's, Kohl's, Best Buy, Winco, REI, Sam's Club, Video Products Distributors, and Cal-ISO.

Industry	Employment	Percent
Agriculture, forestry, fishing and hunting, and mining	271	1.2
Construction	1,335	5.7
Manufacturing	3,157	13.5
Wholesale trade	896	3.8
Retail trade	2,477	10.6
Transportation and warehousing, and utilities	814	3.5
Information	727	3.1
Finance, insurance, real estate, and rental and leasing	2,487	10.6
Professional, scientific, management, administrative, and waste management services	2,805	12.0
Educational, health and social services	3,833	16.3
Arts, entertainment, recreation, accommodation and food services	1,192	5.1
Other services (except public administration)	907	3.9
Public administration	2,564	10.9

Source: Census 2000 (U.S. Census Bureau 2004b)

4.1.5 Recreation at Folsom Lake State Recreation Area

This analysis is focused on the existing conditions for three recreation use areas; Folsom Point, Beal's Point, and Granite Bay within the FLSRA that would be used for staging, borrow material excavation and processing, and materials stockpiling under all of the action alternatives. FLSRA is part of the California Department of Parks and Recreation (DPR) park system.

FLSRA is an important local, regional, and state recreation resource. With more than 1.5 million visitors in 2000, the FSLRA is one of the most popular areas in the DPR system. Recreational uses include both water-based activities and land-based activities. Water-based activities account for approximately 85 percent of all visits to the FLSRA. Approximately 75 percent of users visit the FSLRA during the warmer spring and summer months. DPR obtains revenue from use fees paid by the public and rental fees associated with concession operations in the FLSRA.

Use fees are directly related to the number of visitors and overnight users. Fees collected for both day use and overnight use vary between peak-season and off-season as illustrated in Table 4-9. Numerous other fees collected in the FLSRA are collected dependent upon the amenities offered in particular recreational areas including pay showers, special events, and boat launches. Total fees collected for the three focus areas in Fiscal Year (FY) 2004/2005 are listed in Table 4-10.

	Peak Season⁽¹⁾	Off-Peak Season
Day Use Fees⁽²⁾		
Developed Parking	\$7	\$5
Undeveloped Parking	\$3	\$3
Boat Launch	\$8	\$5
Camping Fees per night⁽³⁾	\$20	\$15

⁽¹⁾ Camping peak season May 15 – September 15; all other activities April 1 – September 30

⁽²⁾ Effective July 1, 2004

⁽³⁾ Effective January 1, 2005

Source: CDPR 2006c, CDPR 2006d

Location	Regular Day Use	Boat Launch	Annual Pass	Special Events	Camping	Reserve America	Pay Showers	Rafting	Total
Folsom Point	\$80,281	\$46,397	\$0	\$0	\$0	\$0	\$0	\$0	\$126,678
Beal's Point	\$219,434	\$6,740	\$2,750	\$467	\$103,337	\$109,701	\$4,471	\$480	\$447,380
Granite Bay	\$888,572	\$283,028	\$447,340	\$0	\$0	\$0	\$0	\$0	\$1,618,940
Total	\$1,188,287	\$336,165	\$450,090	\$467	\$103,337	\$109,701	\$4,471	\$480	\$2,192,998

Source: CDPR 2006b

Twelve concessionaires operated in the FLSRA in calendar year 2005. Services provided include aquatic recreation equipment rentals, land equipment rentals, and food services. Total concession gross sales for the entire FLSRA in calendar year 2005 were \$1,938,065 (see Table 4-11). Total rental revenues received by DPR as a result of concession operations were \$342,101.

Location	Concession Gross Sales	Rental Payment
Granite Bay	\$164,391	\$21,722
Brown's Ravine	\$1,425,047	\$296,722
Beal's Point	\$152,934	\$11,737
Lake Natoma	\$195,693	\$11,920
Total for FLSRA	\$1,938,065	\$342,101

Sources: CDPR 2006b.

4.1.5.1 Folsom Point

Folsom Point is the most popular day use area on the Folsom Lake eastern shore. In 2000, 112,200 visitors utilized this area. Facilities include a picnic area with parking for 77 vehicles, and the largest formal boat launch area on the east side of the lake with parking for 129 vehicles. Aquatic and day use facilities quickly reach capacity during peak season weekends as it is a popular site for staging special aquatic events.

Use fees collected for this area include day use fees and boat launch fees. In FY 2004/2005 total day use fees collected were \$80,281 or approximately seven percent of the total day use fees collected for the three focus areas (see Table 4-10). Total boat launch fees collected were \$46,397 or approximately 14 percent of the total boat launch fees collected for the three focus areas. When compared to the other two focus areas, Folsom Point had the lowest total day use fees collected and was in the middle with regards to the total boat launch fees collected. Overall, total use fees collected at Folsom Point in FY 2004/2005 were the lowest of all three sites at \$126,678 or approximately 6 percent of all uses fees collected between the three sites. Folsom Point does not have any concessionaires that pay monthly rental fees to DPR.

4.1.5.2 Beal's Point

Beal's Point includes day use facilities and a campground. Annual attendance in 2000 was 219,986 visitors. Facilities include a guarded swim beach for summer use, parking for approximately 400 vehicles, one boat launch ramp, hiking trails, picnic areas, 49 single camp sites, and 20 RV sites. Concessions include a snack bar and beach equipment rentals.

Fees collected for this area include day use, boat launch, annual passes, camping, special events, Reserve America fees, pay showers, and rafting (see Table 4-10). In FY 2004/2005 total day use fees collected were \$219,434 or approximately 18 percent of the total day use fees collected for the three focus areas. Total boat launch fees collected were \$6,740 or approximately 2 percent of the total boat launch fees collected for the three focus areas. Out of the three focus areas, Beal's Point had the lowest total boat launch fees collected and was in the middle with regards to the total regular day use fees collected. Beal's Point is the only focus area that collected fees for uses other than regular day use, boat launch, and annual passes. Overall, total use fees collected at Beal's Point in FY 2004/2005 were the second highest of the three sites at \$447,380 or approximately 20 percent of all uses fees collected between the three sites.

In calendar year 2005, Beal's Point concessions had gross sales of about \$153,000 (see Table 4-11). Total rental fees paid to DPR for concessions operating at Beal's Point in 2005 were about \$11,700.

4.1.5.3 Granite Bay

Granite Bay is the most popular day use facility within the FLSRA. Annual attendance in 2000 was 507,712 visitors. Facilities include picnic areas, a guarded swim beach for summer use, informal unguarded swim areas, tot lot, equestrian staging area, hiking trails including an Americans with Disabilities Act (ADA) only trail, parking, reservable group picnic area, fishing, and boating. Dependent upon water levels, a maximum of 14 boat launch ramps are available. Concessions in the area include a snack bar and beach equipment rentals.

Fees collected for this area include day use, boat launch, and annual pass (see Table 4-10). In FY 2004/2005, total day use fees collected were \$888,572 or approximately 75 percent of the total day use fees collected for the three focus areas. Total boat launch fees collected were \$283,028 or approximately 84 percent of the total boat launch fees collected for the three focus areas. Out of the three focus areas, Granite Bay had the highest fees collected for each category for which fees are collected at Granite Bay. Overall, total use fees collected at Granite Bay in FY 2004/2005 were \$1,618,940 or approximately 74 percent of all uses fees collected between the three sites.

In calendar year 2005, Granite Bay concessions had gross sales of about \$164,400 (see Table 4-11). Total rental fees paid to DPR for concessions operating at Granite Bay in 2005 were about \$21,700.

4.2 Methods of Economic Analysis

4.2.1 CEQA/NEPA Analysis

This economic analysis is part of the CEQA and NEPA environmental documentation for the Folsom DS/FDR action. For CEQA and NEPA analyses, social and economic changes resulting from a project are addressed differently than physical environmental effects, and furthermore, somewhat differently under CEQA than under NEPA. CEQA does not consider economic or social changes resulting from a project as adverse effects on the environment. If a physical change in the environment is caused by economic or social effects, the physical change may be regarded as an adverse effect. Because the economic effects of project components do not change the physical environment, a CEQA analysis is not necessary.

Under NEPA, economic or social effects must be discussed if they are inter-related to the natural or physical environmental effects of a project. Since economic effects of the upgrades to the Folsom Facility are related to physical environmental effects, a NEPA analysis is required. However, NEPA does not require that economic impacts be judged for significance.

The following sections describe the economic analysis tools and related assumptions for estimating economic impacts from the upgrades at the Folsom Facility.

4.2.2 Assessment Tool

This economic analysis focuses on economic impacts caused by 1) reductions in recreational spending from the temporary closure of recreation facilities and 2) increased labor demands associated with construction-related activities. The analysis uses IMPLAN (Impact Planning and Analysis), an input-output (I-O) database and modeling software, to estimate economic impacts of the project alternatives². An I-O analysis describes and analyzes the relationship among industries.

Any given industry typically purchases goods and services from -- and sells goods and services to -- another industry within a given geographic area, which in turn, sells to or buys from other industries or supplies final consumers. IMPLAN uses these inter-industry linkages and provides a tool to estimate the total economic effects within a region from a change in final demand to one economic sector. Total economic effects include:

- Direct effects – changes in final demand
- Indirect effects – changes in expenditures within the region in industries supplying goods and services
- Induced effects – changes in expenditures of household income

IMPLAN is a widely used regional economic modeling and forecasting software that uses the most recent available individual industry data from a variety of government economic censuses to build a computer model of a specified regional economy. The regional economy could be defined at state, county, and zip code levels. IMPLAN estimates regional economic effects by constructing social accounting matrices³ and converting them to input-output accounts and multipliers for each industry.

A chain of supplies and services, including labor and government, links base and service industries; these relationships are sometimes referred to as backward linkages. Forward linkages, on the other hand, usually referred to as “downstream processing,” consist of support industries that take products produced by the base industry and enhance product value through further processing and packaging. Consumers, both other industries and households, form the final link in the chain. Figure 4-1 shows the general flows of money between industries and consumers that is captured by IMPLAN.

² Minnesota IMPLAN Group (MIG) 2003 <http://www.implan.com/index.html>

³ Social accounts represent the flow of commodities to industries from producers and consumers and the consumption of production factors from outside the region.

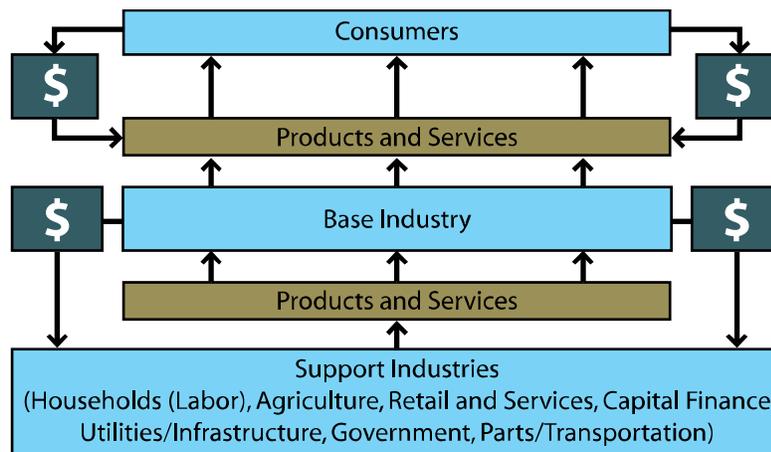


Figure 4-1
Economic Linkages in a Hypothetical Industry

Input-output modeling is built around quantifying interactions between basic and service sectors/industries of an economy. Each industrial or service activity within an economy is assigned to an economic sector within a so-called “transactions” table that reflects the value of goods and services exchanged between sectors of the economy. In any transaction table, the level of detail and method of identifying industries is arbitrary. But, in general, sectors are classified according to government standards such as the North American Industry Code Standards (i.e., NAICS codes), and the level of aggregation is fairly high.

The regional economic model for this analysis includes 2002 IMPLAN data for Sacramento, Placer, and El Dorado Counties. IMPLAN estimates impacts on an annual basis. If the project effects occurred over a shorter period of time, economic effects would be less. This analysis presents estimates of impacts to value of output, value added, and employment. Value of output is the total value of an industry’s production. Value added includes wages and salaries, proprietor’s income, dividends and interest, and indirect business taxes. Employment is the number of jobs in each industry.

4.2.3 Assessment Methods

The following sections describe the methods to analyze economic effects of the Folsom DS/FDR alternatives to recreational spending and construction activities. It is important to note that these estimated impacts are temporary and would only occur during the period of construction.

4.2.3.1 Recreation Economic Impact Assessment

FLSRA is an important local, regional, and state recreation resource. Recreation generates sales, profits, jobs, tax revenues, and income in the study area. Any change to recreation opportunities as a result of the Folsom DS/FDR alternatives would affect the study area's economy. This recreation economic impact analysis focuses on reductions in direct visitor spending for recreation activities, such as user fees, boat rentals, and retail sales as a result of site closures due to storing borrow materials or processing construction materials on recreation facilities. The analysis calculates indirect and induced economic impacts through the use of IMPLAN. The economic analysis makes some key assumptions to estimate direct impacts from reduced recreational spending. IMPLAN also has some built in coefficients and assumptions to determine secondary impacts.

Calculating Direct Economic Effects

To estimate direct effects, it is important to understand the amount of local visitors to the FLSRA versus the amount of visitors that come from outside the region. This analysis assumes that the majority of users of FLSRA are residents of the study area. Specifically, this analysis assumes that all day users are from within the study area and campers and other overnight users arrive from outside the region. A California State Parks survey indicated that 87 percent of users of major state recreation areas live within 60 minutes of the site and the average travel time for all visitors is 45 minutes (DPR 2003). An on-site survey of recreation users for FLSRA indicated that 70 percent of visitors to FLSRA originated from the 3-county region (Fletcher 2004). Because of the majority of local visitors, it is more likely that recreational spending intended for FLSRA would be spent elsewhere in the regional economy and the direct effects to the economy would be less than if most visitors were from outside the region.

In general, for a recreation activity, visitors typically spend money on food, hotels, restaurants, gasoline, boat rentals and/or other supplies required for outdoor activities. These expenditures would occur in various sectors. This analysis assumes that local visitors would find a substitute recreation activity within the study area and continue to spend money within these sectors. Therefore, local spending for food, restaurants, and gasoline would continue in the study area. In some instances, money may not be spent on the exact goods, such as picnic supplies, but it would likely be spent elsewhere in the local economy (for example, on movie tickets). Campers and other overnight users would generally be from outside the region; therefore, reductions in spending would be expected in services, retail, and food and accommodation sectors. FLSRA entrance fees for all users (day and overnight) would be counted as a loss to the state treasury, particularly if users do not visit a state sponsored site as a substitute for FLSRA. This analysis includes an estimate of funds lost to the state treasury from temporary interruptions to identified FLSRA

facilities and assumes that these revenues are not recollected via visits to other state recreational areas in the study region.

The following sections further describe how the analysis calculated direct effects for input into the IMPLAN model. In short, direct effects are based on number of visitors affected and the average daily spending by each visitor. This economic analysis makes a number of assumptions regarding visitor use and spending in the 3-county region for each alternative. A sensitivity analysis of economic effects could be conducted by varying some of these assumptions. For example, if number of visitors is allowed to increase in the future, regional economic effects from reduced recreational spending would increase.

Number of Visits Affected

The number of visits affected represents the loss of visitors at the FLSRA from temporarily interrupting recreation at Beal's Point, Folsom Point, and Granite Bay facilities. Section 3.13, Recreation Resources, identifies the number of visitors that would be affected by each alternative for each facility. It is important to distinguish the type of user to determine a more detailed representation of the total recreational spending contribution lost to the economy.

For purposes of this economic analysis, existing visitation assumptions were used to determine the type of user, for example, day use vs. overnight use or water activity vs. non-water activity. Wallace, Roberts, and Todd, et al. (2003) states that 85 percent of visitors use the recreation area for water-related activities, including boating, wind surfing, jet skis, water skiing, rafting, swimming, and fishing. Of the 85 percent, boating is the most popular water-related activity, accounting for approximately 30 percent of water-related activities. The remaining 15 percent of recreation visits are for non-water activities, such as picnicking, camping, and trail use (Wallace, Roberts, and Todd, et al 2003). According to FLSRA visitation data from 2001 to 2005, about 95 percent of users are day users and 5 percent are overnight users at camping facilities. Some overnight users may choose to stay at nearby hotels or other accommodations and use the FLSRA for day use. About 85 percent of the day users pay entrance fees. All others use free facilities, such as biking and walking trails. This analysis divides the visitors into types of use based on the above percentages.

The construction period for the Folsom DS/FDR spans from 2007 to 2013 or 2014 depending on the alternative. This analysis estimates the economic effects during the year when maximum interruptions to recreation are estimated to occur for each alternative. Table 4-12 summarizes the maximum annual number of visitors affected at Granite Bay, Beal's Point, and Folsom Point. Maximum interruptions to recreation would occur during 2008 under Alternatives 1, 2, and 3; during 2009 under Alternative 4; and during 2012 under Alternative 5. Section 3.13 further discusses effects to recreation.

Table 4-12
Breakdown of Visitors Affected by FLSRA Closures

Type of Use	Maximum Annual Number of Visitors Affected				
	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Campers who boat	347	347	297	1,770	1,884
Campers who do not boat	809	809	693	4,131	4,397
Day users who boat	43,930	43,930	42,874	74,754	79,563
Day users who do not boat	102,503	102,503	100,039	174,425	185,646
Other overnight visitors who boat	1,965	1,965	1,960	2,164	2,303
Other overnight visitors who do not boat	4,586	4,586	4,573	5,049	5,374
Total	154,139	154,139	150,435	262,293	279,167

Based on Recreation analysis Section 3.13, assumptions include:
 95% are day users, 5% are overnight users
 85% are day users who do not pay boat fees
 85% of total users participate in water-related activities, 30% is boating

Source: Wallace, Robert and Todd, LLC 2003; CDPR 2006b

Average Spending per Visit

The average spending per visitor depends on the types of recreational activity in which visitors participate. Table 4-9 shows the user fees for each use. It is assumed that all visitors would have to pay either a day use fee or an overnight fee. Additional recreational spending within the FLSRA includes boat rental fees, other equipment fees, and concessions. Visitors also spend money outside of the FLSRA for food, drinks, gasoline and other recreational needs. This analysis uses local fee data and the Corps national spending profiles to estimate average visitor spending. Table 4-13 shows the assumed average daily visitor spending at FLSRA for each type of visitor. Boat rentals and user fees are based on local rates at Folsom Reservoir for a full day boat use and on FLSRA standards. Spending for “other expenses” (food, gas, and other goods) are based on average spending profiles by the Corps (2003) study.

Table 4-13
Average Daily Visitor Spending at FLSRA, 2002 Dollars

Type of Visitor	Boat Rentals, User Fees⁽¹⁾	Other Expenses (e.g., food, gas)	Total Average Daily Spending
Campers who boat	\$53.03	\$53.02	\$106.05
Campers who do not boat	\$3.64	\$41.11	\$44.75
Day users who boat	\$52.12	\$20.39	\$72.51
Day users who do not boat	\$1.27	\$12.25	\$13.52
Other overnight visitors who boat	\$52.12	\$85.76	\$137.88
Other overnight visitors who do not boat	\$1.27	\$51.11	\$52.38

⁽¹⁾ User fees and boat rentals are based on a 5-person party

⁽²⁾ All day users are from the local area, all overnight users and campers are from outside the region

Source: CDPR 2003, Corps 2003, Folsom Lake Boat Rentals 2005

Direct Effects

The values in Table 4-12 and 4-13 were used to estimate direct effects to the local economy for input into the IMPLAN model. The effects are assumed to represent changes in final demand. IMPLAN requires distribution of direct effects to specific sectors of the economy. For purposes of this analysis, direct effects are distributed to the retail trade, services, camping, entertainment and recreation, and accommodation and food services sectors. It is assumed that these sectors best represent the reduction in recreational spending for boat rentals, hotel costs, camping supplies, gasoline, food, restaurants, and other expenses associated with recreation at FLSRA. As stated above, all the day users would be from the local region; therefore, all spending on “other expenses” would continue to be spent within the region.⁴ For campers and other overnight users, spending on “other expenses” would be lost to the region. These losses are represented by effects to retail trade, services, and accommodation and food service sectors. Table 4-14 identifies the estimated annual direct effects in the region for Alternatives 1 and 5. Alternatives 2 and 3 would have similar overall economic effects to Alternative 1 because losses in recreation would be similar. Alternative 4 would have similar effects to Alternative 5 because total losses in recreation would be similar.

Sector	Alternative 1	Alternative 5
Retail trade	-\$174,500	-\$356,200
Services	-\$33,600	-\$51,400
Camping, entertainment and recreation	-\$1,682,900	-\$3,053,300
Accommodation and food services	-\$163,100	-\$229,300
Institutions	-\$950,300	-\$1,688,800
Total	-\$3,004,400	-\$5,379,000

The institutions sector captures the transfer of money between institutions in various regions and is estimated by IMPLAN. In this instance, it represents lost non-market monetary transfers from the study area to other regions. Such transfers typically occur when goods and services sold in the local market are partially or wholly produced outside the region. As a result some of the local spending dollars are exported to other regions. For example, a final product such as gasoline is produced in multiple regions; therefore, only a portion of the lost dollars from gasoline sales within the study area would have remained in the region. A recreational visitor who chooses to no longer travel to the region may not purchase \$50 worth of gasoline at a local gas station. If the local gas station purchases \$30 worth of gasoline from a wholesaler outside the region then only \$20 would be lost to the local region and the

⁴ “Other expenses” include food, gas, restaurants, hotels, and anything associated with recreational activity at FLSRA besides entry fees and boat rentals.

remaining \$30 would be lost to another region. The institutions sector represents those dollars that would have been transferred to outside regions.

Using IMPLAN to Estimate Secondary Economic Effects

As discussed in Section 4.2.2, IMPLAN identifies economic linkages between industries by estimating multiple economic parameters. Direct impacts are an input into the regional model. IMPLAN default models are generated based on national and state level data and some parameters may be modified for studies that focus on areas smaller than a state. Figure 4-2 presents a flowchart of the regional analysis and its components. The following sections discuss important parameters and any modifications to the default IMPLAN model performed during the model development phase.

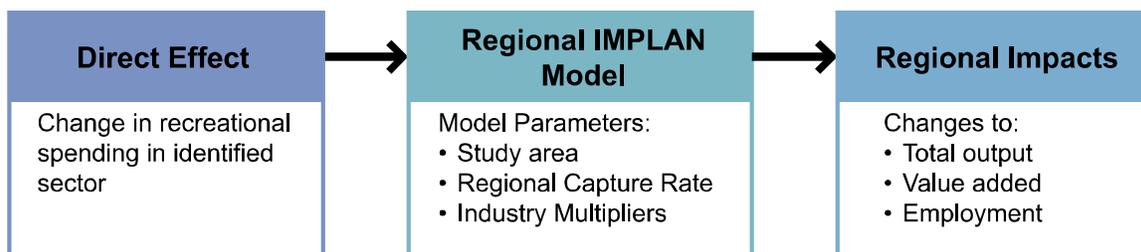


Figure 4-2
Regional Economic Analysis Flowchart

Regional Capture Rate

The capture rate represents the percentage of spending that accrues to the region’s economy as direct sales or final demand. In many cases, visitors purchase goods that are produced outside of the region. Any loss in demand of these goods would not affect the region’s economy; therefore, loss of these purchases should not be used to determine any change in final demand from within the region. A low capture rate would indicate that many goods or supply inputs are purchased from outside the region. IMPLAN sets default capture rates based on national and state level data. Generally, for tourism activities, 60 to 70 percent of visitor spending appears as final demand in the identified region (Stynes undated). The Corps (2003) study defines an average capture rate at 66 percent for multiple Corps projects (Corps 2003). Based on the high level of local use at the FLSRA and the existing studies, the IMPLAN default capture rate was adjusted from 40 percent to 66 percent for the parks sector.

Industry Multipliers

IMPLAN provides the regional economic multipliers for this analysis. Multipliers capture the indirect and induced effects of recreation activity. For example, a multiplier of 2.0 indicates that each dollar of direct sale generates another dollar of secondary sales in the regional economy; a multiplier of 3.0 indicates that each dollar

of direct sale generates an additional \$2 of secondary sales in the regional economy, and so on. For the 3-county study area, the default IMPLAN multiplier for camping, entertainment, and recreation is 2.02. Therefore, for every dollar lost to this sector, \$1.02 would be lost to the total regional economy in indirect and induced effects. In addition to output multipliers, IMPLAN generates multipliers for value added and employment effects.

Deflators

Deflators convert expenditures over time to a specified base year. The regional IMPLAN model is based on year 2002 economic activity and results are expressed in 2002 dollars.⁵ The economic effects from reduced recreation would occur during the length of the construction period. Table 4-15 shows the construction schedule for each alternative. Annual visitation would be affected in time period construction occurs. If construction does not occur throughout an entire year or if visitors are allowed to use the facilities for a portion of the year, economic impacts would be less.

Table 4-15 Construction Activity Timeframe	
Granite Bay	
Alternative 1	None
Alternative 2	Late summer (August, September, October) 2013
Alternative 3	Late summer 2009
Alternative 4	Late summer 2013 to end 2014
Alternative 5	Late summer 2013 to end 2014
Beal's Point	
Alternative 1	Fall 2007 to early summer (May, June) 2009
Alternative 2	Fall 2007 to early summer 2009
Alternative 3	Spring 2008 through summer 2008
Alternative 4	Fall 2007 to end 2009
Alternative 5	Fall 2007 to end 2012
Folsom Point	
Alternative 1	Fall 2007 to end 2012
Alternative 2	Fall 2007 to end 2013
Alternative 3	Fall 2007 to end 2013
Alternative 4	Fall 2007 to end 2013
Alternative 5	Fall 2007 to end 2013

4.2.3.2 Construction-related Economic Impact Assessment

Construction associated with the Folsom DS/FDR alternatives would create jobs and generate additional economic activity within the local region during the period of

⁵ Economic impacts can be adjusted to price levels for other years using economic price indices, such as the Consumer Price Index. Despite the price adjustment, the region's economy is still based on 2002 conditions.

construction.⁶ Table 4-16 summarizes the total number of workers required for each year of project construction (2007 through 2014). The number of workers remains constant for each alternative, but construction periods vary. IMPLAN estimates effects on an annual basis. If construction is shorter than a year, economic benefits would be less.

Year	All Alternatives
2007	34
2008	181
2009	287
2010	207
2011	169
2012	133
2013	188
2014	127

The analysis assumes that the 3-county region labor pool would supply the construction workers necessary for the Folsom DS/FDR. Using the data in Table 4-16, the economic analysis can estimate direct effects to labor associated with construction activities on the region's economy. IMPLAN converts jobs created into a value of output for the economy based on an estimated amount that each worker can contribute in terms of output. No changes were made to the IMPLAN economic parameters for the construction economic impacts analysis.

4.3 Estimated Economic Effects

This section describes the economic effects of implementation of the Folsom DS/FDR alternatives. The analysis assumes constant 2000 visitation levels. Chapter 2 describes the alternatives in detail.

4.3.1 No Action/No Project Alternative Economic Effects

The No Action/No Project Alternative would maintain the current recreation activities and operations at FLSRA without construction or operations of any of the infrastructure alterations proposed under the five action alternatives. No changes to economic conditions and trends are expected to occur under the No Action/No

⁶ Because the Folsom DS/FDR would be a government funded project, economic impacts of increased construction activity at the State level may be offset because funding could be unavailable for another project. Therefore, the benefits of construction-related economic effects are focused on the local region.

Project Alternative. Under the No Action/No Project Alternative, current recreational activities at the FLSRA would continue with no reduction in recreational spending or revenues.

The analysis recognizes that development would increase under the No Action/No Project Alternative relative to existing conditions. The cumulative analysis addresses economic growth as a result of increased development. For purposes of the economic analysis of recreational spending and construction impacts of the proposed alternatives, this section assumes that the No Action/No Project Alternative is the same as the existing conditions.

4.3.2 Action Alternatives Economic Effects

Table 4-17 describes the baseline economy in terms of value of output, employment, and value added of the Sacramento, Placer, and El Dorado 3-county region. These values differ slightly from those presented in Section 4.1, Regional Socioeconomic Setting, because IMPLAN has some varying accounting measures.

Table 4-17			
<i>Economic Baseline in 3-County Region, 2002 Values</i>			
	<i>Value of Output, 1000 \$</i>	<i>Value Added, 1000 \$</i>	<i>Employment, Jobs</i>
3-County Region	\$100,104,188	\$63,913,630	1,067,438

Source: MIG 2003

4.3.2.1 Alternative 1 Economic Effects

Economic Impacts from Reduced Recreational Spending Relative to the Baseline Condition

Construction of Alternative 1 would affect recreation opportunities at Beal’s Point and Folsom Point facilities in the FLSRA. Reductions in recreation would decrease visitor spending in the regional economy. Visitors would not pay entry fees, rent boats or other equipment, and may reduce purchases of food, gas, and other recreation supplies. These reductions in spending would ripple through other sectors of the economy. Under this alternative, Granite Bay facilities would not be affected.

The Beal’s Point facilities would remain open during the entire construction period for the Right Wing Dam, and Dikes 4, 5, and 6. It is anticipated that there would only be minor use of the Beal’s Point area for construction activities, such as the movement of construction vehicles. One or two staging areas would be created using fill material to ensure that the level of impacts to the recreation area are minimized. Construction is estimated to begin in November 2007 extending through early summer 2009. About 10 percent of users would be affected by this alternative. Beal’s Point has both day users and overnight users.

Folsom Point facilities would be fully closed during borrow development and construction on MIAD, the Auxiliary Spillway, the Left Wing Dam, and Dikes 7 and

8. Construction is estimated to occur from 2007 to 2013. Folsom Point only offers day use activities, including a boat launch.

Table 4-18 presents the estimates of total economic impacts to value of output, value added, and employment from reduced recreational area spending for Beal’s Point and Folsom Point facilities associated with construction of Alternative 1. The total output effects are direct inputs into the IMPLAN model; IMPLAN estimates direct effects to value added and employment based on total output. As discussed in Section 4.2.3.1, the direct impacts are a result of reduced day use and overnight entry fees into the FLSRA and spending on additional food, accommodations, and supplies by overnight users. For day users, all additional recreational spending is assumed to continue in the study area because of the many recreation substitutes that the study area offers.

Alternative 1 (2008 Visits)	Total Output, \$	Total Value Added, \$	Employment, Jobs
Direct Impacts	-\$3,004,400	-\$1,115,800	-25
Indirect Impacts	-\$741,000	-\$470,600	-8
Induced Impacts	-\$1,185,800	-\$760,000	-13
Total Impacts	-\$4,931,200	-\$2,346,400	-46

For each year Beal’s Point and Folsom Point facilities are closed, this analysis estimates that value of output in the region would decrease by about \$4.9 million (0.005 percent of 2002 baseline output), total value added would decrease about \$2.3 million (0.002 percent of 2002 baseline value added), and employment would decrease by about 46 jobs (0.004 percent of 2002 baseline employment). These estimates are based on estimated losses of visitation described in Section 3.13 and average visitor spending identified in Section 4.2.3.1. These are the maximum expected impacts that would occur annually during the construction periods identified in Table 4-15.

Table 4-19 presents Alternative 1 average daily total economic impacts to the 3-county region to value of output, value added, and employment based on annual impacts. If construction does not occur throughout the year, these daily impacts would be less. The daily level of impact would change based on weather, time of year, construction schedule, and other factors; however, these values provide general impact estimates that can be used if construction schedules or project implementation changes, causing FLSRA facilities to be closed longer than anticipated or for periods that do not correspond to one or more annual periods. In general, these estimates should be adjusted to the time of year when additional construction would occur.

Loss of recreational spending would be larger during peak use seasons, generally May through September.

Table 4-19
Average Daily Impacts of Reduced Recreational Spending under Alternative 1, 2008 Visits, 2002 Values

	<i>Value of Output, \$/Day</i>	<i>Value Added, \$/Day</i>	<i>Employment, Jobs/Day</i>
3-County Region	-\$13,400	-\$6,400	-0.12

A decline in FLSRA entry fees would reduce funds into the State treasury. Multiple concessionaires also pay rental fees to the State. If FLSRA facilities are closed, concessionaires would move out of the area and rental payments would stop. This analysis evaluates decreases to the State funds by estimating total loss in revenues from decreased entry fees based on estimated visitation losses and rental payments. Tables 4-9 and 4-12 present daily and overnight entry fees and estimated visitation losses for each alternative, respectively. Based on these values, funds to the State would decrease by about \$927,000 from construction of Alternative 1. Table 4-20 shows the breakdown per visitor category of reduced entry fees assuming peak season rates. Under Alternative 1, concessionaires at Beal’s Point would not be affected by construction activities; therefore, rental payments to DPR would not reduce.

Table 4-20
Estimated Annual Reductions in State Revenues Due to Reductions in FLSRA Entry and Boat Launch Fees under Alternative 1, 2008 Visits

Campers who boat	\$ 18,500
Campers who do not boat	\$ 5,400
Day users who boat	\$ 820,000
Day users who do not boat	\$ 35,900
Other overnight visitors who boat	\$ 36,700
Other overnight visitors who do not boat	\$ 10,700
Total visitors affected	\$ 927,200

Day use fees are \$7 per party, camping fees are \$20 per party per night, \$8 boat launch fees per party

Economic Impacts from Construction at the Folsom Facility

Construction required by Alternative 1 would generate economic activity within the region by increasing employment, wages and salaries, and total output.

Approximately 1,330 workers would be needed to complete construction during the 2007 to 2013 Folsom DS/FDR timeframe. Total construction is estimated to occur from 2007 to 2013 or 2014 depending on alternative. Table 4-16 details the workers required per year. Construction labor would likely be supplied from laborers within the 3-county region. The region’s labor pool is assumed to be sufficient to supply the construction’s annual labor needs.

IMPLAN was used to determine indirect and induced effects to the regional economy. Table 4-21 shows the direct, indirect, induced and total economic effect of employing 100 construction workers, as calculated by IMPLAN. This value is used to estimate potential employment benefits for all the alternatives. The total economic effect would be an increase of about \$15.7 million in total value of output, \$9.3 million in value added, and 168 jobs.

	Value of Output, \$	Value Added, \$	Employment, Jobs
Direct Impacts	\$9,409,900	\$5,323,400	100
Indirect Impacts	\$2,503,800	\$1,520,200	27
Induced Impacts	\$3,856,400	\$2,471,700	41
Total Impacts	\$15,770,200	\$9,315,300	168

Table 4-22 presents economic impacts based on the existing construction worker schedule. These economic impacts would benefit the local region and would only occur during the construction period. The impacts would be larger during years when more construction labor is required. Under Alternative 1, construction would be complete by 2013.

Year	Number of Workers	Value of Output, \$	Value Added, \$	Employment, Jobs
2007	34	\$5,361,900	\$3,167,200	57
2008	181	\$28,543,900	\$16,860,600	304
2009	287	\$45,260,500	\$26,734,700	482
2010	207	\$32,644,300	\$19,282,600	348
2011	169	\$26,651,600	\$15,742,800	284
2012	133	\$20,974,400	\$12,389,300	223
2013	188	\$29,648,000	\$17,512,700	316
2014	127	\$20,028,200	\$11,830,400	213

IMPLAN generates direct employment numbers estimates based on the expected value of output that a full time worker could produce. Induced effects are then estimated with average wage data, which IMPLAN bases on state levels. IMPLAN data shows that average annual salary for full-time construction laborer ranges from \$46,000 to \$50,000, or about \$22.10 to \$24.04 per hour. These values are slightly higher than local data. According to California Labor Market Data Library wage and salary data for employment in California industries, construction laborers in the Sacramento MSA earned an average hourly wage of \$15.38 per hour in 2002. Skilled laborers received \$17.95 per hour (California Labor Market Information Data Library 2006). The IMPLAN wage averages include regions of California, such as

Los Angeles and the San Francisco Bay Area, where wages are typically higher. Considering this data, the level of total economic effects may be less than those identified in Table 4-22.

4.3.2.2 Alternative 2 Economic Effects

The recreation-related economic impacts under Alternative 2 would be similar to those described for Alternative 1. Recreation impacts are determined on an annual visitor basis. Under this alternative, construction activities would occur near the Granite Bay recreation facilities; however, it is not expected that recreation activity would be affected. Construction is anticipated to occur during late summer 2013. Effects to Beal's Point and Folsom Point facilities would be similar to Alternative 1, except Folsom Point facilities would be closed for an additional year.

Under Alternative 2, state revenues would decrease similar to Alternative 1. Because construction at Folsom Point would be longer under Alternative 2, total reduction to state revenues would be more than Alternative 1. Funds to the State are estimated to decrease by approximately \$927,000 in 2008, which is the year with the most expected interruptions to recreation. In total, reductions in state revenues would be slightly larger under this alternative relative to Alternative 1 because of an additional year of closure at Folsom Point.

The number of construction workers required under this alternative would be the same as under Alternative 1. This alternative is scheduled over a longer construction period; however, the economic benefits from additional construction time would be minimal.

4.3.2.3 Alternative 3 Economic Effects

This alternative would require less construction relative to Alternatives 1 and 2; therefore, FLSRA recreational facilities may be closed for a shorter period of time. Under this alternative, construction north of Granite Bay is anticipated to occur during late summer 2009; however, interruptions to recreation are not expected to occur because of the distance of the staging area to the recreational facilities. Recreation at Beal's Point would be interrupted during construction on the Right Wing Dam and Dikes 4, 5, and 6. Construction at Beal's Point is estimated to begin in April 2008 and continue through summer. The construction timeframe at Beal's Point is shorter than the other alternatives. Similar to Alternative 2, Folsom Point facilities are expected to be completely closed during the 2007 to 2013 construction period. The difference in economic effects of this alternative compared to Alternatives 1 and 2 would be minimal.

Under Alternative 3, reductions to state funds would be slightly less than under Alternatives 1 and 2 because of the shorter construction period. Funds to the State are estimated to decrease by about \$900,000 during the year with maximum estimated impacts (2008).

The number of construction workers required would be the same under Alternative 3 as under Alternatives 1 and 2; however, the construction period would be shorter. The economic effects of fewer construction days would likely be small.

4.3.2.4 Alternative 4 Economic Effects

This alternative would require more construction relative to Alternatives 1, 2, and 3; therefore, the FLSRA facilities would be interrupted for a longer period of time. Construction at Granite Bay is expected to occur from late summer 2013 through 2014. Approximately 25 percent of users of Granite Bay facilities would be affected by this alternative. Beal's Point facilities would be interrupted during borrow development and construction on the RWD and Dikes 4, 5, and 6. Construction at Beal's Point is expected to begin in November 2007 and continue through 2009. Approximately 50 percent or less of users of Beal's Point facilities would be affected by this alternative. Effects would be greater if borrow excavation at the north end of Beal's Point is needed. Facility closures at Folsom Point would be similar to Alternatives 2 and 3. Maximum visitation losses under this alternative are expected to occur in 2009.

Under Alternative 4, reductions to State funds would be greater than under Alternatives 1 through 3 because of the longer construction period. Funds to the State are estimated to decrease by about \$1.6 million during the year with maximum estimated recreation losses (2009).

The number of construction workers required would be the same under Alternative 4 as under Alternatives 1, 2, and 3; however, the economic benefits of construction to the local economy would last longer under this alternative because of the a longer construction period. The economic effects of additional construction days would likely be small.

4.3.2.5 Alternative 5 Economic Effects

This alternative would require additional construction relative to the other action alternatives; therefore; FLSRA recreational facilities would be affected for a longer time period. Construction at Granite Bay is estimated to begin in late summer 2013 and continue through 2014. Approximately 50 percent of facility users would be affected by this alternative. Beal's Point facilities would be partially closed during borrow development and construction of the RWD and Dikes 4, 5, and 6. Construction is estimated to occur from November 2007 through 2012, affecting approximately 75 percent of its users. Under this alternative, it is likely that borrow activity would occur at the south and north end of Beal's Point. Folsom Point facility closures would be similar to Alternatives 2 through 4. Table 4-23 presents total economic impacts to value of output, value added, and employment from reduced recreational spending for Granite Bay, Beal's Point, and Folsom Point facilities

during the year when maximum visitation losses are expected to occur (2014) under this alternative.

Table 4-23
Annual Economic Impacts to Total Value of Output, Value Added, and Employment of Reduced Recreational Spending under Alternative 5, 2014 Visits, 2002 Dollars

Alternative 5 (2014 Visits)	Total Output, \$	Total Value Added, \$	Employment, Jobs
Direct Impacts	-\$5,379,001	-\$2,002,879	-\$44
Indirect Impacts	-\$1,336,472	-\$849,239	-\$15
Induced Impacts	-\$2,142,285	-\$1,373,019	-\$23
Total Impacts	-\$8,857,758	-\$4,225,137	-\$82

Under Alternative 5, reductions to state funds would be greater than under Alternatives 1 through 4 because of the longer construction period. Funds to the State are estimated to decrease by about \$1.7 million during the year with maximum estimated impacts (2014).

The economic benefits of construction to the local economy would last longer under this alternative because of more worker days. The economic effects of additional construction days would likely be small.

4.3.3 Comparative Analysis of Alternatives

The economic impacts of the action alternatives depend on the amount of time that the recreational facilities at FLSRA would be closed and the amount and time of construction labor required for project components. The impacts under each alternative would vary as these factors change. Table 4-24 qualitatively compares the effects of all alternative.

Economic Impact Description	Alternative 1 Economic Effects	Alternative 2 Economic Effects	Alternative 3 Economic Effects	Alternative 4 Economic Effects	Alternative 5 Economic Effects
Reduced recreational spending	Value of Output: -\$4.9 million Value Added: -\$2.3 million Employment: -45 jobs	Slightly greater than Alternative 1	Less impacts than Alts 1 and 2 because fewer construction days and FLSRA could be closed for a shorter time	Slightly less than Alternative 5, Greater impacts than Alts 1-3	Value of Output: -\$8.4 million Value Added: -\$4 million Employment: -77 jobs
Reduced State revenues	-\$940,000	Slightly greater than Alternative 1 because of longer construction at Folsom Point	Less impacts than Alts 1 and 2 because FLSRA could be closed for a shorter time	Greater impacts than Alts 1-3 because FLSRA closed for a longer time	-\$1.7 million Greater impacts than Alts 1-4 because FLSRA closed for a longer time
Increase economic activity from construction per 100 jobs (impact vary per year based on number of workers)	Value of Output: \$15.7 million Value Added: \$9.3 million Employment: 168 jobs	Same as Alternative 1	Slightly less beneficial impacts than Alts 1 and 2 because shorter construction period	More beneficial impacts than Alts 1-3 because longer construction period	More beneficial impacts than Alts 1-4 because longer construction period

4.3.4 Cumulative Effects

Chapter 5 presents projects considered in the cumulative effects analysis. Implementation of these projects would produce economic benefits to the region by providing employment and increasing output. Projects planned to alleviate traffic congestion in the Folsom area would ease access within and out of the region. Local residents may be more willing to drive to shopping centers, restaurants, and recreation areas with less traffic. Also, outside visitors may drive into the region for recreation, shopping, and other activities. Increased spending at the retail and recreation levels would ripple through other sectors the economy.

Under the cumulative condition, population growth is expected to continue at forecasted rates for the 3-county region. In Sacramento County, the total population is expected to increase from 1.37 million in 2005 to approximately 2 million in 2020; in Placer County, the population is expected to increase 305,675 in 2005 to approximately 456,000 in 2020. El Dorado County's population is expected to increase 173,407 in 2005 to approximately 221,000 in 2020 (EDD 2004). Urban development necessary to accommodate growth would provide construction jobs for

housing and commercial building. Increased economic opportunities would attract businesses to the region, providing more economic activity. Increased population growth would also increase demand for recreation in the region, including FLSRA facilities.

The Folsom DS/FDR alternatives would temporarily close Folsom Point, Granite Bay, and Beal's Point facilities at FLSRA. This would decrease economic activity in the region as discussed above. This analysis assumes that users would likely find a substitute recreation activity in the region and continue to spend money within the economy. Therefore, economic activity would not decrease as much as if local residents left the region for recreation opportunities. Under the cumulative condition, the region's economy would continue to grow. FLSRA facilities would be open when construction of the Folsom DS/FDR is complete and recreation activity would be restored and likely improved. No other identified cumulative project would result in permanent or temporary closure of recreational facilities and a reduction of recreational spending in the region.

Chapter 5

Cumulative Effects

5.1 Introduction

Cumulative effects analyses are an important element of the environmental documentation and approval process and are required by both NEPA and CEQA. Cumulative effects are two or more effects that may be considered insignificant when analyzed separately, but become significant when considered together. Cumulative effects must take into consideration related past, present, and reasonably foreseeable future projects. The cumulative effect is the change in the environment that occurs from the incremental effects of a project when considered with the effects of other past, present, and probable future projects.

The cumulative effects analyses in this EIS/EIR evaluate the combined effects of the Folsom DS/FDR action and other projects that could have effects similar to the Folsom DS/FDR action. The subsequent sections describe the regulatory basis for cumulative effects, the methodology used to analyze cumulative effects in this document, the related projects considered in the analyses, and finally, the cumulative effects by environmental resource.

5.2 Regulatory Basis

5.2.1 National Environmental Policy Act

NEPA regulations (40 CFR Section 1508.25) require an Environmental Impact Statement to discuss impacts which may be cumulative. NEPA defines a cumulative impact as:

“...the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time” (40 CFR Section 1508.7).

5.2.2 California Environmental Quality Act

According to Section 15130(a) of the CEQA Guidelines, a lead agency must discuss the cumulative impacts of a project when the project's incremental effect is “cumulatively considerable”, that is, when impacts of a project, combined with impacts from other projects, are considered significant. Cumulative impacts are defined in the CEQA Guidelines as:

“...two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts.

- (a) The individual effects may be changes resulting from a single project or a number of separate projects.
- (b) The cumulative impact from several projects is the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time” (CEQA Guidelines Section 15355).

5.3 Methodology

This cumulative effects analysis uses the “list” approach as defined in CEQA (CEQA Guidelines Section 15130(b)(1)(A)). Section 5.4 presents a comprehensive list of past, present, and probable future projects that could have effects similar to those of the Folsom DS/FDR action.

5.3.1 Study Area

The study area for the cumulative effects analysis includes the entire area surrounding the Folsom Reservoir and the area of the lower American River to Lake Natoma. Several resource areas may expand the study area to include additional areas (local roads, etc.) in order to fully analyze the cumulative effects.

5.3.2 Timeframe

The timeframe for this cumulative analysis extends from 2007 through 2014, which is the length of the Folsom DS/FDR construction period. Because one possible outcome of the Folsom DS/FDR action could be the requirement to amend the current reservoir flood control operations plan (scheduled for 2018), reoperation of the reservoir is mentioned as a cumulative effect project. Reoperation will have its own separate environmental analysis and EIS/EIR, and thus is not addressed in detail within this section.

5.4 Related Projects

Table 5-1 provides a list of past, present and probable future projects in the general vicinity of the study area that are included in the cumulative effects analysis.

No.	Project Name	Description	Date of Completion
1.	New Folsom Bridge	New bridge downstream of Main Concrete Dam	Late 2008
2.	Future Redundant Water Supply Intake and Pipeline for Roseville, Folsom, and San Juan Water District	A new 84-inch-diameter inlet water pipe connected to the proposed Auxiliary Spillway side approach channel.	When new Flood Control Diagram is implemented, not to exceed 2018.
3.	Folsom Dam Road Closure	Closure of Dam Road for public safety and security reasons.	2003
4.	L.L. Anderson Dam Improvements	Widen the spillway of French Meadows Reservoir.	Unknown
5.	Lower American River Common Features Project	Levee stabilization and raising in Lower American River, Natomas Cross Canal, and elsewhere in Sacramento region.	Ongoing
6.	Long-Term Reoperation of Folsom Dam and Reservoir	Interim operation agreement with SAFCA expires.	2018
7.	Sacramento Municipal Utility District (SMUD) 230kV Transmission Line Relocation	Relocation of transmission lines and towers because of construction of New Folsom Bridge.	Late 2006 or early 2007

5.4.1 Folsom Bridge Project

The Corps is proposing to construct a new bridge downstream of Folsom Dam Road. This new bridge would be part of the American River Watershed Project and is proposed to alleviate traffic congestion in downtown Folsom as a result of the closure of Folsom Dam Road. That road once accommodated 18,000 vehicles per day. Construction of the new bridge is scheduled to begin in 2007 and traffic is expected to be on the bridge by December 2008.

5.4.2 Future Redundant Pipeline

Several water agencies are proposing to construct a parallel pipeline within an existing pipeline right-of-way to improve water transport capability and reliability. The project would also include a new water supply intake. The new intake and pipeline may be completed together or as separate projects.

5.4.3 Folsom Dam Road Closure

In February of 2003, Folsom Dam Road was closed to public use due to dam safety concerns. Following a Record of Decision issued May 2005, Reclamation allowed the road to be opened to commuter traffic for 3-hour periods during the morning and

evening peak periods subject to the City of Folsom providing safety and infrastructure improvements. The City of Folsom is currently unable to open the roads subject to Reclamation's conditions; therefore, the road remains temporarily closed. Relative to the impacts analysis conducted for this EIS/EIR, it was assumed that the Dam Road remains closed for the foreseeable future (i.e., through the construction period); hence, the transportation impacts analysis is considered to be conservative (i.e., potential impacts on nearby streets resulting from Folsom DS/FDR construction would, for the most part, be greater than would otherwise occur if the Dam Road is opened pursuant to the ROD)."

5.4.4 L.L. Anderson Dam Improvements

As part of the American River Watershed Project, the Corps plans modifications to L.L. Anderson dam at French Meadows Reservoir thereby reducing the PMF levels that would otherwise reach Folsom Reservoir.

5.4.5 Lower American River Common Features Project

The Corps, SAFCA, and the Reclamation Board are implementing ongoing programs for levee stability in the lower American River region, and elsewhere along the Sacramento River. Substantial levee improvement has been completed and the vast majority of the project will be constructed prior to implementation of the Folsom DS/FDR.

5.4.6 Long-Term Reoperation of Folsom Dam and Reservoir

The current approved flood control diagram for Folsom Reservoir requires 400,000 acre-ft of flood storage capacity during the flood season. However, the reservoir is currently operated for additional flood storage capacity through an agreement between Reclamation and SAFCA. This "interim reoperation" requires a variable flood storage capacity of 400,000 to 670,000 acre-ft, depending on upstream storage conditions. A long-term reoperation plan is currently in the planning phase to update the approved flood control diagram to a variable 400,000 to 600,000 acre-ft of required flood storage capacity. An EIS/EIR would be developed by the Corps to address reoperation of the Folsom Facility based on the constructed features and reoperation potential of the Proposed Action.

5.4.7 SMUD 230kV Transmission Line Relocation

SMUD owns and operates a 230kV transmission line that extends along the northern boundary of Folsom Prison and provides electricity from the Upper American River Project hydropower facilities to Sacramento County and a portion of Placer County. This transmission line and nine existing lattice steel towers are currently in the corridor proposed for the New Folsom Bridge Project and will be relocated north of the proposed New Folsom Bridge and road, to avoid construction conflicts. A Draft Environmental Assessment/Finding of No Significant Impact is currently being prepared for this utility relocation. The relocation of the transmission line and towers

would also allow for a possible future connection into the Western Area Power Association (WAPA) Folsom substation (Reclamation 2006e).

5.5 Summary of Cumulative Effects for Individual Resource Areas

The following section presents a summary of the cumulative effects analysis by environmental resource area. A complete cumulative analysis is included in each resource section. These brief descriptions explain the Folsom DS/FDR action's contribution to cumulative effects on each resource.

5.5.1 Hydrology, Water Quality, and Groundwater

Flood protection would improve as a result of the Folsom DS/FDR and the other cumulative projects. This would result in positive cumulative benefits. Folsom DS/FDR-related construction activities could potentially influence water quality, change the viability of wetlands, and alter groundwater and surface water levels. When combined with construction of the New Folsom Bridge; Future Redundant Water Pipeline for Roseville, Folsom, and San Juan Water Districts; and the Lower American River Common Features Project, there is a possibility that water resources would be affected. However, each project's associated Storm Water Pollution Prevention Plans (SWPPPs), Best Management Practices (BMPs), pertinent permits, and appropriate monitoring and testing would ensure that measures are implemented to avoid hydrologic resource impairment including water quality degradation, changing water levels, and detrimental effects to wetlands. This would result in effective mitigation of significant cumulative impacts.

5.5.2 Water Supply

Of the projects identified in Table 5-1 only the Long-term Reoperation of Folsom Dam and Reservoir would potentially affect water supply. Impacts of reoperation are unknown and would be addressed in separate environmental compliance documentation; however, for this cumulative analysis, the impact is assumed to be less than significant after mitigation. Other projects in Table 5-1 would not have any effects on water supplies. The Folsom DS/FDR could potentially reduce reservoir storage by approximately 0 to 1,243 acre-feet which would be considered less than significant. No other known projects would reduce reservoir storage; therefore, the Folsom DS/FDR's incremental contribution to the cumulative condition would be less than significant.

5.5.3 Air Quality

Many of the projects in Table 5-1, including the New Folsom Bridge, include construction within the study region. Construction of these projects would increase emissions of criteria pollutants, including VOC, NO_x, CO, SO₂, and PM emissions, from onsite construction and transport of materials. If these construction projects are

implemented concurrently, the combined cumulative effects would be above CEQA thresholds for air quality emissions and the General Conformity *de minimis* thresholds. Each project would need to mitigate individual air quality effects, which could decrease overall cumulative effects. However, without consideration of scheduling and sequence of activities, concurrent construction projects within and adjacent to Folsom Reservoir would have significant cumulative air quality impacts.

The effects of the Folsom DS/FDR to air quality would be cumulatively considerable. Additionally, mitigated NO_x, PM₁₀ and CO emissions associated with the Folsom DS/FDR would be greater than the General Conformity *de minimis* threshold. Therefore, these incremental effects would be significant under the cumulative condition.

5.5.4 Aquatic Resources

The Folsom Bridge Project is expected to result in limited impacts to fishery resources, in part in areas also potentially affected by the Folsom DS/FDR actions. Therefore, the cumulative effects of the Folsom Bridge Project and the Folsom DS/FDR actions would not be cumulatively considerable for fishery resources in general.

5.5.5 Terrestrial Resources

Vegetation

The Folsom Bridge Project is expected to result in limited impacts to native vegetation, in part in areas also potentially affected by the Folsom DS/FDR Action. These impacts include impacts to jurisdictional wetlands. The project provides mitigation to reduce these impacts to a less-than-significant level. The Sacramento Municipal Utility District Transmission Line Project will result in limited impacts to native vegetation, primarily in areas also potentially affected either by the Folsom Bridge Project or the Folsom DS/FDR Action. Additional impacts to native vegetation in the Folsom DS/FDR Action area are not expected from this project. Potential alterations to stream flow due to modification of the spillway at French Meadows Reservoir would be attenuated in the long distance between L.L. Anderson Dam and the Folsom DS/FDR Action area and are not likely to affect vegetation in the Folsom DS/FDR Action area. Although work related to the Lower American River Common Features Project is on-going, it is close to completion and consists primarily of levee work outside the floodway.

Therefore, the effects of these projects in combination with the Folsom DS/FDR Action would not be cumulatively considerable for vegetation in general, for riparian vegetation, or for wetland vegetation.

Special-status Plant Species

The Folsom Bridge Project is not expected to result in impacts to special-status plant species. The SMUD Transmission Line Project is not expected to result in impacts to special-status plant species. Potential alterations to stream flow due to modification of the spillway at French Meadows Reservoir would be attenuated in the long distance between L.L. Anderson Dam and the Folsom DS/FDR Action area and are not likely to affect vegetation in the Folsom DS/FDR Action area. Although work related to the Lower American River Common Features Project is on-going, it is close to completion and consists primarily of levee work outside the floodway.

Cumulative impacts to federally or state-listed plant species from the Folsom DS/FDR Action are not expected to occur because species in those categories are unlikely to occur in the project area. In addition, other special-status plant species are unlikely to be affected by the Folsom DS/FDR Action. While complete avoidance of such species may not be possible, should they be found in the interim, the proposed mitigation measures would reduce the impact to a less-than-significant level. The implementation of the Folsom DS/FDR Action, its implementation along with the Folsom Bridge Project would not result in cumulatively considerable impacts.

Therefore, the effects of these projects in combination with the Folsom DS/FDR Action would not be cumulatively considerable for special-status plant species.

Special-status Wildlife Species

Construction-related disturbances for all alternatives of the Folsom DS/FDR Action have the potential to affect elderberry shrubs, the host plant for the valley elderberry longhorn beetle. Mitigation measures specified in Section 3.5.2 would reduce this impact to a less-than-significant level. Mitigation for these impacts may be compensated in a joint area with elderberry compensation for the Folsom Bridge Project to provide better quality habitat and greater cost efficiency.

Construction-related disturbances for all alternatives of the Folsom DS/FDR Action have the potential to affect only small amounts of existing amphibian aquatic habitat, most of which is unsuitable to marginally suitable for amphibian species, including special-status species. Terrestrial habitat potentially utilized by western spadefoot toad may be altered temporarily or permanently, but since the distribution of this species appears to be limited by the lack of aquatic breeding habitat rather than terrestrial habitat, none of the proposed alternatives are likely to affect the overall habitat value for this species. Mitigation measures, such as performing pre-construction surveys and implementation of a Mitigation, Monitoring and Reporting Plan for wetlands affected by the project, would reduce both direct and indirect impacts to a less-than-significant level. Therefore, these impacts would result in only a very minor contribution to ongoing cumulative effects caused by other projects within the region.

Construction-related disturbances for all alternatives of the Folsom DS/FDR Action have the potential to affect special-status reptiles, birds, and bats and their habitat, and other breeding migratory birds. However, other habitat is available adjacent to the project area. With the mitigation measures described in Section 3.5.2, these potential impacts would be reduced to a less-than-significant level.

The DEIS/EIR for the Folsom Bridge project (Corps 2006b) found there would be no adverse effects to the California red-legged frog or the giant garter snake from any of the alternatives evaluated for that project because "...no suitable habitat for special-status reptiles, amphibians, or invertebrates was noted during the wetland delineation for the proposed project" (Corps 2006b). The DEIS/EIR for the Folsom Bridge project did identify potential impacts to the white-tailed kite and for the bald eagle if these species were to be present during construction. This document also provided mitigation measures to reduce any potential impacts to a less-than-significant level.

Construction activities for three other projects would be implemented concurrently with, and generally within the footprint of, construction activities implemented for the Folsom DS/FDR Action. Therefore, they would not contribute to additional direct or indirect impacts. These projects include the Reliable Water Supply Project for the City of Roseville, City of Folsom, the San Juan Water District project and the Sacramento Municipal Utility District Transmission Line Project.

Because environmental documents to fulfill NEPA/CEQA requirements have not yet been completed for the redundant water pipeline for the City of Roseville, City of Folsom, the San Juan Water District project, or the Sacramento Municipal Utility District Transmission Line Project impacts to wildlife and wildlife habitat, including special-status species, have not been identified. However, any alternative that would install a new intake and redundant delivery pipeline would affect habitat already disturbed by the existing infrastructure. Furthermore, a substantial portion of the construction-related impacts would occur concurrently with, and within the footprint of, construction activities for the Folsom DS/FDR Action. Likewise, a substantial portion (possibly all) of the construction-related impacts for Sacramento Municipal Utility District Transmission Line Project would occur within the footprint of, construction activities for the Folsom DS/FDR Action or the Folsom Bridge project.

Potential alterations to stream flow due to modification of the spillway at French Meadows Reservoir would be attenuated in the long distance between L.L. Anderson Dam and the Folsom DS/FDR Action area. Although work related to the Lower American River Common Features Project is on-going, it is close to completion. Impacts to wildlife and their habitat due to the Folsom DS/FDR Action are less-than-significant with mitigation and, therefore, would not contribute to cumulative impacts with the remaining levee work.

Therefore, the effects of these projects in combination with the Folsom DS/FDR Action would not be cumulatively considerable for wildlife in general or for special-status wildlife.

5.5.6 Soils, Minerals, and Geological Resources

Blasting could potentially be required for the Folsom DS/FDR and the New Folsom Bridge. However, blasting would be of sufficient distance from the Bear Mountains Fault system and would not trigger seismic activity. Cumulative adverse effects associated with seismic activity would be less than significant.

Although the construction of the New Folsom Bridge and the Folsom DS/FDR actions would involve a substantial amount of soil and material displacement, the potential for landslides within the study area is low and construction techniques would be implemented to minimize the potential for landslides. Cumulative adverse effects associated with landslides would be less than significant.

Although the construction of the New Folsom Bridge and the Folsom DS/FDR actions would involve a substantial amount of soil and material displacement, impacts associated with this loss would be less than significant. Any minerals that would be excavated would not be used for commercial purposes and therefore would not be considered an economic loss. Similarly, excavated topsoil is not of a high ecological or agricultural value. Cumulative adverse effects associated with soil losses would be less than significant.

Combined construction activities would result in significant impacts associated with soil erosion. However, both action would be mitigated through the implementation of BMPs set forth in the SWPPP. The development and implementation of an SWPPP for each project would effectively mitigate impacts to a less than significant level.

5.5.7 Visual Resources

Cumulative effects on visual resources were evaluated considering the effects of past, present, and reasonably foreseeable projects. Table 5-1 summarizes projects in the cumulative analysis. Under the cumulative condition, only the New Folsom Bridge Project and Folsom DS/FDR would affect visual resources within the local visual setting. However, because the New Folsom Bridge Project would not be visible from the same FLSRA view points, it would not create a noticeable change in the characteristic visual landscape. The Folsom DS/FDR would not contribute to any cumulative effects.

5.5.8 Agricultural Resources

Because none of the alternatives, including the No Action/No Project Alternative, would affect agricultural resources, there would be no cumulative effects.

5.5.9 Transportation and Circulation

Most of the projects include construction within the study region that will require transport of materials to and from the site. In addition, population is increasing in the region, which will further increase traffic congestion in the study area. Under the cumulative condition, all Folsom Facility construction projects would have the potential for significant transportation and circulation effects should construction activities occur concurrently. Cumulative effects of traffic near the Main Concrete Dam would be limited by restricted access, staging, and closed construction areas. Also, cumulative effects of construction projects could be controlled through the scheduling and sequencing of haul truck traffic. Once completed, the new Folsom Bridge will greatly alleviate traffic congestion within the vicinity of the Folsom construction areas.

Alternatives of the Folsom DS/FDR would have significant impacts to transportation and circulation at select roads, including East Natoma Street and Scott Road, from increased trip generation. The Folsom DS/FDR would further increase traffic in a highly congested area along East Natoma Street. This would be considered a significant cumulative effect.

5.5.10 Noise

The potential for cumulative noise impacts from other nearby projects occurring concurrently with the Folsom DS/FDR include the New Folsom Bridge Project. Construction activities associated with Folsom DS/FDR would be similar to those anticipated for the Folsom DS/FDR. Similar construction activities include: earthwork, concrete work, blasting operations and truck hauling operations. Cumulative noise impacts would occur for residential areas along Folsom-Auburn Road south of Folsom Reservoir and along East Natoma Street in particular when the Auxiliary Spillway work and the New Folsom Bridge Project would be under construction during the same period beginning 2008. Both the Folsom Bridge Project and the Folsom DS/FDR include mitigation measures to minimize noise impacts and are anticipated to reduce the impacts to a less than significant level.

5.5.11 Cultural Resources

The Folsom DS/FDR, in conjunction with the cumulative projects listed above, and the growth potential of the region, could lead to cumulative impacts to cultural resources. However, provided that proper mitigation consistent with Section 106 of the NHPA for federal actions and CEQA for state, county and municipal actions, is implemented for all projects, cumulative impacts would likely be avoided. The Folsom DS/FDR would implement appropriate mitigation measures and would therefore not contribute to a significant cumulative impact to cultural resources.

5.5.12 Land Use, Planning, and Zoning

Any land use action taken, such as building a flood protection structure and/or acquisition of real estate rights (easements or fee title), that could change the existing land use operation or function of an impacted parcel would be a potentially significant impact to land use. It is unlikely that the projects identified in Table 5-1 would have any notable adverse impact on local land use designations or zoning designations. Therefore, the cumulative effect of the Folsom DS/FDR action would be less than significant.

5.5.13 Recreation Resources

Table 5-1 describes the projects included in the cumulative analysis. Besides, the Folsom DS/FDR, the other projects would not restrict access to or use of major recreation sites at the Folsom Lake State Recreation Area (FLSRA). The Folsom Dam Road Closure will continue to redirect traffic through city streets and may cause further traffic interruptions to those trying to access FLSRA facilities. The New Folsom Bridge should relieve some of the traffic interruptions. Construction of the bridge should not have any direct effect on FLSRA facilities. The DPR, in partnership with Reclamation, recently began work on the integrated FLSRA General Plan and Resource Management Plan Update. This process would update the current general plan, as well as the long-range vision for the area. The General Plan will result in improvements to the FLSRA facilities.

The Folsom DS/FDR impacts to recreation would be cumulatively considerable during the construction period because of the magnitude of potential decreases in visitation at FLSRA facilities.

5.5.14 Public Services and Utilities

The Folsom DS/FDR would not have cumulatively considerable impacts to utilities and public services, including electricity, natural gas, stormwater, solid waste, water and wastewater infrastructure, telecommunication infrastructure, and existing roads.

5.5.15 Hydropower Resources

The Folsom DS/FDR actions would have no impacts to hydropower generation; therefore, there would be no cumulative impacts.

5.5.16 Population and Housing

No significant impact on population and housing would occur as a result of the Folsom DS/FDR action. It is unlikely that the projects identified in Table 5-1 would have any impact on population and housing in a negative way. Therefore, the cumulative effect of the Folsom DS/FDR action would be less than significant.

5.5.17 Public Health and Safety

Cumulatively, the Folsom DS/FDR action would have a beneficial effect on public health and safety with respect to natural disasters. The Folsom DS/FDR action would reduce current dam deficiencies, such as potential failure due to seismic (earthquake), static (seepage), and hydrologic concerns (probable maximum flood events), and provide greater protection to downstream populations in the Sacramento metropolitan area from potential flood impacts. Effects on public health and safety with respect to hazardous, toxic, and radiological waste were found not to have the potential to contribute to cumulative effects because the effects are either temporary or have no potential to be additive to other projects. Therefore, the Folsom DS/FDR action would not have an adverse cumulative effect on public health and safety.

5.5.18 Indian Trust Assets

The Folsom DS/FDR would not affect any Indian Trust Assets; therefore, it would not have any cumulative considerable impacts.

5.5.19 Environmental Justice

The Folsom DS/FDR would have no significant environmental justice impacts and would not contribute to any cumulative environmental justice impacts.

5.5.20 Socioeconomics

Population and economic development in the Folsom DS/FDR study area is increasing. The Folsom DS/FDR would not have a cumulative considerable impact to the region's economy.

5.6 Unavoidable Adverse Impacts

The CEQA Guidelines state that any significant environmental impacts that cannot be avoided if the project is implemented must be described. This description extends to those significant impacts that can be mitigated, but not reduced to a level of insignificance. The following section discusses significant and unavoidable impacts related solely to the project, as well as cumulative impacts of the project in combination with existing and reasonably foreseeable future projects.

5.6.1 Project-Related Significant and Unavoidable Impacts

The Folsom DS/FDR would have a significant unavoidable impact on the following resources:

5.6.1.1 Recreation

Folsom DS/FDR construction would result in a temporary loss of recreational use at major recreation sites and trails. Folsom Point would be closed to the public during 5 to 6 peak seasons, depending on the alternative. This would result in a significant and unavoidable impact to the region's recreation and potential overcrowding of

other regional facilities. Partial closure and reduced access to the Folsom Point-Browns Ravine Trail would be a significant and unavoidable impact. Construction would also cause the cancellation of some special events scheduled at FLSRA because of the shutting down of Folsom Point. Under Alternatives 4 and 5, there would be significant and unavoidable impacts to recreation at Granite Bay and Beal's Point. All significant and unavoidable impacts would be temporary and last only during the construction period.

5.6.1.2 Visual

Borrow areas and processing facilities at Beal's Point would be within the foreground views from most all vantage points at Beal's Point for Alternatives 1 through 5. These activities would significantly impact Class A and B visual resources. Impacts from borrow areas and processing facilities at Granite Bay for Alternatives 4 and 5 would be within the foreground views from the beach area and could affect Class A and Class B visual resources. The borrow area and processing plant at MIAD Left would be within the foreground views from most all vantage points at Browns Ravine/Folsom Reservoir Marina under Alternatives 4 and 5. These impacts would be significant and unavoidable until completion of construction.

Several residential developments contain homes with lake views. These residents would potentially view construction activities throughout the day and evening throughout the duration of the Folsom DS/FDR under all the alternatives. Construction-related impacts to visual resources as perceived scenic views from residential developments would be significant and unavoidable for the duration of the construction period. Alternatives 2 through 4 would involve raises to Folsom Facility that could permanently impair views of the reservoir from several private residential developments; these impacts would be considered significant and unavoidable.

Under Alternatives 2 and 3, construction of parapet walls would impair views of hikers along trails that circumnavigate the western and southern part of the reservoir. This view impact would be further impaired by placement of a safety rail at the top of each wall to prevent walking on top of and falling off of the walls. This permanent visual impact would be significant and unavoidable.

This construction would also cause a significant and unavoidable permanent impact on the visual character of the Folsom Facility. Under Alternatives 2 through 5 the raising of existing embankments and the construction of new embankments could impair view of the reservoir from the shoreline. These impacts would be permanent, and considered significant and unavoidable.

5.6.1.3 Terrestrial Resources

Inundation caused by emergency flood retention could adversely affect other special-status wildlife. Inundation above the OHWM could adversely affect special status

wildlife such as western burrowing owls, northwestern pond turtles, California horned lizards, giant garter snakes, long billed curlew, white faced ibis, mountain plovers, and various bat species.

Because such inundation would be a rare event and even for a 151-year flood would last for less than two days, with the water being progressively lowered, little or no impacts to reptiles and to ground-foraging birds that do not breed in the project area would occur.

The nests of ground nesting birds may be inundated if emergency retention occurs after eggs have been laid. Any western burrowing owls that occupy areas that lie between the current OHWM and the maximum reservoir elevation that would result from implementation of the project could be subject to drowning, loss of burrows and loss of eggs. These impacts would be significant and unavoidable.

5.6.1.4 Land Use

Under Alternatives 2 through 5, if substantial inundation of non-federal property surrounding Folsom Reservoir could not be avoided through other flood protection measures (such as a flood protection berm) under an extreme flood or Probable Maximum Flood (PMF) event, fee title would be acquired for the impacted non-federal parcel. The effect of acquiring fee title for an impacted non-federal parcel and associated discontinuation of the existing land use function or operation would be a significant and unavoidable impact to land use.

5.6.2 Cumulative Significant and Unavoidable Impacts

Without proper scheduling and sequencing, the Folsom DS/FDR would have significant and unavoidable adverse cumulative impacts to recreation, traffic and air quality.

5.7 Relationship Between Short-Term Uses and Long-Term Productivity

NEPA guidance (NEPA Section 102(2)(c)(iv) and 40 CFR 1502.16) requires a discussion of long-term versus short-term effects. At issue is whether short-term effects are counterbalanced by long-term effects. The discussion of effects should include effects that narrow the range of beneficial uses of the environment or pose long-term risks to health and safety.

All action alternatives implement dam safety measures that involve construction of new features, raising dam and/or dike elevations, constructing seismic and static retrofits, and construction of staging and borrow sites. These would include short-term uses of capital, labor, fuels, and construction materials, habitats, and recreation areas. General construction material resource commitments are largely irreversible,

since most of the construction materials are unsalvageable. The labor and fuel used in the construction and operation of the Folsom DS/FDR are irretrievable. Habitat and recreation area losses would only be temporary during construction activities and would be recommitted as habitat and recreation areas or mitigated elsewhere.

Benefits include reduction of potential flooding-related loss of resources, property, and human life. The environmental uses of these areas would not change, and habitat for a variety of species would still exist in the creek, levees, and streambanks. There are no adverse effects that would pose a long-term risk to health and safety.

5.8 Irreversible and Irretrievable Commitment of Resources/Significant Irreversible Changes

In accordance with the NEPA and CEQA Guidelines (NEPA Section 102(2)(c)(v) and 40 CFR 1502.16 and Public Resources Code 21100(b)(2)(B) and CEQA Guidelines 15126(c), 15126.2(c), and 15127), this EIS/EIR discusses any irreversible and irretrievable commitment of resources that would be consumed with the implementation of the Folsom DS/FDR. Significant irreversible environmental changes are defined as uses of nonrenewable resources during the initial and continued phases of the project which may be irreversible, since a large commitment of these resources makes future removal of nonuse unlikely.

Construction activities would involve the consumption of nonrenewable natural resources such as the earthen borrow material, concrete and slurry mixture, and petroleum for fuel. The resources used in site preparation, construction material transportation, borrow material transportation, excavation, and disposal of excess excavated materials would be permanently committed to the Folsom DS/FDR alternatives. In addition, continued operation and maintenance of the completed Folsom DS/FRD would use petroleum for fuel and potentially soil and concrete.

Additionally, Alternatives 2, 3, 4, and 5 could require dam raises and construction of new embankments. Views of the reservoir from nearby residences could be impaired by the raised and new embankments. The visual character of the Folsom Facility would also be permanently altered with any raise. This loss in scenic quality would be considered a significant irreversible change since there is no feasible mitigation to reduce the visual impacts of new embankments or a raise to the Folsom Facility.

5.9 Growth Inducement

Section 15126.2 of the CEQA Guidelines requires an environmental document to:

“Discuss the ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. Included in this are projects which would remove obstacles to population growth...”

In general, an action would be considered growth inducing if it caused or contributed to economic or population growth. Growth-inducing actions would result in more economic or population growth than would have occurred otherwise from other factors. Thus, a growth-inducing action would promote or encourage growth beyond that which could be attributed to other factors known to have a significant relationship to economic or population growth.

The various alternatives currently being considered for the Folsom DS/FDR action would not contribute directly to population or economic growth by constructing additional housing or by building new businesses. However, the Folsom DS/FDR would generate additional economic benefits during construction and would contribute to greater flood protection for the Sacramento area once complete. Therefore, the Folsom DS/FDR may have some limited growth inducing potential.

Although the Folsom DS/FDR has limited growth inducing potential, it would not necessarily result in growth. Each municipality or county controls growth at the local level through land use policies in each jurisdiction. Decision-makers alone are able to transform growth-inducing potential or pressure, created by economic or social conditions, into actual growth.

Within the study area, growth and development are controlled by the local governments of the City of Sacramento, City of Folsom, County of Sacramento, County of El Dorado, and County of Placer. Consistent with California law, each of these local governments has adopted a general plan and each general plan provides an overall framework for growth and development within the jurisdiction of each local government. Local, regional, and national economic conditions also directly affect growth and development.

Additionally, although the Folsom DS/FDR would provide for greater flood protection, there are many other components to the flood protection system along the American River. For instance, the Corps is responsible for the levee system along the lower American River, and FEMA is responsible for flood hazard mapping and the Flood Insurance Program. Recent improvements by the Corps to the lower American River levees resulted in FEMA issuing a Letter of Map Revision (LOMR) on February 18, 2005 removing a number of properties from the Special Flood Hazard Area and from flood insurance requirements. Any additional flood damage reduction benefits offered by the Folsom DS/FDR would not result in new LOMRs. Moreover, development has already occurred in significant portions of the American River floodplain and is currently expanding despite floodplain designation and costs associated with providing flood insurance. Thus, eliminating the flood risk designations or reducing the area within the floodplain would not increase growth or development in the American River floodplain.

Therefore, the Folsom DS/FDR would not promote or encourage growth beyond that which could be attributed to the other factors noted above that are known to have a significant relationship to economic or population growth.

Chapter 6

Consultation and Coordination

6.1 Related Laws, Rules, Regulations, and Executive Orders

Implementation of the Folsom DS/FDR is subject to multiple Federal and State statutes and local planning regulations. Chapters 1 and 3 describe the regulations related to each environmental resource. This section identifies compliance efforts for applicable regulations. Table 6-1 lists the statute, the section it is described in, any relevant permits or processes required, and the status of compliance.

Table 6-1			
Related Laws, Rules, Regulations, and Executive Orders			
Statute	Section with Description	Relevant Permits/Processes	Status of Compliance
Federal Statute			
National Environmental Policy Act of 1969 (NEPA)	Section 1.8	EIS, Record of Decision	Ongoing
National Historic Preservation Act of 1966 (NHPA)	Section 1.8, Section 3.11.1.2	Section 106 Consultation	Ongoing
Clean Air Act	Section 1.8, Section 3.2.2.1	Conformity provisions, mitigation measures	Ongoing
River and Harbors Act	Section 1.8	Analyzed in EIS/EIR ⁽¹⁾	In Compliance
Clean Water Act (CWA)	Section 1.8, Section 3.1.1.2	Section 401 and 404 requirements, NPDES permit	Ongoing
Endangered Species Act (ESA)	Section 1.8, Section 3.4.1.3, Section 3.5.1	Section 7 Consultation, Biological Assessment,	Ongoing
Fish and Wildlife Coordination Act (FWCA)	Section 1.8	Coordination Action Report	Ongoing
Migratory Bird Treaty Act	Section 1.8, Section 3.5.1	Analyzed in EIS/EIR	In Compliance
Executive Order 11990, Protection of Wetlands	Section 3.5.1	Analyzed in EIS/EIR	In Compliance
Executive Order 12898, Environmental Justice	Section 1.8, Section 3.22	Analyzed in EIS/EIR	In Compliance
Farmland Protection Policy Act	Section 1.8, Section 3.8.1	Analyzed in EIS/EIR	In Compliance
Indian Trust Assets	Section 3.18	Analyzed in EIS/EIR	In Compliance

Table 6-1 Related Laws, Rules, Regulations, and Executive Orders			
Statute	Section with Description	Relevant Permits/Processes	Status of Compliance
State Statute			
Porter-Cologne Water Quality Control Act	Section 1.8, Section 3.1.1.2	NPDES, Waste Discharge Requirements	Ongoing
California Environmental Quality Act (CEQA)	Section 1.8	EIR	Ongoing
California ESA	Section 1.8	DFG consultation	Ongoing
Natural Community Conservation Planning Act	Section 1.8	DFG consultation	Ongoing
Government Code Section 65040.12(e) Environmental Justice	Section 1.8	Analyzed in EIS/EIR	In Compliance
California Land Conservation Act (Williamson Act)	Section 3.8.1	Analyzed in EIS/EIR	In Compliance
California Clean Air Act	Section 3.2.2.1	Ambient air quality standards, mitigation measures	Ongoing
Local Statute			
Sacramento County General Plan	Section 3.10.1	Zoning requirements	In Compliance
El Dorado County General Plan	Section 3.10.1	Zoning requirements	In Compliance
Placer County General Plan	Section 3.10.1	Zoning requirements	In Compliance

⁽¹⁾ regulation addressed through EIS/EIR process

Note: Ongoing – Some requirements of the regulation remain to be met by subsequent installation actions before implementation of some of the actions associated with this project. Once the statutory requirement for each action has been met, compliance will be labeled “in compliance”.

6.2 Public Scoping Meetings

On October 6, 2005, the U.S. Department of Interior, Bureau of Reclamation (Reclamation) published the Notice of Intent to prepare an EIS to correct seismic, static, and hydrologic issues associated with the structures that make up Folsom Dam. The Folsom DS/FDR EIS/EIR, which in addition to Reclamation, includes the Corps, SAFCA, DWR, and the State Reclamation Board. These agencies held public scoping meetings at the following locations to receive comments:

- Granite Bay, December 12, 2005.
- Folsom, December 14, 2005.
- Sacramento, December 15, 2005.

Approximately 90 people attended the three meetings, including members of the public, elected officials, and representatives from public agencies, water resources, waterways, and electric power and flood control. All three public meetings were held in an open house forum. Displays were set up to provide information on issues, impacts, agency roles, and opportunities for public involvement. The displays included the following information:

Display 1. Project Overview

- Background information about the Folsom Dam, its role in the Central Valley Project, its role as a flood control facility for the Sacramento area, the critical need for improvements, and the proposed alternatives.

Display 2. Issues

- The three main issues (hydrologic, seismic and static) that need to be addressed in order to maintain the long term safety of Folsom Dam.
- Associated structures explained in detail with graphics.

Display 3. Impacts

- Potential impacts to both the reservoir and the Folsom area during construction and after modifications are complete.

Display 4. Roles & Responsibilities

- The collaborative relationship of Reclamation with the Corps to improve the structural integrity of Folsom Dam and protect the region from floods.

Display 5. EIR/EIS Process

- A timeline and explanation of the complete environmental review process from developing the purpose and need, to adopting the Record of Decision, with information describing continued public involvement.

At the scoping meetings, the public had the opportunity to comment, either verbally or written, on the Folsom Dam project. The following bullets provide a summary of major issues from public comments received including verbal comments made during the public scoping meetings, and all written comments submitted during the comment period where possible. These comments were addressed during development of the EIS/EIR.

- What is the role of each of the agencies and how will the two Federal agencies interact in completing the project?
- What are the major impacts from this project and how will they be mitigated?
- How will traffic be affected?

- What level of safety will the new dam features provide?
- What downstream affects will the new facilities have?
- How will agencies keep the public informed about future meetings and other project updates?
- What will the impacts be on local homeowners during construction?
- What are the recreational, cultural, and natural resource impacts and how will they be mitigated?

6.3 Agency Coordination

Table 6-2 presents the agencies involved in development of the Folsom DS/FDR EIS/EIR. The following sections further describe these agencies' roles in the process and the involvement of other Federal, State, and local agencies. These efforts are ongoing and agencies in addition to those listed below could be consulted throughout the project implementation.

Agency	Role in Folsom DS/FDR
Reclamation	NEPA Lead Agency
Corps	Cooperating Agency under NEPA
Reclamation Board/DWR	CEQA Lead Agency
SAFCA	Responsible Agency under CEQA

6.3.1 U.S. Department of Interior, Bureau of Reclamation

Reclamation is participating in the Folsom DS/FDR pursuant to the Safety of Dams Program and the Energy and Water Development Act of 2006. Reclamation's main objective under the Dam Safety Program is to ensure the Folsom Facility can safely pass the Probable Maximum Flood (PMF)¹. The Energy and Water Development Appropriations Act of 2006 directed Reclamation and the Corps to collaborate on authorized activities to maximize flood damage reduction improvements and address dam safety needs at the Folsom Facility. As the Federal lead agency, Reclamation is responsible for complying with NEPA, Section 106 of the NHPA, FWCA, ESA, and CWA.

¹ The PMF is defined as "the flood that may be expected from the most severe combination of critical meteorological and hydrologic conditions that are reasonably possible in a particular drainage area" (Corps 2002).

6.3.2 U.S. Army Corp of Engineers

The Corps is participating in the Folsom DS/FDR pursuant to the flood damage reduction objectives and the Energy and Water Development Act of 2006. The Corp's flood damage reduction objective is to provide the region downstream of the Folsom Facility with a level of flood protection that the community has interpreted as a minimum of a 1-in-100-year flood protection.

6.3.3 California Department of Water Resources and State Reclamation Board

With increased development in flood prone areas and recent legal decisions, the State is at financial risk for flood damages. DWR and the State Reclamation Board are participating in the Folsom DS/FDR to improve flood protection and management in the region. The State Reclamation Board is the State lead agency responsible for CEQA compliance of the Folsom DS/FDR. The Reclamation Board's mission includes controlling flooding along the Sacramento River and its tributaries in cooperation with the Corps.

6.3.4 Sacramento Area Flood Control Agency

SAFCA is the local agency involved in the Folsom DS/FDR. In 1989, the City of Sacramento, the County of Sacramento, the County of Sutter, the American River Flood Control District and Reclamation District 1000 created SAFCA through a Joint Exercise of Powers Agreement (SAFCA Undated, Corps 1996). The purpose of SAFCA was to represent local interests during the flood protection planning process (SAFCA Undated, Corps 1996).

6.3.5 U.S. Fish and Wildlife Service

USFWS is participating in the Folsom DS/FDR pursuant to the ESA and FWCA. The project agencies are consulting with USFWS for preparation of a Biological Opinion and Coordination Action Report.

6.3.6 California Department of Fish and Game

CDFG participation is based on its responsibilities for protecting California's fish and wildlife resources and native plants and habitat. CDFG also protects special status species through implementing the California ESA. The project agencies and sponsors are consulting with CDFG for effects to sensitive species and plant communities.

6.3.7 State Water Resources Control Board

SWRCB has authority over California water quality and appropriate surface water rights. The SWRCB and nine Regional Water Quality Control Boards (RWQCB) carry out the NPDES permitting process for point source discharges and the CWA Section 303 water quality standards program. The Folsom DS/FDR agencies and

sponsors are consulting with the Central Valley RWQCB for potential effects to water quality from construction activities.

6.3.8 CVP Water and Power Users

Reclamation has been actively coordinating with approximately 240 CVP water and power users who will be responsible for 15 percent of the cost of the Dam Safety portion of the Folsom DS/FDR.

6.4 Project Management and Technical Teams

Many management and technical teams studied and reviewed the construction and environmental impacts of the Folsom DS/FDR. These teams included representatives from multiple agencies.

- PASS Team - Project Alternative Solutions Study Team
- PASS II Team - Project Alternative Solutions Study II Team
- OMG - Oversight Management Group
- PDT - Project Development Team
- PMT - Project Management Team
- Mitigation and Monitoring Team
- PMG - Project Management Group

Chapter 7

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Chapter 7
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Chapter 9

Document Recipients

This Chapter lists Federal, State, regional, and local public and private agencies and organizations that have either received a copy of this Draft EIS/EIR or a notification of document availability. In addition to the regulatory agencies, agencies with special expertise or interest in evaluating environmental issues related to the project are included. Private agencies, organizations, and individuals who may be affected by the project or who have expressed an interest in the project through the public involvement process are also included.

The Folsom DS/FDR Draft EIS/EIR is available on the web at:

http://www.usbr.gov/mp/nepa/nepa_projdetails.cfm?Project_ID=1808

Copies of the Draft EIS/EIR are available for public review at the following locations:

- Bureau of Reclamation, Denver Office Library, Building 67, Room 167, Denver Federal Center, 6th and Kipling, Denver, CO 80225
- Bureau of Reclamation, Mid-Pacific Regional Office Library, 2800 Cottage Way, W-1825, Sacramento, CA 95825-1898
- El Dorado County Library, 345 Fair Lane, Placerville, CA 95667-5699
- Folsom Public Library, 300 Persifer Street, Folsom, CA 95630
- Natural Resources Library, U.S. Department of the Interior, 1849 C Street NW, Main Interior Building, Washington, DC 20240-0001
- Roseville Public Library, 311 Vernon Street, Roseville, CA 95678
- Sacramento Central Library, 828 I Street, Sacramento, CA 95814-2589

9.1 Elected Officials and Representatives

Governor of California
 Honorable Arnold Schwarzenegger
United States Senate
 Honorable Barbara Boxer
 Honorable Dianne Feinstein
House of Representatives
 Honorable John Doolittle
 Honorable Doris Matsui
 Honorable Daniel Lungren
California Senate
 Honorable Dave Cox
California Assembly
 Honorable Roger Niello

9.2 Government Departments and Agencies

9.2.1 U.S. Government

Advisory Council on Historic Preservation
Agricultural Stabilization and Conservation Service
Army Corps of Engineers
Bureau of Land Management
Bureau of Reclamation
Council on Environmental Quality
Environmental Protection Agency
Federal Emergency Management Agency
Federal Highway Commission
Fish and Wildlife Service
Geological Survey
National Marine Fisheries Service
National Park Service
Natural Resources Conservation Service
Office of Environmental Project Review
Western Area Power Administration

9.2.2 State of California

Senate Committee on Natural Resources
Assembly Committee on Water, Parks, and Wildlife
Air Resources Board
California Water Commission
Central Valley Regional Water Quality Control Board

Department of Conservation
Department of Corrections
Department of Fish and Game
Department of Parks and Recreation
Department of Recreation
Department of Transportation
Department of Water Resources
Native American Heritage Preservation
Office of Transportation Planning
Reclamation Board
State Clearinghouse
State Lands Commission
Water Resources Control Board

9.2.3 Regional, County, and City

City of Folsom
El Dorado County
Granite Bay Advisory Council
Placer County
Sacramento Area Flood Control Agency
Sacramento County
Sacramento Metropolitan Air Quality Management District

9.3 Private Organizations and Businesses

SARA – Save The American River Association
El Dorado Irrigation District
Friends of the River
LARTF – Lower American River Task Force

Chapter 10

Glossary

Term	Definition
abatement	Reduction or decrease in amount, degree, intensity or worth.
abutment	The part of a dam that contacts the riverbank.
access easement	Grants the right of access.
acquisition of in fee title	Acquisition of ownership. Parcel would be acquired in its entirety, probably in fee at appraised value.
acre-foot (AF)	The volume of water that would cover 1 acre to a depth of 1 foot, or 325,851 gallons of water. On average, 1 acre-foot could supply one to two households with water for a year. A flow of 1 cubic foot per second for a day is approximately 2 acre-feet.
adjudicate	To decide or settle something in a legal setting.
aesthetic	A term that denotes those properties of an entity that appeal to the senses.
air district	A political body responsible for managing air quality on a regional or county basis. California is divided into 35 air districts.
alkalinity	Alkalinity is a measure of the capacity of water to neutralize acids and is also known as the buffering capacity.
alluvial soils	Soils deposited through the action of moving water. These soils lack horizons and are usually highly fertile.
alternative	A collection of actions or action categories assembled to provide a comprehensive solution to problems.

Term	Definition
ambient	1) The existing or background air, soil, water, or plant quality in a given community. 2) The allowable amount of materials, as a concentration of pollutants, in air, soil, water, or plants.
Amphibolite schist bedrock	Strongly foliated crystalline metamorphic bedrock containing amphibolite minerals that may include magnesium, iron, calcium, sodium, aluminum, and iron.
anadromous fish	Fish that spend a part of their life cycle in the sea and return to freshwater streams to spawn.
annual grassland	Annual grassland is a heterogeneous mix of non-native grasses, annual forbs and wildflowers.
appurtenant structures	Refers to ancillary features of a dam, such as outlets, spillways, bridges, drain systems, tunnels, towers, etc.
aquifer	Underground layer of porous rock, sand, etc. that contains water.
archaeology	The study of human cultures through the recovery, documentation and analysis of material remains and environmental data, including architecture, artifacts, human remains, and landscapes.
armored	A facing layer or protective cover of concrete structural features placed to prevent erosion or the sloughing off of an embankment. Also, a layer of large stones, broken rocks or boulders, or precast blocks placed in specific random fashion on a river to protect against flowing water.
arterial	A signalized street that primarily serves through-traffic and that secondarily provides access to abutting properties, with signal spacings of 2.0 miles or less.
artifact	Any object manufactured, used or modified by humans. Common examples include tools, utensils, art, food remains, and other products of human activity.

Term	Definition
asbestos	A naturally occurring fibrous silicate mineral popular in manufacturing and industry due to its strength, chemical and thermal stability. USEPA has banned or severely restricted its use in manufacturing and construction because it has been found to be a health hazard.
attainment area	Areas that do meet the ambient air quality standards.
auxiliary spillway	A spillway, usually located in a saddle or depression in the reservoir rim which leads to a natural or excavated waterway, located away from the dam which permits the planned release of excess flood flow beyond the capacity of the service spillway. A control structure is seldom furnished. The crest is set at the maximum water surface elevation for a 100-year flood or some other specific frequency flood. The auxiliary spillway thus has only infrequent use. Any secondary spillway that is designed to be operated very infrequently and possibly in anticipation of some degree of structural damage or erosion to the spillway during operation.
avian species	Of, relating to, or derived from birds.
background view	The part of a scene or view that lies behind objects in the foreground.
barge	A vessel, either motorized or towed, used to carry products in navigable waterways.
bathymetry	The measurement of the depth of the waterbody floor from the water surface; the equivalent of topography, or an underwater elevation model.
bedrock	The solid rock that underlies all soil, sand, clay, gravel, and other loose materials on the earth's surface.

Term	Definition
beneficial use	Uses of the waters of the state that may be protected against quality degradation include domestic, municipal, agricultural and industrial supply; recreation and navigation; and the preservation of fish and wildlife.
benthic	Pertaining to the bottom of a body of water.
best management practices	Best Management Practices (BMPs) are effective, practical, structural or nonstructural methods which prevent or reduce the movement of sediment, nutrients, pesticides and other pollutants from the land to surface or ground water, or which otherwise protect water quality from potential adverse effects of activities.
biological assessment	Information prepared by, or under the direction of, a Federal agency to determine whether a proposed action is likely to: (1) adversely affect listed species or designated critical habitat; (2) jeopardize the continued existence of species that are proposed for listing; or (3) adversely modify proposed critical habitat. Biological assessments must be prepared for "major construction activities." See 50 CFR §402.02. The outcome of this biological assessment determines whether formal consultation or a conference is necessary. [50 CFR §402.02, 50 CFR §402.12]
biological opinion	A written statement setting forth the opinion of the USFWS or the NMFS as to whether or not a federal action is likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of critical habitat.
blasting	Using explosives to loosen rock for excavation.
borrow	Material excavated from one area to be used as fill material in another area.
brome	An opportunistic and imported annual grass, usually considered inferior forage, which has replaced native grasses throughout the West.

Term	Definition
California Endangered Species Act (CESA)	California legislation that prohibits the “take” of plant and animal species designated by the CDFG as either endangered or threatened. Take includes hunting, pursuing, catching, capturing, killing, or attempting such activity. CESA provides the CDFG with administrative responsibilities over the plant and wildlife species listed under the State act as threatened or endangered. CESA also provides CDFG with the authority to permit the take of State-listed species under certain circumstances.
California Environmental Quality Act (CEQA)	California legislation that requires State, regional, and local agencies to prepare environmental impact assessments for proposed projects that will have significant environmental effects and to circulate these documents to other agencies and the public for comment before making decisions. CEQA requires that the lead agency make findings for all significant impacts identified in the environmental impact report. The lead agency must propose mitigation to reduce environmental impacts to a less-than-significant level unless the mitigation is infeasible or unavailable and there are overriding considerations that require the project to be approved. See Public Res. Code Sections 21001.1, 21002, 21080; Guidelines 15002(c).
candidate species	Plant and animal taxa considered for possible addition to the List of Endangered and Threatened Species. These are taxa for which the Fish and Wildlife Service has on file sufficient information on biological vulnerability and threat(s) to support issuance of a proposal to list, but issuance of a proposed rule is currently precluded by higher priority listing actions. [61 FR 7596-7613 (February 28, 1996)]

Term	Definition
carbon monoxide (CO)	A colorless, odorless, poisonous gas, produced by incomplete burning of carbon-based fuels, including gasoline, oil, and wood. Carbon monoxide is also produced from incomplete combustion of many natural and synthetic products.
census tract	A small, relatively permanent statistical subdivision of a county established by the US Census and designed to be homogenous with respect to population characteristics, economic status, and living conditions. Tracts usually have between 2,500 and 8,000 residents.
Central Valley Project (CVP)	A federally operated water management and conveyance system that provides water to agricultural, urban, and industrial users in California. The CVP was originally authorized by legislation in 1937.
chaparral	Habitat that consists of a dense cover of perennial, mostly evergreen shrubs, generally 1 to 3 meters in height.
cofferdam	A watertight enclosure, open at the top, that is pumped dry to expose the bottom of a body of water so that construction may be undertaken in the dry.
cold water ecosystem	Uses of water that support cold water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.
coliform bacteria	Organisms common to the intestinal tract of humans and animals; the organisms' presence in waste water is an indicator of pollution. Generally reported as colonies per 100 milliliters of sample.

Term	Definition
conjunctive use	The operation of a groundwater basin in combination with a surface water storage and conveyance system. Water is stored in the ground water basin for later use in place of or to supplement surface supplies. Water is stored by intentionally recharging the basin during years of above-average surface water supply.
conservation measures	Actions to benefit or promote the recovery of listed species that are included by the Federal agency as an integral part of the proposed action. These actions will be taken by the Federal agency or applicant, and serve to minimize or compensate for, project effects on the species under review. These may include actions taken prior to the initiation of consultation, or actions which the Federal agency or applicant have committed to complete in a biological assessment or similar document.
contractor use area	Designated area to be used by construction contractor(s) for materials stockpiling, staging, parking, portable toilets, etc.
control delay	The component of delay that results when a control signal causes a lane group to reduce speed or to stop; it is measured by comparison with the uncontrolled condition.
conveyance	A pipeline, canal, natural channel, or other similar facility that transports water from one location to another.
crest	The top surface of the dam. A roadway may be constructed across the crest to permit vehicular traffic or facilitate operation, maintenance, and examination of the dam. Also, the high point of the spillway control section.
criteria pollutant	Any pollutant for which USEPA has established a National Ambient Air Quality Standard (NAAQS), specifically carbon monoxide, lead, nitrogen oxides, ozone, particulate matter, and sulfur oxides.

Term	Definition
critical habitat	Designation for federally listed species. Consists of: (1) the specific areas within the geographical area occupied by the species at the time it is listed in accordance with the provisions of Section 4 of the Federal ESA (16 USCA 1533), on which are found those physical or biological features (constituent elements) that are: (a) essential to the conservation of the species and (b) may require special management considerations or protection; and (2) specific areas outside the geographical area occupied by the species at the time it is listed in accordance with the provisions of Section 4 of ESA (16 USCA 1533), upon a determination by the Secretary that such areas are essential for the conservation of the species. (16 USCA 1532(5)(A).) Designated critical habitats are described in 50 CFR 17 and 50 CFR 226.
cubic feet per second (cfs)	Rate of water release representing a volume of 1 cubic foot passing a given point during 1 second, equivalent to approximately 7.48 gallons per second or 448.8 gallons per minute. In a stream channel, a release of 1 cubic foot per second is equal to the release at a rectangular cross section, 1 foot wide and 1 foot deep, flowing at an average velocity of 1 foot per second.
cultural resource	A wide-ranging category that describes an extensive variety of resources, regardless of significance. These resources may include archaeological sites, isolated artifacts, features, records, manuscripts, historical sites, traditional cultural properties, historical resources, and historic properties.
cumulative impact	The incremental impact or effect of the action together with impacts of past, present, and reasonable foreseeable future actions (regardless of the source of these other actions).

Term	Definition
dam	Dams are usually constructed by making a large embankment that blocks an existing watercourse. This embankment is used to control the release of flood waters downstream of the Dam. Dams usually contain a small outlet pipe that limits the amount of water that can exit the dam. Any flows in excess of the capacity of the dam outlet are stored behind the dam. The Folsom Facility is operated and maintained by Reclamation as part of the CVP.
day-night noise level	The day-night noise level (L_{dn}) is the energy average sound level for a 24-hour day determined after the addition of a 10-dBA penalty to all noise events occurring at night between 10:00 p.m. and 7:00 a.m. The L_{dn} is used by local jurisdictions to rate community noise impacts from transportation noise sources.
dBA	A unit of measurement/sound level for A-weighted sounds. Environmental sounds are measured with the A-weighted scale of the sound level meter. The A scale simulates the frequency response of the human ear, by giving more weight to the middle frequency sounds, and less to the low and high frequency sounds.
decibel (dB)	A unit used to express the intensity of a sound wave. In sound, decibels generally measure a scale from 0 (the threshold of hearing) to 120-140 dB (the threshold of pain).
de minimis amount	A legal term for an amount that is small enough to be ignored, too small to be taken seriously.
detention dam	A dam built to store streamflow or surface runoff, and to control the release of such stored water.
detritus	Dead or decaying organic matter.
dewatering	Removing water by pumping, drainage, or evaporation.

Term	Definition
dike	An embankment that blocks an area on a reservoir or lake rim that is lower than the top of the dam.
direct (economic) effect	Change in final demand in an industry.
dissolved oxygen	Amount of free oxygen found in water; perhaps the most commonly employed measurement of water quality. Low DO levels adversely affect fish and other aquatic life. The ideal dissolved oxygen for fish life is between 7 and 9 mg/L; most fish cannot survive when the DO level falls below 3 mg/L.
diversion	The action of taking water out of a river system or changing the flow of water in a system for use in another location.
dredge	To dig under water. A machine that digs under water.
earthfill dam	An embankment dam in which more than 50 percent of the total volume is formed of compacted earth material generally smaller than 3-inch size. Seepage through the dam is controlled by the designed use of upstream blankets and/or internal cores constructed using compacted soil of very low permeability.
easement	The right to use land owned by another for some specific purpose.
ecosystem	A recognizable, relatively homogeneous unit that includes organisms, their environment, and all the interactions among them.
electric conductivity	The measure of a solution's ability to conduct electricity. Electric conductivity units are used to express salinity levels in soil and water. When salt is dissolved in water the conductivity increases, so the more salt, the higher the value.

Term	Definition
embankment	An earth structure the top of which is higher than the adjoining surface. A shaped earth or rockfill dam. Fill material, usually earth or rock, placed with sloping sides and with a length greater than its height. An embankment is generally higher than a dike.
emergency gate	A standby or auxiliary gate used when the normal means of water control is not available. The first gate in a series of flow controls, remaining open while downstream gates or valves are operating.
emergency spillway	A spillway which provides for additional safety should emergencies not contemplated by normal design assumptions be encountered, i.e., inoperable outlet works, spillway gates, or spillway structure problems. The crest is usually set at maximum water surface. A spillway that is designed to provide additional protection against overtopping of a dam and is intended for use under extreme conditions such as misoperation or malfunction of the service spillway or other emergency conditions.
emergent	A plant rooted in shallow water that has most of its vegetative growth above water.
endangered species (CESA)	Any species listed as endangered under the California Endangered Species Act. Endangered species are native California species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant that has been determined by the CDFG to be in serious danger of becoming extinct throughout all, or a significant portion, of its range due to one or more causes, including loss of habitat, change in habitat, exploitation, predation, competition, or disease. See California Fish and Game Code Section 2062.

Term	Definition
endangered species (ESA)	Any species listed as endangered under the Federal ESA. Endangered species are any species (including subspecies or a qualifying distinct population segment) that is in danger of extinction throughout all or a significant portion of its range. See 16 USCA 1532(6).
endemic	Endemic in biology and ecology means exclusively native to a place or biota. A species that is endemic is unique to that place or region, found naturally nowhere else.
environmental impact report (EIR)	A detailed written report, required by the CEQA, analyzing the environmental impacts of a proposed action, adverse effects that cannot be avoided, alternative courses of action, and cumulative impacts.
environmental impact statement (EIS)	A detailed written statement, required by Section 102(2)(c) of the National Environmental Policy Act (NEPA), analyzing the environmental impacts of a proposed action, adverse effects that cannot be avoided, alternative courses of action, short-term uses of the environment versus the maintenance of long-term productivity, and any irreversible and irretrievable commitment of resources.
environmental justice	Refers to the concept that people of all races, cultures, and incomes deserve fair treatment with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies.
ephemeral stream	An ephemeral stream has flowing water only during, and for a short duration after, precipitation events in a typical year. Ephemeral stream beds are located above the water table year-round. Groundwater is not a source of water for the stream.
epilimnion	Warm, upper waters of a thermally-stratified water body that is directly affected by seasonal air temperature and wind.

Term	Definition
equivalent noise level	The equivalent noise level (L_{eq}) is the constant sound level that in a given period has the same sound energy level as the actual time-varying sound pressure level. L_{eq} provides a methodology for combining noise from individual events and steady state sources into a measure of cumulative noise exposure. It is used by local jurisdictions and the Federal Highway Administration (FHWA) to evaluate noise impacts.
erosion	A gradual wearing away of soil or rock by running water, waves, or wind. Surface displacement of soil caused by weathering, dissolution, abrasion, or other transporting.
essential fish habitat	Waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.
estuarine	Pertaining to an estuary; a water passage where ocean water mixes with river water.
exceedence noise level	Exceedence levels are values from the cumulative amplitude distribution of all the noise levels observed during a measurement period. They are designated L_n , where n represents a value from 0 to 100 percent. For example, L_{50} is the median noise level, or the noise level in dBA exceeded 50 percent of the time during the measurement period.
exhaust gas recirculation (EGR)	An emission control method that involves recirculating exhaust gases from an engine back into the intake and combustion chambers. This lowers combustion temperatures and reduces NO_x .
exotic species	A species that did not originally occur in the areas in which it is now found, but that arrived as a direct or indirect result of human activity.
fallow farmland	Cultivated land that is not seeded for one or more growing seasons.

Term	Definition
fault creep	Gradual movement along a fault that occurs in the absence of an earthquake.
fault zone	In geology, faults are discontinuities (cracks) in the Earth's crust that are the result of differential motion within the crust. Faults are the source of many earthquakes that are caused by slippage vertically or laterally along the fault.
Federal Endangered Species Act (ESA)	Federal legislation that requires Federal agencies, in consultation with the USFWS and NOAA Fisheries, to ensure that their actions do not jeopardize the continued existence of endangered or threatened species or result in the destruction or adverse modification of the critical habitat of these species. The ESA recognizes the value to the nation of species in danger of, or threatened with, extinction. The act requires Federal agencies to conserve these species and their habitats and ranges to the extent practicable. Section 4 of the ESA (16 USCA 1533) provides a listing process for species considered “endangered” (in danger of becoming extinct) or “threatened” (threatened to become endangered). The Secretary of Commerce, acting through NOAA Fisheries, is involved for projects that may affect marine or anadromous fish species listed under the ESA. All other species listed in the ESA are under USFWS jurisdiction. Section 7 of the ESA (16 USCA 1536(a)(2)) requires that all Federal agencies, in consultation with the Secretaries of the Interior and Commerce (acting through USFWS and NOAA Fisheries, respectively), ensure that their actions do not jeopardize the continued existence of species listed as endangered or threatened and protected or result in the destruction or adverse modification of the critical habitat of these species. Section 9 of the ESA (16 USCA 1538) prohibits take of a listed

Term	Definition
	<p>species. Section 9 (16 USCA 1538) compliance is applicable if the proposed action would result in the take of any listed threatened (if not subject to special rule) or endangered fish or wildlife species and such take is not authorized in a biological opinion issued by USFWS or NOAA Fisheries. Section 10 of the ESA (16 USCA 1539) authorizes the conditions for the USFWS or NOAA Fisheries to issue a permit for incidental take of a listed species when there is no other Federal agency involved. See 16 USC 1531 et seq. federally covered species.</p>
fill	<p>Manmade deposits of natural soils or rock products and waste materials designed and installed in such a manner as to provide drainage, yet prevent the movement of soil particles due to flowing water.</p>
filter	<p>One or more layers of granular material which is incorporated in an embankment dam and is graded (either naturally or by selection) to allow seepage through or within the layers while preventing the migration of material from adjacent zones.</p>
fine particulate matter	<p>Particulate matter less than 2.5 microns in diameter (PM2.5).</p>
flip bucket	<p>An energy dissipator located at the downstream end of a spillway and shaped so that water flowing at a high velocity is deflected upwards in a trajectory away from the foundation of the spillway.</p>
flood easement	<p>See Occasional flowage easement below.</p>

Term	Definition
flood protection berm	Also referred to as a new embankment, and in earlier administrative drafts of this document as an auxiliary dike, or a mini-dike. A flood protection berm is a small embankment built in low elevation areas as a flood protection measure . Flood protection berms are structures to reduce or eliminate the flooding of non-federal property. These flood protection featuresstructures would be a simple berm constructed of earthen material excavated at the specific site or imported from within the boundaries of the hauled in-reservoir, from the closest area with stockpiled material. These flood protection features could also be constructed as, a parapet wall of unknown height, or another type of suitable structure.
flood protection berm easement	Grants the right to build, maintain, repair, operate, and replace a flood protection berm.
Folsom Facility	The physical features that surround Folsom Reservoir, including LWD, RWD, Main Concrete Dam, Dikes 1 through 8, and MIAD.
Folsom Joint Federal Project (Folsom FJP)	A cooperative effort by Reclamation and the Corps, along with SAFCA, California DWR, and the Reclamation Board, to address hydrologic, static, and seismic issues with Folsom Dam and Appurtenant Structures.
forage fish	Small fish which breed prolifically and serve as food for predatory fish.
forb	A broadleaf plant that has little or no woody material in it.
foreground view	The part of an image or view that appears to be closest to the viewer.

Term	Definition
freeboard	Generally defined as the difference in elevation from the top edge of a flood control facility (channel, dam, basin) to the design WSE. Freeboard provides a factor of safety and protects against unknown factors such as wave action. Freeboard varies based on the type of project and velocities of flows, but is generally between 1-3 feet.
freshwater marsh	Freshwater marsh communities within the Project area are wetland communities fed by seeps or springs and are permanently to semi-permanently flooded.
friable asbestos	A form of asbestos found to be the most dangerous because of its ability to become airborne. Friable asbestos can be crushed or reduced to powder form with hand pressure.
fry	Small adult fish, especially when in large groups.
fugitive dust	Particles lifted into the ambient air caused by man-made and natural activities such as the movement of soil, vehicles, equipment, blasting, and wind. This excludes particulate matter emitted directly from the exhaust of motor vehicles and other internal combustion engines, from portable brazing, soldering, or welding equipment, and from piledrivers.
fuseplug	A form of auxiliary spillway consisting of a low embankment designed to be overtopped and washed away during an exceptionally large flood.
gigawatt hour (GWh)	One gigawatt hour (GWh) equals one million kilowatt hours. A kilowatt hour (KWh) is equivalent to the energy consumed by a 100-watt light bulb burning for 10 hours.

Term	Definition
gravity dam	A dam constructed of concrete and/or masonry that relies on its weight and internal strength for stability. Gravity dams are generally used where the foundation is rock and earthfill in proper quality and quantity is not available.
habitat enhancement	To improve degraded habitat. Management actions that enhance habitat do not result in increasing the extent of habitat area.
habitat protection, protect habitat	To maintain the existing extent and quality of habitat.
habitat restoration, restore habitat	To create habitat. Management actions that restore habitat.
hazardous waste	Any solid, liquid, or gaseous substance which, because of its source or measurable characteristics, is classified under state or federal law as hazardous and is subject to special handling, shipping, storage, and disposal requirements.
historic property	Any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places. This includes artifacts, records, and remains that are related to and located within such properties. As a general guideline, a cultural resource should be at least 50 years old to be considered as a historic property.
historical resource	Per CEQA guidelines, a resource listed or eligible for listing on the California Register of Historical Resources. It must be significant based on one or more of four criteria to be considered a historical resource on a local, state, or national level.
hydraulic jump	The sudden and usually turbulent passage of water in an open channel from low stage, below critical depth, to high stage, above critical depth. During this passage, the velocity changes from supercritical to subcritical. There is considerable loss of energy during the jump.

Term	Definition
hydropower	Energy or power produced by moving water.
hypolimnion	Cold, deep waters of a thermally stratified water body. It is typically the coldest layer in the summer and warmest in the winter. It is isolated from wind mixing and typically too dark for much plant photosynthesis to occur.
igneous rock	Igneous rocks are formed from magma (melted rock) that has cooled and solidified, either within the Earth's crust or on the Earth's surface.
impervious	Surface that prevents or significantly reduces the entry of water into the underlying soil, resulting in runoff from the surface in greater quantities and/or at an increased rate when compared to natural conditions prior to development.
impoundment	Body of water created by a dam.
incursion	The act of a species entering some territory or domain that is not their native habitat.
indian trust assets (ITAs)	Legal interests in property held in trust by the United States government for Indian tribes or individuals, or property protected under United States law for Indian tribes and individuals. Federal agencies are required to take responsibility for protection and maintenance of ITAs. There are no ITAs present in the project area; therefore, they were not evaluated.
indirect (economic) effect	Changes in industry sectors within the region that supply goods and services to industries directly affected by the changes in final demand.
induced (economic) effect	Changes in economic activity resulting from household spending of the income earned from changes in final demand.
inhalable particulate matter	Particulate matter less than 10 microns in diameter (PM10).
input-output (I-O) analysis	Describes commodity flow from producers to intermediate and final consumers.

Term	Definition
instream flows	Year-round flows in rivers and streams.
intermittent stream	A stream that flows part of the time because of a connection with groundwater or because of season snow melt and, therefore, is dry most of the year.
invasive species	Non-native species of plants or animals that out-compete native species in a specific habitat.
inversion layer	A layer of warm air in the atmosphere that prevents the rise of cooling air and traps pollutants beneath it.
invertebrate	An animal that lacks a backbone or spinal column.
jet grouting	A method of compacting soil using a hose or other device by injecting a grout slurry at high pressures into the liquefiable soils.
jurisdiction	The territory or geographic area within which power can be exercised, or the power or authority of a court to hear and try a case.
kilowatt (kW)	The basic unit of electric demand, equal to 1,000 watts. Average household demand is 10 to 20 kilowatts.
landslide	An abrupt movement of soil and bedrock downhill in response to gravity. Landslides can be triggered by an earthquake or other natural causes.
leach field	Porous soiled area, through which septic tank leach lines run, emptying out the treated liquid waste, forced from the tank, which then percolates down through the soil.
levee	An elevated berm that is used to protect adjacent low lying ground from floodwaters. The levee is usually lined with a structural material such as concrete or rip-rap to ensure that it does not fail from erosion. This lining usually extends many feet below ground to ensure that scour caused by high water velocities cannot undermine the levee.

Term	Definition
level of service (LOS)	A qualitative measure describing operational conditions within a traffic stream, based on service measures such as speed and travel time, freedom to maneuver, traffic interruptions, comfort, and convenience.
lift line	Horizontal construction joint created when new concrete is placed on previously placed concrete.
liquefaction	Process where water-saturated sediment (sandy material) temporarily loses strength, usually because of an earthquake, and behaves like a fluid. Soil or sand changes from solid ground and behaves like a liquid, which can cause the ground above the liquefied sediment to break into small blocks.
listed species (CESA)	Species or subspecies declared as threatened or endangered by the CDFG in 14 CCR Section 670.5.
listed species (ESA)	Species, including subspecies, of fish, wildlife, or plants federally listed at 50 CFR 17.11 and 50 CFR 17.12 as either endangered or threatened, or listed at 14 CCR Section 670.2 and 14 CCR Section 670.5 as threatened or endangered.
littoral zone	Area on or near the shore of a body of water.
low-income population	That portion of the population that falls within the low-income bracket as defined based on federal poverty thresholds. The low-income index is determined annually by the US Department of Health and Human Services.
maximum contaminant level (MCL)	The highest level of a contaminant that is allowed in drinking water. MCL's are set as close to the Maximum Contaminant Level Goal as feasible using the best available treatment technology.
mesic site	Characterized by having a medium moisture supply e.g., a type of habitat or soil.

Term	Definition
metamorphic rock	A rock changed from its original form and/or composition by heat, pressure, or chemically active fluids, or some combination of them.
middleground view	The part of an image or view that lies between the foreground and background.
minority population	Any individual or racial/ethnic group that is not categorized as White, not Hispanic or Latino.
mitigation	To moderate, reduce, or alleviate the impacts of a proposed activity; including: (a) avoiding the impact by not taking a certain action or parts of an action; (b) minimizing impacts by limiting the degree or magnitude of the action and its implementation; (c) rectifying the impact by repairing, rehabilitating, or restoring the affected environment; (d) reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and (e) compensating for the impact by replacing or providing substitute resources or environments.
monolith	A concrete section or block of the dam.
most probable number (MPN)	Most Probable Number of coliform-group organisms per unit volume of sample water. Expressed as the number of organisms per 100 mL of sample water.
multiplier	A ratio of total economic effects to direct economic effects that captures the size of indirect and induced effects to the region's economy.
National Environmental Policy Act (NEPA)	Federal legislation establishing the national policy that environmental impacts will be evaluated as an integral part of any major federal action. Requires the preparation of an environmental impact statement (EIS) for all major federal actions significantly affecting the quality of the human environment.

Term	Definition
National Pollutant Discharge Elimination System (NPDES)	A permitting program under section 402 of the Clean Water Act required for all point sources discharging pollutants into waters of the United States. The purpose of the NPDES program is to protect human health and the environment.
native vegetation	Stands of blocks of naturally occurring plant communities. These include a range of vegetation associations such as woodlands, grasslands, forests, wetlands, mangroves etc. Scattered native trees and shrubs in cleared paddocks or urban areas are more usually considered separately as scattered or isolated plants.
navigable waters	<p>Waters of the United States including:</p> <ul style="list-style-type: none"> (a) All waters that are currently used, were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters that are subject to the ebb and flow of the tide. (b) Interstate waters, including interstate wetlands. (c) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats and wetlands, the use, degradation, or destruction of which would affect or could affect interstate or foreign commerce, including waters used or which could be used for industries in interstate commerce. (d) All impoundments of waters otherwise defined as navigable waters. (e) Tributaries of waters identified in (a) through (d). (f) Wetlands adjacent to waters identified in (a) through (d).

Term	Definition
nephelometric turbidity unit (NTU)	NTU is an indication of the clarity of water, or the amount of suspended particles in water. Low NTU values indicate high quality water. NTU is obtained by measuring the amount of scattering of light in water.
new embankment	See flood protection berm above.
nitrogen dioxide	A pollutant that causes smog and acid rain, as well as eye, throat, and lung irritation. Nitrogen dioxide is mainly produced by burning fossil fuels (e.g., emissions from burning gasoline in a car).
nitrogen oxide (NO _x)	The chemical transformation caused by sunlight. The reaction of nitrogen oxides with hydrocarbons in the presence of sunlight to form ozone is an example of a photochemical reaction.
non-attainment area	Areas that do not meet the ambient air quality standards.
non-criteria pollutant	Any recognized and otherwise regulated air pollutants that are not listed as criteria pollutants.
non-native species	Also called introduced species or exotic species; refers to plants and animals that originate elsewhere and are brought into a new area, where they may dominate the local species or in some way negatively impact the native species environment.
nonpoint source	A contributing factor to water pollution that cannot be traced to a specific spot. Man-made or man-induced alteration of the chemical, physical, biological, or radiological integrity of water, originating from any source other than a point source.

Term	Definition
North American Vertical Datum (NAVD)	The vertical control datum established in 1991 by the minimum-constraint adjustment of the Canadian-Mexican-U.S. leveling observations. It held fixed the height of the primary tidal bench mark, referenced to the new International Great Lakes Datum of 1985 local mean sea level height value, at Father Point/Rimouski, Quebec, Canada.
objective release	Releases resulting in a flow that may be sustained without risk of levee failure.
obligate species	A species limited to a restricted environment, such as a wetland.
occasional flowage easement	Flood easement; grants the right to occasionally flood, as determined necessary and appropriate during extreme storm events. Property owner retains fee ownership; however, such an easement may restrict the construction of new structures and/or uses for human habitation withinon the easement areapremises.
OHWM	Ordinary high water mark of the reservoir.
one-hundred year (100-year) flood	A flooding event that has a one percent chance of occurring in any given year. The term "100-year" is a measure of the size of the flood, not how often it occurs. Several 100-year floods can occur within the same year or within a few short years. The 100-year event for any given area is based on a statistical frequency analysis of local rainfall data. The analysis determines the amount of rainfall that would only have a one percent chance of occurring in a given year. Hydrologic analysis is then applied to the watershed, based on the 100-year rainfall magnitude. The result provides the expected release of the watershed during a 100-year event.
opportunistic species	Species that take advantage of the situation. An opportunistic feeder is one that will eat whenever food is available.

Term	Definition
overland flow	Flow of water across the land surface in a down-gradient direction.
overtop	Flow of water over the top of a dam or embankment.
ozone	Ozone gas is a molecule that consists of three oxygen molecules. It is naturally occurring in the earth's atmosphere at all levels and is responsible for filtering out much of the sun's ultraviolet radiation.
palliative	Describes a material that may be used to reduce or mitigate adverse effects. For instance, a binding palliative material may be applied to an exposed surface for dust and erosion control.
panorama	A panorama is a wide, all-encompassing view; hence also a panoramic format.
parapet wall	A solid wall built along the top of a dam (upstream and/or downstream edge) used for ornamentation, for safety of vehicles and pedestrians, or to prevent overtopping caused by wave runup.
peak particle velocity (PPV)	Pertaining to vibration measurements, peak particle velocity is the maximum rate of ground movement measured by any of the 3 mutually perpendicular components of ground motion. Units are expressed in inches per second. PPV is often used in determining potential damage to buildings from stress associated with blasting and other construction activities.
peaking facility	A powerplant that is scheduled to operate during peak energy demand.
penstock	A sluice or gate for restricting flow of water; a conduit or pipe for conducting water.
perennial plant	A plant that grows for more than one season; it over-winters in a dormant condition and resumes growth the following season.
petrographic	The description and classification of rocks

Term	Definition
pH	A relative scale, from 0 to 14, of how acidic or basic (alkaline) a material is, where a pH of 7 is neutral, smaller readings are increasingly acid.
photochemical reaction	The chemical transformation caused by sunlight. The reaction of nitrogen oxides with hydrocarbons in the presence of sunlight to form ozone is an example of a photochemical reaction.
piezometer	An instrument which measures pressure head or hydraulic pressures in a conduit or hydraulic pressures within the fill of an earth dam or the abutment; at the foundation because of seepage or soil compression; or on a flow surface of a spillway, gate, or valve.
Pineapple Express	The Pineapple Express is a Pacific Ocean subtropical jet stream that brings warm moist air from Hawaii (where pineapples are grown) to the U.S. West Coast states of California, Oregon, and Washington, as well as the Canadian province of British Columbia.
piping	Erosion of embankment or foundation material (soil) due to leakage.
piscivorous fish	Fish that eat other fish.
plankton	A diverse group of minute animals (zooplankton) and plants (phytoplankton) that freely drift in the water.
point source	Any discernible, confined, or discrete conveyance from which pollutants are or may be discharged, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft.

Term	Definition
probable maximum flood (PMF)	The largest flood that may reasonably be expected to occur at a given point on a stream from the most severe combination of critical meteorologic and hydrologic conditions that are reasonably possible on a particular watershed.
promulgated	Documents that are formally made public.
radial gate	A pivoted crest gate, the face of which is usually a circular arc, with the center of curvature at the pivot about which the gate swings. A gate with a curved upstream plate and radial arms hinged to piers or other supporting structure.
radiological waste	Radioactive waste is produced from activities that use radioactive materials such as mining, nuclear power generation, and various processes in industry, defense, medicine, and scientific research. Radioactive waste can be in gas, liquid or solid form, and the waste can remain radioactive for a few hours or several months or even hundreds of thousands of years. There are varying degrees of radioactivity.
re-entrained road dust	Particulate emissions that are kicked-up from movement of vehicles on paved roadway surfaces.
regional capture rate	Percentage of spending that accrues to the region's economy as direct sales or final demand.
release rate (ramping criteria)	The rate of change in instantaneous output. The ramp rate is established to prevent undesirable effects due to rapid changes in loading or discharge.
relocation	The impacted property owner is paid fair market value for their property, is provided assistance to locate comparable housing and is entitled to relocation benefits and services in accordance with Public Law 91-646.
retaining wall	A wall separating two levels.

Term	Definition
return period	The average length of time separating flood events of a similar magnitude: a 100-year flood will occur on average once in every 100 years.
riffle	A section of stream that has shallow, fast-flowing water followed by deep, slow-flowing water.
riparian	The strip of land adjacent to a natural watercourse such as a river or stream. Often supports vegetation that provides important wildlife habitat values when a complex forest structure is present and important fish habitat values when vegetation grows large enough to overhang the bank.
riprap	A layer of large uncoursed stones, broken rock, or precast blocks placed in random fashion on the upstream slope of an embankment dam, on a reservoir shore, or on the sides of a channel as protection against wave and ice action.
ruderal fields	Growing along roadsides or in disturbed or abandoned farmland.
Safety of Dams Program	Reclamation's program to identify potential issues with existing dams and develop corrective actions to protect public safety, property, and the environment. Reclamation's main objective under the Dam Safety Program is to ensure the Folsom Facility can safely pass the Probable Maximum Flood (PMF).
savanna	An ecological community that is dominated by scattered trees and large areas of grasses and other forbs.
sedimentary rock	Rocks formed from material, including debris of organic origin, deposited as sediment by water, wind, or ice and then compressed and cemented together by pressure.

Term	Definition
seepage	Percolation of water through the soil from unlined canals, ditches, laterals, watercourses, or water storage facilities.
seismic	Of or related to movement in the earth's crust caused by natural relief of rock stresses.
sensitive species	Listed species, species that are candidates for listing, and other species that have been designated as species of special concern by Federal or State agencies or scientific organizations (see “special-status species”).
shear key	Prevent sliding of a dam along its foundation by excavating a large tunnel or hole through a concrete section into the dam foundation then backfilling with concrete.
shell	Shell material includes impervious soil and miscellaneous shell soil placed on the outside of a dam or dike to create a shell.
siltation/sedimentation	Deposition of waterborne sediments due to a decrease in velocity and corresponding reduction in the size and amount of sediment which can be carried.
slough	A swamp, marsh, or muddy backwater.
slurry	Watery mixture of insoluble matter which is pumped beneath a dam to form an impervious barrier. Cement grout.
spawn	Laying of eggs, especially by fish.

Term	Definition
special status species	Species in any of the following categories: plants listed, proposed for listing, or candidates for possible future for listing under the federal Endangered Species Act, plants listed or proposed for listing under the California Endangered Species Act, plants listed as rare or endangered under the California Native Plant Protection Act, plants that meet the definitions of rare or endangered under the State CEQA Guidelines, plants considered by the CNPS to be “rare, threatened, or endangered in California” (Lists 1B and 2), plants considered by CNPS as plants about which more information is needed to determine their status, and plants of limited distribution (Lists 3 and 4), which may be included as special-status species on the basis of local significance.
species	Species of fish, wildlife, or plants, any subspecies of fish, wildlife, or plants, and any distinct population segment of vertebrate fish or wildlife that interbreeds when mature.
species of concern	Species that could be affected by actions and are not listed as threatened or endangered under the Federal ESA; proposed for listing under ESA; candidates under ESA; listed as threatened or endangered under the CESA; candidates under CESA; plants listed as rare under the California Native Plant Protection Act; California fully protected species or specified birds under various sections of the California Fish and Game Codes; California species of special concern; or California Native Plant Society List 1A, 1B, 2, or 3 species.

Term	Definition
spillway	The channel or passageway around or over a dam through which excess water is released or "spilled" past the dam without going through the turbines. A spillway is a safety valve for a dam and, as such, must be capable of discharging major floods without damaging the dam, while maintaining the reservoir level below some predetermined maximum level.
spillway gate	A gate on the crest of a spillway to control the discharge or reservoir water level.
staging area	See contractor use area.
static	Issues that occur during normal daily operations, include potential seepage and piping of the wing dams and dikes.
stilling basin	Concrete portion downstream from conduit, tunnel, or control structure. A pool, usually lined with reinforced concrete, located below a spillway, gate, or valve into which the discharge dissipates energy to avoid downstream channel degradation. A basin constructed to dissipate the energy of rapidly flowing water (e.g., from a spillway or outlet) and to protect the riverbed from erosion.
storage capacity	The total amount of reservoir capacity normally available for release from a reservoir below the maximum storage level. It is total or reservoir capacity minus inactive storage capacity. More specifically, it is the volume of water between the outlet works and the spillway crest.
subsidence	Sinking of the land surface due to compaction of soil caused by loading, removal of underground fluids, or other mechanisms.
subsidence inversion	An inversion at elevations of 1,000 to 2,000 feet enhanced by vertical mixing in the air layer below the inversion. A condition that produces an increase in temperature with height.

Term	Definition
sulfur dioxide (SO ₂)	Sulfur dioxide is a gas produced by burning coal, most notably in power plants. Some industrial processes, such as production of paper and smelting of metals, produce sulfur dioxide. Sulfur dioxide is closely related to sulfuric acid, a strong acid. Sulfur dioxide plays an important role in the production of acid rain.
surcharge pool/space	The reservoir capacity provided for use in passing the inflow design flood through the reservoir. It is the reservoir capacity between the maximum water surface elevation and the highest of the following elevations: top of exclusive flood control capacity, top of joint use capacity, or top of active conservation capacity. Temporary storage.
surface inversion	A temperature inversion based at the earth's surface (from 1 to 500 feet); that is, an increase of temperature with height beginning at the ground level. This condition is due primarily to greater radiative loss of heat at and near the surface than at levels above.
suspended particulate matter (SPM)	Particles suspended in the air of less than 10 micrometer in size which can accumulate in the lungs and bronchi bringing about breathing problems for those affected. SPM is caused by human activities (cars and industry) but also by natural phenomena.
swale	A low place in a tract of land. A wide, shallow ditch, usually grassed or paved. A wide open drain with a low center line.
tainter gate	A term used by the Corps of Engineers to describe radial gates (see radial gate).

Term	Definition
take	Under the ESA, “To harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct” in regard to federally listed, endangered species of wildlife (16 USCA 1532[19]). “Harm” is further defined as an act “which actually kills or take threatened species injures”. Harm may include “significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or shelter” (50 CFR 17.3). Under the California Fish and Game Code, take is defined as “to hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill” (California Fish and Game Code Section 86).
tendon anchor	Holes drill through all sections of a main concrete dam to the foundation then replaced with steel bar anchored in cement at the foundation to prevent sliding during seismic activity.
terrestrial species	Types of species of animals and plants that live on or grow from the land.
threatened species (ESA)	Any species listed as threatened under the CESA. Threatened species are native California species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant that have been determined by the CDFG, although not presently threatened with extinction, to be likely to become an endangered species in the foreseeable future in the absence of special protection and management efforts. See California Fish and Game Code Section 2067.
toe	The junction of the face of a dam with the ground surface.

Term	Definition
toe drain	Open-jointed tile or perforated pipe located at the toe of the dam used in conjunction with horizontal drainage blankets to collect seepage from the embankment and foundation and conveys the seepage to a location downstream from the dam.
total dissolved solids (TDS)	A water quality parameter defining the concentration of dissolved organic and inorganic chemicals in water, usually expressed in milligrams per liter (mg/L).
total maximum daily load (TMDL)	The maximum amount of a pollutant that can be discharged into a water body from all sources (point and non-point) and still maintain water quality standards. Under Clean Water Act Section 303(d), TMDLs must be developed for all water bodies that do not meet water quality standards after application of technology-based controls.
total organic carbon (TOC)	A measure of the concentration of organic carbon in water, determined by oxidation of the organic matter into carbon dioxide.
toxic air contaminant (TAC)	As defined by California Health and Safety Code, Section 39655 (a): an air pollutant which may cause or contribute to an increase in mortality or in serious illness, or which may pose a present or potential hazard to human health. Substances which have been identified by the USEPA as hazardous air pollutants (e.g. benzene, asbestos) shall be identified by the Board as toxic air contaminants.
toxic waste	A waste that can produce injury if inhaled, swallowed, or absorbed through the skin.
tributary	River or stream flowing into a larger river or stream.
turbidity	A cloudy appearance that results when excessive silt or other substances are in the water.

Term	Definition
underground storage tank (UST)	A tank located at least partially underground and designed to hold gasoline or other petroleum products or chemicals.
understory	The layer formed by the leaves and branches of the smaller trees under the forest canopy.
unincorporated land	A region of land is unincorporated if it is not a part of any municipality. To "incorporate" in this context means to form a municipal corporation, i.e., a city or similar. Unincorporated, in turn, implies no city and hence no city, town, village, or other municipal government.
urban blight	A condition of property or the uses of property in parts of a city, town, or neighborhood that are detrimental to the physical, social, and/or economic well-being of a community. It can include abandoned buildings or those severely neglected by their owners, vacant lots full of rubble and garbage, or dangerous and/or illegal uses such as crack houses.
value added	Economic measurement of wages and salaries, proprietor's income, dividends and interest, and indirect business taxes.
value of output	Total value of an industry's production.
vault toilet	The vault toilet is a brick or otherwise semi-modern enclosure (for your privacy) surrounding a hole in the ground, which has a seat and standoff going into what amounts to a cesspool. Not a septic tank, but directly into a cesspool.
vernal pool	Seasonally ponded landscape depressions in which water accumulates because of limitations to subsurface drainage and that support a distinct association of plants and animals.
vista	A view or the visual percept of a region.

Term	Definition
volatile organic compound (VOC)	Reactive gases released during combustion or evaporation of fuel and regulated by USEPA. VOCs react with NO _x in the presence of sunlight and form ozone.
warm water ecosystem	Uses of water that support warm water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.
watershed	An area that drains to a particular channel or river, usually bounded peripherally by a natural divide of some kind such as a hill, ridge, or mountain.
water table	The surface of underground, gravity-controlled water, or the level of ground water.
weir	An overflow structure built across an open channel to raise the upstream water level and/or to measure the flow of water.
wetlands	Lands including swamps, marshes, bogs, and similar areas such as wet meadows, river overflows, mudflats, and natural ponds. An area characterized by periodic inundation or saturation, hydric soils, and vegetation adapted for life in saturated soil conditions. Any number of tidal and nontidal areas characterized by saturated or nearly saturated soils most of the year that form an interface between terrestrial and aquatic environments; including freshwater marshes around ponds and channels, and brackish and salt marshes. A jurisdictional wetland is subject to regulation under the Clean Water Act. A nonjurisdictional is subject to consideration under the Fish and Wildlife Coordination Act.
wing dam	A dam that only partially blocks a river and extends from only one riverbank.
zoning	Land use regulations are enacted to manage use of land and are used to control the character of an area.