

Appendix C

WSIP Facility Improvement Project Information

APPENDIX C

WSIP Facility Improvement Project Information

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**TABLE C.1
SFPUC WSIP PROJECT INFORMATION – DESCRIPTION OF PROJECT FACILITIES¹**

Project Number	Project Name	Description	PHYSICAL STRUCTURES											PHYSICAL REQUIREMENTS			
			Pipeline (miles)	Tunnel (miles)	Storage/ Basin (square feet)	Treatment (square feet)	Vaults/ Valve Houses	Pump Station	Other Facilities	Number of Structures	Maximum Height (feet)	Maximum Depth (feet)	Additional Sites for Borrow or Disposal?	Existing Land Use	Land Acquisition Required?	Temporary Staging Areas	Power Available?
SJ-1	Advanced Disinfection	This project would provide for the planning, design and construction of a new advanced disinfection facility for the Hetch Hetchy water supply to comply with the new federal drinking water regulatory requirements contained in the Long Term-2 Enhanced Surface Water Treatment Rule. This regulation is designed to provide treatment for the parasite <i>Cryptosporidium</i> . The project is in the planning phase and the SFPUC is evaluating applicable technologies and possible locations to identify the most technologically sound and cost-effective alternative. In addition, the project includes planning and conceptual engineering for providing advanced disinfection facilities at the Sunol Valley and Harry Tracy WTPs. This project may be combined with the Tesla Portal Disinfection project (SJ-5) along with portal modifications and the need for project SJ-2 may be affected by the location and technology selected for this project.	0.2	0	0	20,000	4	0	None	1	35'	20'	No	At Tesla Portal, a caretaker's residence, two valve houses, & chlorination facility	No, except land possibly needed for associated power requirements	On-site	Yes, but potentially need additional power from Hetch Hetchy
SJ-2	Lawrence Livermore Supply Improvements	This project includes design and construction of treatment upgrades for the water supplied to the Lawrence Livermore Laboratory. The project would construct water treatment facilities from the Thomas Shaft of the Coast Range Tunnel. An advanced disinfection facility planned at an upstream location (SJ-1) could affect project design.	0	0	0	TBD	TBD	TBD	TBD	TBD	TBD	TBD	TBD	Undeveloped	No	TBD	Yes
SJ-3	San Joaquin Pipeline System	<p>The preferred project would generally be located within the existing San Joaquin Pipeline (SJPL) right-of-way and would include:</p> <ul style="list-style-type: none"> Construction of a new 6.4 mile long, 86" diameter fourth SJPL parallel to the existing three pipelines at the east end of the pipelines, starting at Oakdale Portal, and associated portal modifications; Construction of two additional crossover facilities between the San Joaquin Pipelines within the existing right-of-way, both located in Stanislaus County with one about 20 miles east of Modesto and the other about 15 miles west of Modesto and improvements at the existing Roselle Crossover; Construction of a new 10-mile long, 86-inch diameter fourth SJPL parallel to the existing three pipelines at the west end of the pipelines ending at Tesla Portal. <p>This project would provide additional facilities to upgrade the hydraulic capacity of the SJPL system to 314 mgd (and a 271 mgd average during system maintenance when a pipeline segment must be taken out of service) and provide redundancy for pre-stressed concrete cylinder pipe for reliability.</p> <p>Note: While the current preferred alternative would construct 16 miles of pipeline facilities, depending on the results of the conditions assessment of the existing pipelines, as much as 22 miles of pipeline facilities could be constructed.</p>	16.4	TBD where required for pipeline under-pass of roads, other utilities or environmentally sensitive areas	0	0	2	0	New valve houses and improvements at Oakdale Portal and Tesla Portal; two new crossover facilities.	NA	12' deep for 90" pipe assumes max 4' cover (may need to be revised)	Trench: 11' wide, 12' deep (assumes maximum 4' cover over 86" pipe)	Clean spoils may be stockpiled on ROW (so as not to block irrigation) and adjacent property owners may be allowed to move spoils to adjacent agricultural land if they so desire and it is agreeable to City.	Agriculture and golf course uses within SFPUC ROW; residential uses adjacent to SFPUC ROW.	No, except land possibly needed for associated power requirements and temporary construction easements.	Additional ROW might be needed temporarily for staging.	TBD (depends on location of 2 proposed crossover facilities)

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SJ-4	Rehabilitation of Existing San Joaquin Pipelines	<p>Reconditioning/rehabilitation of the existing SJPL pipelines. There are three existing pipelines, each 47.7 miles long, extending from Oakdale Portal to Tesla Portal:</p> <ul style="list-style-type: none"> SJPL-1, riveted steel pipe 56- to 72-inch internal diameter; SJPL-2, reinforced concrete pipe and welded steel pipe, 61- to 62-inch internal diameter; SJPL-3, pre-stressed concrete cylinder pipe and welded steel pipe, 78-inch internal diameter. 	47.7 miles long each	0	0	0		SJPL – 2 Throttling Stations 1 and 2 Roselle Crossover San Joaquin River Valve House	0	None	0	NA	NA	No	Pipelines (within existing SJPL right-of-way) and routed through: open grasslands (sometimes used for grazing), City of Modesto, orchards, Tracy Golf Course. Conditions assessment and reconditioning activities could also affect public recreation areas in Modesto (linear parks with walking and bike paths).	No	No	No
SJ-5	Tesla Portal Disinfection Station	<p>This project includes the planning, design, and construction of new disinfection facilities for the Hetch Hetchy water supply. The project would replace and upgrade the existing disinfection facilities at the Tesla Portal Disinfection Facility to meet current seismic, safety/fire, and building code standards. The preferred project would include construction of:</p> <ul style="list-style-type: none"> New control building and storage room; Pump houses; Chemical storage tanks and feed equipment and sampling systems; Emergency generator, including primary and standby power supplies; Access road. <p>It should be noted that the design and location of the Advanced Disinfection project (SJ-1), would affect the design and location of this project.</p>	0	0	0	6,000	0	0	Administration building (control room and offices) and pump houses (low horsepower pumps for domestic water and fire safety).	1	30'	15'	TBD	A caretaker's residence, two valve houses, and chlorination facility.	No except land possibly needed for associated power requirements	Yes	Yes	
Sub-totals			64+	0	0	26,000	6+	0		2	30 to 35'	11 to 20'						
SV-1	Alameda Creek Fishery Enhancement	<p>This project would recapture the water released as part of the Calaveras Dam project (SV-2) and return it back to the regional system for use. A number of structural and non-structural recovery alternatives are under consideration including: a water recapture facility downstream of the Sunol Valley WTP, conjunctive groundwater use, horizontal collector wells, or other groundwater recovery systems yet to be defined. Other alternative designs for this project could be developed. If a structural alternative involving construction of a recapture facility is selected, the recapture facility would be located at the downstream end of the reach of Alameda Creek between the lower Sunol Valley and the confluence with Arroyo de la Laguna. As an alternative to the recapture facility, the SFPUC may coordinate with other water agencies to develop and implement other means of recapturing fishery enhancement flows consistent with the 1997 CDFG MOU.</p>	TBD	0	0	0	0	TBD	Number of pumps depends on the alternative, ranging from 1 pump station to multiple pumps required.	TBD	TBD	TBD	TBD	Alternatives would be located in or near Alameda Creek downstream of Sunol Valley WTP.	No	TBD	TBD	
SV-2	Calaveras Dam Replacement	<p>This project would provide for the planning, design, and construction of a replacement dam at the Calaveras Reservoir to meet seismic safety requirements. The new dam would provide for a reservoir with the same storage capacity as the original reservoir (96,800 acre-feet), but the replacement dam would be designed to accommodate enlargement of the dam in the future. The preferred project would include construction of:</p> <ul style="list-style-type: none"> New earth-fill dam; 	0	0	62,508,600	0	2	0	1. Zoned Earth-Fill Dam with Open Chute Spillway; 2. Various instrumentation; 3. Calaveras Road Upgrades (TBD).	3 (Dam, Spillway, Inlet Tower)	220' (foundation to dam crest)	NA	7 borrow areas (totaling over 222 acres)	Existing Calaveras Dam	No	Four staging areas: (1) north of the replacement dam; (2) south of the existing dam at Watershed Keeper's residence;	Yes	

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SV-2 (cont.)	Calaveras Dam Replacement	<ul style="list-style-type: none"> • New intake tower and new outlet valve for water releases for instream flow requirements; • New or rehabilitated outlet works for seismic safety and improved operations and maintenance. • New bypass structure at the Alameda Creek Diversion Dam <p>As part of this project, Calaveras Reservoir would be operated to release up to 6,300 afy (5.5 mgd) of water to Alameda Creek in support of fisheries in compliance with the 1997 CDFG MOU. When flow is available in Alameda Creek, releases would be made through the proposed bypass structure at the Alameda Creek Diversion Dam and would be supplemented as necessary with releases from Calaveras Dam.</p>															(3) dam access road at Calaveras Road; (4) top of the existing dam.	

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SV-3	Additional 40-mgd Treated Water Supply	<p>This project would provide for the planning, design, and construction of an additional 40 mgd of treatment capacity at the Sunol Valley WTP. The project would increase the sustainable capacity of the Sunol Valley WTP to 160 mgd. The planning level study will include studies to evaluate treatment operations protocol and an alternative treatment process. The preferred project would include construction of:</p> <ul style="list-style-type: none"> • New flocculation and sedimentation system; • Upgrade of existing filters or addition of three new filters and a new flow distribution chamber; • New filtered water and backwash piping; • New chemical feed and piping system; • Upgrade of the electrical supply system; • Miscellaneous piping, valves, and mechanical and electrical work; • Approximately 2 miles of 78-inch diameter pipe to connect to the Alameda Siphons or Irvington Tunnel. 	1.5 to 2	0	42,000	0	0	0	Misc. piping, valves, chemical feed, electrical supply upgrades, and drainage piping system. Upgrade of electrical supply system (e.g. the Calaveras Substation)	1	10'	TBD	TBD	Undeveloped SFPUC lands immediately adjacent to Sunol WTP facilities	No, but may need easement across private property.	TBD	Yes
SV-4	New Irvington Tunnel	<p>This project would construct a new tunnel parallel to and just south of the existing Irvington Tunnel to convey water from the Hetch Hetchy system and the Sunol Valley WTP to the Bay Area. The new tunnel would be a redundant water transmission facility to the existing Irvington Tunnel. The preferred project would include construction of:</p> <ul style="list-style-type: none"> • New 18,200-foot long, 10-foot diameter tunnel; • New portal at the east end adjacent to the existing Alameda West Portal in the Sunol Valley with connections to the existing and proposed new siphon; • New portal at the west end adjacent to the existing Irvington Portal in Fremont with connections and to the existing and proposed new pipeline (BD-1); • Valves and equipment to control and monitor flows; • Modifications to the existing Alameda West and Irvington Portals. 	0.0	3.4	0	0	9-12 (reinforced concrete vault across fault, Irvington Portal crossover valve vault, etc.)	0	1. New Alameda West Portal 2 and Overflow Shaft. 3. New access road to Irvington Portal and Alameda West Portal. 4. New Irvington Portal 2 and air release pipe. 5. Complete demolition and rebuild of existing Irvington Portal manifold. 6. Valves and equipment to control and monitor flows. 7. Two new permanent bridges across Alameda Creek. (Note: A total of two bridges are necessary to construct and operate both the New Irvington Tunnel and Alameda Siphons Upgrade projects; the determination of when to build the bridges would depend on which project would be constructed first. Since this determination has not been made to date, the bridges are evaluated under both projects.)	0	NA	NA	Up to four spoils disposal areas proposed; spoils transported to one of these areas by conveyor belt.	New east tunnel portal would be about 75 feet north or south of Alameda West Portal. New west tunnel portal would be about 175 feet south of existing Irvington Portal. Lands immediately adjacent to existing portals are undeveloped except for caretaker's home and water facilities at Irvington Portal and water facilities at Alameda West Portal. There is one residence located south of Alameda West Portal and residential uses located west of Irvington Portal.	Some sections of ROW do not have easements or fee ownership. Access to new west portal (south of Irvington Portal) would likely be outside of easement.	Three staging areas: 1. east of Alameda West Portal; 2. northwest of Alameda East Portal (west of Calaveras Rd); 3. west of existing cottage at Irvington Portal (at base of hill, east of homes).	NA
SV-5	SVWTP – Treated Water Reservoirs	<p>This project would provide for the planning, design, and construction of new treated water storage reservoirs at the Sunol Valley WTP (SVWTP) to comply with requirements of the California Department of Health Services. The preferred project would include construction of:</p> <ul style="list-style-type: none"> • One five-million-gallon chlorine contact basin; • Two 8.75-million gallon storage basins; • New inlet and outlet piping and reservoir drainage system; • Pipe bridge over Alameda Creek; • Chemical (ammonia and chlorine) storage and feed system; • Backup filter wash water supply and filter washwater supply system; 	0.3	0	138,200	0	1	0	1. Chemical storage and feed system. 2. Pumping system for filter backwashing and other miscellaneous pumping appurtenances. 3. Backup filter backwash system. 4. Washwater supply system. 5. Reservoir drainage system, controls & instrumentation. 6. Expansion of the existing SVWTP electrical substation. 7. Modification of existing valves. 8. Upgrade of existing dechlorination station and miscellaneous piping.	1	15'	TBD	TBD	Site is within boundary of existing SVWTP. Site is currently used for temporary equipment or supply storage on an as-needed basis. The existing Calaveras Nursery is located to the north and open space is located to the west.	No	Not Specified	The power supply would be through an expansion of the existing SVWTP electrical substation.

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SV-5 (cont.)	SVWTP – Treated Water Reservoirs (cont.)	<ul style="list-style-type: none"> Instrumentation and controls and miscellaneous pumping appurtenances to integrate the reservoirs into the existing treatment plant; Expansion of the existing SVWTP electrical substation; Two 750 kW diesel powered emergency generators. 															
SV-6	San Antonio Backup Pipeline	This project would consist of three proposed facilities: 1. San Antonio Backup Pipeline, a new pipeline (size undetermined) from San Antonio Reservoir to San Antonio Pump Station, about 2 miles long; (2) San Antonio Creek Discharge Facilities (improvements allowing for the discharge of Hetch Hetchy water and associated road improvements); and (3) Alameda East Portal Vent Overflow Pipeline and portal modifications.	2.3	0	0	0	2	0	1. New discharge facilities at San Antonio Creek (at end of the new pipeline). 2. New pipeline from the existing overflow outlet near Alameda East Portal, passing adjacent to the San Antonio Pump Station (SAPS), and continuing to the discharge point on Alameda Creek.	NA	NA	No	Undeveloped SFPUC lands	Undeveloped SFPUC lands; pipeline alignment would generally extend between San Antonio Creek and reservoir access road (sometimes extending in the road, across this road, or close to the creek), then cross Calaveras Road, and extend along the west side of this road to SAPS.	TBD	No	NA
Sub-totals			4 to 5	3+	63 million	0	14 to 17	TBD		5+	10 to 220'						
BD-1	Bay Division Pipeline Reliability Upgrade	<p>This project would construct a new Bay Division Pipeline No. 5 (BDPL 5) from the Irvington Tunnel Portal in Fremont to the Pulgas Tunnel Portal near Redwood City, consisting of 16 miles of new pipeline and 5 miles of tunnel under San Francisco Bay. Portions of the section of BDPL No. 1 between Edgewood Valve Lot and Pulgas Valve Lot would be removed (approximately 1.4 miles) and existing above ground and submarine sections of BDPL Nos. 1 and 2 over the 5-mile long section from Newark Valve House to Ravenswood Valve House would be decommissioned (decommissioning is not part of this project). The redundancy provided by the project would increase the overall transmission capacity of the Bay Division pipeline system. The preferred project would include construction of:</p> <ul style="list-style-type: none"> New welded-steel pipeline, approximately 72 inches in diameter, extending along the 7-mile reach from Irvington Portal to Newark Valve Lot, located within the existing SFPUC ROW of BDPL Nos. 1 and 2; New "Bay Tunnel" segment of BDPL No. 5, approximately 120 inches in diameter, extending 5 miles from Newark Valve Lot to Ravenswood Valve Lot, crossing under San Francisco Bay and adjacent marshlands. BDPL Nos. 1 and 2 would tie into the tunnel at both ends and would be decommissioned between Newark and Ravenswood Valve Lots; New welded-steel pipeline, approximately 60 inches in diameter extending along the 9-mile reach from Ravenswood Valve Lot to Pulgas Portal, located within the existing SFPUC ROW of BDPL Nos. 1 and 2; New facilities at eight valve vault lots along the alignment, containing new concrete vaults and control structures that house electrical control panels, isolation valves, mechanical equipment, and cross-connections between BDPL No. 5 and the existing BDPLs; 	16	5	0	0	8 valve facilities, with up to 15 vaults total	0	<p>Isolation valves and piping for connection to new Irvington extension and Pulgas Tunnels. One flow meter at each end of the alignment (2 total).</p> <p>Control buildings for electrical and mechanical equipment at each of the valve lots (8 total).</p> <p>New tunnel shafts at Ravenswood and Newark. Final decision as to which shaft would be the drive shaft and which would be the receiving shaft is still to be determined.</p> <p>For the drive shaft, excavated diameter would be approximately 50 feet with parking for up to 40 construction work vehicles. Staging area would accommodate mucking out materials handling area, on-site power generation (as needed) or a transformer station, ventilation fans and mufflers, water supply, compressed air supply and miscellaneous temporary construction facilities totaling approximately 30,000 s.f.</p> <p>The receiving shaft would require a demobilization area for disassembly & removal of Tunnel Boring Machine, materials handling area, on-site power generation (as needed) or a transformer station, ventilation fans & mufflers, water supply, compressed air supply and miscellaneous temporary construction facilities totaling approximately 11,000 s.f.</p>	8 above ground electrical control buildings at the valve lots	Electrical control buildings would be above ground single story structures (up to 30' high).	The pipeline would be buried. The valve vaults are mostly below ground.	Potential disposal areas include salt ponds near Dumbarton Strait and South Bay Salt Pond Restoration Project.	<p>Pipeline ROW traverses urbanized areas of Fremont, Newark, East Palo Alto, Menlo Park, Redwood City, traversing commercial, residential, school, park uses. The pipeline could affect approximately 16 schools (Cesar Chavez Academy [1,000 ft.], Costano [crossed by ROW] in East Palo Alto; Chadbourne, Durham [1,000 ft.], Fremont [1,500 ft.], Irvington [adjacent], Mission San Jose Junior/Senior High School [1,000 ft.], school near Azeveda Park [500 ft.], Walters Junior High School [750 ft.] in Fremont; Bell Haven [500 ft.] and Flood [500 ft.] in Menlo Park; Bunker [crossed by ROW] in Newark; Fair Oaks [1,500 ft.], Hawes [crossed by ROW], John Gill [crossed by ROW], West Bay Christian Academy [crossed by ROW] in Redwood City) and 11 parks (Azeveda, Fremont, Knoll, and Mission San Jose parks in Fremont; Flood County in Menlo Park; Ash Street and Birch Grove parks in Newark; Edgewood, Fleishman, Hawes, and Red Morton parks in Redwood City).</p> <p>The Newark shaft site has an existing valve house and is surrounded by industrial uses. The Ravenswood shaft site is bordered by BDPL right-of-way to the south, marshland to the east, Cargill Salt Ponds to the north, and University Avenue to the west. Approximately 15 acres of this site is in use for soil remediation, and might eventually be used as a maintenance yard. The Irvington portal vicinity is mostly undeveloped (except for caretaker's home and water facilities) and residential uses are located west of the portal and adjacent to BDPL right-of-way in this vicinity.</p>	Some sections of the ROW do not have easements or fee ownership. The tunnel shaft on the west end of the tunnel can be located on a 40-acre site owned by SFPUC at the Ravenswood valve house. The tunnel shaft on the east end of the tunnel can be located on a 12-acre site owned by SFPUC at the Newark Valve House. The tunnel would require subsurface easement.	For the tunnel section, the staging area near the Newark Valve House would require leasing additional land from owners adjacent to the existing pipeline ROW for use as temporary construction staging and stockpiling area. Owners include Leslie Salt Co., FMC Co., Cargill, and SamTrans. Additional staging areas for the pipeline contractors are being investigated.	Yes

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BD-1 (cont.)	Bay Division Pipeline Reliability Upgrade (cont.)	<ul style="list-style-type: none"> Two flow metering vaults at or near Mission Boulevard (in Fremont) and Pulgas Portal areas; and New Isolation valves and piping for connecting BDPL No. 5 to Irvington and Pulgas portals. 																right-of-way. If required, the easement would be just to the north of the SFPUC right-of-way, and could be up to 2,300 feet long and 5 to 15 feet wide.		
BD-2	BDPL Nos. 3 and 4 Crossovers	<p>This project would construct three additional crossover facilities along Bay Division Pipelines Nos. 3 and 4 (BDPL 3 and 4) to provide operational flexibility for maintenance or during emergencies. The new crossover facilities would reduce the length of pipe to be removed from service, either for maintenance or for emergencies, and would reduce the duration of outages. Each crossover facility would include construction of:</p> <ul style="list-style-type: none"> Four mainline valves and one cross-connect valve; Automatic controlled actuators; Discharge facilities to enable release of water that meets water quality discharge requirements within discrete pipeline segments to surface waters either for maintenance or emergencies. 	0	0	0	0	3 valve vaults	0	Valve vaults would be 3,750 square feet each. Discharge location of drainage outfalls vary depending on site conditions. Piping to connect facility to outfalls. Control buildings for electrical and mechanical equipment at each valve vault (3 total).	3 above ground control buildings	3 to 8'	TBD (mostly under-ground)	TBD	Sites would be located in undeveloped areas on Veterans Administration Medical Center and Gunn High School lands (Barron Creek), Ulistac Natural Area (Guadalupe Creek), and reservoir lands (Bear Gulch).	If permanent drainage outfalls are constructed, an easement or use permit would likely be required. If temporary connections are made, easements/ permits may not be required.	Not specified, but adjacent areas at Bear Gulch and Guadalupe River are undeveloped.	No			
BD-3	Seismic Upgrade of BDPLs Nos. 3 and 4 at Hayward Fault	This project would provide for the planning, design and construction of upgraded, seismically-resistant sections of the Bay Division Pipelines Nos. 3 and 4 where they cross the Hayward Fault. The replacement pipelines would be located between the two new crossover/isolation valves that would be built as part of the BDPL Nos. 3 and 4 Crossover/ Isolation Valve at Hayward Fault project (an WSIP project determined to be independent of the PEIR). In addition to the replacement pipelines, a new bypass pipeline between the two new crossover/isolation valve vaults could also be built as part of one of the several alternatives being considered for this project.	3	0	0	0	0-2 (TBD)	0	None	0	NA	Buried pipeline	No	Site spans the I-680/Mission Boulevard freeway interchange. All work would be performed within existing ROW.	No	Within BDPL ROW	TBD			
Sub-totals			19	5	0	0	11 to 20	0		11	Up to 30'									
PN-1	Baden and San Pedro Valve Lots Improvements	This project would upgrade valve vaults, valves, and piping at the existing Baden and the San Pedro Valve Lots to meet current seismic standards. Work could also be performed at the Pulgas Pump Station and Pulgas Valve Lot as part of transmission reliability. The project would include a new pressure-reducing valve at one of the locations to allow transfer of water between high- and low-pressure zones from the Harry Tracy WTP to the Peninsula under an emergency scenario.	<1	0	0	0	2 at San Pedro; 6 at Baden	2	Install new valves, pressure and flow meters, motor operators, SCADA valve controls, modify valves/pumps/ sump/vent shaft, and either enlarge existing vault or add new vault at Baden and/or San Pedro Valve Lots.	1 new; 11 retrofitted / rebuilt / replaced	Vaults: 1 to 3' above ground	30'	Disposal sites for excavated materials	Majority of work would occur within existing water supply facility sites owned by SFPUC.	No	On-site	Yes, from PG&E service area			
PN-2	Crystal Springs/ San Andreas Transmission Upgrade	This project would consist of seismic improvements of facilities that convey water from Crystal Springs Reservoir to the Harry Tracy WTP. This project would increase the transmission capacity of the existing raw water pipeline from Crystal Springs Reservoir to San Andreas Reservoir in order to reliably supply 140 mgd of raw water for treatment at the Harry Tracy WTP. The project would include:	4.5	0.5**	0	Emergency chemical injection systems at CS and SA	32 existing vaults (number of vaults would most likely be reduced) & new vaults	Complete renovation or new pump station based on alternatives analysis	Repair lower culvert linking Upper and Lower Crystal Springs Reservoir; upgrade/repair Crystal Springs Outlet Structure Nos. 1 & 2; upgrade or replace Crystal Springs Pump Station (PS), including increasing capacity to transfer water between	8 existing, 1 or 2 may be completely replaced	Existing PS is 25' and new PS would be no higher; other structures would be below ground.	100' for tunnels; 30' for pipelines; 15' for building foundations; 100' for piles.	TBD	Project involves repair or replacement of existing SFPUC water facilities. If a new parallel pipeline is needed and an alternative alignment is chosen, an easement may be necessary. The most likely alignments would be within the watershed on SFPUC lands.	TBD	Significant staging areas would be required at all work sites. UCSD, CSOS1, CSOS2, CSPA,	Power upgrades at CSPA required. Low voltage and/or solar cells at various locations			

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Project Number	Project Name	Description	PHYSICAL STRUCTURES										PHYSICAL REQUIREMENTS					
			Pipeline (miles)	Tunnel (miles)	Storage/ Basin (square feet)	Treatment (square feet)	Vaults/ Valve Houses	Pump Station	Other Facilities	Number of Structures	Maximum Height (feet)	Maximum Depth (feet)	Additional Sites for Borrow or Disposal	Existing Land Use	Land Acquisition Required?	Temporary Staging Areas	Power Available?	
PN-2 (cont.)	Crystal Springs/ San Andreas Transmission Upgrade (cont.)	<ul style="list-style-type: none"> Repair of the Upper Crystal Springs Dam discharge culverts; Upgrade and repair of Lower Crystal Springs Dam outlet structures and tunnels conveying water to the Crystal Springs Pump Station; Replacement or refurbishment of the Crystal Springs Pump Station; Upgrade and repair of the chemical system and Crystal Springs chlorine emergency feed; Improvements to the Crystal Springs–San Andreas Pipeline, including replacement of approximately 1,350 feet of 66-inch diameter pipeline, general renewal of the remaining pipeline, and addition of new manholes, blow-off valves, and isolation valves; or construction of a new redundant pipeline along a new alignment; Seismic and hydraulic upgrade and repair of the San Andreas outlet facilities; Addition of fish screens on the outlet structures for both Crystal Springs and San Andreas Reservoirs; Repair of two pipelines that convey raw water from San Andreas Reservoir to the Harry Tracy WTP raw water pump station. 					are limited to CSPS and outlets of four tunnels.		reservoirs from 80 to approximately 120 mgd depending on future modeling (maximum rate would be 140 mgd to match HTWTP output); build new power substation (chemical injection equipment is new only minor strengthening of pipe required); renew pipeline sections that are not replaced at San Andreas Reservoir; depending on alternative analysis, a new redundant pipeline may be required; upgrade/repair of San Andreas Outlet Structure Nos. 2 & 3 (significant retrofit of SA 2 Tunnel may be required); repair San Andreas pipelines Nos. 2 & 3; pump station capacity upgrades as required to meet HTWTP raw water supply requirements. **There are four existing tunnels that would require strengthening and/or retrofit.						CSSAPL, SAOS2, SAOS3, HTWTP.	throughout the project.		
PN-3	HTWTP Long-Term Improvements	<p>This project would be a seismic retrofit and rehabilitation of the existing building and facility to provide long-term reliability and process improvements. The project would increase the sustained treatment capacity of the plant from 120 to 140 mgd for 60 days. The proposed improvements would include:</p> <ul style="list-style-type: none"> Replacement and upgrade of the ozone generation system for primary disinfection; Replacement or upgrade of the existing sedimentation basins at the same location; Improvements to sludge handling facilities; New, redundant pipeline from the treatment works to the finished water storage reservoir; Raw water pump station improvements; Upgrade and replacement of electrical and instrumentation components, including improvements to process and plant security facilities. 	Possible transmission improvements within the facility property (1-2 miles)	0	2 treated water reservoirs	Project is a treatment facility	TBD (valves and vaults may be required)	1 raw water pump station	Some of the 16 identified structures would require upgrades but would not be determined until completion of PN-7. Mechanical, structural, electrical, and process upgrades are anticipated with known upgrades occurring within existing development footprints. However, structures could be added within the HTWTP property. Improvements include disinfection treatment upgrades, raw water pumping upgrades, replacement/upgrade of sedimentation basins at same location, sludge facilities, and power and instrumentation upgrades.	TBD	TBD	TBD	TBD	HTWTP site is currently developed with water treatment facilities.	No	Available area within HTWTP property.	Yes	
PN-4	Lower Crystal Springs Dam Improvements	<p>This project would consist of major repairs and improvements to Lower Crystal Springs Dam to provide adequate protection of the dam and downstream areas from the probable maximum flood, as defined by the California Division of Safety of Dams (DSOD). DSOD has placed operational restrictions on the dam, and the capacity of the reservoir is limited to 56,800 acre-feet. The project would restore the historical reservoir capacity of 68,000 acre-feet. The project would be coordinated with San Mateo County, which is concurrently planning the replacement of the existing county bridge built above the crest of the dam. Project elements would include:</p>		0	0	0	0	0	0	Raise dam parapet to provide required freeboard during probable maximum flood (PMF), which also could require strengthening abutments; lengthen spillway crest to increase discharge capacity; install new mechanical gates to replace the antiquated stop log system; enlarge the stilling basin to accommodate the PMF discharge. Project cannot be completed until Skyline Blvd (Hwy 35) bridge project is completed by San Mateo County.	TBD	TBD	TBD	TBD	The Lower Crystal Springs Dam is an existing dam and the Lower Crystal Springs Reservoir level is currently restricted by the CA Division of Safety of Dams (DSOD). The inundation zone is currently undeveloped; with implementation of the proposed project, including improvements to the dam and spillway, the reservoir levels would be restored to inundation zone levels that were permissible by DSOD prior to 1983.	No	Adjacent to the Dam's south abutment	Yes

TABLE C.1 (Continued)
SFPUC WSIP PROJECT INFORMATION – DESCRIPTION OF PROJECT FACILITIES¹

Project Number	Project Name	Description	PHYSICAL STRUCTURES										PHYSICAL REQUIREMENTS				
			Pipeline (miles)	Tunnel (miles)	Storage/ Basin (square feet)	Treatment (square feet)	Vaults/ Valve Houses	Pump Station	Other Facilities	Number of Structures	Maximum Height (feet)	Maximum Depth (feet)	Additional Sites for Borrow or Disposal	Existing Land Use	Land Acquisition Required?	Temporary Staging Areas	Power Available?
PN-4 (cont.)	Lower Crystal Springs Dam Improvements (cont.)	<ul style="list-style-type: none"> Lowering the existing parapet wall on either side of the existing spillway to lengthen the overflow weir (central spillway) from the reservoir; Raising the remaining parapet walls and adding two new spillway bays, one on each side of the existing central spillway; Enlarging the spillway stilling basin to accommodate the probable maximum flood; Installing four gates (with control building) or installing a fixed weir within the spillway to restore the historical storage capacity. 															
PN-5	Pulgas Balancing Reservoir Rehabilitation	<p>This project would provide for the planning, design, and construction of improvements to the existing Pulgas Balancing Reservoir and associated facilities. The project would include:</p> <ul style="list-style-type: none"> Modifications to the inlet/outlet piping (Phase 1, currently under construction); Design and construction to rehabilitate and/or expand of the discharge channel to Crystal Springs Reservoir (or to install a parallel channel) (Phase 2); Geotechnical investigations, design and construction of recommended seismic improvements, including repair/replacement of the reservoir walls, floor and roof (Phase 3); Restoration of a 6- to 8-acre sediment catchment basin in Laguna Creek to also serve as sustainable habitat for San Francisco garter snake and California red-legged frog, including culvert replacement, sediment removal, revegetation, and protective measures to avoid impact to sensitive species (Phase 4); Modification of the existing dechlorination process, including modifications to the chemical feed system to enable pH adjustment and dechlorination system to operate reliably (Phase 5). 	0	0	0	Project is a treatment facility west of Canada Road	0	0	Five phases: 1. new inlet/outlet piping to ensure optimal mixing in reservoir; 2. rehabilitate/replace existing Pulgas Channel with an enlarged channel to accommodate estimated maximum flow of 250 mgd; 3. structural rehabilitation and roof replacement; 4. restore the existing sedimentation basin for the enhancement of the habitat as a mitigation project for the existing dechlorination facility; 5. modification of the existing dechlorination process (increase capacity of carbon dioxide, chemical feed systems).	NA	NA	NA	NA	Project would be located within existing Pulgas Balancing Reservoir and existing Pulgas Channel, Laguna Creek Sedimentation Basin area and existing dechlorination facility.	No	Pulgas Reservoir parking area at the entrance (east of Canada Road) would be used for Phase 1 Inlet/Outlet Modifications project	Yes
Sub-totals			±7 to 9	0.5+	2	0	8+	3+		3+	1 to 25						
SF-1	San Andreas Pipeline No. 3 Installation	<p>This project would replace the out-of-service Baden-Merced Pipeline, which is beyond repair, and would construct a new pipeline extension of the existing San Andreas Pipeline No. 3 from the San Pedro Valve Lot in Daly City to the Merced Manor Reservoir in San Francisco. It would also connect the existing San Andreas Pipeline No. 2 at Sloat Boulevard in San Francisco and install an additional pipeline to serve the water turnouts along San Andreas Pipeline No. 2. The project would provide seismic reliability and system redundancy for Peninsula and San Francisco customers. The project would include:</p> <ul style="list-style-type: none"> New 3.8 mile long, 36-inch diameter pipeline; Approximately 0.27 miles of 36-inch diameter pipeline for three connections between San Andreas Pipelines 2 and 3; 	4.17	0	0	0	2	0	1. 4.07 miles of 36-inch and 0.1 mile of 12- to 16-inch diameter steel pipeline; 2. removal and/or slurry fill of the existing Baden Merced pipeline; 3. installation of line valves, vaults, and manholes; 4. installation of cathodic protection systems and monitoring stations, sample taps, air valves, blow offs, and other pipeline appurtenances.	2	8'	2'	NA	This pipeline would extend from San Pedro Valve Lot in Daly City to Merced Manor Reservoir in San Francisco. The entire length of the proposed pipelines would be located in developed, urban areas of San Francisco and Daly City. Most of the pipeline alignment, approximately 3 miles, would be located within existing roadways, parking lots, and other paved areas, with the remainder crossing through open space corridors in Lake Merced Golf & Country Club, San Francisco Golf Club. Adjacent uses include residential, commercial, school, church, and park uses.	The entire length of the proposed pipelines would be located within right-of-ways or easements owned by the City and County of San Francisco or in public roadways.	Additional ROW might be needed temporarily for staging	Yes

TABLE C.1 (Continued)
SFPUC WSIP PROJECT INFORMATION – DESCRIPTION OF PROJECT FACILITIES¹

Project Number	Project Name	Description	PHYSICAL STRUCTURES										PHYSICAL REQUIREMENTS				
			Pipeline (miles)	Tunnel (miles)	Storage/ Basin (square feet)	Treatment (square feet)	Vaults/ Valve Houses	Pump Station	Other Facilities	Number of Structures	Maximum Height (feet)	Maximum Depth (feet)	Additional Sites for Borrow or Disposal	Existing Land Use	Land Acquisition Required?	Temporary Staging Areas	Power Available?
SF-1 (cont.)	San Andreas Pipeline No. 3 Installation (cont.)	<ul style="list-style-type: none"> Removal of the Baden-Merced Pipeline where the new San Andreas Pipeline No. 3 alignment matches the Baden-Merced alignment. Less than 0.1 mile of 12- to 16-inch diameter new pipeline for five branch connections to user turnouts (three turnouts to Daly City, two turnouts to SF distribution lines); Installation of line valves and vaults, manholes, cathodic protection and monitoring stations, sample taps, air valves, blow-offs, and other pipeline appurtenances. 															
SF-2	Groundwater Projects – Local	<p>This project includes three groundwater projects: Lake Merced, Local Groundwater, and Regional Groundwater.</p> <ul style="list-style-type: none"> The Lake Merced project would address raising the level of Lake Merced in San Francisco using a supplemental source of water, such as treated stormwater, recycled water, groundwater, or SFPUC system water. The Local Groundwater Projects would include development of 2 mgd of new local groundwater for blending with water in the potable water system in San Francisco. An estimated 4 wells and well stations would be constructed to develop this new local groundwater. This project would also include the use of an additional 2 mgd of groundwater through replacement of existing irrigation wells at the San Francisco Zoo, Golden Gate Park and/or other locations, once recycled water were available for irrigation (to be developed under SF-3). Two existing wells also would be modified to enable emergency supply to local residents in the event of a major earthquake or other disaster. This project also would include the pipelines, water treatment equipment and controls needed to add the groundwater to the municipal supply. The additional water supply developed under this project would be used during both nondrought and drought years. 	3.5	0	0	500	0	0	<p>Install new wells, well stations and associated pipelines, water treatment and controls at Lake Merced Pump Station, South Sunset Playground, West Sunset Playground, and Golden Gate Park (or alternate location at Central Pump Station or Francis Scott Key Annex). Modify wells at SF Zoo and North Lake (Golden Gate Park) for emergency supply. Replace wells at the Zoo, Pine Lake (Stern Grove), Golden Gate Park and/or other locations (TBD); about 2,500 sq. ft. per site.</p> <p>Projects completed in 2005 and 2006: Initial phases of the Lake Merced project were completed in 2005 (upgrades to allow dechlorinated water to be discharged to Lake Merced and installation of a flow meter and water level meter). Local Groundwater Projects currently underway or completed in 2006 include the following: (1) construction of emergency well upgrades at SF Zoo Well No. 5; (2) construction and testing of test well at South Sunset Playground; and (3) emergency well upgrades in Golden Gate Park (North Lake); (4) earth embankment stabilization for seismic safety at Sunset Reservoir per State Division of Safety of Dams requirements. Sunset Reservoir seismic and general upgrades would resume in early 2007 to provide general facility rehabilitation and upgrade consisting of crack repairs, sealing of the reservoir roof, replacement of expansion joints and cover plates, improved reservoir access, drainage repairs, and miscellaneous roadway and site improvements. Valve and gate upgrades are also included.</p>	6	16'	3'	NA	Varies: SFPUC Lake Merced Pump Station; South Sunset Playground; West Sunset Playground; Francis Scott Key Annex: school's parking lot. Golden Gate Park locations; SF Zoo: zoo; Pine Lake: Stern Grove; Central Pump Station.	Not for well sites located on City property. May be required for sites located on SFUSD property at Francis Scott Key Annex.	It is possible that additional staging, laydown or stockpile areas may be needed that are outside existing identified well locations.	Yes

TABLE C.1 (Continued)
SFPUC WSIP PROJECT INFORMATION – DESCRIPTION OF PROJECT FACILITIES¹

Project Number	Project Name	Description	PHYSICAL STRUCTURES										PHYSICAL REQUIREMENTS						
			Pipeline (miles)	Tunnel (miles)	Storage/ Basin (square feet)	Treatment (square feet)	Vaults/ Valve Houses	Pump Station	Other Facilities	Number of Structures	Maximum Height (feet)	Maximum Depth (feet)	Additional Sites for Borrow or Disposal	Existing Land Use	Land Acquisition Required?	Temporary Staging Areas	Power Available?		
SF-2 (cont.)	Groundwater Projects – Regional	As part of the regional conjunctive-use project, the SFPUC would construct about 10 new groundwater production wells in San Mateo County to develop about 6 mgd of potable groundwater as part of a regional conjunctive-use project for uses as a supplemental drought-year supply. In non-drought years under this project, the SFPUC would provide potable water from the regional system to customers in Daly City, San Bruno and South San Francisco to substitute for groundwater currently used for municipal purposes, thereby reducing	0.5	0	0	0	0	0	0	0	Up to 10 new wells and well stations in San Mateo County, Daly City, San Bruno, South San Francisco and Colma. Wells are estimated to be 600 feet deep.	10	16'	3'	NA	Specific well station sites not yet identified	Locations not determined in San Mateo County	It is possible that additional staging, laydown or stockpile areas may be needed that are outside existing identified well locations.	TBD
SF-3	Recycled Water Projects	<p>This project includes recycled water projects in San Francisco and other locations. Projects include Westside Baseline and Harding Park/Lake Merced. This project would provide treatment, storage, and distribution facilities for about 4 mgd of recycled water to users on the west side of San Francisco. Primary users would include Golden Gate Park, Lincoln Park, Lincoln Park Golf Course, Harding Park Golf Course, San Francisco Zoo, Sunset Boulevard medians, and San Francisco State University. As described under Groundwater Projects (SF-2), the SFPUC is also investigating appropriate sources of supply for increasing and maintaining Lake Merced lake levels, including recycled water that has undergone advanced treatment.</p> <ul style="list-style-type: none"> The Westside Baseline project would include a recycled water treatment facility at or near the Oceanside Water Pollution Control Plant (SF Zoo overflow parking lot) or locations in or near Golden Gate Park, about 8 miles of distribution pipelines, new storage at the recycled water treatment plant site, use of existing storage facilities in Golden Gate Park, and additional storage/pumping – possibly in the Lincoln Park area and other locations (TBD). The project would provide about 2.8 mgd of recycled water (average annual demand) primarily to Golden Gate Park, Lincoln Park, Lincoln Park Golf Course, San Francisco Zoo, Sunset Boulevard medians, and San Francisco State University. 	20	0	TBD	Approximately 50,000	0	1 or 2	Utilize existing Golden Gate Park (2 mg) Reservoir. Additional storage in the Lincoln Park area. Other potential small booster pumping station(s) have not been identified.	1 to 4	40'	Not Specified	Not Specified	OWPCP has limited space in an existing room that houses odor control scrubbers; the Zoo overflow parking lot is unpaved and in use by the zoo; the Richmond-Sunset site is currently used for construction spoils storage; the McQueen site is currently being used by Rec & Park as their Urban Forestry Center. Golden Gate Park storage tank (existing facility), Lincoln Park (golf course).	Treatment: City-owned property, Dept. of Rec & Parks, Zoological Society has a 30 year lease. Storage: Golden Gate Park (existing 2 mg reservoir); another may be required in the Lincoln Park area, which is owned/operated by the City's Dept. of Rec & Parks.	Not Specified	No		
		<ul style="list-style-type: none"> The Harding Park/Lake Merced project would probably include advanced recycled water treatment potentially co-located with the tertiary facility, but could also consist of a satellite treatment facility; about 1.3 miles of distribution pipelines, and storage at the recycled water treatment plant. The project would provide about 1.3 mgd of highly treated recycled water for restoration of the Lake Merced levels, and possibly for irrigation of the Harding Park/Fleming Golf Course. The advanced treatment process may be required for use in Lake Merced, and could include nutrient removal to prevent eutrophication of Lake Merced. 																	
Sub-totals			28+	0	0	±50,500	2	1 or 2		19 to 22	8 to 40	3+							

NOTES: afy = acre-feet per year; mgd = million gallons per day; NA = Not applicable; SCADA = Supervisory Control and Data Acquisition; sq. ft. = square feet; TBD = To be determined as project designs are developed and as part of separate, project-level CEQA review

¹ Project information presented in this table is preliminary and subject to change as project designs are developed.

SOURCE: SFPUC, 2006

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**TABLE C.2
SFPUC WSIP PROJECT INFORMATION – PROJECT FACILITIES OPERATIONS¹**

Project Number	Project Name	Operational Changes	Change in chemical use?	New Lighting?	Change in Number of Employees	Any New Pumps?	Change in Truck Deliveries?	Permanent Change in Drainage/ Discharges?	Change in Power Demand	Emergency Generator/ Standby Power Required?
SJ-1	Advanced Disinfection	TBD (may require increased manpower).	Possible addition of new treatment chemicals (hydrofluorosilicic acid, and sulfuric acid or carbon dioxide). Potential use of new chemical for cleaning of UV lamps. Propane or diesel for standby power generator.	Likely, lighting at existing facilities	Operations Rep reports to site once/day for 2-4 hours.	TBD	Yes, approximately 1-2 additional deliveries per week per new chemical. Would use existing route: I-580, Chrisman Road, Vernalis Road, Existing Access Road	No new discharges	Yes, power to be provided to new facility.	Yes, standby generator of 750-2500 KVA would be needed.
SJ-2	Lawrence Livermore Supply Improvements	This is unmanned facility monitored by SCADA 24/7.	TBD	TBD	Operations Rep reports to site once/day for 2-4 hours.	TBD	I-580, Corral Hollow Road, Dirt Access Road	TBD	Yes	TBD
SJ-3	San Joaquin Pipeline System	Increased manpower during flow rate changes.	Propane or diesel for standby power generator.	Lighting at new facilities	Operations Rep reports during flow rate changes (8 days per year times two employees).	No	No	TBD	Yes, power to be provided for automation and operation of crossovers and valves at Oakdale and Tesla.	TBD
SJ-4	Rehabilitation of Existing San Joaquin Pipelines	None, reconditioning work would be conducted during the planned maintenance period (November through March).	No	No	TBD	No	No	No	No	No
SJ-5	Tesla Portal Disinfection Station	This is unmanned facility monitored by SCADA 24/7.	Possible addition of new treatment chemicals (hydrofluorosilicic acid, and sulfuric acid or carbon dioxide). Propane or diesel for standby power generator.	Likely, lighting at existing facilities	Operations Rep reports to site once/day for 2-4 hours.	TBD	Yes, approximately 1-2 additional deliveries per week per new chemical. Would use existing route: I-580, Chrisman Road, Vernalis Road, Existing Access Road	No new discharges	Yes, power to be provided to new facility.	Yes

TABLE C.2 (Continued)
SFPUC WSIP PROJECT INFORMATION – PROJECT FACILITIES OPERATIONS¹

Project Number	Project Name	Operational Changes	Change in chemical use?	New Lighting?	Change in Number of Employees	Any New Pumps?	Change in Truck Deliveries?	Permanent Change in Drainage/ Discharges?	Change in Power Demand	Emergency Generator/ Standby Power Required?
SV-1	Alameda Creek Fishery Enhancement	TBD, depending on alternative selected.	No	No	No	TBD	No	TBD	TBD	No
SV-2	Calaveras Dam Replacement	Increased maintenance; Calaveras Reservoir would be operated to release up to 6,300 afy (5.5 mgd) of water to Alameda Creek for fish flow enhancement. Instrumentation calibrated at least annually or at manufacturer-recommended intervals; all valves cleaned every 6 months; packing or seals should be checked for undue leakage every 6 months.	No	No	No, O&M activities are required for existing dam and would be the same for new dam.	No	No	Dam will not reduce historic discharges since storage would be restored to DSOD-approved levels. The 1997 MOU with California Dept. of Fish & Game requires releases of up to 6,300 AF/year. It is expected a new MOU will be negotiated during the permitting phase.	Negligible.	No
SV-3	Additional 40-mgd Treated Water Supply	25% increase in maintenance activities.	Increased use of treatment chemicals.	400W metal halide cobra lighting fixtures mounted on 30' poles to provide general illumination.	No, same as existing (3 staff per shift, 3 shifts per day).	No, except possibly small pumps for chemical feed.	25% increase in chemical deliveries.	Drainage piping system is proposed to direct surface flows.	Likely increased need for power, but limited since it would be a largely gravity-driven operation.	No, but standby power for SVWTP would likely provide power for project as well.
SV-4	New Irvington Tunnel	NA	NA	NA	NA	NA	NA	NA	NA	NA
SV-5	SVWTP - Treated Water Reservoirs	No	Increased use of sodium hypochlorite and ammonia. Diesel for standby power facilities.	400W metal halide cobra lighting fixtures mounted on 30' poles to provide general illumination; about 11 light standards.	No, same as existing (3 shifts/day).	Yes for filter backwashing, chemical feed, etc.	Additional chemical deliveries of sodium hypochlorite and ammonia.	Possible maintenance discharges.	Yes, power would be provided through an expansion of the existing SVWTP electrical substation.	Yes
SV-6	San Antonio Backup Pipeline	Second pipeline would allow discharge of dechlorinated water to San Antonio	No	No	No	No	No	Improved discharge of Hetch Hetchy water, minimizing environmental impacts.	No	No

**TABLE C.2 (Continued)
SFPUC WSIP PROJECT INFORMATION – PROJECT FACILITIES OPERATIONS¹**

Project Number	Project Name	Operational Changes	Change in chemical use?	New Lighting?	Change in Number of Employees	Any New Pumps?	Change in Truck Deliveries?	Permanent Change in Drainage/ Discharges?	Change in Power Demand	Emergency Generator/ Standby Power Required?
SV-6 (cont.)	San Antonio Backup Pipeline (cont.)	Creek during emergency outages. Pipeline would serve as a water supply alternative if existing SAPL is out of service due to maintenance or emergency reasons.								
BD-1	Bay Division Pipeline Reliability Upgrade	<p>Would increase system capacity to meet 2030 demands, improve drought delivery through increased replenishment of Peninsula reservoirs, and allow more frequent maintenance of aged existing BDPLs than is now possible. Following construction of the project, the above ground and submarine sections of BDPL Nos. 1 and 2 from Newark Valve House to Ravenswood Valve House would be decommissioned (decommissioning not part of this project).</p> <p>BDPL No. 1 last reach between Edgewood Valve Lot and Pulgas Valve Lot would be removed.</p>	Propane or batteries for standby power generators.	Yes	NA	Yes	NA	<p>Yes, new treated water discharge to San Francisco Bay would be located at Ravenswood Valve Lot for draining the Bay Tunnel. Draining the Bay Tunnel for maintenance is expected to occur once every 20 years.</p> <p>Additional discharge points would be added to the pipeline reach between Edgewood Road and Pulgas Tunnel.</p>	Yes	Yes

TABLE C.2 (Continued)
SFPUC WSIP PROJECT INFORMATION – PROJECT FACILITIES OPERATIONS¹

Project Number	Project Name	Operational Changes	Change in chemical use?	New Lighting?	Change in Number of Employees	Any New Pumps?	Change in Truck Deliveries?	Permanent Change in Drainage/ Discharges?	Change in Power Demand	Emergency Generator/ Standby Power Required?
BD-2	BDPL Nos 3 & 4 Crossovers	Reduces the length of pipe out of service at any one time, reduces impact of maintenance or unplanned outages of BDPLs 3 or 4 on system flows. Could allow more frequent maintenance than is now possible.	Propane or diesel for standby power generator.	Yes	No	Yes	No	Yes, treated water would be discharged to creeks for maintenance (every 5 to 10 years, or in an emergency).	Yes	Yes
BD-3	Seismic Upgrade Of BDPLs Nos. 3 and 4 at Hayward Fault	Improves seismic resistance of BDPLs 3&4 across the Hayward Fault.	No	No	No	No	No	No	No	No
PN-1	Baden and San Pedro Valve Lots Improvements	Operation of new PRV at Baden Valve Lot would occur during emergencies only but would be run for maintenance purposes approximately 2 times per year.	Propane for standby power generator.	No	No	No	No	No	No	Baden has two existing standby backup generators and a 10,000-gallon diesel tank on site. New standby generator is required.
PN-2	Crystal Springs/ San Andreas Transmission Upgrade	Increased operations and maintenance due to increased pumping/ transmission capacity.	No	TBD	No	Yes, pump station capacity upgrades.	No	TBD	Yes	No new sources
PN-3	HTWTP Long-Term Improvements	Potential increase in operations and maintenance due to increased sustainable treatment capacity.	Yes, potential increased use of treatment chemicals.	TBD	Increased staffing	Yes, raw water pump station upgrades.	Increased chemical deliveries.	TBD	Yes	TBD
PN-4	Lower Crystal Springs Dam Improvements	Yes, historic storage capacity restored.	No	No	No	No	No	Improvement would allow restoration of historic storage capacity and would continue to allow safe passage of PMF to San Mateo Creek.	No	TBD

**TABLE C.2 (Continued)
SFPUC WSIP PROJECT INFORMATION – PROJECT FACILITIES OPERATIONS¹**

Project Number	Project Name	Operational Changes	Change in chemical use?	New Lighting?	Change in Number of Employees	Any New Pumps?	Change in Truck Deliveries?	Permanent Change in Drainage/ Discharges?	Change in Power Demand	Emergency Generator/ Standby Power Required?
PN-5	Pulgas Balancing Reservoir Rehabilitation	No	No	No	No	No	No	TBD	No	No
SF-1	San Andreas Pipeline No. 3 Installation	No	No	No	No	No	No	No	Yes	No
SF-2	Groundwater Projects - Local	Increased chlorination or chloramination supplies, operation inspections, lubrication, calibration of monitoring equipment.	Increased chlorination or chloramination supplies. Diesel for standby power facilities.	Possible security lighting	1 person, 1 hour every day or two on average	Yes	Increased chemical deliveries.	SFPUC system water, treated stormwater, or recycled water would be added to Lake Merced to augment lake levels.	Yes	Yes, emergency generator or capability to be operated with portable emergency generator.
	Groundwater Projects – Regional	Increased chlorination or chloramination supplies during drought years only, operation inspections, lubrication, calibration of monitoring equipment.	Increased chlorination or chloramination supplies during drought years only. Diesel for standby power facilities.	Possible security lighting	1 person, 1 hour every day or two on average	Yes	Increased chemical deliveries during drought years.	No	Yes, during drought years and periodic testing.	Yes, emergency generator or capability to be operated with portable emergency generator.
SF-3	Recycled Water Projects	Increased deliveries & maintenance	Increased use of treatment chemicals. Diesel for standby power facilities.	Yes	Up to 6	Yes	Increased chemical deliveries.	Yes (reduced wastewater discharges)	Yes	Yes

¹ Project information presented in this table is preliminary and subject to change as project designs are developed.

**TABLE C.3
SFPUC WSIP PROJECT INFORMATION – PROJECT FACILITY LOCATIONS¹**

Project Number	Project Name	Preferred Location	Affected Counties	Affected Cities	Major Access Roads	Nearby Waterways	Alternative Locations
SJ-1	Advanced Disinfection	Tesla Portal	San Joaquin	None	I-580, Chrisman Rd, Vernalis Road, Existing Access Road	A small vegetated swale on-site	None
SJ-2	Lawrence Livermore Supply Improvements	Thomas Shaft, which is off Corral Hollow Road.	San Joaquin	None	I-580, Corral Hollow Rd, dirt access road	Adjacent to drainage swale (determined to be wetlands by Corps) at Thomas Shaft site.	None
SJ-3	San Joaquin Pipeline System	6.4-mile new pipeline starting at Oakdale Portal; two crossovers, one about 20 miles east of Modesto and the other about 15 miles west of Modesto; 10-mile fourth pipeline at west end of pipelines, ending at Tesla Portal.	San Joaquin, Stanislaus, and Tuolumne	None	Access is available, however, in some areas, access would need to be negotiated with the local landowners.	Crosses Delta Mendota Aqueduct and California Aqueduct Alt 5 (16.3 miles on western end crosses San Joaquin River)	Alt 1 & 2: Full length pipelines from Oakdale Portal to Tesla Portal within existing ROW. Alt. 3: New 60-inch pipeline from Oakdale Portal to Tesla Portal with 8,000-horsepower pump station. Alt 4: described as preferred location; Alt. 5: New 16.3 mile pipeline ending at Tesla Portal, two crossovers, replacement of 6.4 miles of PCCP. All alternatives would include upgrade of existing Roselle crossover station.
SJ-4	Rehabilitation of Existing San Joaquin Pipelines	Across Central Valley from Oakdale Portal to Tesla Portal	San Joaquin, Stanislaus, and Tuolumne	Riverbank, Modesto	SFPUC has access rights to the SJPL right-of-way	Existing pipelines cross under the San Joaquin River, Delta Mendota Aqueduct, and California Aqueduct	None
SJ-5	Tesla Portal Disinfection Station	Tesla Portal	San Joaquin	None	I-580, Chrisman Rd, Vernalis Rd, Existing Access Rd	A small vegetated swale on-site	None
SV-1	Alameda Creek Fishery Enhancement	Alameda Creek in Alameda County.	Alameda	None	Calaveras Road	Alameda Creek	Structural and non-structural recovery alternatives under consideration and other alternative designs for this project could be developed.
SV-2	Calaveras Dam Replacement	Immediately downstream of Calaveras Dam.	Alameda and Santa Clara	None	I-680, Highway 84, Calaveras Rd	Calaveras, Arroyo Hondo, Alameda, San Antonio Creeks	None
SV-3	Additional 40-mgd Treated Water Supply	Sunol Valley Water Treatment Plant (SWTP)	Alameda	None	I-680, Calaveras Rd	Alameda Creek	Sunol Valley

TABLE C.3 (Continued)
SFPUC WSIP PROJECT INFORMATION – PROJECT FACILITY LOCATIONS¹

Project Number	Project Name	Preferred Location	Affected Counties	Affected Cities	Major Access Roads	Nearby Waterways	Alternative Locations
SV-4	New Irvington Tunnel	New east tunnel portal would be about 75 feet south of Alameda West Portal. New west tunnel portal would be about 175 feet south of existing Irvington Portal.	Alameda	Fremont	I-680, Calaveras Rd	Alameda Creek, Mission Creek (tunnel-no impact), Pirate Creek (tunnel-no impact), unnamed (0.25 mi. west of Mission Blvd, Fremont), and unnamed seasonal drainage (ROW crossing at Calaveras Road).	New 120-inch diameter pipe from Alameda East Portal to a new tunnel portal near SVWTP. From the portal, a new 132-inch diameter tunnel would extend west and terminate in Fremont. Also considering alternate locations for the new Alameda West and Irvington Portals, within a few hundred feet of the existing and proposed portals (similar tunnel location).
SV-5	SVWTP –Treated Water Reservoirs	Site is within boundary of existing SVWTP.	Alameda	None	I-680, Calaveras Rd	Alameda Creek	None
SV-6	San Antonio Backup Pipeline	Pipeline would extend between San Antonio Reservoir and San Antonio Pump Station.	Alameda	None	I-680, Highway 84, Calaveras Rd	Calaveras, Arroyo Hondo, Alameda, San Antonio Creeks	None
BD-1	Bay Division Pipeline Reliability Upgrade	The new pipeline would be located within the existing easement for the BDPL Nos. 1 and 2, which extends approximately 21 miles from Irvington Tunnel Portal in Fremont to Pulgas Tunnel Portal near Redwood City. The 5-mile long tunnel portion extends from Newark to East Palo Alto, running beneath San Francisco Bay and surrounding marshlands. A sub-surface easement would be required for this portion.	Alameda and San Mateo	Newark, Fremont, East Palo Alto, Menlo Park, Redwood City	There are many regional and local roads that traverse the pipeline alignment including the I-680, I-880, and Highway 101 freeways; Highway 84, Edgewood Road on the Peninsula; Mission Boulevard (2 crossings; Highway 238), Washington Boulevard, Paseo Padre Parkway, Durham Road, Grimmer Boulevard, Warren Avenue, Dixon Road, and Scott Creek Road in Fremont.	Crosses San Francisco Bay, Newark/Unnamed Sloughs, and could affect the following creeks: Agua Caliente (Fremont), Cordilleras Creek (Redwood City), Mission Creek (Fremont), Ojo de Agua Creek (Redwood City), six unnamed creeks (at Alameda de las Pulgas in Redwood City, Boone Drive in Fremont, Highway 84 in Redwood City, Marsh Drive in Menlo Park, Moores Avenue in Newark, N. of Farwell Drive in Fremont), and an unnamed drainage at Marsh Road in Newark.	Alternative locations may include a southern or northern alignment adjacent to BDPL Nos. 3 and 4.

TABLE C.3 (Continued)
SFPUC WSIP PROJECT INFORMATION – PROJECT FACILITY LOCATIONS¹

Project Number	Project Name	Preferred Location	Affected Counties	Affected Cities	Major Access Roads	Nearby Waterways	Alternative Locations
BD-2	BDPL Nos. 3 and 4 Crossovers	Preferred locations and sites include: (1) Guadalupe River – Site B; (2) Barron Creek – Site C; and (3) Bear Gulch Reservoir – Site C.	Santa Clara and San Mateo	San Jose, Santa Clara, Palo Alto, and Atherton	Not Specified	Barron Creek (Santa Clara County, City of Palo Alto), Bear Gulch Reservoir (San Mateo County, Town of Atherton), Guadalupe Creek (Santa Clara County, cities of San Jose and Santa Clara).	Could be located in the vicinity of the following creeks: Adobe Creek (Santa Clara County, cities of Los Altos and Palo Alto), Calabazas Creek (Santa Clara County, cities of Santa Clara and Sunnyvale), Coyote Creek (Santa Clara County, cities of Milpitas and San Jose), Hamlin Court (Santa Clara County, City of Sunnyvale), Matadero Creek (Santa Clara County, City of Palo Alto), Ojo de Agua Creek (San Mateo County, City of Redwood City), Permanente Creek (Santa Clara County, City of Woodside), Redwood Creek (San Mateo County, City of Woodside), Saratoga Creek (Santa Clara County, City of Santa Clara), and Stevens Creek (Santa Clara County, City of Mountain View).
BD-3	Seismic Upgrade of BDPL Nos. 3 and 4 at Hayward Fault	Spans the I-680/Mission Boulevard interchange between Tissiack Place, Cayuga Place, and Indian Hills Road on the north side and Crawford Street on the south side	Alameda	Fremont	I-680 and Mission Blvd	Aqua Fria Creek	None
PN-1	Baden and San Pedro Valve Lots Improvements	Baden: W. Orange Ave at El Camino Real in South San Francisco; San Pedro: San Pedro Road and Junipero Serra Boulevard in Daly City; Pulgas Pump Station: Cañada Road between Highway 92 and Edgewood Road. Pulgas Valve Lot: Edgewood Road near I-280.	San Mateo	Baden: South San Francisco; San Pedro: Daly City	Baden: El Camino Real (Highway 82), West Orange Ave in South San Francisco; San Pedro: I-280, Junipero Serra Blvd, San Pedro Rd in Daly City. Pulgas Pump Station off of Canada Road. Pulgas Valve Lot off of Edgewood Road.	Baden Valve Lot: Colma Creek (South San Francisco); Pulgas Pump Station: San Andreas Creek, Crystal Springs Reservoir, and unnamed blue-lined tributary to Crystal Springs Reservoir (Unincorporated San Mateo County); Pulgas Valve Lot: Cordilleras Creek (Unincorporated San Mateo County, City of San Carlos).	None

TABLE C.3 (Continued)
SFPUC WSIP PROJECT INFORMATION – PROJECT FACILITY LOCATIONS¹

Project Number	Project Name	Preferred Location	Affected Counties	Affected Cities	Major Access Roads	Nearby Waterways	Alternative Locations
PN-2	Crystal Springs/San Andreas Transmission Upgrade	Proposed improvements would be located at: the Upper Crystal Springs (C.S.) Dam culverts (under Hwy 92); C.S. Outlet Tower Nos. 1 & 2 and C.S. Pump Station (west of I-280 near Skyline Blvd/Crystal Springs Rd intersection); Crystal Springs-San Andreas (S.A.) Pipeline, S.A. Inlet Structure, S.A. Outlet Towers Nos. 2 & 3 (west of I-280, generally between Millbrae Ave. and Crystal Springs Rd.), HTWTP (east of I-280 and south of Crystal Springs Rd.).	San Mateo	Pump Station Facility near Hillsborough. San Andreas PL traverses San Mateo County adjacent to Hillsborough, Burlingame, and Millbrae. Adits in San Andreas Reservoir adjacent to Millbrae	I-280 freeway, Skyline Blvd (Hwy 35), Crystal Springs Rd, Polhemus Rd, Hwy 92, SFPUC watershed, pump station, and HTWTP access roads.	San Mateo Creek, Upper and Lower Crystal Springs Reservoir, San Andreas Reservoir	NA
PN-3	HTWTP Long-Term Improvements	HTWTP is located south of Crystal Springs Road.	San Mateo	Adjacent to San Bruno and Millbrae	I-280 freeway, Crystal Springs Rd	San Andreas Reservoir	No long-term alternatives developed yet.
PN-4	Lower Crystal Springs Dam Improvements	Dam is located west of I-280 freeway and Skyline Blvd., and south of Crystal Springs Rd.	San Mateo	None	I-280 freeway, Skyline Blvd, Crystal Springs Rd	San Mateo Creek, Lower Crystal Springs Reservoir	NA
PN-5	Pulgas Balancing Reservoir Rehabilitation	Located on the east side of Cañada Road, southeast of the Pulgas Water Temple.	San Mateo	None	I-280 freeway, Cañada Rd	Pulgas Channel, Upper Crystal Springs Reservoir	NA
SF-1	San Andreas Pipeline No. 3 Installation	This pipeline would extend from San Pedro Valve Lot in Daly City (San Pedro Road at Junipero Serra Blvd) to Merced Manor Reservoir in San Francisco (at Ocean Avenue and 22nd Avenue).	San Francisco and San Mateo	San Francisco, Daly City	Highway 280, Junipero Serra Blvd, 19th Avenue, Brotherhood Way, and Ocean Avenue.	None	NA
SF-2	Groundwater Projects – Local	Lake Merced Pump Station, (South Sunset Playground 40th/Wawona), West Sunset Playground (41st/Quintara), Golden Gate Park (Lincoln/42nd), or alternative locations, North Lake (north side of North Lake in Golden Gate Park,	San Francisco	San Francisco	Great Highway, 19th Avenue, Sunset Blvd	Lake Merced and Pine Lake are within 1,000 feet of two of the projects	The 1997 SFPUC Groundwater Master Plan EIR evaluated various groundwater production alternatives & recommended a group of projects very similar to those proposed in the WSIP Local Groundwater Project.

TABLE C.3 (Continued)
SFPUC WSIP PROJECT INFORMATION – PROJECT FACILITY LOCATIONS¹

Project Number	Project Name	Preferred Location	Affected Counties	Affected Cities	Major Access Roads	Nearby Waterways	Alternative Locations
	Groundwater Projects – Local (cont.)	near 43rd/Fulton intersection), SF Zoo, Central Pump Station, Pine Lake (Stern Grove), other Golden Gate Park locations.					
SF-2 (cont.)	Groundwater Projects – Regional	Up to 10 sites within the Westside Groundwater Basin, cities of Daly City and San Bruno and the service area for the California Water Service Company's South San Francisco Service Area (including South San Francisco, Colma and unincorporated areas of northern San Mateo County). Wells could possibly be located in the cities of San Francisco, Burlingame, or Millbrae	San Mateo	Daly City, San Bruno, San Francisco, Burlingame, Millbrae, South San Francisco, Colma and unincorporated areas of northern San Mateo County.	TBD	Colma Creek	Alternative Analysis Report will be conducted in FY 06/07.
SF-3	Recycled Water Projects	Treatment site location is currently TBD; options include the OWPCP, SF Zoo overflow parking lot, the site of the old Richmond-Sunset Treatment Plant, and the site of the old McQueen Plan. Treated water storage will be provided at the treatment site, and also off-site; off-site locations include new storage in Lincoln Park (golf course), and the conversion of existing storage in Golden Gate Park Pipeline alignments within City streets.	San Francisco	San Francisco	Sloat Blvd, Highway 1, Great Highway	Pacific Ocean, lakes in Golden Gate Park, Lake Merced	Treatment: Previous location of the Richmond-Sunset Treatment Plant (now used as a staging area for Rec & Park) and within Oceanside facility. Storage: not yet identified.

¹ Project information presented in this table is preliminary and subject to change as project designs are developed.

**TABLE C.4
SFPUC WSIP PROJECT INFORMATION – PROJECT FACILITY CONSTRUCTION¹**

Project Number	Project Name	Preliminary Construction Schedule	Construction Duration (years)	Construction Area (acres)	Excavation/ Spoils Volume (cubic yards)	Concrete Material (cubic yards)	Demolition Required	Dewatering Required	Temporary Construction Access Routes	Number of Crews	Construction Hours	Construction Rate
SJ-1	Advanced Disinfection	2009-2010	1 to 2	2	TBD	TBD	No	TBD	I-580, Chrisman Rd, Vernalis Rd, Existing Access Rd	TBD	TBD	NA
SJ-2	Lawrence Livermore Supply Improvements	2010-2011	1	TBD	TBD	TBD	No	No	I-580, Corral Hollow Rd, Dirt Access Rd	TBD	TBD	NA
SJ-3	San Joaquin Pipeline System	2011-2014	3	Most construction would occur within existing ROW (100-200 feet wide) with additional 200 feet temporary/ additional ROW possibly needed to the north of the SJPL ROW. Minimum Total Disturbance = 16.4 mi. x 50 feet = 100 acres. Maximum Total Disturbance = 16.4 mi. x 200 feet = 400 ac. (Note that this requirement would range from 140 to 575 acres for alternative 5.) Up to 11 temporary construction staging areas as big as 400 by 700 feet would be required (70 acres).	424,000	TBD	TBD	From San Joaquin River to Highway 33	Construction access available, but would need to be improved and negotiated with local landowners in some locations.	2 to 5 Crews, with maximum of 100 personnel total	TBD	NA
SJ-4	Rehabilitation of Existing San Joaquin Pipelines	2008-2014 The long-range rehabilitation program would not be developed until 2008. Most rehabilitation work would be conducted during the months of November through March. The 1st rehabilitation contract might start as early as 2008.	7 to 8	All work would be within the existing ROW	Rehabilitation spoils quantities cannot be estimated without the conditions assessment and subsequent determination of rehabilitation methods. Conservative estimate would be about 100,000 cubic yards.	None	TBD	Excavations within 4 miles west of the San Joaquin River and 10 miles east of the River most likely would require dewatering	Access to existing ROW exists through ROW agreements. No additional access agreements anticipated	TBD	TBD	NA
SJ-5	Tesla Portal Disinfection Station	2009-2011	1 to 2	2	TBD	TBD	TBD	TBD	I-580, Chrisman Rd, Vernalis Rd, Existing Access Rd	TBD	TBD	NA
Sub-totals (Rounded)				±104 to 650	±524,000	TBD						
SV-1	Alameda Creek Fishery Enhancement	2011	1	TBD	TBD	TBD	NA	Not Specified	TBD	Not Specified	TBD	NA
SV-2	Calaveras Dam Replacement	2009-2011; flow release after 2011	2 to 3	666 (includes borrow areas)	6,300,000 cy total excavation and 4,000,000 cy spoil	60,000	Yes, existing cofferdam, chemical treatment building and valve vaults, existing spillway, and portions of the outlet tower.	Yes	Calaveras Road	2 to 3 Crews, 25 people/ crew	TBD	NA
SV-3	Additional 40-mgd Treated Water Supply	2010-2013	2 to 3	1.5	100,000	2,000	No	Not Anticipated	Calaveras Rd	Avg. Crew Size: 40 Max. Crew Size: 80	TBD	NA
SV-4	New Irvington Tunnel	2009-2013	3 to 4	120 (additional area for staging could be required)	190,000	TBD	Yes, potential demolition of existing Irvington Portal structure.	Yes	If the spoils are trucked outside of Sunol Valley, project would construct/ improve new access roads between Alameda West Portal and Calaveras Rd, Spoil Area 1 and Calaveras Rd, permanent gravel	Avg. Crew Size: 60 Max. Crew size: 144	TBD	60 to 100 feet per day of tunnel advancement by boring machine drive

**TABLE C.4 (Continued)
SFPUC WSIP PROJECT INFORMATION – PROJECT FACILITY CONSTRUCTION¹**

Project Number	Project Name	Preliminary Construction Schedule	Construction Duration (years)	Construction Area (acres)	Excavation/ Spoils Volume (cubic yards)	Concrete Material (cubic yards)	Demolition Required	Dewatering Required	Temporary Construction Access Routes	Number of Crews	Construction Hours	Construction Rate
SV-4 (cont.)	New Irvington Tunnel (cont.)								between existing and new overflow shafts in Sunol Valley, between existing Irvington Portal and Mission Blvd.			
SV-5	SVWTP –Treated Water Reservoirs	2008-2010	2	10.5	300,000	30,900	No	No	Calaveras Rd, Interstate 680	Avg. Crew Size: 40 Max. Crew Size: 80	TBD	NA
SV-6	San Antonio Backup Pipeline	2009-2011	2	TBD	51,000 cy total excavation and 37,000 cy spoil	TBD	No	TBD	Along access road to San Antonio Reservoir	TBD	TBD	TBD
Sub-totals (Rounded)				±800	±7 million	±92,900						
BD-1	Bay Division Pipeline Reliability Upgrade	2009-2013	4	Construction and staging would occur within the ROW corridor, which varies in width between 40 and 80 feet. Estimated Total Disturbance = 165 to 175 ac. Note that the amount disturbed by the pipeline at any one time would be around 3 acres.	434,000	TBD	Portions of the section of BDPL No. 1 between Edgewood Valve Lot and Pulgas Valve Lot would be removed (approximately 1.4 miles). The above ground and submarine sections of BDPLs 1 and 2 would be decommissioned.	Yes at both tunnel shafts and some reaches of the pipeline.	Both the Newark and Ravenswood Shaft sites would be accessed by existing city streets and there are several alternatives for highway access. The pipeline would be accessed from the numerous local roads and state highways.	Pipeline: A minimum of 5 separate crews; 3 on the pipeline, 2 to 3 for the tunnel, and additional crews at the valve vaults and the street and rail crossings.	TBD	Tunnel: 50 to 80 feet/day for initial liner and 120 feet/day for final liner. Pipeline: 120 to 160 feet per day average, up to 300 feet per day maximum if installing in open fields without obstruction.
	Bay Tunnel Segment	2009-2013	4	3.5 to 9 acres	260,000 to 355,000							
BD-2	BDPL Nos. 3 & 4 Crossovers	2010-2012	2	TBD but minimum 0.4 ac. at each site	43,500	TBD	May have to go through levee at Guadalupe site for outfall.	Discharge of treated water to creeks or exist. storm drains during construction.	Not Specified. Likely routes: Lick Mill Rd (Guadalupe River site), Foothill Expressway-Veterans Administration Medical Center-Gunn High School (Barron Creek), and Reservoir Rd-Alameda de Las Pulgas (Bear Gulch site).	TBD	TBD	TBD
BD-3	Seismic Upgrade of BDPLs Nos. 3 and 4 at Hayward Fault	2010-2012	1 to 2	TBD	Phase B – 55,300	TBD	No	Possible	Construction access to pipeline route would almost always be through the closest roads that intersect the ROW.	TBD	TBD	NA
Sub-totals (Rounded)				±170 to 180	±800,000 to 900,000	TBD						
PN-1	Baden and San Pedro Valve Lots Improvements	2009-2011	2	Approx. 2 ac.	Baden Valve Lot: 4,000; San Pedro Valve Lot: 700; Pulgas Pump Station: TBD; Pulgas Tunnel Gate Shaft: 270; Pulgas Tunnel Air Shaft: TBD.	TBD	Yes, removal of existing vaults, shed, existing pipeline segment, roof above pump station.	Yes	Baden Valve Lot: El Camino Real (Highway 82), West Orange Ave in South San Francisco; San Pedro Valve Lot: Junipero Serra Blvd and San Pedro Rd in Daly City; Pulgas Pump Station off of Canada Road in San Mateo County; Pulgas Valve Lot off of Edgewood Road in San Mateo County.	TBD	TBD	NA
PN-2	Crystal Springs/ San Andreas Transmission Upgrade	2011-2013	2 to 3	TBD	Not Specified (estimated to be up to 9,000 cy)	TBD	Crystal Springs Pump Station (if not upgraded)	Project has discharge valve that empties into San Mateo Creek; discharge valve would be replaced and/or re-anchored. Outlet structures and the adits within them at both Lower Crystal Springs and San Andreas Reservoirs,	I-280 freeway, Skyline Blvd. (HWY 35), Crystal Springs Road, Polhemus Road, Hwy 92, SFPUC watershed, pump station, and HTWTP access roads	TBD	TBD	NA

TABLE C.4 (Continued)
SFPUC WSIP PROJECT INFORMATION – PROJECT FACILITY CONSTRUCTION¹

Project Number	Project Name	Preliminary Construction Schedule	Construction Duration (years)	Construction Area (acres)	Excavation/ Spoils Volume (cubic yards)	Concrete Material (cubic yards)	Demolition Required	Dewatering Required	Temporary Construction Access Routes	Number of Crews	Construction Hours	Construction Rate
PN-2 (cont.)	Crystal Springs/ San Andreas Transmission Upgrade (cont.)							are the upstream inlets to the aforementioned valves. There would be structural and mechanical work on these structures to harden them. This may require coffer dams and other dewatering measures.				
PN-3	HTWTP Long-Term Improvements	2011 to 2013	2 to 3	TBD	Not Specified	Not Specified	Not Specified	Not Specified	I-280 freeway, Crystal Springs Road	Not Specified	TBD	NA
PN-4	Lower Crystal Springs Dam Improvements	2010-2011	1	6	21,000	TBD	Yes, modification of spillway, parapet wall, and stilling basin	TBD	I-280 freeway, Skyline Blvd, Crystal Springs Road	TBD	TBD	NA
PN-5	Pulgas Balancing Reservoir Rehabilitation	2010-2013	3	TBD	TBD	TBD	TBD	TBD	I-280 freeway, Cañada Road	TBD	TBD	NA
Sub-totals (Rounded)				±8	±35,000	TBD						
SF-1	San Andreas Pipeline No. 3 Installation	2009-2010	2	23	44,170	3,200	Yes, removal of certain portions of existing BMPL	Yes	City streets along pipeline alignment.	2 crews, 8 to 10 people/crew	TBD	60 to 200 feet/day
SF-2	Groundwater Projects – Local	2009 to 2012	San Francisco: 3 (intermittent)	0.04/site (0.7 ac. for 18 sites) + pipeline alignments	TBD	TBD	TBD	No	TBD	TBD	TBD	Not Specified
	Groundwater Projects – Regional	2010 to 2014	Regional: 4		TBD	TBD	TBD	No	TBD	TBD	TBD	Not Specified
SF-3	Recycled Water Projects	2010 to 2012	2 yrs for treatment facility; longer for pipelines	5 to 7	47,200	10,800	TBD	Yes	Sloat Blvd, potential Highway 1 entrance. Possible haul routes: Highway 1, Skyline Blvd, Lake Merced Blvd, John Muir Dr, Brotherhood Way, I-280.	2 to 4 crews, 10 to 35 people/crew	TBD	Not Specified
Sub-totals (Rounded)				±29 to 31	±91,400	±14,000						

¹ Project information presented in this table is preliminary and subject to change as project designs are developed.

**TABLE C.5
SFPUC WSIP PROJECT INFORMATION – AFFECTED ROADS/RAILROADS AND CONSTRUCTION TRAFFIC**

Project Number	Project Name	Temporary Construction Access Roads	In-Road (parallel to or within ROW)	Freeway Crossing	Major Road Crossings	Minor Road Crossings	Railroad Crossings	Daily Truck Trips	Ave./Max. Worker Daily Trips
SJ-1	Advanced Disinfection	I-580, Chrisman Road, Vernalis Road, Existing Access Road	No	None	No	No	No	TBD	TBD
SJ-2	Lawrence Livermore Supply Improvements	I-580, Corral Hollow Road, Dirt Access Road	No	None	No	No	No	TBD	TBD
SJ-3	San Joaquin Pipeline System	Construction access available, but would need to be negotiated with local landowners in some locations.	Yes	4 Crossings: Hwy 99, I-5, I-580 freeways, Highways 33	21 Crossings: Wilms, Rd., Wamble Rd (twice), River Rd, McCracken Rd, Welty Rd, Koster Rd, Bird Rd, Chrisman Rd, Bernard Rd, W. Vernalis Rd, Fogarty Rd, Emery Rd, Roselle Ave, Blewitt Rd, Koster Rd. The following road crossings would be used as well in addition to the above list if Alt 5 is selected: Blue Gum Ave, Dunn Rd, Gates Rd, Maze Blvd, Pelican Rd, Orchard Rd.	33	2 Crossings	Pipe Delivery: 4 trips/day (ave); haul truck volumes not specified.	
SJ-4	Rehabilitation of Existing San Joaquin Pipelines	None expected	The existing ROW would be used for accessing pipeline sites from nearby local public and private roads.	Existing pipelines cross under I-580 and I-5 freeways. Improvements for these under crossings are not anticipated.	Existing pipelines cross under Rte 33, Rte 132, Rte 99; Rte 108 (McHenry Ave); Standiford Ave near MP 74.8; Prescott Rd near MP 75.1; Sisk Rd near MP 76.2. It is not known at this time if any improvements would be required at these under crossings	The existing pipelines cross under 14 minor roads. It is not known at this time if any of these under crossings would require improvements.	Existing pipelines cross under: Sierra Railroad near MP 57.7; Union Pacific near MP 64; Burlington Northern Santa Fe near MP 69.3; Union Pacific near MP 73.5; Union Pacific near MP 76.4; Union Pacific near MP 89.5. It is not known at this time if any improvements would be required under crossings.	TBD	TBD
SJ-5	Tesla Portal Disinfection Station	I-580, Chrisman Road, Vernalis Road, Existing Access Road	No	None	No	No	No	15 (average) - 40 (maximum) truck trips/day & up to 4 trips/day	25
SV-1	Alameda Creek Fishery Enhancement	Calaveras Road and possibly Highway 84	No	No	No	No	No	Not Specified	Not Specified
SV-2	Calaveras Dam Replacement	Calaveras Road	TBD	No	No	No	No	88 daily 9 peak hour	240 daily (Up to 400)
SV-3	Additional 40-mgd Treated Water Supply	Calaveras Road	No	No	No	No	No	64 daily 8 peak hour	80 daily
SV-4	New Irvington Tunnel	Construct/improve new access roads between Alameda West Portal and Calaveras Rd, Spoil Area 1 and Calaveras Rd, permanent gravel between existing and new overflow shafts in Sunol Valley, between existing Irvington Portal and Mission Blvd.	No	No	No	No	No	290 daily 36 peak hour	288 daily
SV-5	SVWTP - Treated Water Reservoirs	Calaveras Road	TBD	No	No	No	No	80 daily 10 peak hour	80 daily
SV-6	San Antonio Backup Pipeline	Access road to San Antonio Reservoir and Calaveras Road	San Antonio Reservoir Access Road/Calaveras Road	No	No	Calaveras Road	No	80 daily 10 peak hour	80 daily
BD-1	Bay Division Pipeline Reliability Upgrade	Both the Newark and Ravenswood Shaft sites would be accessed by existing city streets and there are several alternatives for highway access. The pipeline would be accessed from the numerous local roads and state highways.	Ivy Drive, Bay Road, Avenue Del Ora, Bennett Road.	Pipeline, 3 crossings: the I-680, I-880, and Highway 101 freeways	20 to 25 major road crossings including: Edgewood Road Woodside Road El Camino Real Middlefield Road Marsh Road Willow Road University Avenue Central Avenue Mowry Avenue	Numerous	7, including 4 active	Pipe Delivery: 8 trips/day (ave); disposal volumes approximately 8 loads per day, 16 one-way trips. Tunnel: If onsite disposal is not available, then 120-160 trips/day to haul muck offsite If concrete rings would be manufactured offsite, then 15 trips/day to transport concrete rings to jobsite.	Pipeline Average: 20 workers per pipe crew, 20 per vault crew, 10 per crossing crew. Tunnel: 25 to 38 workers

TABLE C.5 (Continued)
SFPUC WSIP PROJECT INFORMATION – AFFECTED ROADS/RAILROADS AND CONSTRUCTION TRAFFIC

Project Number	Project Name	Temporary Construction Access Roads	In-Road (parallel to or within ROW)	Freeway Crossing	Major Road Crossings	Minor Road Crossings	Railroad Crossings	Daily Truck Trips	Ave./Max. Worker Daily Trips
BD-1 (cont.)	Bay Division Pipeline Reliability Upgrade (cont.)				Stevenson Blvd. Grimmer Blvd. Fremont Blvd. Paseo Padre Parkway Driscoll Road Mission Blvd.			Should Contractor elect to install an on site concrete batch plant then bulk transport of sand, aggregate, cement would occur periodically throughout the tunnel construction period. For drive and receiving shafts, 9 to 13 truck trips per day, intermittently over several months	
BD-2	BDPL Nos 3 & 4 Crossovers	Not Specified. Likely routes: Lick Mill Rd. (Guadalupe River site), Foothill Expressway-Veterans Administration Medical Center-Gunn High School (Barron Creek), and Reservoir Road-Alameda de Las Pulgas (Bear Gulch site).	No	No	No	No	No	TBD	TBD
BD-3	Seismic Upgrade of BDPLs Nos. 3 and 4 at Hayward Fault	Not specified, but I-680 and Mission Blvd. are adjacent to site.	Yes	I-680 (jack and bore)	I-680 and Mission Blvd.	Not Specified	No	Not Specified	Not Specified
PN-1	Baden and San Pedro Valve Lots Improvements	Baden: El Camino Real (Highway 82), West Orange Avenue in South San Francisco; San Pedro: Junipero Serra Blvd., San Pedro Rd. in Daly City; Pulgas Pump Station off of Canada Road; Pulgas Valve Lot off of Edgewood Road.	No	No	No	No	No	Baden: 2 to 4 peak hour truck trips; San Pedro: 25 peak hour trips; Pulgas Valve Lot and Pulgas Pump Station: 25 peak hour trips	Not Specified
PN-2	Crystal Springs/San Andreas Transmission Upgrade	I-280 freeway, SFPUC watershed and pump station roads	No	I-280 (S.A. Outlet Tower Nos. 2 & 3)	Hwy 92 (Upper C.S. Dam culverts)	No	No	Not Specified	Not Specified
PN-3	HTWTP Long-Term Improvements	I-280 freeway, Crystal Springs Road	No	No	No	No	No	TBD	TBD
PN-4	Lower Crystal Springs Dam Improvements	I-280 freeway, Skyline Boulevard, Crystal Springs Road	No	No	No	No	No	TBD	TBD
PN-5	Pulgas Balancing Reservoir Rehabilitation	I-280 freeway, Cañada Road	No	No	Cañada Road (channel located west of Canada Road)	No	No	TBD	TBD
SF-1	San Andreas #3 Pipeline Installation	Highway 280, Junipero Serra Blvd, 19 th Ave, Brotherhood Way, and Ocean Ave, and city streets along alignment.	Possibly numerous other local streets to be determined.	No	19th Avenue	Numerous	Yes (MUNI track)	20	4
SF-2	Groundwater Projects - Local	Lake Merced Pump Station: Brotherhood Way, Lake Merced Boulevard; South Sunset Playground: Wawona St.; West Sunset Playground: Rivera, Quintara St., 40th Ave.; Golden Gate Park: 41st Ave, 42nd Ave, Lincoln Way; SF Zoo: Sloat Blvd; North Lake: 43rd Ave, Fulton St. Haul routes at these sites: 19th Ave, Sunset Blvd, Highway 1, I-280.	TBD (Pipeline locations not yet specified – potential alignments 40th Ave, 41st Ave., Ortega St., and others)	No	Sunset Blvd., Lincoln Way	Numerous local roads possible	No	TBD	TBD
	Groundwater Projects - Regional	Highway 1, I-280, Highway 101, El Camino Real	TBD (Locations not specified)	No	TBD	TBD (Locations not specified)	TBD	20/site (1 peak hour trip/site for pipeline)	45/site
SF-3	Recycled Water Projects	Sloat Blvd, potential Highway 1 entrance. Possible haul routes: Highway 1, Skyline Blvd, Lake Merced Blvd, John Muir Dr, Brotherhood Way, I-280.	TBD (Pipeline locations not yet specified - potential alignments Sloat Blvd., 42nd Ave. and others)	No	TBD (Pipeline locations not specified- Sloat Blvd., Great Highway, Lincoln Way, others)	TBD (Pipeline locations not specified)	No	20 trips/day (10 truckloads); max. 10 truck trips during peak hour	88

¹ Project information presented in this table is preliminary and subject to change as project designs are developed.

**TABLE C.6
PERMITS, APPROVALS, AND EARLY COORDINATION WITH OTHER AGENCIES THAT MAY BE REQUIRED^a**

Project Number	Project Name	ACOE Section 10	Individual or ACOE NWP Section 404	National Wildlife Refuge	SHPO Section 106	NMFS Section 7 / USFWS Section 7	USFWS FWCA	National Park Service, GGNRA ^b	State Lands Commission Lease/ Permit ^c	Caltrans ^d	DWR, Central Valley Flood Protection Board	DWR, Division of Safety of Dams	CDFG 1602, 2080.1, 2081, or MOA	DHS (Public Water System)	SWRCB (SWPPP)	RWQCB 401	RWQCB Discharge/ Dewatering	BAAQMD	BCDC	Local CUPA/ HazMat Business Plan
SJ-1	Advanced Disinfection		Possible		Possible	Possible							X	X	X	Possible		TBD		
SJ-2	Lawrence Livermore Supply Improvements		X (TS site only)		Possible	X (TS site only)							X (TS site only)	X	X	X (TS site only)				X
SJ-3	San Joaquin Pipeline System		X	Possible	X	X			X	Possible	Possible		X		X	X				X
SJ-4	Rehabilitation of Existing San Joaquin Pipelines	Possible	Possible	Possible	Possible	Possible				Possible			Possible							
SJ-5	Tesla Portal Disinfection Station												X	X	X					X
SV-1	Alameda Creek Fishery Enhancement		TBD		TBD	TBD				Possible			X			TBD				
SV-2	Calaveras Dam Replacement		X		X	X	X					X		X	X	X	X			X
SV-3	Additional 40-mgd Treated Water Supply													X	X					X
SV-4	New Irvington Tunnel		X		X	X				Possible			X		X	X	X			X
SV-5	SVWTP – Treated Water Reservoirs													X	X					X
SV-6	San Antonio Backup Pipeline																			
BD-1	Bay Division Pipeline Reliability Upgrade	Possible	X	Possible	X	X	X ^e		X	Possible			X		X	X	X		Possible	X
BD-2	BDPL Nos. 3 and 4 Crossovers		X			X	X			Possible			X		X	X	X			
BD-3	Seismic Upgrade of BDPLs Nos. 3 and 4 at Hayward Fault	TBD	TBD		TBD	TBD	TBD		TBD	Possible			TBD	TBD	TBD	TBD	TBD	TBD		
PN-1	Baden and San Pedro Valve Lot Improvements									Possible				X			X			
PN-2	Crystal Springs/San Andreas Transmission Upgrade	X	X		X	X		EC ^b		Possible			X	X	X	X	X			X
PN-3	HTWTP Long-Term Improvements							EC ^b		Possible				X	X					
PN-4	Lower Crystal Springs Dam Improvements	X	X		X	X	X	EC ^b		Possible		X	X	X	X	X	X			X
PN-5	Pulgas Balancing Reservoir Rehabilitation							EC ^b					X							
SF-1	San Andreas Pipeline No. 3 Installation									Possible					X	X	X			
SF-2	Groundwater Projects (Local and Regional)									Possible				X				X		
SF-3	Recycled Water Projects									Possible				X		X				

NOTES: ACOE = U.S. Army Corps of Engineers; BAAQMD = Bay Area Air Quality Management District; BCDC = San Francisco Bay Conservation and Development Commission; Caltrans = California Department of Fish and Game/Transportation; CDFG = California Department of Fish and Game; CUPA = Certified Unified Program Agency; DHS = California Department of Health Services; DWR = California Department of Water Resources; EC = Early Coordination Requested; (FWCA = Fish and Wildlife Coordination Act); GGNRA = Golden Gate National Recreation Area; MOA = Memorandum of Agreement; NMFS = U.S. National Marine Fisheries Service; (NWP = National Permit for Stream and Wetland Restoration Activities); RWQCB = Regional Water Quality Control Board; SHPO = State Historic Preservation Office; SWPPP = stormwater pollution prevention plan; SWRCB = State Water Resources Control Board; TBD = To Be Determined; TS = Thomas Shaft; USFWS = U.S. Fish and Wildlife Service.

- ^a Additional approvals may be identified for WSIP facility projects when separate, project-level CEQA analysis is completed.
- ^b The GGNRA requests consultation during project development and advance notification of meetings and would like to assist in creating mitigations for potential impacts from these projects.
- ^c Section 6327 of the Public Resources Code provides that if a facility is for the "procurement of fresh-water from and construction of drainage facilities into navigable rivers, streams, lakes and bays," and if the applicant obtains a permit from the local reclamation district, State Reclamation Board, the U.S. Army Corps of Engineers, or the Department of Water Resources, then an application shall not be required by the State Lands Commission. Since the proposed program appears to fall within this section, a lease from the Commission would not be required, provided one of the above-listed permits is obtained.
- ^d As part of project-level CEQA review, Caltrans requests that each facility improvement project be reviewed to determine if it encroaches on any state facilities. Any encroachment on Caltrans right-of-way would require an encroachment permit, and CEQA-related environmental studies may be necessary (including studies related to biological resources, cultural resources, and hazardous materials). A qualified professional must conduct these studies to satisfy Caltrans's environmental review policies. Ground-disturbing activities on the site prior to completing and/or approving the required environmental documents could affect Caltrans' ability to issue a permit for the project.
- ^e The USFWS and the Coastal Conservancy are interested in acquiring clean dredge material generated by this project for use in wetland restoration associated with the South Bay Salt Pond Restoration Project, particularly within the Don Edwards San Francisco Bay National Wildlife Refuge (contact Clyde Morris, Manager, 510-792-0222, ext. 25). The USFWS recommends that the SFPUC coordinate with the USFWS's Division of Endangered Species at the Sacramento Fish and Wildlife Office (916-414-6600).

TABLE C.6 (Continued)
PERMITS, APPROVALS, AND EARLY COORDINATION WITH OTHER AGENCIES THAT MAY BE REQUIRED

Project Number	Project Name	San Mateo County Transit District	Coastal Conservancy	Association of Bay Area Governments	Local Flood Control Districts ^f	Alameda County Flood Control and Water Conservation District	Alameda County Water District ^g	East Bay Regional Park District ^h	City of Fremont ⁱ	City of Menlo Park	City of Palo Alto	Coastside County Water District
SJ-1	Advanced Disinfection											
SJ-2	Lawrence Livermore Supply Improvements											
SJ-3	San Joaquin Pipeline System				Possible							
SJ-4	Rehabilitation of Existing San Joaquin Pipelines				Possible							
SJ-5	Tesla Portal Disinfection Station											
SV-1	Alameda Creek Fishery Enhancement				Possible		EC	EC				
SV-2	Calaveras Dam Replacement					EC ^j	EC	EC	EC			
SV-3	Additional 40-mgd Treated Water Supply						EC	EC				
SV-4	New Irvington Tunnel				Possible		EC	EC				
SV-5	SVWTP – Treated Water Reservoirs						EC	EC				
SV-6	San Antonio Backup Pipeline				Possible		EC	EC				
BD-1	Bay Division Pipeline Reliability Upgrade	EC ^k	EC ^l	EC ^l	Possible		EC	EC	EC	EC ^m		
BD-2	BDPL Nos. 3 and 4 Crossovers				Possible						EC ⁿ	
BD-3	Seismic Upgrade of BDPLs Nos. 3 and 4 at Hayward Fault				Possible				EC			
PN-1	Baden and San Pedro Valve Lot Improvements											
PN-2	Crystal Springs/San Andreas Transmission Upgrade				Possible							
PN-3	HTWTP Long-Term Improvements											
PN-4	Lower Crystal Springs Dam Improvements											EC ^o
PN-5	Pulgas Balancing Reservoir Rehabilitation											
SF-1	San Andreas Pipeline No. 3 Installation				Possible							
SF-2	Groundwater Projects (Local and Regional)				Possible							
SF-3	Recycled Water Projects				Possible							

NOTE: EC = Early Coordination Requested

^f As part of project-level CEQA review, the Alameda County Flood Control and Water Conservation District requests that each facility improvement project that includes pipelines be reviewed to determine if an encroachment permit is required where the pipelines cross the District's channels and creek inverts.

^g The ACWD requests that the BD-1 project be coordinated with the ACWD earlier (during project planning and design phases, rather than during the construction phase) to minimize impacts associated with conflicting water facilities and potential impacts on the ACWD's ability to meet customer demands and fire flow requirements. In addition, all Sunol Valley projects (SV-1 through SV-6) will need to take into account potential effects of facility construction on downstream water intakes at ACWD's facilities in the flood control channel. The project-level CEQA review for the SV-2 project will need to consider coordination and notification related to Calaveras Reservoir release protocols that could affect downstream groundwater recharge and the potential for flooding.

^h As part of project-level CEQA review, each facility improvement project in the Sunol Valley region should be reviewed to determine if it encroaches on EBRPD property. The EBRPD requests coordination of construction mitigation measures for certain WSIP projects in the Sunol Valley to minimize construction impacts on recreational uses and allow coordination of fire suppression planning and response (including review of traffic control plans). As part of the project-level EIR for SV-2, the EBRPD states that the SFPUC needs to coordinate the timing of water releases from Calaveras Dam to maximize benefits to amphibians and anadromous fish species.

ⁱ The City of Fremont requests consultation (regarding the applicability of encroachment permits, and development and review of traffic control plans) during the planning and design phases of the SV-2, BD-1, and BD-3 projects as well as any other WSIP project that could affect the Fremont transportation network.

^j As part of the project-level CEQA review, mitigation measures should be developed to establish coordination and notification protocols between the SFPUC and the ACFCWCD regarding Calaveras Reservoir releases that could affect the potential for downstream flooding.

^k The USFWS requests that the BD-1 project be coordinated with the Transit District's Dumbarton Rail Project to minimize habitat impacts for both projects.

^l The Coastal Conservancy requests that the SFPUC coordinate with the Coastal Conservancy and Association of Bay Area Government's Bay Trail project (regarding completion of the Bay Trail gap through SFPUC lands).

^m The City of Menlo Park requests coordination of construction mitigation measures for the BD-1 project to minimize construction impacts (e.g., access and parking) on local residents and businesses, including the Menlo Business Park.

ⁿ The City of Palo Alto requests early consultation on the BD-2 project.

^o The Coastside CWD requests consultation during development of the adaptive management program for Crystal Springs Reservoir as part of the operations phase of the PN-4 project.