

APPENDIX F

Probable Construction Costs for Capital Improvement Program

Table F-1. Summary of Probable Construction Costs for Near-Term Capital Improvements ^(a,b)

CIP Group	Pressure Zone	Existing Diameter	New Diameter	Quantity, ft	Improvement Type	Timeframe Required	Location	Unit Cost	Estimated Construction Cost ^(c)	Capital Cost (includes mark-ups) ^(c,d)
Aqueduct Pressure Zone										
FF EX CIP022	A2	6	8	273	Replace Pipeline	Near-Term	Blair Place between 9 th Street and 4-inch mains near Hydrant 1449	\$ 160	\$ 44,000	\$ 71,000
FF EX CIP022	A2	6	8	276	Replace Pipeline	Near-Term	Agnew Place between 9 th Street and 4-inch mains near Hydrant 1565	\$ 160	\$ 44,000	\$ 71,000
FF EX CIP023	A2	6	8	778	Replace Pipeline	Near-Term	Eardley Avenue between College Avenue and Tammy Way	\$ 160	\$ 124,000	\$ 201,000
FF EX CIP024	A2	NA	8	210	New Pipeline	Near-Term	Dutton Avenue from Duncan Street south to end of pipeline on Dutton Avenue near Apple Creek Lane	\$ 160	\$ 34,000	\$ 55,000
FF EX CIP025	A2	6	8	264	Replace Pipeline	Near-Term	Sovereign Lane between Donahue Avenue and Westgate Circle	\$ 160	\$ 42,000	\$ 68,000
FF EX CIP031	A3	6	8	366	Replace Pipeline	Near-Term	Delpport Avenue between West Avenue and Stroven Lane	\$ 160	\$ 59,000	\$ 96,000
FF EX CIP031	A3	4	8	396	Replace Pipeline	Near-Term	McMinn Avenue from Sunset to Hughes Avenue	\$ 160	\$ 63,000	\$ 102,000
FF EX CIP032	A3	6	8	114	Replace Pipeline	Near-Term	Sebastopol Rd from Timothy Rd to Roberts Ave	\$ 160	\$ 18,000	\$ 29,000
FF EX CIP041	A4	NA	8	18	New Pipeline	Near-Term	Salem Avenue at Elliott Avenue, connecting the proposed CIP 8-inch pipeline on Salem Ave to the existing 14-inch pipeline on Elliott Ave.	\$ 160	\$ 3,000	\$ 5,000
FF EX CIP041	A4	4	8	88	Replace Pipeline	Near-Term	Albany Drive between Oliver Lane and Richmond Dr	\$ 160	\$ 14,000	\$ 23,000
FF EX CIP041	A4	4	8	247	Replace Pipeline	Near-Term	Albany Drive between Richmond Dr and Clement Ave	\$ 160	\$ 39,000	\$ 63,000
FF EX CIP041	A4	4	8	249	Replace Pipeline	Near-Term	Albany Drive between Clement Ave and Victor Dr	\$ 160	\$ 40,000	\$ 65,000
FF EX CIP041	A4	6	8	250	Replace Pipeline	Near-Term	Clement Avenue between Albany Drive and Malano Court	\$ 160	\$ 40,000	\$ 65,000
FF EX CIP041	A4	4	8	364	Replace Pipeline	Near-Term	Clement Avenue between Malano Court and Emeritus Circle, and east of Emeritus Circle	\$ 160	\$ 58,000	\$ 94,000
FF EX CIP041	A4	6	8	468	Replace Pipeline	Near-Term	Salem Avenue between Elliott Avenue and Clement Avenue	\$ 160	\$ 75,000	\$ 122,000
FF EX CIP042	A4	6	8	144	Replace Pipeline	Near-Term	Hidden Valley Drive from Moss Rock Court to Winding Ridge Rd	\$ 160	\$ 23,000	\$ 37,000
FF EX CIP042	A4	6	8	650	Replace Pipeline	Near-Term	Hidden Valley Drive from Parsons Drive to Moss Rock Court	\$ 160	\$ 104,000	\$ 168,000
FF EX CIP043	A4	6	8	56	Replace Pipeline	Near-Term	Haven Drive between Hawthorne Court and Iris Court	\$ 160	\$ 9,000	\$ 15,000
FF EX CIP043	A4	4	8	70	Replace Pipeline	Near-Term	Geary Drive between James Avenue and Finlaw Street	\$ 160	\$ 11,000	\$ 18,000
FF EX CIP043	A4	4	8	125	Replace Pipeline	Near-Term	Haven Drive between Eleanor Avenue and Hawthorne Court	\$ 160	\$ 20,000	\$ 32,000
FF EX CIP043	A4	4	8	213	Replace Pipeline	Near-Term	Geary Drive between Bryden Lane and James Avenue	\$ 160	\$ 34,000	\$ 55,000
FF EX CIP043	A4	4	8	223	Replace Pipeline	Near-Term	Eleanor Avenue between Haven Drive and Belmont Court	\$ 160	\$ 36,000	\$ 58,000
FF EX CIP043	A4	4	8	237	Replace Pipeline	Near-Term	Augustan Avenue between Haven Drive and Belmont Court	\$ 160	\$ 38,000	\$ 62,000

Table F-1. Summary of Probable Construction Costs for Near-Term Capital Improvements ^(a,b)

CIP Group	Pressure Zone	Existing Diameter	New Diameter	Quantity, ft	Improvement Type	Timeframe Required	Location	Unit Cost	Estimated Construction Cost ^(c)	Capital Cost (includes mark-ups) ^(c,d)
FF EX CIP043	A4	6	8	247	Replace Pipeline	Near-Term	Geary Drive between James Avenue and Finlaw Street	\$ 160	\$ 39,000	\$ 63,000
FF EX CIP043	A4	8	8	258	Replace Pipeline	Near-Term	E Foothill Drive between E Haven Dr and Thomas Dr	\$ 160	\$ 41,000	\$ 66,000
FF EX CIP043	A4	4	8	292	Replace Pipeline	Near-Term	Haven Drive between Augustan Avenue and Eleanor Avenue	\$ 160	\$ 47,000	\$ 76,000
FF EX CIP043	A4	6	8	307	Replace Pipeline	Near-Term	Haven Drive between Eleanor Avenue and Hawthorne Court	\$ 160	\$ 49,000	\$ 79,000
FF EX CIP043	A4	6	8	395	Replace Pipeline	Near-Term	Haven Drive between Iris Court and E Foothill Drive	\$ 160	\$ 63,000	\$ 102,000
FF EX CIP043	A4	6	8	538	Replace Pipeline	Near-Term	Grahn Drive between Norte Way and E Foothill Dr	\$ 160	\$ 86,000	\$ 139,000
FF EX CIP043	A4	6	8	643	Replace Pipeline	Near-Term	Diamond Court	\$ 160	\$ 103,000	\$ 167,000
FF EX CIP043	A4	4	8	731	Replace Pipeline	Near-Term	Elizabeth Way between Town and Country Drive and Parsons Drive	\$ 160	\$ 117,000	\$ 190,000
FF EX CIP043	A4	4	8	824	Replace Pipeline	Near-Term	Haven Drive between 4 th Street and Augustan Avenue	\$ 160	\$ 132,000	\$ 214,000
FF EX CIP051	A5	6	8	113	Replace Pipeline	Near-Term	Sherwood Drive between Marian Ln and Sherwood Court	\$ 160	\$ 18,000	\$ 29,000
FF EX CIP051	A5	6	8	118	Replace Pipeline	Near-Term	Leonard Avenue between Alderbrook Drive and Sherwood Drive	\$ 160	\$ 19,000	\$ 31,000
FF EX CIP051	A5	6	8	250	Replace Pipeline	Near-Term	Sherwood Drive between Little John Ln and Marian Ln	\$ 160	\$ 40,000	\$ 65,000
FF EX CIP051	A5	6	8	252	Replace Pipeline	Near-Term	Sherwood Drive between Leonard Avenue and Little John Ln	\$ 160	\$ 40,000	\$ 65,000
FF EX CIP051	A5	6	8	319	Replace Pipeline	Near-Term	Sherwood Drive between Marian Ln and Sherwood Court	\$ 160	\$ 51,000	\$ 83,000
FF EX CIP051	A5	4	8	414	Replace Pipeline	Near-Term	Raegan Way between Talbot Avenue and Alderbrook Drive	\$ 160	\$ 66,000	\$ 107,000
FF EX CIP051	A5	6	8	677	Replace Pipeline	Near-Term	Gilbert Drive between Montgomery Drive and Leonard Avenue	\$ 160	\$ 108,000	\$ 175,000
FF EX CIP052	A5	4	8	298	Replace Pipeline	Near-Term	Doctors Park Dr, east side of loop north of Spring Creek Drive	\$ 160	\$ 48,000	\$ 78,000
FF EX CIP052	A5	6	8	951	Replace Pipeline	Near-Term	Church Street between Sonoma Avenue and Spring Creek Drive	\$ 160	\$ 152,000	\$ 246,000
FF EX CIP053	A5	6	8	206	Replace Pipeline	Near-Term	Vallejo Street between Mt Olive Drive and Melbrook Way (East)	\$ 160	\$ 33,000	\$ 53,000
FF EX CIP053	A5	6	8	804	Replace Pipeline	Near-Term	Vallejo Street between Melbrook Way (East) and Melbrook Way (West)	\$ 160	\$ 129,000	\$ 209,000
FF EX CIP053	A5	6	12	156	Replace Pipeline	Near-Term	Vallejo Street between Farmers Lane and Mt Olive Drive	\$ 221	\$ 35,000	\$ 57,000
FF EX CIP053	A5		12	422	New Pipeline	Near-Term	Farmers Lane between Hoen Avenue and Vallejo Street	\$ 221	\$ 93,000	\$ 151,000
FF EX CIP053	A5	6	12	666	Replace Pipeline	Near-Term	Mt Olive Drive between Vallejo Street and Mt Olive Court	\$ 221	\$ 147,000	\$ 238,000
FF EX CIP054	A5	4	8	46	Replace Pipeline	Near-Term	Gray Court at Sonoma Avenue	\$ 160	\$ 7,000	\$ 11,000
FF EX CIP061	A6	6	8	625	Replace Pipeline	Near-Term	Aston Ave from Hendley St to Miras Ln	\$ 160	\$ 100,000	\$ 162,000

Table F-1. Summary of Probable Construction Costs for Near-Term Capital Improvements ^(a,b)

CIP Group	Pressure Zone	Existing Diameter	New Diameter	Quantity, ft	Improvement Type	Timeframe Required	Location	Unit Cost	Estimated Construction Cost ^(c)	Capital Cost (includes mark-ups) ^(c,d)
FF EX CIP921	A8	6	8	440	Replace Pipeline	Near-Term	Valley Oaks Dr from Valley Lakes Dr to Valley Oaks PI	\$ 160	\$ 70,000	\$ 113,000
FF EX CIP922	A8	6	8	204	Replace Pipeline	Near-Term	Autumn Leaf Dr from Autumn Leaf PI to Mockingbird Dir	\$ 160	\$ 33,000	\$ 53,000
FF EX CIP923	A8	6	8	550	Replace Pipeline	Near-Term	Rockgreen PI from Fairfield Dr to loop	\$ 160	\$ 88,000	\$ 143,000
FF EX CIP923	A8	6	8	719	Replace Pipeline	Near-Term	Fairfield Dr from White Oak Dr to Rockgreen PI	\$ 160	\$ 115,000	\$ 186,000
FF EX CIP924	A8	6	8	431	Replace Pipeline	Near-Term	Greenfield Cir, north from Oakmont Dr (west of Deerfield Circle)	\$ 160	\$ 69,000	\$ 112,000
FF EX CIP926	A8	6	8	259	Replace Pipeline	Near-Term	Meadowridge Dr from Meadowridge Ct to Meadow Creek Ln	\$ 160	\$ 41,000	\$ 66,000
FF EX CIP926	A8	6	8	796	Replace Pipeline	Near-Term	Meadowridge Dr from Stonr Bridge Rd to Aspen Meadows Cir	\$ 160	\$ 127,000	\$ 206,000
FF EX CIP927	A8		8	623	New Pipeline	Near-Term	Woodgreen St from Oakmont Dr to Hydrant on Woodgreen St, creating loop for existing dead end on Woodgreen	\$ 160	\$ 100,000	\$ 162,000
Near-Term, Aqueduct Zone, Subtotal				20,653					\$ 3,378,000	\$ 5,472,000
Hillside Pressure Zones—Pipelines										
FF EX CIP132	R13	6	8	866	Replace Pipeline	Near-Term	Northwest of Pump Station S13	\$ 160	\$ 138,000	\$ 224,000
FF EX CIP331	R3	10	12	606	Replace Pipeline	Near-Term	Fountaingrove Parkway, east of Fir Ridge Drive.	\$ 221	\$ 134,000	\$ 217,000
FF EX CIP401	R4	12	16	25	Replace Pipeline	Near-Term	Del Rosa Ave between Sunrise Ave and Piedra Ln	\$ 283	\$ 7,000	\$ 11,000
FF EX CIP401	R4	12	16	125	Replace Pipeline	Near-Term	Del Rosa Ave between Sunrise Ave and Piedra Ln	\$ 283	\$ 35,000	\$ 57,000
FF EX CIP919	R13	6	8	757	Replace Pipeline	Near-Term	Northwest of Pump Station S13, beyond pipe replacement recommended in FF EX CIP132	\$ 160	\$ 121,000	\$ 196,000
FF EX CIP920	R13R1	6	8	524	Replace Pipeline	Near-Term	Coney Ct from Wild Oak Dr to end	\$ 160	\$ 84,000	\$ 136,000
FF EX CIP920	R13R1	6	8	984	Replace Pipeline	Near-Term	Wild Oak Dr from PRC 16 to Coney Ct	\$ 160	\$ 157,000	\$ 254,000
FF EX CIP925	R12	6	8	453	Replace Pipeline	Near-Term	Singing Woods Ln from Oak Mesa Dr to Cliffwood Dr	\$ 160	\$ 72,000	\$ 117,000
FF EX CIP925	R12	6	8	492	Replace Pipeline	Near-Term	Oak Mesa PI from Oak Mesa Dr to Singing Woods Ln	\$ 160	\$ 79,000	\$ 128,000
FF EX CIP925	R12	6	8	917	Replace Pipeline	Near-Term	Cliffwood Dr from Overlook Dr to Singing Woods Ln	\$ 160	\$ 147,000	\$ 238,000
FF EX CIP945	R10	8	16	215	Replace Pipeline	Near-Term	Woodview Dr from Westline Ct, northeast toward Reservoir R10	\$ 283	\$ 61,000	\$ 99,000
FF EX CIP945	R10	10	16	296	Replace Pipeline	Near-Term	Woodview Dr southeast from Reservoir R10	\$ 283	\$ 84,000	\$ 136,000
FF EX CIP945	R10	10	16	323	Replace Pipeline	Near-Term	Woodview Dr north from Reservoir R10	\$ 283	\$ 91,000	\$ 147,000
FF EX CIP945	R10	12	16	410	Replace Pipeline	Near-Term	Woodview Dr from Skycrest Way and Skycrest Dr	\$ 283	\$ 116,000	\$ 188,000
FF EX CIP945	R10	8	16	774	Replace Pipeline	Near-Term	Woodview Dr from Deer Hollow Ln to Westline Ct	\$ 283	\$ 219,000	\$ 355,000

Table F-1. Summary of Probable Construction Costs for Near-Term Capital Improvements ^(a,b)

CIP Group	Pressure Zone	Existing Diameter	New Diameter	Quantity, ft	Improvement Type	Timeframe Required	Location	Unit Cost	Estimated Construction Cost ^(c)	Capital Cost (includes mark-ups) ^(c,d)
FF EX CIP945	R10	12	16	1,659	Replace Pipeline	Near-Term	Woodview Dr between Reservoir R10 and Skycrest Way	\$ 283	\$ 469,000	\$ 760,000
FF EX CIP950	R4	6	8	92	Replace Pipeline	Near-Term	Quail Ct, west from Los Olivos Ave	\$ 160	\$ 15,000	\$ 24,000
FF EX CIP950	R4	6	8	348	Replace Pipeline	Near-Term	Los Olivos Ave between Manzanita Ave and Quail Ct	\$ 160	\$ 56,000	\$ 91,000
FF EX CIP951	R4				Hydrant Installation	Near-Term	Install a hydrant on Incline Dr to 16" main on Hidden Valley Dr	\$ 11,000	\$ 11,000	\$ 18,000
FF EX CIP952	R4	6	12	752	Replace Pipeline	Near-Term	Cobblestone Dr	\$ 221	\$ 166,000	\$ 269,000
FF EX CIP952	R4	8	12	821	Replace Pipeline	Near-Term	Cobblestone Dr	\$ 221	\$ 182,000	\$ 295,000
FF EX CIP952	R4	6	12	947	Replace Pipeline	Near-Term	Cobblestone Dr	\$ 221	\$ 210,000	\$ 340,000
FF EX CIP952	R4R1	6	12	133	Replace Pipeline	Near-Term	Deer Park Dr, southwest from Shallow Creek Dr toward Sleepy Hollow Dr	\$ 221	\$ 29,000	\$ 47,000
FF EX CIP952	R4R1	8	12	156	Replace Pipeline	Near-Term	Bonita Vista Ln, between Sleepy Hollow Dr and Bonnie Ln	\$ 221	\$ 35,000	\$ 57,000
FF EX CIP952	R4R1	8	12	160	Replace Pipeline	Near-Term	Bonita Vista Ln, north from Bonnie Ln	\$ 221	\$ 35,000	\$ 57,000
FF EX CIP952	R4R1	8	12	205	Replace Pipeline	Near-Term	Sleepy Hollow Dr from Bonita Vista Ln to Sleepy Hollow Ct	\$ 221	\$ 45,000	\$ 73,000
FF EX CIP952	R4R1	6	12	216	Replace Pipeline	Near-Term	Deer Park Dr, northeast from Sleepy Hollow Dr toward Shallow Creek Dr	\$ 221	\$ 48,000	\$ 78,000
FF EX CIP952	R4R1	8	12	237	Replace Pipeline	Near-Term	Sleepy Hollow Dr from Deer Park Dr to Aaron Dr	\$ 221	\$ 52,000	\$ 84,000
FF EX CIP952	R4R1	8	12	431	Replace Pipeline	Near-Term	Sleepy Hollow Dr from Deer Park Dr to Sleepy Hollow Ct	\$ 221	\$ 95,000	\$ 154,000
FF EX CIP952	R4R1	8	12	478	Replace Pipeline	Near-Term	Sleepy Hollow Dr from Parker Hill Rd to Aaron Dr	\$ 221	\$ 106,000	\$ 172,000
FF EX CIP952	R4R1	8	12	618	Replace Pipeline	Near-Term	Bonita Vista Ln, from Chanate Rd to Bonnie Ln	\$ 221	\$ 137,000	\$ 222,000
FF EX CIP952	R4R1	8	12	740	Replace Pipeline	Near-Term	Bonita Vista Ln, south from Sleepy Hollow Dr	\$ 221	\$ 164,000	\$ 266,000
FF EX CIP952	R4	10	16	191	Replace Pipeline	Near-Term	Chanate Rd	\$ 283	\$ 54,000	\$ 87,000
FF EX CIP952	R4	10	16	193	Replace Pipeline	Near-Term	Chanate Rd	\$ 283	\$ 55,000	\$ 89,000
FF EX CIP952	R4	10	16	270	Replace Pipeline	Near-Term	Chanate Rd	\$ 283	\$ 76,000	\$ 123,000
FF EX CIP952	R4	10	16	339	Replace Pipeline	Near-Term	Chanate Rd	\$ 283	\$ 96,000	\$ 156,000
FF EX CIP952	R4	10	16	372	Replace Pipeline	Near-Term	Chanate Rd	\$ 283	\$ 105,000	\$ 170,000
FF EX CIP952	R4	10	16	392	Replace Pipeline	Near-Term	Chanate Rd	\$ 283	\$ 111,000	\$ 180,000
FF EX CIP952	R4	10	16	762	Replace Pipeline	Near-Term	Chanate Rd	\$ 283	\$ 216,000	\$ 350,000
FF EX CIP953	R4R2	6	8	147	Replace Pipeline	Near-Term	Stonecrest Ct from Encina Ct to hydrant	\$ 160	\$ 24,000	\$ 39,000
FF EX CIP953	R4R2	6	8	235	Replace Pipeline	Near-Term	Miraloma Dr from Buena Vista Dr to Stonecrest Ct	\$ 160	\$ 38,000	\$ 62,000

Table F-1. Summary of Probable Construction Costs for Near-Term Capital Improvements ^(a,b)

CIP Group	Pressure Zone	Existing Diameter	New Diameter	Quantity, ft	Improvement Type	Timeframe Required	Location	Unit Cost	Estimated Construction Cost ^(c)	Capital Cost (includes mark-ups) ^(c,d)
FF EX CIP953	R4R2	6	8	281	Replace Pipeline	Near-Term	Miraloma Dr from Stonecrest Ct to Encina Ct	\$ 160	\$ 45,000	\$ 73,000
FF EX CIP953	R4R2	8	12	55	Replace Pipeline	Near-Term	Terra Linda Dr southeast from PRC 43	\$ 221	\$ 12,000	\$ 19,000
FF EX CIP953	R4R2	6	12	275	Replace Pipeline	Near-Term	Terra Linda Dr from Terra Linda Ct to Buena Vista Dr	\$ 221	\$ 61,000	\$ 99,000
FF EX CIP953	R4R2	6	12	1,039	Replace Pipeline	Near-Term	Terra Linda Dr between PRC 43 and Terra Linda Ct	\$ 221	\$ 230,000	\$ 373,000
FF EX CIP953	R4R2	6	12	1,353	Replace Pipeline	Near-Term	Buena Vista Dr from Terra Linda Dr to Miraloma Dr	\$ 221	\$ 300,000	\$ 486,000
Near-Term, Hillside Pressure Zones—Pipelines, Subtotal				21,664					\$ 4,823,000	\$ 7,816,000
Hillside Pressure Zones—Pump Stations										
OP EX CIP101	R10			1	Pump Station Generator	Near-Term	Install Onsite Generator at Pump Station S10	\$ 220,000	\$ 220,000	\$ 356,000
OP EX CIP333	R3			1	Pump Station Generator	Near-Term	Install Onsite Generator at Pump Station S3	\$ 220,000	\$ 220,000	\$ 356,000
FF EX CIP332 ^(e)	R3			2	Pump Improvement	Near-Term	Replace booster pumps at Station S3 with a firm pumping capacity of 1,500 gpm to mitigate fire flow deficiencies in R4 and R17 Pressure Zones. Cost Estimate is based on total pumping capacity of 3,000 gpm —2 pumps at 125 hp, 1,500 gpm and 195 feet of head.	\$ 102,659	\$ 205,000	\$ 332,000
FF EX CIP133	R13			3	Pump Improvement	Near-Term	Replace booster pumps at Station S13 with a firm pumping capacity of 1,500 gpm to mitigate fire flow deficiencies in R14 Pressure Zone. Cost Estimate is based on total pumping capacity of 2,250 gpm—3 pumps at 100 hp, 750 gpm and 320 feet of head.	\$ 82,127	\$ 246,000	\$ 399,000
FF EX CIP141	R14			3	Pump Improvement	Near-Term	Replace booster pumps at Station S14 with a firm pumping capacity of 1,500 gpm to mitigate fire flow deficiencies in R14 Pressure Zone. Cost Estimate is based on total pumping capacity of 2,250 gpm—3 pumps at 75 hp, 750 gpm and 265 feet of head.	\$ 61,595	\$ 185,000	\$ 300,000
Near-Term, Hillside Pressure Zones—Pump Station Improvement Subtotal									\$ 1,076,000	\$ 1,743,000
Near-Term, All Zones, Total				42,317					9,277,000	15,031,000

^(a) Costs shown are based on historical values compiled from various pipeline projects and other cities' bid tabs, scaled to March 2014 dollars with an ENR CCI of 9702 (20 City Average).

^(b) Recommended groundwater wells are not included in this table because their specific location (pressure zone) has not been determined yet.

^(c) Total cost is rounded to nearest \$1,000.

^(d) Costs include mark-ups equal to 62 percent (Construction Contingency: 20 percent of construction cost; Professional Services: 35 percent of construction cost plus 35 percent of construction contingencies).

^(e) Cost estimate is for replacement of pumps only, and therefore differs from the cost estimate presented for the pump station in Appendix B (2/16/2012 TM), which included costs for upgrading the entire pump station.

Table F-2. Summary of Probable Construction Costs for Intermediate-Term and Buildout Capital Improvements ^(a,b)

CIP Group	Pressure Zone	Existing Diameter	New Diameter	Quantity, ft	Improvement Type	Timeframe Required	Location	Unit Cost	Estimated Construction Cost ^(c)	Capital Cost (includes mark-ups) ^(c,d)	Timeframe Required	2020 Cost to City Customers	2025 Cost to City Customers	Buildout Cost to City Customers	Cost Allocation to Existing City Customers ^(e)	Cost Allocation to Future City Customers ^(e)	Total Cost to City Customers
Intermediate Timeframe, Aqueduct Pressure Zone																	
FF IM CIP915	A6	6	8	479	Replace Pipeline	Intermediate	Aston Ave from Petaluma Hill Rd to John Richards Way	\$ 160	\$ 77,000	\$ 125,000	2025		\$ 125,000		\$ 70,313	\$ 54,688	\$ 125,000
FF IM CIP916	A1	6	8	243	Replace Pipeline	Intermediate	Apache St from W. Steele Ln to Huron Ct	\$ 160	\$ 39,000	\$ 63,000	2025		\$ 63,000		\$ 35,438	\$ 27,563	\$ 63,000
FF IM CIP916	A1	6	8	483	Replace Pipeline	Intermediate	Apple Valley Ln from W. Steele Ln to Rockwood Ct	\$ 160	\$ 77,000	\$ 125,000	2025		\$ 125,000		\$ 70,313	\$ 54,688	\$ 125,000
FF IM CIP917	A4	6	8	338	Replace Pipeline	Intermediate	Schuman Dr from Mendocino Ave to Rowe Dr	\$ 160	\$ 54,000	\$ 87,000	2025		\$ 87,000		\$ 48,938	\$ 38,063	\$ 87,000
FF IM CIP917	A4	6	8	429	Replace Pipeline	Intermediate	Meyers Dr from Steele Ln to Young Dr	\$ 160	\$ 69,000	\$ 112,000	2025		\$ 112,000		\$ 63,000	\$ 49,000	\$ 112,000
FF IM CIP918	A1	6	8	902	Replace Pipeline	Intermediate	McBride Ln from W. Steele Ln toward Terry Ln	\$ 160	\$ 144,000	\$ 233,000	2025		\$ 233,000		\$ 131,063	\$ 101,938	\$ 233,000
Intermediate Timeframe, Aqueduct Subtotal				2,874					\$ 460,000	\$ 745,000		\$ -	\$ 745,000	\$ -	\$ 419,063	\$ 325,938	\$ 745,000
Intermediate Timeframe, Hillside Pressure Zones																	
FF IM CIP928	R9R1	6	8	204	Replace Pipeline	Intermediate	Tachevah Dr from Bethards DR to Woodlake Dr	\$ 160	\$ 33,000	\$ 53,000	2020	\$ 53,000			\$ 29,813	\$ 23,188	\$ 53,000
FF IM CIP928	R9R1	6	8	395	Replace Pipeline	Intermediate	Woodlake Dr from Tachevah Dr entrance road to southeast.	\$ 160	\$ 63,000	\$ 102,000	2020	\$ 102,000			\$ 57,375	\$ 44,625	\$ 102,000
FF IM CIP929	R9R1	6	8	337	Replace Pipeline	Intermediate	Knolls Dr from Tachevah Dr to Knolls Hills Cir (northwest)	\$ 160	\$ 54,000	\$ 87,000	2020	\$ 87,000			\$ 48,938	\$ 38,063	\$ 87,000
FF IM CIP929	R9R1	6	8	348	Replace Pipeline	Intermediate	Knolls Hills Cir from Knolls Dr (northwest) to Hydrant	\$ 160	\$ 56,000	\$ 91,000	2020	\$ 91,000			\$ 51,188	\$ 39,813	\$ 91,000
FF IM CIP930	R9R1	6	8	119	Replace Pipeline	Intermediate	Ronne Dr between Deer Run and Neotomas Ave.	\$ 160	\$ 19,000	\$ 31,000	2020	\$ 31,000			\$ 17,438	\$ 13,563	\$ 31,000
FF IM CIP930	R9R1		8	277	New Pipeline	Intermediate	Ronne Dr between Deer Run and Neotomas Ave, completing loop	\$ 160	\$ 44,000	\$ 71,000	2020	\$ 71,000			\$ 35,500	\$ 35,500	\$ 71,000
FF IM CIP930	R9R1	6	8	419	Replace Pipeline	Intermediate	Townview Ave from Post Ranch Rd to Ronne Rd	\$ 160	\$ 67,000	\$ 109,000	2020	\$ 109,000			\$ 61,313	\$ 47,688	\$ 109,000
FF IM CIP930	R9R1	6	8	481	Replace Pipeline	Intermediate	Post Ranch Rd from Neotomas Ave to Townview Ave	\$ 160	\$ 77,000	\$ 125,000	2020	\$ 125,000			\$ 70,313	\$ 54,688	\$ 125,000
FF IM CIP931	R9R1	6	8	640	Replace Pipeline	Intermediate	Sidney Sq from Creekside Rd to end	\$ 160	\$ 102,000	\$ 165,000	2020	\$ 165,000			\$ 92,813	\$ 72,188	\$ 165,000
FF IM CIP932	R6R1	6	8	208	Replace Pipeline	Intermediate	Mayette Ave from Wanda Way to Albert Dr	\$ 160	\$ 33,000	\$ 53,000	2020	\$ 53,000			\$ 29,813	\$ 23,188	\$ 53,000
FF IM CIP933	R6R1	4	8	672	Replace Pipeline	Intermediate	Matanzas Way from Hahman Dr to Rock Creek Dr	\$ 160	\$ 107,000	\$ 173,000	2020	\$ 173,000			\$ 43,250	\$ 129,750	\$ 173,000
FF IM CIP934	R6R1	6	8	223	Replace Pipeline	Intermediate	Mayette Ave from Elkhorn Ct to Caribou Ct	\$ 160	\$ 36,000	\$ 58,000	2020	\$ 58,000			\$ 32,625	\$ 25,375	\$ 58,000
FF IM CIP934	R6R1	6	8	242	Replace Pipeline	Intermediate	Mayette Ave from Impala Ct to Kodiak Ct	\$ 160	\$ 39,000	\$ 63,000	2020	\$ 63,000			\$ 35,438	\$ 27,563	\$ 63,000
FF IM CIP934	R6R1	6	8	269	Replace Pipeline	Intermediate	Mayette Ave from Evans Dr to Yulupa Ave	\$ 160	\$ 43,000	\$ 70,000	2020	\$ 70,000			\$ 39,375	\$ 30,625	\$ 70,000
FF IM CIP934	R6R1	6	8	302	Replace Pipeline	Intermediate	Mayette Ave from Kodiak Ct to Elkhorn Ct	\$ 160	\$ 48,000	\$ 78,000	2020	\$ 78,000			\$ 43,875	\$ 34,125	\$ 78,000
FF IM CIP934	R6R1	6	8	317	Replace Pipeline	Intermediate	Mayette Ave from Caribou Ct to Evans Dr	\$ 160	\$ 51,000	\$ 83,000	2020	\$ 83,000			\$ 46,688	\$ 36,313	\$ 83,000
FF IM CIP934	R6R1	6	8	426	Replace Pipeline	Intermediate	Mayette Ave from Princeton Way to Impala Ct	\$ 160	\$ 68,000	\$ 110,000	2020	\$ 110,000			\$ 61,875	\$ 48,125	\$ 110,000
FF IM CIP934	R6R1	6	8	815	Replace Pipeline	Intermediate	Princeton Way from Mayette Ave north to first cul de sac	\$ 160	\$ 130,000	\$ 211,000	2020	\$ 211,000			\$ 118,688	\$ 92,313	\$ 211,000
FF IM CIP935	R9R1	6	8	131	Replace Pipeline	Intermediate	Stonehedge DR from Glencannons St toward Westminster Pl	\$ 160	\$ 21,000	\$ 34,000	2020	\$ 34,000			\$ 19,125	\$ 14,875	\$ 34,000
FF IM CIP935	R9R1	6	8	277	Replace Pipeline	Intermediate	Hoen Ave from Rockmeadow Pl to Glencannon St	\$ 160	\$ 44,000	\$ 71,000	2020	\$ 71,000			\$ 39,938	\$ 31,063	\$ 71,000
FF IM CIP935	R9R1	6	8	372	Replace Pipeline	Intermediate	Hoen Ave from Burlington Pl to Rockmeadow Pl	\$ 160	\$ 59,000	\$ 96,000	2020	\$ 96,000			\$ 54,000	\$ 42,000	\$ 96,000
FF IM CIP935	R9R1	6	8	397	Replace Pipeline	Intermediate	Hoen Ave from Eliggi Ct to Burlington Pl	\$ 160	\$ 63,000	\$ 102,000	2020	\$ 102,000			\$ 57,375	\$ 44,625	\$ 102,000
FF IM CIP935	R9R1	4	8	569	Replace Pipeline	Intermediate	Devonshire Pl from Stonehedge Dr to end	\$ 160	\$ 91,000	\$ 147,000	2020	\$ 147,000			\$ 36,750	\$ 110,250	\$ 147,000

Table F-2. Summary of Probable Construction Costs for Intermediate-Term and Buildout Capital Improvements ^(a,b)

CIP Group	Pressure Zone	Existing Diameter	New Diameter	Quantity, ft	Improvement Type	Timeframe Required	Location	Unit Cost	Estimated Construction Cost ^(c)	Capital Cost (includes mark-ups) ^(c,d)	Timeframe Required	2020 Cost to City Customers	2025 Cost to City Customers	Buildout Cost to City Customers	Cost Allocation to Existing City Customers ^(e)	Cost Allocation to Future City Customers ^(e)	Total Cost to City Customers
FF IM CIP936	R6R1	6	8	283	Replace Pipeline	Intermediate	Midway Dr, east from Yulupa Ave	\$ 160	\$ 45,000	\$ 73,000	2020	\$ 73,000			\$ 41,063	\$ 31,938	\$ 73,000
FF IM CIP936	R6R1	6	8	290	Replace Pipeline	Intermediate	Yulupa Ave from Midway Dr to Magowan Dr	\$ 160	\$ 46,000	\$ 75,000	2020	\$ 75,000			\$ 42,188	\$ 32,813	\$ 75,000
FF IM CIP936	R6R1	6	8	291	Replace Pipeline	Intermediate	Yulupa Ave from Magowan Dr to Sonoma Ave	\$ 160	\$ 47,000	\$ 76,000	2020	\$ 76,000			\$ 42,750	\$ 33,250	\$ 76,000
FF IM CIP936	R6R1	6	8	311	Replace Pipeline	Intermediate	Yulupa Ave from Montgomery Dr to Midway Dr	\$ 160	\$ 50,000	\$ 81,000	2020	\$ 81,000			\$ 45,563	\$ 35,438	\$ 81,000
FF IM CIP936	R6R1	4	8	637	Replace Pipeline	Intermediate	Magowan Dr between Franquette Ave and Yulupa Ave	\$ 160	\$ 102,000	\$ 165,000	2020	\$ 165,000			\$ 41,250	\$ 123,750	\$ 165,000
FF IM CIP937	R6	6	8	290	Replace Pipeline	Intermediate	Randall Ln	\$ 160	\$ 46,000	\$ 75,000	2020	\$ 75,000			\$ 42,188	\$ 32,813	\$ 75,000
FF IM CIP938	R6	6	8	575	Replace Pipeline	Intermediate	Bridle Trl from Jackson Dr toward Montgomery Ln	\$ 160	\$ 92,000	\$ 149,000	2020	\$ 149,000			\$ 83,813	\$ 65,188	\$ 149,000
FF IM CIP939	R6	6	8	315	Replace Pipeline	Intermediate	Culebra Ave from Mission Blvd to Primavera Dr	\$ 160	\$ 50,000	\$ 81,000	2020	\$ 81,000			\$ 45,563	\$ 35,438	\$ 81,000
FF IM CIP939	R6	6	8	469	Replace Pipeline	Intermediate	Culebra Ave from Primavera Dr to Las Raposas Ct	\$ 160	\$ 75,000	\$ 122,000	2020	\$ 122,000			\$ 68,625	\$ 53,375	\$ 122,000
FF IM CIP940	R7	6	8	663	Replace Pipeline	Intermediate	Del Monte Ct from St. Francis Rd to end	\$ 160	\$ 106,000	\$ 172,000	2020	\$ 172,000			\$ 96,750	\$ 75,250	\$ 172,000
FF IM CIP941	R6	6	8	430	Replace Pipeline	Intermediate	Bridgewood Dr from Greenmeadow Dr to first hydrant toward Eastside Ct	\$ 160	\$ 69,000	\$ 112,000	2020	\$ 112,000			\$ 63,000	\$ 49,000	\$ 112,000
FF IM CIP941	R6	6	8	1,096	Replace Pipeline	Intermediate	Fistor Dr from Brush Creek Rd to Cox Dr	\$ 160	\$ 175,000	\$ 284,000	2020	\$ 284,000			\$ 159,750	\$ 124,250	\$ 284,000
BO IM CIP960 ^(f)	R9		12	2,228	New Pipeline	Intermediate	Farmers Lane Extension	\$ 221	\$ 493,000	\$ 799,000	2025 ^(f)						\$ -
BO IM CIP960 ^(f)	R9		16	2,707	New Pipeline	Intermediate	Farmers Lane Extension	\$ 283	\$ 766,000	\$ 1,241,000	2025 ^(f)						\$ -
BO IM CIP960 ^(f)	R11		12	210	New Pipeline	Intermediate	Farmers Lane Extension	\$ 221	\$ 46,000	\$ 75,000	2025 ^(f)						\$ -
BO IM CIP960 ^(f)	R9		12	97	New Pipeline	Intermediate	Future Emergency Pump Station S9B Discharge Pipelines	\$ 221	\$ 21,000	\$ 34,000	2025 ^(f)						\$ -
BO IM CIP960 ^(f)	R9		16	64	New Pipeline	Intermediate	Future Emergency Pump Station S9B Discharge Pipelines	\$ 283	\$ 18,000	\$ 29,000	2025 ^(f)						\$ -
BO IM CIP960 ^(f)	R11		12	88	New Pipeline	Intermediate	Future Emergency Pump Station S9B Suction Pipelines	\$ 221	\$ 19,000	\$ 31,000	2025 ^(f)						\$ -
BO IM CIP961	R9				New Pump Station	Intermediate	Construct new Emergency Pump Station S9B with a firm pumping capacity of 3,500 gpm to support demand in R9 Pressure Zone. ^(g)	\$ -	\$ 1,800,000	\$ 2,916,000	2025	\$ -	\$ 2,916,000	\$ -		\$ 2,916,000	\$ 2,916,000
Intermediate Timeframe Hillside Subtotal				19,484					\$ 5,414,000	\$ 8,773,000		\$ 3,648,000	\$ 2,916,000	\$ -	\$ 1,896,000	\$ 4,668,000	\$ 6,564,000
Intermediate Timeframe, All Zones, Subtotal				22,358					\$ 5,874,000	\$ 9,518,000		\$ 3,648,000	\$ 3,661,000	\$ -	\$ 2,315,063	\$ 4,993,938	\$ 7,309,000

Table F-2. Summary of Probable Construction Costs for Intermediate-Term and Buildout Capital Improvements ^(a,b)

CIP Group	Pressure Zone	Existing Diameter	New Diameter	Quantity, ft	Improvement Type	Timeframe Required	Location	Unit Cost	Estimated Construction Cost ^(c)	Capital Cost (includes mark-ups) ^(c,d)	Timeframe Required	2020 Cost to City Customers	2025 Cost to City Customers	Buildout Cost to City Customers	Cost Allocation to Existing City Customers ^(e)	Cost Allocation to Future City Customers ^(e)	Total Cost to City Customers
Buildout Timeframe, Aqueduct Pressure Zone																	
BO CIP900 ^(f)	A3		8	2,831	New Pipeline	Buildout	Price Ave from Merced Ave to S Wright Rd	\$ 160	\$ 453,000	\$ 734,000	2035 ^(f)						\$ -
BO CIP900 ^(f)	A3		12	610	New Pipeline	Buildout	Merced Ave from Chico Ave to Price Ave	\$ 221	\$ 135,000	\$ 219,000	2035 ^(f)						\$ -
BO CIP900 ^(f)	A3		12	810	New Pipeline	Buildout	Merced Ave from Price Ave to Miles Ave	\$ 221	\$ 179,000	\$ 290,000	2035 ^(f)						\$ -
BO CIP900 ^(f)	A3		12	983	New Pipeline	Buildout	S Wright Rd from Price Ave to Miles Ave	\$ 221	\$ 218,000	\$ 353,000	2035 ^(f)						\$ -
BO CIP900 ^(f)	A3		12	2,806	New Pipeline	Buildout	Miles Ave from Merced Ave to S Wright Rd	\$ 221	\$ 621,000	\$ 1,006,000	2035 ^(f)						\$ -
BO CIP900 ^(f)	A3		12	2,956	New Pipeline	Buildout	Chico Ave from S Wright Rd to Merced Ave	\$ 221	\$ 654,000	\$ 1,059,000	2035 ^(f)						\$ -
BO CIP901 ^(f)	A3		8	661	New Pipeline	Buildout	Finley Industrial Park	\$ 160	\$ 106,000	\$ 172,000	2035 ^(f)						\$ -
BO CIP901 ^(f)	A3		8	692	New Pipeline	Buildout	Yuba Dr from Fresno Ave toward Ash Dr	\$ 160	\$ 111,000	\$ 180,000	2035 ^(f)						\$ -
BO CIP901 ^(f)	A3		8	942	New Pipeline	Buildout	Yuba Dr from Ash Dr toward Fresno Ave	\$ 160	\$ 151,000	\$ 245,000	2035 ^(f)						\$ -
BO CIP901 ^(f)	A3		8	2,870	New Pipeline	Buildout	Yuba Dr from Stony Point Rd to Ash Dr	\$ 160	\$ 459,000	\$ 744,000	2035 ^(f)						\$ -
BO CIP901 ^(f)	A3		12	304	New Pipeline	Buildout	Finley Industrial Park	\$ 221	\$ 67,000	\$ 109,000	2035 ^(f)						\$ -
BO CIP901 ^(f)	A3		12	589	New Pipeline	Buildout	Finley Ave between Fresno Ave and Leddy Ave	\$ 221	\$ 130,000	\$ 211,000	2035 ^(f)						\$ -
BO CIP901 ^(f)	A3		12	684	New Pipeline	Buildout	Finley Industrial Park	\$ 221	\$ 152,000	\$ 246,000	2035 ^(f)						\$ -
BO CIP901 ^(f)	A3		12	706	New Pipeline	Buildout	Stony Point Rd from Ludwig Ave toward Yuba Dr	\$ 221	\$ 156,000	\$ 253,000	2035 ^(f)						\$ -
BO CIP901 ^(f)	A3		12	907	New Pipeline	Buildout	Fresno Ave from Yeager Dr to Yuba Dr	\$ 221	\$ 201,000	\$ 326,000	2035 ^(f)						\$ -
BO CIP901 ^(f)	A3		12	1,218	New Pipeline	Buildout	Finley Industrial Park	\$ 221	\$ 270,000	\$ 437,000	2035 ^(f)						\$ -
BO CIP901 ^(f)	A3		12	1,307	New Pipeline	Buildout	Fresno Ave from Yuba Dr to Ludwig Ave	\$ 221	\$ 289,000	\$ 468,000	2035 ^(f)						\$ -
BO CIP901 ^(f)	A3		12	1,725	New Pipeline	Buildout	Fresno Ave from Golden Gate Ave to Finley Ave; Finley Ave from Fresno Ave to west	\$ 221	\$ 382,000	\$ 619,000	2035 ^(f)						\$ -
BO CIP901 ^(f)	A3		12	1,949	New Pipeline	Buildout	Bellevue Ave - Stony Point Rd	\$ 221	\$ 431,000	\$ 698,000	2035 ^(f)						\$ -
BO CIP901 ^(f)	A3		12	2,435	New Pipeline	Buildout	Burbank Ave, north from Hearn Ave	\$ 221	\$ 539,000	\$ 873,000	2035 ^(f)						\$ -
BO CIP901 ^(f)	A3		12	2,462	New Pipeline	Buildout	S Wright Rd from Miles Ave to Madera Ave	\$ 221	\$ 545,000	\$ 883,000	2035 ^(f)						\$ -
BO CIP901 ^(f)	A3		12	2,956	New Pipeline	Buildout	Madera Ave from S Wright Rd to Yeager Dr	\$ 221	\$ 654,000	\$ 1,059,000	2035 ^(f)						\$ -
BO CIP901 ^(f)	A3		12	4,593	New Pipeline	Buildout	Ludwig Ave from Stony Point Rd to Fresno Ave	\$ 221	\$ 1,017,000	\$ 1,648,000	2035 ^(f)						\$ -
BO CIP901 ^(f)	A3		12	5,716	New Pipeline	Buildout	S Wright Rd from Madera Ave to Ludwig Ave, and Ludwig Ave from S Wright Rd to Fresno Ave	\$ 221	\$ 1,265,000	\$ 2,049,000	2035 ^(f)						\$ -
BO CIP906 ^(f)	A9		8	328	New Pipeline	Buildout	Pepperwood Rd from Bader Rd to Violetti Rd	\$ 160	\$ 52,000	\$ 84,000	2035 ^(f)						\$ -

Table F-2. Summary of Probable Construction Costs for Intermediate-Term and Buildout Capital Improvements ^(a,b)

CIP Group	Pressure Zone	Existing Diameter	New Diameter	Quantity, ft	Improvement Type	Timeframe Required	Location	Unit Cost	Estimated Construction Cost ^(c)	Capital Cost (includes mark-ups) ^(c,d)	Timeframe Required	2020 Cost to City Customers	2025 Cost to City Customers	Buildout Cost to City Customers	Cost Allocation to Existing City Customers ^(e)	Cost Allocation to Future City Customers ^(e)	Total Cost to City Customers
BO CIP906 ^(f)	A9		8	402	New Pipeline	Buildout	Violetti Rd from Pepperwood Rd to Bader Rd	\$ 160	\$ 64,000	\$ 104,000	2035 ^(f)						\$ -
BO CIP906 ^(f)	A9		8	487	New Pipeline	Buildout	Pepperwood Rd from Bader Rd, north toward Aleppo Dr	\$ 160	\$ 78,000	\$ 126,000	2035 ^(f)						\$ -
BO CIP906 ^(f)	A9		8	791	New Pipeline	Buildout	Bader Rd from Violetti Rd to Pepperwood Rd	\$ 160	\$ 126,000	\$ 204,000	2035 ^(f)						\$ -
BO CIP908 ^(f)	A6		12	1,054	New Pipeline	Buildout	Future E Bellevue Ave, east from end to Future Miller Rd	\$ 221	\$ 233,000	\$ 377,000	2035 ^(f)						\$ -
BO CIP908 ^(f)	A6		12	1,151	New Pipeline	Buildout	Future Miller Rd from Miller/Elsa to Future E Bellevue Ave	\$ 221	\$ 255,000	\$ 413,000	2035 ^(f)						\$ -
BO CIP908 ^(f)	A6		12	1,182	New Pipeline	Buildout	Bucks Rd from Santa Rosa Ave to Brooks Ave	\$ 221	\$ 262,000	\$ 424,000	2035 ^(f)						\$ -
BO CIP908 ^(f)	A6		12	1,213	New Pipeline	Buildout	E Robles Ave from Santa Rosa Ave to Brooks Ave	\$ 221	\$ 268,000	\$ 434,000	2035 ^(f)						\$ -
BO CIP908 ^(f)	A6		12	1,273	New Pipeline	Buildout	Future E Bellevue Ave from Miller Rd to Petaluma Hill Rd	\$ 221	\$ 282,000	\$ 457,000	2035 ^(f)						\$ -
BO CIP908 ^(f)	A6		12	1,327	New Pipeline	Buildout	Miller Dr end, through to Elsa Dr.	\$ 221	\$ 294,000	\$ 476,000	2035 ^(f)						\$ -
BO CIP908 ^(f)	A6		12	1,522	New Pipeline	Buildout	Miller Rd south of Winterhaven Ave	\$ 221	\$ 337,000	\$ 546,000	2035 ^(f)						\$ -
BO CIP908 ^(f)	A6		12	1,735	New Pipeline	Buildout	E Todd Rd, east from end	\$ 221	\$ 384,000	\$ 622,000	2035 ^(f)						\$ -
BO CIP908 ^(f)	A6		12	2,446	New Pipeline	Buildout	Brooks Ave from E Robles Ave to Bucks Rd	\$ 221	\$ 542,000	\$ 878,000	2035 ^(f)						\$ -
BO CIP908 ^(f)	A6		12	2,559	New Pipeline	Buildout	Future Rd from E Bellevue Ave to Magnolia Ave	\$ 221	\$ 567,000	\$ 919,000	2035 ^(f)						\$ -
BO CIP908 ^(f)	A6		12	2,842	New Pipeline	Buildout	Future Rd from Magnolia Ave to E Todd Rd	\$ 221	\$ 629,000	\$ 1,019,000	2035 ^(f)						\$ -
BO CIP908 ^(f)	A6		12	3,045	New Pipeline	Buildout	Magnolia Ave from Brooks Ave, east toward Petaluma Hill Rd	\$ 221	\$ 674,000	\$ 1,092,000	2035 ^(f)						\$ -
BO CIP909 ^(f)	A3		12	2,631	New Pipeline	Buildout	Moorland Ave from W Robles Ave to Todd Rd	\$ 221	\$ 583,000	\$ 944,000	2035 ^(f)						\$ -
BO CIP913	A1		8	1,219	New Pipeline	Buildout	Along Dennis Ln from Pascal St to Bluegrass Ln	\$ 160	\$ 195,000	\$ 316,000	2035			\$ 316,000		\$ 316,000	\$ 316,000
BO CIP914 ^(f)	A6		12	1,080	New Pipeline	Buildout	Petaluma Hill Rd from Kawana Springs Rd to Yolanda Ave	\$ 221	\$ 239,000	\$ 387,000	2035 ^(f)						\$ -
BO CIP914 ^(f)	A6		12	1,799	New Pipeline	Buildout	Franz Kafka Ave from Kawana Ter, south, then west to Petaluma Hill Rd	\$ 221	\$ 398,000	\$ 645,000	2035 ^(f)						\$ -
Buildout Timeframe, Aqueduct Zone, Developer-Funded				72,578					\$ 15,452,000	\$ 25,032,000		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Buildout Timeframe, Aqueduct Zone, City-Funded				1,219					\$ 195,000	\$ 316,000		\$ -	\$ -	\$ 316,000	\$ -	\$ 316,000	\$ 316,000
Buildout Timeframe, Aqueduct Zone, Subtotal				73,797					\$ 15,647,000	\$ 25,348,000		\$ -	\$ -	\$ 316,000	\$ -	\$ 316,000	\$ 316,000

Table F-2. Summary of Probable Construction Costs for Intermediate-Term and Buildout Capital Improvements ^(a,b)

CIP Group	Pressure Zone	Existing Diameter	New Diameter	Quantity, ft	Improvement Type	Timeframe Required	Location	Unit Cost	Estimated Construction Cost ^(c)	Capital Cost (includes mark-ups) ^(c,d)	Timeframe Required	2020 Cost to City Customers	2025 Cost to City Customers	Buildout Cost to City Customers	Cost Allocation to Existing City Customers ^(e)	Cost Allocation to Future City Customers ^(e)	Total Cost to City Customers
Buildout Timeframe, Hillside Pressure Zones																	
BO CIP902 ^(f)	R6		8	130	New Pipeline	Buildout	Wallace Rd from Ranchette Rd to Deer Trail Rd	\$ 160	\$ 21,000	\$ 34,000	2035 ^(f)						\$ -
BO CIP902 ^(f)	R6		8	279	New Pipeline	Buildout	Wallace Rd from Ranchette Rd toward Badger Rd	\$ 160	\$ 45,000	\$ 73,000	2035 ^(f)						\$ -
BO CIP902 ^(f)	R6		8	657	New Pipeline	Buildout	Wallace Rd from Deer Trail Rd to Future Rd	\$ 160	\$ 105,000	\$ 170,000	2035 ^(f)						\$ -
BO CIP902 ^(f)	R6		8	914	New Pipeline	Buildout	Future Rd north of Anderson Rd, from Ranchette Rd north to Future Rd	\$ 160	\$ 146,000	\$ 237,000	2035 ^(f)						\$ -
BO CIP902 ^(f)	R6		8	951	New Pipeline	Buildout	Future Rd from Wallace Rd to east.	\$ 160	\$ 152,000	\$ 246,000	2035 ^(f)						\$ -
BO CIP902 ^(f)	R6		8	1,004	New Pipeline	Buildout	Anderson Dr from Badger Rd to Ranchette Rd	\$ 160	\$ 161,000	\$ 261,000	2035 ^(f)						\$ -
BO CIP902 ^(f)	R6		8	1,083	New Pipeline	Buildout	Ranchette Rd from Anderson Dr to Wallace Rd	\$ 160	\$ 173,000	\$ 280,000	2035 ^(f)						\$ -
BO CIP902 ^(f)	R6		8	1,341	New Pipeline	Buildout	Future Rd north of Anderson Rd and Ranchette Rd, from Future Rd to Creekmont Ct	\$ 160	\$ 214,000	\$ 347,000	2035 ^(f)						\$ -
BO CIP902 ^(f)	R6		8	1,852	New Pipeline	Buildout	Wallace Rd from Future Rd to Creekmont Ct	\$ 160	\$ 296,000	\$ 480,000	2035 ^(f)						\$ -
BO CIP902 ^(f)	R6		8	2,247	New Pipeline	Buildout	Creekmont Ct	\$ 160	\$ 359,000	\$ 582,000	2035 ^(f)						\$ -
BO CIP902 ^(f)	R6		8	2,433	New Pipeline	Buildout	Deer Trail Rd	\$ 160	\$ 389,000	\$ 630,000	2035 ^(f)						\$ -
BO CIP902 ^(f)	R6		12	2,746	New Pipeline	Buildout	Harville Rd from Calistoga Rd to Baird Rd; Baird Rd from Harville Rd to Rincon Ave	\$ 221	\$ 608,000	\$ 985,000	2035 ^(f)						\$ -
BO CIP904 ^(f)	R7		12	575	New Pipeline	Buildout	Austin Rd, southwest of La Sierra Dr	\$ 221	\$ 127,000	\$ 206,000	2035 ^(f)						\$ -
BO CIP904 ^(f)	R7		12	614	New Pipeline	Buildout	Melita Rd from Hwy 12 to Kensington Rd	\$ 221	\$ 136,000	\$ 220,000	2035 ^(f)						\$ -
BO CIP904 ^(f)	R7		12	907	New Pipeline	Buildout	La Sierra Dr from Austin Rd to Los Alamos Rd; Los Alamos Rd from La Sierra Dr to Scotland Dr	\$ 221	\$ 201,000	\$ 326,000	2035 ^(f)						\$ -
BO CIP904 ^(f)	R7		12	1,142	New Pipeline	Buildout	Melita Rd from Melita Cr to Hwy 12	\$ 221	\$ 253,000	\$ 410,000	2035 ^(f)						\$ -
BO CIP904 ^(f)	R7		12	1,201	New Pipeline	Buildout	Unnamed way from Melita Rd and Kensington Rd to Austin Rd	\$ 221	\$ 266,000	\$ 431,000	2035 ^(f)						\$ -
BO CIP905 ^(f)	R8		8	738	New Pipeline	Buildout	Los Alamos Rd from Fawn Dr to Futura Way	\$ 160	\$ 118,000	\$ 191,000	2035 ^(f)						\$ -
BO CIP905 ^(f)	R8		8	848	New Pipeline	Buildout	Los Alamos Rd from Scotland Dr to Fawn Dr	\$ 160	\$ 136,000	\$ 220,000	2035 ^(f)						\$ -
BO CIP905 ^(f)	R8		8	1,019	New Pipeline	Buildout	Fawn Dr from Los Alamos Dr to Futura Way	\$ 160	\$ 163,000	\$ 264,000	2035 ^(f)						\$ -
BO CIP905 ^(f)	R8		12	404	New Pipeline	Buildout	Los Alamos Rd from Futura Way to Leggerini Rd	\$ 221	\$ 89,000	\$ 144,000	2035 ^(f)						\$ -
BO CIP905 ^(f)	R8		12	1,076	New Pipeline	Buildout	Leggerini Rd from Los Alamos Rd to Sunhawk Dr	\$ 221	\$ 238,000	\$ 386,000	2035 ^(f)						\$ -
BO CIP905 ^(f)	R8		12	1,166	New Pipeline	Buildout	Wildwood Trl, south	\$ 221	\$ 258,000	\$ 418,000	2035 ^(f)						\$ -
BO CIP905 ^(f)	R8		12	1,298	New Pipeline	Buildout	Wildwood Trl, north	\$ 221	\$ 287,000	\$ 465,000	2035 ^(f)						\$ -
BO CIP905 ^(f)	R8		12	1,477	New Pipeline	Buildout	Futura Way from Los Alamos Rd to Fawn Dr	\$ 221	\$ 327,000	\$ 530,000	2035 ^(f)						\$ -
BO CIP907 ^(f)	R11		8	282	New Pipeline	Buildout	Linwood Ave, east of Hibiscus Dr	\$ 160	\$ 45,000	\$ 73,000	2035 ^(f)						\$ -
BO CIP907 ^(f)	R11		12	1,063	New Pipeline	Buildout	Future Rd near Kawana Tank between Franz Kafka Ave and Kawana Springs Rd (west)	\$ 221	\$ 235,000	\$ 381,000	2035 ^(f)						\$ -
BO CIP907 ^(f)	R11		12	1,141	New Pipeline	Buildout	Franz Kafka Ave from Kawana Ter to south.	\$ 221	\$ 253,000	\$ 410,000	2035 ^(f)						\$ -
BO CIP907 ^(f)	R11		12	2,423	New Pipeline	Buildout	Future Rd near Kawana Tank between Franz Kafka Ave and Kawana Springs Rd (east)	\$ 221	\$ 537,000	\$ 870,000	2035 ^(f)						\$ -

Table F-2. Summary of Probable Construction Costs for Intermediate-Term and Buildout Capital Improvements ^(a,b)

CIP Group	Pressure Zone	Existing Diameter	New Diameter	Quantity, ft	Improvement Type	Timeframe Required	Location	Unit Cost	Estimated Construction Cost ^(c)	Capital Cost (includes mark-ups) ^(c,d)	Timeframe Required	2020 Cost to City Customers	2025 Cost to City Customers	Buildout Cost to City Customers	Cost Allocation to Existing City Customers ^(e)	Cost Allocation to Future City Customers ^(e)	Total Cost to City Customers
BO CIP910	R6		8	468	New Pipeline	Buildout	Maria Ln dead end to Santa Rosa Creek Dr; Santa Rosa Creek Dr from Maria Ln to S. Boas Dr	\$ 160	\$ 75,000	\$ 122,000	2035			\$ 122,000		\$ 122,000	\$ 122,000
BO CIP911	R7		8	405	New Pipeline	Buildout	Fairway Dr from Fairway Ct to dead end	\$ 160	\$ 65,000	\$ 105,000	2035			\$ 105,000		\$ 105,000	\$ 105,000
BO CIP911	R7		8	635	New Pipeline	Buildout	Fairway Dr from Hwy 12 to Fairway Ct	\$ 160	\$ 101,000	\$ 164,000	2035			\$ 164,000		\$ 164,000	\$ 164,000
BO CIP912 ^(f)	R4		8	187	New Pipeline	Buildout	Happy Valley Ct	\$ 160	\$ 30,000	\$ 49,000	2035 ^(f)						\$ -
BO CIP912 ^(f)	R4		8	321	New Pipeline	Buildout	Happy Valley Ave from Happy Valley Ct to Happy Valley Rd	\$ 160	\$ 51,000	\$ 83,000	2035 ^(f)						\$ -
BO CIP912 ^(f)	R4		8	412	New Pipeline	Buildout	Happy Valley Ave from Montecito Ave to Happy Valley Ct	\$ 160	\$ 66,000	\$ 107,000	2035 ^(f)						\$ -
BO CIP912 ^(f)	R4		8	477	New Pipeline	Buildout	Montecito Ave from Happy Valley Ave to Happy Valley Rd	\$ 160	\$ 76,000	\$ 123,000	2035 ^(f)						\$ -
BO CIP912 ^(f)	R4		8	494	New Pipeline	Buildout	Montecito Ave from Happy Valley Rd toward Zieber Rd	\$ 160	\$ 79,000	\$ 128,000	2035 ^(f)						\$ -
BO CIP912 ^(f)	R4		8	846	New Pipeline	Buildout	Montecito Ave from Ridgeway Dr to Happy Valley Ave	\$ 160	\$ 135,000	\$ 219,000	2035 ^(f)						\$ -
BO CIP912 ^(f)	R4		8	851	New Pipeline	Buildout	Happy Valley Rd from Happy Valley Ave to Montecito Ave	\$ 160	\$ 136,000	\$ 220,000	2035 ^(f)						\$ -
BO CIP912 ^(f)	R4		8	1,028	New Pipeline	Buildout	Ridgeview Dr from Montecito Ave toward Zieber Rd	\$ 160	\$ 164,000	\$ 266,000	2035 ^(f)						\$ -
BO CIP970	R7			3	Pump Improvement	Buildout	Replace booster pumps at Station S7 with a firm pumping capacity of 3,200 gpm to mitigate storage deficiencies in R7 Pressure Zone. Cost Estimate is based on total pumping capacity of 4,800 gpm—3 pumps at 100 hp, 1,600 gpm and 170 feet of head.	\$ 82,127	\$ 246,000	\$ 399,000	2035			\$ 399,000		\$ 399,000	\$ 399,000
BO CIP971	R17			2	Pump Improvement	Buildout	Replace booster pumps at Station S17 with a firm pumping capacity of 1,300 gpm to mitigate storage deficiencies in R17 Pressure Zone. Cost Estimate is based on total pumping capacity of 2,600 gpm—2 pumps at 100 hp, 1,300 gpm and 200 feet of head.	\$ 82,127	\$ 164,000	\$ 266,000	2035			\$ 266,000		\$ 266,000	\$ 266,000
Buildout Timeframe, Hillside Zones, Developer-Funded				37,627					\$ 7,077,000	\$ 11,465,000		\$ -	\$ -		\$ -	\$ -	\$ -
Buildout Timeframe, Hillside Zones, City-Funded				1,507					\$ 652,000	\$ 1,056,000		\$ -	\$ -	\$ 1,056,000	\$ -	\$ 1,056,000	\$ 1,056,000
Buildout Timeframe, Hillside Zones, Total				39,134					\$ 7,729,000	\$ 12,521,000		\$ -	\$ -	\$ 1,056,000	\$ -	\$ 1,056,000	\$ 1,056,000
Buildout Timeframe, All Zones, Developer-Funded				110,205					\$ 22,529,000	\$ 36,497,000		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Buildout Timeframe, All Zones, City-Funded				2,726					\$ 847,000	\$ 1,372,000		\$ -	\$ -	\$ 1,372,000	\$ -	\$ 1,372,000	\$ 1,372,000
Buildout Timeframe, All Zones, Total				112,931					\$ 23,376,000	\$ 37,869,000		\$ -	\$ -	\$ 1,372,000	\$ -	\$ 1,372,000	\$ 1,372,000
Buildout plus Intermediate, All Zones, Developer-Funded				110,205					\$ 23,893,000	\$ 38,706,000		\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Buildout plus Intermediate, All Zones, City-Funded				25,084					\$ 5,359,000	\$ 8,681,000		\$ 3,648,000	\$ 3,661,000	\$ 1,372,000	\$ 2,315,063	\$ 6,365,938	\$ 8,681,000
Buildout plus Intermediate, All Zones, Total				135,289					\$ 29,252,000	\$ 47,387,000		\$ 3,648,000	\$ 3,661,000	\$ 1,372,000	\$ 2,315,063	\$ 6,365,938	\$ 8,681,000

^(a) Costs shown are based on historical values compiled from various pipeline projects and other cities' bid tabs, scaled to March 2014 dollars with an ENR CCI of 9702 (20 City Average).

^(b) Recommended groundwater wells are not included in this table because their specific location (pressure zone) has not been determined yet.

^(c) Total cost is rounded to nearest \$1,000.

^(d) Costs include mark-ups equal to 62 percent (Construction Contingency: 20 percent of construction cost; Professional Services: 35 percent of construction cost plus 35 percent of construction contingencies).

^(e) Costs for Intermediate-Timeframe Pipeline Replacement projects are allocated to existing and future customers based on the increase in cross-sectional area of the pipeline. For example, for project FF IM CIP916, the recommendation is to replace the existing 6-inch pipeline with an 8-inch pipeline. The existing 6-inch pipeline has a cross-sectional area that is 56% of the cross-sectional area of an 8-inch pipeline, therefore 56% of the cost is allocated to existing customers, while the remaining 44% is allocated to future customers. For Intermediate-Timeframe projects recommending new pipelines or hydrants, the cost is divided equally between existing and future customers.

^(f) Costs for this project are not included in CIP because the project is within a City designated specific plan area or in a future development area and is expected to be fully funded and installed by the project proponents.

^(g) Cost estimate is based on a firm capacity of 3,500 gpm, in the context of industry cost data, cost curves, and construction costs for similar facilities. Estimate does not include land acquisition costs. Costs for demolition of Reservoir R9C are not included in CIP.