

SAFE & RELIABLE WATER FEASIBILITY STUDIES

- A. Consider the Approval of the City of Lindsay Well 11 Feasibility Study (pp. 194 – 230)
- B. Consider the Approval of the City of Lindsay Water Feasibility Study (pp. 231 – 283)
- C. Consider the Approval of Formation of a City Water Ad-Hoc Committee and Application (pp. 284 – 287)

FEASIBILITY STUDIES TIMELINE

Council Authorized P&P Consulting group to conduct the studies

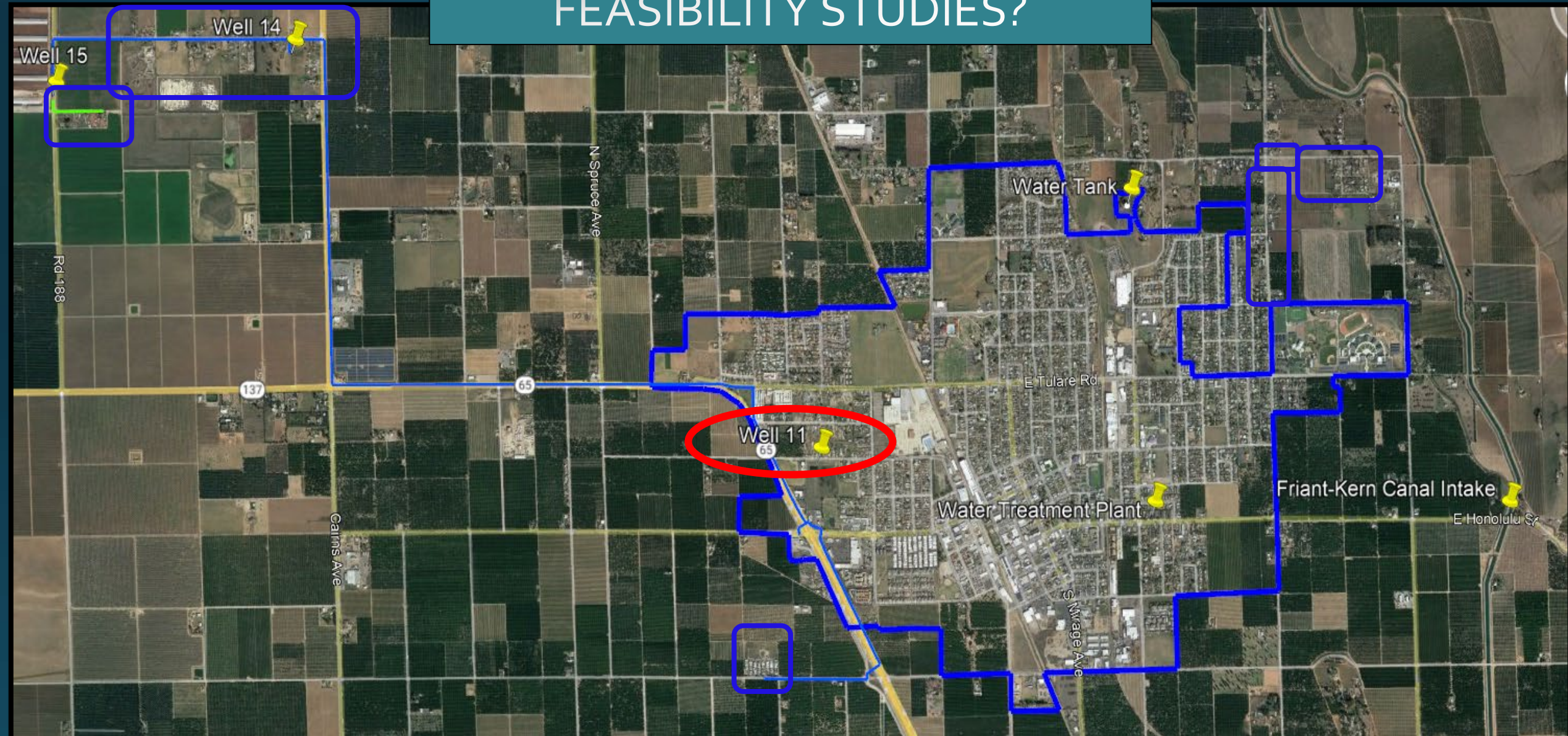


Council received both Draft studies

P&P Completed Studies and submitted to Staff for review

Delayed Council Presentation due to Flooding

WELL 11 vs WATER FEASIBILITY STUDIES?



11.3A. WELL 11 FEASIBILITY STUDY

WELL DESCRIPTION

- Drilled 1980
- 668' deep
- 150' sanitary seal
- Perforated from 300' to 550'
- 125 HP Submersible Pump
- Flow Rate 1,400 gpm
- Hydropneumatics pressure tank

CONTAMINANTS TO MITIGATE

- Perchlorate
- Nitrate

MITIGATION

- **Non-Treatment Alternatives**
 - Consolidation of the Water System
 - Well Modification or Replacement
 - Blending of Water sources
 - Surface Water
- **Treatment Alternatives**
 - Reverse Osmosis
 - Biological Treatment
 - Ion Exchange

RECOMMENDED TREATMENT

ION EXCHANGE TREATMENT PROCESS

STAGE 1

Ion Exchange for **Perchlorate**

Small volume of waste thru backwashing

Nonhazardous

Discharged into the basin

STAGE 2

Ion Exchange for **Nitrate**

Waste Brine

Nonhazardous-very high in TDS (i.e. Salt)

A. Off-Site Evaporation Brine Disposal

B. On-Site Evaporation Lined Pond



COSTS

ION EXCHANGE TREATMENT PROCESS

CAPITAL

OPERATIONAL & MAINTENANCE

				Water Produced (MG/Year)			
	<u>Fixed Cost</u>	+	<u>Variable Cost*</u>	=	<u>100</u>	or	<u>250</u>
\$5,943,000 (Evaporation Ponds)	\$119,690/year		\$1.06/kgal	=	\$225,650 (\$2.26/kgal)		\$384,690 (\$1.53/kgal)
\$5,043,000 (Off-Site Brine Disposal)	\$107,690/year		\$2.09/kgal	=	\$316,690 (\$3.17/kgal)		\$630,190 (\$2.52/kgal)

*Variable Cost=Power, perchlorate Resin, Salt, Solids Disposal

IMPORTANCE OF WELL 11

- ✓ Access to Clean and Safe Water
- ✓ Secure and Reliability Water Source
- ✓ Control over Water Quality
- ✓ Potential Cost Savings
- ✓ Less Environmental Challenges

FISCAL IMPACT

Budget \$25,000

Spent to Date \$18,115.20

Funding Source: The City was awarded a Technical Assistance Grant for planning Purposes through the Safe and Affordable Funding for Equity and Resilience Program (SAFER). This grant will cover the cost of the study as well as the Plans, Specifications, & Estimate (PS&E) package.

RECOMMENDATION

City Staff recommends and requests that the City Council approve the Well 11 Feasibility Study, its findings and recommendations

11.3B WATER FEASIBILITY STUDY

PURPOSE

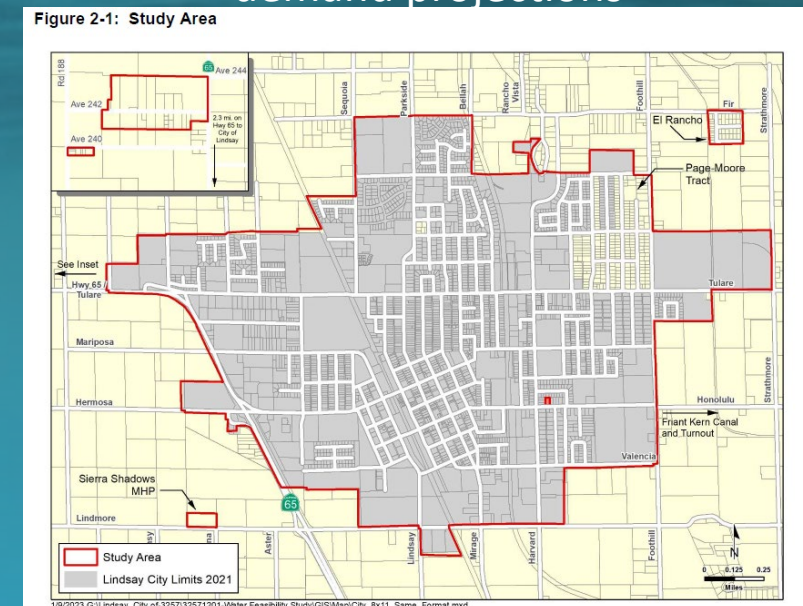
- Potential Water Supply Shortage
- Explore alternatives
- **Schedule of Improvements to mitigate shortage and ensure Safe and reliable drinking water**

OBJECTIVES

- Assess the current state of the water system.
- Identify challenges and limitations.
- Evaluate potential solutions.
- Determine the feasibility of implementing recommended solutions

METHODOLOGY

- Data collection
- Technical analysis:
 - Assess infrastructure
 - water quality
 - demand projections



EVALUATION OF THE WATER SYSTEM

✓ Water System Demand

- ❖ Historic Supply and demand numbers
- ❖ Future Demands:
 - Scenario 1 - Indoor water Use Conservation Requirements
 - Scenario 2 - 15% per capita demand reduction
 - Scenario 3 - "Status quo" without any implemented water conservation

✓ Water System Supply

- ❖ Evaluation
 - ❖ Winter –When surface water supply is not available due to maintenance/no allocation
 - ❖ Summer – When surface water supply is available but not enough to meet demand

✓ Surface Water Treatment Facility

- ❖ Water thru USBR allocations
- ❖ Current Operations
- ❖ Deficiencies

✓ Distribution System-

- ❖ Evaluated using Computer model to simulate the operation of the system
- ❖ Identified Areas with Substandard Operating Pressures
- ❖ Recommendations for Water Main Improvements

✓ Storage System

- ❖ Sufficient available storage volume

DIFICIENCIES

✓ Water Treatment System

❖ Water Supply

- USBR Allocations
- Well 14 & 15
- Projects Identified

❖ Contact Clarifier

- ✓ Retrofit or Upgraded

❖ Disinfecting By Products (DBP) MCL exceedance

- ✓ Project Identified

✓ Water Distribution System

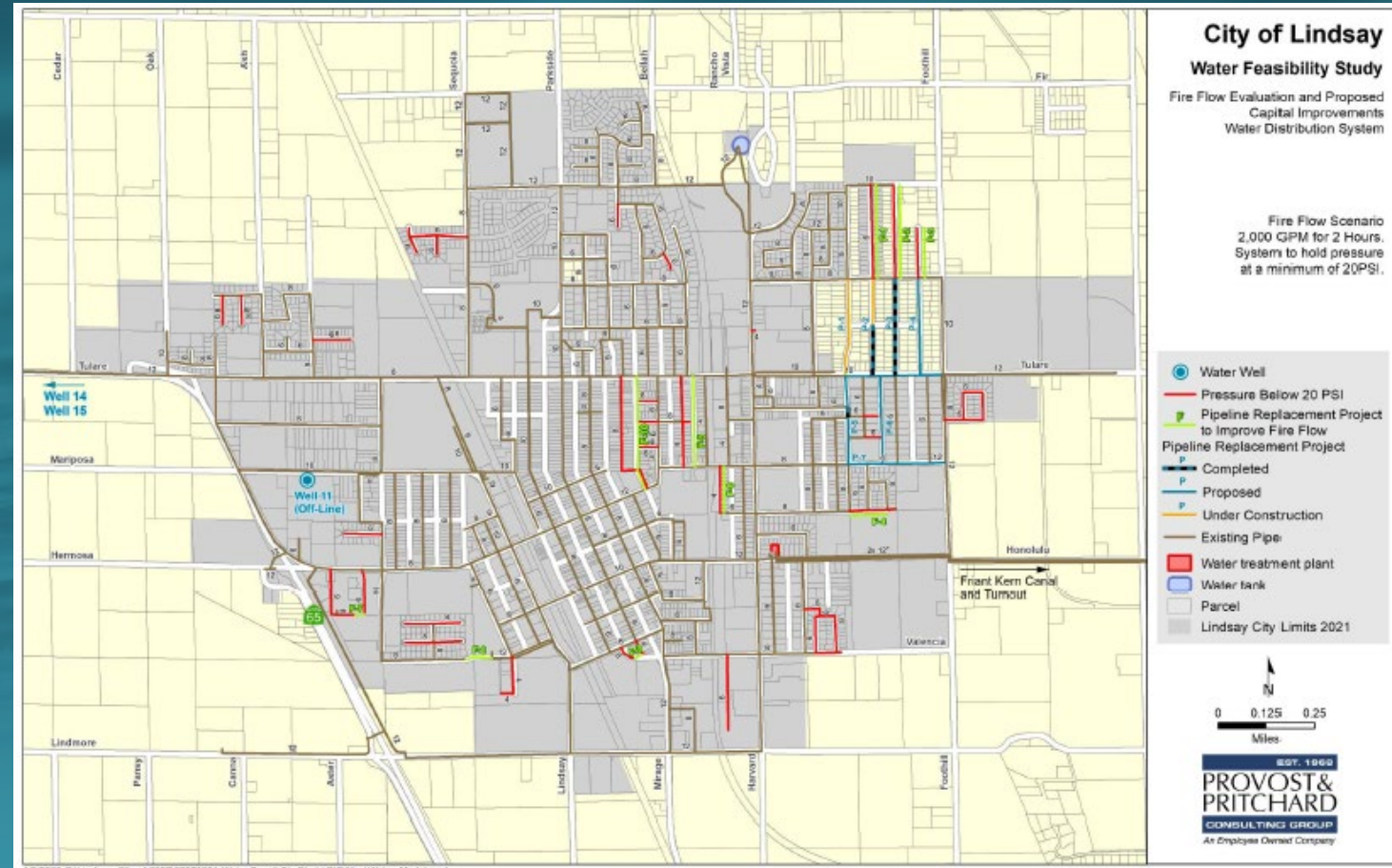
❖ Aging Infrastructure

- ❖ Not meeting fire flow requirements due to pipe size

❖ Projects Identified

✓ Storage System

❖ None



SOLUTIONS

Project No.	Project Type	Project Description	Notes	Project Limits	Project Specifics				Project Timing						Estimated Grand Total	Possible Funding Source
					Ex. Size/	New Size/	Replace/	Length	2023-2024	2024-2025	2026-2026	2028-2027	2027-2028	2028-2029		
PIPELINES PROJECTS																
Pipelines																
Varies (See Table 3-11)	C	Main Line Replacement/ Dead End Elimination	1, 2	TBD	8 in	8 in				\$300,000	\$988,000	\$988,000	\$988,000	\$988,000	\$6,916,000	Enterprise
Groundwater Wells																
GW-1	C	Drinking Water Test Well #1	1	TBD			New		\$300,000						\$300,000	Enterprise
GW-2	C	New Well #1 (Winter Demand)	2, 4	TBD		850 gpm	New			\$2,220,000					\$2,220,000	Enterprise
GW-3	C	New Well #1 Infrastructure	2	TBD			New			\$2,700,000					\$2,700,000	Enterprise
GW-4	C	Drinking Water Test Well #2	1	TBD			New				\$300,000				\$300,000	Enterprise
GW-5	C	New Well #2 (Winter Demand)	2,4	TBD		1,000 gpm	New				\$2,220,000				\$2,220,000	Enterprise
GW-6	C	New Well #2 Infrastructure	2	TBD							\$2,700,000				\$2,700,000	Enterprise
GW-7	C	Drinking Water Test Well	1	TBD								\$300,000			\$300,000	Enterprise
GW-8	C	Replacement Well	2, 3	TBD		750 gpm	Replace						\$2,220,000		\$2,220,000	Enterprise
GW-9	C	New Well #3 (Winter Demand)	2, 3, 5	TBD		750 gpm	New							\$2,220,000	\$2,220,000	Enterprise
GW-10	C	New Well #3 Infrastructure	2	TBD			New							\$2,700,000	\$2,700,000	Enterprise
GW-11	C	Harvard Park Irrigation Well	1	TBD			New							\$1,500,000	\$1,500,000	Enterprise
GW-12	C	City Park Irrigation Water Well	1	TBD			New							\$1,500,000	\$1,500,000	Enterprise
GROUNDWATER WELL TREATMENT																
WT-1	P	Well 11 - Treatment A/Bs	1, 2	Well 11			New		\$25,000						\$25,000	Enterprise
WT-2	P	Well 11 - Treatment PG&E	1, 2	Well 11											\$150,000	SRF ³
WT-3	C	Well 11 - Water Treatment	1, 2	Well 11											\$5,943,000	SRF ³
WT-4	C	Well 14 - Upgrades	1	Well 14			New		\$150,000						\$150,000	Enterprise
SURFACE WATER PROJECTS																
SW-1	C	DBP Mitigation	1, 2	SWTP			New		\$500,000						\$500,000	Enterprise
SW-2	C	Filter Bank D Renovations	1	SWTP			Replace		\$400,000						\$400,000	Enterprise
SW-3	C	Water Plant Upgrades	1, 2	SWTP			Replace			\$100,000					\$100,000	Enterprise
SW-4	C	Clarifier Renovations	1, 2	SWTP			Replace								\$10,000	Enterprise
SW-5	C	Turnout Upgrades	1	Canal Turnout			Replace			\$100,000	\$100,000				\$200,000	Enterprise
SW-6	C	Appurtenances (Approved CIP)	1	TBD			Replace		\$120,000	\$766,800	\$472,000	\$570,000	\$20,000		\$1,948,800	Enterprise
SW-7	C	Water Meters Digital Upgrade	1	TBD			Replace							\$2,000,000	\$2,000,000	Enterprise
STORAGE IMPROVEMENTS																
T-1	C	Storage Tank Improvements	1	TBD			Replace		\$450,000						\$450,000	Enterprise

P = Planning Project; C = Construction Project
¹ Project Listed in Draft Capital Improvement Plan Provided by the City.
² Project Proposed for Inclusion in CIP; additional details in Water Feasibility Study.
³ Supply Projects are potentially interchangeable based on timing and demand needs.

⁴ Planned well replacement by the year 2030, as a result of reaching useful life expectancy.
⁵ Additional well will be needed sometime after 2030 to address supply needs, as illustrated in Figure 3-1.
⁶ SRF refers to the California State Revolving Fund

SOLUTIONS

Table 3-12: Pipeline Projects Construction Cost

Project No.	Construction Cost	Construction Contingency (30%)	Engineering & Construction Management (18%)	Total Preliminary Cost Estimate
Fire Flow Projects				
F-1	\$391,900	\$117,600	\$70,500	\$580,000
F-2	\$391,900	\$117,600	\$70,500	\$580,000
F-3	\$192,900	\$57,900	\$34,700	\$285,500
F-4	\$162,300	\$48,700	\$29,200	\$240,200
F-5	\$208,200	\$62,500	\$37,500	\$308,200
F-6	\$398,000	\$119,400	\$71,600	\$589,000
F-7	\$55,100	\$16,500	\$9,900	\$81,500
F-8	\$116,300	\$34,900	\$20,900	\$172,100
F-9	\$61,200	\$18,400	\$11,000	\$90,600
F-10	\$499,000	\$149,700	\$89,800	\$738,500
Subtotal				\$3,665,600
Pipeline Replacement Projects				
P-1	\$412,000	\$123,600	\$74,200	\$609,800
P-2	\$199,000 ¹	\$59,700 ¹	\$35,800 ¹	\$294,500 ¹
P-3	Completed	Completed	Completed	--
P-4	\$398,000	\$119,400	\$71,600	\$589,000
P-5	\$413,300	\$124,000	\$74,400	\$611,700
P-6	\$391,900	\$117,600	\$70,500	\$580,000
P-7	\$382,700	\$114,800	\$68,900	\$566,400
P-8	\$413,300	\$124,000	\$74,400	\$611,700
Subtotal				\$3,253,300
¹ Remaining estimated cost, as project has already been partially completed.				

SOLUTIONS

Table 3-14: Groundwater Well Treatment Projects Construction Cost

Project Name	Project Description	Construction Cost	Construction Contingency (30%)	Engineering & Construction Management (18%)	Total Preliminary Cost Opinion
WT-1	Well 11 – Treatment Alternatives	--	--	--	\$25,000 ¹
WT-2	Well 11 – Treatment PS&E	--	--	\$150,000	\$150,000
WT-3	Well 11 - Treatment	\$5,943,000	--	--	\$5,943,000 ¹
WT-4	Well 14 Upgrades	\$150,000	--	--	\$150,000

¹ Costs already included in Draft CIP from City.

SOLUTIONS

Project No.	Project Type	Project Description	Notes	Project Limits	Project Specifics				Project Timing							Estimated Grand Total	Possible Funding Source	
					Ex. Size/ Diam.	New Size/ Diam.	Replace/ New	Length	2023-2024	2024-2026	2026-2028	2028-2027	2027-2028	2028-2029	2029-2030			
Pipelines																		
Varies (See Table 3-11)	C	Main Line Replacement/ Dead End Elimination	1, 2	TBD	8 in	8 in	Replace	1,300 ft	\$988,000	\$988,000	\$988,000	\$988,000	\$988,000	\$988,000	\$988,000	\$988,000	\$6,916,000	Enterprise
Groundwater Wells																		
GW-1	C	Drinking Water Test Well #1	1	TBD			New		\$300,000								\$300,000	Enterprise
GW-2	C	New Well #1 (Winter Demand)	2, 4	TBD		850 gpm	New			\$2,220,000							\$2,220,000	Enterprise
GW-3	C	New Well #1 Infrastructure	2	TBD			New			\$2,700,000							\$2,700,000	Enterprise
GW-4	C	Drinking Water Test Well #2	1	TBD			New				\$300,000						\$300,000	Enterprise
GW-5	C	New Well #2 (Winter Demand)	2,4	TBD		1,000 gpm	New					\$2,220,000					\$2,220,000	Enterprise
GW-6	C	New Well #2 Infrastructure	2	TBD			New					\$2,700,000					\$2,700,000	Enterprise
GW-7	C	Drinking Water Test Well															\$300,000	Enterprise
GW-8	C	Replacement Well															\$2,220,000	Enterprise
GW-9	C	New Well #3 (Winter Dema															\$2,220,000	Enterprise
GW-10	C	New Well #3 Infrastructure															\$2,700,000	Enterprise
GW-11	C	Harvard Park Irrigation We															\$1,500,000	Enterprise
GW-12	C	City Park Irrigation Water V															\$1,500,000	Enterprise
Ground Water Well Treatment																		
WT-1	P	Well 11 - Treatment A/Bs															\$25,000	Enterprise
WT-2	P	Well 11 - Treatment PG&E															\$150,000	SRF ³
WT-3	C	Well 11 - Water Treatment															\$5,943,000	SRF ³
WT-4	C	Well 14 - Upgrades															\$150,000	Enterprise
Surface Water Projects																		
SW-1	C	DBP Mitigation	1, 2	SWTP			New		\$500,000								\$500,000	Enterprise
SW-2	C	Filter Bank D Renovations	1	SWTP			Replace		\$400,000								\$400,000	Enterprise
SW-3	C	Water Plant Upgrades	1, 2	SWTP			Replace			\$100,000							\$100,000	Enterprise
SW-4	C	Clarifier Renovations	1, 2	SWTP			Replace			\$10,000							\$10,000	Enterprise
SW-5	C	Turnout Upgrades	1	Canal Turnout			Replace				\$100,000	\$100,000					\$200,000	Enterprise
SW-6	C	Appurtenances (Approved CIP)	1	TBD			Replace		\$120,000	\$766,800	\$472,000	\$570,000	\$20,000				\$1,948,800	Enterprise
SW-7	C	Water Meters Digital Upgrade	1	TBD			Replace									\$2,000,000	\$2,000,000	Enterprise
Tank Improvements																		
T-1	C	Storage Tank Improvements	1	TBD			Replace				\$450,000						\$450,000	Enterprise
Totals									\$2,833,000	\$12,727,800	\$2,310,000	\$8,578,000	\$1,308,000	\$3,208,000	\$10,808,000	\$38,872,800		

PROJECTED TOTAL PROJECT CAPITAL IMPROVEMENT NEEDED

\$38,872,800

P = Planning Project; C = Construction Project
¹ Project Listed in Draft Capital Improvement Plan Provided by the City.
² Project Proposed for Inclusion in CIP; additional details in Water Feasibility Study.
³ Supply Projects are potentially interchangeable based on timing and demand needs.
⁴ Planned well replacement by the year 2030, as a result of reaching useful life expectancy.
⁵ Additional well will be needed sometime after 2030 to address supply needs, as illustrated in Figure 3-1.
⁶ SRF refers to the California State Revolving Fund

WATER QUALITY & SAFETY

Current

- ✓ Fire Flow Supply
- ✓ Lead & Copper
- ✓ Corrosion Control
- ✓ Disinfection byproducts (DBP)
- ✓ Turbidity Exceedances
- ✓ Perchlorate & Nitrate- Well 11

Future

- ✓ Hexavalent Chromium (Cr6)
- ✓ 1, 2, 3 Trichloropropane (1,2,3-TCP)

KEY FINDINGS

The Water Feasibility Study has provided valuable information in regard to the challenges facing the City's water supply system and has recommended several projects to address these.

- Aging infrastructure and equipment Capital Improvement Plan.
 - Pose a significant risk to the reliability and safety of the water supply system
- Reliable Water Supply
- Quality & Safe Drinking Water

The city's water rates revenues are significantly below the existing expenditures and do not cover the cost of providing current water services neither Capital Improvement Projects

FISCAL IMPACT

Budget \$45,000

Spent to Date \$\$25,609.10

Funding Source: General Fund

Remanding Funds will go towards the preparation of a Grant application

RECOMMENDATION

City Staff recommends and requests that the City Council approve the Water Feasibility Study, its findings and recommendations

**To beginning a pathway towards the improvement of water reliability, quality and safety.
City growth & Economic Development.**