

Dana Reserve Water & Wastewater Phasing Evaluation

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Overview of Dana Reserve Development

- Residential Units: 1,289
- Public Parks and Streetscapes: 10.1 Acres
- Commercial: 4.7 Acres



Figure 1-1: Phasing Plan

Source: Dana Reserve Specific Plan

NCS D Water Demand Projections

Table 2-1: NCS D Projected District Water Demand by Year							
Land Use Type	Projected District Water Use ¹ (AF)						
	2024	2025	2026	2027	2028	2029	2030
Single Family	1,397	1,406	1,415	1,424	1,433	1,441	1,450
Multi-Family	135	136	136	137	138	139	140
Commercial	97	97	98	99	99	100	100
Landscape	263	265	267	268	270	272	273
Other	7	7	7	7	7	7	7
Agricultural Irrigation	18	18	18	18	18	18	18
Losses	189	190	191	192	194	195	196
District Subtotal²	2,106	2,119	2,132	2,145	2,159	2,172	2,184
Potential District Infill							
Annexations under Review	141	176	211	246	282	317	352
Sales to Other Agencies							
WMWC	0	417	417	417	417	417	417
GSWC	0	208	208	208	208	208	208
GSWCCR	0	208	208	208	208	208	208
Subtotal	0	833	833	833	833	833	833
TOTAL (AF)	2,247	3,128	3,176	3,224	3,274	3,322	3,369
NOTE:							
1. Year 2025 and 2030 projections from NCS D 2020 UWMP Table 4-2.							
2. Subtotals and total quantities have been rounded to the nearest AF.							

Phased Annual Water Demand Increases

Table 2-5: NCSD & Dana Reserve Projected District Water Use

Land Use Type	Projected Water Demand (AF)						
	2024	2025	2026	2027	2028	2029	2030
Single Family	1,397	1,406	1,415	1,424	1,433	1,441	1,450
Multi-Family	135	136	136	137	138	139	140
Commercial	97	97	98	99	99	100	100
Landscape	263	265	267	268	270	272	273
Other	7	7	7	7	7	7	7
Agricultural Irrigation	18	18	18	18	18	18	18
Losses	189	190	191	192	194	195	196
Subtotal	2,106	2,119	2,132	2,145	2,159	2,172	2,184
District Interconnections							
WMWC	0	417	417	417	417	417	417
GSWC	0	208	208	208	208	208	208
GSWCCR	0	208	208	208	208	208	208
Subtotal	0	833	833	833	833	833	833
Dana Reserve Project							
Single Family	26.9	65.4	118.9	167	211	230	230
Multi-Family	5.3	28.9	36.2	56.6	63.8	63.8	63.8
Commercial	2.7	5.4	23.4	31.1	33.8	36.5	36.5
Recreation/Park	-	-	-	9.6	9.6	9.6	9.6
Subtotal	34.9	99.7	179	264	318	340	340
TOTAL (AF)	2,141	3,051	3,144	3,242	3,310	3,345	3,357

Preliminary Hydraulic Modeling

- WaterCAD Model updated by MKN to evaluate phased water system improvements based on yearly development plans
- **Scenarios Modeled**
 - Current/future demand conditions (ADD, MDD, PHD, MDD + FF)
 - Delivery to WMWC, GSWC, GSWCCR, JRPS
- **Assessment Criteria**
 - System Pressure: 40 – 80 psi
 - Evaluation at nine (9) locations
 - Pipeline Velocity < 5 ft/s
- **Recommendations**
 - Deferred installation for Tefft St 16” Replacement; required at system buildout to maintain MDD + FF conditions
 - Upgrades required to maintain pressures at Sandydale Dr and Frontage Rd while preventing Futura Lane residual pressures from dropping under MDD + FF conditions

Recommended Pipeline Improvements

- **Project 1:** New 16” Main on North Oak Glen Dr (\$4,240,000)
- **Project 2:** New 16” HWY 101 Crossing at Sandydale Dr (\$1,490,000)
 - 2-year implementation
 - Prioritize as soon as CS/RS development begin
- **Project 3:** Extension of Water Service along N Frontage Rd (by Developer)
- **Project 4:** Willow EOL Connection (by Developer)
 - 2-year implementation
 - Should be completed by Developer during Phase 1 Development
- **Project 5:** 16” Main Replacement on Tefft St (\$8,770,000)
 - 2-year implementation
 - Can be deferred initially

Water Storage Analysis

- NCSD Population (2020): **13,771**
- NCSD Projection (2045): **16,031**
- Projection with Dana Reserve Maximum Development (2045): **18,398**

Storage Requirements	Existing Conditions ¹	Existing Conditions with Dana Reserve	Maximum Anticipated Infill Development ² with Dana Reserve
Fire	540,000	540,000	540,000
Equalization	952,489	1,108,198	1,256,843
Emergency	2,065,650	2,486,250	2,550,600
Total	3,558,139	4,134,448	4,347,443
Existing Above-Ground Storage Capacity	3,280,000	3,280,000	3,280,000
Gross Surplus/(Deficiency)	(278,139)	(854,448)	(1,067,443)

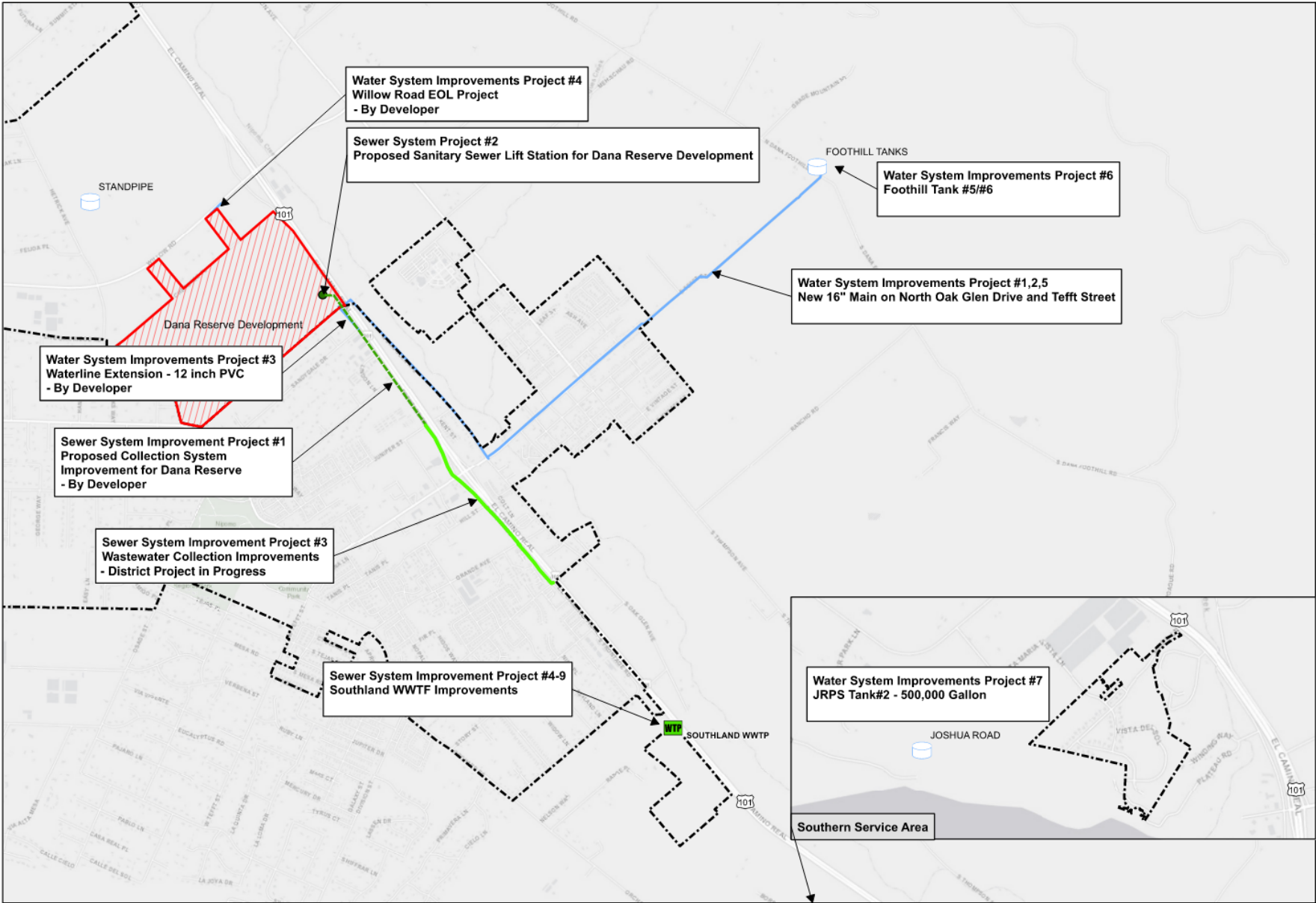
Notes:

1. Existing conditions based on 2019 NCSD customer usage data.
2. Maximum anticipated infill development based on current land development status and potential future development status.

Recommended Water Storage Improvements

- **Project 6: Foothill Tank Improvements** (\$4,950,000)
 - 2-year implementation
 - Necessary to meet existing deficiencies & future Dana Reserve demands
- **Project 7: Joshua Rd Pump Station Reservoir Improvements** (\$7,040,000)
 - 2-year implementation
 - Recommend completion prior to Residential Unit No. 1009

Proposed Water & Sewer System Improvements



NCSD Wastewater Demand Projections

Table 3-1: Annual District Wastewater Flow Projection

Flows	Projected District Wastewater Flows (GPD)							
	2024	2025	2026	2027	2028	2029	2030	2045
Existing District and County Service Area Flows ¹	591,246	591,246	591,246	591,246	591,246	591,246	591,246	591,246
Future District Service Area Flows ²	54,189	67,736	81,283	94,831	108,378	121,925	135,472	338,681
Future Blacklake Service Area ²	--	58,000	58,000	58,000	58,000	58,000	58,000	58,000
ADU Contributions ²	4,186	5,232	6,279	7,325	8,372	9,418	10,464	26,161
TOTAL (GPD)³	650,000	722,000	737,000	751,000	766,000	781,000	795,000	1,014,000

NOTES:

1. From Dana Reserve Evaluation Table 3-4
2. Flow Values from Dana Reserve Evaluation Table 3-5. Ultimate buildout of service area projected to occur in 2045 per the 2020 NCSD UWMP. The Blacklake Consolidation Project is anticipated to come online in the year 2025
3. Wastewater flow totals have been rounded to the nearest 1,000 GPD

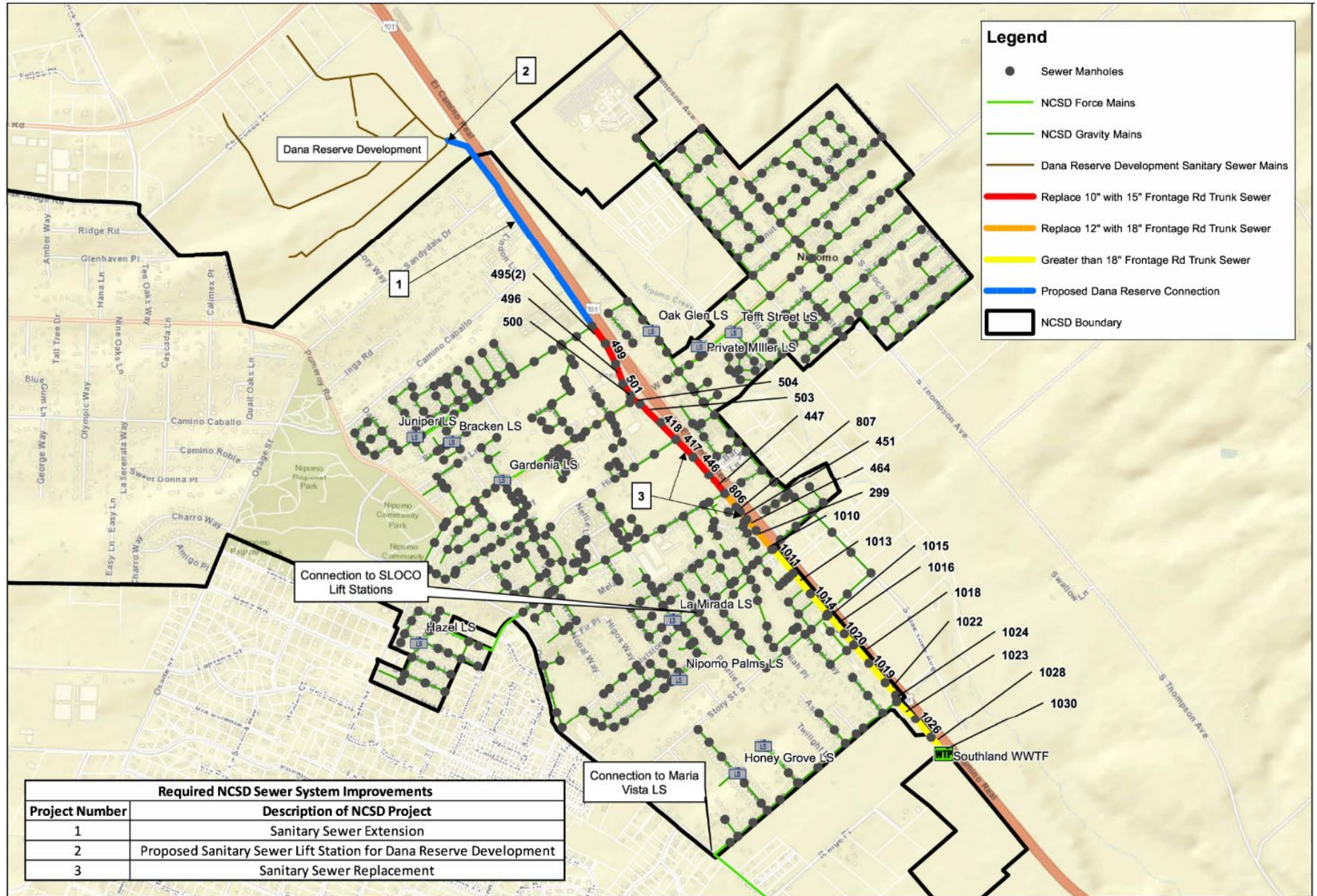
Phased Annual Wastewater Demand Increases

Table 3-4: Annual District Wastewater Flow Projection							
Flows	Projected Cumulative District Wastewater Flows (GPD) ¹						
	2024	2025	2026	2027	2028	2029	2030
Town and Blacklake Collection Areas							
Existing District and County Service Area Flows	591,246	591,246	591,246	591,246	591,246	591,246	591,246
Future District Service Area Flows	–	67,736	81,283	94,831	108,378	121,925	135,472
Future Blacklake Service Area	–	58,000	58,000	58,000	58,000	58,000	58,000
ADU Contributions	–	5,232	6,279	7,325	8,372	9,418	10,464
Subtotal (GPD)	592,000	723,000	737,000	752,000	766,000	781,000	796,000
Dana Reserve Project							
Single Family	14,351	34,915	63,469	89,212	112,735	122,944	122,944
Multi-Family	4,243	23,115	29,034	45,337	51,144	51,144	51,144
Commercial	2,163	4,327	18,748	24,950	27,113	29,277	29,277
Recreation/Park	–	–	–	5,530	5,530	5,530	5,530
Subtotal (GPD)	21,000	63,000	112,000	166,000	197,000	209,000	209,000
TOTAL (GPD)²	613,000	786,000	849,000	918,000	963,000	990,000	1,005,000
NOTES:							
1. Conversion factor: 1 AFY equals 892.022 gpd							
2. Wastewater flow totals have been rounded to the nearest 1,000 GPD							

Recommended Sewer System Improvements

- **Project 1:** Connection to Dana Reserve collection area (by Developer)
- **Project 2:** Sanitary Sewer Lift Station for Dana Reserve (by Developer)
 - Triplex lift station
 - Only one pump necessary to handle flows initially
 - 8-ft diameter, 12-ft deep wet well with submersible solids-handling pumps
 - Odor control system
 - Design for future PHF of 377 GPM
- **Project 3:** Frontage Rd Trunk Sewer Replacement (in progress by District)
 - Replace 10-inch with 3,500 LF 15-inch PVC between Juniper St & Grande Ave
 - Replace 12-inch with 1,170 LF 18-inch PVC between Grande Ave & Division St

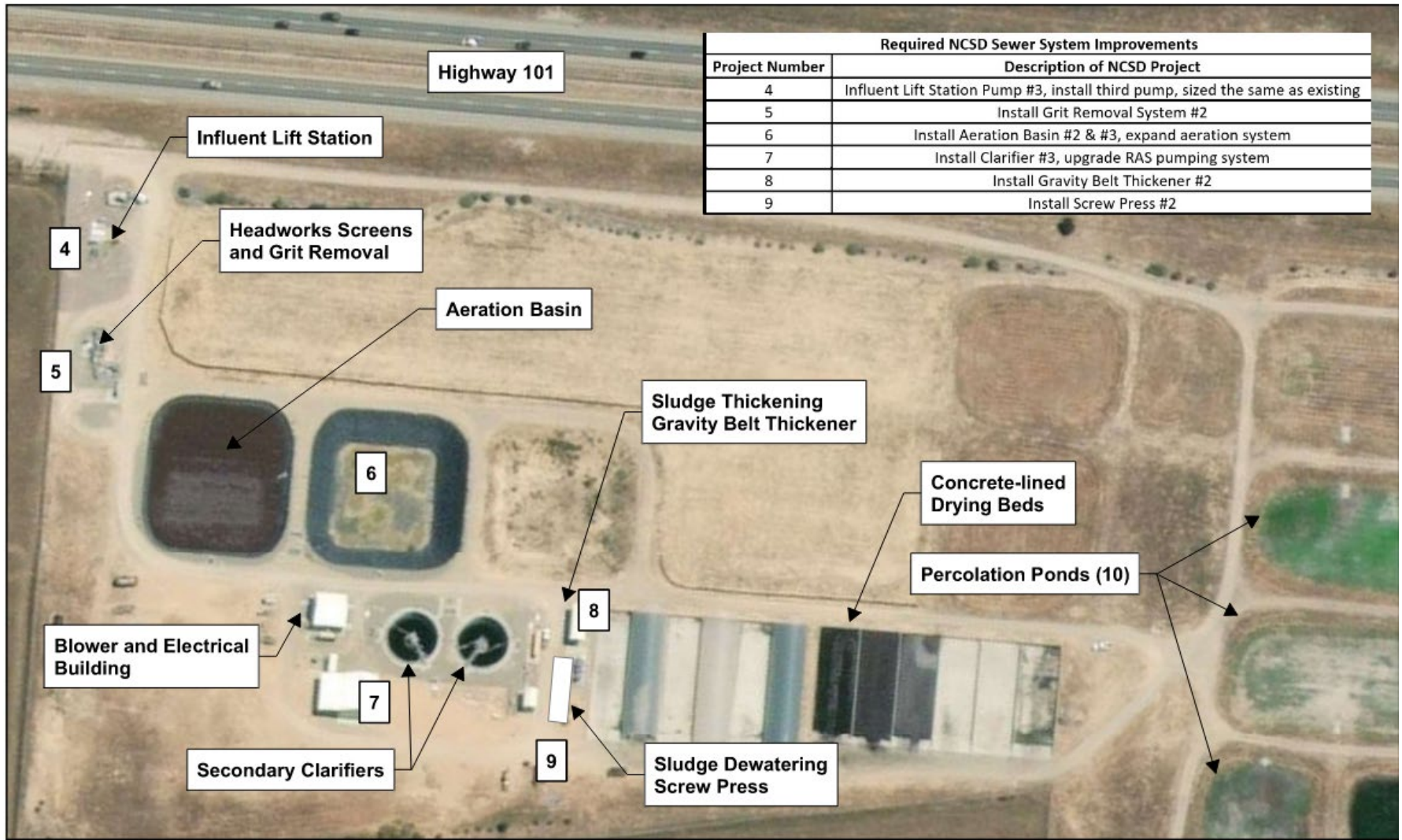
Proposed Wastewater Collection System Improvements



Recommended Southland WWTF Improvements

- **Project 4:** Influent LS Pump No.3 – new pump (\$100,000)
- **Project 6:** Install Aeration Basins No. 2 & 3 (\$5,580,000)
- **Project 8:** Install Gravity Belt Thickener No. 2 (\$1,300,000)
- **Project 9:** Install Screw Press No. 2 (\$2,380,000)
 - To be completed prior to completion of first residential unit
- **Project 7:** Install Clarifier No. 3 & upgrade RAS system (\$4,840,000)
 - To be completed prior to completion of residential unit no. 440
- **Project 5:** Install Grit Removal System (\$1,070,000)
 - To be completed prior to completion of residential unit no. 690

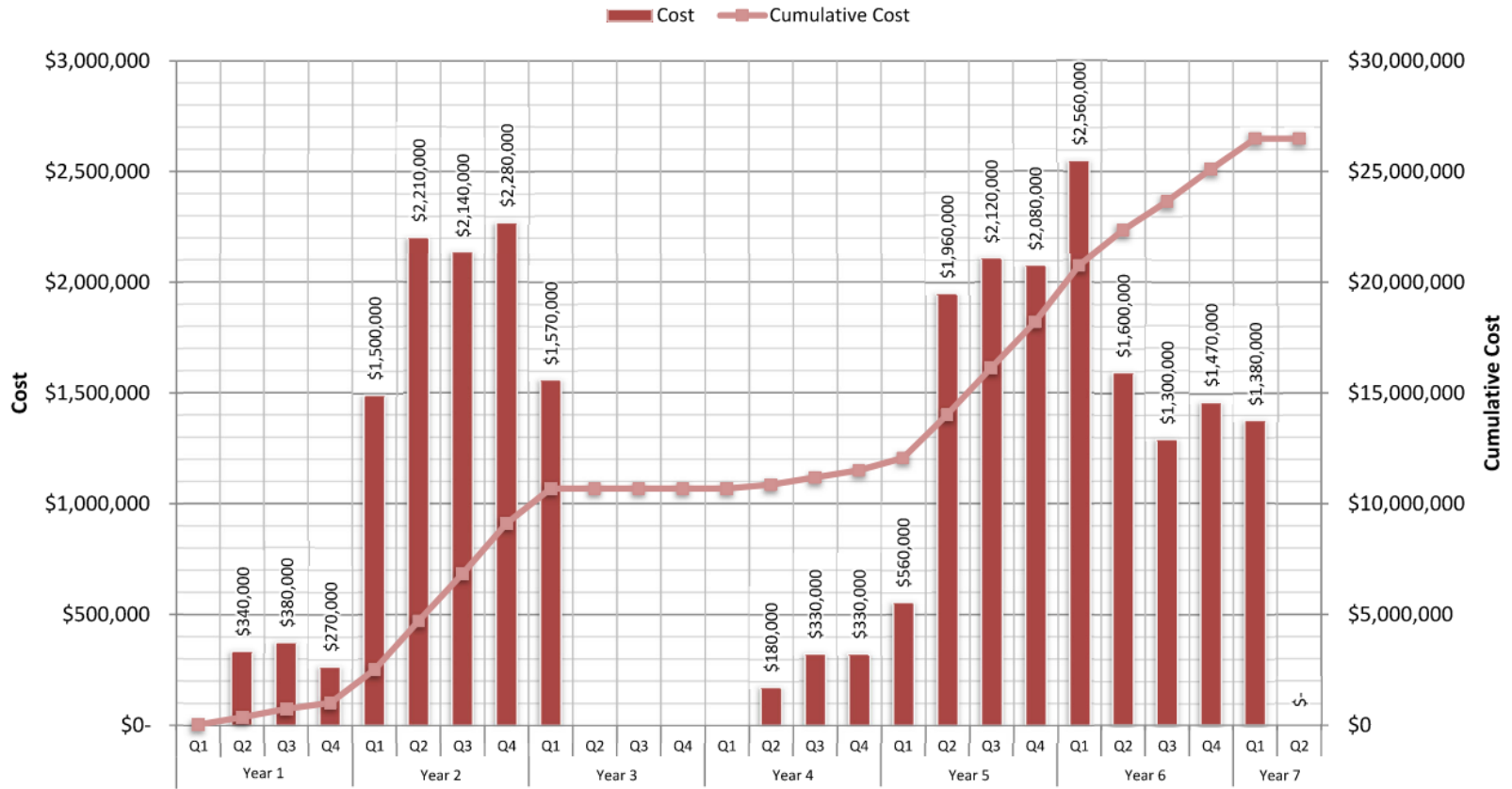
Proposed Southland WWTF Improvements



Summary of Water Project Cost Opinions

Project and Description	Engineering, Administration, & Construction Management	Construction	Contingency	Total
Project 1 – New 16” Main on North Oak Glen Drive	\$800,000	\$2,640,000	\$800,000	\$4,240,000
Project 2 – New 16” HWY 101 Crossing at Sandydale	\$280,000	\$930,000	\$280,000	\$1,490,000
Project 4 – Willow EOL Connection	Developer Funded			
Project 5 – 16” Main Replacement on Tefft Street	\$1,650,000	\$5,470,000	\$1,650,000	\$8,770,000
Project 6 – Foothill Tank Improvements	\$930,000	\$3,090,000	\$930,000	\$4,950,000
Project 7 – Joshua Road Pump Station Reservoir	\$1,360,000	\$4,500,000	\$1,180,000	\$7,040,000
Water Projects Subtotal	\$5,020,000	\$16,360,000	\$4,840,000	\$26,490,000

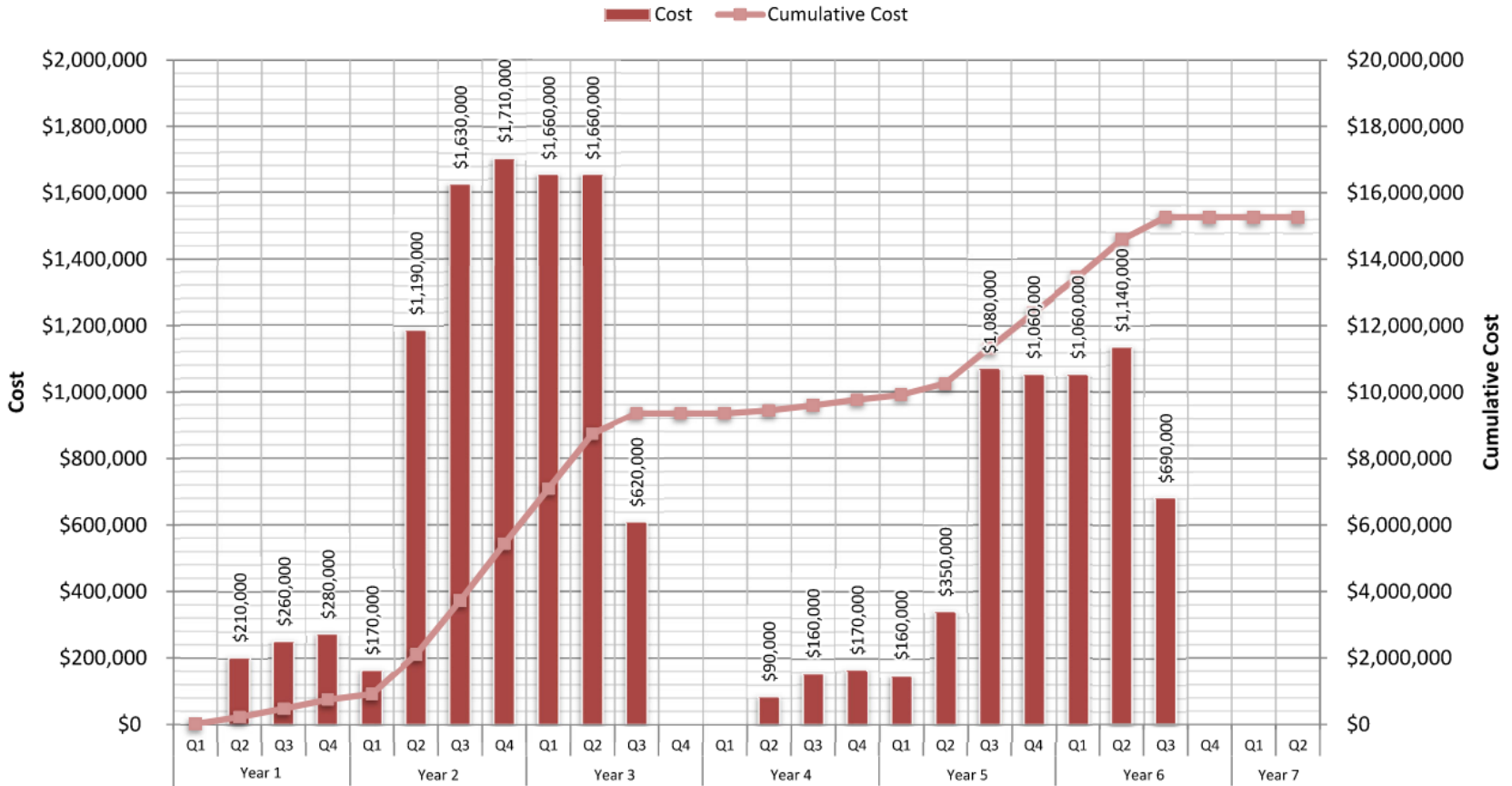
Water Projects Cash Flow Report



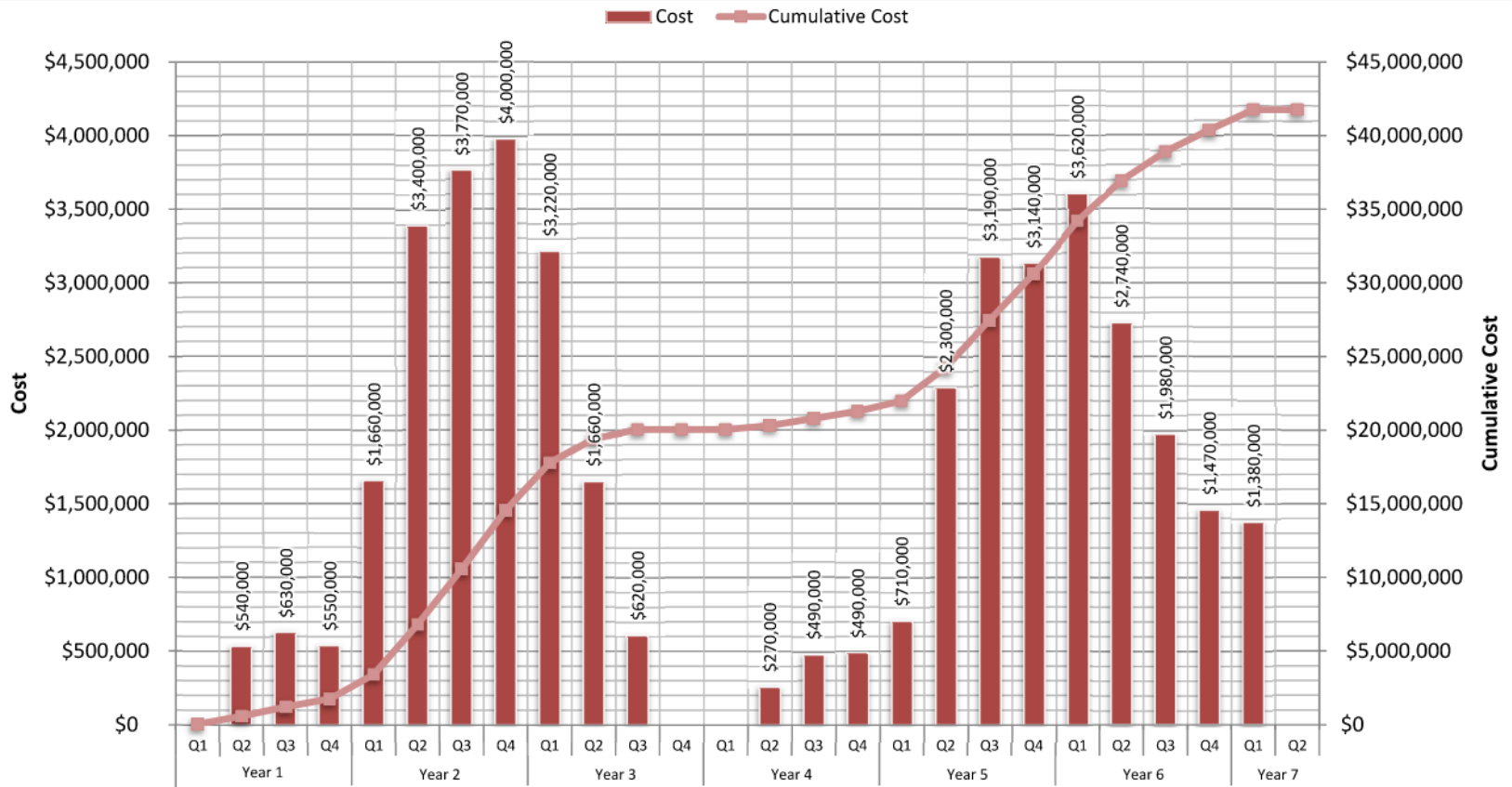
Summary of Wastewater Project Cost Opinions

Project and Description	Engineering, Administration, & Construction Management	Construction	Contingency	Total
Project 2A - Proposed Sanitary Sewer Lift Station, Force Main, and Wastewater Connection System Connection for Dana Reserve Development	Developer Funded			
Project 2B - Dana Reserve Lift Station Pump #3	Developer Funded			
Project 3 - Sanitary Sewer Replacement (Frontage Road Trunk Sewer Replacement)	In Progress – District Funded			
Project 4 - Influent Lift Station	\$20,000	\$60,000	\$20,000	\$100,000
Project 5 - Grit Removal	\$210,000	\$650,000	\$210,000	\$1,070,000
Project 6 - Extended Aeration Basins	\$1,050,000	\$3,480,000	\$1,050,000	\$5,580,000
Project 7 - Secondary Clarifiers	\$910,000	\$3,020,000	\$910,000	\$4,840,000
Project 8 - Gravity Belt Thickener	\$250,000	\$800,000	\$250,000	\$1,300,000
Project 9 - Dewatering Screw Press	\$450,000	\$1,480,000	\$450,000	\$2,380,000
Wastewater Projects Subtotal	\$2,890,000	\$9,490,000	\$2,890,000	\$15,270,000

Wastewater Projects Cash Flow Report



Combined Water + Wastewater Cash Flow Report





Questions