Attachment 1A

JURUPA COMMUNITY SERVICES DISTRICT

EASTVALE MASTER SEWER PLAN UPDATE

February, 2004

Prepared By
Albert A. Webb Associates

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INTRODUCTION

As requested by the District, Webb Associates has updated the Master Sewer Plan for the Eastvale area to include developments that have been submitted since our original report was completed in May, 1999. The results of our review are contained in this letter report, which is divided into the following sections:

- Introduction
- Projected Land Use
- Tributary Wastewater Drainage Areas
- Wastewater Design Flow Determination
- Hydraulic Analysis
- Cost Analysis
- Findings, Conclusions, and Recommendations

BACKGROUND

In May, 1999, Webb Associates completed a Master Sewer Plan for the Eastvale area. Since the completion of this report, several trunk sewer facilities have been designed and constructed (Plate 1). Additionally, more detailed development plans have been submitted to the District over the last five years in the form of the tentative tract maps and sewer improvement plans. Consequently, we have updated the May, 1999 report. The updated letter report includes revisions to the tributary wastewater drainage areas and land use projections. We have also conducted another hydraulic analysis of the proposed sewer system.

PROJECTED LAND USE

The land use projections incorporated in this revised sewer system are updated from the information presented in the May, 1999 report. The projected land uses in areas where developments are not currently proposed were based on the preliminary Riverside County Integrated Project (RCIP) Eastvale Area Land Use Plan. However, in cases where a proposed tentative tract has been submitted to the District, the projected land use was based upon the proposed development plans.

TRIBUTARY WASTEWATER DRAINAGE AREAS

The tributary wastewater drainage areas were adjusted based upon the street layouts in areas of proposed developments that have occurred in the last five years. Each tributary area ultimately drains to a point of collection in the proposed trunk sewer system. As with the original Master Plan, where no development plans were proposed, the general topography of the undeveloped areas was used to determine sewerage flow directions. The exact boundaries of these tributary areas may vary when future engineering plans are developed. Several tributary areas were reconfigured from the previous study. The revised tributary wastewater drainage areas are shown on Plate 2.

In addition to land use changes that have occurred during the last five years, two additional tributary areas have been included in this update. The May, 1999 report did not include the Santa Ana River Water Company (SARWC) as a tributary area. Because of the topography within the Water Company boundaries and the shared boarders with the District, it is probable that if sewerlines are ever constructed within the SARWC area, they would be tributary to the Eastvale trunk sewer system. Therefore, estimated potential wastewater flows from the SARWC were included in this study.

The second tributary area incorporated into this update includes an area that was previously proposed to flow to the SARI line that will now be tributary to the Eastvale trunk sewer system. The subject area is identified on Plate 2 as the "Proposed CFD Land Conservation Area".

WASTEWATER DESIGN FLOW DETERMINATION

The average daily wastewater flow was determined based upon the land uses for each tributary area. A wastewater generation factor was applied to each land use, summarized by the following:

- Residential (single family) 280 gpd/edu
- Residential (multi family) 160 gpd/edu
- Commercial 2,000 gpd/ac
- Industrial
  - Heavy 2,000 gpd/ac
  - Light 1,120 gpd/ac
- Schools
  - Elementary 10 gpd/student
  - Middle 15 gpd/student
  - High 25 gpd/student
- Infiltration 100 gpd/ac

A summary of the projected average daily wastewater flows is enclosed in Appendix A.

A peaking factor was applied to the wastewater flow quantities (average daily flows) to obtain the "design flow" to account for the diurnal flow rate variations. The peak factor utilized in this study was as follows:

$$Q_{peak} = 2.5Q_{ADF}^{(0.91)}$$

Where Q_{peak} and Q_{ADF} are in millions of gallons per day (mgd)

It should be noted that the District standard peak factor equation is somewhat conservative in comparison to recent District flow measurements (flow meter data) as indicted on Figure 1 and in comparison to other jurisdictions as shown on Figure 2.

HYDRAULIC ANALYSIS

The computer software utilized for hydraulic analysis and modeling was SewerCAD. Input for this model consisted of pipeline diameters, nodal elevations, pipe flow line elevations, and wastewater design flow quantities and locations. Based on this input information, the software calculated the pipeline capacities for the sewer system and determined if the pipeline diameters were sufficient for the design flows.

All pipelines in the proposed sewer system are trunk sewers which are 10" in diameter or larger. The maximum pipeline design capacity was based upon a maximum flow depth ("D") to diameter ("d") ratio (D/d) of 0.75. An assumed Manning's roughness coefficient "n" of 0.013 was taken into account as well except for a reach of pipeline along the Hall Avenue extension between Chandler Street and the River Road Lift Station. In this reach, a roughness coefficient of 0.009 was used to reflect the currently proposed pipeline design material of PVC lined RCP pipe. Nodal elevations of proposed sewerlines were based upon the natural terrain of the undeveloped regions, design slopes (if available), and minimum slope requirements for each pipe diameter.

All but one of the projected average daily flows shown in Appendix A were multiplied by the appropriate District standard peak factor and were applied to the computer model at the locations indicated on Plate 2. The one flow that did not follow this methodology was Tributary Area 1 ("Sky Country"), which is completely developed. The flow input into the model for Tributary Area 1 was based upon the highest actual peak flow that was measured by the District.

The results of the hydraulic computer analysis indicated five reaches of pipeline were over design capacity ($D/d \leq 0.75$) and three reaches of pipe were over the pipeline's full flow capacity. The pipelines that were over "design" capacity were still below full flow capacity thereby indicating pipe flow surcharging will not occur. The data for the three reaches of pipe theoretically over full flow capacity are shown on Table 1.

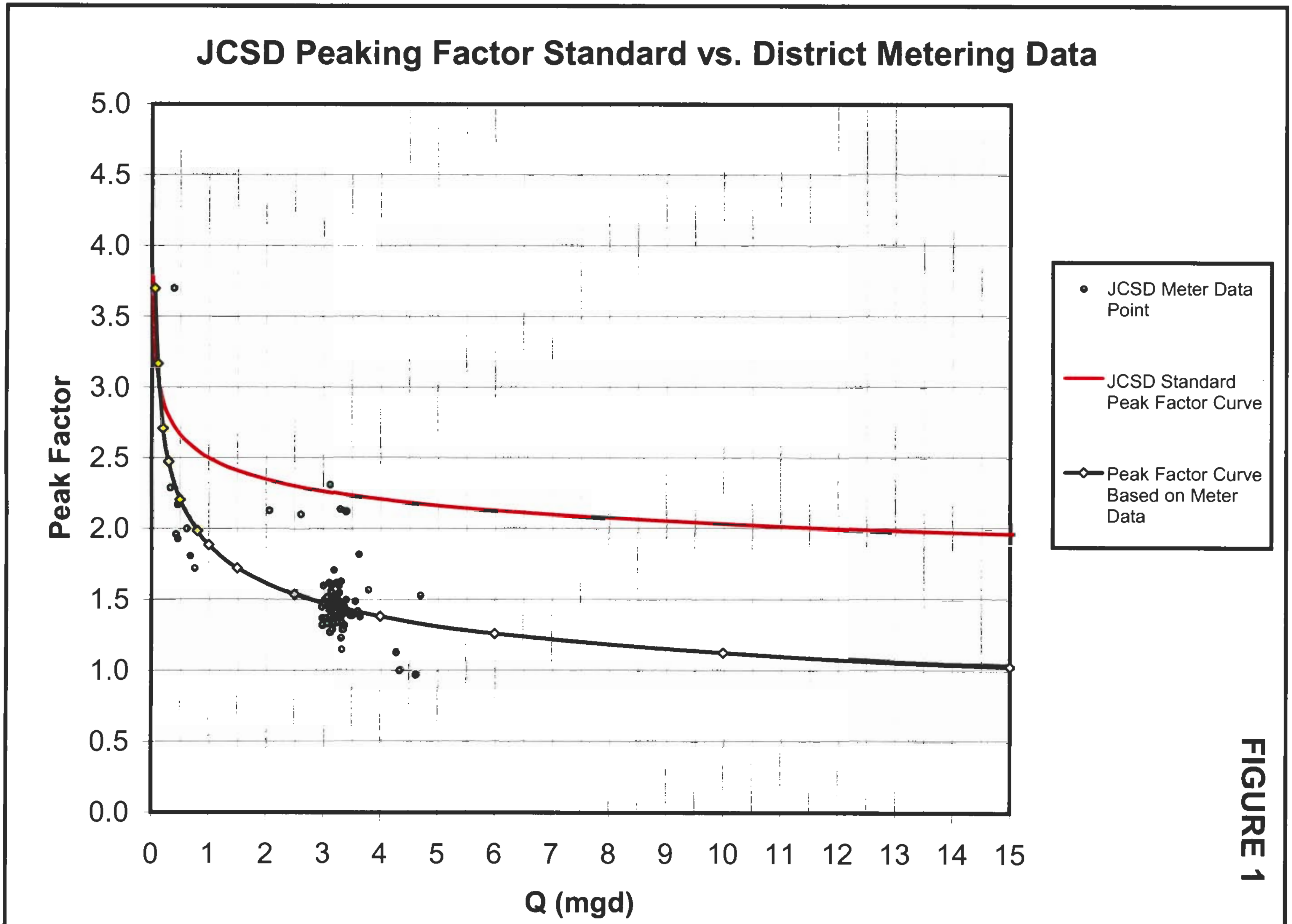

FIGURE 1

G:\2001\01-0288\Peaking Factor Study.xls

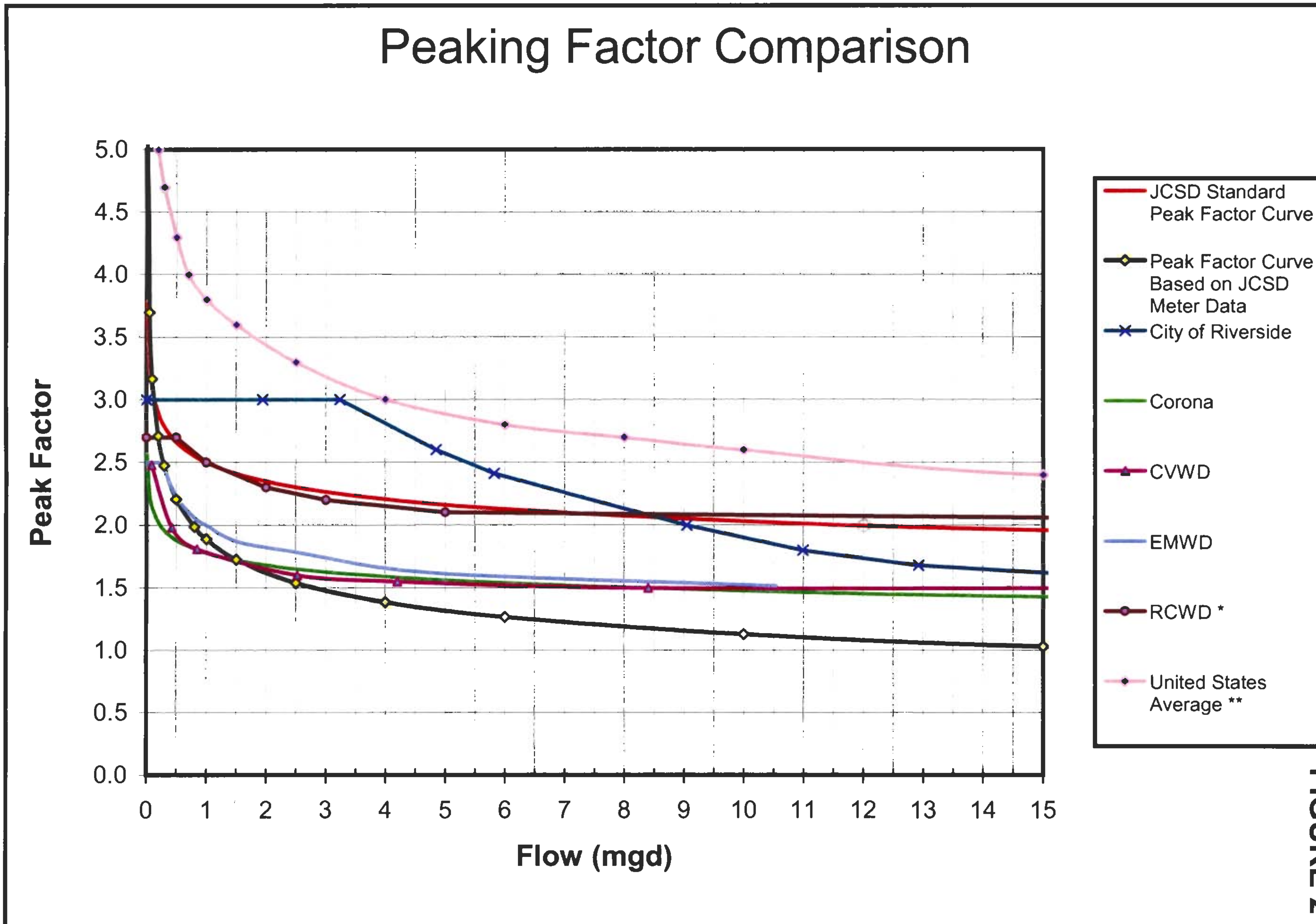

FIGURE 2

* Maximum flow rate of range used for curve.

** From Gravity Sanitary Sewer Design and Construction, 1982, ASCE Water Pollution Control Federation, p. 40. Peak on Maximum day.

G:\2001\01-0288\Peaking Factor Study.xls

Table 1 – Pipeline Reaches Requiring Additional Capacity Review

Reach	Pipeline Reach Description	Modeled Pipeline Peak Flow (mgd)	Full Pipe Capacity (mgd)	Percentage Above Full Pipe Capacity
A	Cleveland Avenue north of Schleisman Road	3.70	3.54	4.5%
B	Citrus Street between Sumner Avenue & Cleveland Avenue	10.29	8.37 ✓	22.9%
C	Easement pipeline between Hamner Avenue & Tract 28784	5.74	5.41	6.1%

Reaches A and C are not of a concern since, as previously stated, the District's peak factor equation is conservative and the theoretical percentage above full flow pipe capacity is small. Further investigation of Reach B indicated the peak factor (District standard) applied to this reach was 2.2. As shown on Figure 2, this peak factor, for a projected average daily flow of 4.4 mgd, is much higher than other local jurisdictions. Further, the Eastvale computer model was also analyzed using the District's actual metered peak factor curve shown on Figure 1. The results of the analysis utilizing the actual experienced peak flows indicated all pipelines as shown on Plate 1 would flow at a capacity below the District standard design flow criteria ($D/d \leq 0.75$). Therefore, the Eastvale plan sewer system shown on Plate 1 is adequate to convey the projected wastewater peak flows.

COST ANALYSIS

Pipelines

The unit costs used for sewerlines include pipeline material and installation, manholes, asphalt concrete removal, disposal, and replacement. Construction costs were determined by reviewing the three lowest bids of similar recent projects and through a cost study where a "generic bid" was sent to three prominent contractors in the area. The generic bid was based on the assumptions that an average project for the District would consist of 2,500 linear feet of pipe, and that asphalt concrete roads would be removed, disposed of, and replaced. Road reconstruction was assumed to be 25 feet wide with 4 inches of AC pavement over 8 inches of Class II base. The average depth of the pipe was assumed to be 20 ft and would require B-2 bedding. It was assumed nine, 5 ft diameter manholes would be installed for each project. Not included in the unit cost estimates are extraordinary construction items such as bore casings, dewatering, rock removal, etc… A summary of these estimated unit costs are as shown on Table 2.

Table 2 – Estimated Unit Cost of Pipelines

Sewer Line Dia. (in.)	Construction Cost	Project Cost*
10	$145.00	$205.00
12	$165.00	$230.00
15	$175.00	$245.00
18	$195.00	$275.00
21	$210.00	$295.00
24	$240.00	$335.00
27	$260.00	$365.00
30	$290.00	$405.00
36	$335.00	$470.00
39	$400.00	$560.00
42	$440.00	$615.00
48	$485.00	$680.00

**Project cost is 1.4 times construction cost rounded to nearest $5. Project cost includes: construction cost, construction contingencies, design engineering including plans and specifications; design and construction surveying and mapping; geotechnical evaluation and report; engineering contract administration; field inspection and basic environmental documentation. Costs are based on Engineering New Record (E.N.R.). The Engineering news Record Construction Cost Index for the Los Angeles Areas for October 2003 was utilized. This value is 7,543.67. Escalation, financing, interest during construction, legal, land, R.O.W. agent, and environmental impact report costs are not included in construction costs. Additionally, not included in the unit cost estimates are extraordinary construction items such as bore casings, dewatering, rock removal etc...*

Lift Station, Forcemain, and Treatment Plant Capacity

Additional lift station, forcemain, and treatment plant capacity project costs associated with the Eastvale Master Sewer Plan update include the River Road lift station and force main and wastewater treatment capacity purchase at the Western Riverside County Regional Wastewater Reclamation Plant (WRCRWRP). The River Road lift station and force main estimated project cost is $6,650,000[1]. The purchase of treatment plant capacity at WRCRWRP was assumed to reflect the current costs to construct a wastewater treatment plant. Presently, due to the increasing costs of solids treatment and disposal, a typical unit construction cost is $8/gallon. Using an estimated unit construction cost of $8/gallon multiplied by the projected ultimate average daily flow of 9.6 mgd and the aforementioned 1.4 project cost factor, the total estimated project cost for treatment is $107,520,000. The project cost could be even more considering that the increasing cost for solids treatment and disposal is amongst other unknowns.

[1] *"River Road Lift Station Preliminary Design Report", November 2003, prepared by Albert A. Webb Associates.*

A summary of the estimated project costs for the Eastvale sewer system are shown on Table 3. As shown on Table 3, the total project cost estimate of the updated sewer system is about $140 million.

Table 3 – Estimated Project Cost Summary

Master Plan Improvement	Estimated Project Cost
Trunk & Interceptor Sewerlines	$ 25,330,000[1,2,3]
River Road Lift Station & Associated Force Mains	$ 6,650,000[2,3]
Treatment Plant Capacity Purchase at WRCRWRP	$107,520,000
Total Estimated Project Cost	$139,500,000

[1] *Refer to Appendix B for Details*
[2] *Total estimated construction cost rounded up to the nearest $10,000.*
[3] *Project is 1.4 times the construction cost. Project cost includes: construction cost, construction contingencies, design engineering including plans and specifications; design and construction surveying and mapping; geotechnical evaluation and report; engineering contract administration; field inspection and basic environmental documentation. Costs are based on Engineering New Record (E.N.R.). The Engineering news Record Construction Cost Index for the Los Angeles Areas for October 2003 was utilized. This value is 7,543.67. Escalation, financing, interest during construction, legal, land, R.O.W. agent, and environmental impact report costs are not included in construction costs.*

FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

As summarized in Appendix A, the total projected average daily wastewater flow for the Eastvale area is about 9.6 MGD. This amount is approximately 1.4 MGD greater than the 8.2 MGD projected in the original report primarily due to additional flows from the Santa Ana River Water Company area and the CFD land conversion area. The updated projected development estimates 27,838 dwelling units as opposed to the original report that projected 24,657 dwelling units. Finally, the estimated project cost of the updated Eastvale Master Sewer Plan improvements is $139,500,000.

We have concluded that the proposed trunk sewer system as shown on Plate 1 is adequately sized to accommodate the projected design flows. As such, it is our recommendation that the Master Sewer Plan for the Eastvale area be amended as described in this letter report.

REGISTERED PROFESSIONAL ENGINEER
WALLACE H. FRANZ
No. 26979
Exp. 3-31-05
CIVIL
STATE OF CALIFORNIA

APPENDIX A

TRIBUTARY WASTEWATER DRAINAGE AREA AVERAGE DAILY FLOWS

JURUPA COMMUNITY SERVICES DISTRICT
EASTVALE MASTER SEWER PLAN UPDATE

Appendix A. Projected Ultimate Land Use and Average Daily Flow
By Tributary Drainage Area

Tributary Drainage Area No.[1]	Area (ac)	Residential[2]: Rural Residential (<0.2 du/ac)	Very Low Density (0.4-2 du/ac)	SP125-W (2du/ac)	Low Density (2-5 du/ac)	Medium Density (5-8 du/ac)	Med-High Density (8-14 du/ac)	High Density (14-20 du/ac)	# of edu's	Proposed Developments: Tract Number	Area (ac)	du's	Total # of edu's	Q_{ADF}[3] (gpd)	Commercial: Retail (ac)	Office (ac)	Community Centers (ac)	Industrial[4]: Light (ac)	Heavy (ac)	Business Park (ac)	Public Facilities (ac)	Comm/Ind Q_{ADF}[5] (gpd)	Schools: No. of Students (each)	Q_{ADF}[7] (gpd)	City Overlay (ac)	Conservation (ac)	Conservation Habitat (ac)	Open Space: Recreation (ac)	Rural (ac)	Water (ac)	Mineral Resources (ac)	Agricultural (ac)	Highway (ac)	Total Q_{ADF} (gpd)
E1[8]	1,026.5		41.1	939.4	18.9				2,037				2,037	570,360	2.8							5,600	730	7,300				4.8						583,260
E2	155.2								0		83.7	297	297	83,160								0	800	8,000				19.4						91,160
									0		37.1	118	118	33,040								0												33,040
E3	194.3								0		22.8	67	67	18,760								0						10.0						18,760
									0		29.8	140	140	39,200								0												39,200
									0		26.5	112	112	31,360								0												31,360
									0		24.6	89	89	24,920	80.6							161,200												186,120
E4	131.1								0	TT 29124	60.5	265	265	74,200	70.6							141,200												215,400
E5	73.3				46.1				185				185	51,800	17.2							34,400						16.0						86,200
E6	68.8		68.8						138				138	38,640								0												38,640
E7	237.1				53.5				214	TT 28783	38.8	143	357	99,960								0												99,960
									0	TT 28784	67.3	260	260	72,800								0												72,800
									0	TT 29093	47.5	187	187	52,360								0												52,360
									0	TT 29115	30.0	132	132	36,960								0												36,960
E8	152.8					77.8			545		25.6	322[6]	729	204,120	49.4							98,800												302,920
E9	168.2								0		81.7	438[6]	250	70,080	86.5							173,000												243,080
E10	153.3								0		49.6	244	244	68,320								0												68,320
									0		59.9	738[6]	422	118,080								0												118,080
									0		43.8	282[6]	161	45,120								0												45,120
E11	97.1								0	TT 28910	59.3	180	180	50,400								0												50,400
									0	TT 28933	37.8	172	172	48,160								0												48,160
E12	80.2								0				0	0						80.2		160,400												160,400
E13	83.1				83.1				332				332	92,960								0												92,960
E14	107.2				107.2				429				429	120,120								0												120,120
E15	170.0								0	TT 28520	60.1	205	205	57,400	26.6							53,200	800	12,000										122,600
									0	TT 28943	83.3	364	364	101,920								0												101,920
E16	155.8				44.0				176	TT 28945	43.2	151	327	91,560								0												91,560
									0	TT 28946	68.6	271	271	75,880								0												75,880
E17	321.3				106.3				425	TT 28880	115.7	499	924	258,720								0	800	8,000				34.3						266,720
									0	TT 29334	56.0	200	200	56,000								0												56,000
E18	83.1				83.1				332				332	92,960								0												92,960
E19	21.0				21.0				84				84	23,520								0												23,520
E20	152.6								0				0	0			152.6					305,200												305,200
E21	40.5				0.0				0				0	0								0	1,750	43,750										43,750
E22	120.3				60.2				241				241	67,480								0	1,750	43,750										111,230
E23	94.2								0	TT 30633	77.6	318	318	89,040	16.6							33,200												122,240
E24	74.3								0	TT 29207	66.3	251	251	70,280								0						8.0						70,280
E25	39.7								0	TT 2[illegible]208	39.7	151	151	42,280								0												42,280
E26	40.1								0	TT 28821	40.1	158	158	44,240								0												44,240
E27	38.9								0	TT 28821	34.2	158	158	44,240								0						4.7						44,240
E28	39.3								0	TT 28621	16.5	89	89	24,920								0												24,920
									0	TT 28622	22.8	84	84	23,520								0												23,520
E29	62.0				62.0				248				248	69,440								0												69,440
E30	79.9				50.5				202	TT 29533	29.4	119	321	89,880								0												89,880
E1-E30	4,261.2	0.0	109.9	939.4	735.9	77.8	0.0	0.0	*5,588*		1,579.8	6,568	12,029	*3,368,160*	350.3	0.0	152.6	0.0	0.0	80.2	0.0	*1,166,200*	6,630.0	*122,800*	0.0	0.0	0.0	91.2	0.0	0.0	0.0	0.0	0.0	*4,657,160*

[1] Refer to Plate 2.

[2] Land use designations for tributary areas E1-E30 were determined from Eastvale Area Land Use Plan for the Riverside County Integrated Project, April 2001.
The following densities were used to calculate residential land uses: Rural Residential (0.2 du/ac); Very Low Density (2 du/ac); SP125-W (2du/ac); Low Density (4 du/ac); Medium Density (7 du/ac); Medium-High Density (12 du/ac); High Density (18 du/ac)

[3] Based on 280 gpd/edu and 160 gpd for mobile homes and multi-family units.

[4] Distinction between "light" and "heavy" industrial land use is based on air and noise pollution factors; wastewater generation is assumed equal for both land uses.

[5] Commercial and industrial wastewater flow quantities are based on 2,000 gpd/ac.

[6] Total number of multi-family units. Converted to edu's by multiplying by 160/280.

[7] Based on type of school and number of studunts: 10gpd/stu for elementary; 15gpd/stu for middle; 25gpd/stu highschool

[8] Area No. 25 will be included in the Sky Country tributary area (Area No. E1) because there is a sewer that connects No. 25 to the north east portion of the Sky Country Development.

Infiltration/inflow (not shown on this table) was factored into SewerCAD calculations for final pipe designs.

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EASTVALE MASTER SEWER PLAN UPDATE

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E31	80.2				41.7				167	TT 29104	38.5	157	324	90,720								0												90,720
E32	199.2								0	TT 28623	19.1	83	83	23,240								0						15.6						23,240
									0	TT 28624	20.4	97	97	27,160								0												27,160
									0	TT 28641	31.2	117	117	32,760								0												32,760
									0	TT 28642	29.2	106	106	29,680								0												29,680
									0	TT 28643	20.7	95	95	26,600								0												26,600
									0	TT 28644	29.4	119	119	33,320								0												33,320
									0	TT 29248	33.6	139	139	38,920								0												38,920
E33A	39.9				39.9				160				160	44,800								0												44,800
E33B	162.3				89.5				358	TT 27591	29.5	15	373	104,440								0												104,440
									0	TT 28742	43.3	200	200	56,000								0												56,000
E34	318.4								0	TT 28369	27.6	126	126	35,280	10.4							20,800	800	12,000				25.3						68,080
									0	TT 28387	26.6	121	121	33,880								0												33,880
									0	TT 28388	23.6	109	109	30,520								0												30,520
									0	TT 28680	25.9	119	119	33,320								0												33,320
									0	TT 28681	37.2	98	98	27,440								0												27,440
									0	TT 28682	22.4	112	112	31,360								0												31,360
									0	TT 28683	20.5	80	80	22,400								0												22,400
									0	TT 28684	20.3	81	81	22,680								0												22,680
									0	TT 28685	16.6	118	118	33,040								0												33,040
									0	TT 28686	26.0	109	109	30,520								0												30,520
									0	TT 28687	36.0	153	153	42,840								0												42,840
E35	174.6		26.7		147.9				645				645	180,600								0												180,600
E36	234.1				31.0				124	TT 29148	129.8	487	611	171,080				65.3				73,136						8.0						244,216
E37	161.8				161.8				647				647	181,160								0												181,160
E38	165.1								0				0	0				165.1				184,912												184,912
E39	153.4				153.4				614				614	171,920								0												171,920
E40	217.0		20.7		177.0				749	TT 30480	19.3	50	799	223,720								0												223,720
E41	140.7				73.8				295				295	82,600				66.9				74,928												157,528
E42	143.2				76.8				307				307	85,960				66.4				74,368												160,328
E43	49.1				49.1				196				196	54,880								0												54,880
E44	59.7				59.7				239				239	66,920								0												66,920
E45	54.9		25.6		29.3				168				168	47,040								0												47,040
E46	310.5				169.2				677	TT 30480	99.3	256	933	261,240								0												261,240
									0	TT 29677	42.0	173	173	48,440								0												48,440
E47	198.0				133.9				536	TT 29677	64.1	263	799	223,720								0												223,720
E48	63.1				63.1				252				252	70,560								0												70,560
E49	147.9				147.9				592				592	165,760								0												165,760
E50	75.7								0				0	0								0							75.7					0
Swan Lake																																		
J25																							2,750	68,750				50.3						68,750
CFD Conv.	652												3,400	952,000																				952,000
SARWC	1,664												2,100	588,000																				588,000
E31-E50	3,148.8	0.0	73.0	0.0	1,645.0	0.0	0.0	0.0	6,726		932.1	3,583	10,309	2,886,520	10.4	0.0	0.0	363.7	0.0	0.0	0.0	428,144	800.0	12,000	0.0	0.0	0.0	48.9	75.7	0.0	0.0	0.0	0.0	3,326,664
Eastvale[9]	7,410.0	0.0	182.9	939.4	2,380.9	77.8	0.0	0.0	12,314.0		2,511.9	10,151	22,338	6,254,680	360.7	0.0	152.6	363.7	0.0	80.2	0.0	1,594,344	7,430.0	134,800	0.0	0.0	0.0	140.1	75.7	0.0	0.0	0.0	0.0	7,983,824
Tributary Total	9,726	0	182.9	939.4	2,380.9	77.8	0.0	0.0	12,314.0	0.0	2,511.9	10,151	27,838	7,794,680	360.7	0	152.6	363.7	0.0	80.2	0.0	1,594,344	10,180.0	203,550	0	0	0	190.4	75.7	0.0	0.0	0.0	0.0	9,592,574

[1] Refer to Plate 2.
[2] Land use designations for tributary areas E31-E50 were determined from Eastvale Area Land Use Plan for the Riverside County Integrated Project, April 2001.
The following densities were used to calculate residential land uses: Rural Residential (0.2 du/ac); Very Low Density (2 du/ac); SP125-W (2du/ac); Low Density (4 du/ac); Medium Density (7 du/ac); Medium-High Density (12 du/ac); High Density (18 du/ac)
[3] Based on 280 gpd/edu and 160 gpd for mobile homes and multi-family units.
[4] Distinction between "light" and "heavy" industrial land use is based on air and noise pollution factors; wastewater generation is assumed equal for both land uses.
[5] Commercial and industrial wastewater flow quantities are based on 2,000 gpd/ac.
[6] None
[7] Based on type of school and number of students: 10gpd/stu for elementary; 15gpd/stu for middle; 25gpd/stu highschool
[8] Area No. 25 will be included in the Sky Country tributary area (Area No. E1) because there is a sewer that connects No. 25 to the north east portion of the Sky Country Development.
[9] Eastvale Subtotal consists of tributary areas E1-E50
[10] The District Total for this spreadsheet totalizes areas within the tributary boundaries only. Areas outside the tributary areas but withing the District Boundaries account for approximately 3,800 acres, therefore, the total area within the District is
[11] Total District Residential EDU's (Households)
Infiltration/inflow (not shown on this table) was factored into SewerCAD calculations for final pipe designs.

APPENDIX B

PIPELINE COST ESTIMATES

APPENDIX B
PIPELINE COST ESTIMATES

Nodal Map Pipe Reach Label	Description	Quantity	Unit	Unit Price	Construction Cost	Project Cost[1]
1	10 inch	1,168	LF	$145	$169,360	$237,104
2	10 inch	1,232	LF	$145	$178,640	$250,096
3	10 inch	1,436	LF	$145	$208,220	$291,508
4	10 inch	2,070	LF	$145	$300,150	$420,210
5	15 inch	720	LF	$175	$126,000	$176,400
6	18 inch	2,145	LF	$195	$418,275	$585,585
7	42 inch	1,263	LF	$440	$555,720	$778,008
8	42 inch	46	LF	$440	$20,240	$28,336
9	42 inch	1,985	LF	$440	$873,400	$1,222,760
10	42 inch	300	LF	$440	$132,000	$184,800
11	42 inch	3,000	LF	$440	$1,320,000	$1,848,000
12	42 inch	202	LF	$440	$88,880	$124,432
13	12 inch	367	LF	$165	$60,555	$84,777
14	12 inch	2,306	LF	$165	$380,490	$532,686
15	12 inch	2,248	LF	$165	$370,920	$519,288
16	NOT USED					
17	NOT USED					

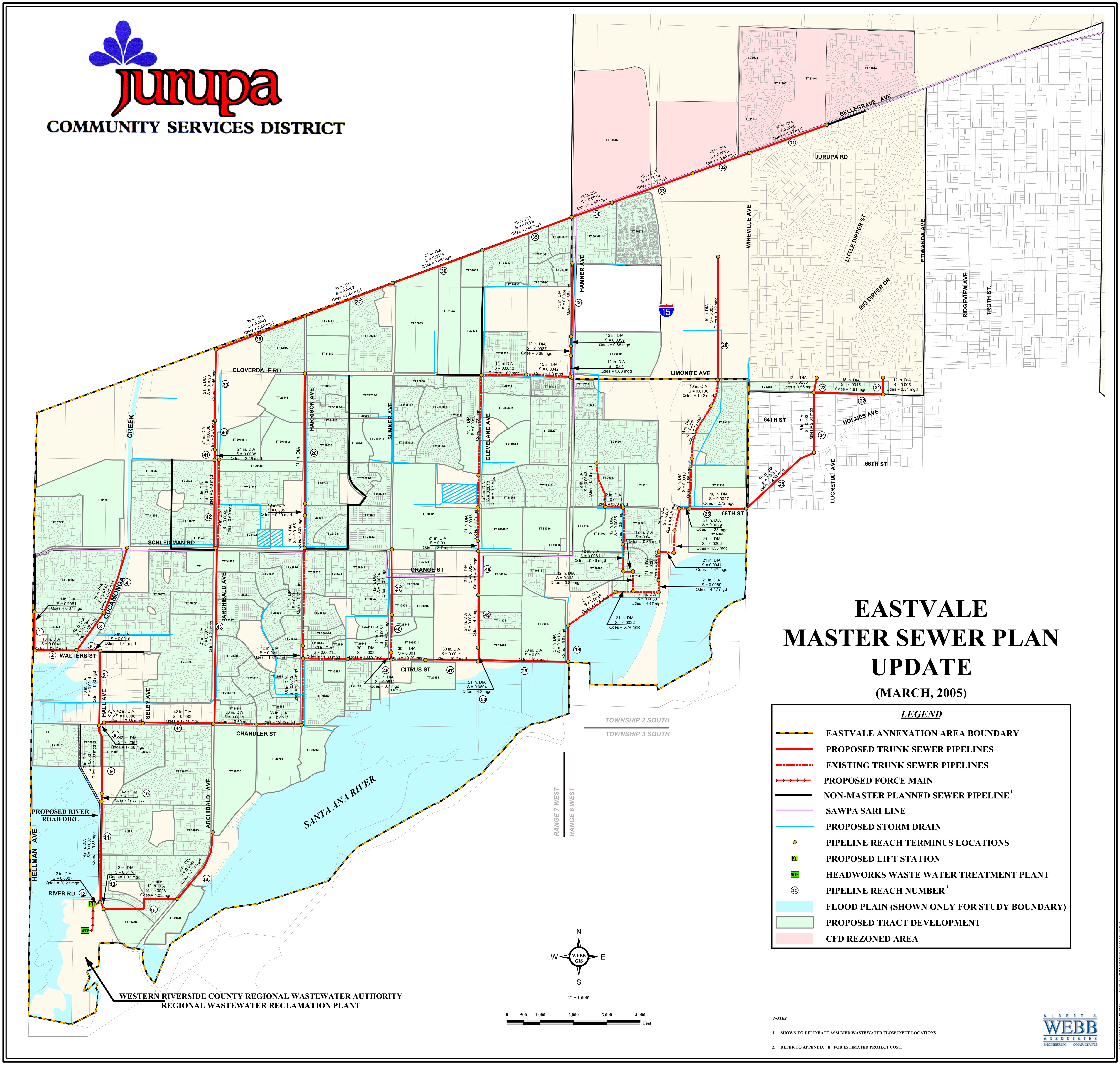
Nodal Map Pipe Reach Label	Description	Quantity	Unit	Unit Price	Construction Cost	Project Cost[1]
18	NOT USED					
19	27 inch	1,122	LF	$260	$291,686	$408,360
20	10 inch	3,650	LF	$145	$529,250	$740,950
21	12 inch	670	LF	$165	$110,550	$154,770
22	15 inch	1,950	LF	$175	$341,250	$477,750
23	12 inch	860	LF	$165	$141,900	$198,660
24	18 inch	1,806	LF	$195	$352,170	$493,038
25	18 inch	2,664	LF	$195	$519,480	$727,272
26	18 inch	1,976	LF	$195	$385,320	$539,448
27	12 inch	1,972	LF	$165	$325,380	$455,532
28	10 inch	4,000	LF	$145	$580,000	$812,000
29	30 inch	2,641	LF	$290	$765,867	$1,072,214
30	12 inch	2,170	LF	$165	$358,050	$501,270
31	10 inch	2,351	LF	$145	$340,939	$477,315
32	12 inch	1,588	LF	$165	$262,020	$366,828
33	15 inch	2,830	LF	$175	$495,250	$693,350
34	18 inch	1,297	LF	$195	$252,915	$354,081
35	18 inch	2,829	LF	$195	$551,655	$772,317

APPENDIX B
PIPELINE COST ESTIMATES

Nodal Map Pipe Reach Label	Description	Quantity	Unit	Unit Price	Construction Cost	Project Cost[1]
36	21 inch	2,833	LF	$210	$594,930	$832,902
37	21 inch	2,826	LF	$210	$593,460	$830,844
38	21 inch	2,841	LF	$210	$596,610	$835,254
39	21 inch	2,181	LF	$210	$458,010	$641,214
40	21 inch	856	LF	$210	$179,760	$251,664
41	21 inch	345	LF	$210	$72,450	$101,430
42	21 inch	2,570	LF	$210	$539,700	$755,580
43	21 inch	5,270	LF	$210	$1,106,700	$1,549,380
44	42 inch	2,115	LF	$440	$930,600	$1,302,840
45	12 inch	106	LF	$165	$17,490	$24,486
46	12 inch	1,203	LF	$165	$198,495	$277,893
47	30 inch	1,322	LF	$290	$383,380	$536,732
48	21 inch	1,325	LF	$210	$278,250	$389,550
49	21 inch	1,262	LF	$210	$264,957	$370,940
50	21 inch	350	LF	$210	$73,500	$102,900
Totals:		84,269	LF		**$18,094,824**	**$25,330,000**

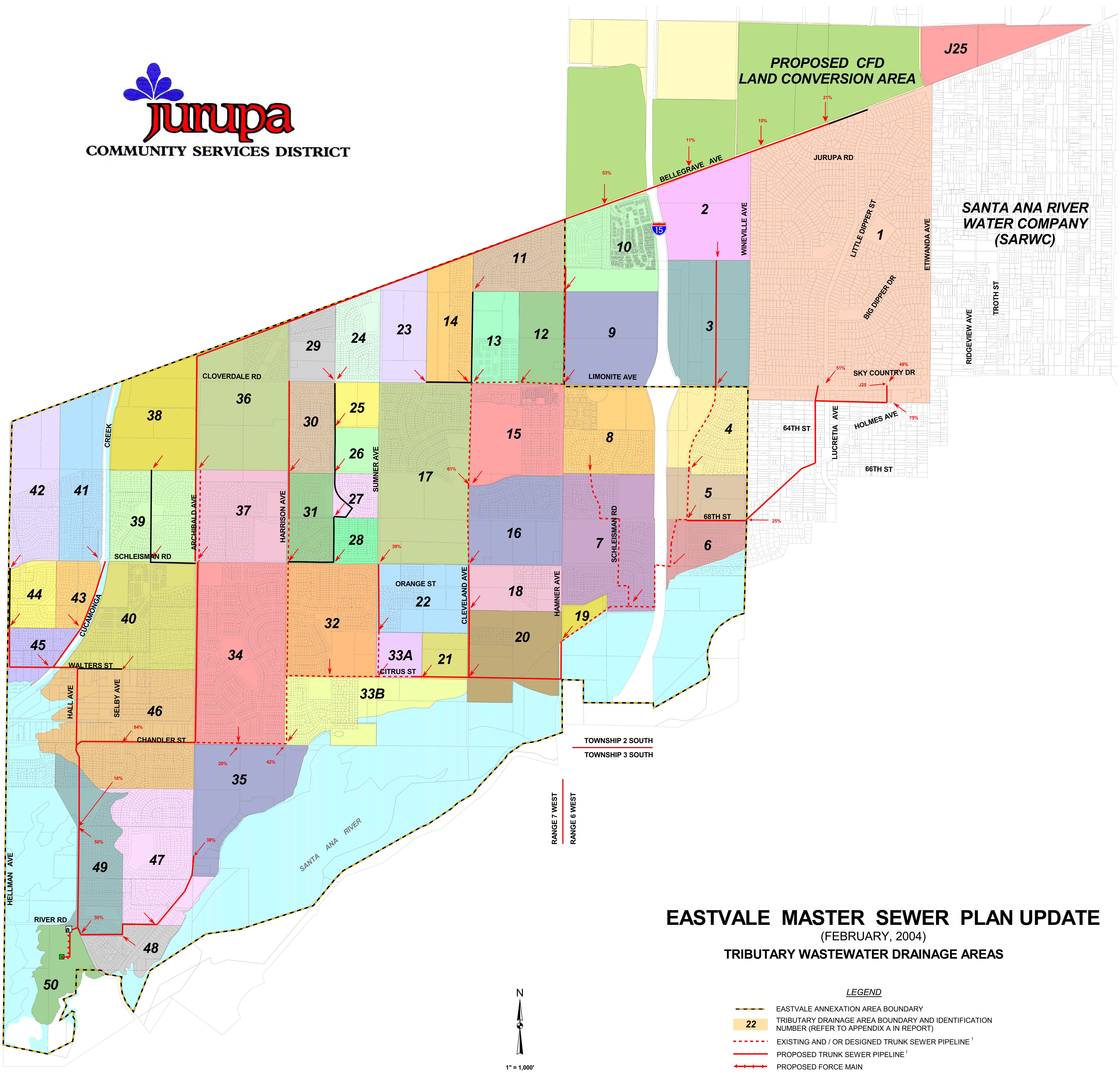
[1]Project cost is 1.4 times construction cost rounded to nearest $10,000. Project cost includes: construction costs, construction contingencies, design engineering including plans and specifications; design and construction surveying and mapping; geotechnical evaluation and report; engineering contract administration; field inspection and basic environmental documentation. Costs are based on Engineering News Record(ENR) The Engineering News Record Construction Cost Index (Los Angeles) for October, 2003 is 7,543.67 Escalation, financing, interest during construction, legal, land, R-O-W agent, and environmental impact report costs are not included.

Plate 1



Jurupa
COMMUNITY SERVICES DISTRICT
EASTVALE
MASTER SEWER PLAN
UPDATE
(MARCH, 2005)
LEGEND
EASTVALE ANNEXATION AREA BOUNDARY
PROPOSED TRUNK SEWER PIPELINES
EXISTING TRUNK SEWER PIPELINES
PROPOSED FORCE MAIN
NON-MASTER PLANNED SEWER PIPELINE 1
SAWPA SARI LINE
PROPOSED STORM DRAIN
PIPELINE REACH TERMINUS LOCATIONS
PROPOSED LIFT STATION
HEADWORKS WASTE WATER TREATMENT PLANT
PIPELINE REACH NUMBER 2
FLOOD PLAIN (SHOWN ONLY FOR STUDY BOUNDARY)
PROPOSED TRACT DEVELOPMENT
CFD REZONED AREA
NOTES:
1. SHOWN TO DELINEATE ASSUMED WASTEWATER FLOW INPUT LOCATIONS.
2. REFER TO APPENDIX "B" FOR ESTIMATED PROJECT COST.
WESTERN RIVERSIDE COUNTY REGIONAL WASTEWATER AUTHORITY
REGIONAL WASTEWATER RECLAMATION PLANT
PROPOSED RIVER ROAD DIKE
SANTA ANA RIVER
TOWNSHIP 2 SOUTH
TOWNSHIP 3 SOUTH
RANGE 7 WEST
RANGE 6 WEST
N
S
E
W
1" = 1,000'
0
500
1,000
2,000
3,000
4,000
Feet
JURUPA RD
BELLEGRAVE AVE
LIMONITE AVE
CLOVERDALE RD
SCHLEISMAN RD
ORANGE ST
CITRUS ST
CHANDLER ST
WALTERS ST
RIVER RD
68TH ST
66TH ST
64TH ST
HOLMES AVE
HAMNER AVE
WINEVILLE AVE
ETIWANDA AVE
RIDGEVIEW AVE.
TROTH ST.
LITTLE DIPPER ST
BIG DIPPER DR
LUCRETIA AVE
CLEVELAND AVE
SUMNER AVE
HARRISON AVE
ARCHIBALD AVE
SELBY AVE
HALL AVE
HELLMAN AVE
CUCAMONGA
CREEK
ALBERT A. WEBB ASSOCIATES
ENGINEERING CONSULTANTS

PLATE 2



EASTVALE MASTER SEWER PLAN UPDATE

(FEBRUARY, 2004)

TRIBUTARY WASTEWATER DRAINAGE AREAS

LEGEND

- EASTVALE ANNEXATION AREA BOUNDARY
- 22 TRIBUTARY DRAINAGE AREA BOUNDARY AND IDENTIFICATION NUMBER (REFER TO APPENDIX A IN REPORT)
- EXISTING AND / OR DESIGNED TRUNK SEWER PIPELINE [1]
- PROPOSED TRUNK SEWER PIPELINE [1]
- PROPOSED FORCE MAIN
- NON-MASTER PLANNED SEWER PIPELINE SHOWN TO DELINEATE ASSUMED WASTEWATER FLOW INPUT LOCATIONS
- APPROXIMATE WASTEWATER INPUT LOCATION FOR TRIBUTARY AREA (INPUT IS 100% UNLESS OTHERWISE ANNOTATED)
- U PROPOSED SEWER LIFT STATION

[1] 8" DIAMETER PIPELINES ARE NEITHER SHOWN NOR CONSIDERED TO BE TRUNK SEWERS AND ARE ASSUMED TO BE CONSTRUCTED BY PRIVATE DEVELOPERS.

ALBERT A. WEBB ASSOCIATES
ENGINEERING CONSULTANTS